

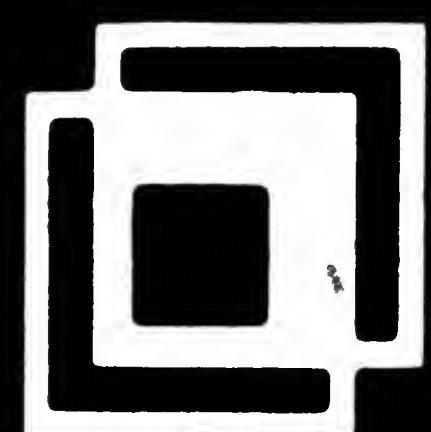
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OFFICIAL GAZETTE  
UNITED STATES  
PATENT OFFICE  
VOL NO 1037

DECEMBER  
1983

MICRO PHOTO DIVISION



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Vol. 1037 Number 1

# OFFICIAL GAZETTE

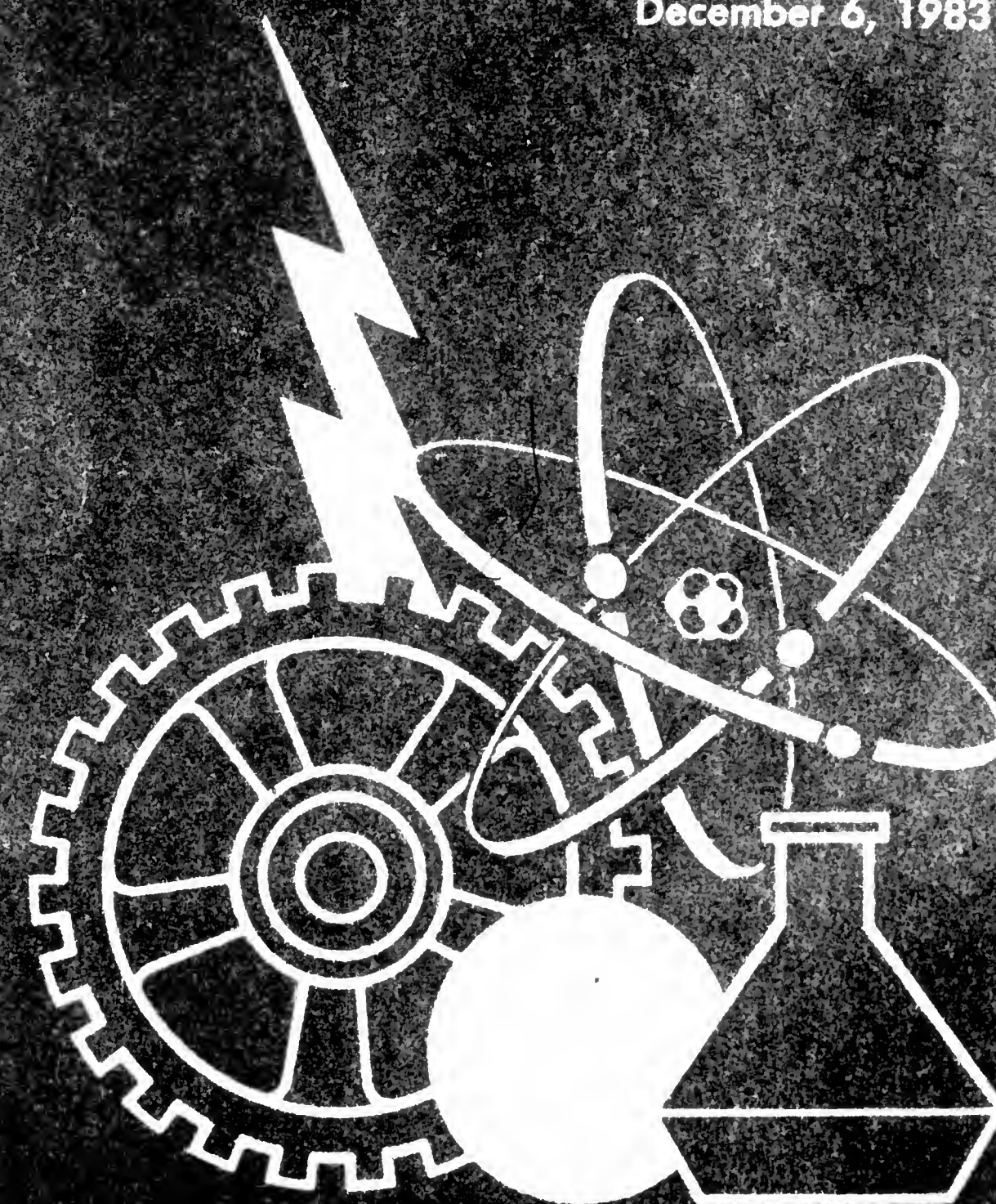
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PATENTS

December 6, 1983



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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	\$ 125.00
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• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
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Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,  
Commissioner of Patents  
and Trademarks.

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,282,287, Re. S.N. 532,037, Filed Sept. 14, 1983, Cl. 428/437, BIOCHEMICAL AVIDIN-BIOTIN MULTIPLE-LAYER SYSTEM, Roger W. Giese, Owner of Record: Inventor, Attorney or Agent: Richard P. Crowley, Ex. Gp.: 164

4,286,671, Re. S.N. 528,267, Filed Aug. 31, 1983, Cl. 172/253, KIT FOR CONVERTING A ROTARY TILLER INTO A PLOW, James A. Mays, Owner of Record: Inventor, Attorney or Agent: Frank E. Robbins, et al., Ex. Gp.: 334

4,287,948, Re. S.N. 529,061, Filed Sept. 2, 1983, Cl. 166/170, TUBULAR MEMBER INTERIOR WIPER, Archie K. Haggard, Owner of Record: Inventor, Attorney or Agent: James F. Weiler, et al., Ex. Gp.: 356

4,387,268, Re. S.N. 530,805, Filed Sept. 9, 1983, Cl. 524/285, NUCLEATION AGENTS FOR CRYSTALLINE POLYMERS, Nicholas Vanderkooi, Jr., et al., Owner of Record: Allied Chemical Corp., Morris Township, N.J., Attorney or Agent: Richard A. Negin, Ex. Gp.: 142

## REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,168,315, Reexam. No. 90/000,466, Requested: Nov. 7, 1983, Cl. 424/276, DIANISYL THIAZOLE COMPOUND, COMPOSITIONS AND METHOD OF ANTITHROMBOTIC TREATMENT, Ronald H. Rynbrandt, et al., Owner of Record: Upjohn Co., Kalamazoo, Mich., Attorney or Agent: John Killinger, Ex. Gp.: 125, Requester: Upjohn Co., Kalamazoo, Mich.

## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,891,375, Vandamme and Rouyer, APPARATUS FOR THE PRODUCTION OF HIGH BULK YARN; 3,165,881, de Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; 3,232,037, Henri Crouzet, FALSE-TWIST SPINDLE; 3,584,450, Henri Crouzet, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, filed Feb. 1, 1977, D.C., M.D.N.C. (Greensboro), Doc. C-77-47-G, Milliken Research Corp., et al. v. Collins & Aikman Corp. Stipulation and Order of Dismissal that complaint and counterclaim are dismissed with prejudice filed Jan. 21, 1980.

2,891,375, Vandamme and Rouyer, APPARATUS FOR THE PRODUCTION OF HIGH BULK YARN; 3,012,397, Henri Servage, METHOD OF MAKING HIGH-BULK YARNS; 3,165,881, de Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; 3,232,037, Henri Crouzet, FALSE-TWIST SPINDLE; 3,584,450, Henri Crouzet, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, filed Oct. 15, 1976, D.C., M.D.N.C. (Greensboro), Doc. C-76-550-G, Deering Milliken Research Corp., et al. v. Sapona Mfg. Co., Inc. Stipulation of Dismissal that complaint and counterclaim be dismissed with prejudice filed July 31, 1980.

3,012,397. (See 2,891,375.)

3,098,210, Smiths Industries Ltd., ECHO RANGING AND LIKE SYSTEMS, filed Dec. 11, 1978, D.C., S.D.N.Y., Doc. 78-Civ-5940 RJW, Smiths Industries Ltd. v. Simrad A.S. Same, filed Nov. 7, 1979, D.C., M.D. Fla. (Tampa), Doc. 79-1150-Civ-T-GC, Smiths Industries Ltd. v. KGS Marine, Inc. Same, filed Nov. 19, 1979, D.C., E.D. Calif. (Sacramento), Doc. S 79-875 PCW, Smiths Industries Ltd. v. BayMar. Same, filed Nov. 19, 1979, D.C., S.D. Fla. (Miami), Doc. 79-5420-CIV-EBD, Smiths Industries Ltd. v. Southern Marine Research, Inc.

3,153,436, Mary Jane Schmidt, SPIRAL MEAT SLICER, filed June 1, 1979, D.C. Colo. (Denver), Doc. 79-C-646, Mary Jane Schmidt v. Hickory Baked Ham Co. Stipulated Judgment dismissing claims and counterclaims filed Oct. 30, 1979.

3,165,881. (See 2,891,375.)

3,190,973, Gentex Corp., RIGID SHELL HELMET AND RIGGING AND SOUND ATTENUATING MEANS THEREFOR; 3,241,154, same, SAFETY

HELMETS; 3,470,564, same, SAFETY HELMET WITH SOUND ATTENUATING EARCUPS, filed July 31, 1981, D.C., E.D. Pa. (Philadelphia), Doc. 81-3077, Gentex Corp. v. Intamar Logistics, Inc.

3,226,833, Jerome H. Lemelson, AUTOMATIC INSPECTION APPARATUS AND METHOD; 3,636,635, same, AUTOMATIC MEASUREMENT APPARATUS; 3,481,042, same, SURFACE SENSING APPARATUS, filed Apr. 20, 1983, D.C. Del. (Wilmington), Doc. 83-220, Intertech Licensing Corp. v. Brown & Sharpe Mfg. Co. Same, filed Apr. 20, 1983, D.C. Del. (Wilmington), Doc. 83-221, Intertech Licensing Corp. v. The Bendix Corp. Same, filed Apr. 20, 1983, D.C. Del. (Wilmington), Doc. 83-222, Intertech Licensing Corp. v. E. Letz, Inc.

3,232,037. (See 2,891,375.)

3,241,154, Gentex Corp., SAFETY HELMETS; 3,470,564, same, SAFETY HELMET WITH SOUND ATTENUATING EARCUPS; 3,619,814, same, PROTECTIVE HELMET WITH ADJUSTABLE HEADBAND, filed Jan. 14, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80-0195, Gentex Corp. v. Emge Aviation-Marine Products, Inc. Plaintiff's Patent Nos. 3,241,154, 3,470,564 and 3,619,814 are valid and have been infringed by defendant. Defendant is permanently enjoined and restrained from further infringing Plaintiff's patents. Filed Mar. 24, 1981.

3,241,154. (See 3,190,973.)

3,247,969, Fiestaglass Pool Products, Inc., SWIMMING POOL, filed Dec. 31, 1979, D.C. Ariz. (Phoenix), Doc. 79-1048 PHX, Fiestaglass Pool Products, Inc., et al. v. Paddock Pool Construction Co., et al.

3,267,934, William E. Thornton, ELECTROCARDIAC COMPUTER, filed Feb. 6, 1979, D.C. Colo. (Denver), Doc. 79-F-120, Del Mar Avionics v. International Medical Corp. Order for Dismissal filed Dec. 10, 1979.

3,311,990, Donald E. Wright, LEVEL, filed Jan. 2, 1980, D.C., N.D. Ill. (Chicago), Doc. 80C0004, Empire Level Mfg. Corp. v. Cotter & Co., Inc.

3,317,994, Southwire Co., METHOD OF CONDITIONING METAL FOR HOT FORMING; 3,623,532, same, CONTINUOUS PICKLING OF CAST ROD; 3,672,430, same, METHOD OF PRODUCING A HOT-FORMED COPPER-BASE PRODUCT; 3,716,423, same, HOT-FORMED COPPER-BASE PRODUCT; 4,129,170, same, APPARATUS FOR PRODUCING A HOT-FORMED PRODUCT, filed Aug. 9, 1979, D.C., N.D. Tex. (Amarillo), Doc. CA-2-79-131, Asarco, Inc. v. Southwire Co. Complaint and action dismissed without prejudice on Mar. 10, 1980.

3,355,714, Hewlett-Packard Co., ON-LINE COMPUTING SYSTEM FOR PROCESSING MATHEMATICAL FUNCTIONS; 3,523,282, same, CALCULATOR; 3,825,736, same, CALCULATOR WITH PROVISION FOR EFFICIENTLY MANIPULATING FACTORS AND TERMS, filed Dec. 21, 1979, D.C., S.D.N.Y., Doc. 79-Civ-6932, Hewlett-Packard Co. v. Unisonic Products Corp.

3,414,254, Norfin, Inc., SHEET COLLATING DEVICE, filed Feb. 15, 1979, D.C. Colo. (Denver), Doc. 79-F-158, International Business Machines Corp. v. Norfin, Inc. Order for Dismissal with prejudice filed Nov. 27, 1979.

3,442,692, The Proctor & Gamble Co., METHOD OF CONDITIONING FABRICS; 3,686,025, same, TEXTILE SOFTENING AGENTS IMPREGNATED INTO ABSORBENT MATERIALS; 3,743,534, same, PROCESS FOR SOFTENING FABRICS IN A DRYER; 3,944,694, same, ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER; 3,956,556, same, ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER, filed Oct. 4, 1977, D.C.,

N.D. Ohio (Toledo), Doc. C77-520, Papercraft Corp., et al. v. The Proctor & Gamble Co. Plaintiff is permanently enjoined and restrained from further infringing Defendant's patents per Consent Judgment filed Feb. 27, 1978.

3,464,568, Peter K. Hexter, TOWEL BAR CONSTRUCTION, filed Jan. 25, 1980, D.C.N.J. (Newark), Doc. 80-225, Peter K. Hexter and Lanape Products, Inc. v. Melard Mfg. Corp. Order of dismissal of action filed Oct. 28, 1980.

3,470,564. (See 3,190,973 and 3,241,154.)

3,476,898, Unimax Switch Corp., PIVOT FOR SNAP-ACTING SWITCH, filed Jan. 11, 1980, D.C., N.D. Ill. (Chicago), Doc. 80 C 169, Unimax Switch Corp. v. Otto Engineering, Inc. Cause dismissed with prejudice and without costs per Stipulation and Order dated Aug. 27, 1980.

3,481,042. (See 3,226,833.)

3,523,282. (See 3,355,714.)

3,584,450. (See 2,891,375.)

3,599,038, Nordson Corp., APPARATUS AND SYSTEMS FOR HIGH-VOLTAGE ELECTROSTATIC CHARGING OF PARTICLES; 3,731,145, same, ELECTROSTATIC SPRAY GUN WITH SELF-CONTAINED MINIATURIZED POWER PACK INTEGRAL THEREWITH, filed Apr. 20, 1978, D.C., N.D. Ohio (Toledo), Doc. C 78-337, Gema A. G. Apparatebau v. Nordson Corp. Same, filed Apr. 20, 1978, D.C.N.J. (Newark), Doc. 78-835, Gema A.G. Apparatebau v. Nordson Corp.

3,619,814. (See 3,241,154.)

3,623,532. (See 3,317,994.)

3,636,635. (See 3,226,833.)

3,672,430. (See 3,317,994.)

3,686,025. (See 3,442,692.)

3,716,423. (See 3,317,994.)

3,731,145. (See 3,599,038.)

3,743,534. (See 3,442,692.)

3,746,608, Mitsuhiro Takahashi, SHAPED ARTICLE OF SYNTHETIC RESIN HAVING MECHANICALLY DISORDERED ORIENTATION, filed Aug. 7, 1978, D.C., N.D. Ohio (Cleveland), Doc. C-78-977, Weld-Loc Systems, Inc. v. Pak-Tron, Inc. Same, filed Aug. 9, 1978, D.C., E.D. Va. (Norfolk), Doc. 78-377-N, Weld-Loc Systems, Inc. v. Dynaric, Inc. Same, filed Apr. 4, 1979, D.C., N.D. Ill. (Chicago), Doc. 79 C 1527, Weld-Lock Systems, Inc. v. Wilton Corp.

3,783,083, Monarch Marking Systems, Inc., COMPOSITE WEB OF PRESSURE SENSITIVE LABELS; 3,852,139, same, METHOD OF DISPENSING LABELS; 3,948,172, same, LABEL PRINTING AND APPLYING APPARATUS; 3,957,562, same, APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS, filed Sept. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76 C 3345, Monarch Marking Systems, Inc. v. Consolidated Food Corp.

3,825,736. (See 3,355,714.)

3,838,241, CS&M, Inc., MATRIX FABRICATION, filed Jan. 2, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 79 05028, Covington Brothers Technologies v. CS&M, Inc.

3,852,139. (See 3,783,083.)

3,853,122, Strauch and Bloomberg, METHOD AND DEVICE FOR ACHIEVING A PENILE ERECTION, filed Dec. 7, 1979, D.C. Minn. (St. Paul), Doc. 3-79-608, Selwyn Z. Freed v. American Medical Systems, Inc.

3,944,694. (See 3,442,692.)

3,948,172. (See 3,783,083.)



3,956,556. (See 3,442,692.)

3,957,562. (See 3,783,083.)

4,009,265, Alan N. Howard, METHODS AND FORMULATIONS FOR THE TREATMENT OF OBESITY; 4,298,601, same, METHOD AND FORMULATIONS FOR THE TREATMENT OF OBESITY, filed June 7, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-2693, *Cambridge Plan International v. Optibal Co., et al.*

4,035,109, Drath & Schlosser, PUMP FOR FLUENT, AND ESPECIALLY HEAVY AND ABRASIVE MATERIALS, filed May 9, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-2979, *Graco, Inc. v. Binks Mfg. Corp.*

4,040,806, Kenneth B. Kennedy, PROCESS FOR PURIFYING HYDROCARBON GAS STREAMS, filed Aug. 15, 1979, D.C. New Mexico (Albuquerque), Doc. 79-652 JB, *K.B. Kennedy Engineering Co., Inc. v. Southwestern Public Service Co.* Order filed Feb. 6, 1980.

4,045,176, Proksch and Bonderman, PREPARATION OF OPTICALLY CLEAR SERUM, filed Apr. 20, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 2736, *Analytical Controls and American Hospital Supply Corp. v. Fisher Scientific Co., Inc.*

4,066,423, McGill and Scott, ADSORPTION-ABSORPTION VAPOR RECOVERY SYSTEM, filed Jan. 9, 1980, D.C., N.D. Okla. (Tulsa), Doc. 80-C-17-E, *McGill, Inc. v. John Zink Co.* Defendant Zink is enjoined from further infringement of claim 2 of the McGill Patent, letters patent no. 4,066,423. Defendant is further enjoined from inducing infringement and contributing to infringement by its customers, of claim 2 of letters patent no. 4,066,423. Filed June 22, 1983.

4,077,328, Glenn Taylor, ROTARY DUMP, filed July 28, 1983, D.C., N.D. Ga. (Atlanta), Doc. C83-1595, *Bankhead Enterprises, Inc. v. Diversified Metal Fabricators, Inc., et al.*

4,123,315, William A. Nickerson & Co., Ltd., MACHINE FOR ASSEMBLING WOOD I-BEAMS, filed June 28, 1983, D.C. Ore. (Portland), Doc. 83-986, *David R. Davidson v. Columbia Pacific Structural Components, Inc.*

4,129,170. (See 3,317,994.)

4,136,359, Apple Computer, Inc., MICROCOMPUTER FOR USE WITH VIDEO DISPLAY; 4,278,972, same, DIGITALLY-CONTROLLED COLOR SIGNAL GENERATION MEANS FOR USE WITH DISPLAY, filed May 17, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 3212, *Apple Computer, Inc. v. Jade Computer Products, Inc.* Same, filed May 17, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 3213, *Apple Computer, Inc. v. Michael P. McCaul and Sheila Ann McCaul, doing business as Cosmic Computers, Unlimited.* Same, filed May 17, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 3214, *Apple Computer, Inc. v. Ironsides Computer Corp., et al.*

4,183,057, ACS Hospital Systems, Inc., ACTUATING SYSTEM FOR A RENTAL TELEVISION, filed May 13, 1981, D.C., W.D. Pa. (Pittsburgh), Doc. 81-787 *ACS Hospital Systems, Inc. v. Montefiore Hospital.* Judgment is rendered for the Defendant per Order filed May 25, 1983.

4,186,877, Wilcox and Conrad, BY-PASS NOZZLES, filed July 14, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 4825, *Delavan Corp. v. Spraying Systems Co.*

4,233,661, Bolton and Dallen, COMPUTER CONTROLLED REGISTRATION AND INQUIRY SYSTEM, filed May 23, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 3516, *Registration Control Systems, Inc. v. Compusystems, Inc.*

4,278,972 (See 4,136,359.)

4,296,580, Roger Neil Weinar, WALL CONSTRUCTED FROM PANELS HELD IN POSITION

WITH THE AID OF CONCEALED FASTENERS AND CONCEALABLE FASTENERS FOR USE IN ASSEMBLING SUCH WALL, filed Oct. 28, 1981, D.C., E.D. Mich. (Ann Arbor), Doc. 81-73995, *National Gypsum Co. v. Rollform, Inc.* U.S. Pat. No. 4,296,580 is invalid per Judgment filed May 20, 1983.

4,298,601, Alan N. Howard, METHOD AND FORMULATIONS FOR THE TREATMENT OF OBESITY, filed Feb. 2, 1983, D.C. S.D. Calif. (San Diego), Doc. 83-0278-JLI(1), *Cambridge Plan International v. Ultra Drug Co.* Defendant is hereby enjoined and restrained from further infringing U.S. Pat. No. 4,298,601 per Consent Decree entered June 6, 1983. Same, filed June 9, 1983, D.C., W.D.N.Y. (Buffalo), Doc. 83-628C, *Cambridge Plan International v. Republic Drug Co.* Same, filed Dec. 27, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 6763, *Cambridge Plan International v. Leo Daboub.* Stipulation and Order for dismissal with prejudice and without costs entered June 10, 1983. Same, filed July 7, 1983, D.C., E.D. Mich. (Detroit), Doc. 83-2703, *Cambridge Plan International v. O'Conner Products Co.*

4,298,601. (See 4,009,265.)

4,313,861, Union Carbide Corp., LATEX AUTODEPOSITION COATINGS, filed Feb. 2, 1983, D.C., S.D. W. Va. (Charleston), Doc. 83-2103, *Amchem Products, Inc. v. Union Carbide Corp., et al.* Stipulation of Dismissal with prejudice by plaintiff filed June 29, 1983.

4,366,143, Midgley and Wilkins, ASSAY FOR THE FREE PORTION OF SUBSTANCES IN BIOLOGICAL FLUIDS, filed Jan. 3, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 0016, *Amersham International PLC v. Travenol Laboratories, Inc.* Stipulated Order of Dismissal without prejudice as to all defendants entered May 11, 1983.

4,377,195, Jack Weil, PRIVATE CUBICLE ENCLOSURE, filed Aug. 3, 1983, D.C., S.D.N.Y., Doc. 83-Civ-5739, *Indecor, Inc. v. Fox-Wells & Co., Inc.*

4,381,871, Dopyera and Miller, SWIVEL COUPLING ELEMENT, filed June 20, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-3878, *Big Inch Marine Systems, Inc. v. Gripper, Inc., et al.*

4,383,286, Roy T. Hicks, COOLING AND POWER INPUT ASSEMBLY, filed Aug. 4, 1983, D.C., S.D.N.Y., Doc. 83-Civ-5794 CES, *Kensington Microwave, Ltd. v. Roy T. Hicks.*

#### Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Dec. 30, 1983:

Adams, Thomas, Northern Telecom Ltd., Patent Dept., P.O. Box 3511, Station C, Ottawa, Ont., Canada K1Y 4H7

Jones, Philip W., Gowling & Henderson, 160 Elgin St., Ottawa, Ont., Canada K1N 8S3

Lake, James R., Ridout & Maybee, 2300 Richmond-Adelaide Centre, 101 Richmond St. West, Toronto, Canada M5H 2J7

Schmitkons, George E., 4511 Simmons La., Temple Hill, Md. 20748

Sharp, William R., 705 Holly Tree La., Waldorf, Md. 20601

Sinnott, Timothy J., Barrigar & Oyen, Suite 700, The National Bldg., 130 Slater St., Ottawa, Canada K1P 6E2

Vernon, Robert E., DuPont Canada, Inc., Box 2200, Streetville, Mississauga, Ont., Canada L5M 2H3

WILLIAM FELDMAN,  
Director, Office of  
Enrollment and Discipline.

## PATENT NOTICES

### Certificates of Correction for the Week of Dec. 6, 1983

D. 268,330	4,371,741	4,391,781	4,402,267
D. 270,049	4,374,926	4,391,966	4,402,747
Re. 31,312	4,377,915	4,392,066	4,403,380
4,040,825	4,378,097	4,393,112	4,403,435
4,201,648	4,379,434	4,393,883	4,403,496
4,240,909	4,379,882	4,394,478	4,403,729
4,256,894	4,380,640	4,394,589	4,404,140
4,318,853	4,382,025	4,395,268	4,404,925
4,320,658	4,383,332	4,395,274	4,404,999
4,322,220	4,383,353	4,396,404	4,405,191
4,331,566	4,385,016	4,396,490	4,405,287
4,334,780	4,385,682	4,396,615	4,405,375
4,343,794	4,385,829	4,396,760	4,405,522
4,348,550	4,385,950	4,396,872	4,405,864
4,356,506	4,386,119	4,397,554	4,406,521
4,356,634	4,387,380	4,398,104	4,406,870
4,359,634	4,387,597	4,398,583	4,407,066
4,362,054	4,387,618	4,398,733	4,407,233
4,363,424	4,388,358	4,398,915	4,407,331
4,363,487	4,388,834	4,399,243	4,407,343
4,365,323	4,389,084	4,399,432	4,407,433
4,365,357	4,389,125	4,400,308	4,408,030
4,367,541	4,389,787	4,400,939	4,408,542
4,368,345	4,390,986	4,401,253	4,409,085
4,370,094	4,391,483	4,401,691	4,410,294

### Disclaimer

4,228,741.—*Frank D. Bruner*, Omaha, Nebr. AUTOMATICALLY RELEASING STABILIZER. Patent dated Oct. 21, 1980. Disclaimer filed Sept. 14, 1983, by the assignee, *Paxton & Vierling Steel Co.* Hereby enters this disclaimer to claim 15 of said patent.

### Dedication

4,196,723.—*Lawrence A. Moose, Jr.*, Memphis, Tenn. DUAL FENESTRATED SURGICAL DRAPE WITH A FLAP CAPABLE OF COVERING AND ISOLATING EITHER FENESTRATION. Patent dated Apr. 8, 1980. Dedication filed Oct. 17, 1983, by the assignee, *The Buckeye Cellulose Corp.* Hereby dedicates to the Public the remaining term of said patent.

### Disclaimer and Dedication

4,247,045.—*Wayne R. Mitchell*, Muncy and *Kenneth Wands*, Riverside, Pa. AUTOMATIC VOLUME CONTROL SYSTEM. Patent dated Jan. 27, 1981. Disclaimer and Dedication filed Sept. 1, 1983, by the assignee, *Redland Prismo Corp.* Hereby disclaims and dedicates to the Public the remaining term of said patent.



# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the

table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of Cleveland Public Library	(513) 369-6936
	Columbus: Ohio State University Libraries	(216) 623-2870
	Toledo/Lucas County Public Library	(614) 422-6286
Oklahoma	Stillwater: Oklahoma State University Library	(419) 255-7055 Ext. 212
Pennsylvania	Cambridge Springs: Alliance College Library	(405) 624-6546
	Philadelphia: Franklin Institute Library	(814) 398-2098
	Pittsburgh: Carnegie Library of Pittsburgh	(215) 448-1321**
	University Park: Pattee Library, Pennsylvania State University	(412) 622-3138
Rhode Island	Providence Public Library	(814) 865-4861
South Carolina	Charleston: Medical University of South Carolina	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(803) 792-2372
Texas	Austin: McKinney Engineering Library, University of Texas	(901) 725-8876
	Dallas Public Library	(512) 471-1610
	Houston: The Fondren Library, Rice University	(214) 749-4176
Washington	Seattle: Engineering Library, University of Washington	(713) 527-8101 Ext. 2587
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(206) 543-0740
	Milwaukee Public Library	(608) 262-6845
		(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

\*Collection organized by subject matter.

\*\*Call only between the hours of 10:00 a.m. and 5:00 p.m.

## PATENT EXAMINING CORPS RENE D. TEGTMEYER, Assistant Commissioner WILLIAM FELDMAN, Deputy Assistant Commissioner CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director	1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director	11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director	3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthetics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director	3-09-82
Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director	1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director	5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director	3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director	1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGN, GROUP 290—KENNETH L. CAGE, Director	1-30-81
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director	7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director	11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director	9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,243,822 to 3,248,737, inclusive  
Plant Patents . . . . . Numbers 2,616 to 2,627 inclusive



## REEXAMINATIONS

DECEMBER 6, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

### B1 Re. 28,576 (147th) PROCESS FOR RAPID DISSOLVING WATER-SOLUBLE VINYL ADDITION POLYMERS USING WATER-IN-OIL EMULSIONS

Donald R. Anderson, Oswego, and Alvin J. Frisque, La Grange, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Reexamination Request No. 90/000,246, Aug. 25, 1982.  
Reexamination Certificate for Reissue Patent Re. 28,576, issued Oct. 21, 1975, Ser. No. 413,848, Nov. 9, 1973.  
Original No. 3,734,873, dated May 22, 1973, Ser. No. 278,329, Aug. 7, 1972. Continuation of Ser. No. 172,946, Aug. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 92,031, Dec. 15, 1970, Pat. No. 3,624,019.

Int. Cl.<sup>3</sup> C08J 3/06

U.S. Cl. 523—336

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 7, 10, 11, and 22-27 is confirmed.

Claims 2, 3, 5, 9, 15-17 and 20, having been finally determined to be unpatentable, are cancelled.

Claims 1, 4, 6, 8, 14 and 19 are determined to be patentable as amended:

Claims 12, 13, 18, 21, 28, and 29, dependent on amended claims, are determined to be patentable.

New claims 30-39 are added and determined to be patentable.

1. A method of rapidly dissolving water-soluble vinyl addition polymers into water, which comprises the steps of:

(A) preparing a water-in-oil emulsion which contains dispersed therein from 5 to 75 percent by weight of finely-divided water-soluble vinyl addition polymer; said emulsion containing an oil-soluble emulsifying agent and having during such preparation of said emulsion an oil-to-water ratio between 5:1-1:10, and said oil being a hydrocarbon liquid; and then,

(B) inverting said polymer-containing emulsion in water in the presence of a water soluble-surfactant whereby the water-soluble vinyl addition polymer is released into the water as a solution.

### B1 3,237,132 (145th) DIELECTRIC MICROWAVE RESONATOR

Akira Okaya, Leonia, N.J., assignor to Patlex Corp., Westfield, N.J.

Reexamination Request No. 90/000,330, Feb. 18, 1983.  
Reexamination Certificate for Patent No. 3,237,132, issued Feb. 22, 1966, Ser. No. 3,872, Jan. 21, 1960.

Int. Cl.<sup>3</sup> H01P 1/207, 7/10

U.S. Cl. 333—211

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-10 is confirmed.

1. Microwave apparatus for operation at a predetermined frequency including a wave guide to which microwaves are supplied, a dielectric resonator located in the wave guide

intermediate the ends of the wave guide, the cross section of the wave guide being substantially unobstructed upstream of the resonator, said dielectric resonator being a solid piece of material having a particular natural frequency of dielectric resonance the effective coupling of the solid piece being dependent upon the orientation of the resonator with respect to the microwaves, but which is not dependent on piezoelectric characteristics and which is also independent of the size and shape of the wave guide and resonating at that frequency to reflect or absorb, depending upon the modes of the microwaves and frequency of the dielectric resonator, the microwave frequency corresponding to said resonator frequency, the material of the resonator having a power factor less than 0.005 and a dielectric constant greater than 5, and the mode inside the resonator being unique by having a configuration which corresponds selectively to the TE or TM mode.

### B1 3,434,165 (143rd) HOSPITAL BED

Francis X. Keane, Dublin, Ireland, assignor to Kinco, Ltd., Chicago, Ill.

Reexamination Request No. 90/000,219, Jun. 17, 1982.  
Reexamination Certificate for Patent No. 3,434,165, issued Mar. 25, 1969, Ser. No. 650,984, Jul. 3, 1967.

Int. Cl.<sup>3</sup> A61G 7/00, 7/06; A61F 5/37

U.S. Cl. 5—61

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 15 is confirmed.

Claims 6-14, having been finally determined to be unpatentable, are cancelled.

Claims 1, 16, and 17 are determined to be patentable as amended:

Claims 2-5, dependent on amended claims, are determined to be patentable.

New claims 18-102 are added and determined to be patentable.

1. A bed comprising:  
a bed support means, a patient supporting portion mounted on the bed support means, a substantially U-shaped keel holding the patient supporting portion, and a pivot means connecting the keel and the bed support means for controlled oscillatory movement of the patient supporting



portion relative to the bed support means about a central longitudinal axis of oscillation, the oscillation axis extending above the center of gravity of the U-shaped keel and patient supporting portion of the bed and any patient positioned on the patient supporting portion.

**B1 3,597,549 (146th)**  
**HIGH SPEED DATA COMMUNICATION SYSTEM**  
 Wayne D. Farmer, Madison Township, Middlesex County, and Edmund E. Newhall, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Reexamination Request No. 90/000,242, Aug. 11, 1982.  
 Reexamination Certificate for Patent No. 3,597,549, issued Aug. 3, 1971, Ser. No. 842,581, Jul. 17, 1969.  
 Int. Cl.<sup>3</sup> H04J 3/08

U.S. Cl. 370-88

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-19 is confirmed.

New claims 20-28 are added and determined to be patentable.

1. In combination, a closed transmission loop and plural stations coupled thereto for transmitting information signals and operation codes among such stations, means in each said station responsive to a predetermined one of said codes on said loop to initiate station transmission on to said loop, and means inserting said predetermined code as the final portion of such transmission.

**B1 3,982,419 (144th)**  
**APPARATUS FOR AND METHOD OF DETERMINING ROTATIONAL AND LINEAR STIFFNESS**  
 John T. Boys, Christ Church, New Zealand, assignor to Standard Pressed Steel Co., Jenkintown, Pa.  
 Reexamination Request No. 90/000,256, Sep. 13, 1982.  
 Reexamination Certificate for Patent No. 3,982,419, issued Sep. 28, 1976, Ser. No. 507,417, Sep. 19, 1974.  
 Continuation-in-part of Ser. No. 357,920, May 7, 1983, abandoned.  
 Claims priority, application United Kingdom, May 9, 1972, 21480/72  
 Int. Cl.<sup>3</sup> B25B 23/14; B23P 19/06; G01D 1/10, 1/16  
 U.S. Cl. 73-862.24

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-39, 42-82, and 85-88 is confirmed.

Claims 40, 83, and 89 are determined to be patentable as amended.

Claims 41 and 84, dependent on amended claims, are determined to be patentable.

83. Apparatus for sensing a desired point on a curve representing the variation of two related inputs, generated by an external source, wherein said related inputs are torque and rotation imparted to a threaded fastener, said curve is the torque-rotation curve through which the fastener is being tightened, and wherein said curve has a generally linear portion and said desired point lies beyond said generally linear portion, said apparatus comprising:  
 first means for developing a signal representative of the instantaneous gradient of said curve, and  
 second means responsive to said gradient signal for determining a significant change in slope of said curve containing said desired point, said second means including means for storing [a] said signal representative of the gradient of said curve in the generally linear portion thereof and for developing a control signal when said instantaneous gradient signal in the portion of said curve beyond said generally linear portion has a predetermined relationship relative to said stored signal.

## DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 6, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

**T103,701**  
**NUCLEATED POLYESTER COMPOSITION CONTAINING RED PHOSPHORUS**  
 Harold W. Tuller, Jones La., Long Valley, N.J. 07853; Nicholas Vanderkooi, Jr., 8 Van Riper Ave., Pompton Plains, N.J. 07444; John C. Haylock, 153 Conestoga Ter., Sparta, N.J. 07871, and Theodore Largman, 7 Upper Field Rd., Morristown, N.J. 07960

Filed Jan. 3, 1983, Ser. No. 455,341  
 Int. Cl.<sup>3</sup> C08K 3/02  
 U.S. Cl. 524-293

No Drawing. 32 Pages Specification

A polyester composition comprising the salt of a dimer acid, trimer or salt of a mixture of dimer acid and trimer acid, and from 0.5 to 10 percent fine particulate red phosphorous. The salt is preferably the sodium salt of the dimer and/or trimer acids. Alternately, the salt can be the sodium salt of an organic polymer having pendant carboxyl groups. The red phosphorous can contain a phosphine suppressant such as a metal hydroxide or copper compound. The preferred red phosphorous used is believed to be coated with an aliphatic polyamine and bisphenol A, epichlorohydrin condensate, reacted with acrylonitrile and ethylene oxide produced by American Hoescht as Exolite TM405. The composition can contain a filler, plasticizer, impact modifier, and/or a polyepoxide.

**T103,702**  
**STABILIZATION OF POLYMER BLENDS WITH METAL NITRITES**

Kenneth W. Wilcox, and James N. Short, both c/o Phillips Petroleum Company, Bartlesville, Okla. 74004  
 Filed Aug. 2, 1982, Ser. No. 403,982  
 Int. Cl.<sup>3</sup> C08K 3/28, 3/10  
 U.S. Cl. 524-429

No Drawing. 17 Pages Specification

An alkali metal or alkaline earth metal nitrite is added to a polymer blend comprising (1) block copolymer formed from monovinyl-substituted aromatic hydrocarbon monomer and a conjugated diene monomer and (2) styrene polymer to improve thermal stability and to inhibit gel and fisheye formation.

**T103,703**  
**PRODUCTION OF AROMATIC POLYKETONES**  
 Howard M. Colquhoun, 25 Beeston Dr., Knutsford, Cheshire, England, and David F. Lewis, 25 Lanswood Park, Hartford, Northwich, Cheshire, England  
 Filed Mar. 1, 1983, Ser. No. 471,156  
 Claims priority, application United Kingdom, Mar. 17, 1982, 82 07783

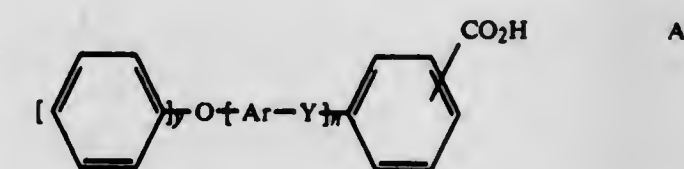
Int. Cl.<sup>3</sup> C08G 16/00, 67/00  
 U.S. Cl. 528-125

No Drawing. 21 Pages Specification

A process for the production of a thermoplastic aromatic polyketone which process comprises reacting in the presence

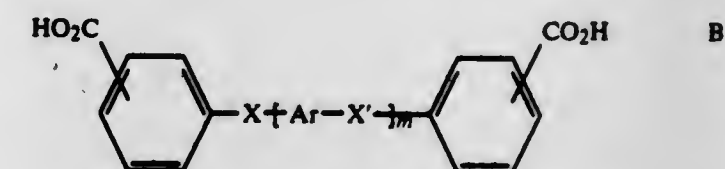
of a fluoroalkane sulphonic acid, preferably CF<sub>3</sub>SO<sub>2</sub>OH, the reactants selected from the following class:

(a) at least one aromatic monocarboxylic acid of the formula:

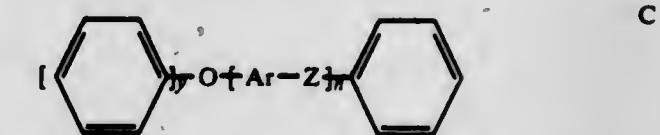


where -Y- is a direct link, -O-, -S-, -NAr'- where Ar' is a monovalent aromatic radical (preferably phenyl); Ar is a divalent aromatic radical but must not be -Ph-CO-Ph- or -Ph-SO<sub>2</sub>-Ph- (where -Ph- is phenylene) when y is 1; and n is an integer of  $\geq 1$  and y is an integer of 1 to 3;

(b) a mixture of at least one aromatic dicarboxylic acid of the formula:

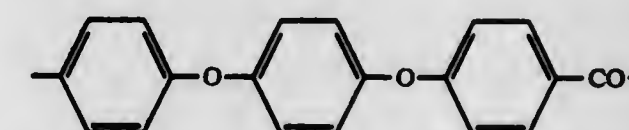


where -X- and -X'- are independently a direct link -O-, -S-, -NAr'- where Ar' is as defined in (a); m is 0 or an integer of  $\geq 1$ ; and Ar is as defined in (a); and at least one aromatic compound of formula:



where -Z- is -O- or a direct link; and Ar, n, and y are as defined in (a); and  
 (c) a combination of (a) and (b).

The aromatic carboxylic acid is particular 4-(4-phenoxy)phenoxy benzoic acid which yield an aromatic polyketherketone having repeat units of the formula



## REISSUES

DECEMBER 6, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,453

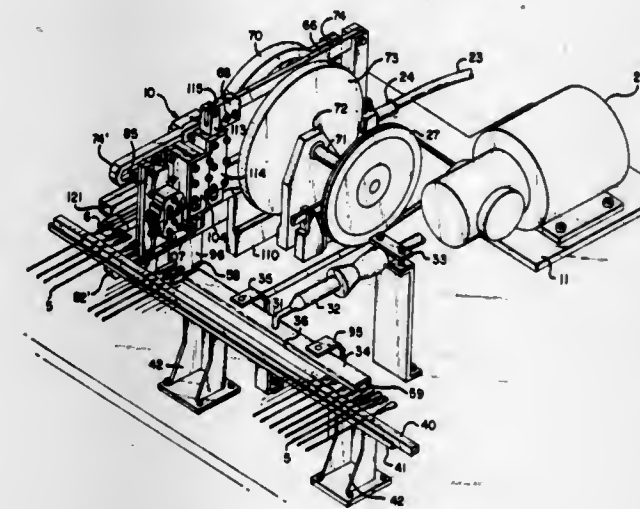
### LAUNDRY FEEDING APPARATUS

Niels J. Olsen, Bornholm, Denmark, and Henry J. Weir, Dublin, Ireland, assignors to Beta S/A, Luxembourg, Luxembourg  
Original No. 4,050,173, dated Sep. 27, 1977, Ser. No. 610,373, Sep. 4, 1975. Application for reissue Sep. 25, 1979, Ser. No. 78,971

Claims priority, application Denmark, Sep. 4, 1974, 4673/74  
Int. Cl.<sup>3</sup> D06F 67/04

U.S. Cl. 38—143

25 Claims



[3. Apparatus for spreading and feeding laundry of claim 2, wherein each said transmission comprises:] Apparatus for spreading and feeding pieces of laundry, comprising:

- a conveyor for receiving laundry from a spreading apparatus; said conveyor having an upstream and a downstream end;
- a spreading apparatus comprising at least one pair of clamping devices; each said clamping device including means for holding a piece of laundry; said clamping devices being positioned upstream of said upstream end of said conveyor and above said conveyor; clamping device moving means for moving said clamping devices of said pair thereof apart and together crosswise to the motion of said conveyor and always upstream of said conveyor; said clamping device moving means comprising a separate transmission for each said clamping device; the two said transmissions for said pair of clamping devices moving said clamping devices together and apart, each said transmission comprising:
  - a first group of stationary pulleys; a second group of movable pulleys; a sliding bar; said second group of pulleys being mounted on said sliding bar; each said sliding bar of each said transmission of said pair of clamping devices being [slidable] movable toward and away from said sliding bar of said transmission of the other said clamping device of said pair; means for [sliding] causing said sliding bars to move toward each other and apart;
  - each said transmission further comprising a cable loop passing around both said first and said second pulley groups of said transmission and also being attached to the respective said clamping device, whereby said sliding bar and said clamping device [moves] move together; and
  - a blade positioned further upstream from said conveyor than said clamping devices and positioned above said conveyor; said blade being movable toward said conveyor to contact the piece of laundry held by said clamping devices and to move the piece of laundry onto said conveyor.

Re. 31,454

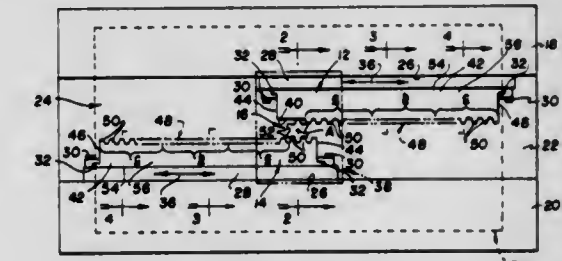
### MONITORING AND STIMULATION ELECTRODE

Alan C. Hymes, Hopkins, Minn., assignor to LecTec Corporation, Eden Prairie, Minn.  
Original No. 4,125,110, dated Nov. 14, 1978, Ser. No. 849,405, Nov. 7, 1977. Continuation of Ser. No. 785,225, Apr. 6, 1977, abandoned, which is a continuation of Ser. No. 635,008, Nov. 25, 1975, abandoned. Application for reissue Nov. 12, 1980, Ser. No. 206,160

Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—641

25 Claims



1. An electrode for establishing electrical connection to a patient's skin comprising:
  - an electrically conductive backing and current distribution member;
  - electrical terminal means attached to said member, said terminal means being adapted for connection of the electrode to an electrical wire; and
  - a substrate attached to said backing and current distribution member for interfacing with the patient's skin, said substrate comprising a homogeneous material including between 21% and 65% high molecular weight hydrophilic polysaccharide material, at least about 0.006% electrolytic salt, at least about 0.6% water and an alcohol, said substrate being sufficiently pliant to permit conformation of the shape of the electrode to the body contours, said substrate being sufficiently firm to prevent penetration of the body contours through the substrate thereby preventing contact of the backing member with the skin, and said substrate being uniformly conductive thereby providing a homogeneous conducting surface to the skin.

Re. 31,455

### HERBICIDAL

#### 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

Horst O. Bayer, Levittown; Colin Swithenbank, Perkasi, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Original No. 4,063,929, dated Dec. 20, 1977, Ser. No. 617,560, Sep. 29, 1975. Continuation-in-part of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. Application for reissue Sep. 1, 1978, Ser. No. 939,292

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.<sup>3</sup> C07C 65/14; A01N 9/24

U.S. Cl. 71—115

7 Claims

1. An agronomically-acceptable salt of a compound of the formula





## PLANT PATENTS

GRANTED DECEMBER 6, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,151

### GRAPEVINE

Luther C. Hahn, Thermal, and Joseph Maranto, Bakersfield, both of Calif., assignors to Superior Farming Company, Bakersfield, Calif.

Filed Jan. 11, 1982, Ser. No. 338,372  
Int. Cl.<sup>3</sup> A01H 5/03

U.S. Cl. Plt.—47

1 Claim

1. A new and distinct variety of grapevine, substantially as illustrated and described, which is characterized by a very large, vigorous productive vine, having a slender trunk and very long split straps, reddish brown bark, medium to long cane and round, slightly enlarged nodes and shoots basically green with reddish longitudinal striations and tips growing straight up, bifurcated and trifurcated tendrils, medium size bud, slightly pointed, medium size leaves with U shaped petiole sinus; date of bloom and fruit ripening 7-10 days earlier than Superior Seedless (U.S. Plant Pat. No. 3,106) and 14 days earlier than Thompson Seedless (unpatented); clusters of medium size, loose to compact, seedless white colored berries irregular in size, mostly large, firm, crisp, attractive, sweet taste, attributable to an early high solids-sugar and low acid content.

5,152

### ROSE PLANT JACGUM

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 1, 1982, Ser. No. 353,023  
Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—10

1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its

abundant red buds and blooms borne on a low, dense plant with small disease resistant foliage.

5,153

### IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsen, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,076  
Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of impatiens plant known by the cultivar name Cosmos, as described and illustrated, and particularly characterized by its intense mauve flower color; long, narrow variegated foliage; self-branching, thin stems and procumbent growth, making the cultivar ideal for hanging baskets; early and continuous flowering, with flower intensity and variegation being most pronounced in high light conditions.

5,154

### PAMELA HETHERINGTON CORONATION

Ernest E. Hetherington, Arcadia, Calif., assignor to Fred A. Stewart Inc., San Gabriel, Calif.

Filed Jul. 8, 1982, Ser. No. 396,241  
Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct variety of hybrid orchid, substantially as described and illustrated herein, and distinguished from its parent (grex Blc. Pamela Hetherington) and other orchids by its combination of delicate, lilac-rose flower color, superior flower substance, strength of stem structure, and vigorous, reliable blooming.



## PATENTS

GRANTED DEC. 6, 1983

### ERRATA

For CLASS	See PATENT NO.
445-035 .....	4,418,452
381-105 .....	4,418,599
383-011 .....	4,418,733
206-279 .....	4,418,805
420-584 .....	4,419,129
126-089 .....	4,419,139
502-026 .....	4,419,267
502-158 .....	4,419,268
502-169 .....	4,419,269
502-209 .....	4,419,270
502-065 .....	4,419,271
502-084 .....	4,419,272
502-080 .....	4,419,273
502-304 .....	4,419,274
502-322 .....	4,419,275
502-347 .....	4,419,276
585-435 .....	4,419,526
381-051 .....	4,419,540
381-007 .....	4,419,541

# PATENTS

GRANTED DECEMBER 6, 1983

## GENERAL AND MECHANICAL

4,418,431

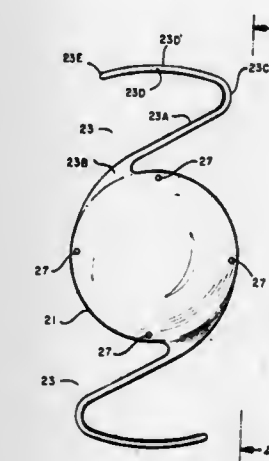
### INTRAOCULAR LENS

Fred T. Feaster, 800 8th Ave., Suite 234, Ft. Worth, Tex. 76104  
Filed Dec. 17, 1981, Ser. No. 331,645

Int. Cl.<sup>3</sup> A61F 1/16, 1/24

U.S. Cl. 3-13

46 Claims



16. An intraocular insert suitable for use as an artificial lens implant in the anterior chamber or posterior chamber of a human eye, comprising:

a lens body having first and second position fixation members extending from opposite sides of the periphery of said lens body,

each of said first and second position fixation members comprising an arm portion having a base joined to the periphery of said lens body with said arm portion extending from said lens body, an elbow, and an elongated outward-convex seating portion having a first end joined to said arm portion by said elbow, and an opposite free end, said elongated outward-convex seating portion being located outward of said arm portion relative to said lens body,

the two bases of said arm portions of said first and second position fixation members being located on opposite sides of said lens body and on opposite sides of a plane coinciding with and passing through the axis of said lens body, said plane also passing through said arm portions and through said outward-convex seating portions,

each arm portion of each of said position fixation members crosses said plane from its base and has its elbow including the inside edge of its elbow located on a side of said plane opposite the side on which its base is located,

each outward-convex seating portion of each of said position fixation members extends from its elbow in a direction such that it crosses said plane with its free end located on the side of said plane on which its base is located,

the curvature of the elbow of each of said position fixation members is much sharper than the curvature of its outward-convex seating portion,

each position fixation member being relatively small in cross-section and resilient such that its arm portion may be moved toward said lens body and its elongated outward-convex seating portion may be moved toward its arm portion and hence toward said lens body,

each of said outward-convex seating portions providing a broad area of tissue contact and fixation when said insert is implanted in the eye.

4,418,432

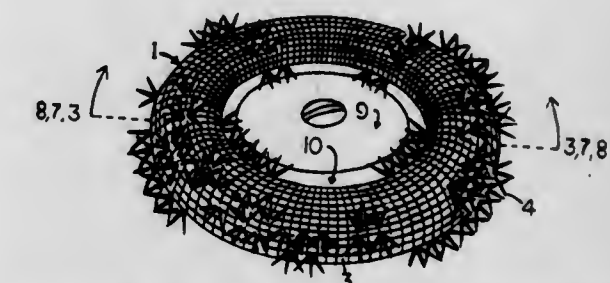
### DRAIN FILTER HAVING FILAMENTARY SURFACE IRREGULARITIES TO ENTANGLE HAIR AND DEBRIS

Stella M. Vidal, 175 SW. 14th St., Apt. 3, Miami, Fla. 33130  
Filed Aug. 26, 1981, Ser. No. 296,293

Int. Cl.<sup>3</sup> A47K 1/14; E03C 1/26, 1/264

U.S. Cl. 4-286

65 Claims



1. An article for preventing hair and debris from entering a drain of a bathtub, shower stall, lavatory, sink and the like having a liftable stopper and flange, said article comprising: a unitary body shaped and dimensioned to be adapted to extend entirely around the lifted stopper periphery and to extend entirely around the external periphery of the drain generally covering the area between the drain periphery and the top of the lifted stopper periphery;

said body being of filamentary material defining openings for the free passage of water therethrough down into the drain; a plurality of outward projections connected to said filamentary material above said opening and cooperating therewith, operable to entangle and hold hair and debris carried by water flowing through said openings.

4,418,433

### METHOD AND SYSTEM FOR RECLAIMING AND RECYCLING GUM AND WATER IN A CARPET DYEING PROCESS

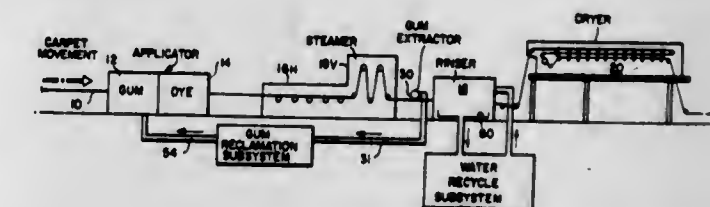
Ronald Moreland, Chatsworth, and Marion L. Hawkins, Dalton, both of Ga., assignors to Diamond Carpet Mills, Incorporated, Eton, Ga.

Filed Aug. 7, 1981, Ser. No. 290,935

Int. Cl.<sup>3</sup> D06B 21/00, 23/20

U.S. Cl. 8-149.1

21 Claims



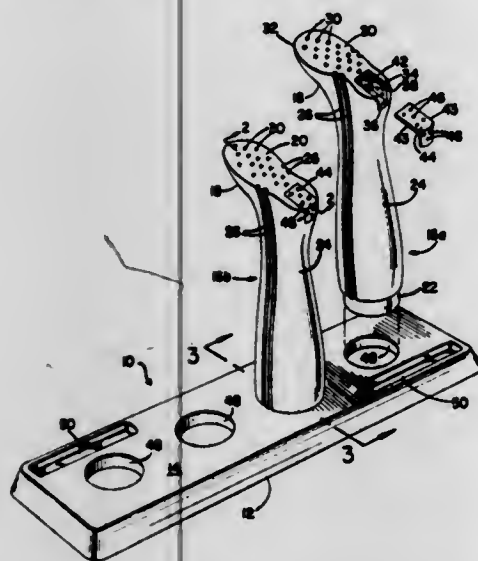
1. In method of reclamation of gum from a dyeing process for coloring the pile yarns of a carpet web or the like, continuously conveyed through several operating stages wherein the carpet web is coated at one of said stages with a continuous layer of viscous gum and has applied thereto a dyeing agent for coloring the pile yarns of the web and is passed through a steamer stage for setting of the dye in the pile yarns, the improvement comprising:

- extracting gum from the carpet web after it exits the steamer stage where the dye has been set, the gum being extracted before rinsing of the pile yarns,
- filtering the extracted gum,
- returning the filtered gum to one of said stages for reuse in the dyeing process.



**4,418,434**  
**DEODORIZING BOOT STAND**  
 Choon S. Joh, 788 Rodriguez St. #61, Watsonville, Calif. 95076  
 Filed Mar. 8, 1982, Ser. No. 355,352  
 Int. Cl.<sup>3</sup> A43D 3/00  
 U.S. Cl. 12—128 B

10 Claims



- Apparatus for the storage of articles of footwear comprising:
  - a base;
  - at least a pair of form members shaped and dimensioned substantially to conform to the shape and dimensions of a selected pair of footwear articles to be stored thereon, and thereby adapted to maintain the shape of said footwear articles when one of said form members is inserted into the interior of one of said footwear articles, said form members each having a first end and a second end, said first end having a lateral surface configured generally in the form of a shoe-sole, each of said form members having a hollow portion at least at said first end;
  - means for removably attaching said second end of each of said form members to said base;
  - a plurality of holes in said lateral surface of each of said form members, said holes communicating with said hollow portion thereof;
  - a recessed compartment, integrally formed in each of said form members near said first end thereof, and having a plurality of holes communicating with said hollow portion;
  - means for accessing said compartment from the exterior of said form member; and
  - closure means for selectably opening and closing said means for accessing;
- whereby said compartment is adapted to receive a deodorizing or disinfecting substance productive of vapors, said vapors being passed from said compartment to the interior of said article of footwear through said holes in said compartment, said hollow portion, and said holes in said lateral surface when said article of footwear is stored on said form member.

**4,418,435**  
**CARBON BUTT CLEANING APPARATUS AND METHOD**  
 J. Edgar Arnold, Summerville, S.C., assignor to Alumax, Inc., San Mateo, Calif.

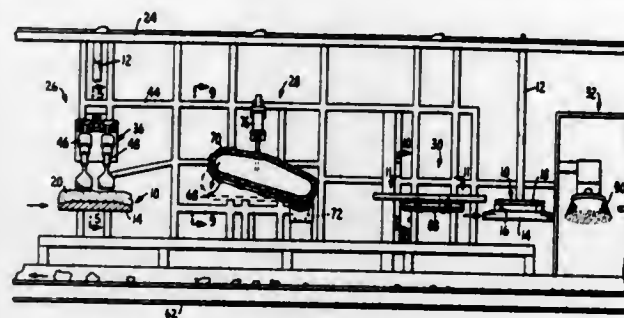
Filed Mar. 22, 1982, Ser. No. 360,454  
 Int. Cl.<sup>3</sup> B08B 1/02

U.S. Cl. 15—4

10 Claims

- Apparatus for cleaning cryolite from spent anodes comprising a plurality of automatic processing stations, overhead transportation means for automatically transporting separate spent anodes from and through each such station, first jackhammer means at a first one of the processing stations for breaking the cryolite loose from the top side surfaces of each anode passing through the station, rotary scraper means at a

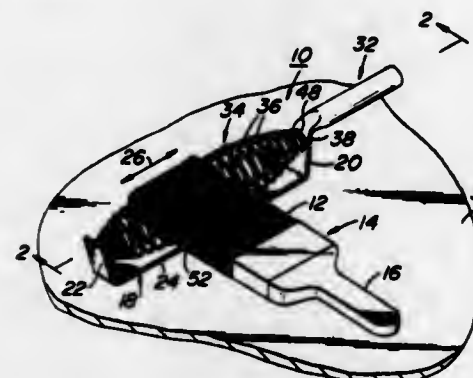
second one of the processing stations for scraping off cryolite loosened at the first station, second jackhammer means at a third one of the processing stations for knocking cryolite from



the center of the top surface of each anode passing through the third station and rotating brush means at a fourth one of the processing stations for brushing loosened cryolite from each anode passing through the fourth station.

**4,418,436**  
**BRUSH BRISTLE CLEANING SYSTEM**  
 Abraham Eisenberg, 6604 Chippewa Dr., Baltimore, Md. 21209  
 Filed Feb. 22, 1982, Ser. No. 351,011  
 Int. Cl.<sup>3</sup> A46B 17/06  
 U.S. Cl. 15—104 R

9 Claims



- A brush bristle cleaning system including:
  - (a) a frame defining a longitudinally extending base member;
  - (b) a handle member; and
  - (c) a helical wire element defining a plurality of helical loops, said helical wire element extending in said longitudinal direction, said helical wire element being secured to said frame and said handle member, said helical wire element being fixedly secured to said frame at discrete locations.

**4,418,437**  
**PIPE CLEANING APPARATUS**  
 James R. French, Hornerthorpe, Butt La., Great Yarmouth, Norfolk, England

Filed Mar. 5, 1982, Ser. No. 355,192  
 Claims priority, application United Kingdom, Mar. 12, 1981, 8107823

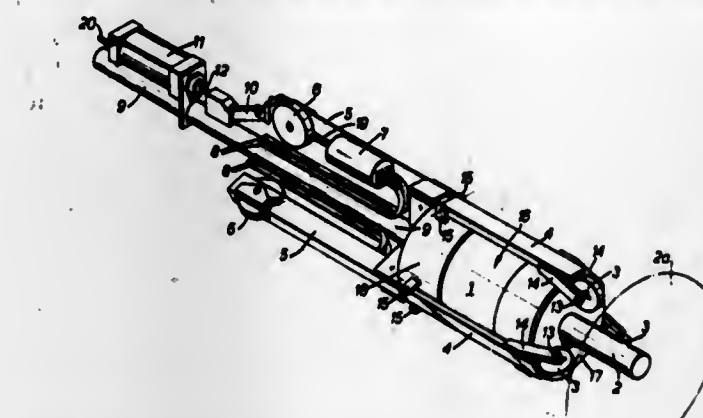
Int. Cl.<sup>3</sup> B08B 9/04

U.S. Cl. 15—104.09

10 Claims

- Apparatus for cleaning the bore of a pipe comprising: a housing means, a cleaning tool motor mounted in said housing means and adapted to receive a pipe cleaning tool rotatable with the drive shaft, at least three guide devices, support means connected to the housing means and supporting said guide devices and disposed around the housing means in spaced apart relationship towards the drive shaft end of the housing so as in use to bear against the bore of a pipe to be cleaned thereby to position the drive shaft coaxially of the pipe, drive wheel

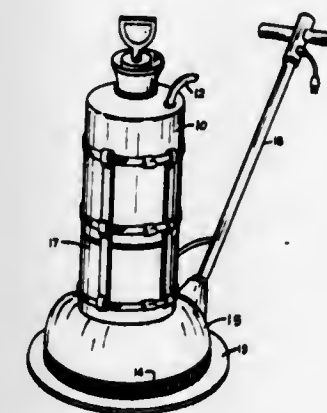
means for advancing said housing means through a pipe, means for mounting said drive wheel means on said housing means, drive motor means operatively associated with the drive wheel means for driving the apparatus through a pipe to be cleaned,



a jacking means for the drive wheel means which extends away from the end of the housing means remote from the drive shaft, and actuator means operative for actuating said jacking means for jacking the drive wheel means into driving contact with the wall of a pipe to be cleaned.

**4,418,438**  
**ROTARY CARPET CLEANING PAD**  
 Barry L. Cutler, 7 Stanford Ct., E. Windsor, N.J. 08520  
 Filed Aug. 2, 1982, Ser. No. 404,602  
 Int. Cl.<sup>3</sup> A47L 11/14  
 U.S. Cl. 15—230

7 Claims



- A carpet cleaning pad for rotary floor cleaning machines comprising a disc of a base sheet material and supported therein the following: an annular strip of fibrous bristles around the periphery of the disc, a plurality of substantially radial strips of fibrous bristles and a bed of firmly looped strands woven to a hooked rug solidity to present a compact cleaning surface filling in the remaining areas within said annular strip.

**4,418,439**  
**CURVED GLASS ICE-SCRAPER**  
 Marcel Porchet, 2265 Brebeuf St., Apt. 9, Longueuil, Canada J4J 3P9

Filed Jan. 29, 1982, Ser. No. 344,887

Claims priority, application Canada, Jun. 25, 1981, 380604

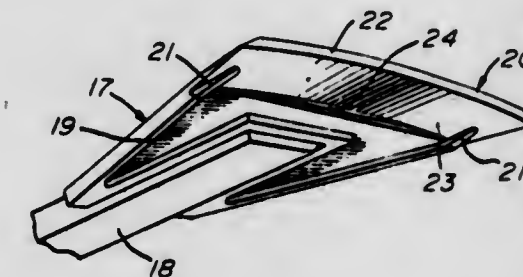
Int. Cl.<sup>3</sup> B60S 1/04; A47L 1/06

U.S. Cl. 15—236 R

2 Claims

- An ice-scraper for the outer convex surface of a vehicle window, comprising a body of flat triangular shape and made of a cast one-piece flexible and resilient plastic material, said body having a straight base edge, an opposite apex portion and converging side edges, said straight base edge bevelled to form a scraping edge, said body having a slit parallel to said base edge and located intermediate said base edge and said apex portion, said slit terminating short of and at a generally equal

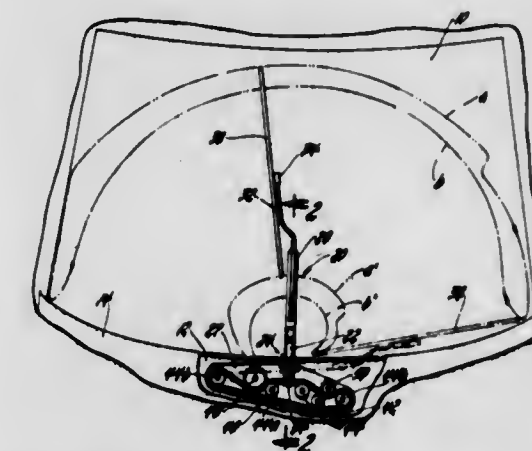
distance from the respective side edges, the part of said body lying between said slit and said base edge forming a blade portion, and the part of said body extending from said slit towards and including said apex portion forming a shank portion, said base portion being integrally connected to said shank portion solely beyond the ends of said slit, whereby said blade



portion can flex in a direction parallel to said base edge when applied against a convex window surface by pressure applied on the ends of said blade portion through said shank portion, and a separate handle rigidly secured to said shank portion, extending away from said body and generally perpendicular to said base edge.

**4,418,440**  
**WINDSHIELD WIPER APPARATUS**  
 Stephen Sigety, Jr., Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.  
 Filed Jul. 6, 1982, Ser. No. 395,145  
 Int. Cl.<sup>3</sup> B60S 1/18, 1/36  
 U.S. Cl. 15—250.21

3 Claims



- Vehicle windshield wiper apparatus comprising, a guide arm, means rotatably mounting the guide arm adjacent one end thereof on an axis of the vehicle, a wiper arm mounted on the guide arm for translation relative thereto and unitary rotation therewith about said axis, wiper means on the wiper arm adapted to clean the vehicle windshield, and endless belt drive means connected to the wiper arm adjacent one end thereof to move such end along a predetermined path noncentric with said axis whereby the guide arm and wiper arm are oscillated as a unit about said axis and the wiper arm simultaneously translated relative the guide arm to provide a corresponding predetermined area of cleaning of the windshield by the wiper means.

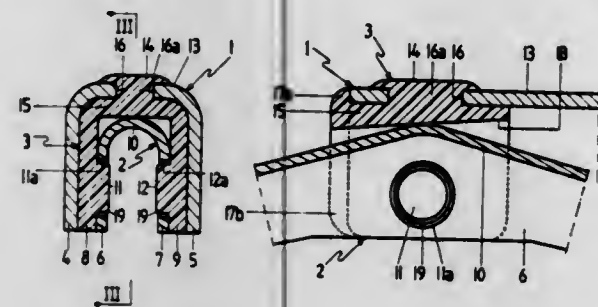


# 4,418,441 SPACER FOR ROTATABLY CONNECTING WIPER BLADE PARTS

Johan H. van den Berg, Hasselt, Belgium, assignor to Champion Spark Plug Europe S.A., Binche, Belgium  
Filed Oct. 14, 1981, Ser. No. 311,315  
Claims priority, application France, Oct. 15, 1980, 80 22030  
Int. Cl.<sup>3</sup> B60S 1/38

U.S. Cl. 15—250.42

12 Claims



1. A spacer (3) for rotatably connecting a first yoke (1) to a second yoke (2) of a wiper blade assembly, the first yoke (1) having at the outer end portion substantially the form of an inverted U with the flanges (4, 5) joined by a web (13), said spacer (3) having substantially the form of an inverted U with a pair of flanges (8, 9) joined by a web (15), the spacer (3) being provided with first means (16a, 14, 21a) for securing the spacer (3) to the first yoke (1) and provided with second means (11, 12, 23, 24, 31, 32) for rotatably securing the spacer to the second yoke (2), characterized in that said first means (16a, 14, 21a) are integrally formed on the web (15) of said inverted U of the spacer and project in a direction opposite to the direction of the flanges (8, 9) of the spacer, said first means are secured to the web (13) of the first yoke (1), said second means (11, 12, 23, 24, 31, 32) are integrally formed on the two flanges (8, 9) of the inverted U of the spacer and project toward each other, said second means are pivotally secured to said second yoke (2), the flanges (4, 5) of the first yoke surround the flanges (8, 9) of the spacer for holding the second means (11, 12, 23, 24, 31, 32) of the spacer (3) assembled with the second yoke (2).

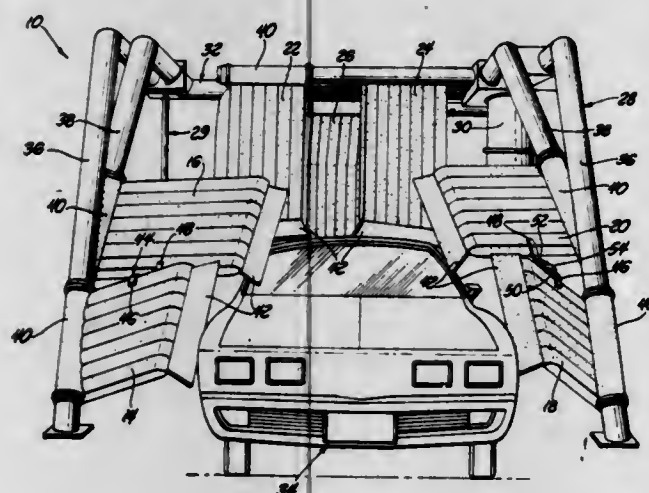
# 4,418,442 FLUID STRIPPING APPARATUS INCLUDING A STRAP FOR INTERCONNECTING ADJACENT AIRBAGS

David R. Day, 4334 Ocean Dr., Apt. 203, Corpus Christi, Tex. 78012, and Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455

Filed May 17, 1982, Ser. No. 378,956  
Int. Cl.<sup>3</sup> B60S 3/04

U.S. Cl. 15—312 A

11 Claims



1. An apparatus (10) for stripping fluids from the surface of a vehicle, said apparatus (10) comprising: an air distributor (28); inflatable bags (14, 26), each of generally rectangular

transverse cross section, said bags 14-26 supported by said air distributor (28) and each of said bags (14-26) including an inlet end (40) connected to said air distributor (28) for introducing air under pressure into said bags (14-26) and a nozzle end (42) of smaller area than said inlet end (40) spaced apart from said inlet end (40) for emitting a stream of air while maintaining said bags (14-26) in a nonflailing and inflated orientation, and characterized by connector means (44) having one end portion (46) secured to a first of said bags (14, 18) and a second end portion (48) secured to a second of said bags (16, 20) disposed above said first bag and spaced along said bags (14-20) from said air distributor (28) for connecting said first bag (14, 18) to said second bag (16, 20) for properly positioning said second bag (16, 20) in relation to a vehicle body when said first bag (14, 18) is deflected by the engaging vehicle (34).

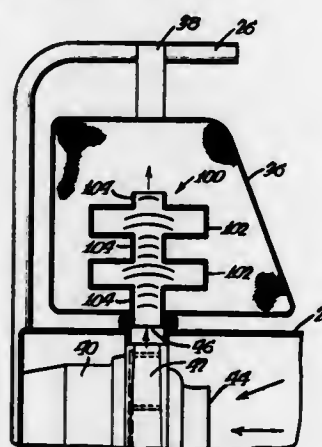
# 4,418,443 NOISE SUPPRESSOR FOR VACUUM SWEEPERS AND THE LIKE

Ernest J. Fischer, Skokie, Ill., assignor to Breuer Electric Mfg. Co., Chicago, Ill.

Filed Dec. 7, 1981, Ser. No. 328,123  
Int. Cl.<sup>3</sup> A47L 9/00

U.S. Cl. 15—326

15 Claims



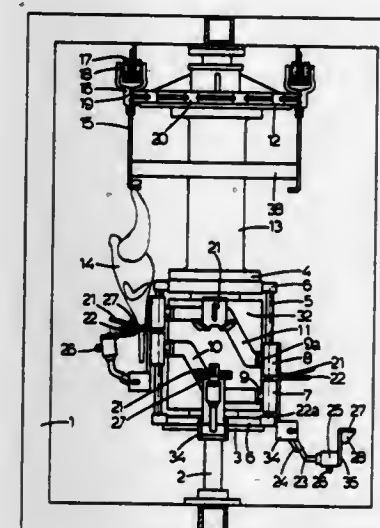
1. In combination with an enclosure for connection with an exhaust outlet from an air blower, wherein said enclosure has means for exhausting air introduced therein, a sound reducing muffler comprising a housing having a cylindrical wall of a first diameter and planar end walls which extend from opposite circumferences of said cylindrical wall toward and perpendicular to the axis thereof and have circular openings of a second and smaller diameter formed therethrough coaxial with said axis of said cylindrical wall, and first and second tubular members of said second diameter, each connected at one end with a respective one of said planar end walls about the circumference of the opening therein to extend outwardly, but not inwardly, of said housing, an opposite end of said first tubular member being connectable with the exhaust outlet from the air blower to extend an opposite end of said second tubular member to interior of said enclosure for conveying air from the blower into said enclosure, said muffler acting as a low pass noise filter to reduce high frequency noises attending passage of air through the blower.

# 4,418,444 APPARATUS FOR SEPARATING THE NECK OF A HEADLESS PLUCKED FOWL

Pieter Meyn, and Cornelis Meyn, both of Oostzaan, Netherlands, assignors to Meyn Machinefabriek BV, Oostzaan, Netherlands

Filed Mar. 25, 1982, Ser. No. 362,036  
Claims priority, application Netherlands, Mar. 27, 1981, 8101528

U.S. Cl. 17—11

Int. Cl.<sup>3</sup> A22C 21/00

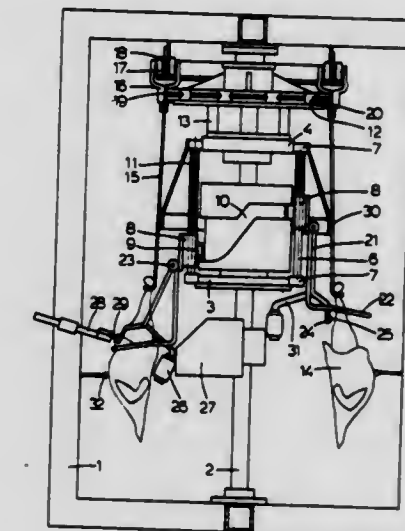
1. An apparatus for separating the neck of a headless plucked fowl hanging by the ankle joints from a hook of an overhead conveyor, said apparatus comprising a frame, at least one horizontally extending fork-shaped clamping member adapted to receive the neck of a fowl suspended from said conveyor, said clamping member being mounted in said frame for movement along with said conveyor and for vertical movement up and down relative to the fowl, means for controlling the vertical movement of said clamping member, a pressure arm co-operating with said clamping member and pivotally mounted with respect to the latter for movement between a first rest position free of the fork opening of said clamping member and a second operating position closing said fork opening and pressing the fowl's neck received in the clamping member to pinch off the vertebrae of the neck from the remaining part of the spinal column of the fowl while leaving the skin of the neck intact, means for operating said pressure arm in timed relationship to the movements of said clamping member, said means moving said arm to its said second position when the clamping member is substantially in its upper position, a second fork member situated above said clamping member, likewise mounted in said frame for movement along with said conveyor and for vertical movement up and down relative to the fowl, said fork member being adapted to support the fowl on both sides of its neck, and means for moving said fork member in timed relationship with the movement of said clamping member in such a manner that said two members are moved together upwards with the fork member close above the clamping member and that, after the operation of the pressure arm to break the fowl's neck, the fork member remains in its upper position supporting the fowl while the clamping member together with the pressure arm is moved downwards whereby the separated neck vertebrae are at least partially pulled out of the skin of the neck through the opening previously formed by the removal of the fowl's head.

# 4,418,445 APPARATUS FOR CUTTING OPEN A FOWL BY A TRANSVERSE CUT

Pieter Meyn, and Cornelis Meyn, both of Oostzaan, Netherlands, assignors to Meyn Machinefabriek BV, Oostzaan, Netherlands

Filed Mar. 25, 1982, Ser. No. 362,037  
Claims priority, application Netherlands, Mar. 27, 1981, 8101527

5 Claims U.S. Cl. 17—11

Int. Cl.<sup>3</sup> A22C 21/06

1. Apparatus for opening the body cavity of a fowl by a transverse cut which fowl is hanging by the ankle joints from a hook of an overhead conveyor, the vent of which fowl having been previously cut out, said apparatus comprising a frame, cutting means carried by said frame in a stationary position with respect to said conveyor, at least one guide means movably connected to said frame, means for moving said guide means along with said conveyor, slide means vertically reciprocally mounted on said guide means, means for moving said slide means along said guide means towards and away from a fowl carried by said conveyor, means carried by said slide means for engaging and holding the fowl in a position allowing it to be cut by said stationary cutting means as it is carried along by said conveyor in a pre-determined path of travel, said holding means comprising a stretching member movably connected to said slide means for reciprocating movements between a first position in which said stretching member can be inserted into the body cavity of the fowl through the vent opening cut out therein and a second position outwardly of said first position, means for moving said stretching member between said two positions in synchronisation with the movements of said slide means, whereby on the downward movement of the slide means the stretching member in its said first position is inserted into the fowl body cavity and then moved to its second position to stretch the skin of the fowl upwardly towards said stationary cutting means.

# 4,418,446 MOLD ASSEMBLY FOR FOOD PATTY MOLDING MACHINE

Kenneth Sandberg, Lockport, and James Stoub, Oak Forest, both of Ill., assignors to Formax, Inc., Mokena, Ill.  
Continuation of Ser. No. 240,955, Mar. 5, 1981, abandoned. This application Mar. 24, 1982, Ser. No. 361,186

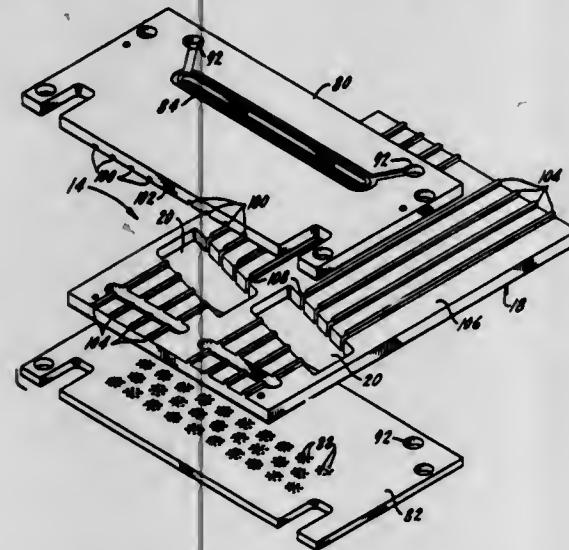
Int. Cl.<sup>3</sup> A22C 7/00  
U.S. Cl. 17—32

5 Claims

1. In a food patty molding machine of the kind comprising:



- a mold plate including at least one mold cavity extending through the plate;
- a pair of mold closure plates, engaging opposed surfaces of the mold plate in close-fitting surface-to-surface engagement;
- mold plate drive means for cyclically driving the mold plate along a given path, between the closure plates, from a fill position to a discharge position and back to the fill position;
- a fill passage having one end extending through one closure plate, communicating with the mold cavity when the mold plate is in its fill position;
- and a food pump for pumping a moldable food product through the fill passage into the mold cavity;



- an improved mold assembly, enabling the machine to form patties having non-planar main surfaces, comprising:
- at least one rib-forming channel of uniform cross-sectional shape throughout its length formed in the surface of each closure plate engaging a surface of the mold plate, the rib-forming channel extending longitudinally of the closure plate surface parallel to the path of movement of the mold plate and traversing the mold cavity;
  - and at least one rib-forming projection extending longitudinally of each closure-plate-engaging surface of the mold plate, complementary in cross-sectional shape to the rib-forming channel in the adjacent closure plate, in close-fitting sliding engagement in the rib-forming channel in the adjacent closure plate.

4,418,447

#### METHOD AND APPARATUS FOR PROCESSING STUFFED SAUSAGE CASING

Francis J. Ziolkowski, Bridgewater, N.J., assignor to Devro, Inc., Somerville, N.J.

Filed Jul. 2, 1981, Ser. No. 279,895

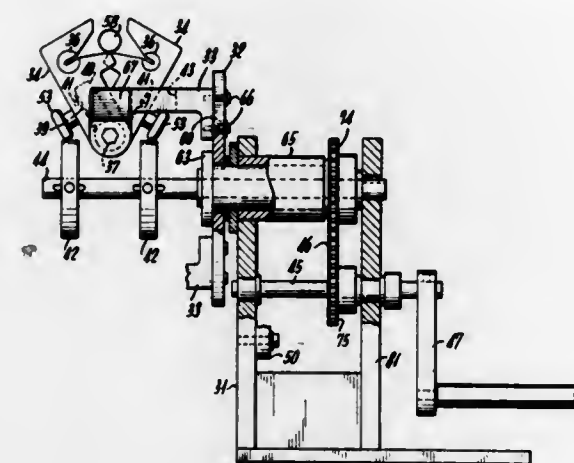
Int. Cl.<sup>3</sup> A22C 11/00

U.S. Cl. 17-34

12 Claims

1. Apparatus for forming individual sausage links comprising:
  - a support frame;
  - a mounting means attached to the support frame and capable of moving in an endless cycle;
  - means to move said mounting means;
  - a plurality of support brackets affixed at spaced points on said mounting means;
  - a pair of forming arms attached to each of said support brackets;
  - each of said forming arms having an inner surface which faces the inner surface of the other forming arm in the same pair of forming arms and an outer surface which is opposite the inner surface;
  - each of said forming arms having at the end of said arm an opening which faces toward the opening in the other forming arm of the same pair;

- a slot in the closed end of each opening;
- and a cutting edge at the closed end of said slot in at least a portion of the total number of forming arms;
- means to direct a filled casing into the space formed by the opening in a pair of forming arms;
- a follower attached to at least one of the forming arms in each pair;



- an actuator attached to said support frame and operatively connected to said forming arms through said followers to first move at least one of the forming arms in each pair toward one another to contact the filled casing when said mounting means is moved in an endless cycle;
- said actuator being capable of moving said forming arms toward one another until the cutting surfaces in a pair of forming arms overlap, thereby cutting the casing into an individual link.

4,418,448

#### CLAMP FOR HOSES OR THE LIKE

Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

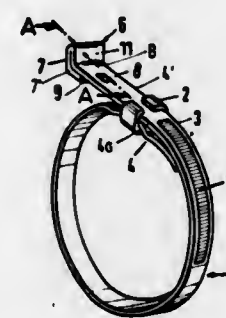
Filed Jan. 29, 1982, Ser. No. 343,740

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122656

Int. Cl.<sup>3</sup> B65D 63/02, 63/00; A44B 21/00

U.S. Cl. 24-20 TT

7 Claims



1. A clamp for hoses of the like, comprising an elongated strap including a toothed loop-shaped intermediate portion, a toothed first end portion overlapped by and meshing with said intermediate portion, and a second end portion extending from said intermediate portion and comprising a bendable tensioning projection extending outwardly in a direction away from said intermediate portion and having a first face extending substantially transversely of said strap, said second end portion further including an integral protuberance offset with respect to the general plane of said second end portion, extending toward said intermediate portion and having a second face adjacent to said first face and arranged to oppose bending of said projection when the projection is urged in a direction to reduce the size of said intermediate portion, said projection constituting a folded-over part of said second end portion and including two mutually inclined legs one of which extends outwardly and the other of which includes a panel provided with said first face

- and disposed at that side of said second end portion which faces said intermediate portion.

4,418,449

#### SLIDE FASTENER

Helmut Helmberger, Steinhausen, and Helmut Wulz, Birmensdorf, both of Switzerland, assignors to Oplon W. Erlich Hellmann GmbH, Cham, Switzerland

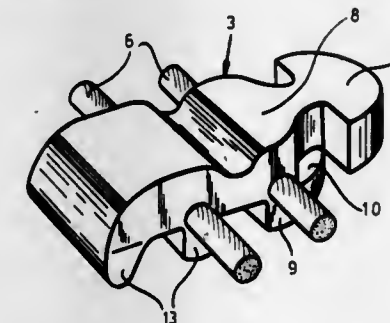
Filed Oct. 16, 1980, Ser. No. 197,597

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2942009; Nov. 16, 1979, 2946229

Int. Cl.<sup>3</sup> A44B 19/06

U.S. Cl. 24-401

6 Claims



1. A slide-fastener stringer comprising:
  - a pair of support tapes having confronting edges;
  - respective coupling elements extending along said edges and interdigitating upon movement of a slide along said coupling elements; and
  - means for securing said coupling elements to said tape, each of said coupling elements comprising:
    - at least one connecting textile cord running the length of the coupling element inwardly of the respective edge, and
    - a multiplicity of flat one-arm unbent coupling members affixed to said textile cord and projecting therefrom over the respective edge, each of said coupling members:
      - having a bottom surface bearing upon one side of said tape,
      - having a plane parallel to said tapes and subdividing each coupling member into an upper part and a lower part, said parts being molded unitarily with one another and lying above said bottom surface,
      - having a mushroom-shaped head projecting beyond the respective edge and formed exclusively on the upper part, and a neck reaching toward said edge,
      - having a pair of ledges formed above said bottom surface exclusively on said lower part with upwardly facing surfaces in said plane laterally projecting beyond said neck for engagement with interdigitating heads of the coupling element of the other tape to lock the interdigitated heads against forces perpendicular to said plane, and
      - having a shank region inwardly of the respective edge and engaged by said means, said shank region lying above said plane and embedding said cord therein.

4,418,450

#### WEB FITTING WITH WEBBING PROTECTOR

Roger Nelson, Howell, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed May 15, 1981, Ser. No. 263,973

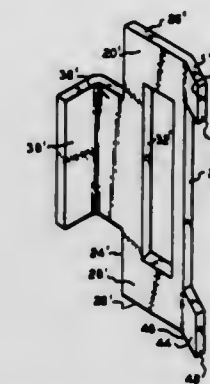
Int. Cl.<sup>3</sup> B61D 45/00, 63/00

U.S. Cl. 24-265 CD

6 Claims

5. In a fitting retainer to be used in pairs with a web loop, a substantially planar body having inner and outer surfaces, an outer edge, an inner edge, end edges, an elongated web receiving opening having ends and a length substantially parallel to said outer edge, and a locking tab extending from said inner edge intermediate said end edges having a portion transversely

- disposed to the plane of said body, the improvement comprising, an extension defined on said body adjacent each end edge and off-set with respect to said web receiving opening ends and extending beyond said outer edge a distance at least as great as



- the thickness of the web to be used with said body whereby said extensions extend beyond webbing passing over said outer edge to protect the webbing from being crushed against the outer edge, said extensions being separated by a distance at least as great as the length of the web receiving opening.

4,418,451

#### METHODS FOR THE PRODUCTION OF MULTI-LEVEL SURFACE PATTERNED MATERIALS

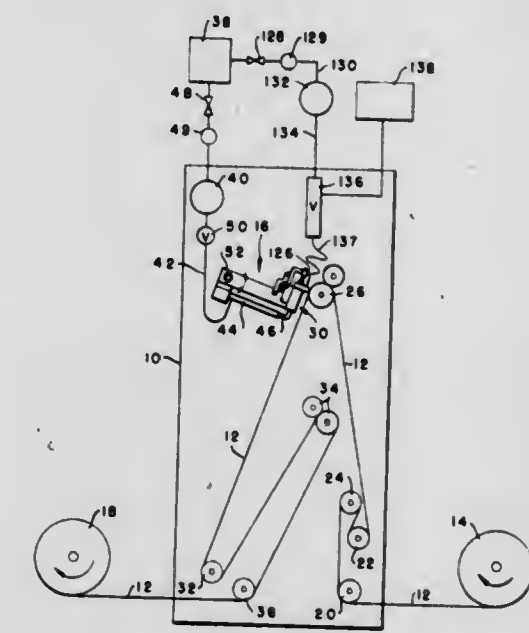
Edward L. Crenshaw, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 23, 1981, Ser. No. 227,723

Int. Cl.<sup>3</sup> D06C 23/04

U.S. Cl. 26-2 R

10 Claims



1. In a method of patterning a substrate material containing thermally modifiable surface components by directing streams of heated pressurized fluid into the surface of a relatively moving substrate material to thermally modify and reduce the height of surface areas contacted by the streams while starting and stopping the flow of selected of the streams in accordance with pattern control information; the improvement therein comprising the step of controllably varying the temperature of selected of the heated fluid streams striking selected of said surface areas during relative movement of the substrate material by introducing a controlled amount of cooler fluid into the flow of the heated fluid stream striking each of said selected surface areas to correspondingly vary the height reduction of said selected surface areas and produce a surface pattern characterized by surface areas of high, low and intermediate height while maintaining the length of each of said selected streams.
7. In a method of patterning the pile surface of a relatively



moving pile fabric containing thermally modifiable pile yarn components by selective application of streams of pressurized heated fluid into pile surface areas of the fabric in accordance with pattern control information to reduce the pile height in said surface areas, the improvement therewith comprising the steps of controllably varying the temperature of selected of the fluid streams striking selected of said pile surface areas during relative movement of the fabric by rapidly introducing a controlled amount of cooler fluid into the flow of each of said selected fluid streams to controllably vary the fluid stream temperatures during relative movement of the surface area thereby to correspondingly vary the degree of reduction of the pile height in said surface portions and produce a surface pattern in the pile fabric characterized by high, low, and intermediate levels of pile height while maintaining the length of each of said selected streams.

4,418,452

## X-RAY DETECTOR

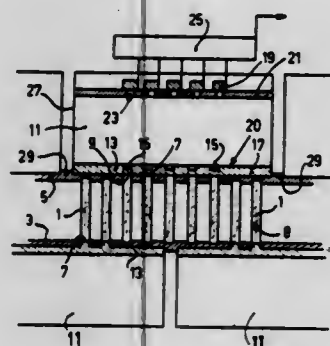
Walter H. Kuhl; Johannes A. J. Van Leunen; Bart van der Eijk; Antonius J. J. M. van der Bolt, and Arthur M. E. Hobbrechts, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 885,670, Mar. 13, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 79,909

Claims priority, application Netherlands, Mar. 28, 1977, 7703294

Int. Cl.<sup>3</sup> H01J 9/12

U.S. Cl. 445—35



1. A method for manufacturing a radiation detector of the type which comprises a photocathode which is disposed on an entrance window, an electron detector including a semiconductor junction, and means, including a perforated aperture plate disposed between the entrance window and the electron detector, which transmit electrons from the photocathode to the electron detector; comprising the steps of:

first assembly the entrance window and electron detector to the means which transmit electrons; then covering one or more perforations in the aperture plate with removable spherical shield(s); then forming the photocathode on the surface of the entrance window; and then removing the spherical shield(s).

4,418,453

## HEATING APPARATUS FOR SHRINK TUBING

Christopher K. Brown, Camp Hill, and Donald A. Wion, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 3, 1981, Ser. No. 239,967

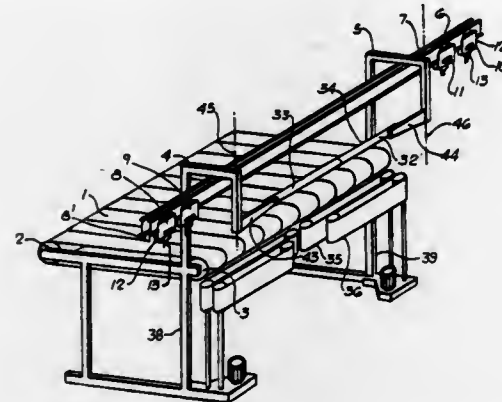
Int. Cl.<sup>3</sup> B27F 9/00; H01R 43/00

U.S. Cl. 29—33 M

1. Apparatus for securing heat shrinkable tubing to the leading end of a wire comprises:

a duct having an open first end and an open second end, said duct having a first linear slot extending between said first end and said second end, said duct further having an aperture between said ends,

a hot air source positioned to provide hot air to said aperture into said duct, a tube between said hot air source and said aperture, said hot air passing from said source through said tube to said aperture transversely of said slot, conveyor means adjacent to said first linear slot, said conveyor means having gripping means for gripping said wire so that the leading end will extend axially into said duct



through said first linear slot, said conveyor means moving from said first end toward said second end so that said wire is conveyed laterally of its axis, whereby,

1 Claim a wire having a piece of heat shrinkable tubing placed on the leading end can be gripped by said gripping means and conveyed by; said conveyor means with said leading end extending into said first linear slot and exposed to said hot air in said duct, thereby shrinking said heat shrinkable tubing onto said leading end.

4,418,454

## BURNISHING TOOTHED POWER TRANSMISSION MEMBERS

James T. Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

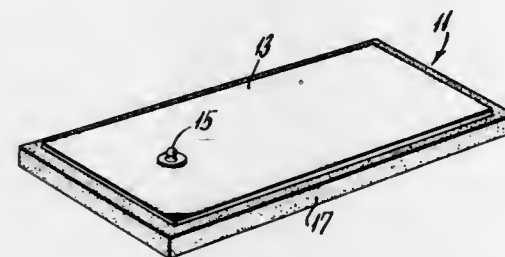
Continuation of Ser. No. 237,240, Feb. 23, 1981, abandoned.

This application Mar. 25, 1983, Ser. No. 478,807

Int. Cl.<sup>3</sup> B24B 39/00; B21H 3/00

U.S. Cl. 29—90 B

5 Claims



5. A rack for burnishing toothed gears comprising: a unitary body of an elongated shape including leading and trailing ends and a toothed face extending therebetween; said unitary body including a flat mounting surface that faces in an opposite direction as the toothed face and also including a pair of side walls that face in opposite directions away from each other and extend in a perpendicular relationship from the mounting surface to the toothed face in a parallel relationship to each other; said toothed face of the unitary body including a leading section extending parallel to the mounting surface at the leading end of the rack; the toothed face also including an intermediate section that is slightly inclined with respect to the leading section and the mounting surface in a lateral direction along the elongated length of the body at a location between the leading and trailing ends thereof; and the toothed face also including a trailing section that is slightly inclined with respect

to the leading section and the mounting surface in a lateral direction along the elongated length of the body at the trailing end thereof and with an opposite inclination of the same angular extent as the intermediate section from the leading section.

4,418,456

## TUBULAR BURNER CONSTRUCTION AND METHOD OF MAKING THE SAME

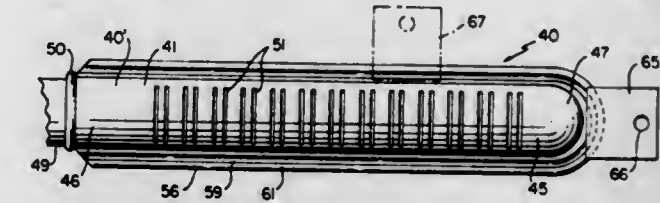
Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 4, 1981, Ser. No. 318,031

Int. Cl.<sup>3</sup> F23D 13/36

U.S. Cl. 29—157 C

10 Claims



4,418,455

## METHOD OF MANUFACTURING A FLUID COOLED BLADE OR VANE

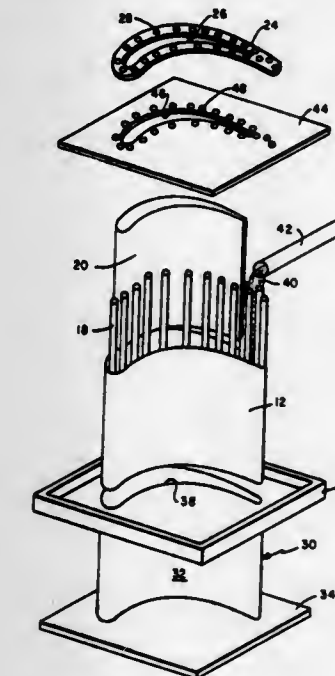
Arthur Cohn, Palo Alto, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 4, 1981, Ser. No. 259,997

Int. Cl.<sup>3</sup> B23P 15/04

U.S. Cl. 29—156.8 H

14 Claims



1. In a method of making a tubular burner construction having wall means defining a longitudinal fuel receiving chamber therein, said wall means having port means provided therein and leading from said chamber to the exterior of said burner construction for issuing fuel from said chamber, said wall means comprising two separate substantially like parts secured together at open ends thereof to define said tubular construction, the improvement comprising the steps of stamping each port from the same sized blank with a first pair of dies so that each part is initially substantially identical and has an outer peripheral flange means at said open end thereof, forming said port means with a second pair of dies in only one of said parts and inboard of said open end thereof while at the same time cutting away part of said flange means with said second pair of dies so that the peripheral flange means of said one part is shorter throughout its width than said peripheral flange means of the other of said parts, and securing said flange means of said parts together by turning said flange means of one of said parts over said flange means of the other of said parts and crimping said flange means together to seal said flange means to each other.

4,418,457

## APPARATUS AND PROCESS FOR EXPANDING TO JOIN A TUBE INTO A TUBE SHEET OPENING

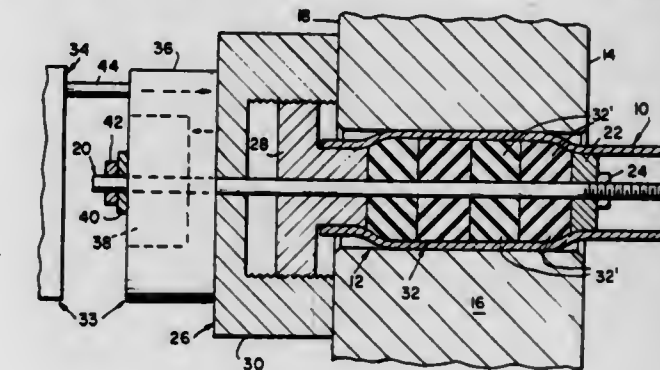
Richard A. Mueller, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Jan. 21, 1982, Ser. No. 341,048

Int. Cl.<sup>3</sup> B23P 15/26; B21D 39/04, 39/08

U.S. Cl. 29—157.4

12 Claims



1. An apparatus for radially expanding to join a tube into an opening of a tube sheet, including an inner face and outer face thereof, comprising:

- (a) a tube mated within the tube sheet opening such that the majority of the length of the tube is exterior from and generally perpendicular to the inner face of the tube sheet;
- (b) a shaft extending axially inside the tube;
- (c) an inner end cap bound to one end of the shaft for longitudinal axial movement in combination with the shaft with respect to the tube;
- (d) an inner collar cap slidably mounted on and along the



- shaft in proximity with the tube sheet opening at the tube sheet outer face;
- (e) an elastomeric means slidably mounted on and along the shaft within the tube sheet opening between the inner end cap and the inner collar cap for longitudinal axial movement on and along the shaft with respect to the tube;
- (f) an outer locating collar abutting the outer face of the tube sheet in proximity with the tube sheet opening, said outer locating collar connected to the inner collar cap such that the inner collar cap may be substituted by other inner collar caps of different diameters, and such that the position of the inner collar cap may be adjusted within the outer locating collar along the longitudinal axis of the shaft; and
- (g) a means for pulling the shaft in one axial direction while simultaneously pushing the outer locating collar in the opposite axial direction against the outer face of the tube sheet, such that when the inner end cap and the outer locating collar contact the elastomeric means the respective continuing axial forces from pulling and pushing compress the elastomeric means against the inside of the tube causing the tube to expand outwardly against the inner surface of the tube sheet opening to form an interference fit between the tube wall and the inner surface of the tube sheet opening.
7. A process for radially expanding to join a tube to an opening of a tube sheet, including an inner face and an outer face thereof, said process comprising the following steps:
- (a) mating a tube within the tube sheet opening such that the majority of the length of tube is exterior from and generally perpendicular to the inner face of the tube sheet;
- (b) aligning a shaft axially inside of said tube, said shaft having an inner end cap bound thereto for longitudinal axial movement in combination with the shaft with respect to the tube;
- (c) mounting an elastomeric means slidably on and along the shaft within the tube sheet opening for longitudinal axial movement on and along the shaft with respect to the tube;
- (d) mounting an inner collar cap slidably on and along the shaft in proximity to the tube sheet opening at the tube sheet outer face, said inner collar cap positioned on and along the shaft such that said elastomeric means is between said inner collar cap and said inner end cap;
- (e) positioning an outer locating collar such that said outer locating collar abuts the outer face of the tube sheet in proximity with the tube sheet opening, said outer locating collar connected to the inner collar cap such that the inner collar cap may be substituted by other inner collar caps of different diameters, and such that position of the inner collar cap may be adjusted within the outer locating collar along the longitudinal axis of the shaft; and
- (f) pulling the shaft in one axial direction while simultaneously pushing the outer locating collar in the opposite axial direction against the outer face of the tube sheet, such that when the inner end cap and the inner collar cap contact the elastomeric means the continuing respective axial forces from pulling and pushing compress and subsequently radially expand the elastomeric means against the inside of the tube, thereby causing the tube to expand radially against the inner surface of the tube sheet opening to form an interference fit between the tube wall and the inner surface of the tube sheet opening.

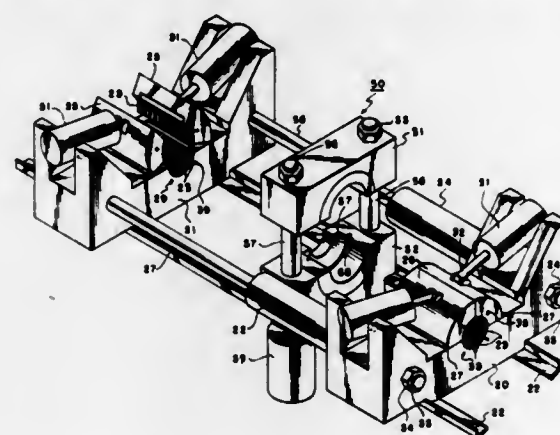
**4,418,458**  
**APPARATUS FOR MAKING PIPE COUPLING JOINT**  
 John J. Hunter, 1410 Willow Pond, Abilene, Tex.  
 Division of Ser. No. 932,178, Aug. 9, 1978, Pat. No. 4,257,155, which is a continuation of Ser. No. 708,867, Jul. 26, 1976, abandoned. This application Nov. 18, 1980, Ser. No. 207,787  
 Int. Cl.<sup>3</sup> B23P 19/04

U.S. Cl. 29—237

2 Claims

1. Apparatus for interference fit joining rigid malleable pipe sections comprising:

- (a) means for holding a second pipe section in axial alignment with a first pipe section;
- (b) means for holding said first pipe section in axial alignment with said second pipe section and simultaneously axially telescoping the end of said first pipe section within the end of said second pipe section; and
- (c) means for deforming the mouth portion of said second pipe section radially inwardly to form an annular groove in said first pipe section and fit said mouth portion of said second pipe section within said annular groove, said means for deforming including:
- (i) first and second semi-circular members adapted to form a circular ring when positioned adjacent each other,



said circular ring having a substantially smooth inner surface tapered from an internal diameter as large as the external diameter of said first pipe section to an internal diameter larger than the external diameter of the mouth of said second pipe section;

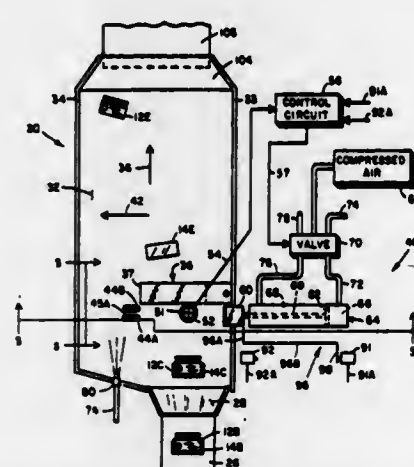
(ii) means for positioning said first and second semi-circular members adjacent each other and surrounding said first pipe section adjacent the mouth of said second pipe section; and

(iii) means for driving said circular ring axially over the mouth of said second pipe section sufficiently to radially deform said mouth inwardly, thereby forming an annular groove in said first pipe section and radially pressing said mouth into said groove.

**4,418,459**  
**APPARATUS SEPARATING HYBRID SUBSTRATE FROM CARRIER PLATE**  
 Gajendra M. Patel, Fremont, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.  
 Division of Ser. No. 129,507, Mar. 11, 1980, Pat. No. 4,360,960. This application Nov. 27, 1981, Ser. No. 325,418  
 Int. Cl.<sup>3</sup> B23P 19/04

U.S. Cl. 29—239

3 Claims



1. Apparatus for separating a leaded hybrid substrate from a heat conductive carrier plate that it is sitting on, the flat bottom

of the substrate being contiguous with and stuck to the flat top surface of the plate by solder flux following a reflow solder operation, comprising:

- first means for creating a first force on one of the substrate and plate for moving said one of the substrate and plate in one direction, said first force being in a plane substantially parallel to the contiguous surfaces; and
- second means creating a second force on the other one of the substrate and plate for moving it in a direction generally opposite to the one direction so as to create a shear force in the one direction along the contiguous surfaces of the plate and substrate.

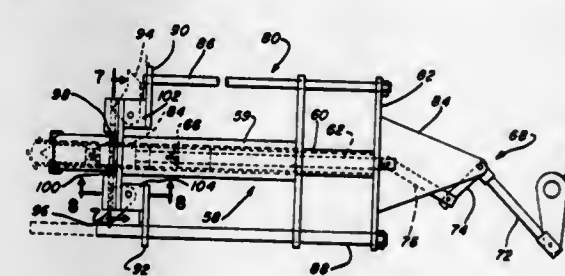
**4,418,460**  
**METHOD AND APPARATUS FOR SEPARATING A LID FROM A CONTAINER**  
 Charles N. Ruth, 2414 Sandridge Ct., Grand Junction, Colo. 81503

Filed Aug. 11, 1981, Ser. No. 291,985

Int. Cl.<sup>3</sup> B23Q 17/00

U.S. Cl. 29—403.3

12 Claims



1. A method for removing a first end of a container, comprising the steps of:  
 entering a second end of the container; and  
 applying a force to the first end of the container in a direction inwardly to outwardly of the container to remove the first end of the container.

**4,418,461**  
**PROCESS FOR PRODUCING SLATS FOR A VERTICAL SLATTED VENETIAN BLIND**  
 Horst Spohr, Cuxhaven, Fed. Rep. of Germany, assignor to Bautex Adolf Stover KG, Langen-Sievern, Fed. Rep. of Germany

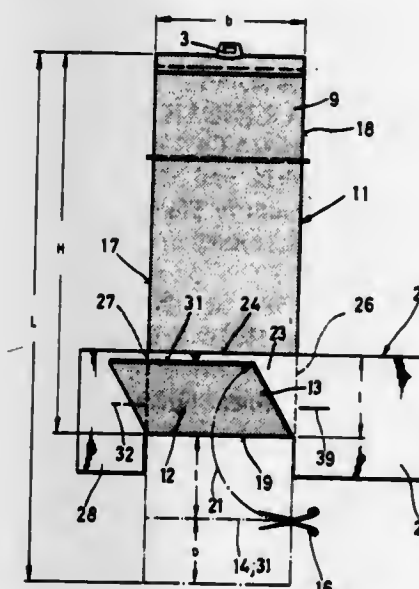
Filed Dec. 2, 1981, Ser. No. 326,817

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1981, 3115832

Int. Cl.<sup>3</sup> B23Q 17/00; A41H 1/00

U.S. Cl. 29—407

5 Claims



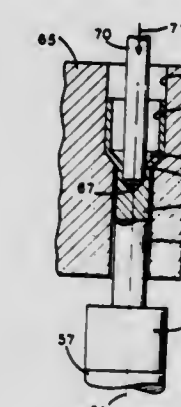
1. Method of producing ready-to-use slats from semifinished slat portions for use in a slatted Venetian blind having verti-

cally directed slats, the semifinished slat portions being overlapped, comprising the steps of cutting the free lower end of each semifinished slat to a predetermined length corresponding to the installation height plus an extra length equal to a wrap-over portion, folding the wrap-over portion at a bending edge, forming in the lower end portion of the slat in the vicinity of the wrap-over portion at least two holes, positioning retaining pins in said holes and subsequently locking said pins.

**4,418,462**  
**METHOD OF ASSEMBLING AND DISASSEMBLING A CONTROL COMPONENT STRUCTURE**  
 Lewis A. Walton, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.  
 Division of Ser. No. 952,522, Oct. 18, 1978, abandoned. This application Jun. 26, 1981, Ser. No. 277,553  
 Int. Cl.<sup>3</sup> B23P 19/00

U.S. Cl. 29—426.4

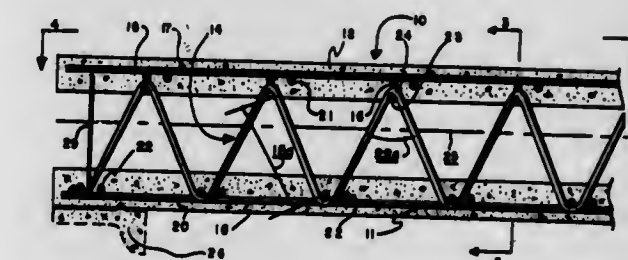
5 Claims



1. A method for installing and removing a burnable poison rod having a stem protruding from one end thereof from a spider having a bore for receiving the stem comprising the steps of inserting the stem in an axial direction into the spider bore, securing the stem in the bore, pressing the stem in the axial direction with respect to the bore with sufficient force to overcome the force securing the stem in the bore, and withdrawing the stem from the bore.

**4,418,463**  
**METHOD OF FABRICATING A COMPOSITE STRUCTURE OF CONCRETE AND STEEL NETWORK**  
 Robert C. McNeill, Ogden, Utah, assignor to Ogden Structural Products, Inc., Ogden, Utah  
 Continuation-in-part of Ser. No. 151,428, May 19, 1980, abandoned. This application Jan. 26, 1981, Ser. No. 228,581  
 Int. Cl.<sup>3</sup> B22D 11/126; B21F 15/08, 27/10  
 U.S. Cl. 29—527.4

2 Claims



1. The method of fabricating a composite structure of concrete and steel network, comprising the steps:  
 providing a three dimensional wire network structure;  
 providing a first upwardly opening form, said form including members to provide a stiff structural assembly, and means pivotally supporting the assembly about a longitudinal axis thereof, so that the assembly may be rotated about said axis;  
 providing a first layer of high structural strength concrete



mix the length and breadth of the first upwardly opening form;  
lowering the network structure into the mix in the form so that a portion of one side of said structure is submerged within the mix;  
providing means supporting the three dimensional structure upwardly from the bottom of the form, so that the wires thereof are above the bottom of the first form;  
providing means for clamping the first layer into the form upon the subsequent cure of said layer;  
allowing a period of time for the first concrete layer to cure at least to initial hardness;  
providing a second upwardly opening form with a second layer of high structural strength concrete mix the length and breadth thereof;  
pivoting the stiffening structure over and supporting said structure so that a portion of the other side of the wire structure is submerged within the second concrete layer parallel to and above the bottom of the second form; and allowing a period of time for the second concrete layer to cure at least to initial hardness.

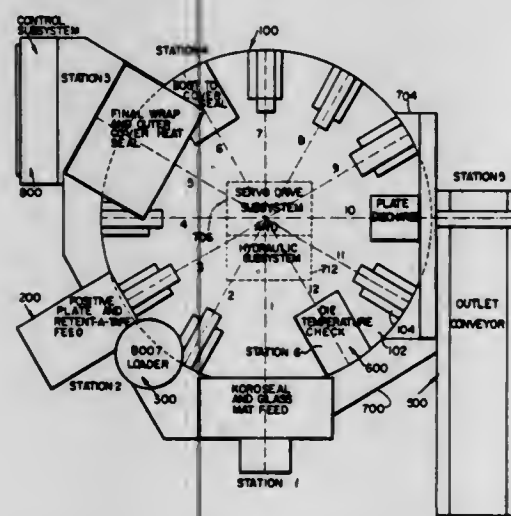
#### 4,418,464 WRAPPING APPARATUS FOR INDUSTRIAL BATTERY PLATES

Hector DiGiacomo, Lafayette Hill, Pa.; Robert R. Raos, Freeport, Calif., and Al L. Zabko, Solon, Ohio, assignors to General Battery Corporation, Reading, Pa.

Filed Jul. 31, 1980, Ser. No. 174,151  
Int. Cl.<sup>3</sup> B23P 19/04; H01M 2/14

U.S. Cl. 29—564.6

41 Claims



1. An apparatus for doubly wrapping and enveloping a rectangular storage battery plate having bottom and side edges comprising:

fixture means for selectively receiving a battery plate;  
first supply means for depositing a first swatch of an enveloping material on said fixture means;  
second supply means for depositing a second swatch of a wrapping material on said fixture means such that said second swatch is on top of said first swatch;  
means for depositing a wrapped and booted battery plate on said fixture means, including  
means for laterally displacing a battery plate, bottom edge first, from a selected ready position;  
third supply means for interposing a third swatch of a wrapping material in the path of lateral displacement of said battery plate such that the bottom edge intercepts the middle of said third swatch which is thereby wrapped about said battery plate; and  
fourth supply means for interposing a selectively configured boot in the path of lateral displacement of said battery plate such that said boot envelopes the bottom edge of said battery plate wrapped by said third swatch;

means for wrapping said first and second swatches about the battery plate, including  
means for tamping said plate into said fixture such that said first and second swatches conform to the side edges of said plate; and  
means for folding said first and second swatches over said plate such that end portions of said first swatch overlap; and  
means for selectively bonding said boot and said first swatch so as to define an outer envelope which maintains said second and third swatches wrapped about said battery plate.

#### 4,418,465 WIRE CUTTING AND INSULATION SOFTENING APPARATUS

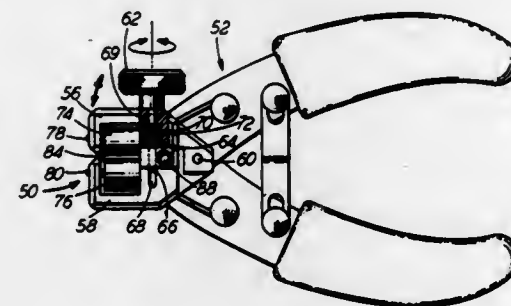
Willard E. Rapp, Griggstown, N.J., assignor to Western Electric Co., New York, N.Y.

Division of Ser. No. 307,454, Oct. 1, 1981, Pat. No. 4,382,456.  
This application Feb. 25, 1983, Ser. No. 469,664

Int. Cl.<sup>3</sup> B23P 23/00

U.S. Cl. 29—566.1

5 Claims



1. Apparatus for cutting and softening insulated wire comprising:

a pair of wire cutters;  
means attached to the pair of wire cutters for softening the insulation of the wire comprising:  
(a) a pair of opposed rollers; and  
(b) means for mounting the rollers such that they are relatively movable away from one another to enable an insulated wire to be wrapped to be passed therebetween, and relatively movable towards each other for engaging and softening the wire insulation.

#### 4,418,466 METHOD OF MAKING A LINEAR LIGHT-DETECTING DIODE INTEGRATED CIRCUIT

James R. Piedmont, Alexandria, and Michael Hascakaylo, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 27, 1981, Ser. No. 258,168  
Int. Cl.<sup>3</sup> H01G 9/06

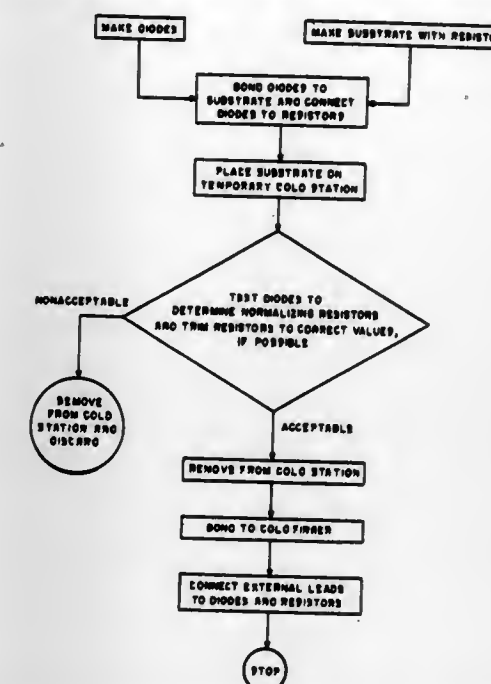
U.S. Cl. 29—572

2 Claims

1. The method of making a linear light-detecting diode array integrated circuit, including at least the steps of:

(a) preparing a linear array of diodes;  
(b) preparing a substrate with resistors thereon corresponding to said diodes;  
(c) mounting said array on said substrate and electrically connecting said resistors to corresponding diodes;  
(d) placing said substrate on a temporary cold station;  
(e) testing the light detectivity of said diodes to determine

normalization resistance values therefor, and trimming corresponding resistances to such values;  
(f) removing said substrate from said cold station;



(g) bonding said substrate to a cold finger; and  
(h) connecting external leads on said substrate and said cold finger.

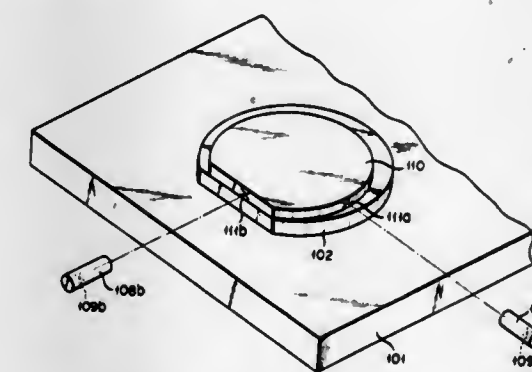
#### 4,418,467 SEMICONDUCTOR WAFER WITH ALIGNMENT MARKS AND METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Hiroshi Iwai, Takadonishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 18, 1982, Ser. No. 390,031  
Claims priority, application Japan, Jun. 26, 1981, 56-99358  
Int. Cl.<sup>3</sup> H01L 21/66

U.S. Cl. 29—574

12 Claims



1. A method for manufacturing a semiconductor device, comprising the steps of: forming a numeral, letter, symbol or combination thereof as alignment marks on a side surface of a semiconductor wafer, aligning said semiconductor wafer with a unit apparatus for manufacturing said semiconductor device by utilizing said alignment marks, and processing said semiconductor wafer with said unit apparatus.

8. A semiconductor wafer with a numeral, letter, symbol or combination thereof as a mark formed on a side surface thereof for manufacturing a semiconductor device therefrom.

1037 O.G.—2

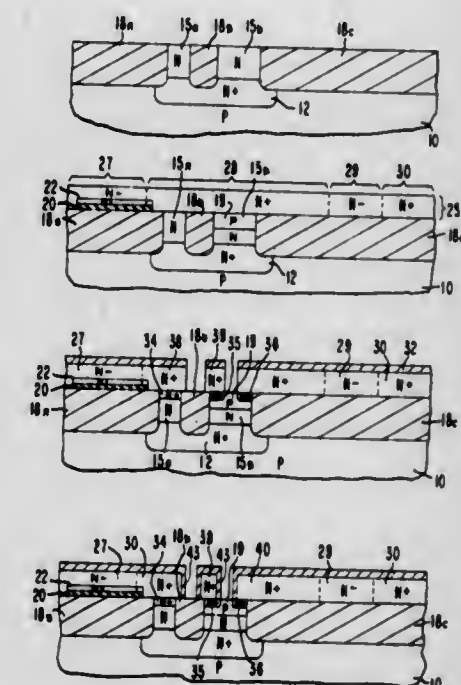
#### 4,418,468 PROCESS FOR FABRICATING A LOGIC STRUCTURE UTILIZING POLYCRYSTALLINE SILICON SCHOTTKY DIODES

Madhukar B. Vora, Los Gatos, and Herma K. Hingrah, San Jose, both of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed May 8, 1981, Ser. No. 261,842  
Int. Cl.<sup>3</sup> H01L 21/20, 21/76

U.S. Cl. 29—577 C

9 Claims



1. A process for fabricating an integrated circuit comprising: fabricating a pocket of semiconductor material surrounded by insulating material;  
depositing a layer of a metal silicide on a first region of the insulating material;  
depositing a first layer of semiconductor material on the layer of metal silicide; and  
forming selected portions of a second layer of semiconductor material over at least a second region of the insulating material, the first layer of semiconductor material, and selected portions of the pocket, at least those portions of the second layer extending from the first layer to the pocket and from the pocket to the second region having higher impurity doping than that portion of the second layer overlying the second region.



**4,418,469**  
**METHOD OF SIMULTANEOUSLY FORMING BURIED RESISTORS AND BIPOLAR TRANSISTORS BY ION IMPLANTATION**

Tsutomu Fujita, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

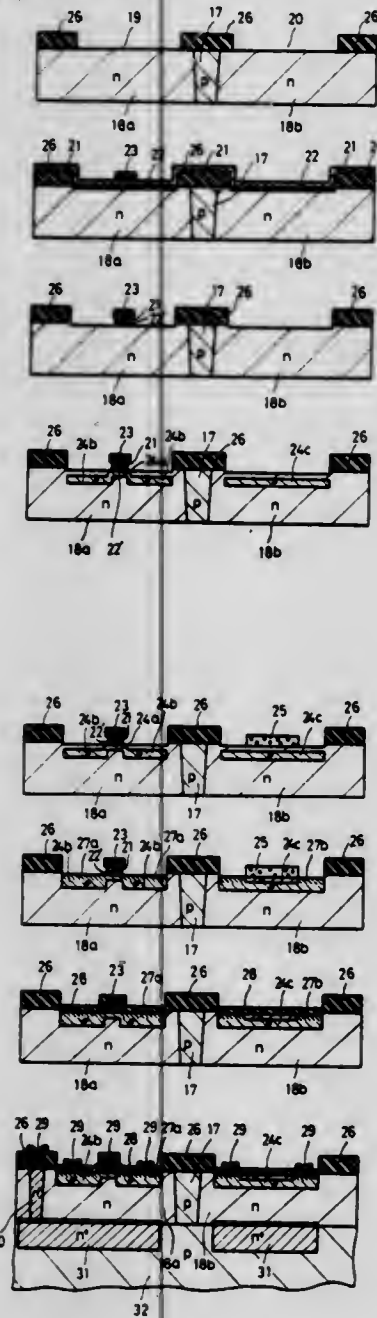
Continuation of Ser. No. 137,462, Apr. 4, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,532

Claims priority, application Japan, Apr. 12, 1979, 54-44927

Int. Cl.<sup>3</sup> H01L 21/74

U.S. Cl. 29—577 C

13 Claims



1. A method of making semiconductor integrated circuit devices comprising, in combination, the successive steps of:

- (A) forming a first and a second island regions of a first conductivity type,
- (B) forming an emitter region of said first conductivity type selectively in said first island region,
- (C) forming an active base region of a second conductivity type opposite to said first conductivity type under said emitter region, and a buried resistor layer of said second conductivity type in said second island region, said active base region and said buried resistor layer being formed simultaneously by an ion implantation with a first kind of ions of said second conductivity type from the surfaces of said first and said second island regions,
- (D) forming a mask for subsequent ion implantation selectively on said buried resistor layer except on contact regions to be formed in said second island region, and thereafter
- (E) forming non-active base regions so as to be in contact with said active base region, and said contact regions so as to be in contact with said resistor layer, said non-active base regions and said contact regions being formed simul-

taneously by another ion implantation with a second kind of ions of said second conductivity type and with a lower energy and a higher dose amount than the case of said ion implantation with said first kind of ions, from the surfaces of said first and said second island regions.

2. A method of making semiconductor integrated circuit devices comprising, in combination, the successive steps of:

- (a) forming a first and a second island regions of a first conductivity type,
- (b) forming an emitter region of said first conductivity type selectively in said first island region,
- (c) forming a mask on said second island region except on contact regions for a buried resistor layer to be formed in said second island region,
- (d) forming non-active base regions in said first island region, and contact regions in said second island region simultaneously by an ion implantation with a first kind of ions of a second conductivity type opposite to said first conductivity type, from the surfaces of said first and said second island regions,
- (e) removing said mask, and thereafter
- (f) forming an active base region under said emitter region so as to be in contact with said non-active base regions, and said buried resistor layer so as to be in contact with said contact regions, said active base region and said buried resistor layer being formed simultaneously by another ion implantation with a second kind of ions of said second conductivity type and with a higher energy and a lower dose amount than the case of said ion implantation with said first kind of ions, from the surfaces of said first and said second island regions.

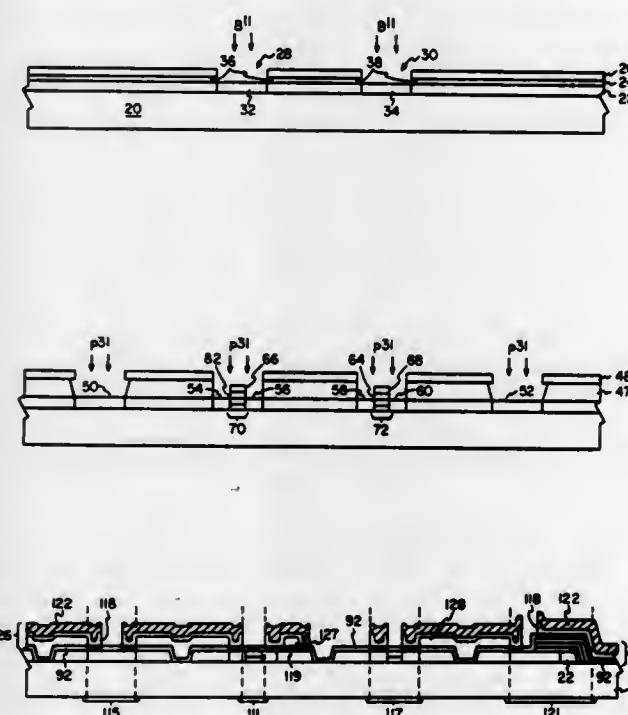
**4,418,470**  
**METHOD FOR FABRICATING SILICON-ON-SAPPHIRE MONOLITHIC MICROWAVE INTEGRATED CIRCUITS**  
 Ronald J. Naster, Syracuse; Simon A. Zaidel, Liverpool; Ying-Chen Hwang, Liverpool; Earl L. Parks, Liverpool, and William R. Cady, Scotia, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 21, 1981, Ser. No. 313,378

Int. Cl.<sup>3</sup> H01L 29/80, 27/02, 29/04

U.S. Cl. 29—577 C

20 Claims



1. A method of fabricating monolithic microwave integrated circuits comprising the steps of:

- (a) simultaneously forming upon a wafer comprising a layer of silicon disposed upon a major surface of a sapphire substrate, a plurality of active, field effect transistor circuit

elements and a plurality of passive circuit elements with said layer of silicon; said step further comprising:

- (1) forming a circuit element defining photoresist mask upon the surface of said wafer, said mask having openings therethrough to define the implant areas of predetermined active and passive circuit elements at exposed areas of said surface of said wafer;
- (2) implanting a dopant of a particular electrical conductivity type and at a particular doping density into said exposed areas;
- (3) removing said photoresist mask; and
- (4) repeating steps (1), (2) and (3) for each desired implant of a particular desired dopant;
- (b) removing selected portions of said layer of silicon to produce a plurality of electrically isolated islands containing at least one circuit element; and
- (c) depositing a plurality of metallization layers upon said wafer in a predetermined pattern to simultaneously form inductive circuit elements and circuit interconnections for said integrated circuit.

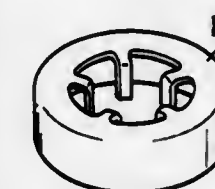
**4,418,471**  
**METHOD OF PRODUCING A STATOR YOKE OF A SMALL-SIZED MOTOR**  
 Michihiro Torii, Hamamatsu, and Hiroaki Kobayashi, Toyohashi, both of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,475

Int. Cl.<sup>3</sup> H02K 15/02

U.S. Cl. 29—596

7 Claims



1. A method of producing a stator yoke of a motor wherein said stator yoke has a multiplicity of polar teeth, comprising the steps of:

- a. forming an intermediate blank so that said blank has an inner cylindrical portion and an outer cylindrical portion projecting in the same direction as said inner cylindrical portion,
- b. cutting said inner cylindrical portion along an axial direction of said blank to form a multiplicity of polar teeth arranged at a constant pitch, said cutting being conducted by a cutting edge inclined at an acute angle relative to the axis of said blank, and
- c. effecting a punching to deepen portions between bases of the adjacent polar teeth.

**4,418,472**  
**METHOD OF DELINEATING THIN FILM MAGNETIC HEAD ARRAYS**

Robert V. Lorenze, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1981, Ser. No. 324,195

Int. Cl.<sup>3</sup> G11B 5/42

U.S. Cl. 29—603

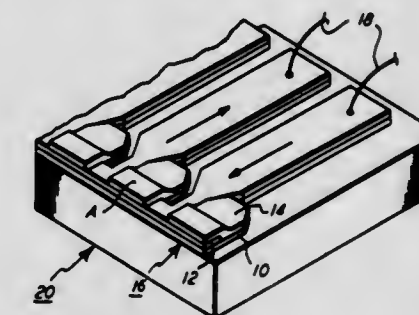
7 Claims

1. A method of forming thin film magnetic head arrays, comprising the steps of:

- (a) preparing a single crystal silicon substrate having a surface with a (110) orientation and having a plurality of {111} planes intersecting said surface;
- (b) fabricating a plurality of the thin film magnetic head arrays on the (110) oriented surface of said substrate, each array comprising a plurality of vertically configured, thin film magnetic head structures, each magnetic head structure in an array having a gap region aligned substantially in a one of said {111} planes, the gap regions of the mag-

netic head structures making up an array being substantially parallel with those of the other arrays on said substrate;

- (c) forming a mask over the magnetic head arrays and exposed portions of said substrate, the mask having a pattern of openings, each opening exposing selected portions of each of said magnetic head structures making up an array and having an edge surface which lies in a selected {111} plane that is subsequently to include the array contact surface and the gap regions of the individual magnetic



head structures making up the array associated with that opening;

- (d) ion beam milling the masked structure of step (c) along the selected {111} plane and at angles perpendicular to the (110) oriented surface of said substrate to etch through the exposed portions of said thin film magnetic head structures and into part of said substrate; and
- (e) anisotropically etching completely through the remainder of the milled substrate of step (d) along the selected {111} planes.

**4,418,473**  
**METHOD OF MAKING EDGE PROTECTED FERRITE CORE**

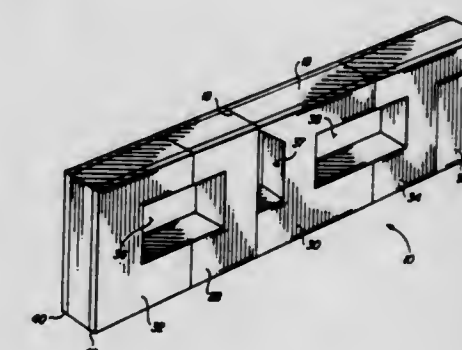
Robert W. Burkhardt, Tucson, Ariz.; Allen R. Cox, Chandlers Ford, and John D. Hartley, Winchester, both of England, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,425

Int. Cl.<sup>3</sup> G11B 5/42

U.S. Cl. 29—603

16 Claims



1. A process for making a ferrite core for a magnetic head comprising the steps of:

- obtaining two very thin plate-like substrates respectively of a magnetic ferrite material and a non-magnetic ceramic material, each having a narrow edge circumscribing the substrate as a plurality of continuous edge surfaces and joining two outwardly facing plate-like surfaces;
- edge bonding the obtained substrates to form a bonded ferrite core having a transducing gap intermediate the bonded substrates at an air bearing one of said edge surfaces of the just-formed bonded ferrite core;
- placing at least one bonded ferrite core into a vacuum deposition system such that the plate-like surfaces of the bonded ferrite core are disposed perpendicularly to a



target of a film material to be deposited on the bonded ferrite core and keeping the plate-like surfaces spaced from any other item in the vacuum deposition system; operating the deposition system such that a film layer of the target material is simultaneously deposited on all exposed surfaces of said placed substrates including said plate-like surfaces of said ferrite core; and removing the substrates from the system after the desired film thickness is obtained from said operated system.

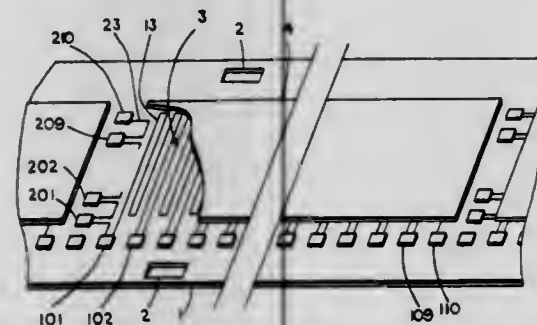
4,418,474

# PRECISION RESISTOR FABRICATION EMPLOYING TAPPED RESISTIVE ELEMENTS

William P. Barnett, 744 Pelham La., San Jose, Calif. 95127  
Continuation-in-part of Ser. No. 114,144, Jan. 21, 1980,  
abandoned. This application Jun. 25, 1980, Ser. No. 162,963  
Int. Cl.<sup>3</sup> H01C 7/02

U.S. Cl. 29—612

36 Claims



1. A method of fabricating a resistor having a predetermined value of resistance within a precisely-predetermined tolerance range, comprising the following steps:

- providing an elongated resistive element having a plurality of contact pads thereon, said pads having predetermined spacings along said element so as to divide said element into resistive segments, said resistive element constituting a first layer of resistive material, the portions of said first layer which constitute said control pads being covered by a second layer, said second layer being of a material which is different from that of said first layer and which is capable of being bonded to a connecting wire, said segments each having a resistance value which is less than said tolerance range;
- measuring the resistance of a known number of segments from 1 to m, where m is a whole number, of said resistive segments;
- calculating the number of said resistive segments necessary to attain said predetermined value of resistance, within a tolerance range equal to the value of resistance of one of said resistive segments, using as a basis the measured resistance of said known number of resistive segments;
- identifying a pair of said contact pads which are connected across said calculated number of resistive segments, and (e) connecting conductors to the pads so identified.

4,418,475

# METHOD OF MANUFACTURING A PRINTED CIRCUIT CARD EDGE CONNECTOR HAVING A PULL THROUGH BELLOWS CONTACT A LAY-OVER INSULATOR

J. Preston Ammon; Harry R. Weaver, both of Dallas, Tex., and Richard O. Norman, Oxnard, Calif., assignors to Elfab Corporation, Dallas, Tex.

Division of Ser. No. 95,226, Nov. 19, 1979, Pat. No. 4,324,451.  
This application Apr. 8, 1982, Ser. No. 366,654

Int. Cl.<sup>3</sup> H05K 3/00

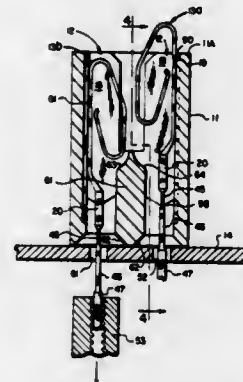
U.S. Cl. 29—842

9 Claims

1. A method for manufacturing a printed circuit card edge connector comprising the steps of:

- providing an insulative substrate having a plurality contact

receiving holes therein, said holes forming arrays lying along linear paths;  
providing an insulative block having a plurality of pull through sleeves each including a pair of parallel, laterally spaced alignment troughs comprising an alignment track;  
providing a plurality of contacts each having an upper contactor region, an intermediate mounting portion, a lower tail portion, and a pair of laterally extending projections adapted for engagement with and being received into the alignment troughs in said insulative block, said contacts each including intermediate press fit mounting regions and being connected to a common support strip;



inserting a plurality of contacts interconnected by a common support strip into the top openings of said sleeves;  
positioning said laterally extending projections of said contacts in said insulative housing alignment troughs with said contact tails extending out the bottom openings of said sleeves in axial alignment relative one to the other;  
removing the common support strip;  
inserting the contact tails through the contact receiving apertures in the insulative substrate; and  
applying a longitudinal force to the tails of the contacts to press fit, and thereby rigidly mount, the contacts into the apertures in the substrate.

4,418,476

# OFFSET INDICATOR EXTENSION

Helmut E. Missun, 7824 Via del Mundo, Scottsdale, Ariz. 85258  
Filed Feb. 1, 1982, Ser. No. 344,319

Int. Cl.<sup>3</sup> G01B 3/22

U.S. Cl. 33—172 B

11 Claims



1. An apparatus for extending the reach of an offset indicator tool of the type which includes an offset indicator dial, a first pivotably mounted needle, and a mechanism for converting

movements of said first needle into indications on said dial, said apparatus comprising:

- a housing;
- a linking member pivotably coupled within said housing and having a first end for cooperatively engaging said first needle so as to transmit movements of said linking member to said first needle;
- a lever pivotably mounted about a first point on said housing and having an upper end for cooperatively engaging a second end of said linking member so as to transmit movements of said lever to said linking member; and;
- a second needle pivotably mounted about said first point on said housing and in frictional engagement with said lever such that movements of said second needle are transmitted to said lever.

4,418,477

# MEASURING TAPE

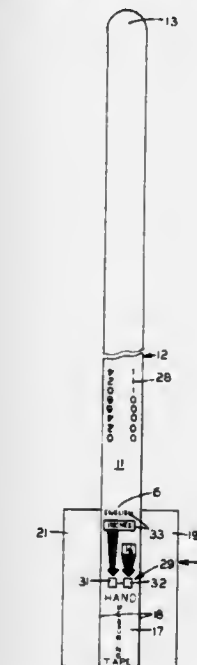
John R. Montgomery, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

Filed May 18, 1981, Ser. No. 264,862

Int. Cl.<sup>3</sup> G01B 3/10

U.S. Cl. 33—179

1 Claim



1. A measuring device comprising a strip of flexible non-elastic sheet material having a given maximum width along a first portion thereof extending from one free end to a second end attached to one end of a second portion of said strip, said second portion including an opposite free end and having a central longitudinal region and two adjacent side regions, said second portion having a second width greater than said given maximum width such that said side regions are foldable longitudinally of said strip so as to cover said central longitudinal region on one face thereof and to form a slide to receive said first portion of said strip of said given maximum width, said first portion being calibrated on said one face in indicia of longitudinal dimensions, said second portion having aperture means formed in said central longitudinal region and indexing means on an opposite face of said central longitudinal region for cooperating with said indicia of longitudinal dimensions to define said indicia characterizing the length of said strip extending from said slide toward said one free end and returned to said slide adjacent said second end of said first portion.

4,418,478

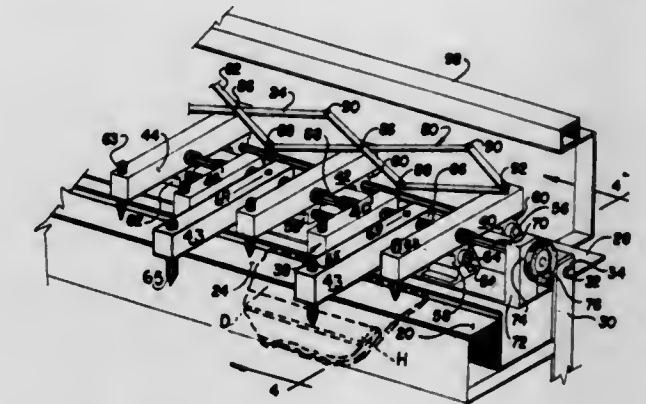
# DRAPERY PLEAT AND FOLD LINE MARKING MACHINE

Ronald W. Morgan, 6311 Lime Rd., Louisville, Ky. 40222  
Filed Jun. 1, 1981, Ser. No. 268,911

Int. Cl.<sup>3</sup> B43L 9/08

U.S. Cl. 33—192

9 Claims



1. A drapery pleat marking and fold marking machine comprising:

- a supporting base member;
- a first adjustable mechanism for marking a first series of spaces on a drapery panel;
- a second adjustable mechanism for marking a second series of spaces between the first series of spaces;
- said first adjustable mechanism comprising a series of equally spaced pairs of bars, slidably mounted on elongated slide means; each pair of bars being joined by an adjustable connecting means, and an elongated drive means in operative relation with said adjustable connecting means of each pair of bars; said drive means co-acting with said adjustable connecting means to adjust the space between each of the bars of each pair of bars in a uniform manner; said adjustable connecting means being longitudinally slidable on the elongated drive means;
- a third series of bars, equidistantly mounted in fixed relation between each pair of equally spaced bars for making a third series of marks on the drapery panel;
- said second adjustable mechanism comprising adjustable interconnecting means serving to vary the distance between each pair of bars in a uniform, equally spaced manner; and
- marking means provided on each bar and adapted to engage the drapery panel for marking off the several series of spaces.

4,418,479

# VARIABLE RANGE SIGHTING MECHANISM FOR USE WITH ARCHERY BOW

John Stachnik, R.D. #2, Box 166, Susquehanna, Pa. 18847

Filed Sep. 27, 1978, Ser. No. 946,195

Int. Cl.<sup>3</sup> G01C 15/12; F41G 1/46

U.S. Cl. 33—265

4 Claims

1. A sighting mechanism for use with an archery bow, comprising:

- a mounting plate for mounting said sighting mechanism to said bow;
- a sight bar having a front sight mounted on a forward portion thereof and a rear sight mounted on a rear portion thereof being adapted to be adjustable in one or more degrees of freedom;
- means for attaching said sight bar to said mounting plate; and
- elevation adjustment means connected to said mounting plate and to said sight bar for adjusting the elevation of said sight bar with respect to said mounting plate for accurate shooting at one or more predetermined distances, said elevation adjustment means comprising a plate attached at a first point to said sight bar and at a second



point pivotably mounted to said mounting plate and having a plurality of predetermined detent positions represent-



tative of preselected shooting distances for adjusting the angle of elevation of said sight bar.

4,418,480

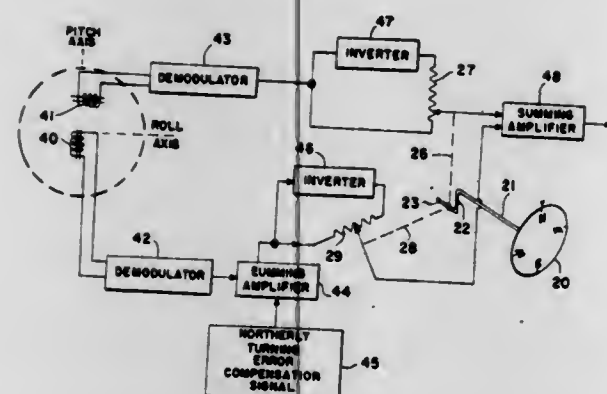
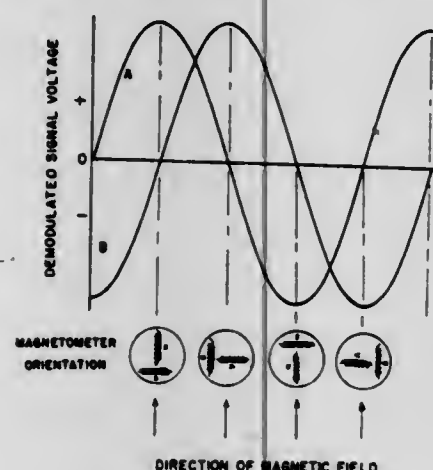
## MAGNETIC HEADING REFERENCE

H. Douglas Garner, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 9, 1982, Ser. No. 367,187  
Int. Cl.<sup>3</sup> G01C 17/30

U.S. Cl. 33—349

20 Claims



1. A device for generating a signal indicative of the difference between the actual heading and the selected heading of a vehicle comprising:

first and second magnetometers mounted on the vehicle in a horizontal plane during normal movement of the vehicle and with the sensing elements of the magnetometers at an angle with each other;  
first demodulating means for demodulating the output of said first magnetometer;

first inverter means for inverting the output of said first demodulating means;  
second demodulating means for demodulating the output of said second magnetometer;  
second inverter means for inverting the output of said second demodulating means;  
a dial calibrated in the points of a compass for selecting the heading of the vehicle;  
means receiving the outputs of said first demodulating means and said first inverter means and under the control of said dial for generating a sin signal proportional to the output of said first demodulating means times the sin of the angle through which said dial is rotated;  
means receiving the outputs of said second demodulating means and said second inverter means and under the control of said dial for generating a cos signal proportional to the output of said second demodulating means times the cos of the angle through which said dial is rotated; and  
means for summing said sin signal and said cos signal to produce said signal indicative of the difference between the actual heading and the selected heading of the vehicle.

4,418,481

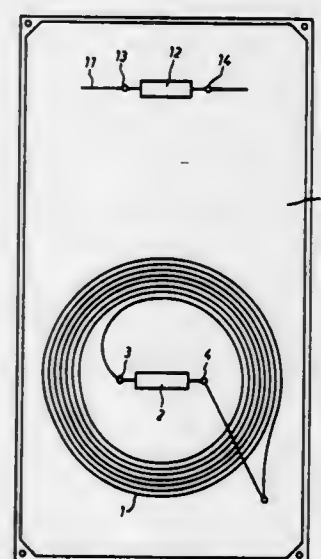
## APPARATUS FOR THE DEHUMIDIFICATION AND DRYING OF DAMP STRUCTURES

Walter Wehrli, Hotel Bahnhof, Urnäsch, Switzerland

Filed Oct. 14, 1980, Ser. No. 196,881  
Int. Cl.<sup>3</sup> F26B 23/04

U.S. Cl. 34—1

8 Claims



1. An apparatus for the dehumidification and drying of damp structures, comprising a first spirally wound flat electric coil connected at each end to a respective terminal of a first condenser and comprising further a second spirally wound flat electric coil connected at each end to a respective terminal of a second condenser, the plane defined by said first coil extending perpendicularly to the plane defined by said second coil, said apparatus being mounted substantially adjacent to said damp structure to be dried wherein said apparatus generates an electric field which is in opposition to that naturally occurring in the damp structure, said generated electric field acting to force moisture from said damp structure.

4,418,482

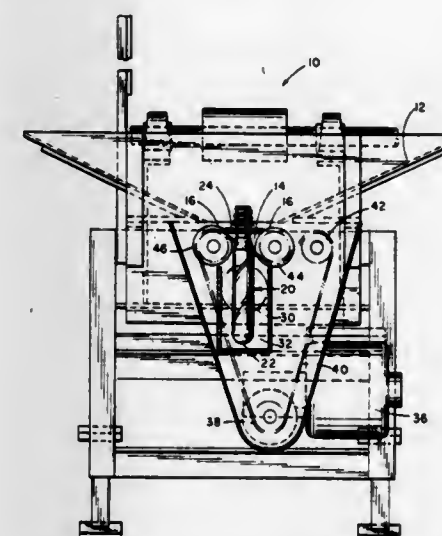
## DEVICE AND METHOD FOR FEEDING HOT ARTICLES TO PREVENT MUTUAL ADHERENCE THEREOF

Samuel S. Aidlin, 50-79 Village Garden Dr., Sarasota, Fla. 33580, and Stephen H. Aidlin, 7442 Vanderipe Rd., Sarasota, Fla. 33583

Filed Sep. 30, 1982, Ser. No. 430,709  
Int. Cl.<sup>3</sup> F26B 7/00, 25/02

U.S. Cl. 34—20

4 Claims



1. A device for feeding hot articles, particularly pre-molded blanks, each having a ring collar, comprising in combination a pair of rollers spaced a predetermined distance smaller than the diameter of said ring collar from one another for transporting the hot articles one after the other in a predetermined direction, said rollers being rotatable in opposite directions along respective axes of rotation thereof, a substantially closed plenum located under said rollers, and extending in an axial direction substantially over the entire length of said rollers, blower means arranged to positively direct cooling air toward the hot articles during their transportation so that the cooling air flows around the articles to cool said articles, and to prevent mutual adherence of the hot articles to one another, said rollers each having an outer surface provided with a helical groove for engaging and holding the ring collar of each of said articles during transportation of said hot articles so as to move said articles in a translatable manner only along the axial direction along said rollers and inside said plenum located under said rollers, said helical groove having dimensions similar to that of a phonograph groove formed on a phonograph roller.

4,418,483

## METHOD OF MANUFACTURING SHOE SOLE MATERIAL AND SHOES PRODUCTS MADE BY THE SAME

Minoru Fujita, 8-banchi, 2 chome, Kouryo-cho, Kita-ku, Kobe-shi, Hyogo-ken, Japan, and Shigeo Nishida, Hyogo, Japan, assignors to Rinzei Co., Ltd., Hyogo, Japan, by said Shigeo Nishida

Filed Mar. 31, 1981, Ser. No. 249,451

Int. Cl.<sup>3</sup> B29D 27/00; A43B 13/18, 13/12; B32B 5/20

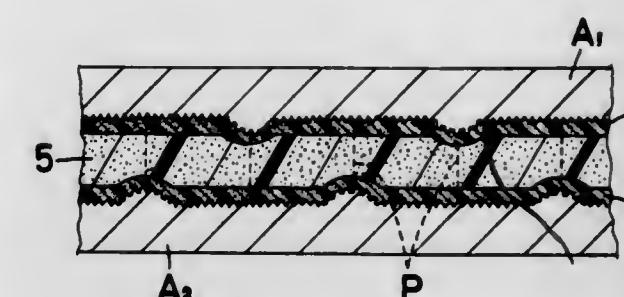
U.S. Cl. 36—28

13 Claims

1. A method of manufacturing shoe sole material, which comprises:

superposing a first sheet for a midsole layer on a second sheet for an outsole layer in a mold having a pattern formed on at least the mold surface in contact with said second sheet, said first sheet comprising a synthetic resin, a crosslinking agent and a foaming agent, said second sheet comprising a synthetic resin, a crosslinking agent and a foaming agent, said first and second sheets having

different foamability ratios and being capable of being fused together under heat; and  
hot-pressing said superposed first and second sheets in said mold to foam at least said first sheet and form crosslink-



ages in and between said first and second sheets to fuse said first and second sheets together.

6. A shoe product containing the shoe sole material manufactured according to the method of claim 1.

4,418,484

## METHOD OF DREDGING AND DREDGING IMPLEMENT

Tjako A. Wolters, Zeist; Gerard W. H. Goedegebuure, Amstelveen; Bartholomeus M. de Witt, Amsterdam, all of Netherlands, and Constantius H. M. Veltman, Safat, Kuwait, assignors to Ballast-Nedam Groep N.V., Amstelveen; Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V. and Scheepswerf en Machinefabriek "De Liesbosch" B.V., Nieuwegein, all of, Netherlands

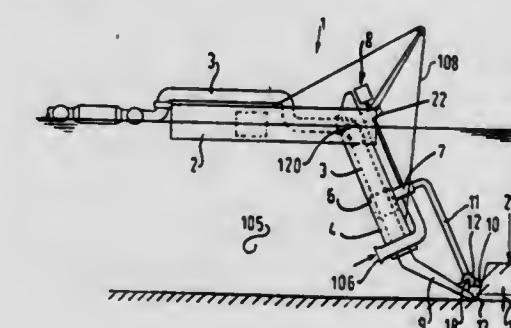
Filed Dec. 1, 1980, Ser. No. 211,925

Claims priority, application Netherlands, Nov. 15, 1979, 7908362; European Pat. Off., Nov. 29, 1979, 79200703.1

Int. Cl.<sup>3</sup> E02F 3/88

U.S. Cl. 37—63

10 Claims



1. The method of removing a selected top layer of subaqueous material while leaving the material underlying such layer in essentially undisturbed condition, which comprises the steps of:

(a) providing a suction inlet mouth of elongate, flattened form and traveling such mouth along a particular path which is overburdened by the top layer of subaqueous material to be removed,  
(b) forcibly directing water ahead of the suction inlet mouth in the direction of travel thereof and during the traveling of step (a), and  
(c) controlling the direction and the energy of the water directed in step (b) to fluidize substantially only the material of said top layer and thereby leave a well defined and smooth surface of the underlying material which is parallel to said path.



4,418,485

**SNOWBLOWER GEARBOX ASSEMBLY**

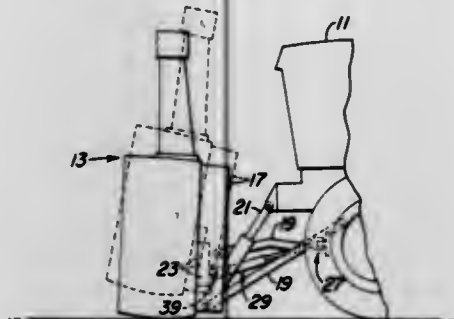
Kenneth E. Herren, Beaver Dam, Wis., assignor to Deere &amp; Company, Moline, Ill.

Filed Mar. 29, 1982, Ser. No. 362,732

Int. Cl. E01H 5/09

U.S. Cl. 37-244

2 Claims



1. In combination, a snowblower having a housing containing a rotatably mounted collector and impeller and gear box drivingly communicating with said collector and impeller, said gear box comprising a casing having at least a first and second section fixably and detachably mounted to each other defining a chamber, said housing having a rear wall containing a plurality of mounting stations mating to said casing such that said casing can be fixably and detachably mounted to any one of said mounting stations, an input shaft rotatably mounted in said casing having a portion extending therefrom and carrying a fixably and detachably mounted first gear within said chamber, an output shaft rotatably mounted in said casing having a portion extending therefrom in driving communication with said collector and impeller, said output shaft carrying a fixably and detachably mounted second gear in driven communication with said first gear.

4,418,486

**HEATED SMOOTHING ROLL**

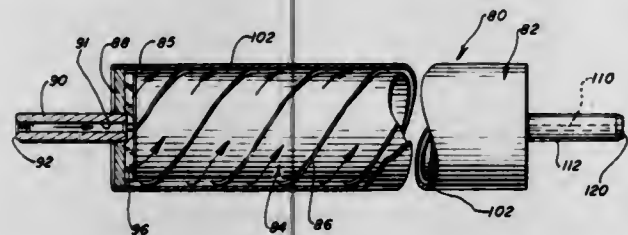
Kasimir Kober, Niles, Ill., assignor to Chicago Dryer Company, Chicago, Ill.

Filed Oct. 27, 1981, Ser. No. 315,685

Int. Cl. D06F 61/06, 67/02

U.S. Cl. 38-58

6 Claims



1. An ironing apparatus comprising a first rotatable cylinder adapted to have laundry articles urged into engagement with the periphery thereof for effecting an ironing operation; an inner cylinder rotatable as a unit with said first cylinder and mounted within said first rotatable cylinder with the longitudinal cylinder axes substantially coincident so as to define an inner chamber having open ends and disposed in said first cylinder; said chamber being defined by said inner cylinder outer periphery and said first cylinder inner periphery and providing a passageway through which a heated thermal liquid may pass along the length of said first cylinder; said inner chamber being substantially liquid-tight between the open ends thereof; first liquid conduit means for passing a heated thermal liquid into one end of said inner chamber, and second liquid conduit means for removing heated thermal liquid at the opposite end of said inner chamber; helical blade means disposed in said inner chamber between the open ends thereof for impelling heated thermal liquid between said first conduit means and said second conduit means during the normal rotation of the rotatable cylinders; said inner cylinder being of substantially

uniform cross-section and said helical blade means being substantially uniformly arranged along the length of said inner chamber between the open ends thereof.

4,418,487

**MOUNTING BRACKET FOR GUNSIGHT**

Travis R. Strahan, Rte. 7, Townsend Cir., Ringgold, Ga. 30736

Filed Feb. 2, 1982, Ser. No. 345,083

Int. Cl. F41G 1/38

U.S. Cl. 42-1 ST

8 Claims



1. A mounting bracket for mounting a scope-type sight on a handgun, said handgun having a frame, a barrel supported on the frame, a handle disposed angularly relative to the barrel remote from the discharge end of the barrel, said frame including a trigger guard disposed about a trigger spaced below the barrel adjacent the handle, said bracket comprising a substantially rectangular housing having a channel extending longitudinally therethrough from a first end to a second end to define a spaced pair of side walls, a top wall and a bottom wall, said channel being of a size for receiving at least the barrel and a portion of the frame, said top wall including a planar exterior surface for supporting said sight, said bottom wall extending from the first end of the housing and having a terminus spaced from the second end, said bottom wall including an interior surface having a shape conforming substantially to that of said frame adjacent the trigger guard, each side wall having a bore intermediate said terminus and said second end, the bore in one side wall being aligned with the bore in the other side wall for receiving a pin extending from one bore to the other, a protuberance disposed on the exterior surface of said bottom wall and having a terminal surface substantially at said terminus, and adjustable stop means carried by said protuberance for extension from said terminal surface, whereby said mounting bracket may be supported on the frame by positioning said pin through said frame and securing said stop means against said trigger guard.

4,418,488

**PISTOL AND REMOVABLE CARTRIDGE SHAPED BARREL INSERT**

Jack Hughes, P.O. Box 275 Thrall Rd., Ellensburg, Wash. 98926

Filed Oct. 2, 1981, Ser. No. 307,741

Int. Cl. F41C 3/00, 21/10, 21/22

U.S. Cl. 42-75 B

11 Claims

1. A pistol body for releasably receiving a cartridge barrel in the form of a large bore cartridge, comprising:  
a frame having a handle with a trigger and hammer housing at one end;  
said frame having a muzzle nose piece at a remaining frame end;  
a laterally open barrel receiving depression formed in the frame between the trigger and hammer housing, and the muzzle nose piece, adapted to receive the cartridge barrel;  
a firing pin mounted within the frame adjacent the barrel depression, said firing pin being movable within the frame along a central axis;

4,418,490

**FISH BAIT PROTECTOR**

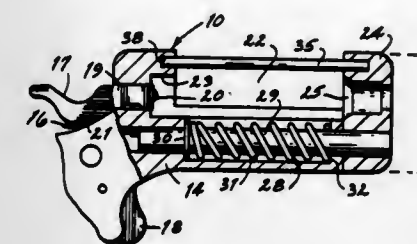
Frank A. Ancona, 5424 N. Tracy, Kansas City, Mo. 64118

Filed Mar. 11, 1982, Ser. No. 356,942

Int. Cl. A01K 97/06

U.S. Cl. 43-25.2

6 Claims



a hammer and trigger mechanism within the housing on the frame, a trigger being selectively operable to actuate a hammer to strike the firing pin and move it axially toward the barrel receiving depression;  
wherein the muzzle nose piece is spaced axially forward of the firing pin, and is axially movable on the frame to

receive and secure a cartridge barrel within the barrel receiving depression; and  
biasing means operatively connecting the muzzle nose piece and the frame for yieldably urging the nose piece axially toward the firing pin to yieldably press a cartridge barrel against the trigger and hammer housing with the cartridge barrel centered axially on the central axis of the firing pin.

4,418,489

**STRIKE SIGNALLING APPARATUS FOR A FISHING ROD**

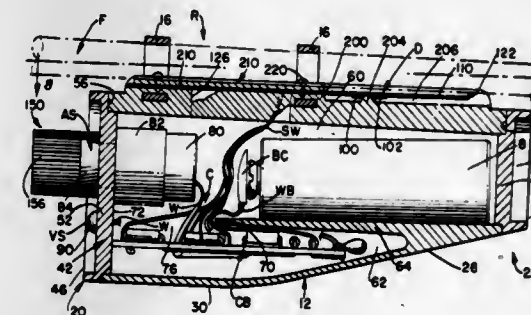
William R. Mathauser, 3000 "B" Ave., Anacortes, Wash. 98221

Filed May 26, 1981, Ser. No. 266,979

Int. Cl. A01K 97/12

U.S. Cl. 43-17

20 Claims



1. A device for use in fishing comprising:  
self-contained means mountable on different fishing rods of various types and sizes for signalling when a fish has struck including as follows;  
a housing detachably mounted on a fishing rod at a selected position;  
attaching means detachably mounting said housing on the fishing rod;  
fishing rod deflection monitoring means directly mounted on said housing and including a strain gauge; and means contacting the fishing rod and transferring fishing rod deflection to said strain gauge in a manner which causes said strain gauge to react to such rod deflection and said strain gauge being mounted on said rod contacting means;  
alerting means to be activated by said strain gauge when a predetermined amount of fishing rod deflection has occurred; and  
circuit means connecting said alerting means to said strain gauge and to a power source;  
said housing protecting said deflection monitoring means from environmental conditions which may cause said monitoring means to inconsistently sense rod flexure.

4,418,491

**AUTOMATIC ANGLING MACHINE**

Thorbjorn Christiansen, N-8400 Sortland, Norway

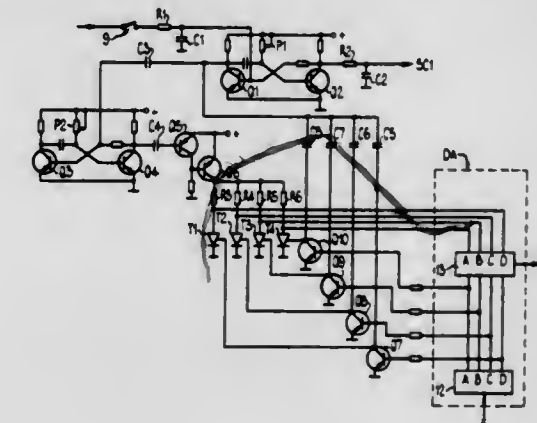
Filed Jul. 9, 1979, Ser. No. 56,063

Claims priority, application Norway, Jul. 13, 1978, 782433

Int. Cl. A01K 89/017; B66D 1/48

U.S. Cl. 43-26.1

2 Claims



1. In an automatic angling machine comprising a machine housing, a line reel rotatably mounted on said housing for winding and unwinding of fishing line, an electric motor for driving said line reel, an electromagnetic clutch, control circuits for controlling operation of said motor and said clutch in a prescribed manner to effect a plurality of fishing functions of the machine, a switch operating member operatively coupled to said fishing line, an automatic depth control circuit, and a switch actuated by movement of said operating member for activating said clutch, the improvement comprising: an improved switch operating member including a rocker arm pivotally mounted on said housing to function as a double-armed lever, said rocker arm being pivotable from a first position to a second position, the free end of one arm constituting a hoop placed over said fishing line issuing from said line reel, the free end of the other arm arranged to actuate said switch when the hoop end pivots from said first position to said second position when the line is in a slack condition, said operating member, by



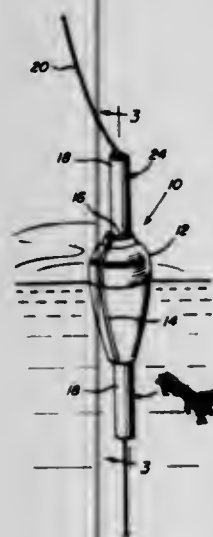
its operative coupling with said line, being maintained in said first position and prevented from actuating said switch when the line issuing from said line reel is in a taut condition; a plurality of counters and comparators in said depth control circuit for controlling operation of said motor and clutch to effect prescribed ones of said fishing functions of the machine in independence on correspondence between a set fishing depth and the counts of a plurality of said counters indicating the fishing depth; and, between said switch and said clutch and motor, an electronic circuit which, during line discharge in progress, causes actuation of said motor to effect a hauling function of the machine for a first preset period of time by the closing of said switch, and which is arranged to cooperate with said automatic depth control circuit to effect a normal fishing mode function of the machine for a second preset period of time, and thereafter cause repeated line discharge until another closing of said switch.

#### 4,418,492 FISHING FLOAT

Sam E. Rayburn, P.O. Box 704, Loveland, Colo. 80537  
Filed Jul. 27, 1981, Ser. No. 286,900  
Int. Cl.<sup>3</sup> A01K 93/00

U.S. Cl. 43—44.9

3 Claims



1. A new and improved slip-type fishing float for use on a fishing line, said float comprising:

float body means of a buoyant construction having a substantially centrally positioned, axially extending bore and further having a first slit extending radially outwardly from said bore and being in communication therewith; and slit tube means positionable within said bore and having a second slit associated therewith, said slit tube means being substantially frictionally retained within said bore and being selectively manually rotatable therein so as to selectively effect alignment and misalignment of said first and second slits as desired, said fishing line being directable through said first and second slits into said bore when said first and second slits are aligned and then being retained within said float body means by a manual rotation of said slit tube means so as to effect a misalignment of said first and second slits, at least one lock means for effecting a snag-free attachment of said slip-type fishing float to said fishing line, said lock means being operably attachable to said slit tube means so as to effect said snag-free attachment of said slip-type fishing float to said fishing line, said lock means including a central bore and outwardly extending appendages with said fishing line being positionable between said appendages into said central bore and being securely retained therein to effect a slidable securing of said fishing float to said fishing line, said appendages extending outwardly through said second slit contained in said slit tube means, said appendages being forced together when so positioned within said second slit, thereby

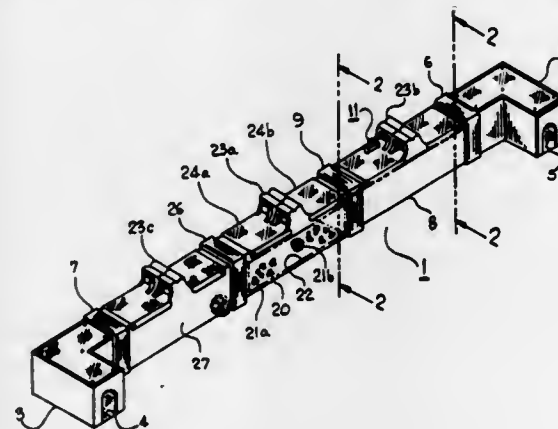
to effectively prevent said fishing line from passing out of said central bore.

#### 4,418,493 MODULAR ANIMAL TRAP

Carmel T. Jordan, 1040 Grandview Ave., Union, N.J. 07083  
Filed Nov. 23, 1981, Ser. No. 323,958  
Int. Cl.<sup>3</sup> A01M 23/20

U.S. Cl. 43—67

10 Claims



1. A trapping device for capturing animals which comprises in combination:

one or more modular units comprising a first substantially rigid hollow structure having a base portion, top and side walls, assembled to provide a continuous runway for said animals which is closed except for one or more ingress areas initially open and large enough to admit one of said animals;

at least one gate;

a pair of curved tracks disposed on opposite inner walls of said first rigid hollow structure;

said gate mounted to ride to-and-fro along said tracks internally in said rigid hollow structure from said initial open position in which the principal plane of said gate is adjacent the floor of said first hollow structure near said ingress area to a closed position in which said gate is interposed transversely across said ingress area, completely closing said ingress area;

spring-biasing means connected between said gate and a point inside said rigid hollow structure in the area in which said animal is to be confined to urge said gate from open to closed position;

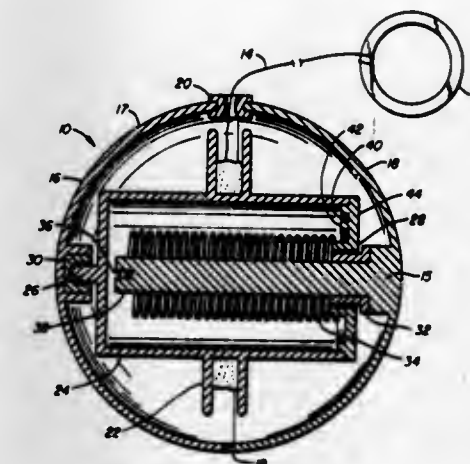
and means comprising a treadle in said rigid hollow structure in the path of an entering animal, beyond said ingress area, said treadle constructed and arranged to trigger said spring-biasing means to urge said gate to move along said tracks from said open to said closed position, for preventing said animal from escaping through said ingress area; wherein said first hollow structure includes in the top wall thereof a slot intermediate the ends of said structure, a first latching means including detent means disposed on the exterior of said top wall adjacent said slot, said detent means being constructed and arranged to be inaccessible to the area in which said animal is confined and to said ingress area, and said detent means responsive to operate upon impact by the leading edge of said spring-biased gate when said leading edge passes through said slot to engage and secure said gate in closed, latched position.

#### 4,418,494 RETURNING BALL TOY

Edmond Ghandour, 2636 Stuart St., Berkeley, Calif. 94705  
Continuation of Ser. No. 923,155, Jul. 10, 1978, abandoned. This application Jan. 14, 1981, Ser. No. 225,133  
Int. Cl.<sup>3</sup> A63H 27/12

U.S. Cl. 46—61

6 Claims



1. A toy, comprising:

(a) a hollow rotatable hub member;  
(b) a reel mounted on the hub member;  
(c) a rigid housing containing said hub member and reel;  
(d) a fixed axle rigidly mounted in the housing and supporting the hub member for relative rotation with respect to the housing, said axle having a free end located within the hub member;

(e) a torsion spring located within the housing and having two ends, one end being operatively attached to the housing and the other end attached to the hub member so that relative rotation between the hub member and the housing is resisted by tension in the spring; and

(f) a flexible cord having a first end attached to the reel and a second free end passed through the housing, said cord being adapted for being coiled about the reel so that when the cord is moved, the reel and hub member rotate about the axle relative to the housing, resisted by the tension in the spring.

#### 4,418,495 MINIATURE RACING VEHICLE AND WRIST-BORNE LAUNCHING PLATFORM ASSEMBLY

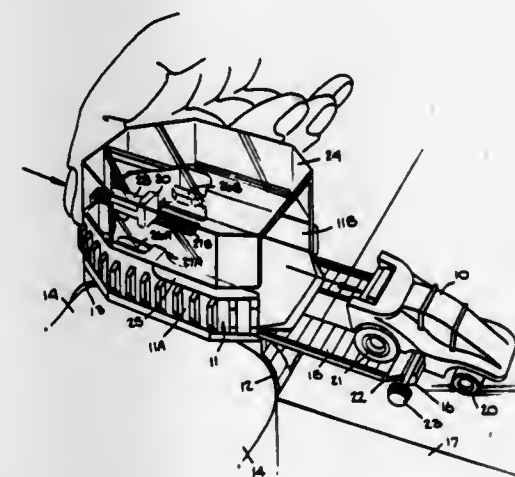
Melvin R. Kennedy, Hampton Bays, N.Y., and Dietmar Nagel, Chester, N.J., assignors to Buddy L Corporation, New York, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,475

Int. Cl.<sup>3</sup> A63H 11/10

U.S. Cl. 46—206

10 Claims



1. A toy assembly comprising:

A. a spring motor-powered vehicle having a wind-up knob secured to a stem projecting laterally from the vehicle;  
B. a platform strappable onto the wrist of a player and including a retractable ramp extending from the front end thereof;

C. a transparent cover affixed to the platform to define a hangar having an open front to accommodate the vehicle with its front end facing the hangar opening, the hangar having a side slot to admit the stem, whereby the wind-up knob is outside the hangar and accessible to the player, said hangar being provided with holding elements which frictionally engage the sides of the vehicle to resist withdrawal thereof; and

D. a push-button actuator mounted on the rear of the hangar and having a pusher abutting the rear end of the vehicle whereby when the push-button is pressed in, the pusher advances the vehicle to free it from the holding elements, whereby the vehicle can then run down the extended ramp onto a playing surface.

#### 4,418,496

#### SUPPORT STRUCTURE FOR SMALL FLORAL ARRANGEMENT

Arnold A. Kolstinen, Watertown, S. Dak., assignor to Dakota Plastics Company, Watertown, S. Dak.  
Filed Aug. 25, 1982, Ser. No. 411,863  
Int. Cl.<sup>3</sup> A01G 5/00

U.S. Cl. 47—41.12

10 Claims



1. Support structure for small floral arrangements for use during occasions such as weddings and the like, the support structure comprising grasping means for mounting upon a member having two vertical sides and a horizontal surface transversely of the two vertical sides, the grasping means adapted for resting upon the horizontal surface and to biasingly engage each of the two vertical sides, the grasping means including an elongated sheet of resilient material embodying a generally straight elongated and inclined intermediate portion, a vertical depending first portion extending downwardly from the upper end of said inclined portion, a second portion on the lower end of said inclined portion and joined thereto by an arcuate integral connecting portion, the first vertical depending portion being generally flat throughout its vertical extent for engagement of one side thereof with one of said vertical-sides, the intermediate portion forming an included angle of less than 90° with said one side of said first portion and extending a greater distance in a horizontal direction from the upper end of said vertical depending portion than in a vertical direction from the upper end of said vertical depending portion, said second portion extending downwardly from and inwardly toward said one side of said vertical depending first portion and terminating downwardly in an inwardly and upwardly curving coiled portion for frictional engagement with the other of said vertical sides at a point a spaced distance below the level of the lower end of said inclined intermediate portion, displacement of said coiled portion away from said one side of said depending first portion resulting in an increase of the radius of curvature of said arcuate integral connecting portion and an increase in the included angle between said depending first portion and said intermediate portion, whereby more than



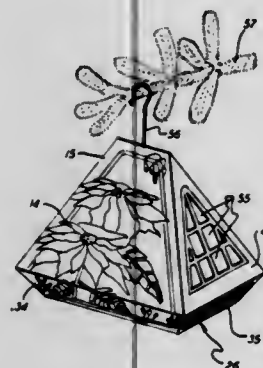
minimal spacing changes between said coiled portion and said one side of said vertical depending first portion may be accommodated.

4,418,497

# COMBINATION GREETING CARD, ORNAMENT AND SEED GERMINATION BOX

Michael D. Mastriano, 261 Shotwell Park, Syracuse, N.Y. 13206  
Filed May 7, 1982, Ser. No. 376,027  
Int. Cl.<sup>3</sup> A01C 1/04; B65D 65/28  
U.S. Cl. 47-67

5 Claims



1. A combination greeting card, ornament and seed germination box comprising an initially flat blank that is foldable into a three-dimensional hollow ornament, a portion of the blank having a greeting message printed thereon, the blank in its flat form being adapted to be received in a mailing envelope and mailed as a greeting card, and a seed germination packet mounted on the blank, the seed packet being located so that when the blank is folded into a three-dimensional hollow ornament it forms an enclosure for the packet, a portion of the blank having cut-outs forming window openings to permit light to enter the ornament and aid in the seed germination.

4,418,498

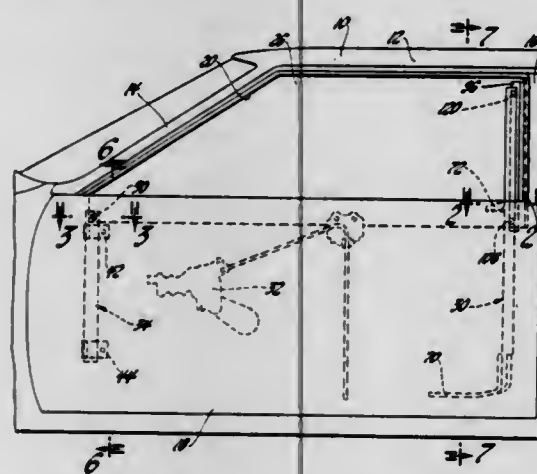
# WINDOW GUIDANCE ARRANGEMENT

Bert R. Wanlass, Warren, and James R. Drouillard, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1982, Ser. No. 342,832  
Int. Cl.<sup>3</sup> E05D 13/02

U.S. Cl. 49-425

3 Claims



1. A window guide mounting a window on a vehicle door for guided movement between a lowered open position and a raised closed position comprising:  
a channel track mounted on the door and having first and second opposed facing spaced apart legs having semi-cylindrical opposed facing grooves extending vertically therealong;  
a carrier positioned between the channel legs, said carrier

having an axial extending bore communicating between the channel legs;

trunnion means mounting the carrier on the window, said trunnion means enabling movement of the carrier relative to the channel track to align the bore with the grooves; and

first and second bearing balls mounted within the bore, said bearing balls being in respective captured rolling contact within the grooves of the first and second channel legs and in rolling contact with one another whereby upon movement of the window between the lowered open and raised closed positions the bearing balls roll against one another and against the first and second channel legs respectively in rolling contact therewith to provide low friction guided movement of the window between the lowered open and raised closed positions and restrain the window against fore and aft movement.

4,418,499

# CUTTER GRINDING MACHINE

Shigeji Shirai, Shizuoka, Japan, assignor to Shinko Machinery Works Inc., Shizuoka, Japan

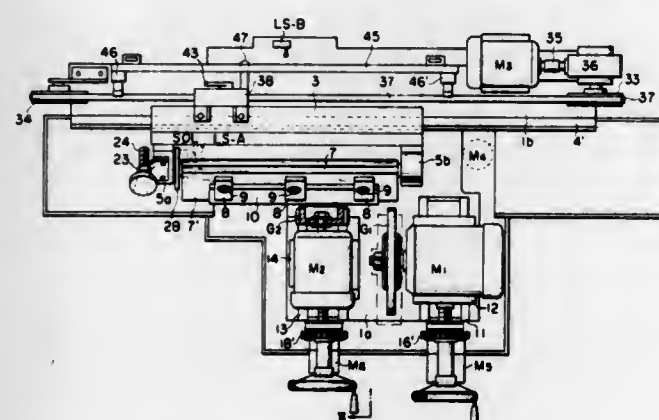
Filed Oct. 28, 1980, Ser. No. 201,466

Claims priority, application Japan, Nov. 1, 1979, 54-141714; Dec. 29, 1979, 54-172612; Feb. 5, 1980, 55-12003; Mar. 11, 1980, 55-31741[U]

Int. Cl.<sup>3</sup> B24B 3/36

U.S. Cl. 51-3

5 Claims



actuated by the reciprocation of said carriage, said carriage reciprocation counting means being adapted so that said reciprocating mechanism is actuated to reciprocate said carriage until said stepping relay steps up a preset number;

wherein a sequential control system is provided for controlling the machine operation so that first said rough grinding wheel is advanced toward said cutter until said proximate position detecting means is actuated, whereupon the advancement thereof is temporarily stopped and the roughing operation is started and continued until said carriage has reciprocated said preset number of times, whereupon said rough grinding wheel is retreated, and then said finish grinding wheel is advanced toward said cutter until said proximate position detecting means is actuated, whereupon the advancement thereof is temporarily stopped and the finish grinding operation is started and continued until said carriage has reciprocated said preset number of times, whereupon said finish grinding wheel is retreated.

4,418,500

# GRINDING APPARATUS

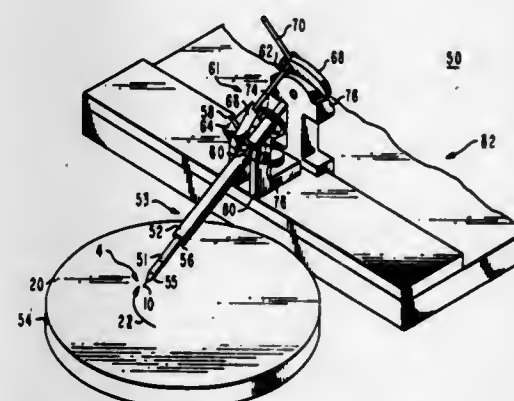
Anil R. Dholakia, East Windsor, and Vincent J. Ruggeri, Howell, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,283

Int. Cl.<sup>3</sup> B24B 9/16, 41/06

U.S. Cl. 51-125.5

8 Claims



1. In an apparatus for grinding two flats of substantially the same dimensions in two portions of a conical tip of a stylus element comprising:

- means for holding the element,
  - a rotatably mounted abrasive surface for grinding the tip portion,
  - means for rotating the element between the two tip portions wherein the point of the tip does not disturb or penetrate the abrasive surface during rotation of the element, and
  - means for contacting the respective tip portions with the abrasive surface so that a constant force is applied to the tip portion being ground, wherein the tip point does not penetrate or disturb the abrasive surface and wherein the tip remains in contact with the abrasive surface during rotation of the element;
- wherein the element holding means is a stylus element holding assembly comprising a holding member to which the stylus element is attached at one end, and a shaft in which the holding member is rotatably mounted;  
wherein the element rotating means includes an index wheel drivingly connected to the stylus element holding assembly; and wherein the stylus element holding assembly includes a flipping lever and the index wheel is drivingly connected to the flipping lever;  
wherein the improvement comprises a fork assembly having flexible fork members attached to the index wheel wherein the fork assembly is drivingly connected to the flipping lever, whereby substantially the same tip portions

are in contact with the abrasive surface after each alternate rotation.

4,418,501

# LAPPING MACHINE AND METHOD

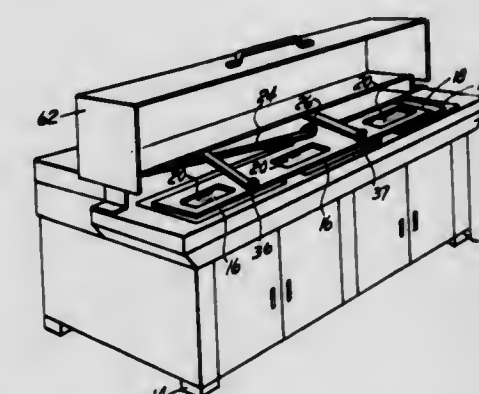
Raymond P. DeSantis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Filed May 15, 1981, Ser. No. 264,037

Int. Cl.<sup>3</sup> B24B 25/00

U.S. Cl. 51-157

4 Claims



1. A lapping machine comprising at least one lap plate, a workpiece holding plate disposed proximate said lap plate and adapted to hold a workpiece with a surface thereof in engagement with said lap plate, power means for reciprocating said holding plate along a first axis of direction, power means for displacing said holding plate along a second axis of direction, said second axis being at an angle to said first axis, such that to each complete reciprocation cycle along said first axis corresponds a small displacement along said second axis, and means for adjusting the length of displacement of said holding plate along said first axis and said second axis for causing a point of the surface in engagement with said lap plate to travel substantially over the whole area of said lap plate in the course of a lapping operation cycle, wherein said means for displacing said holding plate along said first axis comprises a first link pivotally attached at one end to said holding plate and pivotally attached at another end to a first eccentric, and a first power driven rotatable shaft for rotating said first eccentric, and wherein said means for displacing said holding plate along said second axis comprises a second rigid link and a third rigid link disposed substantially parallel, each of said second and third links being pivotally attached at one end to said holding plate and pivotally attached at another end respectively to a second and third eccentrics, and a second and third power driven rotatable shafts each rotating respectively said second eccentric and said third eccentric.

4,418,502

# ELEVATABLE GRINDING WHEEL MOTOR SUPPORT

Lynn J. Ziegelmeyer, P.O. Box 1112, Medford, Oreg. 97501

Filed Jul. 6, 1981, Ser. No. 281,211

Int. Cl.<sup>3</sup> B24B 41/04

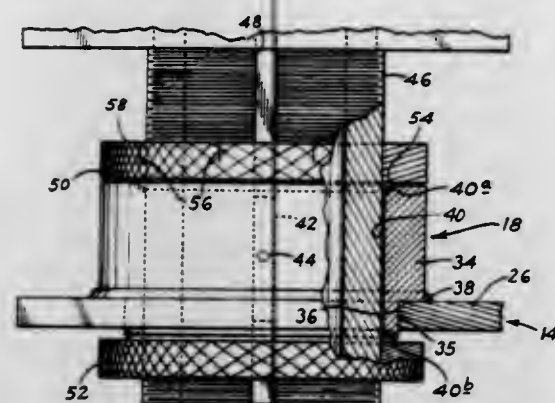
U.S. Cl. 51-166 MH

2 Claims

1. In grinding apparatus including a grinding station and a grinding wheel motor disposed to one side of said station, means supporting said motor for adjustable movement with respect to the station comprising  
a threaded element fixed to the motor,  
a frame,  
a mounting for the threaded element carried by said frame at a fixed position with respect to said station, said mounting having an internal bore extending therethrough which receives said element with clearance provided between outer extremities of the threads in the element and the inner surface of the bore,  
a pair of nuts screwed onto said element bearing on opposite sides of said mounting, and



means interposed between said mounting and said element preventing relative rotational movement therebetween, said nuts and opposite sides of said mounting having means producing centering of said threaded element in said bore with tightening of said nuts against opposite sides of said



mounting, said means producing centering comprising annular beveled recesses on opposite sides of the mounting encircling the bore and annular shoulders on said nuts contactable with said recesses to produce centering of said threaded element in said bore.

4,418,503

# **APPARATUS FOR CONTINUOUSLY POLISHING THE PRESSURE ROLLER OF A COILING MACHINE**

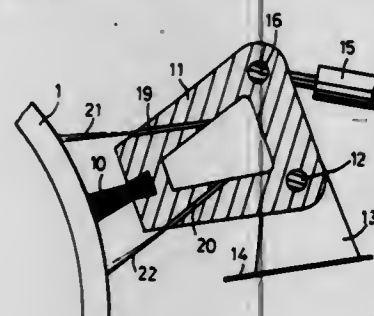
Pierre G. Dantinne, 6, rue du Coudrier, 4100 Seraing, Belgium  
Filed Dec. 12, 1980, Ser. No. 215,682

Claims priority, application Belgium, Dec. 27, 1979, 198772

Int. Cl.<sup>3</sup> B24B 19/00

U.S. Cl. 51—252

1 Claim



1. An apparatus for the continuous polishing of a pressure roller in a coiling machine, comprising at least one abrasive rubbing element which extends parallel to the axis of rotation of and over the entire length of the face of the roller, said abrasive rubbing element being mounted on a longitudinal roller, said longitudinal support being mounted to pivot about two coaxial pivots under the action of at least one pneumatic control jack to which it is pivotably connected, said jack being itself articulated on another pivot which is parallel to said two coaxial pivots, thereby to elastically apply the abrasive rubbing element against the face of said roller as the latter rotates in the coiling machine, so as to smooth said roller face and remove any asperities adhering thereto during the winding of a coil, and said longitudinal support being hollow and supplied with cooling water, said support having a plurality of orifices for projecting jets of water onto the face of the roller near the rubbing element and at least upstream of said rubbing element relative to the direction of rotation of the roller, wherein the pivots for the longitudinal support of the abrasive rubbing element and the pivot of the control jack are mounted on the cradle of the roller, wherein the abrasive rubbing element is formed of a straight row of successive abrasive element segments is constituted by a plurality of abrasive sheets which are superposed and clamped against one another in their housing on their support whose faces abut on one another and whose

end faces of the row are oblique in relation to the longitudinal direction of said row.

4,418,504

# **DRAIN SHIELD FOR GUTTERS**

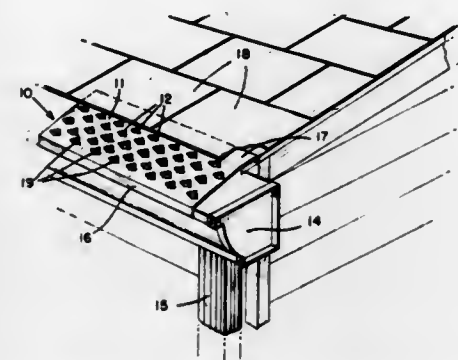
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260

Filed Oct. 19, 1981, Ser. No. 312,498

Int. Cl.<sup>3</sup> E04D 13/00

U.S. Cl. 52—12

6 Claims



1. A drain shield for a gutter comprising: a planar base member having upper and lower surfaces and adapted to be installed on a roof in a downwardly sloping manner over a gutter, a series of arch means, said arch means raised from said upper surface of said base member, trough means, said trough means extending below said lower surface of said base member and down the slope from said arch means, said arch means having an opening in a down slope position in front of and centered with said trough means.

4,418,505

# **STARTER STRIP FOR A TILE ROOF**

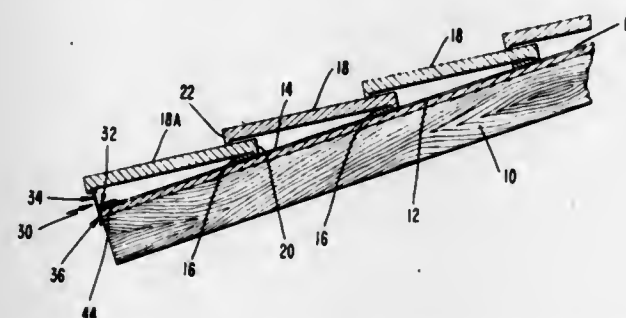
Roger D. Thompson, La Canada, Calif., assignor to Boral (USA) Inc., Los Angeles, Calif.

Filed Jan. 13, 1982, Ser. No. 339,085

Int. Cl.<sup>3</sup> E04B 7/00

U.S. Cl. 52—95

13 Claims



the junction between said cover portion and said base portion, said first and second sections disposed in planar contact with each other, said upper edge of said riser portion being bent back to define said reinforcing edge.

4,418,506

# **GLAZED WALL CONSTRUCTION SYSTEM**

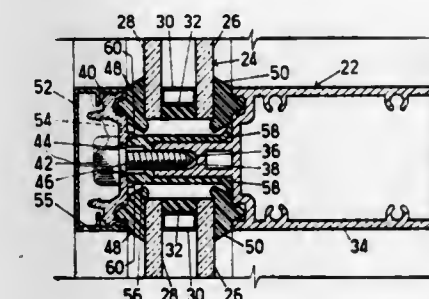
Ronald J. Weber, and Lyon E. Evans, both of Wausau, Wis., assignors to Wausau Metals Corporation, Wausau, Wis.

Filed Sep. 2, 1980, Ser. No. 182,866

Int. Cl.<sup>3</sup> E04B 2/88; E06B 7/14

U.S. Cl. 52—209

9 Claims



1. In a wall construction system including a plurality of wall panels (24) supported in place by a frame system (22), the frame system (22) comprising:

- a frame member (34) for providing structural support for the frame system, the frame member (34) being located behind the wall panels (24);
- a boss (36) formed on the frame member (34) extending forwardly between a pair of adjacent wall panels (24), the boss (36) having a receptacle (38) formed in it;
- an exterior plate (40) attached to the boss (36) on the frame member (34) to hold the wall panels (24) between the plate (40) and the frame member (34), the exterior plate (40) having at least one centrally located fastener hole (44) formed in it;
- a separator (56) interposed between the boss (36) on the frame member (34) and the exterior plate (40), the separator (56) formed of low-heat conductive material to thermally separate the exterior plate (40) and the frame member (34); and
- a threaded fastener (42) formed of a metallic sheet metal threaded fastener (62) having an enlarged head (64) molded on it from low-heat conductive material, the molded head (64) including a pilot shaft (66) extending downwardly therefrom, the fastener (62) extending through the respective holes in the exterior plate (40) and the separator (56) to fasten the exterior plate (40) to the frame member (34) while the molded head (64) of the fastener (42) thermally isolates the frame member (34) from both the exterior air and the exterior plate (40).

4,418,507

# **INTERIOR WALL SYSTEM**

Frank W. Roberts, 380 E. 7500 South, Midvale, Utah 84047; Richard A. Roberts, 4973 Regency; W. Calvin Roberts, 4906 Regency, both of Holladay, Utah 84117; Jack A. Nipko, 13735 Shadow Mountain La., Draper, Utah 84020; Clark S. Roberts, 4906 Regency, Holladay, Utah 84117, and Hal R. Hudson, 759 S. 300 West, Orem, Utah 84057

Filed Jun. 30, 1981, Ser. No. 278,951

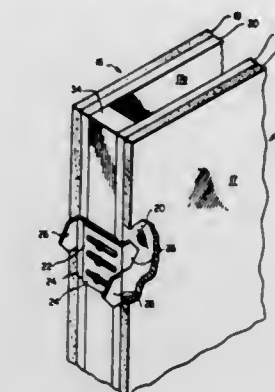
Int. Cl.<sup>3</sup> E04B 2/30

U.S. Cl. 52—241

14 Claims

1. An interior wall system comprising: top and bottom support members; first and second walls attached to said support members, each wall comprising a plurality of composite wall panels, and each composite wall panel comprising an exterior

surface material and an interior insulating material bonded to one side of said exterior surface material; and a plurality of retaining clips interconnecting said first and second walls and also interconnecting the composite wall panels of each wall in abutting relationship, each said clip



comprising two members which are selectively positionable with respect to each other, at least a portion of said members extending between said first and second walls, so as to provide means for adjusting the width between said first and second walls.

4,418,508

# **RUB STRIP ASSEMBLY HAVING LENGTHWISE GROOVE FOR RECEIVING SNAP-IN MEMBER**

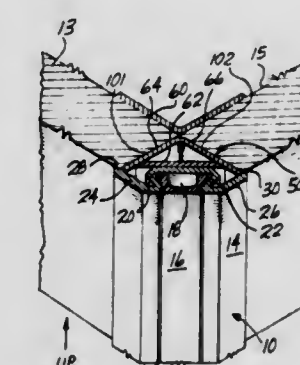
Keith E. Gilliland, Everett, and Richard W. Morris, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 20, 1981, Ser. No. 255,911

Int. Cl.<sup>3</sup> E04F 19/02

U.S. Cl. 52—282

1 Claim



1. A corner assembly for fastening together the end surfaces (101 and 102) of first and second panel members in 90 degree relationship with respect to the major surface areas of said panel members comprising in combination:

- a right angle corner bumper bracket disposed for fastening between said end surfaces (101 and 102) of said first and second panel members, said right angle corner bumper bracket including a transversely disposed strip extending along said bumper bracket in the region forming the right angle thereof;
- an elongated member having first and second leg portions and a lengthwise groove extending along the length of said elongated member between said first and second outer leg portions, said lengthwise groove including a plurality of fasteners distributed along the length thereof for fastening said elongated member to said transversely disposed strip, said first and second outer leg portions abutting said major surface areas of said first and second panel members;
- a channel member having sides, said sides having end portions, and said channel member having a generally U-shaped cross section disposed within said lengthwise groove with said end portions of the sides of said channel



member abutting the bottom surface of said lengthwise groove.

4,418,509

# STRUCTURAL JOINT CONNECTOR

Anthony M. Moyer, Hollywood, and Robert H. Kelly, Miramar, both of Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

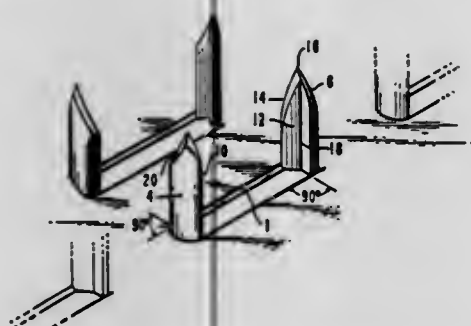
Division of Ser. No. 71,551, Aug. 30, 1979, Pat. No. 4,343,580.

This application Dec. 3, 1981, Ser. No. 327,198

Int. Cl.<sup>3</sup> E04C 3/02; B25G 3/28; F16D 1/02

U.S. Cl. 52—693

10 Claims



1. A structural joint for bearing a structural load comprising: a pair of wooden members fastened together by at least one metal connector plate, said connector plate having: a plurality of pairs of elongated teeth struck from said plate so as to project in a direction substantially perpendicular to said plate; said teeth being struck in pairs so as to leave a plurality of longitudinally extending slots with each of said pairs of teeth being associated with one of said slots; each of said teeth having a pointed tip; each of said teeth having a knife edge portion extending from said plate, said knife edge portion of each said tooth having a cross-sectional thickness thinner than the remaining portion of said tooth and having a sharp edge with a cross-sectional angle of less than 20° and said sharp edge of each said knife edge portion extending from said pointed tip of each of the respective said teeth along a continuous substantially arcuate path to said plate for facilitating penetration of each of said teeth into the respective wooden member to which said connector plate is attached; said knife edge portion of said teeth of said pairs of teeth lying along opposite longitudinal sides of the corresponding said slot; a first group of said teeth of said pairs of teeth being oriented so that their said knife edge portions extend along the corresponding said slots in one direction; and a second group of said teeth of said pairs of teeth being oriented so that their knife edge portions extend along the corresponding said slots in the opposite direction.

4,418,510

# STRETCH WRAPPING APPARATUS AND PROCESS

Patrick R. Lancaster, III, Anchorage, and William G. Lancaster, Louisville, both of Ky., assignors to Lantech, Inc., Louisville, Ky.

Continuation of Ser. No. 74,786, Sep. 12, 1979. This application Apr. 17, 1981, Ser. No. 255,222

Int. Cl.<sup>3</sup> B65B 11/04

U.S. Cl. 53—399

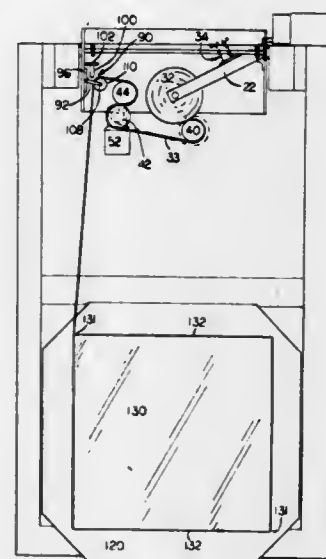
4 Claims

1. A process of making a unitary package by wrapping a plurality of units with a stretched plastic material overwrap forming a unitary load comprising the steps of:

- placing a load on a support;
- positioning a roll of stretchable plastic material on a dispenser means adjacent to said support;
- withdrawing a leading end of said plastic material from said dispenser means and passing said plastic material through a powered prestretch device adapted to drive the plastic material at a proportional speed with respect to the surface speed of the load, said prestretch device comprising a powered roller assembly with at least one rotationally restrictive roller assembly, said rotationally restrictive roller assembly being retarded to a substantially constant

relative speed with respect to the rotationally powered roller assembly so that the plastic material is elongated substantially above its yield point between the roller assemblies, thereby changing strength characteristics and cross-sectional area of the plastic material;

- holding said plastic material adjacent said load and simultaneously prestretching said plastic material substantially above the yield point by driving said prestretch device and causing relative rotation between said load and said dispenser means at a predetermined speed;



- substantially reducing the force on the plastic material while maintaining the majority of the elongation incurred in said powered prestretch device through inelastic strain recovery after it leaves the powered prestretch device; and

- covering the load with previously elongated plastic material so that the units of the load are held under a compressive force.

4,418,511

# APPARATUS AND METHOD FOR FILM PACKAGING

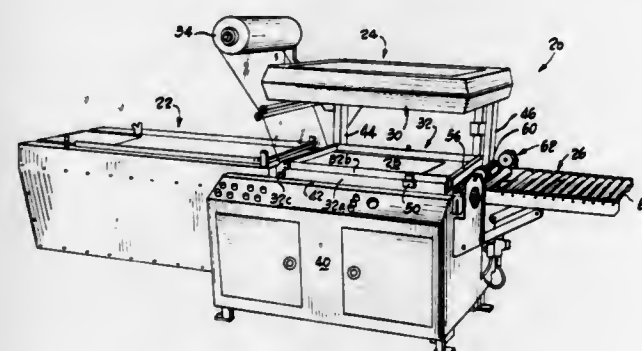
Everett E. Collin, Gray Court, S.C., assignor to Nordson Corporation, Amherst, Ohio

Filed Jun. 13, 1980, Ser. No. 159,365

Int. Cl.<sup>3</sup> B65B 11/52, 61/28

U.S. Cl. 53—427

17 Claims



- In apparatus for film packaging comprising a vacuum platen, a film support frame, the platen and frame being relatively movable toward and away from each other, means for heating film supported by the frame, and means for drawing a vacuum through the platen, the improvement comprising a plate on the platen constructed to support a major portion of a package on the platen and slidable in a forward and back direction on the platen, the plate having a length in the direction of sliding motion greater than half the length of the platen and less than the full length and having an abutment for engaging a package and moving the package relative to the platen, said plate being constructed and arranged to permit flow of gas

through the plate to the underlying platen, and means to slide the plate relative to the platen.

4,418,512

# MACHINE AND METHOD FOR MAKING SUBSTANTIALLY AIR-FREE SEALED POUCHES

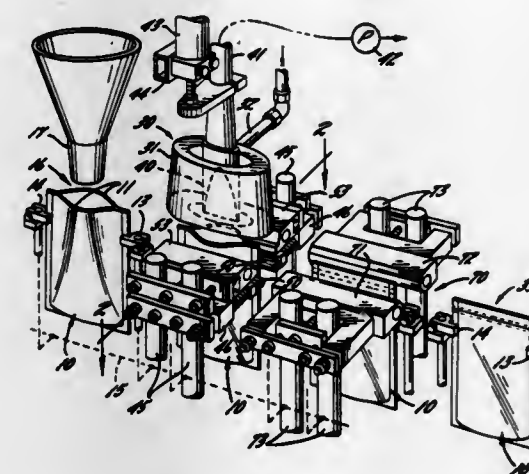
Kenneth R. Johnson, Sarasota, Fla., assignor to Rexham Corporation, New York, N.Y.

Filed Mar. 25, 1981, Ser. No. 247,253

Int. Cl.<sup>3</sup> B65B 31/00

U.S. Cl. 53—434

4 Claims



- A packaging machine for filling, evacuating and closing flexible pouches having open upper end portions, said machine comprising means for advancing the pouches open end up along a predetermined path, means for introducing product into each pouch, a nozzle, means for inserting said nozzle downwardly into each filled pouch, closing means operable to close the upper end portion of the pouch around said nozzle, means for drawing a vacuum through said nozzle to evacuate the air in the pouch, means for retracting said nozzle out of the pouch, said closing means holding the upper end portion of the pouch closed around said nozzle as the nozzle is retracted, means for continuously directing steam downwardly toward the upper end portion of the pouch at least from the time said nozzle is inserted into said pouch to a time subsequent to retraction of the nozzle out of the pouch, and means for closing the upper end portion of the pouch after retraction of the nozzle.

- A method of filling, evacuating and closing flexible pouches having open upper end portions, said method comprising the steps of advancing the pouches open end up along a predetermined path, introducing product into each pouch while holding the upper end portion of the pouch in an open position, inserting a nozzle downwardly into each filled pouch, closing the upper end portion of the pouch around the nozzle, drawing a vacuum through the nozzle to evacuate the air in the pouch, retracting the nozzle upwardly from the pouch while holding the upper end portion of the pouch around the nozzle, closing the upper end portion of the pouch immediately after retraction of the nozzle, and directing steam downwardly toward the upper end of the pouch continuously from a time prior to insertion of said nozzle to a time subsequent to closing of the pouch.

4,418,513

# PACKAGING MACHINE WITH MEANS FOR CLOSING FLEXIBLE POUCHES AROUND A NOZZLE

Jack E. Plahm, Bradenton, Fla., assignor to Rexham Corporation, New York, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,916

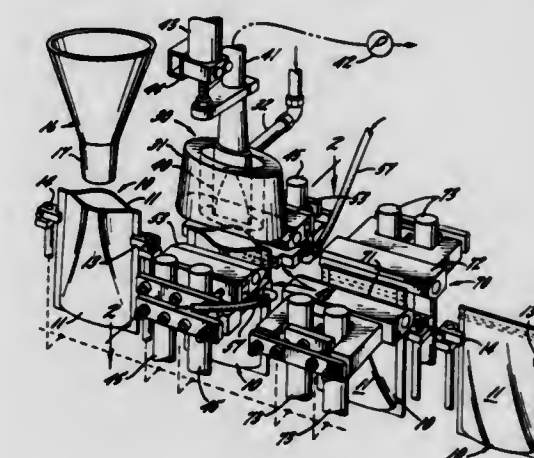
Int. Cl.<sup>3</sup> B65B 31/00

U.S. Cl. 53—434

8 Claims

- A packaging machine for filling, purging and sealing flexible pouches having open upper end portions, said machine comprising means for advancing the pouches open end up along a predetermined path, means for introducing product

into each pouch, a nozzle, means for inserting said nozzle downwardly into each filled pouch, closing means operable to close the upper end portion of the pouch around said nozzle, means for creating a flow of gas through said nozzle to purge the pouch, means for retracting said nozzle out of the pouch, said closing means holding the upper end portion of the pouch closed around said nozzle as the nozzle is retracted, and means for sealing the upper end portion of the pouch after retraction of the nozzle, said machine being characterized in that said closing means comprise a pair of heads disposed on opposite sides of the upper end portion of the pouch, and means for directing pressurized gas through said heads and against the pouch whereby said pressurized gas closes the pouch around said nozzle and holds the pouch closed during retraction of the nozzle.



- A method of filling, purging and closing flexible pouches having open upper end portions, said method comprising the steps of advancing the pouches open end up along a predetermined path, introducing product into each pouch while holding the upper end portion of the pouch in an open position, inserting a nozzle downwardly into each filled pouch, directing pressurized gas towards opposed sides of the pouch to close the upper end portion of the pouch around the nozzle, creating a flow of gas through the nozzle to purge the pouch, retracting the nozzle upwardly from the pouch while directing pressurized gas toward the sides of the pouch to hold the upper end portion of the pouch around the nozzle during retraction of the nozzle and closing the upper end portion of the pouch immediately after retraction of the nozzle.

4,418,514

# ORTHOPEDIC SUPPORT PACKAGE AND METHOD

Donald C. Spann, 1003 Botany Rd., Greenville, S.C. 29615

Continuation of Ser. No. 194,359, Oct. 6, 1980, abandoned. This

application Oct. 23, 1981, Ser. No. 314,181

Int. Cl.<sup>3</sup> B65B 61/24

U.S. Cl. 53—436

9 Claims

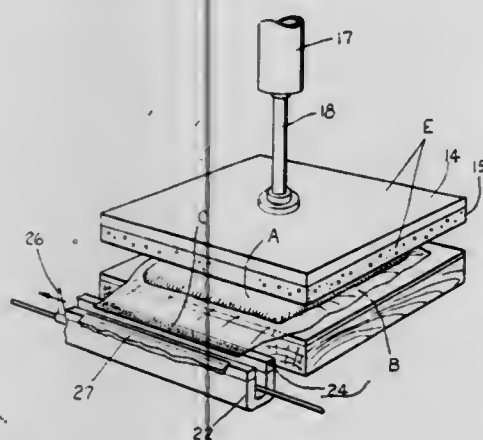
- The method of packaging and dispensing an orthopedic support comprising:

- providing an orthopedic support constructed essentially of resilient synthetic open cell foam material with air entrained therein having a substantial and irregular height profile and a highly bulky configuration;
- providing a thermoplastic bag constructed of heat sealable thermoplastic multi-layered film having a sufficient shelf life to prevent leaking and seeping of air affording storage of said package in a healthcare facility for extended periods of time, said bag being presealed along its edges but providing an open edge portion thereof for insertion of said orthopedic support therethrough;
- placing said orthopedic support within said bag;
- differentially compressing said orthopedic support within said bag to such an extent as to reduce said substantial profile and bulk configuration by a major amount to a generally uniform flat configuration with evacuation of a



corresponding amount of air from said bag by utilizing fluid pressure to urge a platen of a press into compressing relation with a bed of the press by a predetermined amount;

placing a heat seal along said single open edge portion after said compression and evacuation;  
releasing the compressing action of said press after heat sealing said edge portion resulting in the formation of an evacuated marginal portion of said bag extending outwardly about said orthopedic support by an amount corresponding to the reduction in height of said orthopedic support forming a package;



storing said package by a healthcare facility in said compressed generally uniform flat configuration until such time as utilized by an orthopedic patient at said facility; and  
dispensing said product at said time of utilization by releasing compression in said bag and said orthopedic support compressed therein permitting return of said orthopedic support substantially to its original full unrestrained profile and configuration when needed for use by an orthopedic patient.

4,418,515

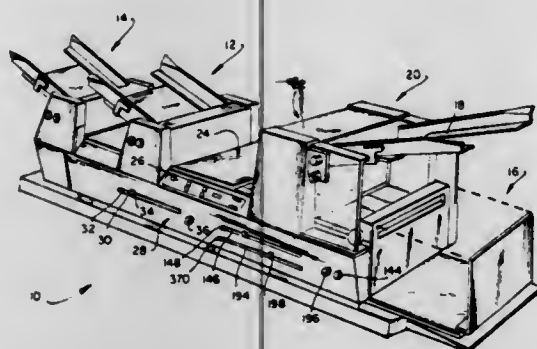
## INSERTER GAUGING SYSTEM

Dean H. Foster, Stratford; Robert E. Mersereau, Westport, and Harold Silverman, Norwalk, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 26, 1980, Ser. No. 210,474  
Int. Cl.<sup>3</sup> B65B 43/26, 43/44, 39/12, 5/04

U.S. Cl. 53-457

9 Claims



2. In an envelope inserter having a longitudinally-extending axis and comprising means for feeding envelopes to an envelope station, envelope positioning means at the envelope station, an array of stripper fingers, means for mounting each stripper finger for reciprocal movement in a vertically extending plane into an envelope to open the mouth of the envelope at the envelope station and ram means for inserting an enclosure into the opened envelope, the improvement comprising means for laterally varying the plane of at least one stripper finger and thus the plane of reciprocal movement of said at least one stripper finger whereby the one stripper finger is

adjustably positionable to accommodate envelopes of differing lengths.

4,418,516

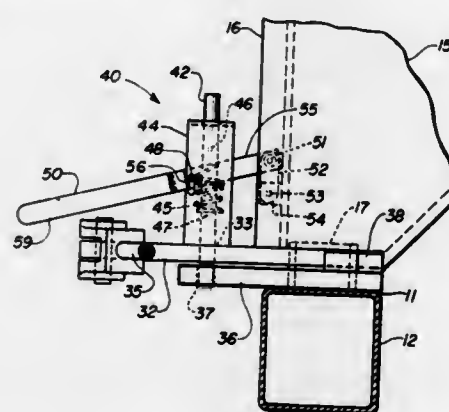
## TRANSPORT LOCK ACTUATOR

James T. Donovan, Gordonville, and E. Graham Webster, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 2, 1982, Ser. No. 364,951  
Int. Cl.<sup>3</sup> A01B 73/00

U.S. Cl. 56-228

10 Claims



1. In a crop harvesting machine having a mobile frame, said frame having a first aperture therethrough; harvesting apparatus supported by said frame for the harvesting of crop material; a tongue having a first end and a remote second end, said first end being pivotally mounted on said frame such that said tongue is pivotally moveable relative to said frame, said first end having a base member affixed thereto and pivotally moveable with said tongue relative to said frame, said base member having a second aperture therethrough alignable with said first aperture in said frame, said second end being adapted for connection to a primary mover; power means for pivotally moving said tongue relative to said frame; a locking pin insertable through said first and second apertures when said first and second apertures are aligned to lock said tongue in a preselected position relative to said frame, said locking pin being in a locked position when interengaged between said base member and said frame through said first and second apertures and in an operating position when disengaged from between said frame and said base member such that said tongue is free to pivotally move relative to said frame, the improvement comprising:

a spring-loaded actuator operatively and selectively engaged with said locking pin to selectively bias said locking pin toward said locked position to automatically move said locking pin into said locked position when said first and second apertures become aligned due to the movement of said tongue by said power means, said actuator also being selectively operable to bias said locking pin toward said operating position to automatically move said locking pin into said operating position when said first and second apertures become aligned.

4,418,517

## ACTUATING MECHANISM FOR HARVESTER TRANSPORT LOCK

Philip J. Ehrhart, Narvon; James T. Donovan, Gordonville, and E. Graham Webster, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 19, 1982, Ser. No. 369,947  
Int. Cl.<sup>3</sup> A01B 73/00

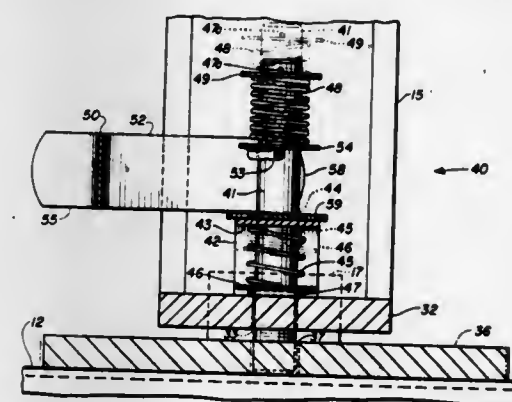
U.S. Cl. 56-228

11 Claims

1. A transport lock actuating mechanism for a crop harvesting machine having a mobile frame, said frame having a first aperture therethrough, harvesting apparatus operatively supported on said frame for the harvesting of crop material, a tongue having a first end pivotally connected to said frame and

a remote second end adapted for connection to a primary mover, a base member affixed to the first end of said tongue to be pivotally movable therewith and having a second aperture therethrough alignable with said first aperture, and power means interconnecting said tongue and said frame for pivoting said tongue relative to said frame, in combination comprising:

- (a) a housing mounted on said base member and movable therewith;
- (b) a locking pin slidably received within said housing for insertion through said second aperture, said locking pin including first and second spaced-apart spring retention members, said locking pin being movable between a locked position in which said locking pin extends through both said first and second apertures such that said base member is not free to move relative to said frame and an



unlocked position in which said locking pin does not extend through both said first and second apertures and said base member is free to move with said tongue relative to said frame;

- (c) a first spring concentrically mounted on said locking pin adjacent said first spring retention member;
- (d) a second spring concentrically mounted on said locking pin adjacent said second spring retention member;
- (e) first and second separably movable compression means for compressing said first spring against said first retention member and for compressing said second spring against said second retention member, respectively, such that said locking pin is biased toward said locked position when said first spring is compressed and biased toward said unlocked position when said second spring is compressed.

4,418,518

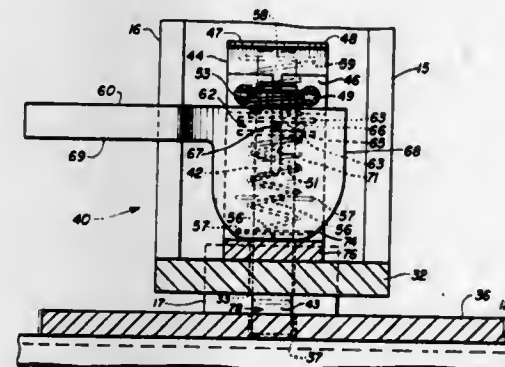
## MECHANISM FOR SPRING LOADING A TRANSPORT LOCK

Earl E. Koch, Mohnton; A. Dale Gamber, Lancaster, and Philip J. Ehrhart, Narvon, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed May 3, 1982, Ser. No. 374,356  
Int. Cl.<sup>3</sup> A01B 73/00

U.S. Cl. 56-228

9 Claims



1. A transport lock actuating mechanism for a crop harvesting machine having a mobile frame, said frame having a first aperture therethrough, harvesting apparatus operatively supported on said frame for the harvesting of crop material, a

tongue having a first end pivotally connected to said frame and a remote second end adapted for connection to a primary mover, a base member affixed to the first end of said tongue to be pivotally movable therewith and having a second aperture therethrough alignable with said first aperture, and power means interconnecting said tongue and said frame for pivoting said tongue relative to said frame, comprising:

- (a) a housing mounted on said base member and movable therewith, said housing including two spaced-apart leg members affixed to said base member on opposing sides of said second aperture and a bight portion spaced from said base member and connected to said leg members;
- (b) a locking pin positioned between said leg members for insertion through said second aperture and said first aperture when aligned with said second aperture, said locking pin being in a locked position when inserted through both said first and second apertures, thereby preventing relative movement between said base member and said frame, and in an unlocked position when said locking pin does not extend into said first aperture such that said base member is free to move relative to said frame;
- (c) first and second springs concentrically mounted on said locking pin, said first and second springs being compressible to bias said locking pin toward said unlocked and said locked positions, respectively;
- (d) first and second spring retention members fixed to said locking pin to limit the movement of said first and second springs relative to said locking pin;
- (e) a spring engaging member concentrically mounted on said locking pin between said first and second springs for sliding movement relative to said locking pin to selectively engage said first spring and said second spring for compression thereof against said first retention member and said second retention member, respectively; and
- (f) an actuating lever pivotally connected to said spring engaging member and operable to selectively move said spring engaging member toward said first retention member and said second retention member to compress said first and second springs, respectively, said actuating lever being further operable to retain said first and second springs in said compressed state until said locking pin moves into the respective position in which it has been biased.

4,418,519

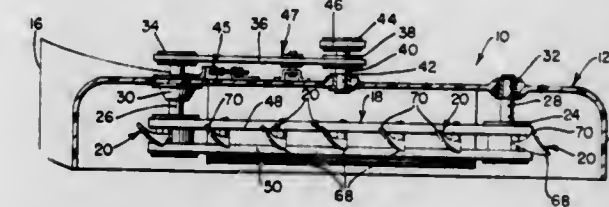
## ENDLESS CHAIN TYPE LAWN MOWER

Mark R. Fralish, Berlin, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 29, 1982, Ser. No. 403,248  
Int. Cl.<sup>3</sup> A01D 55/24

U.S. Cl. 56-244

3 Claims



1. A lawn mower comprising a generally horizontally extending elongated open bottom housing having a grass discharge opening on one side thereof, said housing having a generally vertical side wall, an endless chain-like plastic cutter assembly supported for powered rotational movement within said housing, said cutter assembly including a plurality of plastic impact members, each impact member including an elongated generally flat portion extending horizontally and merging with a curved wing portion having a leading impact edge and a trailing lift edge, said cutter assembly further including a pair of spaced apart generally parallel plastic endless bands and means for connecting said impact members between



said bands, said connecting means permitting said impact members limited pivotal movement upon striking obstacles during rotation of said cutter assembly, and said cutter assembly being rotated with the lift portions of said impact members acting to create an aerating effect and vacuum or suction within said housing for causing grass to be raised for cutting and for discharging cut grass outwardly through said opening in said housing.

4,418,520

# THRUST SWIVEL BEARING ON MOWING KNIVES SUPPORTED IN SWINGING LEVERS OF MOWER CUTTING SYSTEMS

Rudolf Schneider, Remscheid, and Bruno Hüscher, Bad Neuenahr-Ahrweiler, both of Fed. Rep. of Germany, assignors to Busatis-Werke GmbH u. Co. K.G. Boge GmbH, Eitorf, Fed. Rep. of Germany

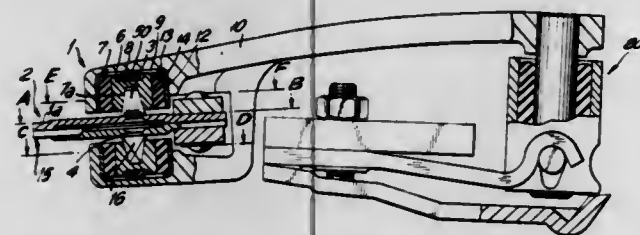
Filed May 29, 1980, Ser. No. 154,365

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922579

Int. Cl.<sup>3</sup> A01D 55/02

U.S. Cl. 56—297

19 Claims



1. A thrust swivel bearing for resiliently supporting a mowing knife in a swing arm of a mower cutting system, comprising a rubber-metal block including an external metal bushing adapted for non-rotatable connection with the swing arm, an annular rubber portion disposed concentrically within said external bushing, and an internal metal bushing disposed concentrically within said rubber portion, and engagement means for non-rotatably securing said rubber-metal block to the mowing knife, said engagement means including a coupling pin surrounded by said internal bushing, said coupling pin adapted for connection to the mowing knife, said rubber-metal block capable of being disconnected in axial direction of said bushings from either one of the swing arm and the mowing knife.

4,418,521

# HARVESTER WITH SELECTIVE FORCE BALANCED SHAKING MECHANISM

Franklin P. Orlando, Morgan Hill, and Donald G. Mortensen, San Jose, both of Calif., assignors to FMC Corporation, Chicago, IL

Filed Dec. 11, 1981, Ser. No. 329,786

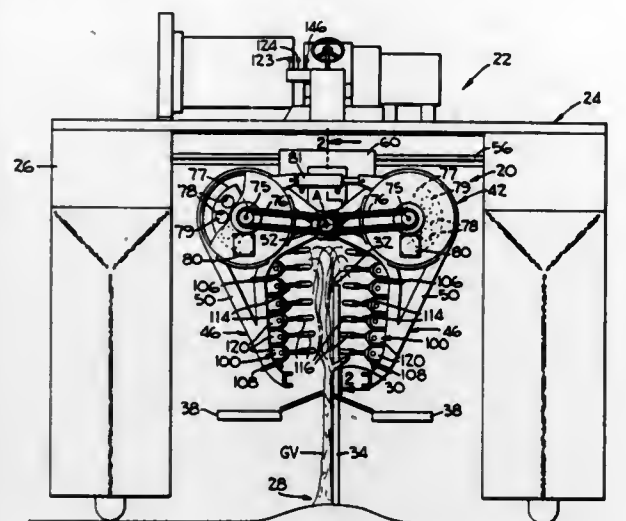
Int. Cl.<sup>3</sup> A01D 46/00

U.S. Cl. 56—330

10 Claims

1. A harvester for shaking crops such as grapes from plants grown in a row comprising a vehicle movable along said row, means defining a front force balanced shaking unit with a shaking head on each side of the row, means defining a rear force balanced shaking unit with a shaking head on each side of the row, means for pivotally supporting said front and rear heads on said vehicle for pivotal movement only about a common axis extending longitudinally of the row during harvesting, and selectively operable power means on the vehicle connected to said front unit and said rear unit for oscillating said heads transversely of the row only about said common axis; the improvement which comprises a foliage shaker assembly rigidly secured to each of said heads each foliage shaker assembly including a plurality of substantially horizontal flexible resilient tines each having a mounting end fixed to the associated head and a free end projecting rearwardly and inwardly toward the adjacent sides of said plants and movable relative to said associated heads only in response to resilient

deflection of said tines, said tines being responsive to forward movement of the vehicle and to oscillation of the heads only



4,418,522

# KNOCKOFF CONTROL SYSTEM AND APPARATUS FOR TEXTILE STRAND TWIST FRAMES

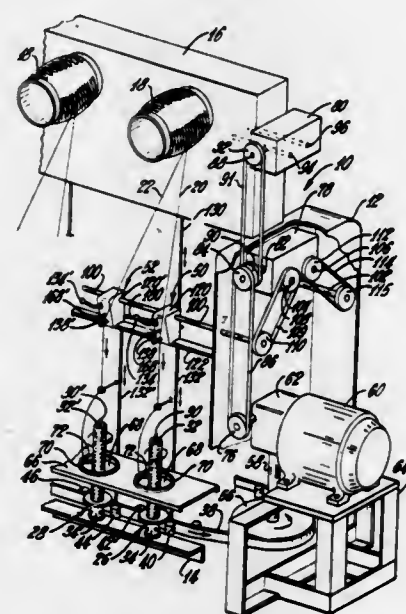
Kenneth T. Harrop, and Robert D. McArtor, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 29, 1981, Ser. No. 278,306

Int. Cl.<sup>3</sup> D01H 7/22, 13/16

U.S. Cl. 57—80

2 Claims



1. Apparatus for transferring dual strands of filamentary material from a single supply package onto first and second bobbins mounted on first and second spindles comprising:

- a first knockoff device controlling a drive to the first spindle and a drive to the supply package, said first knockoff device having means normally under the influence of tension in the first strand of filamentary material for establishing the drive to the first spindle and the drive to the supply package such that the breakage of the first strand being effective on the first knockoff device to interrupt the drive to the first spindle and the drive to the supply package,
- a second knockoff device having means normally under the influence of tension in the second strand of filamentary material for establishing a drive to the second spindle whereby the interruption of the drive to the supply package interrupts feeding of the strands such that the second strand is broken by tension interrupting the drive to the second spindle, and

c. means for establishing interconnection between the second knockoff device with the first knockoff device such that the breakage of the second strand, before breakage of the first strand, interrupts the drive to the second spindle and activates the first knockoff device to interrupt the drive to the first spindle and the supply package.

4,418,523

# NOTCHED ROLLER FOR PRODUCING FANCY YARNS IN SPINNING-TWISTING MACHINES

Paul Lemaire, Wambrechies, France, assignor to Filature Saint Andre, Saint Andre, France

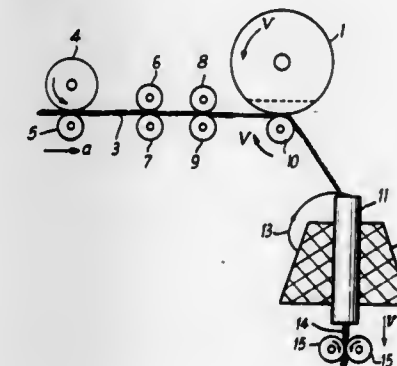
Filed Aug. 7, 1981, Ser. No. 291,128

Claims priority, application France, Jul. 2, 1981, 81 13017

Int. Cl.<sup>3</sup> D02G 3/36, 3/34

U.S. Cl. 57—207

4 Claims



1. A spinning-twisting machine for producing fancy yarns from a non-twisted sliver of textile fibers, said machine having an inlet end at which the sliver of textile fibers is introduced into the machine and an outlet end from which the fancy yarn is removed from the machine, said machine comprising a pair of feed cylinders located at the inlet end for feeding the sliver through the machine, a pair of drawing cylinders spaced from said pair of feed cylinders, said pair of drawing cylinders comprising a first cylinder having a continuous smooth cylindrical circumferentially extending surface for its full axial length and a second cylinder comprising two sections in axial alignment one following the other with at least one of said sections having at least one circumferentially extending notch formed in the circumferential peripheral surface thereof, said notch extending in the circumferential and axial direction of said second cylinder, said drawing cylinders arranged to be driven at a peripheral speed greater than the peripheral speed of said feed cylinders, said drawing cylinders arranged for forming a nip therebetween with the sliver passing through the nip of said drawing cylinders for the full axial length of the nip which includes the full axial length of said two sections of said second cylinder, a rotatable tubular spindle located between said nip of said drawing cylinders and said outlet end and arranged so that the sliver exiting from the nip of said drawing rollers passes through said tubular spindle, a package of a covering textile thread mounted on said tubular spindle for rotation therewith and said covering thread entering said tubular spindle with the sliver, a pair of take-up cylinders located at said outlet end of said machine for pulling the fancy yarn through said spindle, said take-up cylinders having a peripheral speed greater than the peripheral speed of said feed cylinders, so that the portion of the sliver passing through the notch in said second drawing cylinder is subjected to a false twist by the rotating action of said tubular spindle and is stretched by the action of said take-up cylinders while the remaining portion of the sliver passing through the nip of said drawing cylinders outside of said notch is pulled at a speed greater than the linear speed of the portion of the sliver passing through said notch and is wound around the portion of the sliver passing through said notch whereby all of the fibers of the sliver enter said rotary tubular spindle together along with the covering thread to form the fancy yarn withdrawn from the tubular spindle by said take-up cylinders.

4,418,524

# TWISTED YARN AND TWISTED BUNDLE OF YARNS

Osamu Ito, Utsunomiya, and Kazunori Nishizawa, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan  
Filed Jun. 16, 1981, Ser. No. 274,124

Claims priority, application Japan, Jun. 19, 1980, 55-83390; Apr. 27, 1981, 56-63602

Int. Cl.<sup>3</sup> D02G 3/38, 3/04

U.S. Cl. 57—239

23 Claims



1. A twisted combination yarn comprising two twisted, plied, first and second yarns, said first yarn being capable of being shrunk in the direction of the yarn length at least 10% of the original yarn length and being capable of being rendered elastic on contact with water, said first yarn consisting essentially of fibers selected from the group consisting of carboxymethylated cellulose fibers, methylated cotton fibers, sulfated cotton fibers, cationized cotton fibers and partially saponified acrylic fibers, and said second yarn consists essentially of fibers which do not shrink more than 10% in length on contact with water.

4,418,525

# DOUBLE-SIDED OPEN END SPINNING MACHINE

Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

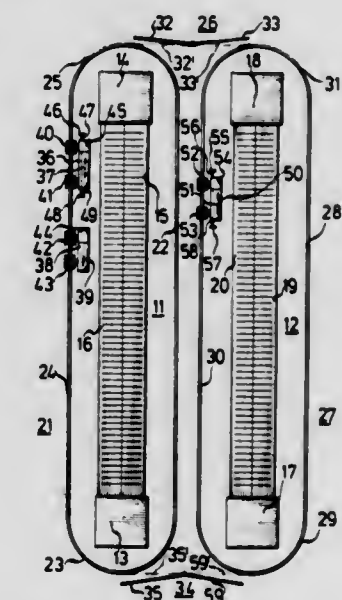
Filed Mar. 24, 1982, Ser. No. 361,573

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111627

Int. Cl.<sup>3</sup> D01H 13/22, 13/14, 13/26

U.S. Cl. 57—264

10 Claims



1. Double-sided open end spinning machine, comprising at least one closed travel track, a servicing device for traveling along the machine and a thread testing device for traveling along the machine, at least said servicing device being disposed on said at least one closed travel track, said servicing device including a travel direction reversing device and a travel obstacle indicator for each travel direction, said travel obstacle indicator being connected to said travel direction reversing device for reversing travel direction of said servicing device.



4,418,526

## CHAIN COUPLING OR LOCKING LINK

Anton Clement, Iserlohn-Letmathe, Fed. Rep. of Germany, assignor to August Thiele, Iserlohn-Kalthof, Fed. Rep. of Germany

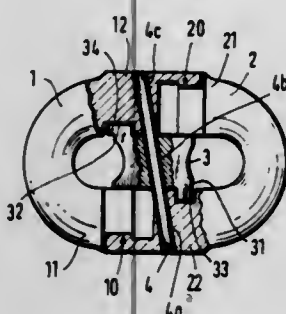
Filed Feb. 12, 1982, Ser. No. 348,459

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 8104620[U]

Int. Cl.<sup>3</sup> F16G 15/04

U.S. Cl. 59—85

3 Claims



1. A chain coupling or locking link, particularly for use in heavy-duty round steel chains, comprising a pair of complementary J-shaped link halves each defining two arms of different lengths, interlockable tongue-and-groove joints formed at facing end portions of said halves, and an arresting recess formed transversely to the major center plane of symmetry of the link in the inner wall portion of the longer arms; an arresting piece insertable between said wall portions and having projecting noses engageable with the respective arresting recesses to prevent said halves from shifting; an inclined bore passing through the opposite halves and said arresting piece for receiving a safety pin; said noses and the corresponding arresting recesses having different cross sections when viewed in the major plane of symmetry of the link to permit the insertion of said arresting piece between said halves in a predetermined orientation only.

4,418,527

## PRECOOLER FOR GAS TURBINES

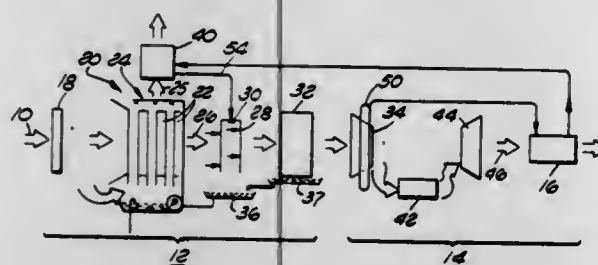
Leslie A. Schlom, 5524 Saloma Ave.; Michael B. Dubey, 5518 Saloma Ave., both of Van Nuys, Calif. 91411, and Andrew J. Becwar, 818 Old Landmark La., La Canada, Calif. 91011

Filed Apr. 21, 1980, Ser. No. 141,759

Int. Cl.<sup>3</sup> F02C 7/00

U.S. Cl. 60—39.05

2 Claims



1. Humidifier and scrubber means for cooling and washing intake air to improve the performance of a gas turbine system, said system including a combustion chamber, a turbine exhausting hot gas and an air compressor for compressing ambient air to supply the combustion chamber with compressed air, said means comprising:

- an indirect evaporative heat exchanger having a dry side, a wet side and an exhaust from said wet side;
- a water spray;
- means for conveying ambient air through the dry side of the indirect evaporative heat exchanger to sensibly cool said air;

means for conveying said sensibly cooled air through said water spray to clean, humidify and further cool said air;

means for collecting water that has not evaporated in the air stream;

means for conveying said humidified air to said turbine air compressor;

a water purifier, comprising:

a water evaporator heated by the hot turbine exhaust, so as to distill water supplied thereto;

a condenser disposed in the path of the wet side exhaust of the indirect evaporative heat exchanger for liquifying said distilled water vapor;

means for conveying distilled water vapor from the evaporator to the condenser; and

means for conveying liquified water from the condenser to said water spray.

4,418,528

## MODULAR GAS TURBINE ENGINE

Terrence R. Pellow, Watford, England, assignor to Rolls-Royce Limited, London, England

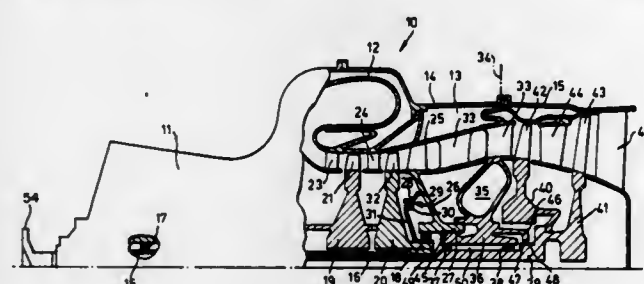
Filed Oct. 10, 1980, Ser. No. 196,114

Claims priority, application United Kingdom, Nov. 3, 1979, 7938143

Int. Cl.<sup>3</sup> F02C 3/10

U.S. Cl. 60—39.161

4 Claims



1. A modular gas turbine engine comprising:

- a gas generator module including a static portion, rotary members contained within the static portion of said gas generator module, a rotary shaft for said gas generator module and supporting said rotary members thereof, a plurality of bearings carried by the static portion of said gas generator module and supporting said rotary shaft therefrom;
- a power turbine module adapted to be detachably attached to said gas generator module and including a static portion, rotary members contained within the static portion of said power turbine module, a rotary shaft for said power turbine module and supporting said rotary members thereof, a plurality of bearings carried by the static portion of said power turbine module and supporting said rotary shaft therefrom; and
- a common bearing chamber defined by a portion of said gas generator module and a portion of said power turbine module, at least a downstream one of said plurality of bearings for the rotary shaft of said gas generator module and said plurality of bearings for the rotary shaft of said power turbine module being positioned within said common bearing chamber whereby when said gas generator module and said power turbine module are separated, each rotary shaft of the respective module remains fully supported by the respective plurality of bearings carried by the respective static portion.

4,418,529

## FUEL SYSTEMS FOR GAS TURBINE ENGINES

Michael J. Joby, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

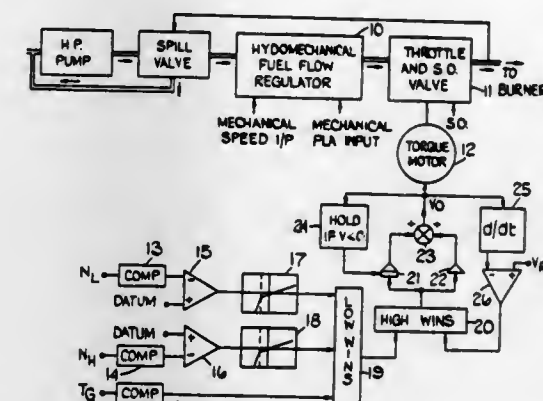
Filed Sep. 17, 1980, Ser. No. 188,211

Claims priority, application United Kingdom, Sep. 21, 1979, 7932879

Int. Cl.<sup>3</sup> F02C 9/28

U.S. Cl. 60—39.281

3 Claims



1. A gas turbine engine fuel system comprising the combination of an hydromechanical speed governor fuel flow control, an electrically operable valve in series with the fuel flow control, and a control circuit connected to said electrically operable valve comprising a phase advance compensation circuit for advancing the phase of incoming signals from an engine speed transducer, said phase advance compensating circuit having input means for receiving said incoming signals, differential amplifier means connected to said phase advance compensating circuit and to a limit signal, and an amplifier connected to said differential amplifier means and having a non-linear transfer characteristic such that its amplification factor is increased significantly when the input thereto representing the error between the phase compensated speed signal and a limit signal exceeds a predetermined level, said amplifier providing an electrical output connected to and controlling said electrically operable valve.

4,418,530

## SEWER PLANT FOR COMPRESSOR STATION OF GAS PIPELINE SYSTEM

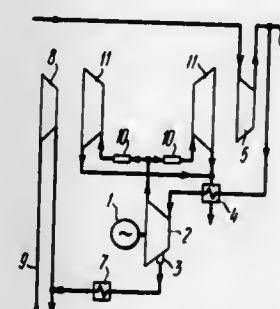
Igor S. Bodrov, Leningrad; Anatoly G. Gudzy; Tatyana M. Lukianova, both of Moscow; Vladimir P. Nitskevich, Khimki; Anatoly P. Ogurtsov, Leningrad; Andrei F. Salnikov, Krasnodar; Mikhail M. Fomichev, Krasnodar; Igor V. Sherstobitov, Krasnodar, and Mikhail B. Schepakin, Moscow, all of U.S.S.R., assignors to Moskovsky Institut Khimicheskogo Mashinostroyeniya, Moscow, U.S.S.R.

Continuation of Ser. No. 860,975, Dec. 15, 1977, abandoned. This application May 13, 1980, Ser. No. 149,536

Int. Cl.<sup>3</sup> F02C 6/18

U.S. Cl. 60—39.181

5 Claims



1. A power plant for a compressor station of a gas pipeline system having gas forcing devices including both a high pressure compressor in a high pressure gas main and an additional low pressure compressor in an additional low pressure gas main, the gas compressed by said high pressure compressor

being brought into said high pressure gas main at a pressure higher than the pressure produced by said low pressure compressor, and gas turbine installations having combustion chambers, said power plant comprising:

- an electric generator intended to meet the power requirements of said compressor station;
- an expansion engine having a collection chamber provided with a discharge package and coupled with the shaft of said electric generator;
- a heater for heating the gas directed to said expansion engine;
- said expansion engine having an intake passage coupled through said heater with a point in said high pressure main, and having a discharge passage coupled with said combustion chambers of the gas turbine installations;
- a gas cooler coupled with said discharge passage of said collection chamber for cooling the flowing gas therein; and
- said collection chamber being coupled through said gas cooler with said additional low pressure gas main at a point where the pressure is lower than at said point of said high pressure main which is coupled with said intake passage of said expansion engine whereby expansion engine is capable of utilizing a pressure differential between said high and said low pressure mains to thus insure that the power plant remains operational in the event that said low pressure compressor is shutdown.

4,418,531

## FLAMEHOLDER STABILIZATION PLATE FOR AN AIRCRAFT ENGINE AFTERBURNER SYSTEM

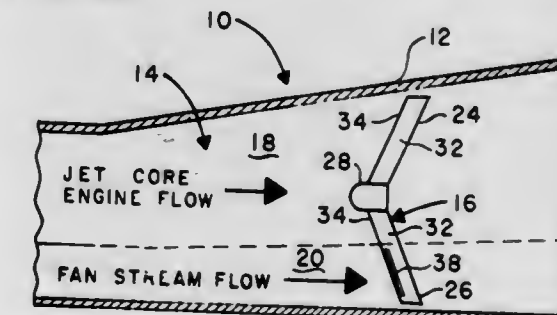
George W. Beal, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 5, 1981, Ser. No. 318,652

Int. Cl.<sup>3</sup> F02K 3/10

U.S. Cl. 60—261

3 Claims



1. In an afterburner system of a turbofan engine having a hollow casing defining a fluid flow duct and an elongated flameholding baffle disposed in said casing across said duct for receiving at separate portions of its front side a hot gas stream flow from a core engine and a cold air stream flow from a fan with droplets of cool augmentor fuel entrained therein, said baffle defining a flame recirculation zone at its rear side, the improvement which comprises:

- a generally planar flameholder stabilization plate attached to the portion of said baffle located substantially outside of said hot gas stream flow so as to not impede said flow but instead extend generally transversely to said baffle and across said cold air stream flow, said plate including a main body attached to said baffle and a plurality of extension tabs extending laterally from opposite sides of said body for substantially shielding said baffle from contact by said cold air stream flow and said droplets of cool fuel entrained therein so as to allow said baffle to remain at a high temperature and thus the flame held thereby in said recirculation zone to be more stable.



**4,418,532**  
**SUPERCHARGED INTERNAL COMBUSTION ENGINE**  
**HAVING A COMPRESSED AIR DRIVEN EXHAUST GAS**  
**EJECTOR**

Shinroku Momose, Musashino, and Tokuchi Mizunuma, Hachioji, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

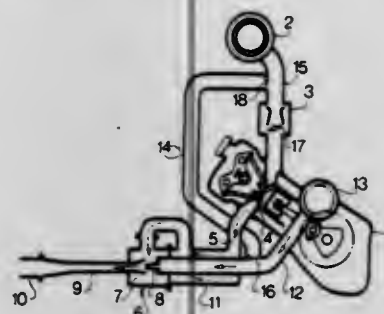
Filed Feb. 12, 1982, Ser. No. 348,557

Claims priority, application Japan, Feb. 16, 1981, 56-21700

Int. Cl.<sup>3</sup> F02D 23/00; F02B 35/00

U.S. Cl. 60—316

1 Claim



1. An intake and exhaust system of an internal combustion engine having an intake pipe and an exhaust pipe, comprising an ejector provided adjacent to said exhaust pipe, said ejector consisting of a nozzle, an exhaust pressure reducing chamber, and a suction throat pipe adjacent to said nozzle, a compressor driven by said engine, a pipe for communicating said compressor with said nozzle of said ejector, conduit means for communicating said exhaust pipe with said exhaust pressure reducing chamber, an exhaust pipe connected to said suction throat pipe, a supercharging pipe for communicating said compressor with said intake pipe, and changeover valve means provided in said supercharging pipe for communicating said compressor with said intake pipe in wide-open throttle operation and with said ejector in part-open throttle operation.

**4,418,533**  
**FREE-PISTON STIRLING ENGINE INERTIAL**  
**CANCELLATION SYSTEM**

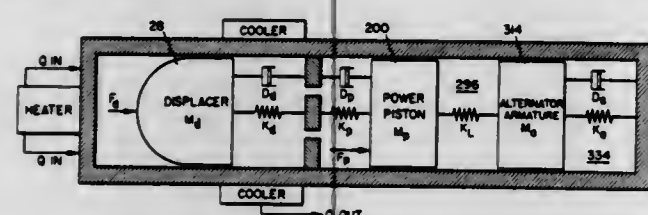
Lawrence R. Folsom, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,718

Int. Cl.<sup>3</sup> F02G 1/06

U.S. Cl. 60—520

10 Claims



1. A free-piston Stirling engine including a hermetically sealable vessel enclosing a working space containing a working gas and having a first end of said working space heated by a heater for heating the working gas and having a second end of said working space cooled by a cooler for cooling the working gas; said vessel also containing a displacer having a mass for shuttling the working gas between said ends through said heater, a regenerator, and said cooler to produce a periodic pressure wave in said working gas; a power piston having a mass driven in axial oscillation in said vessel to produce output power; said displacer mass and said power piston mass forming substantially a first mass in said working space; wherein the improvement comprises:

a second mass in said vessel and outside said working space; means for coupling said second mass in momentum exchange relationship with respect to said first mass; and means for causing oscillation of said second mass in phase opposition to said first mass, whereby the shaking forces exerted by said first mass are cancelled by movement of

said second mass, and the shaking forces exerted through said vessel to ground are minimized.

**4,418,534**  
**HYDRAULIC PRESSURE MASTER CYLINDER**  
 Jurgen Dufft, Kennilworth, England, assignor to Lucas Industries Limited, Birmingham, England

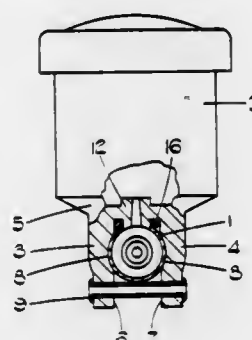
Filed Mar. 10, 1981, Ser. No. 242,261

Claims priority, application United Kingdom, Mar. 18, 1980, 8009049

U.S. Cl. 60—585

Int. Cl.<sup>3</sup> B60T 11/26

3 Claims



1. In a hydraulic master cylinder assembly comprising a cylinder having a bore therethrough, a piston operably disposed within said bore for reciprocating movement therein, at least one opening through the peripheral wall of said cylinder, a separate hydraulic fluid reservoir member removably mounted on said cylinder, a spigot on said reservoir projecting therefrom and extending into said opening so as to resist longitudinal displacement of said reservoir with respect to said cylinder, and a bore through said spigot providing a fluid flow path between the respective interiors of said reservoir and cylinder, the improvement comprising mounting and retaining arms on said reservoir and projecting therefrom to engage the peripheral outer wall of said cylinder on opposite sides thereof comprising at least one pair of spaced, parallel resilient arms attached to and extending from said reservoir at least substantially beyond the central axis of said master cylinder, cylinder engaging recesses on the inner surfaces of said arms shaped to conform to the outer peripheral surface of the cylinder and extending from a position between the reservoir and the axis to a position beyond said axis to engage said peripheral surface for a distance on the side opposite said reservoir so that said arms are resiliently displaceable outwardly for insertion of the cylinder between them until the cylinder engages with the recesses by snap-engagement to securely retain said reservoir on said cylinder by the gripping force produced by the resiliency of said arms.

**4,418,535**  
**DEVICE FOR REGULATING THE PRESSURE OF A**  
**FLUID SUPPLIED TO A FEEDING CIRCUIT FROM A**  
**FLUID SOURCE**

Andre Ecomard, Marly le Roi, France, assignor to Institut Francais du Pétrole, Rueil-Malmaison, France

Filed Jan. 21, 1981, Ser. No. 226,983

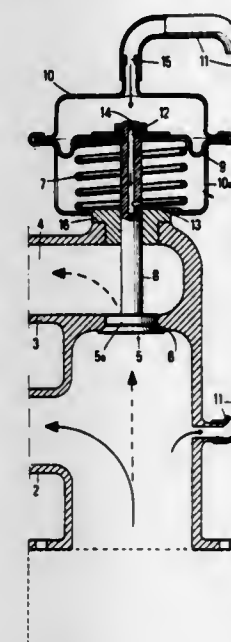
Claims priority, application France, Jan. 21, 1980, 80 01370

U.S. Cl. 60—602

7 Claims

1. In a device for regulating fluid pressure in a utilization circuit having an inlet pipe means and an outlet pipe means, and fed with a fluid under pressure by a fluid source, the device comprising a by-pass fluid conduit connected parallel to said outlet pipe means of said utilization circuit, obturating means adapted for obturating said by-pass conduit, and control means for automatically moving said obturating means into a first open position when pressure in the utilization circuit is higher than a predetermined value, and for automatically moving said

obturating means into a second closed position when the pressure in the utilization circuit is lower than said predetermined value, the improvement wherein said control means comprises a manometric gauge connected to said fluid pressure source through a first calibrated aperture, and having a movable wall therein to define a fluid pressure receiving chamber on one side of the wall, calibrated spring means disposed on the wall, with said obturating means comprising a valve with a valve stem connected to said movable wall, and with the spring means disposed for urging said movable wall and valve stem into said second closed position, said valve stem having a second calibrated aperture, opening into said pressure receiving chamber, and into a passageway leading into the other side of the mov-



able wall for allowing pressurized fluid to pass therethrough from the fluid pressure receiving chamber to atmosphere, and passageway closing means arranged as a guide for said valve stem for closing off passage of fluid through said passageway when pressure in said pressure receiving chamber increases to a level sufficient to displace said movable wall a distance in said first open direction sufficient to close said passageway, whereby as the fluid pressure in said utilization circuit increases, an initial displacement of said movable wall is caused to close said passageway and whereupon closing of said passageway causes a sudden rise in pressure in the fluid pressure receiving chamber to cause a full opening of the valve to lower pressure in the utilization circuit by diverting a partial flow through said bypass conduit.

**4,418,536**  
**RECIPROCATING INTERNAL COMBUSTION ENGINE**  
**WITH DISCONNECTIBLE EXHAUST**  
**TURBOCHARGERS**

Herbert Deutschmann, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,508

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032435

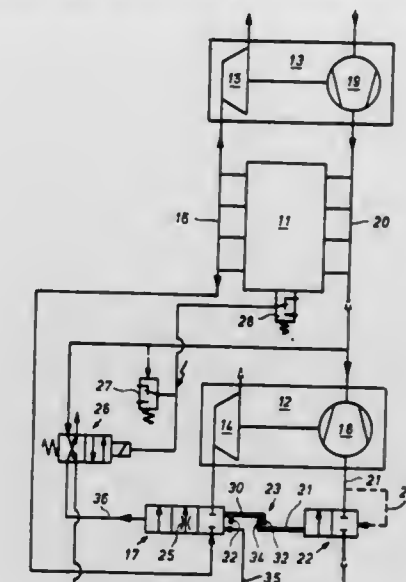
Int. Cl.<sup>3</sup> F02B 37/00

U.S. Cl. 60—602

40 Claims

1. A reciprocating internal combustion engine comprising a plurality of exhaust gas turbocharger means, exhaust means for directing a flow of exhaust gases to the respective gas turbocharger means, and means for selectively connecting and disconnecting at least one exhaust gas turbocharger means during a partial load operation of the engine including a blocking means arranged in the exhaust means and a further blocking means arranged in an intake means of the at least one exhaust gas turbocharger means, coupling means are provided for operatively connecting the blocking means in the exhaust means to the further blocking means so as to permit, upon a connection of the at least one exhaust gas turbocharger means,

the blocking means and the exhaust means to be opened only to an intermediate position at which a rotational speed of the at least one exhaust gas turbocharger means is limited to permissi-



ble values and to permit a further opening of the blocking means in the exhaust means only one of with or after an opening of the further blocking means.

**4,418,537**  
**SUPERCHARGER FOR AN INTERNAL COMBUSTION**  
**ENGINE**

Kenzi Iwamoto, Nishio, and Makoto Kuroyanagi, Hekinan, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

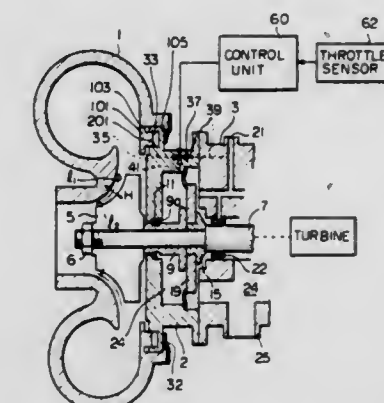
Filed Dec. 9, 1981, Ser. No. 329,134

Claims priority, application Japan, Dec. 24, 1980, 55-181887

Int. Cl.<sup>3</sup> F02B 37/00

U.S. Cl. 60—611

7 Claims



1. A supercharger apparatus for an internal combustion engine, comprising:

means for receiving the energy of the exhaust gas in an exhaust system of the engine;  
 a shaft connected to said means;  
 an impeller connected to an end of the shaft, said impeller is adapted for compressing a fluid passing through the apparatus;  
 a first housing in which said impeller is arranged, said housing forming a part of an intake system of the engine,  
 a second housing for supporting the shaft;  
 journal means for rotatably supporting the shaft on the second housing; and,  
 means for controlling a clearance formed between the first housing and the impeller so that it is changed from a minimum valve substantially equal to zero for effecting a compression of intake air to a maximum value for providing a by-pass passageway for the free passage of intake air therethrough,  
 wherein said means for controlling the clearance comprises

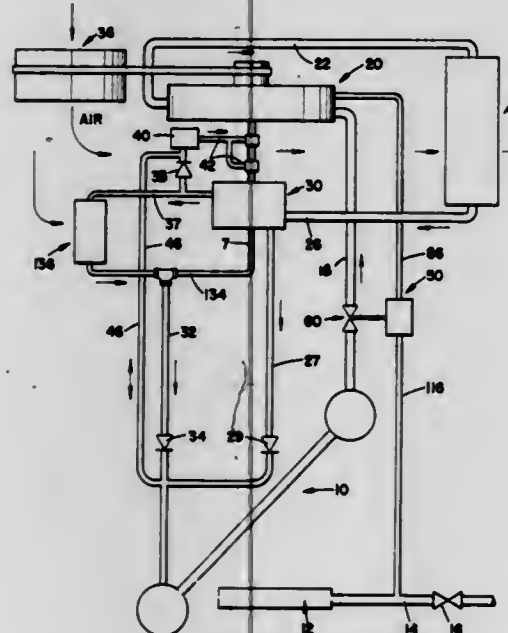


first means responsive to fluid pressure for effecting a limited relative axial movement between the first and the second housings, and second means for producing a fluid pressure directed to the first means,

wherein one of said housings is provided with an axially outwardly opened annular groove, whereas the other one of said housings is provided with an annular projection which is axially slidably inserted into the annular groove, wherein said first means comprise stopping means for limiting the axial slide movement between a first position where the clearance attains the minimum value and a second position where the clearance attains the maximum value, and biasing means for generating a force to urge one of the housings toward one of the positions, and wherein said second means comprise a pressure chamber formed between the annular groove and the annular projection.

4,418,538  
METHOD AND APPARATUS FOR OPERATING A  
SELF-STARTING AIR HEATING SYSTEM  
Charles E. Heinrich, Mentor, Ohio, assignor to TRD Inc.,  
Cleveland, Ohio

Filed Dec. 11, 1980, Ser. No. 215,563  
Int. Cl.<sup>3</sup> F01K 13/02  
U.S. Cl. 60-646



1. In a self-starting air heating system including a fuel burner fired vapor generator, a turbine, and a condenser connected in a circuit such that the vapor output from the generator is conducted to said turbine and then from an outlet from said turbine to said condenser where it is condensed and returned to said boiler, and further including an air blower means driven by said turbine for causing a flow of air over said condenser, and a condensate pump also driven by said turbine for returning the condensed vapor to the vapor generator, the improved method of operation comprising maintaining the circuit portion between said vapor generator and said turbine closed to prevent the vapor output of said vapor generator from passing to said turbine until the pressure differential between the turbine outlet and the vapor generator reaches a minimum predetermined level and after opening said portion of the circuit maintaining it open until after the flow of fuel to said fuel burner has been shut-off and restarted.

4,418,539

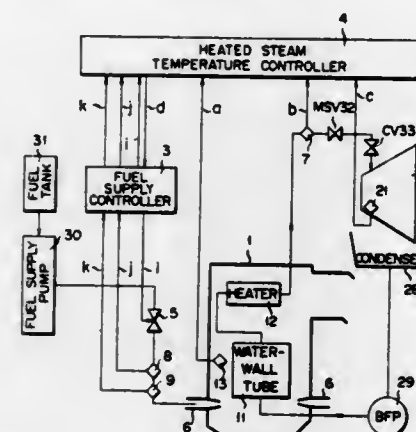
**METHOD AND SYSTEM FOR CONTROLLING THE  
START OF A THERMAL POWER PLANT**

Hidekazu Wakamatsu, Kodaira, and Yoichiro Kogure, Tama,  
both of Japan, assignors to Tokyo Shibaura Denki Kabushiki  
Kaisha, Kawasaki, Japan

Filed Jan. 4, 1982, Ser. No. 336,704  
Claims priority, application Japan, Jan. 14, 1981, 56-3238  
Int. Cl.<sup>3</sup> F01K 13/02

U.S. Cl. 60-646

## 10 Claims



1. A method for controlling the start of a thermal power plant having a turbine, a boiler for generating superheated steam to drive the turbine, a fuel source for supplying fuel to the boiler, a fuel supply controller for controlling the fuel supply from the fuel source to the boiler, and the like, said method comprising the steps of:

supplying fuel from the fuel source to the boiler after the plant has been prepared to start; igniting burners of the boiler thereby to raise the temperature and pressure of water flowing through water tubes of the boiler; causing the fuel supply controller to control the fuel supply to the boiler; and starting the supply of superheated steam from the boiler to the turbine when the superheated steam reaches a temperature which satisfies a condition for starting the turbine, said step of causing the fuel supply controller to control the fuel supply including a step of calculating a desired temperature of combustion gas in the boiler from a process factor indicative of the start mode of the turbine, a step of calculating a process quantity of the fuel supply controller from a difference between the desired temperature of combustion gas calculated and the temperature of the combustion gas detected in the boiler, and a step of operating the fuel supply controller according to the process quantity calculated, thereby controlling the fuel supply from the fuel source to the boiler.

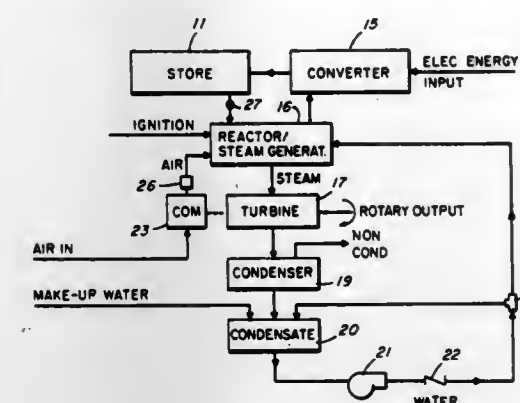
**4,418,540**  
**POWER SYSTEM AND METHOD**  
**Hagop Kasparian, P.O. Box 172, Al Khobar, Saudi Arabia, and**  
**Kaspar Kasparian, P.O. Box 58252, Raleigh, N.C. 27658**  
**Filed Apr. 14, 1980, Ser. No. 140,294**

U.S. Cl. 60-649

### 3 Claims

1. A power system comprising a store of aluminum, a reactor for said aluminum, means to present said aluminum to said reactor, means to introduce steam into said reactor whereby said aluminum is converted to aluminum compound with the

consequent release of energy, means to heat the steam with said released energy, a steam operated power device and



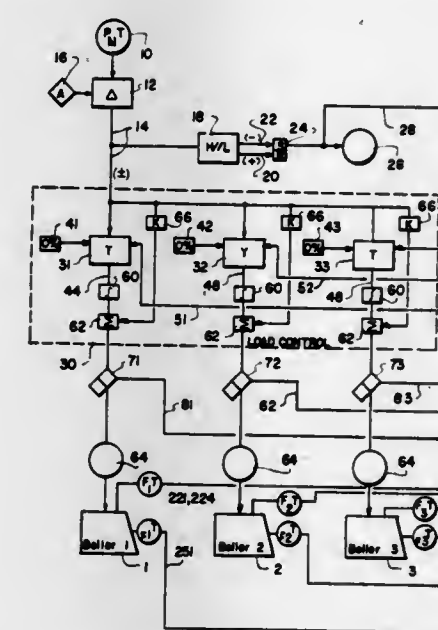
means to operate said device with the heated steam, and means to convert said aluminum compound back to aluminum.

**4,418,541**  
**BOILER LOADING SYSTEM**  
Thomas D. Russell, Montville, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 11, 1982, Ser. No. 357,006  
Int. Cl.<sup>3</sup> F01K 13/02  
U.S. Cl. 60—667

U.S. Cl. 60-667

### 5 Claims



1. A boiler loading method for a power plant having a plurality of boilers and operable at a desired load, the plant having an actual plant load and each boiler having an actual boiler load, comprising:

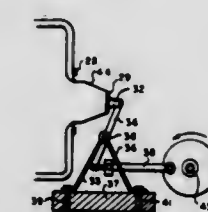
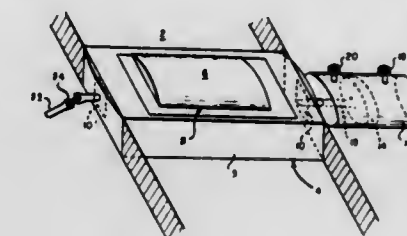
sensing an actual plant load;  
comparing the actual plant load with the desired plant load to generate a plant load change signal representing one of a plant load increase demand and a plant load decrease demand;  
monitoring each actual boiler load;  
determining a change in efficiency of each boiler with an incremental change in boiler load from each actual boiler load respectively, to establish an efficiency increase for each boiler load incremental increase and an efficiency decrease for each incremental boiler load decrease;  
selecting the one of said boilers with the highest efficiency increase upon the occurrence of a plant load increase demand and the one of said boilers with the lowest efficiency decrease upon the occurrence of a plant load decrease demand; and  
loading the one of said boilers which is selected by an amount corresponding to the plant load change signal for

**4,418,542**  
**VEHICULAR THOROUGHFARES FOR POWER**  
**GENERATION**

Robert D. Ferrell, 26 Jaeger Dr., Old Brookville, N.Y.  
 Filed Feb. 4, 1981, Ser. No. 231,537  
 Int. Cl.<sup>3</sup> F04B 9/10, 35/02; F03G 5/00

U.S. Cl. 60-668

## 10 Claims



1. A roadway of the type over which moving vehicles pass, said roadway having positioned in the path of the movement of such vehicles a power generating means for generating power in response to movement of said vehicles over said roadway, said power generating means being in the form of an elastic compressible and deformable container which contains a fluid, said power generating means being responsive to and actuated by the weight of said vehicle as it passes thereover, said power generating means further comprising a vertically displaceable, generally planar member generally coplanar with the roadway, said power generating means comprising said fluid housed in a fluid housing, said fluid being in fluid communication with a generator via transmission means, said fluid while in said housing being in contact with a displaceable bearing surface which when displaced acts upon said fluid, said displaceable bearing surface in turn connected to said generally planar member, said container responsive to the weight of said moving vehicle, said container comprising a body portion disposed vertically beneath said generally planar member, said body portion connected to a neck member in fluid communication with the fluid in said container, said neck member containing a diaphragm portrutable from said body to engage said transmission means whereby when a motor vehicle passes over said generally planar surface, the same is vertically displaced whereby to displace said bearing surface against said fluid whereby said container is deformed and the fluid contained therein is displaced to engage said transmission.

**4,418,543**  
**FUEL NOZZLE FOR GAS TURBINE ENGINE**  
Joseph E. Faucher, East Hartford; Richard R. Wright, William-  
antic; Francis C. Pane, Jr., South Windsor; David Kwoka,  
Windsor, and Edmund E. Striebel, South Windsor, all of  
Conn., assignors to United Technologies Corporation, Hart-  
ford, Conn.

**Filed Dec. 2, 1980, Ser. No. 212,176**

Int. Cl.<sup>3</sup> F02C 7/22

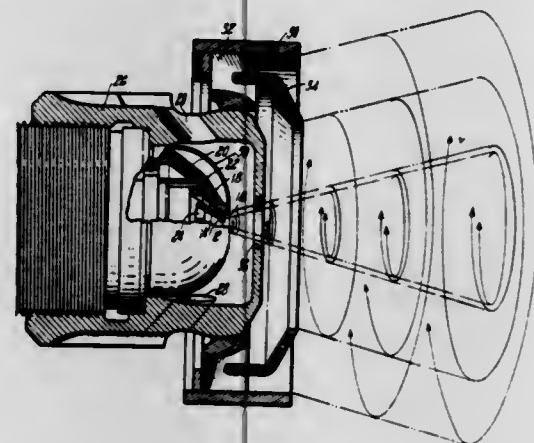
U.S. Cl. 60-742

## 2 Claims

1. A dual orifice type fuel nozzle having a primary fuel passage normally continuously operative throughout the en-



gine operating envelope and a secondary fuel passage normally operative solely during the high thrust regimes and inoperative during the low thrust regimes of said engine operating envelope, for a combustor of gas turbine engine having a compressor, said fuel nozzle having a generally conically shaped casing with a primary fuel passage centrally disposed therein, secondary fuel passage formed therein concentrically disposed relative to the primary fuel passage, both primary and secondary passages exiting fuel into said combustor through a substantially mutual transverse plane, means for imparting a swirl component to compressor discharge air surrounding the fuel



exiting from said primary and secondary passages, means for pressurizing the secondary passage when said primary passage is solely operative with said compressor discharge air whereby said secondary passage maintains a positive pressure for preventing fuel from said primary passage from migrating therein and coking the walls of said secondary passage, first fuel swirl means in said primary passage for imparting a swirl motion to the fuel issuing therefrom, second fuel swirl means in said secondary passage for imparting a swirl motion to the fuel issuing therefrom, said first fuel swirl means, said second fuel swirl means and said means for swirling the air imparting swirling motion in a common direction.

4,418,544

## PUMP FOR VERY COLD LIQUIDS

Helmut Heybutzki; Wolfgang Krug, and Johann Seferiadis, all of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH

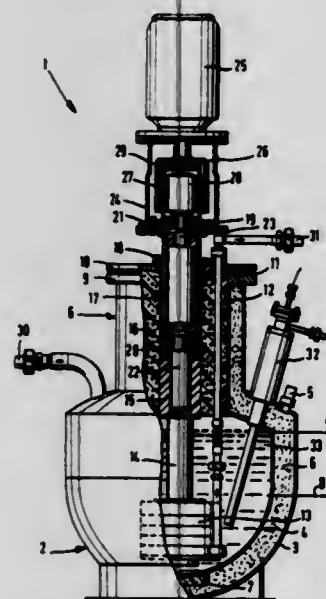
Filed Jun. 28, 1982, Ser. No. 392,652

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126293

Int. Cl.<sup>3</sup> F17C 13/00

U.S. Cl. 62—55

12 Claims



1. Pumping apparatus for very cold liquids comprising: a thermally insulated and pressure-tight sealed vessel having

a thermally insulated neck (8) and equipped with an inlet and an outlet respectively for introduction and removal of a very cold liquid;  
an immersion-type rotary pump (13) mounted on suspension means through said neck of said vessel for operation when immersed in very cold liquid in said vessel, and connected directly to one of said inlet and outlet and to the interior of said vessel;  
a drive-shaft (19) for said rotary pump passing through said vessel neck and through said suspension means for said pump;  
bearings (20,21) for said drive-shaft held by said suspension means;  
thermal insulation means interposed in said drive shaft and in said pump suspension means for opposing heat flow down the neck of said pump, including an insulation (23) on the pump side of said bearings (20,21) and means for pressure-tight sealing of said neck (8) of said vessel, in the form of a seal cap (29) covering the end portion of said drive shaft (19) remote from said pump;  
a permanent magnet coupling (20) for transfer of torque to said drive shaft (19) through said cap (29), connected above said cap to a motor shaft coaxial with said drive shaft;  
a motor (25) outside said vessel for driving said motor shaft and thereby said drive shaft.

4,418,545

## REABSORPTION METHOD FOR TEMPERATURE TRANSFORMATION OF HEAT AND APPARATUS THEREFORE

Dieter Markfort, Am Tor 2, 5064 Rürath 3, Fed. Rep. of Germany

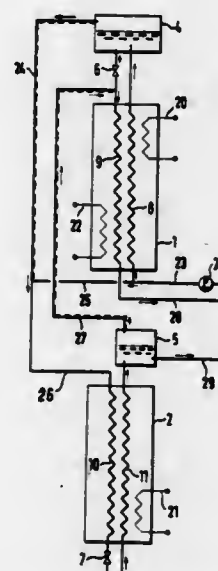
Filed Jan. 6, 1982, Ser. No. 337,398

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, 3100348

Int. Cl.<sup>3</sup> F25B 15/00

U.S. Cl. 62—101

15 Claims



1. In a reabsorption process for transforming low-temperature heat into medium temperature heat by utilizing the energy of high temperature heat, incorporating two fluid loops wherein solutions of a working agent and a solvent are passed through, the working agent is desorbed from the solution in the first loop within a desorber, the latter being a component of the high pressure side of the first loop, and reabsorbed by the solution in the second loop within a reabsorber, the latter being a component of the high pressure side of the second loop, and after depressurization is desorbed from the solution in the second loop within a degasser, the latter being a component of the low pressure side of the second loop, and absorbed by the depressurized solution of the first loop within an absorber, the latter being a component of the low pressure side of said first loop, the improvement, whereby a difference in characteristic

temperature levels is covered by variation of solution concentration, with only minor pressure differences, utilizing the principles of non-adiabatic, differential desorption and adsorption, comprising, combining the desorber and absorber to form a first integrated unit, combining the reabsorber and degasser to form a second integrated unit each of them having internal thermal contact, joining said two separate solution loops into one duct upstream of a common solution pump, maintaining solutions of both loops at identical pressure, temperature and concentration at the exits of the absorber and degasser, and diverging said common duct downstream of said pump.

4,418,546

## CONTINUOUS TUBE REFRIGERATION SYSTEM

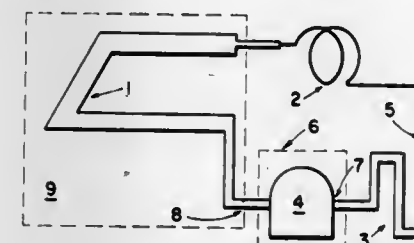
Harrie R. Buswell, 2646 Rhonda Ct., Duluth, Ga. 30136

Filed Mar. 25, 1982, Ser. No. 322,257

Int. Cl.<sup>3</sup> F25B 1/00

U.S. Cl. 62—115

6 Claims



1. A method for providing the refrigerant path in a refrigeration system, said refrigeration system comprising a compressor, said compressor having an output port, a condenser arranged for receiving refrigerant from said output port and dissipating heat from said refrigerant, restriction means arranged for receiving refrigerant from said condenser, an evaporator arranged for receiving refrigerant from said restriction means and allowing said refrigerant to expand and absorb heat, said compressor having an input port for receiving refrigerant from said evaporator, said method including the steps of providing a single, integral length of tubing having a given diameter, forming a first portion of said length of tubing to provide a fluid passageway therethrough of less than said given diameter and having fins extending from said fluid passageway for providing said condenser, forming a second portion of said length of tubing to provide a capillary tubing for providing said restriction means, said first portion and said second portion being in communication through said length of tubing, forming a third portion of said length of tubing for providing a fluid passageway therethrough of less than said given diameter and having flattened portions extending therefrom for providing said evaporator, said second portion and said third portion being in communication through said length of tubing, connecting one end of said length of tubing to said output port of said compressor, and connecting the other end of said length of tubing to said input port of said compressor, so that said refrigerant path is provided by said single, integral length of tubing.

4,418,547

## THERMALLY POWERED HEAT TRANSFER SYSTEMS

Robert W. Clark, Jr., Phoenix, Ariz., assignor to The Saint E. Company, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 214,458, Dec. 8, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 413,095

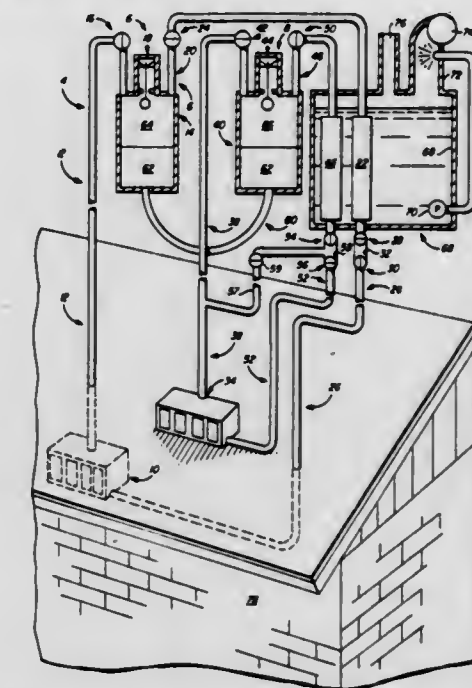
Int. Cl.<sup>3</sup> F25B 1/00

U.S. Cl. 62—116

14 Claims

1. A thermally powered heat transfer system having a first and a second cycle of operation, comprising:  
first and second closed loop heat transfer means each of said transfer means including respectively a first and a second refrigerant, a first and a second condenser means for transferring heat from the first and second refrigerants to a first

and a second heat sink, and a first and a second heat exchanger for transferring heat from a first and a second heat source to the first and the second refrigerants;  
compressor means for said first and second transfer means powered by energy derived from the first heat source for causing said second condenser means to transfer heat from



the second refrigerant to the second heat sink during each first cycle of operation and powered by energy derived from the second heat source for causing said first condenser means to transfer heat from the first refrigerant to said first heat sink during each second cycle of operations; and control means for causing such system to change its cycle of operation.

4,418,548

## VARIABLE CAPACITY MULTIPLE COMPRESSOR REFRIGERATION SYSTEM

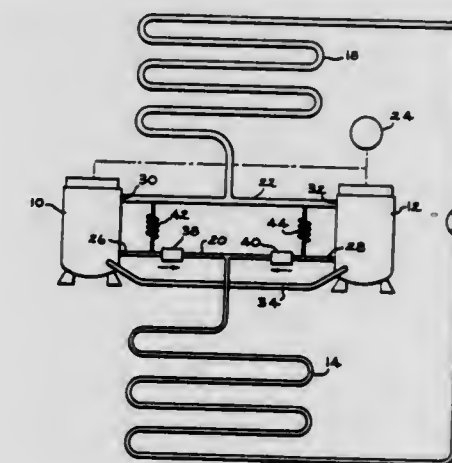
George N. Sawyer, Flint, Tex., assignor to Trane CAC, Inc., La Crosse, Wis.

Filed Mar. 29, 1982, Ser. No. 362,830

Int. Cl.<sup>3</sup> F25B 7/00, 1/00

U.S. Cl. 62—175

8 Claims



1. A multiple compressor refrigeration system including at least two hermetic shell compressors, each having a discharge system for discharging high pressure refrigerant and a suction system for returning low pressure refrigerant to said compressor, a discharge manifold means interconnecting the discharge systems of said compressors, and suction manifold means interconnecting the suction systems of said compressors arranging said compressors in parallel, a first heat exchanger connected to said suction manifold intermediate said suction system openings and a second heat exchanger connected to said discharge



manifold intermediate said discharge system openings, comprising:

control means for energizing one of said compressors in response to a first condition, and another of said compressors, in response to a second condition and both of said compressors in response to a third condition;  
refrigerant flow control means including a check valve associated with the discharge system of each of said compressors, that includes a sealing member movable within a valve body, said check valve being operable for permitting high pressure refrigerant flow between the discharge system of its associated compressor and said discharge manifold when said compressor is energized and for preventing high pressure refrigerant present in said discharge manifold when another one of said compressors is energized from entering the discharge system of said associated compressor when it is de-energized; and  
bleed means arranged between each of said check valves and its associated compressor, said bleed means comprising a bleed valve member connected to the check valve sealing member, and operable when actuated thereby to bleed refrigerant present in the discharge system of its associated compressor to said suction manifold.

4,418,549

# **APPARATUS FOR EXTRACTING POTABLE WATER**

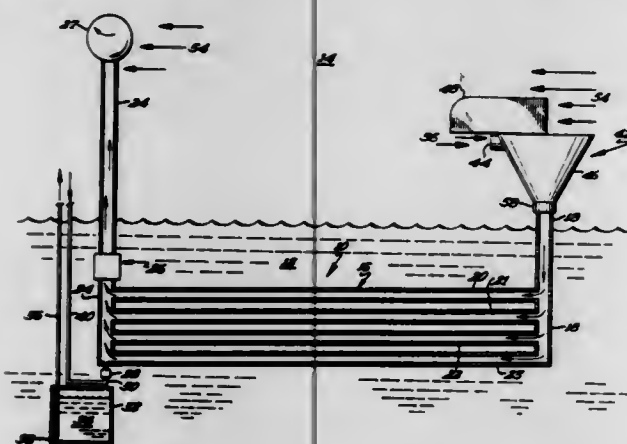
Calice G. Courneya, Rte. 7, Alexandria, Minn. 56308

Continuation of Ser. No. 215,967, Dec. 12, 1980, Pat. No. 4,351,651. This application Sep. 28, 1982, Ser. No. 425,356

Int. Cl.<sup>3</sup> F25D 23/12

U.S. Cl. 62-260

5 Claims



1. Apparatus for extraction of potable water from moisture-laden atmospheric air, comprising, in combination: cold heat exchanger in temperature communication with the subsurface media of earth and providing for passage of moisture-laden air therethrough and providing for the extraction of water from such moisture-laden air by passive cooling of the air to or near the dew point of the air causing the water in the air to condense; air entrance means in air communication with the atmosphere and in air communication with the cold heat exchanger for providing moisture-laden air from the atmosphere to the cold heat exchanger; air exit means in air communication with the cold heat exchanger and in air communication with the atmosphere for providing moisture-drained air from the cold heat exchanger to the atmosphere; means for causing air flow from the atmosphere, through the cold heat exchanger and back to the atmosphere; a reservoir in fluid communication with the cold heat exchanger to collect water condensed out of the moisture-laden air in the cold heat exchanger; wherein the means for causing air flow through the system comprises a turbine arranged in air communication with the termination of the air exits means and operably communicating with the atmosphere for providing a wind driven source of pressure for the system; wherein the air exit means includes an air restrictor which restricts the flow of air to a greater degree as the temperature of the exhaust air through the exit means increases and/or restricts the flow of air to a greater degree as the velocity of the exhaust air through the exit means increases; and wherein the air restrictor restricts the flow of air dependent on

both the temperature and velocity of the exhaust air through the exit means to increase the residence time of the air passing through the cold heat exchanger so that the air flow does not exceed the heat exchanger capability and to maximize the amount of water condensed in the cold heat exchanger.

4,418,550

# **BOAT LOCKING DEVICE**

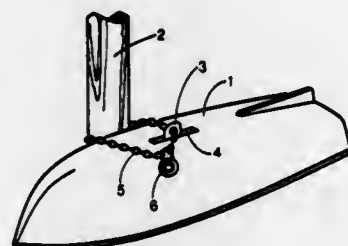
James Hamilton, 189 Upland Rd., Cambridge, Mass. 02140

Filed May 13, 1981, Ser. No. 263,139

Int. Cl.<sup>3</sup> E05B 73/00

U.S. Cl. 70-18

9 Claims



1. A locking system for securing a boat having a centerboard slot against theft or unauthorized movement comprising:  
a metal locking member having an elongated portion shaped and sized to project through said slot with each end of said portion extending beyond the ends of said slot, one end of said portion having means extending outwardly a distance greater than at least one dimension of said slot to prevent movement of said elongated portion entirely through said slot, means forming an opening at the other end of said portion through which a cable may be secured, and an elongated cable extending through said opening with means for securing said cable in a loop, about an immovable object and to said locking member.

4,418,551

# **VENDING MACHINE SECURITY CAGE**

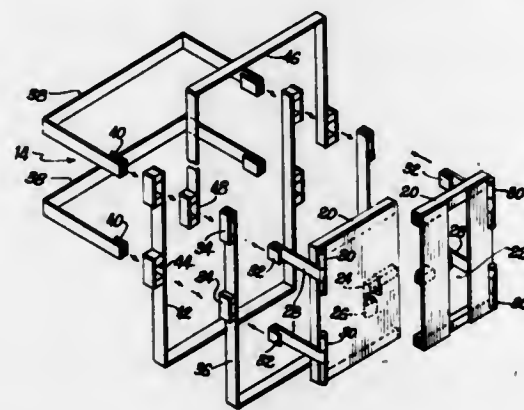
Donald G. Kochackis, 95 E. Prospect St., Chula Vista, Calif. 92011

Filed Jul. 6, 1981, Ser. No. 280,729

Int. Cl.<sup>3</sup> E05B 13/00, 17/14, 67/38; E05C 19/18

U.S. Cl. 70-18

5 Claims



1. A protective barrier assembly for a vending machine cash box comprising:

- (a) a strap structure engaged around portions of said vending machine and defining stable mounting positions adjacent the opposite sides of the vending machine front;
- (b) a door mounted to one of said mounting positions, and being moveable between an open mode exposing the front of said vending machine and a closed mode protecting at least a portion of the front of said vending machine;
- (c) means locking said door securely in the closed position; wherein said door is one of two doors respectively hinged to

said mounting positions and said locking means includes a bar passing behind both doors.

4,418,552

# **SIMULTANEOUSLY LOCKING AND UNLOCKING DEAD BOLT AND LOCK LATCH WITH PANIC UNLOCKING**

Roger J. Nolin, 1838 Whitehurst Dr., Monterey Park, Calif. 91754

Continuation-in-part of Ser. No. 86,945, Oct. 22, 1979, Pat. No. 4,276,760. This application Jul. 1, 1981, Ser. No. 279,590

Int. Cl.<sup>3</sup> E05B 17/04, 59/02, 63/14; E05C 15/02

U.S. Cl. 70-107

17 Claims



1. An improvement in a lockset of the type having an escutcheon mounting a dead bolt assembly and a latch bolt assembly, the dead bolt assembly having inside and outside operators to extend and retract the dead bolt through a dead bolt drive upon locking and unlocking either of the dead bolt operators, the latch bolt assembly having inside and outside operators to extend and retract the latch bolt through a latch bolt drive upon operation of either of the latch bolt operators, the improvement comprising:

- (a) a slide mounted in the escutcheon for movement towards and away from the dead bolt assembly and with such movement away and toward the latch bolt assembly between a first position of the slide and a second position of the slide, respectively;
- (b) means to bias the slide towards its first position proximate the latch bolt assembly and remote from the dead bolt assembly;
- (c) a lock release mounted in the escutcheon for movement between a first position of the lock release and a second position of the lock release, respectively;
- (d) crank means coupled to the dead bolt assembly for rotation between a crank locked position and a crank unlocked position, corresponding to a locked dead bolt and an unlocked dead bolt, respectively, the crank means during its movement from its locked to its unlocked position engaging the lock release and moving the lock release to its first position from its second position, the crank means in its unlocked position maintaining the lock release in its first position;
- (e) means of the lock release to engage the slide and move the slide to its first position during movement of the lock release from its second position to its first position in response to rotation of the crank means between its locked position and its unlocked position, such means thereafter maintaining the slide in its first position;
- (f) a latch actuator in the escutcheon and secured to the latch bolt drive for rotation therewith, the inside operator of the latch bolt drive being engageable with the actuator to rotate it and open the latch bolt;
- (g) means for locking the slide and the latch actuator against

4,418,553

# **VEHICLE FUEL CAP LOCKING DEVICE**

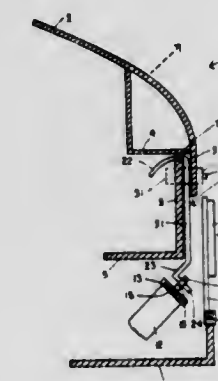
Edward R. Applegate, 520 S. Dennis Ave., Decatur, Ill. 62522

Filed Sep. 9, 1980, Ser. No. 185,524

Int. Cl.<sup>3</sup> B65D 55/02; E05B 65/12; E05C 19/18, 21/00

U.S. Cl. 70-164

2 Claims



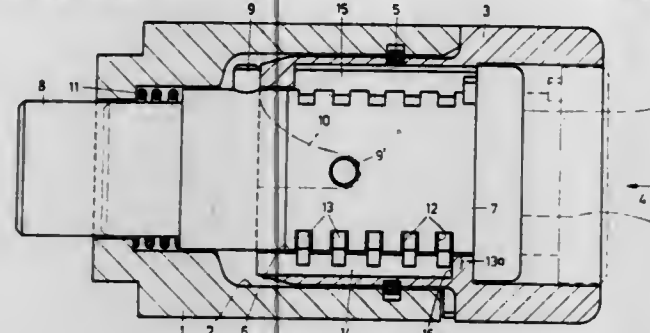
1. In a locking device for use with a vehicle having a trunk compartment and a fuel tank filling tube inlet located adjacent to and below a vertical lower wall of said trunk compartment, wherein said trunk compartment has a lid element which is pivotally mounted to disengage from said trunk compartment lower wall, when said trunk is opened, and engage said trunk compartment lower wall, when said trunk is closed, and wherein said lid element has an interior wall section which normally is positioned above said trunk compartment lower wall, when said trunk lid is in the closed condition, the improvement comprising:

- (1) a removable cap closure member for said fuel tank filling tube inlet, said cap member being adapted to be placed and tightened onto said filling tube inlet by rotation of said cap member, and said cap member having a slot provided on the exterior thereof adapted to receive a bar element, and
- (2) a locking bar element having configured, joined upper and lower portions, said upper portion of said bar element extending (a) from its lower end at a point adjacent said filling tube inlet, (b) past, along, and adjacent to said trunk compartment lower wall, and (c) in and then downwardly along a non-linear path around the top of said trunk compartment lower wall, to be adapted thereby to engage and abut said interior wall section of said trunk lid, when said lid is in a closed condition, and said lower portion of said bar element having a lower terminus adapted to be slideably received within said slot in said cap member to retain, when so received, said cap member against rotational movement and against removal from said filling tank inlet, whereby said cap member is adapted to be locked in place on said filling tank inlet.



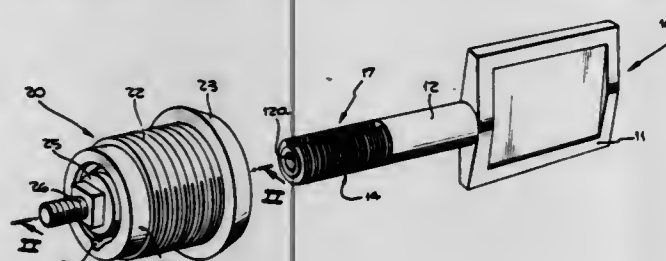
**4,418,554**  
**KEY OPERATED LOCKING MECHANISM**  
 Günter Wolfgang, Wuppertal, Fed. Rep. of Germany, assignor to  
 Nelman S.A., Courbevoie, France  
 Filed Sep. 15, 1981, Ser. No. 302,005  
 Claims priority, application Fed. Rep. of Germany, Sep. 18,  
 1980, 3035172

Int. Cl.<sup>3</sup> E05B 29/02  
 U.S. Cl. 70—360 7 Claims



1. A key operated locking mechanism comprising:
  - (a) a cylinder housing;
  - (b) an axially displaceable cylinder core which rotates in a cylindrical opening in the cylinder housing and which is movable axially between a locking position and an unlocking position;
  - (c) a locking bolt movable by said core between locking and unlocking positions; and
  - (d) plate tumblers on said core which project, in the axially displaced locking position of the cylinder core, beyond the external surface thereof when the key has been withdrawn, wherein in the cylindrical opening in the cylinder housing there is provided at least one contact surface, which is arranged so as to be transverse of the lock axis and is directed towards the locking bolt, for co-operation with a portion of at least one of said plate tumblers that surmounts the cylinder core surface at a point with which the surmounting portion is in abutting contact in the axial position of the cylinder core in which the locking bolt is in its locking position, said contact surface closing a tumbler recess means formed longitudinally in said cylinder housing, into which the recess means plate tumblers project in the locking position when the key has been removed, at the key introduction end, said recess means being open in the direction of the locking bolt.

**4,418,555**  
**CYLINDER TYPE LOCK AND KEY**  
 Tim M. Uyeda, South San Gabriel, Calif., assignor to La Gard,  
 Inc., Torrance, Calif.  
 Filed Feb. 5, 1982, Ser. No. 346,131  
 Int. Cl.<sup>3</sup> E05B 29/02  
 U.S. Cl. 70—366 8 Claims

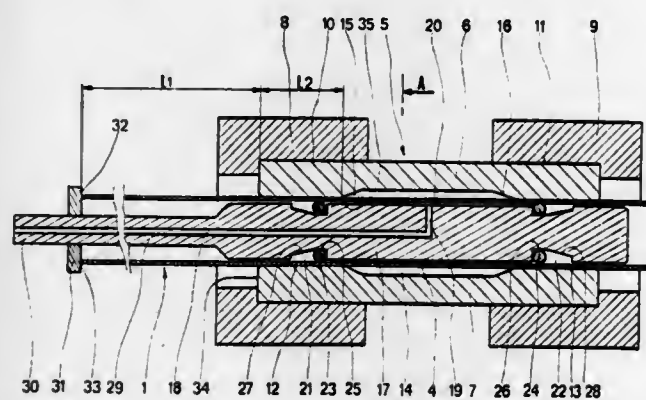


1. In a cylindrical type lock having a rotatable cylinder within a lock body, said cylinder having a plurality of gated tumbler wheels rotatable therein, and a fence member interposed between said cylinder and body and moveable toward the gates of said tumbler wheels whereby rotation of said cylinder relative to said body is normally prevented unless said

fence member is received into each of the gates of said tumbler wheels, the improvement comprising the provision of: a stacked array of a plurality of nested and alternating tumbler wheels and spacer discs wherein said wheels and discs are each provided with identically configured annular projections on one side thereof and annular recesses on an opposite side thereof, said annular recesses being of sufficient size to receive a projection of an adjacent wheel or disc to place the same in a nested relation.

**4,418,556**  
**PRECISION LOCAL EXPANSION SHAPING PROCESS AND APPARATUS FOR METAL TUBES OF SUBSTANTIAL LENGTH**  
 Serge Galle, Jerome Hautdidier, both of Montreuil-Juigne, and Christian Soulet, Uguine, all of France, assignors to Compagnie Europeenne du Zirconium Cezus, Paris, France  
 Filed Jul. 12, 1982, Ser. No. 397,217  
 Int. Cl.<sup>3</sup> B21D 22/10

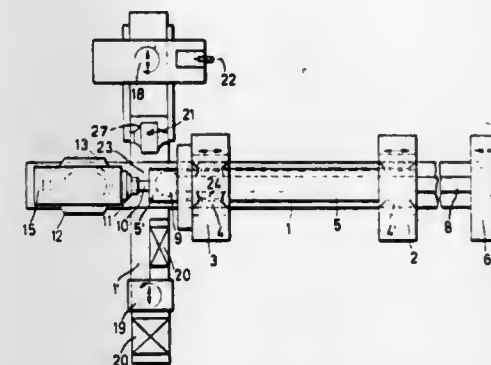
U.S. Cl. 72—62 7 Claims



1. Apparatus for local expansion shaping in a precisely located region of a running part of a cylindrical tube of substantial length, said apparatus comprising a dismantable tubular die open at both ends and including a central expansion chamber, the inside dimensions of which correspond to those of the expanded region to be produced, and, to opposed sides of the expansion chamber, two cylindrical bearing surfaces, the inside diameters of which are substantially equal to the initial outside diameter of the tube to be expanded for an accommodation of the tube within the die; and a mandrel for reception within the die-received portion of the tube, said mandrel including an internal conduit having one end adapted for communication with an external pressure fluid source and a second end laterally directed at a point along the length thereof for communication with, and introduction of pressurized fluid to, an annular space between the mandrel and the tube, said mandrel having compressible seals mounted thereabout at spaced points therealong for sealing engagement with the tube to delimit said annular space between the mandrel and the tube to extend beyond the opposed sides of the expansion chamber into the areas of the cylindrical bearing surfaces of the die; said mandrel including annular grooves thereabout, said grooves being positionable to the opposite sides of the annular space and housing said seals, the grooves being of a transverse width greater than the seals received therein, each groove transversely extending between an inner side toward the annular space and an outer side outwardly spaced relative to the annular space, each of said annular grooves being variable in depth from a maximum depth at the inner side to a minimum depth at the outer side, each seal being of a height greater than the maximum depth of the corresponding groove and capable of increasing compression between the mandrel and tube upon outward movement of the seal in response to pressure increase in the annular space.

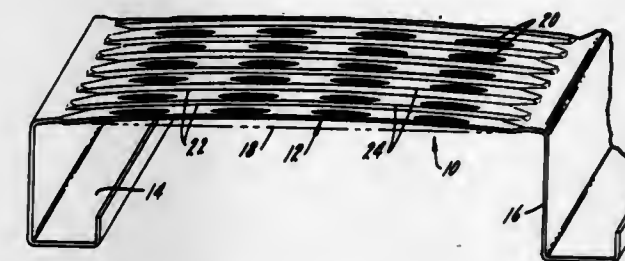
**4,418,557**  
**MAKING A SEAMLESS SPHERICAL CASE**  
 Clemens Halene, Duesseldorf, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany  
 Division of Ser. No. 97,458, Nov. 26, 1979, Pat. No. 4,312,206.  
 This application Jul. 2, 1981, Ser. No. 279,864  
 Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851620

Int. Cl.<sup>3</sup> B21D 22/16  
 U.S. Cl. 72—69 7 Claims



1. A machine for making a spherical case with a cylindrical extension having a support, comprising:
  - a linear bed;
  - head stock means slidably disposed on the bed for holding a tubular blank;
  - a mandrel rod with a head held in the support, there being a pin extending from the head;
  - receiver means on the bed for receiving the pin, at least one of the receiver means and of the mandrel support being also slidably disposed on the bed;
  - a contoured work tool and rolling means;
  - a heating means;
  - said tool and rolling means and said heating means being disposed adjacent to the bed for being individually advanced from different directions transversely to the bed and towards the blank when held by the stock means, said contoured work tool and rolling means coating with the mandrel rod and the head for working the tubular blank stepwise into a spherical case with end nipple; and
  - means for rotating the blank when held by the head stock means during the heating by the heating means and during subsequent rolling by the tool means.

**4,418,558**  
**METHOD OF MANUFACTURE OF VENTILATED SHEET METAL FLOOR MEMBERS**  
 Robert A. Simmons, Deerfield, Ill., assignor to Bantam Systems, Inc., Chicago, Ill.  
 Filed Jul. 27, 1981, Ser. No. 287,291  
 Int. Cl.<sup>3</sup> B21D 35/00  
 U.S. Cl. 72—177 3 Claims

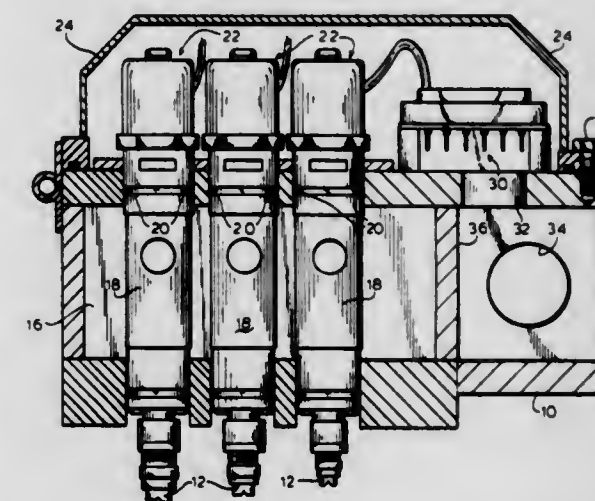


1. The method of manufacture of sheet metal floor members for use in a grain storage bin or like application requiring passage of fluid through the floor members without permitting passage of granular material therethrough, comprising the following steps:
  - A. roll lancing a strip of sheet metal to form a series of short closed slits in the central portion of the strip with the strip

1037 O.G.—3

of sheet metal being fed into the rolls in the direction of its length and all of the slits extending in a common direction transverse to the length of the strip;  
 B. and subsequently roll forming the sheet metal strip to form a series of transverse corrugations in the central portion of the strip parallel to the slits, so that the central portion of the strip is stretched longitudinally and the slits are thereby opened sufficiently to afford multiple narrow, open ventilation slots that allow free passage of fluid while precluding passage of granular material therethrough, simultaneously ironing out projections formed by the lancing of step A;  
 steps A and B being performed sequentially in successive stages of a roll forming machine.

**4,418,559**  
**ROLL COOLANT DISTRIBUTION HEADER**  
 Paul E. Huzyak, Salem, Ohio, assignor to Gulf & Western Manufacturing Co., Southfield, Mich.  
 Filed Dec. 8, 1981, Ser. No. 328,555  
 Int. Cl.<sup>3</sup> B21B 45/02  
 U.S. Cl. 72—201 16 Claims



1. A roll coolant distribution assembly comprising:
  - a header;
  - a chamber defined within said header;
  - a plurality of two-stage valves mounted to said header, portions of said valves being positioned within said chamber;
  - each of said valves including an inlet, an outlet, and means for controlling the passage of coolant from said inlet to said outlet, said inlet positioned within said chamber;
  - a plurality of nozzles extending from said chamber, said valve outlets each being connected to one of said nozzles;
  - said valves each including a solenoid for actuating said controlling means, said solenoids being positioned outside the header and sealed from said chamber; and
  - a cover secured to said header, said cover and said header defining an enclosure for said solenoids.

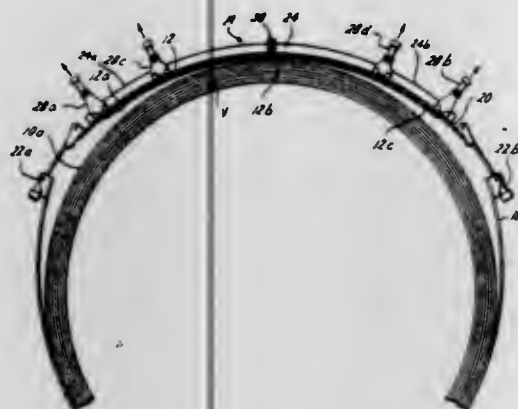
**4,418,560**  
**SHELL LAYER WRAPPING MACHINE AND METHOD OF POSITIONING VESSEL SECTIONS OF A MULTI-LAYER VESSEL**  
 Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay, Houston, Tex.

Filed May 11, 1981, Ser. No. 262,293  
 Int. Cl.<sup>3</sup> B21D 11/02, 31/00; B23D 11/02  
 U.S. Cl. 72—296 9 Claims

1. A wrapping machine used in constructing layered vessels having at least one layer formed of adjoining vessel sections which are welded onto an inner layer and to adjoining vessel sections only after being positioned and pressed into position by such wrapping machine, which comprises:



band means adapted to encircle the layered vessel for positioning and pressing a vessel section onto a vessel layer therebelow;  
said band means having a first arcuate band portion and a second arcuate band portion, said first and said second band portions being joined by tensioning means for applying force to draw said first band portion towards said second band portion; and



selective radial positioning means attached to said second band portion for selectively placing all or only a part of said second band in pressure engagement with said vessel section in order to selectively press said vessel section into radially directed engagement with such vessel layer therebelow.

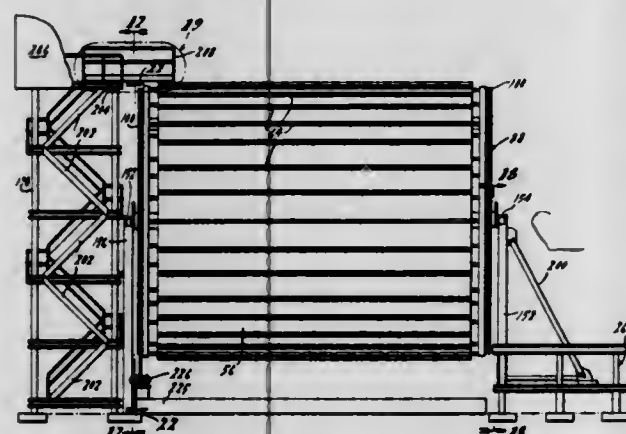
4,418,561

**APPARATUS FOR MANUFACTURE OF TUNNEL TUBES**  
Edward Johnston, Newark, Del.; Morton Jacobs, Houston, Tex.; Melvin E. Miller, Havre de Grace, Md., and Robert A. Kaucic, Newark, Del., assignors to Amca International Corporation, Hanover, N.H.

Filed Apr. 23, 1981, Ser. No. 256,710  
Int. Cl.<sup>3</sup> B21J 7/20

U.S. Cl. 72-406

20 Claims



1. An apparatus for use in the manufacture of generally cylindrical shells for tunnel tubes, said apparatus comprising a fixture generally cylindrical in shape and having means thereon for roll-forming plate material therearound into a generally cylindrical shell, said fixture further having at least one cable channel on an end, pedestal means for supporting said fixture, and winch means positioned at said one end of said fixture having cable means wrapped around said cable channel for rotating said fixture on said pedestal means in order to roll said plate material therearound.

4,418,562

**CONTROL DEVICE FOR A SMALL PRESS**

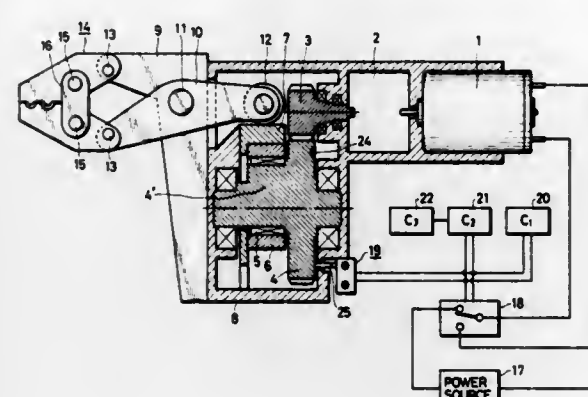
Yasuharu Sakai, Nobuaki Murai, and Kiyotaka Nakano, all of Kyoto, Japan, assignors to Japan Storage Battery Company Ltd., Kyoto, Japan

Filed Feb. 26, 1982, Ser. No. 352,982

Claims priority, application Japan, Mar. 2, 1981, 56-30097  
Int. Cl.<sup>3</sup> B21B 45/02

U.S. Cl. 72-444

8 Claims



1. In a small press in which a rocking lever is rockably mounted on a fulcrum shaft extending from a stationary lever, and is rocked by a cam which is formed on a side of a power transmission gear driven by an electric motor, and in which a pressing or cutting die assembly is coupled through shafts to the front end portions of said rocking lever and said stationary lever, a control device comprising: position detecting means for detecting an operating cycle of said cam, over-current detecting means for detecting an abnormal load on said motor, delay means inhibiting said over-current detecting means during a time wherein a start current flows in said motor, and power switch means for said motor, said power switch means interrupting the flow of current to said motor in response to a signal from said position detector indicating completion of one operating cycle, or a signal from said over-current detecting means indicating an abnormal load on said motor.

4,418,563

**METHOD OF DETERMINING THE IMPACT FRACTURE TOUGHNESS  $K_{ID}$  BY MEANS OF IMPACT TESTS**

Jörg F. Kalthoff, Bad-Krotzingen, and Siegfried Winkler, Freiburg, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung, Munich, Fed. Rep. of Germany

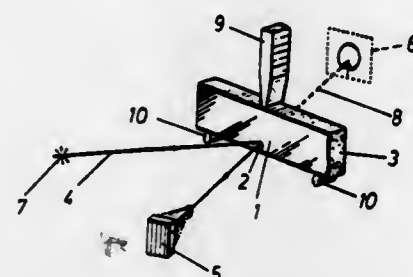
Filed Nov. 13, 1981, Ser. No. 321,144

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044841

Int. Cl.<sup>3</sup> G01N 3/08

U.S. Cl. 73-12

6 Claims



1. A method of determining the impact fracture toughness  $K_{ID}$  of construction materials by applying impact tests to bend specimens, each having a notch therein which is subsequently extended by loading said specimen to form an artificial crack therein, comprising the steps of:

(a) determining according to the shadow optical method of

caustics the impact response curve for a particular loading arrangement and specimen geometry;  
(b) measuring by an impact test the time to fracture  $t_f$  of a corresponding specimen made of a material to be tested, and  
(c) ascertaining from the time to fracture with the aid of the impact response curve the impact fracture toughness  $K_{ID}$  of the construction material of the bend specimen.

4,418,564

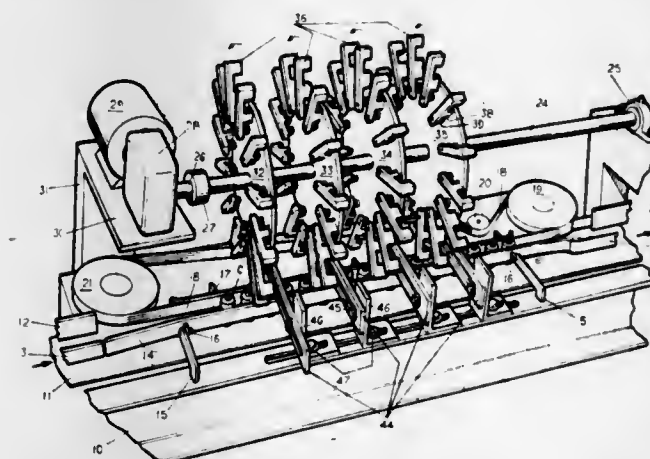
**SNAP ACTION BOTTLE FINISH TESTER AND METHOD**  
John A. McKinley, Clarion, Pa., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 21, 1981, Ser. No. 332,410

Int. Cl.<sup>3</sup> G01N 3/34

U.S. Cl. 73-12

11 Claims



1. Apparatus for testing glass containers to determine whether the finish thereof is weak or acceptable comprising a conveyor for moving a series of containers into a test zone, a pair of opposed guide rails overlying said conveyor for guiding containers, in series, through the test zone, a horizontally driven belt positioned between one of said guide rails and the side of the containers for moving the containers through the test zone, at least four spring loaded impact fingers spaced along said conveyor in said test zone, and means for releasing said fingers successively into contact with the finish of the containers at circumferentially spaced intervals therearound.

4,418,565

**ULTRASONIC BUBBLE DETECTOR**

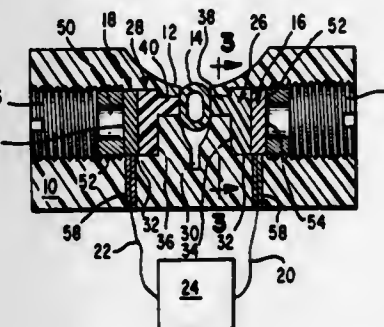
Peter A. St. John, Adelphi, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 3, 1980, Ser. No. 212,653

Int. Cl.<sup>3</sup> G01N 29/02

U.S. Cl. 73-19

7 Claims



1. In ultrasonic bubble detection apparatus, a one-piece, rigid housing made of glass-filled polytetrafluoroethylene, a channel defined in the one-piece housing for receiving flow tubing in which bubbles are to be detected; first ultrasonic sending transducer means positioned in said housing on one side of the channel; second ultrasonic receiving transducer means positioned on the other side of said channel, said sending and receiving transducer means being of the type for respectively

sending and receiving ultrasound energy at a frequency of 1 to 3 MHz; aperture means respectively communicating between each of said first and second transducer means and said channel, said aperture means being filled with an elastomeric material capable of transmitting ultrasound energy between said channel and each transducer means; electric lead means communicating from each transducer means to the exterior of said housing, and added air-containing slot means positioned in the bottom of said channel of a width too small to contain the tubing positioned within said channel and being of a depth extending below the lower edge of each of said transducer means, to hinder the propagation of ultrasound energy through said housing from the first to the second transducer by a route other than one passing through said elastomeric material, whereby tubing inserted in said channel may be in contact with said elastomeric material to provide transmission of ultrasound energy between the first and second transducers, which transmission of ultrasound energy is significantly altered by the presence of a bubble in the tubing, when compared with said tubing completely filled with liquid.

4,418,566

**GAS ANALYZING TECHNIQUES**

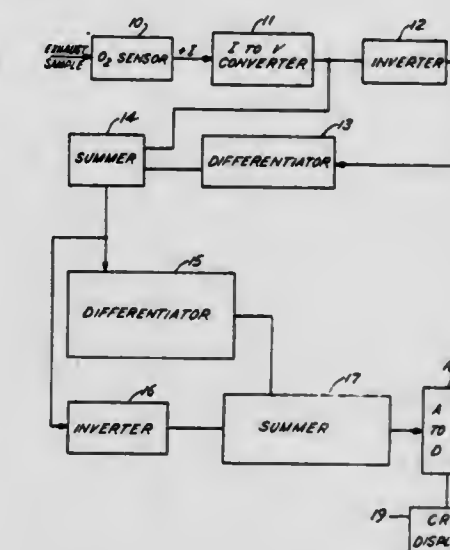
James E. Beck, Des Plaines, and Arvind M. Patel, Chicago, both of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed Jan. 25, 1982, Ser. No. 342,606

Int. Cl.<sup>3</sup> G01N 27/00

U.S. Cl. 73-23

6 Claims



1. In a system for analyzing the concentration of a predetermined gas by use of a sensor means for generating a sensor signal having a sensor value proportional to the partial pressure of the predetermined gas after a predetermined time period, improved apparatus for anticipating the amount of the concentration before the time period expires comprising:

signal processing means for generating a resulting signal proportional to the sum of the sensor value, another value proportional to the first derivative of the sensor value and a third value proportional to the second derivative of the sensor value, the signal processing means further comprising filter means for attenuating at a first rate signals having a frequency below a first cut off frequency, for attenuating at a second rate signals having a frequency above a second cut off frequency and for attenuating at a third rate signals having a frequency above a third cut off frequency greater than the second cut off frequency, and display means for displaying information related to the concentration based on the resulting signal.



4,418,567

**KNOCK SENSING APPARATUS WITH FAIL INDICATOR FOR USE IN AN INTERNAL COMBUSTION ENGINE**  
 Berward Böning, Ludwigsburg; Rudolf Nagel, Asperg; Günter Hönig, Ditzingen; Uwe Kiencke, Ludwigsburg, and Heinz Theuerkauf, Braunschweig-Hondelage, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

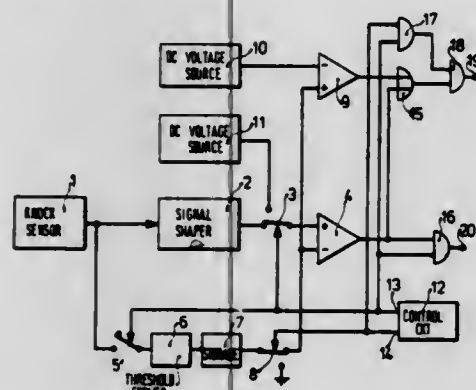
Filed Oct. 9, 1980, Ser. No. 195,385

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942250

Int. Cl.<sup>3</sup> G01L 23/22

U.S. Cl. 73-35

11 Claims



- Apparatus for furnishing a knock signal indicative of knocking in an internal combustion engine comprising sensing means (1; 43, 44, 45, 38) for sensing mechanical oscillations in the internal combustion engine and furnishing sensing output signals corresponding thereto, said sensing output signals constituting said knock signal in the presence of engine knocking; control circuit means (12) for generating a first gating signal defining a measuring phase (22) during which the sensing output signals are measured for presence of said knock signal, and a second gating signal defining a test phase (23) during which the sensing output signals are measured to determine proper operation of the sensing means and generating "fail" signals if said measurement determines improper operation of the sensing means, including comparator means (4, 9) for comparing, during said test phase, said sensing output signals to (a) a first reference signal indicative of a predetermined minimum level, and (b) to a second reference signal indicative of a predetermined maximum level, and switch means (3, 5) controlled by said gating signals and connecting, during said test phase, the sensing output signals to the comparator means.

4,418,568

**HOT FILM FLUID FLOWMETER WITH AUXILIARY FLOW SENSING**

James J. Surman, Mt. Clemens, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 10, 1981, Ser. No. 300,790

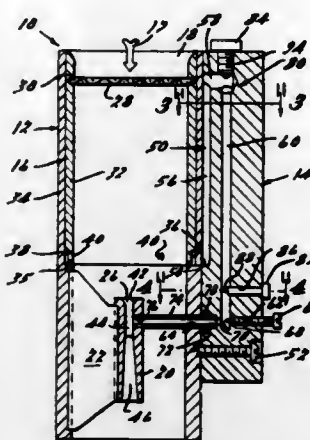
Int. Cl.<sup>3</sup> G01F 5/00, 1/68

U.S. Cl. 73-202

26 Claims

- A fluid flowmeter comprising: means defining a main passage for the flow of a fluid there-through; means defining a secondary passage extending substantially parallel to said main passage and including an inlet for receiving a portion of the fluid flowing in said main passage, a throat and an outlet for discharging the portion back into the main passage; means defining a tertiary passage fluidly interconnecting

said throat and a point in said main passage displaced from said throat; and



a constant temperature thermal anemometer operative to monitor the rate of flow of fluid flowing in said tertiary passage and to generate a total flow rate output signal as a function thereof.

4,418,569

**DEVICE FOR THE CAPACITIVE MEASUREMENT OF THE FILLING LEVEL OF FLUID TO A CONTAINER**

Frank Kühnel, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

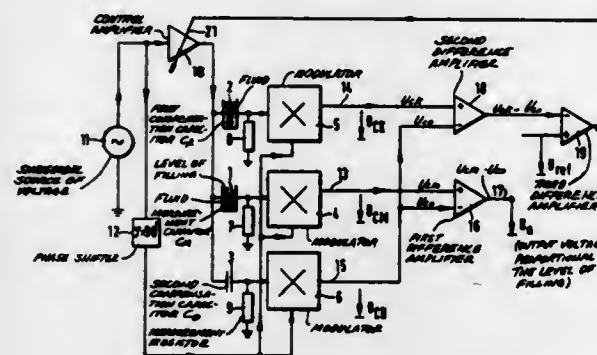
Filed Nov. 6, 1980, Ser. No. 204,392

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945965

Int. Cl.<sup>3</sup> G01F 23/26

U.S. Cl. 73-304 C

8 Claims



- In a device for the capacitive measurement of a level of filling of a fluid in a container having a measurement capacitor which extends into the fluid to be measured in accordance with the level of filling thereof, means for forming an electric value corresponding to the level of filling, and means for compensating for different dielectric constants of the fluid which comprise a compensation capacitor positioned in the fluid, the improvement wherein

a circuit comprises said means for forming an electric value corresponding to the level of filling and said means for compensating for different dielectric constants of the fluid such that only the imaginary part of the complex conductance of the measurement capacitor and of the compensation capacitor enters into said electric value exclusive of the real part thereof in each case, said means for compensating forms a value in accordance with the equation

$$h = \frac{1}{C_{MO}} \frac{C_{KO}(C_M - C_{MO})}{(C_K - C_{KO})}$$

in which:

h is the height of the section of the measurement capacitor extending into the fluid;  
 l is the total height of the measurement capacitor;  
 $C_K$  is the capacitance of a first compensation capacitor in the fluid;  
 $C_{KO}$  is the capacitance of a second compensation capacitor in air;  
 $C_M$  is the capacitance of the measurement capacitor in the fluid; and  
 $C_{MO}$  is the capacitance of the measurement capacitor in air;

said circuit includes:

formation means for the formation of output voltage proportional to the respective capacitances of said capacitors, said formation means comprises a source of sinusoidal voltage for feeding feed voltage to subcircuits, respectively, for each of said capacitors, said subcircuits comprising a measurement resistor connected in series with one of said capacitors, respectively, said formation means includes means for producing a phase-shifted sinusoidal voltage which is shifted 90 degrees with respect to the feed voltage, said subcircuits further comprising, respectively, for each of said capacitors means comprising an alternating voltage multiplier with low pass properties having a cut-off frequency less than twice the frequency of the feed voltage for multiplying the voltage drop on the corresponding said measurement resistor by the phase-shifted sinusoidal voltage and for filtering an alternating-voltage component out of the voltage formed as a product, so that an output voltage proportional to the capacitance of the corresponding one of said capacitors is present at the output of the alternating voltage multiplier with low pass properties.

relating said inductance value to the thickness of said ice sheet.

4,418,571

**LIQUID LEVEL MEASURING SYSTEM**

Einar Asmundsson, Middle Haddam; Robert P. Hart, Glastonbury, and Donald W. Fleischer, Wethersfield, all of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

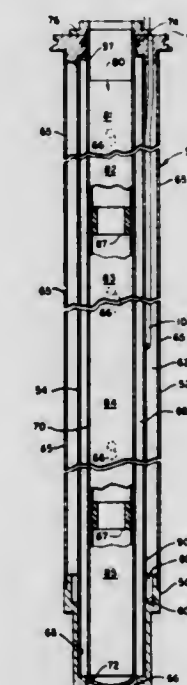
Division of Ser. No. 181,083, Aug. 22, 1980. This application

Dec. 18, 1981, Ser. No. 331,993

Int. Cl.<sup>3</sup> G01F 23/26

U.S. Cl. 73-304 C

6 Claims



- In a liquid level measurement device having an elongated capacitance probe with a succession of a plurality of longitudinally extending capacitor sections, each having a separately measurable capacitance value which varies between dry minimum and submerged maximum values thereof, the improvement wherein the capacitance probe comprises an outer capacitance tube, an imperforate glass tube mounted generally coaxially within the outer capacitance tube to define a capacitor annulus therebetween, and an inner capacitor sleeve mounted coaxially within the glass tube and having a succession of a plurality of separate, longitudinally extending capacitance sleeve sections cooperating with the outer capacitance tube to form said plurality of capacitor sections respectively.

4,418,570

**ICE THICKNESS INDUCTOR PROBE**

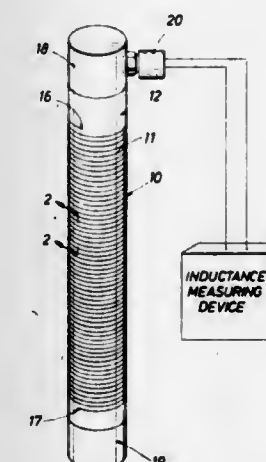
Hollie B. Warren, Jr., and Thomas A. Paulley, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Dec. 8, 1981, Ser. No. 328,562

Int. Cl.<sup>3</sup> G01F 23/00

U.S. Cl. 73-304 R

10 Claims



- An apparatus for determining the thickness of an ice sheet floating on a body of sea water, comprising:

- an elongated support constructed from non-magnetic, non-electrically conducting material capable of withstanding subzero (°C.) temperatures without becoming brittle and having a helical groove formed about an outer surface;
- a coil of non-corroding, low resistance wire wound in a closely packed helix, whose length is greater than its diameter, in said helical groove;
- means for connecting said coil to a source of alternating current; and
- means for measuring an inductance value of said coil and

4,418,572

**SEWER PIPE TESTER**

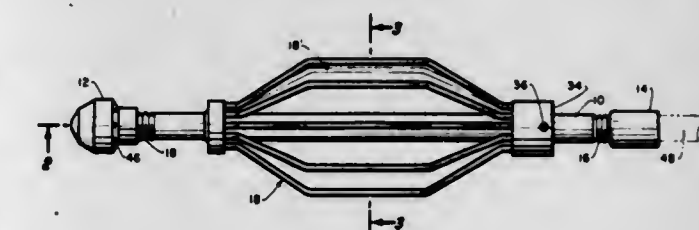
Charles J. Prange, Cridersville, Ohio, assignor to Sewer Rodding Equipment Co., Lima, Ohio

Filed May 1, 1981, Ser. No. 259,370

Int. Cl.<sup>3</sup> G01B 21/00

U.S. Cl. 73-432 R

13 Claims



- A sewer pipe proofer comprising: a section of conduit having an outer diameter substantially smaller than the inner diameter of the sewer pipe being proofed; a fluid spraying nozzle attached to one end of said conduit; a plurality of deformable spacers in the form of rods secured



around said conduit intermediate said ends, said rods being formed to hold said conduit substantially centered and in spaced relationship to the inner wall of said sewer pipe;

means removably securing said rods to said conduit with at least one end being free to be slidably displaced in a direction parallel to the axis of said conduit when the rods are deformed;

restraining means restraining said at least one free end of said rods;

said means removably securing said rods to said conduit being removable to allow easy removal and replacement of individual rods whereby said conduit can be passed through a sewer pipe to test for blockage and easily pass over minor irregularities.

4,418,573

# METHOD FOR MEASURING MATERIAL CHARACTERISTICS

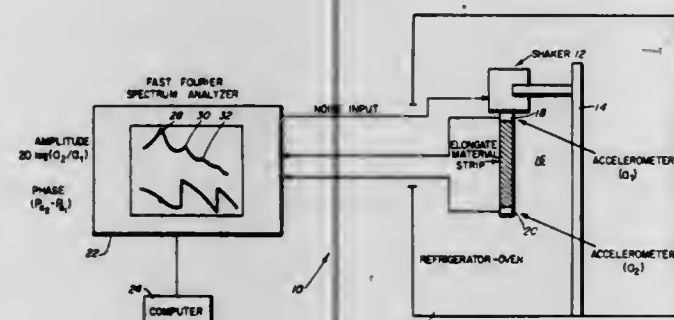
Walter M. Madigosky, and Gilbert F. Lee, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1982, Ser. No. 392,813

Int. Cl.<sup>3</sup> G01H 15/00

U.S. Cl. 73-574

1 Claim



1. A method of measuring acoustic properties of a material comprising:

selecting an elongate sample of the material having a length considerably greater than its lateral dimensions;

securing accelerometers at opposite ends of the elongate sample for measuring longitudinal displacements thereof;

driving one end of the elongate sample with random noise while allowing the other end to move freely for establishing resonant standing waves longitudinally thereof between its ends;

measuring the amplitude and phase difference of acceleration ratio near resonant peaks for the elongate sample when the ends are approximately 90° out of phase with each other which provides values for  $Q$ , wherein  $Q = 20 \log (a_2/a_1)$ , and frequency ( $f$ ) for each resonant peak;

applying the values of  $Q$  to the formula

$$\sin h(\xi \tan \theta/2)(\sin \xi + R\xi \cos \xi) + R\xi \tan \theta/2 \sin \xi \cos h(\xi \tan \theta/2) = 1/Q$$

and solving it simultaneously with the formula

$$\cos h(\xi \tan \theta/2)(\cos \xi - R\xi \sin \xi) + R\xi \tan \theta/2 \cos \xi \sin h(\xi \tan \theta/2) = 0$$

for  $\xi$  and  $\tan \theta/2$ ,

wherein  $\xi$  is related to the speed of sound propagating through the sample,  $\theta$  is the phase lag between stress and strain, and  $R$  is the mass ratio;

calculating the speed of sound ( $c$ ) propagating through the material according to the formula

$$c = 2\pi f L / \xi$$

wherein  $L$  is the length of the elongate sample of material;

calculating Young's modulus ( $E$ ) for the material from the formula

$$E = \rho c^2 \cos^2 (\theta/2) \cos \theta,$$

wherein  $\rho$  is the mass density of the material; and calculating the loss factor ( $\delta$ ) of the material from the formula

$$\delta = \tan \theta.$$

4,418,574

# MAGNETIC METHOD AND APPARATUS FOR MEASURING WALL THICKNESS

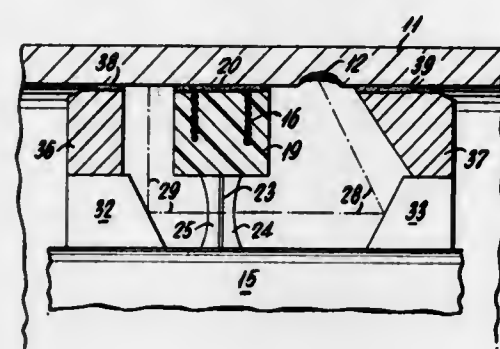
Norman E. Flournoy, Houston, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,600

Int. Cl.<sup>3</sup> G01N 29/04, 27/82

U.S. Cl. 73-601

5 Claims



2. A combined magnetic and acoustic wall thickness and condition measuring apparatus, comprising in combination pulsed magnetic reluctance means for measuring said wall thickness, and

ultrasonic means for measuring the distance of said magnetic means from said wall and for determining the presence of an anomaly in said wall,

said ultrasonic means comprising a transducer mounted in a fixed position relative to said magnetic means, and means for directing ultrasonic energy both perpendicular to said wall and at an angle of incidence greater than the critical angle of refraction of said wall.

4,418,575

# METHOD FOR PROCESSING ULTRASONIC ECHO SIGNALS OF BOTH DIRECTIONALLY REFLECTING AS WELL AS NONDIRECTIONALLY SCATTERING OBJECTS, PARTICULARLY FOR ULTRASONIC IMAGE PROCESSING IN THE FIELD OF SUBSTANCE OR TISSUE INVESTIGATION

Eckart Hundt, Haar, and Elmar Trautenberg, Fuerth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 15, 1981, Ser. No. 264,131

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019435

Int. Cl.<sup>3</sup> G01N 29/00

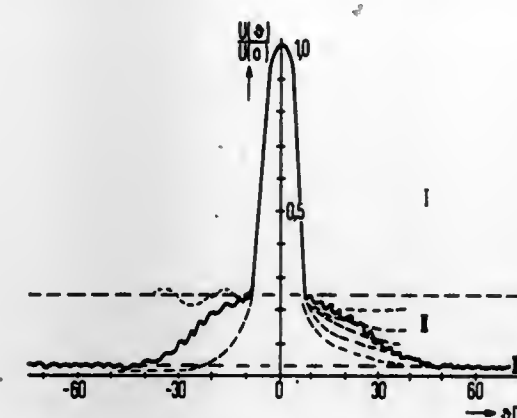
U.S. Cl. 73-607

31 Claims

1. A method for processing ultrasonic echo signals of both directionally reflecting and nondirectionally scattering objects, particularly for ultrasonic image processing in the field of substance and tissue examination, said method comprising: scanning an object from various scanning directions to produce respective ultrasonic echo signals from respective common object areas, and linking the ultrasonic echo signals from various scanning directions as to respective common object areas in dependence upon the presence of echo signal ampli-

udes corresponding to directional reflection from the object for producing an image in such manner that the derivation of

location in said tube above said predetermined portion to assure continuous capillary action in said tube.



the echoes from directionally reflecting or nondirectionally scattering object areas is taken into consideration.

4,418,576

# APPARATUS AND METHOD FOR AUTOMATICALLY REPLENISHING LIQUID AND MEASURING THE RATE OF EVAPORATION OF A LIQUID

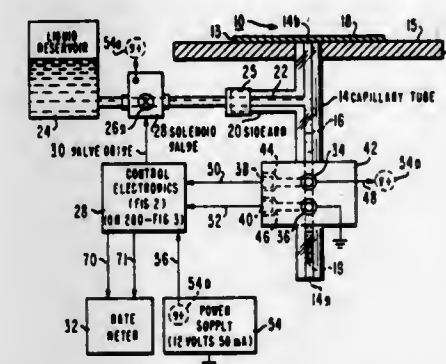
Allan E. White, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 279,739, Jul. 2, 1981. This application Jun. 21, 1983, Ser. No. 505,125

Int. Cl.<sup>3</sup> G01N 33/18, 25/00

U.S. Cl. 73-61.3

13 Claims



1. In an apparatus for automatically measuring the rate of evaporation of a liquid of the type having a capillary tube with a passageway having two open ends, said tube joined at one end to a plane having two parallel extensive surfaces such that the one end portion of the tube extends vertically upwardly through one of the plane surfaces and terminates at the other plane surface, the other open end of the tube being exposed to the ambient; an evaporation surface comprising a sheet of liquid saturable fibrous material attached to the other surface and extending sufficiently over the plane surface to cover the surface and the capillary tube end; whereby liquid saturating the sheet and extending through the passageway of the capillary tube will be drawn upwardly from the tube into the sheet as liquid evaporates from the sheet into the ambient air, the rate of upward movement of liquid in the tube passageway being an indicia of the evaporation rate of the liquid from the sheet, the improvement comprising:

reservoir means for providing said liquid to said tube;

means for replenishing said liquid automatically as it evaporates from said sheet; and

means for determining the rate of evaporation of the liquid by sensing the movement of the liquid drawn upwardly through a predetermined portion of the tube as the liquid evaporates from the sheet;

said replenishing means including means for maintaining continuous capillary action comprising a reservoir supply line for carrying said liquid to said capillary tube at a

# PROCESS FOR MEASURING AND ANALYZING POTENTIALS OF PIEZO-ELECTRIC ORIGIN GENERATED BY A RIGID MEMBER MADE OF AN ORGANIC MATERIAL

Simon Arie, Guy Courvoisier, and Jean-Louis Prost, all of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

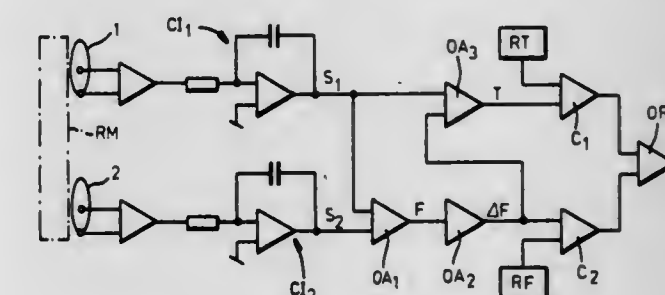
Continuation of Ser. No. 198,005, Nov. 3, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,667

Claims priority, application Switzerland, Feb. 5, 1979, 1085/79

Int. Cl.<sup>3</sup> G01B 7/16

U.S. Cl. 73-772

12 Claims



1. A process for measuring and analyzing potentials of piezo-electric origin generated by a long rigid member made of an organic material as the result of a mechanical strain on this member, characterized by the fact that the signals which are characteristic of the potentials are detected at two longitudinally spaced points at least adjacent to the surface of this member, in that each of these signals is amplified and integrated, that the types of stresses generating the said signals are identified and that these stresses are measured separately.

10. An apparatus for determining stresses in an elongated rigid member of organic material resulting from mechanical action upon said member which is substantially fixed at one end, and responds as a beam fixed at one end, said apparatus comprising:

means for detecting piezoelectric potentials at two points along said member spaced apart by a predetermined distance and spaced from said end and forming said potentials into respective signals;

means for applying and integrating the signals generated at each of said points;

means for determining a difference between the values of the amplified and integrated signals;

means for multiplying said difference by the ratio of the distance between said end and the said point most distal therefrom and the distance between said points to obtain a value of flexion stress; and

means for detecting the difference between the greater of said signals and said value of said flexion stress to obtain a value of torsional stress.

4,418,578

# LOW NOISE VORTEX SHEDDING FLUID FLOW SENSOR

Chester J. Blechinger, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 26, 1982, Ser. No. 401,447

Int. Cl.<sup>3</sup> G01F 1/32

U.S. Cl. 73-861.22

6 Claims

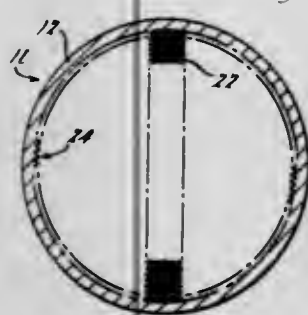
1. An apparatus for measuring the velocity of fluid including:

a wall means for bounding a stream of fluid flow;

a vortex generating means positioned inside said wall means



in the stream of fluid flow for generating a stream of vortices in the wake of said vortex generating means; wall rib means extending from said wall means into the stream of fluid flow and extending longitudinally in the direction of the stream of fluid flow for reducing turbulence in the stream of fluid flow, said wall rib means having alternating troughs and ridges in a direction transverse to fluid flow; and



said vortex generating means being elongated in a direction transverse to the direction of fluid flow and including generator rib means adjacent the stream of fluid flow and extending generally transverse to the direction of elongation of said vortex generating means so that said generator rib means extend generally longitudinally in the direction of the stream of fluid flow for reducing noise and turbulence in the stream of fluid flow, said generator rib means having alternating troughs and ridges in a direction transverse to fluid flow.

4,418,579

## FLUID FLOW MONITORS

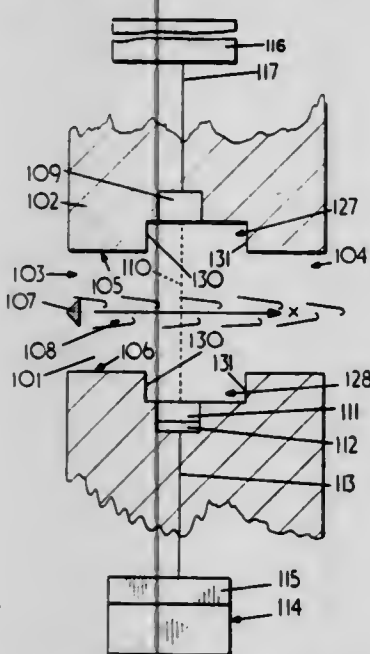
Peter F. Harrington, Ashby-de-la-Zouch, United Kingdom, assignor to Coal Industry (Patents) Limited, London, England  
Filed Dec. 12, 1980, Ser. No. 215,906

Claims priority, application United Kingdom, Dec. 21, 1979, 79/44212; Jun. 13, 1980, 80/19351; Jan. 18, 1980, 80/01698

Int. Cl.<sup>3</sup> G01F 1/32

U.S. Cl. 73—861.23

14 Claims



1. A fluid flow monitor comprising a head portion defining a passage for fluid flow to be monitored, a vortex inducing element arranged at least part way across the passage, sensing means for sensing the vortices induced by the element and for deriving a signal indicative of the sensed vortices, and at least one formation associated with a side wall of the passage and tending to interfere with fluid flow along the passage, the formation being provided on the downstream side of the vortex inducing element, in which the formation is provided by having the sensing means associated with a recessed part of the passage wall.

4,418,580  
PIPETTOR MECHANISM AND DISPOSABLE TIP AND PISTON ASSEMBLY

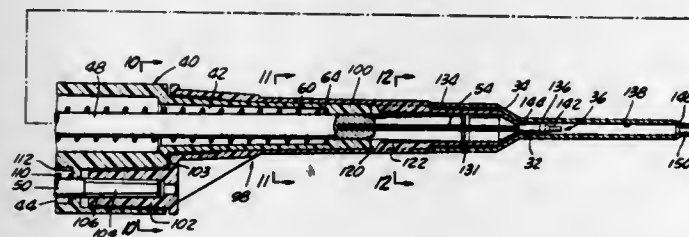
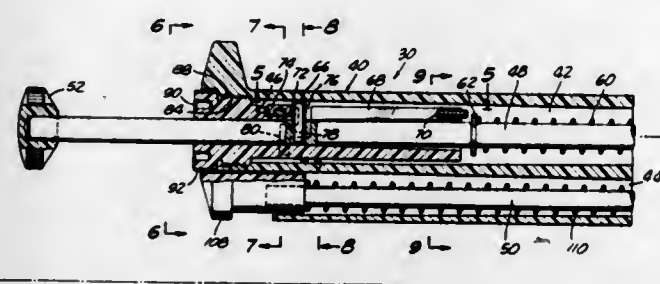
Fred E. Satchell, Chesterfield; William D. Cornell, Ballwin, both of Mo.; Mark O. Uitz, Mountain View, Calif., and Clarence L. Walker, Webster Groves, Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Oct. 13, 1981, Ser. No. 310,489

Int. Cl.<sup>3</sup> B01L 3/02

U.S. Cl. 73—864.13

18 Claims



11. A pipettor for use with a disposable tip and piston assembly, comprising: a housing; a plunger movable in the housing; and an ejector mechanism; said plunger having a forward end adapted to detachably engage the piston of a disposable tip and piston assembly and being sized to move freely in said assembly when the piston is detachably engaged thereby; said ejector including means for substantially simultaneously ejecting a disposable tip and a piston therewithin from the pipettor, including means for removing a piston from the forward end of the plunger.

4,418,581

APPARATUS AND METHOD FOR SAMPLING A LIQUID  
Richard W. Jones, 4 Upland Park Rd., Oxford, England OX2 7RW

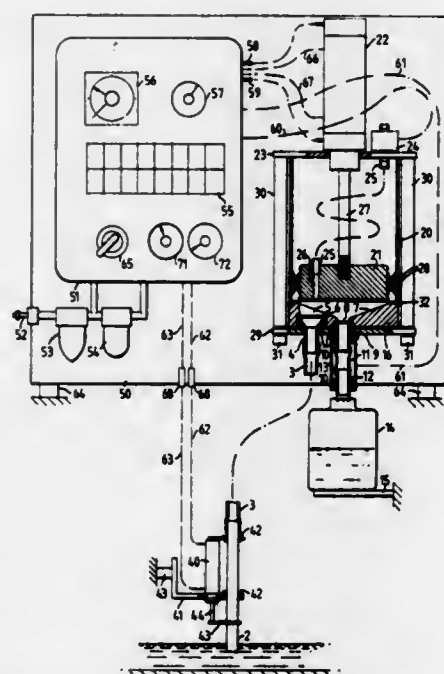
Filed May 12, 1981, Ser. No. 262,904

Claims priority, application United Kingdom, May 13, 1980, 8015727

Int. Cl.<sup>3</sup> G01N 1/14

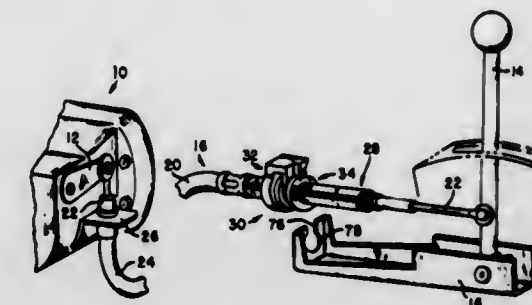
U.S. Cl. 73—864.34

9 Claims



1. A sampler for a substantially liquid material comprising:  
(a) a working chamber;

- (b) a vent valve for supplying compressed air to the working chamber;
- (c) a bulk material inlet to the working chamber;
- (d) a primary piston and cylinder combination whereby the pressure in the working chamber can be varied over a range from sub- to super-atmospheric;
- (e) a drive means for reciprocating the primary piston;
- (f) a catch tank;
- (g) a lip for the catch tank disposed so that when material for sampling rises in the working chamber above the lip level, material flows into the tank and thereafter when the material level falls below lip level, a given volume of material is retained in the tank;
- (h) a sample outlet from the catch tank;
- (i) a sample valve to control the flow of material along the sample outlet; and
- (j) a controller for regulating operation of the vent valve, the drive means and the sample valve.



elongate member including a substantially triangular cross section with the edges of the triangular cross section defining gripping surfaces at the edges and the triangular cross section forming sliding surfaces between the edges.

4,418,582

## NO-LASH TELESCOPING STEERING SHAFT

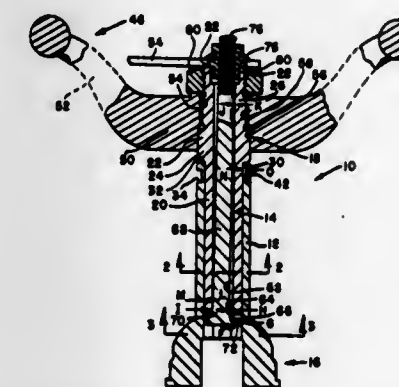
Michael D. Martin, Jeffersonville, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 4, 1981, Ser. No. 270,448

Int. Cl.<sup>3</sup> B62D 1/18

U.S. Cl. 74—493

10 Claims



1. An axially elongatable shaft comprising first and second elongate parts, one of which is axially movable with respect to the other of said parts, said first part being polygonal or noncircular in transverse cross section, and said second part having a substantially corresponding polygonal or noncircular bore therein for receiving said first part, and axially movable means extending from one end of said first part to an opposite end of said first part, said axially movable means being operatively engageable with said first and second parts for causing a moment therebetween substantially about said first part one end in a first axial plane upon axial movement of said means to thereby resist side-to-side and axial relative movement of said first and second parts in said first axial plane, said moment also urging said axially movable means into engagement with said first part substantially at said opposite end to resist side-to-side movement therebetween.

4,418,583

## LOCKING DEVICE

Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 6, 1981, Ser. No. 280,751

Int. Cl.<sup>3</sup> F16C 1/10

U.S. Cl. 74—501.5 R

7 Claims

7. A locking device for attachment to an elongate member said locking device comprising at least a first part and a second part, each of said parts defining an opening through which said elongate member extends, each of said parts being movable axially on said elongate member in a first mode of attachment with said elongate member, one of said parts being rotatable relative to said elongate member and said other part to define a second mode of attachment for said parts with said elongate

4,418,584

## GEAR CRANK FOR A BICYCLE

Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

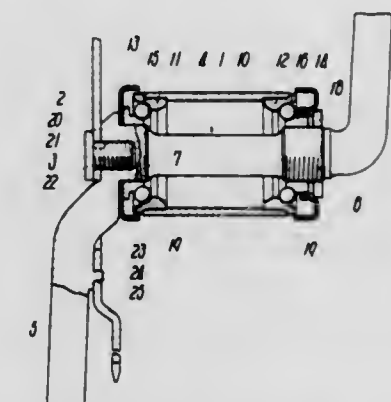
Filed May 26, 1981, Ser. No. 266,649

Claims priority, application Japan, Jun. 11, 1980, 55-81888[U]

Int. Cl.<sup>3</sup> G05G 1/14

U.S. Cl. 74—594.2

3 Claims



1. A gear crank for a bicycle, comprising: a one-piece crank having a crank shaft and a pair of integral crank arms; a chain gear; and a screw member for fixing said chain gear to said crank, said crank having at the axially outer surface of said crank shaft at the one axial end side thereof a receiving face comprising a vertical face to receive thereat said chain gear, said receiving face having a threaded portion extending axially of said crank shaft, said chain gear having a first through bore for said screw member and a second through bore for one of said crank arms and being seated at said receiving face, said screw member screwing with said threaded portion to thereby detachably fix said chain gear to said crank.

4,418,585

## FOUR SPEED RATIO TRANSVERSE AUTOMATIC TRANSMISSION

Stanley L. Pierce, Walled Lake, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 21, 1980, Ser. No. 141,855

Int. Cl.<sup>3</sup> F16H 37/08

U.S. Cl. 74—695

3 Claims

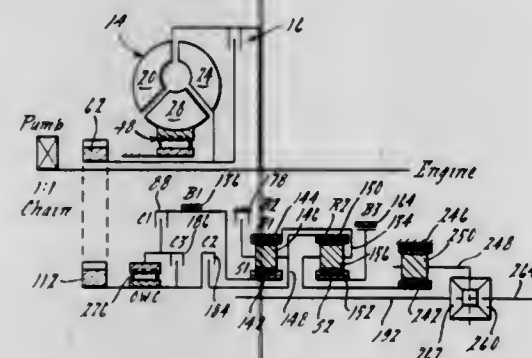
1. In a power transmission mechanism for an automotive vehicle having an engine and traction wheels, a hydrokinetic unit having an impeller and a turbine mounted on a first axis, said impeller being connected to said engine; planetary gearing mounted on a second axis that is spaced laterally from said first axis, a torque input shaft for said gearing;



torque transfer means drivably connecting said turbine and said input shaft;

said gearing comprising a pair of simple planetary gear units, each gear unit having a sun gear, a ring gear, a carrier and planet pinions on said carrier engaging said sun and ring gears, a first friction clutch means and an overrunning coupling in series relationship adapted to connect said input shaft to the sun gear of a first of said gear units, a torque output shaft connected to the carrier of the second of said gear units, a pair of drive shafts for the traction wheels, one drive shaft extending through said gearing and the other extending in the opposite direction, final drive gearing including a differential gear assembly having a torque input element and connecting said torque output shaft with said drive shafts, the ring gear of said first gear unit being connected to the carrier of said second gear unit;

first brake means for braking the sun gear of said first gear unit during overdrive operation;



second brake means for braking the carrier of said first gear unit during reverse drive, the ring gear of said second gear unit being connected to the carrier of said first gear unit; third brake means for braking the sun gear of said second gear unit during first and second underdrive operation; second friction clutch means for connecting said input shaft to the carrier of said first gear unit during third direct drive operation and during overdrive operation; and third friction clutch means in parallel with said overrunning coupling; said torque transfer means comprising a first sprocket connected to the turbine of said hydrokinetic unit, a second sprocket connected to said input shaft and a drive chain drivably connecting said sprockets, said differential gear assembly, said gear units and said second sprocket being mounted about said second axis, said axes being parallel to each other and being adapted to be mounted transversely with respect to the fore-and-aft centerplane of the vehicle.

4,418,586

## SWASH PLATE DRIVE MECHANISM

E. Roland Maki, Rochester, Mich., and Ferdinand Freudenstein, Riverdale, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1981, Ser. No. 265,653

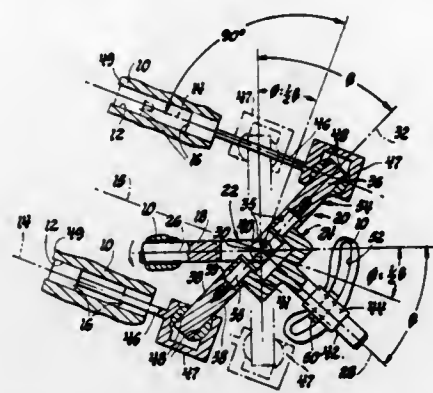
Int. Cl.<sup>3</sup> F16H 23/00, 35/08

U.S. Cl. 74—831

4 Claims

1. A swash plate drive mechanism comprising a pair of rotary shafts with intersecting axes, and an articulated swash plate connected as a floating link between said shafts for piv-

otal movement about crossed-axes such that said shafts are caused to rotate conjointly while said articulated swash plate is



4,418,587

## HYDRAULIC SYSTEM PRESSURE CONTROL FOR A POWER TRANSMISSION

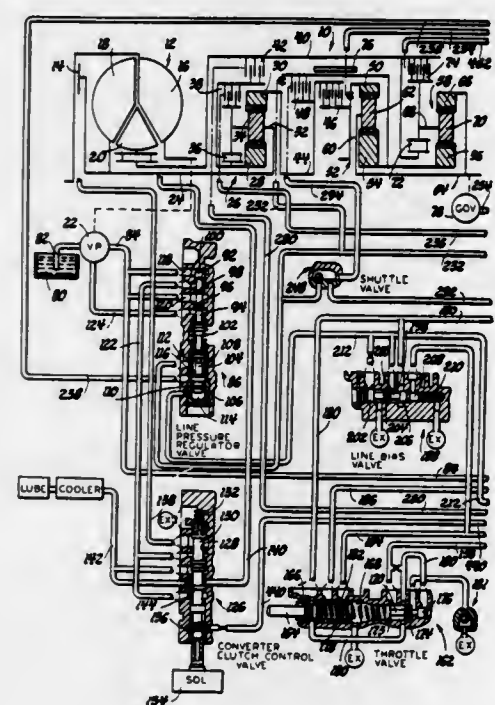
Allen L. Kauffman, Dexter, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1980, Ser. No. 200,957

Int. Cl.<sup>3</sup> B06K 41/04, 41/06

U.S. Cl. 74—867

2 Claims



1. A vehicle transmission and control for a throttle controlled engine driven vehicle comprising; a plurality of fluid pressure operated friction devices for establishing torque transmission paths in the transmission; pump means for supplying pressurized fluid to operate the friction devices; throttle valve means in fluid communication with said pump means and responsive to an engine control which establishes engine torque levels for providing a regulated throttle pressure which increases with increased engine torque levels; system pressure regulator valve means for establishing a system pressure for the fluid from the pump to thereby control the torque capacity of the friction devices including resilient bias means for establishing a minimum system pressure and a pressure bias chamber which is effective to produce a change in the system pressure above the minimum pressure in substantial proportion to the pressure in the pressure bias chamber; and pressure bias valve means in fluid communication between said throttle valve means and said pressure bias chamber for directing a bias pressure to said pressure bias chamber which bias pressure is substantially equal to the throttle pressure when the throttle

pressure is less than a predetermined level and increases in substantial proportion to but less than the throttle pressure when the throttle pressure is above the predetermined level.

4,418,588

## SHARPENING DEVICE FOR SINGLE EDGE TYPE CUTTING BLADES

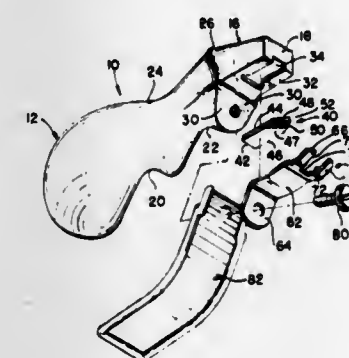
John E. Byers, P.O. Box 556, Whitefish, Mont. 59937

Filed Mar. 1, 1982, Ser. No. 353,051

Int. Cl.<sup>3</sup> B21K 11/00

U.S. Cl. 76—88

7 Claims



1. A sharpening device for tools and instruments having single cutting edge type blades such as lawnmowers and the like, comprising:

- a body having a front end and a rear end and including a hand grip section at said rear end over a substantial portion of said body, said body further including a blade mounting nose portion extending outwardly from said hand grip section and having an outer end which forms the front end of said body,
- said blade mounting nose portion having a generally planar mounting surface extending from said outer end to said hand grip section such that a generally rearwardly angling offset surface is defined on said body, said mounting surface extending generally longitudinally forwardly from said offset surface;
- blade cavity means located in said mounting surface and being generally rectangularly shaped and extending from near said offset surface forwardly and opening on said front end for receiving sharpening blade means therein,
- blade means detachably inserted in said cavity means, said blade means being of predetermined thickness and having a back end and sides configured to be received into said cavity means and having a sharpening end which extends forwardly and outwardly of said front end, said sharpening end being V-shaped to define two sharpening edges, and
- blade guide and retainer means detachably secured to said offset surface and shaped to extend over substantially all of said blade mounting surface for holding said blade means securely in place, said blade guide and retainer means having a guide portion extending forwardly and outwardly of said front end and including a generally U-shaped opening such that a pair of spaced apart guide surfaces are formed so that the sharpening device may be used to sharpen the cutting edge of a tool blade which passes between a sharpening edge and one of said guide surfaces.

4,418,589

## METHOD AND APPARATUS FOR AUTOMATICALLY FACING SAW BLADES HAVING VARYING CONFIGURATIONS OF TEETH

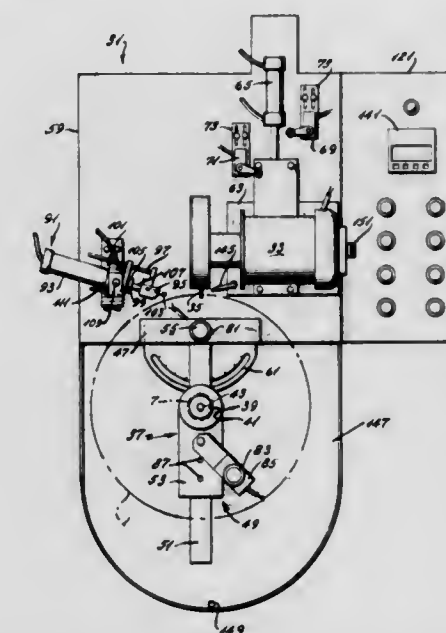
Ronald G. Cowart, Sr., Rte. 2, Box 28, Hahira, Ga. 31632

Filed Feb. 26, 1981, Ser. No. 238,366

Int. Cl.<sup>3</sup> B23D 63/12

U.S. Cl. 76—112

25 Claims



22. A method for grinding saw blades of the rotary type, the method comprising the steps of:

- placing the saw blade on a center spindle;
- indexing the saw blade by extending an indexing means against a saw tooth to an index position;
- retracting the index means;
- gripping the saw blade by electromagnetic force after the saw blade has been indexed, said electromagnetic force being reduced before said indexing step and being increased after said indexing step;
- reciprocating a grinding wheel toward the index position, thereby allowing the grinding wheel to face grind the saw blade;
- retracting the grinding wheel away from the index position;
- repeating steps b-f a predetermined number of times.

4,418,590

SCREW ASSEMBLY WITH TORQUE DETERMINATION  
Oswald Dubiel, Neunkirchen-S.; Karl R. Hirtsiefer, Neunkirchen, both of Fed. Rep. of Germany; Johann Müller, deceased, late of Much, Fed. Rep. of Germany, and by Christine Müller, executrix, Much-Nebhoven, Fed. Rep. of Germany, assignors to Paul-Heinz Wagner, Much-Birrenbachschöhe, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,455

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023005

Int. Cl.<sup>3</sup> B25B 23/14

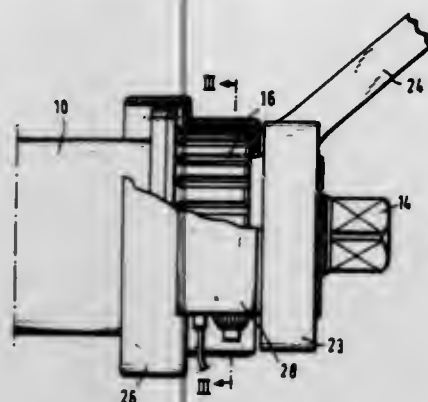
U.S. Cl. 81—467

19 Claims

1. Apparatus comprising a drive unit for imparting torque to a output shaft, a casing housing said drive unit and being subject to such torque, an opening in said casing exposing said output shaft for connection to a driven member, a torsionally elastic tube member surrounding said casing and having axially opposite end portions, means for securing a first end portion of said tube member to said casing, means for preventing rotation of a second end portion and said tube member upon the operation of said drive unit whereby casing torque is transmitted to said first end portion while said second end portion is prevented from rotating, a switch element carried by said tube member at a portion thereof between said first and second end portions whereby torque transmitted to said first end portion is



reflected by switch element movement, switch means for responding to switch element movement, and a switch arm for



transmitting motion of said switch element to said switch means.

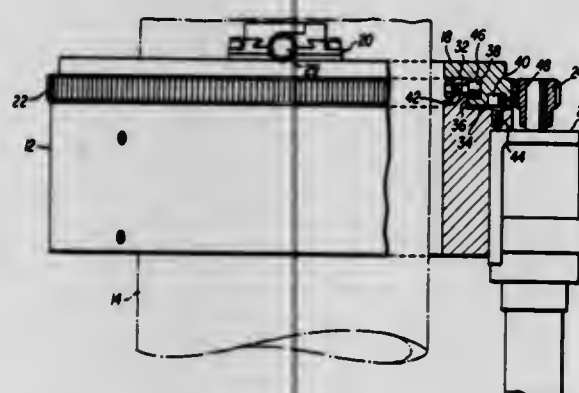
4,418,591

**PIPE END PREPARATION AND CUTOFF TOOL**  
William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool Inc., Rancho Cordova, Calif.

Filed Aug. 24, 1981, Ser. No. 295,368  
Int. Cl.<sup>3</sup> B23B 5/14

U.S. Cl. 82-4 C

7 Claims



1. In a pipe end preparation tool having a tool axis, including a generally annular pipe-engaging support housing member extending along the tool axis, and a tool carrier ring member mounted on the end of the housing member for rotation relative thereto about the tool axis, the improvement comprising, said ring member connected to said housing member by a roller bearing assembly comprising two sets of rollers mounted on one of the members and respectively mounted for rotation about axes, located in orthogonal planes, each set of rollers being circumferentially spaced about the ring and housing members, said rollers having peripheral bearing surfaces engaging and cooperating with circumferential bearing races provided on the other member, said races lying generally in the same respective orthogonal planes as said bearing rollers, said bearing surfaces arranged to lie within said bearing races, said bearing races comprising grooves with sidewalls extending parallel with and engageable by said bearing surfaces, whereby radial and thrust loading applied to the ring member can be reacted by the housing member through the bearing surfaces and bearing races.

4,418,592

**STOPPING FIXTURE**

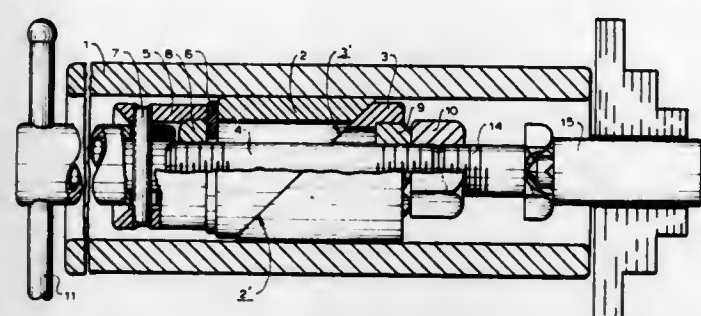
Vladimir Altman, 2985 Ocean Pkwy., #3-D, Brooklyn, N.Y. 11235

Filed Apr. 6, 1981, Ser. No. 159,061

Int. Cl.<sup>3</sup> B23B 3/36

U.S. Cl. 82-34 C

11 Claims



1. A stopping fixture for a hollow headstock spindle having an axis, comprising  
a first element arranged to be inserted into a hollow of a headstock spindle and to move in an axial direction of the latter, said first element having a first surface which is inclined relative to an axis of the headstock spindle;  
a second element also arranged to be inserted into the hollow of the headstock spindle and to move in the axial direction of the latter, said second element having a second surface inclined relative to the axis of the headstock spindle and cooperating with said first inclined surface of said first element so that when one of said elements is moved axially relative to the other of said elements, said elements move radially apart from one another and are pressed against an inner wall of the headstock spindle to be fixed in the latter at a predetermined location; and  
means for moving said one element relative to said other element so as to provide for cooperation of said inclined surfaces of said elements, said moving means including a threaded member connected with said other element so that when said threaded member is moved axially it moves axially said other element relative to said one element, said elements being tubular and having outer cylindrical surfaces of substantially equal diameters and inner cylindrical surfaces of diameters considerably exceeding the diameter of said threaded member.

4,418,593

**FORM TOOL HOLDER**

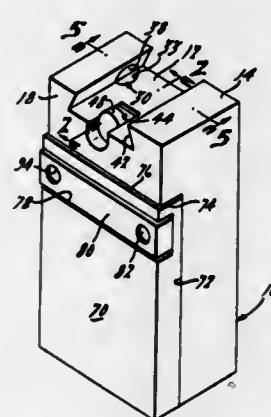
Edmund W. Frydel, Marine City, Mich., assignor to Fox Mfg. Co., Mt. Clemens, Mich.

Filed Sep. 17, 1981, Ser. No. 303,073

Int. Cl.<sup>3</sup> B23B 29/00

U.S. Cl. 82-36 R

6 Claims



1. A form tool holder comprising  
a body having a dovetail slot in one end thereof for accepting and snugly but slidably fitting the dovetail portion of a conventional form tool cutter;

4,418,595

**AUTOMATIC HOLLOW PUNCH SEARCH METHOD FOR DIE-CUTTING MACHINES, PARTICULARLY FOR FOOTWEAR PRODUCTION**

Emiliano Cantella, Vigevano, Italy, assignor to Atom S.p.A., Vigevano, Italy

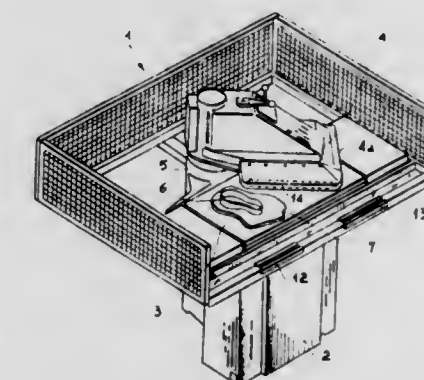
Division of Ser. No. 140,087, Apr. 14, 1980, Pat. No. 4,363,253.

This application Jun. 2, 1982, Ser. No. 384,330

Claims priority, application Italy, Apr. 27, 1979, 22220 A/79  
Int. Cl.<sup>3</sup> B26D 3/00

U.S. Cl. 83-55

5 Claims



mounting means on a side of the body at one end of said dovetail slot for detachably fastening said body to the tool support member of a machine tool; and  
means for holding the cutter securely in said dovetail slot comprising cooperative independently adjustable clamping and back-up means, said clamping means carried by said body at one side of said dovetail slot and being longitudinally movable transversely of the latter, said clamping means having a portion thereof in said dovetail slot complementing and engageable with the dovetail portion of said cutter at one side of said dovetail portion  
said back-up means comprising a way in and extending longitudinally of said dovetail slot and a back-up block mounted in and movable longitudinally along said way, said back-up block having a lateral abutment portion extending from said way into said dovetail slot through the bottom thereof for endwise engagement with the dovetail portion of said cutter to position the latter lengthwise in said slot when the cutter is released by said clamping means and being operative in use to position said cutter with one end portion thereof extending from said slot for proper engagement with a workpiece,  
said clamping means further including an actuator disposed at and operable from the end of said body opposite said dovetail slot, and  
said back-up means further including an actuator disposed at and operable from the side of said body opposite said mounting means for adjusting said back-up means in said way and longitudinally of said dovetail slot, said clamping means and said back-up means being mutually cooperative to hold the cutter in a selected longitudinally adjusted position in said dovetail slot.

1. A method of operating a die-cutting machine particularly for cutting material for footwear, said machine being of the type which has a fixed faceplate on which the material to be cut is placed and a mobile head mounted for motion in a horizontal plane above substantially the entire surface area of said faceplate, said machine further being of the type that uses separate hollow punches of different sizes and shapes positioned by the operator on the material to be cut on said faceplate, the method which comprises the steps of moving said mobile head in said horizontal plane starting from a rest position to seek a hollow punch therebelow, sensing a hollow punch on said material with means on said head as said head is moved in said horizontal plane, moving said head in a continuous and automatic cycle of operation starting from said rest position, moving said head in said horizontal plane until said sensitive element senses a hollow punch, stopping the motion of said head in said horizontal plane after said sensitive element has sensed that it has passed over said hollow punch and that said mobile head is therefore positioned over said sensed hollow punch, moving said head down to said hollow punch and then back up to said horizontal plane in a vertical cutting stroke, and then returning said head to said rest position, said machine comprising electrical circuit means and providing a pair of condensers in said electrical circuit means, causing said sensitive element to generate a signal starting from the time it first senses a hollow punch positioned on said material to be cut until the time it passes over said sensed hollow punch, providing a relatively large capacity in one of said condensers and providing a relatively small capacity in the other of said condensers, positioning both of said condensers in parallel circuits within said circuit means, and arranging said condensers within said circuit means such that either one of said condensers, upon its discharging, will operate other means to cause said head to cease its motion in said horizontal plane and to commence its motion in said vertical cutting stroke, and the step of selectively adjusting the capacity of said condenser of relatively smaller capacity, whereby said large capacity capacitor will not discharge until said head has completely passed over punches of normal to larger than normal size, and whereby said adjusted capacity of said capacitor of relatively smaller capacity will cause stoppage of motion in the horizontal plane and initiation of a vertical cutting stroke when said sensitive element senses a punch of relatively small size.

4,418,594

**BOTTLE SAW SYSTEM**

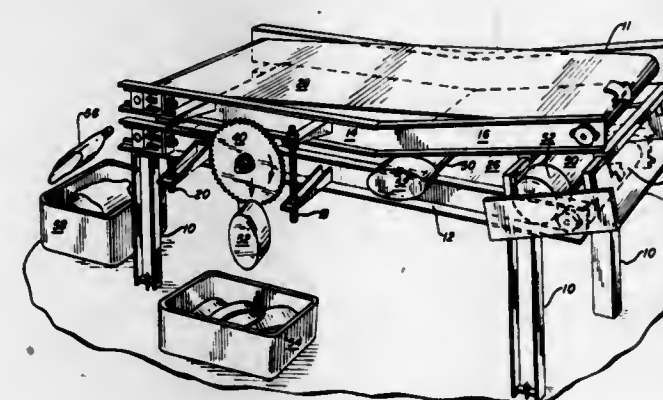
Charles W. Burns, Jr., Orlando, Fla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 13, 1981, Ser. No. 320,867

Int. Cl.<sup>3</sup> B26D 7/08

U.S. Cl. 83-19

6 Claims



6. A method of cutting a plastic bottle into upper and lower portions measured axially of the bottle which comprises guiding the bottle into a compression zone, compressing the bottle, passing the bottle past a saw, and separately recovering upper and lower portions of the bottle.



4,418,596

## PHOTOGRAPHIC PAPER PUNCH

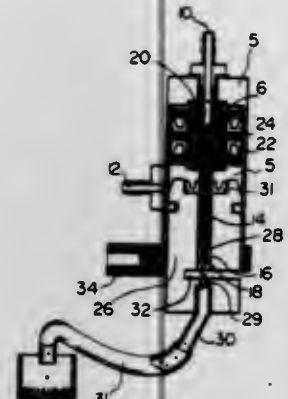
Jose M. Garrocho, 7572 Rockhill Rd., Mississauga, Ontario, Canada L4T 2Z7

Filed Apr. 2, 1981, Ser. No. 250,260

Int. Cl.<sup>3</sup> B26F 1/14

U.S. Cl. 83—98

3 Claims



1. A pneumatic punch for paper comprising:
  - (a) a cylinder having a chamber;
  - (b) a piston seated within the cylinder chamber, to be pneumatically driven between upper and lower limits within the chamber;
  - (c) actuation and retraction air inlet ports through the wall of the cylinder to provide the pneumatic drive of the piston, the ports being separated by the piston against fluid communication within the cylinder chamber between the ports;
  - (d) an elongated guide of constant, circular cross-section secured centrally to the piston on the side thereof exposed to the air from the retraction air inlet port;
  - (e) an elongated punch of circular cross-section concentrically secured to the free end of the guide;
  - (f) a central relatively restricted air passageway from the actuation air inlet side of the piston, extending through the piston, guide and punch;
  - (g) a die cooperating with the punch, having a body rigidly associated with the cylinder and centrally receiving the guide, and having a slot of circular cross-section to receive the punch;
  - (h) a space being provided between the punch, when the piston is at its upper limit, and the entrance to the slot of the die to receive and permit passage of paper to be punched;

whereby, during an operation cycle, air pressure introduced through the actuation air inlet port drives the piston to its lower limit and air is passed through the central air passageway of the piston, guide and punch to force a slug of punched paper on through the slot, that air pressure is then removed, and air pressure is introduced through the retraction air inlet port to force the piston to its upper limit, said punch having associated therewith an air valve, the air valve having a chamber which communicates through valve means with the pressure inlet port, these two valve means cooperating with each other to enable flow of air pressure to either valve chamber or punch cylinder chamber through the actuation air inlet port while sealing off flow of air pressure to the other; the air valve chamber communicating through further valve means with a pressure exhaust port, a further pressure exhaust port being provided in the punch cylinder chamber on the same side of the piston as the actuation air inlet, this punch cylinder chamber pressure exhaust port communicating through valve means with the air valve chamber pressure exhaust port, these latter mentioned valve means cooperating to enable exhaust of air pressure from either the air valve chamber or the punch cylinder chamber while sealing off the exhaust of air pressure from the other, the operation of

these valve means being coordinated with that of the first two mentioned valve means to ensure sealing of the relevant exhaust ports when air pressure is flowing to the respective chambers, the retraction air inlet port of the punch cylinder chamber communicating directly with the air valve chamber, whereby pressurizing of the air valve chamber pressurizes the punch cylinder chamber on the retraction air inlet port side of the piston, and exhausting the pressure from the air valve chamber exhausts the pressure from the punch cylinder chamber on the retraction air inlet port side of the piston.

4,418,597

## ANTI-KICKBACK DEVICE

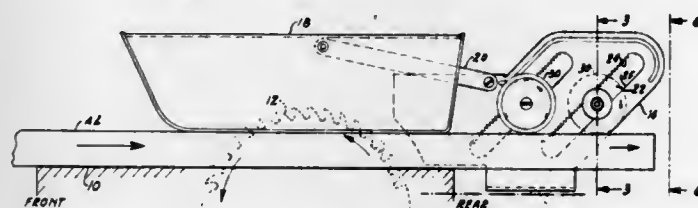
Kenneth J. Krusemark, Hutchinson, Kans., and James L. Stackhouse, Jr., Florissant, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 18, 1982, Ser. No. 340,103

Int. Cl.<sup>3</sup> B26D 7/22; B23D 7/27; B27G 19/00, 21/00

U.S. Cl. 83—478

14 Claims



1. An anti-kickback device for arresting the reverse movement of a workpiece being moved in one direction on a horizontal table comprising: a support member extending upward above said table and fixed against vertical movement relative to said table, an elongated slot in said member extending longitudinally upward from said table, said slot having a surface defined along one longitudinal side of said slot and said surface being formed as a rack, a wheel lying alongside said member and having a coaxial pinion gear of smaller diameter fixed to one side thereof and entered into said slot, said pinion gear being sufficiently smaller in diameter than the width of said slot to permit the horizontal movement thereof into and out of engagement with said rack, means loosely retaining said pinion gear in said slot thereby permitting said wheel to gravitate and rest on the upper surface of said workpiece and to be moved horizontally by said workpiece in a direction to disengage and maintain disengagement of said pinion gear from said rack and to be rotated in one direction when said workpiece is moving in said one direction, and to be moved horizontally in an opposite direction to engage and maintain engagement of said pinion gear in said rack and to be rotated in an opposite direction to cause said pinion gear fixed thereto to be rotated in a direction in said rack to apply a downward force through said wheel to said workpiece when said workpiece moves in an opposite direction.

4,418,598

## ELECTRONIC PERCUSSION SYNTHESIZER

Scott S. Klynas, Simi Valley, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 30, 1981, Ser. No. 335,985

Int. Cl.<sup>3</sup> G10H 1/40, 3/12

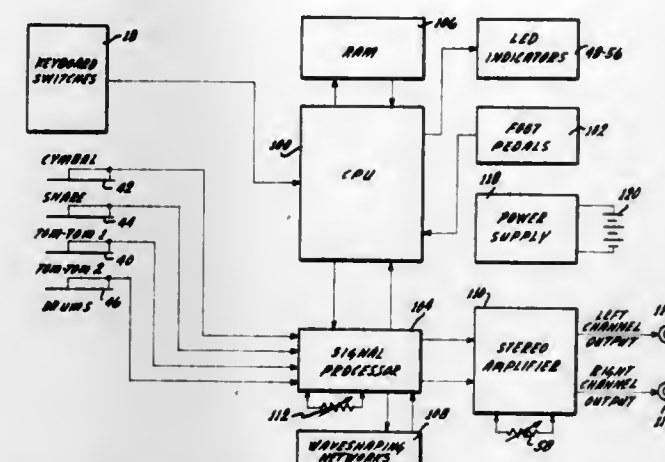
U.S. Cl. 84—1.03

11 Claims

9. An electronic music synthesizer comprising:
  - first input means for producing a first signal representing musical tones;
  - second input means for providing at least two tempo pulses spaced-apart in time where the pulses represent a desired tempo;
  - timing means responsive to the second input means for determining the frequency of occurrence of at least two successive tempo pulses;

indicator means for indicating a particular pair of successive tempo pulses;

storage means responsive to the timing means for storing the determined frequency of occurrence of successive tempo pulses;



tempo signal generating means responsive to the storage means for generating a continuous tempo signal having a frequency equal to the stored frequency; and

sound signal generating means responsive to the first input means and the tempo signal generating means for generating a sound signal from the first signal and the tempo signal.

4,418,599

## ELECTRONIC SIGNAL LEVEL CONTROL APPARATUS FOR ACOUSTICAL-ELECTRICAL TRANSDUCER INSTRUMENT

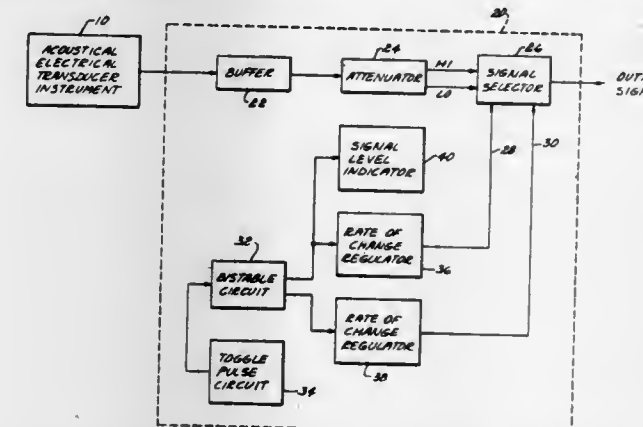
Gregory D. Raskin, 4311 Ave. G #B, Austin, Tex. 78751

Filed Apr. 8, 1982, Ser. No. 366,541

Int. Cl.<sup>3</sup> G01H 1/46

U.S. Cl. 381—1.05

16 Claims



1. Output signal level control apparatus for use with a transducer instrument producing an electrical sound output signal, comprising:
  - (a) input terminals, for coupling to a transducer instrument to obtain the electrical sound output signal;
  - (b) a first attenuator coupled to said input terminals, for receiving said electrical sound output signal and reducing the level of the signal to produce a first level-controlled electrical sound output signal;
  - (c) a second attenuator coupled to said input terminals, for receiving said electrical sound output signal and reducing the level of the signal to produce a second level-controlled electrical sound output signal of a level different from the level of said first attenuated signal;
  - (d) a bistable circuit, for producing first and second oppositely-phased electrical control signals;

said bistable circuit toggling between states and changing said control signals between first and second signal levels in response to an electrical pulse signal input thereto;

- (e) means for producing said electrical pulse signal, for toggling said bistable circuit;
- (f) a first switch element controlled by said first bistable circuit control signal, said switch element being coupled to said first attenuator and passing said first level-controlled electrical sound output signal therethrough when said first control signal is at one of its two levels;
- (g) a second switch element controlled by said second bistable circuit control signal, said switch element being coupled to said second attenuator and passing said second level-controlled electrical sound output signal therethrough when said second control signal is at one of its two levels;
- (h) output terminals coupled to said first and second switch elements for providing access to a level-controlled electrical sound output signal.

4,418,600

## ELECTRONIC MUSICAL INSTRUMENTS OF THE TYPE SYNTHESIZING A PLURALITY OF PARTIAL TONE SIGNALS

Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Selzo Kabushiki Kaisha, Hamamatsu, Japan

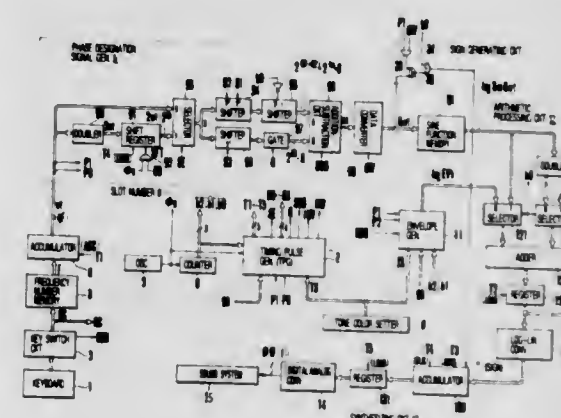
Filed Aug. 17, 1981, Ser. No. 293,699

Claims priority, application Japan, Sep. 8, 1980, 55-124930

Int. Cl.<sup>3</sup> G10H 1/02

U.S. Cl. 84—1.19

11 Claims



1. An electronic musical instrument comprising:
  - phase designation signal generating means for generating first and second phase designation signals on a time division basis, said first and second phase designation signals representing one phase angle value and another phase angle value respectively;
  - memory means connected to said phase designation signal generating means for storing one predetermined waveshape and for delivering a tone signal in response to said first phase designation signal and delivering a window signal in response to said second phase designation signal on a time division basis, both the form of said tone signal and the form of said window signal being the same as that of said predetermined waveshape;
  - modulation means for amplitude-modulating said tone signal in accordance with a modulation signal corresponding to said window signal and for outputting the modulated tone signal; and
  - tone production means for producing a musical tone in response to said modulated tone signal.
9. In an electronic musical instrument in which a musical tone is synthesized by calculating successive sample point amplitudes, each such amplitude being the sum of contributions of plural partial tone components, each being evaluated by scaling a frequency signal by a window function, the improvement comprising:
  - a waveform memory storing sampled amplitude values of a waveshape,
  - first means for accessing said waveshape from said memory at







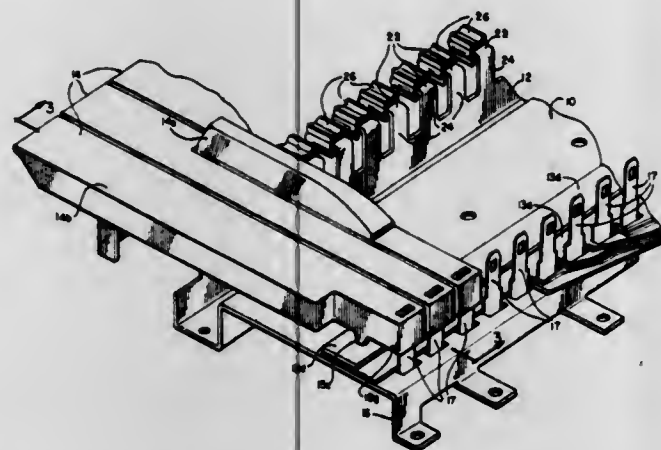
4,418,605

**KEYBOARD FOR MUSICAL INSTRUMENT**

Kjell T. Tollefsen, and Albert W. Nordquist, both of Ivoryton, Conn., assignors to Pratt-Read Corporation, Ivoryton, Conn.  
Filed Jun. 25, 1980, Ser. No. 162,914  
Int. Cl.<sup>3</sup> G10C 3/12

U.S. Cl. 84—434

34 Claims



1. A keyboard for a musical instrument comprising a plurality of elongated keys each having a longitudinal dimension, a bendable pivot spring for each key having second mating means, key bed means for rigidly holding one end section of each pivot spring, and each key having a chamber in a rear section defining a lower opening, said chamber having formed therein first mating means for receiving the second mating means of an associated pivot spring free of a separate fastening device between key and pivot spring, the first and second mating means being removably received rigidly one in the other whereby the pivot spring extends in a direction generally perpendicular to the key longitudinal dimension to form the sole rear (1) pivot, (2) biasing, (3) guidance and (4) support about which the key can rotate in a single plane only.

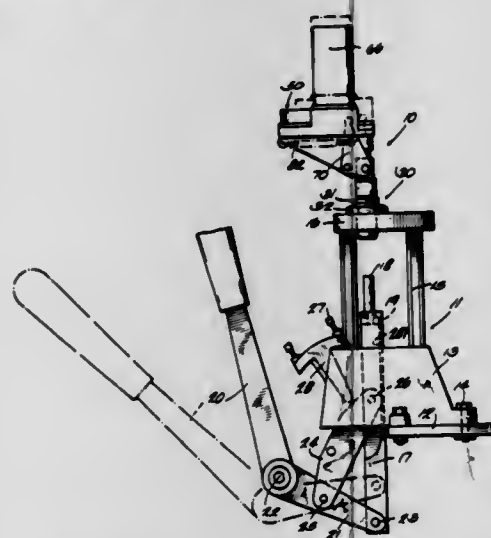
4,418,606

**POWDER MEASURING DEVICE FOR CARTRIDGE RELOADER**

Richard J. Lee, 3146 Kettle Moraine Rd., Hartford, Wis. 53027  
Filed Apr. 15, 1983, Ser. No. 485,148  
Int. Cl.<sup>3</sup> F42B 33/02

U.S. Cl. 86—31

11 Claims



1. A device for measuring the quantity of powder that is inserted in a cartridge in a reloading apparatus having means for driving the cartridge in alternate axial directions and having a support for the device, said device comprising:

an adapter for being mounted on said support and having an axial bore,  
a tubular element in the adapter bore, said element subject to being driven in one axial direction in said bore by a force transmitted through a cartridge being driven into said bore in alignment with said element,  
a body supported from said tubular element outside of said adapter,  
a powder transport member mounted for moving on said body, said member having at least one cavity corresponding in size to the quantity of powder desired in the cartridge, said cavity being located for being loaded with a quantity of powder when said member is in one position and for discharging said quantity through said tubular element into said cartridge when in another position, and drive means engaged with said transport member and responsive to said tubular element being driven in said one axial direction by said force transmitted through a cartridge by driving the transport member alternately between cavity loading position and cavity discharge position.

4,418,607

**SINGLE BARREL EXTERNALLY POWDERED GUN**

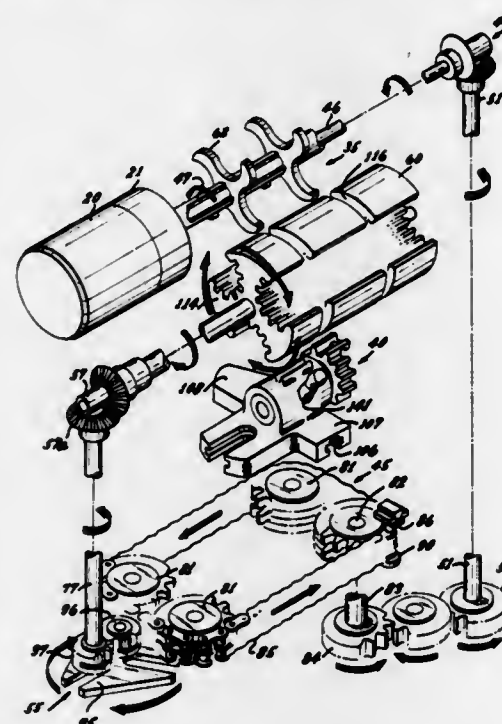
Leonard W. Price, Marina Del Rey, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.

Continuation of Ser. No. 789,502, Apr. 21, 1977, abandoned, which is a continuation of Ser. No. 418,356, Nov. 23, 1973, abandoned. This application Sep. 18, 1981, Ser. No. 303,705

Int. Cl.<sup>3</sup> F41D 10/04

U.S. Cl. 89—33 CA

22 Claims



1. A gun comprising a housing;  
a single gun barrel having a longitudinal axis and disposed within said housing;  
a single gun bolt disposed within said housing and journaled for reciprocation along said longitudinal axis;  
an operating mechanism for said gun bolt;  
means for feeding rounds of ammunition to and from said gun bolt;  
coupling means interengaging said operating mechanism and said feeding means; and  
said feeding means including a first rotating sprocket transfer means and second transfer means, said first rotating sprocket transfer means, driven by said coupling means in a rotational manner different from said second transfer means, and engaging each round of a train of rounds for advancing a train of rounds of ammunition directly to a second transfer means, and

said second transfer means including at least one round receiving pocket, driven by said coupling means in a rotational manner different from said first rotating sprocket transfer means, for receiving a round of ammunition from said first transfer means and for translating said round transversely to said longitudinal axis to the face of said gun bolt.

4,418,608

**ARRANGEMENT FOR PRE-SELECTING THE CADENCE OF FIRING BURSTS OF A PRESSURIZED GAS LOADER OF A GUN**

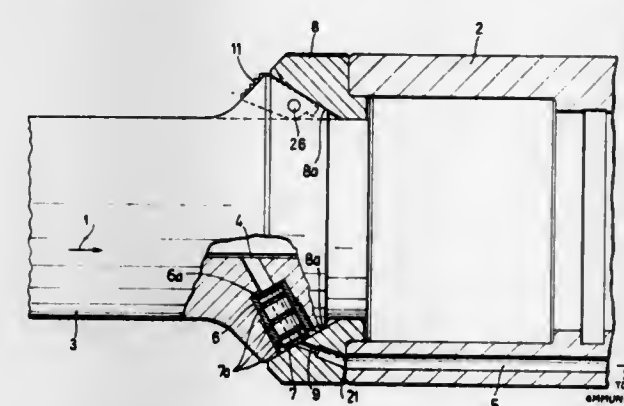
Walter Klumpp, Dulsburg, Fed. Rep. of Germany, assignor to Rbelmetall GmbH, Duesseldorf, Fed. Rep. of Germany  
Filed Mar. 16, 1981, Ser. No. 244,019

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011172

Int. Cl.<sup>3</sup> F41D 5/08

U.S. Cl. 89—193

10 Claims



1. In an arrangement for preselecting the cadence of firing bursts in a machine cannon having a pressurized gas loader operatively mounted in the housing of the machine cannon, said arrangement including means for conducting a portion of the gases formed during firing to the driving means of the weapon, said conducting means having a passage and being provided with means to adjust the cross-section thereof to thereby preselect the cadence of the firing burst, the improvement comprising in combination, said conducting means including at least one first conduit disposed in the walls of the gun barrel and at least one second conduit disposed in the housing of the weapon and in operative communication with the gas loader thereof;  
a ring body operatively mounted on said housing coaxially with respect to said gun barrel and housing and between said first and second conduits;  
said ring body having a plurality of passages disposed therein of different cross-sections, the outlet ends of said passages being disposed along a circular arc in said ring body which intersects the axis of said second conduit means;  
a selected one of said passages forming a conduit for the gases formed at firing from the outlet of the first conduit to the inlet of the second conduit to conduct said gases to a driving piston of the gas loader of the weapon.

4,418,609

**WELL PUMPING SYSTEM**

Richard A. Wickline, Mansfield, and Richard Y. Wickline, Fort Worth, both of Tex., assignors to Wickline, Saginaw, Tex.

Filed Mar. 16, 1981, Ser. No. 244,239

Int. Cl.<sup>3</sup> F01L 25/08; F15B 11/08

U.S. Cl. 91—275

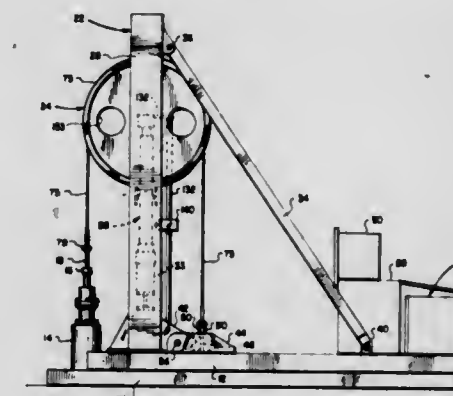
14 Claims

1. A pumping unit for actuating a linear reciprocable pump rod extending from a wellhead, said pumping unit comprising:  
a frame including an elongated horizontally extending base portion and a vertically extending portion mounted on said base portion, said vertically extending portion comprising a single pair of opposed spaced apart vertically

extending beam members interconnected by at least one generally horizontal transverse crossbeam member at a point below the upper ends of said vertically extending beam members, two opposed guide members supported on said vertically extending beam members, respectively, and extending substantially vertically and parallel to each other;

a single travelling pulley assembly including a crossbar and a pair of sheaves rotatably mounted on said crossbar, a pair of opposed bearings supported on opposite ends of said crossbar and adapted to be engaged by said guide members, respectively, and above said crossbeam member for linear reciprocating movement along said vertically extending portion of said frame;

a linear extensible hydraulic cylinder and piston assembly supported at one end on said frame and connected at its opposite end to said pulley assembly;



a pair of flexible cable means anchored at one end to said frame, said flexible cable means being trained over said sheaves, respectively, and secured to said pump rod for linear reciprocation of said pump rod in response to actuation of said cylinder and piston assembly to move said pulley assembly vertically in said guide members through a clear path of reciprocation between said vertically extending beam members whereby said pulley assembly may be at least partly extended above the upper ends of said vertically extending beam members during reciprocation by said cylinder and piston assembly, and said pulley assembly may be inserted in and removed from between said vertically extending beam members from said upper ends of said vertically extending beam members, respectively.

4,418,610

**ELECTROHYDRAULIC CONTROL SYSTEM**

John W. Holtrop, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 8, 1980, Ser. No. 185,036

Int. Cl.<sup>3</sup> F15B 9/10

U.S. Cl. 91—368

4 Claims

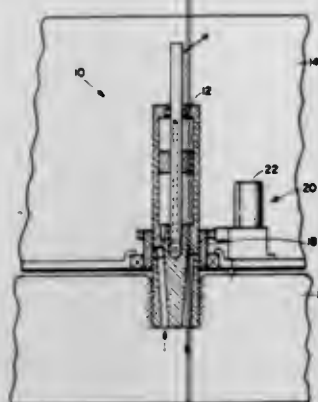
1. A hydraulic system for positioning a movable member which is mounted for rotation about an axis, said hydraulic system comprising:

actuator means for positioning said movable member, said actuator means being connected to said movable member and responsive in rotation about said axis to hydraulic fluid under pressure;

valve means operatively connected to said actuator means for controlling said hydraulic fluid, said valve means being actuatable between a first state preventing transmission of hydraulic fluid pressure to said actuator means and at least one additional state permitting transmission of hydraulic fluid pressure to said actuator means and conduction of hydraulic fluid from said actuator means, said



valve means being configured for movement about said axis; and  
servo control means responsive to a control signal and oper-



atively connected to said valve means for controlling said valve means between said first state and said additional state, said servo control means being attached to said movable member and movable about said axis.

4,418,611

## PNEUMATIC SERVO BOOSTER

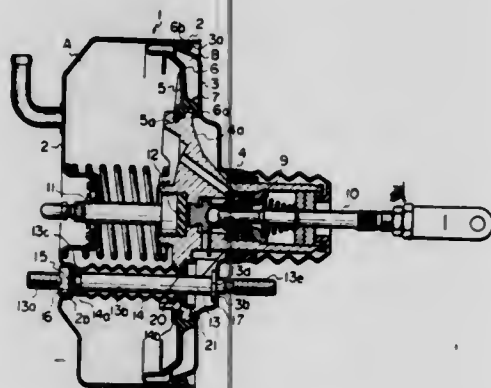
Kiyoshi Tateoka, Fujisawa, and Yoshihiro Hayashida, Chigasaki, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 170,876, Jul. 21, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,141

Claims priority, application Japan, Jul. 20, 1979, 54-101243 Int. Cl.<sup>3</sup> F15B 9/10

U.S. Cl. 91—369 A

3 Claims



1. A pneumatic servo booster comprising:
  - a shell housing having a front and rear shell;
  - a valve body positioned inside said housing and slidably supported by said rear shell, said valve body having a valve mechanism therein;
  - a partitioning member cooperating with said valve body for partitioning the interior space of said housing into a front and rear chamber, said partitioning member having a bore therethrough;
  - a connecting rod axially extending through the front and rear chamber and freely extending through said bore, the rear end of said rod being welded to said rear shell and the front end of said rod extending through said front shell and being threaded;
  - a nut threaded onto said front end of said rod;
  - an integral tubular extensible member surrounding a portion of said rod, one end of said tubular member being sealingly attached to the peripheral edge of said bore and having the portion of the rod adjacent the rear end and within said rear shell passing freely through said tubular member, the other end of said tubular member being sealingly attached to said rod adjacent and within said front shell, said nut when tightened onto said rod drawing the forward end of said tubular member into sealing engagement with the inner surface of said front shell around

the aperture in said front shell through which the front end of said rod extends.

4,418,612

## POWER TRANSMISSION

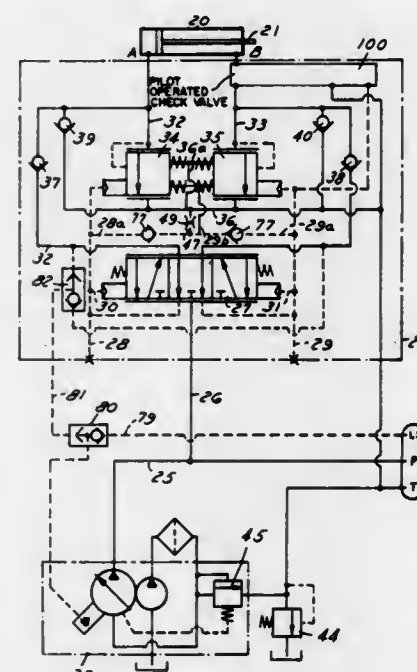
Vinod K. Nanda, Rochester, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed May 28, 1981, Ser. No. 267,853

Int. Cl.<sup>3</sup> F15B 13/04

U.S. Cl. 91—445

6 Claims



1. A hydraulic control system comprising
  - a hydraulic actuator having opposed openings adapted to alternately function as inlets and outlets for moving the element of the actuator in opposite directions,
  - a pump for supplying fluid to said actuator,
  - a meter-in valve means to which the fluid from the pump is supplied,
  - said valve being pilot controlled,
  - a pilot controller for alternately supplying fluid at pilot pressure to said meter-in valve means for controlling the direction of movement of the meter-in valve,
  - a pair of hydraulic lines extending from said meter-in valve means to said respective openings of said actuator,
  - a normally closed meter-out valve associated with each opening of the actuator for controlling the flow out of said actuator,
  - each said meter-out valve being pilot operated by the pilot pressure from said controller,
  - and a pilot operated check valve in one of said pair of lines between said actuator and its respective meter-out valve operable for controlling flow from the meter-in valve means to one end of said actuator and for preventing flow out said end of said actuator, said pilot operated check valve being operable at a lower pilot pressure than said meter-out valve means such that said check valve opens before its associated meter-out valve opens, said check valve including time delay means such that said valve functions to prevent flow out of said actuator after a predetermined time delay from the time when pilot pressure to said meter-out valve means is interrupted, insuring relief valve protection.

4,418,613

## VACUUM BRAKE BOOSTER

Rolf Weller, and Peter Böhm, both of Frankfurt, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 121,552, Feb. 14, 1980, abandoned.

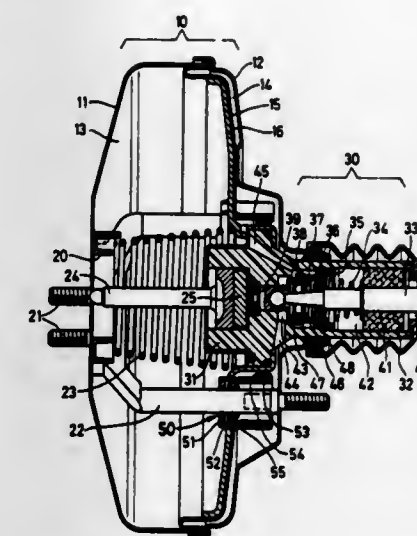
This application Nov. 20, 1981, Ser. No. 323,625

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908516

Int. Cl.<sup>3</sup> B60T 13/00

U.S. Cl. 92—98 D

11 Claims



1. A brake booster utilizing the differential of pressure between a vacuum and atmosphere pressure comprising:
  - a vacuum casing having a longitudinal axis and at least one movable wall disposed therein in a transverse relationship to said axis to divide said casing into a vacuum chamber and a working chamber, said movable wall including a main rolling diaphragm and a diaphragm plate, said movable wall acting on a push rod guided along said axis;
  - at least two bars disposed in said casing spaced from and parallel to said axis connected to the transverse spaced end walls of said casing and penetrating said movable wall;
  - at least two tubular members each connected to said movable wall and surrounding a different one of said bars in a spaced relationship thereto in an area where an associated one of said bars penetrates said movable wall; and
  - at least two small rolling diaphragms having one end fastened to and surrounding an outer circumferential surface of an associated one of said bars and the other end fastened to said movable wall, each of said small rolling diaphragms being disposed between said outer surface of an associated one of said bars and an inner surface of an associated one of said tubular members and completely enclosed by said associated one of said tubular members to slidably seal said bars to said movable wall, each of said small rolling diaphragms being axially guided and radially confined in an associated one of said tubular members.

4,418,614

## CONTROL DEVICE FOR COFFEE EXTRACTOR

Hiroyuki Oota, Iwakura, and Ryuho Narita, Nagoya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 18, 1982, Ser. No. 340,251

Claims priority, application Japan, Jan. 19, 1981, 56-5926[U]; Jan. 23, 1981, 56-9430

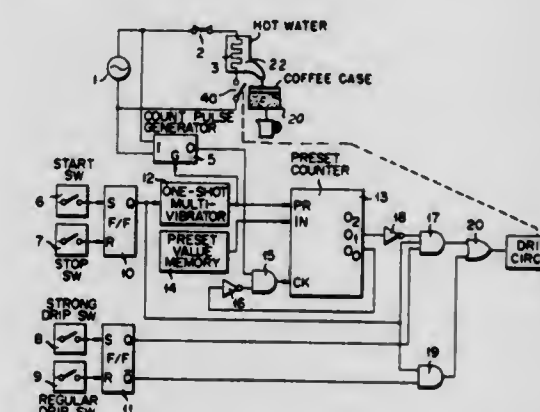
Int. Cl.<sup>3</sup> A47J 31/00

U.S. Cl. 99—280

5 Claims

1. A control device for a coffee extractor having a series circuit, connected between output terminals of a power source and including an electric heater for boiling water and a control switch for controlling the ON/OFF operation of said electric heater; and a drip mechanism which drips coffee by supplying hot water to a case which stores coffee powder, wherein said control device comprises:
  - a drive circuit which controls the ON/OFF operation of said

- control switch in response to an ON instruction signal or an OFF instruction signal;
- a pulse generator which is connected between said output terminals of said power source for generating a count pulse of a predetermined period;
- a start switch which generates a start signal;
- a regular drip switch for dripping regular coffee of a first concentration and a strong drip switch for dripping strong coffee of a second concentration;
- a memory which stores a selectively operated condition data of said regular drip switch and said strong drip switch;
- a counter which is preset with a first count data when said start switch is operated, and which has a first output terminal producing a first level output only when said counter has a specific second count data by the way in which said preset first count data is counted down by one each time said counter receives said count pulse and a second output terminal producing said first level output only when said counter has a predetermined third count data;
- a first logic circuit which couples an input side of said counter, said start switch and said count pulse generator with one another; and



- a second logic circuit which couples an output side of said counter, said drive circuit and said memory with one another;
- said second logic circuit including first and second discriminating circuits;
- said first discriminating circuit being controlled to supply said ON instruction signal to said drive circuit if said counter does not retain said specific second count data when said memory circuit stores the operated condition data of said strong drip switch and said start switch is operated, controlled to supply said OFF instruction signal to said drive circuit when said counter becomes to retain said specific second count data, and controlled to supply again said ON instruction signal to said drive circuit when said counter becomes not to retain said specific second count data; and
- said second discriminating circuit being controlled to supply said ON instruction signal continuously to said drive circuit when said memory circuit stores the operated condition data of said regular drip switch and said start switch is operated.

4,418,615

## CONVECTION BARBECUE PIT

Michael R. Higgins, P.O. Box 522, Mesquite, Tex. 75149

Filed Jun. 24, 1982, Ser. No. 391,676

Int. Cl.<sup>3</sup> A47J 27/62

U.S. Cl. 99—331

16 Claims

1. A thermostatically controlled convection barbecue pit, comprising:
  - a firebox comprising a firebox access door, a firebox outlet port, and a firebox inlet port;
  - thermostatically controlled firebox damper means for regulating the passage of air through said firebox inlet port into said firebox;
  - a cooking chamber having at least one cooking chamber



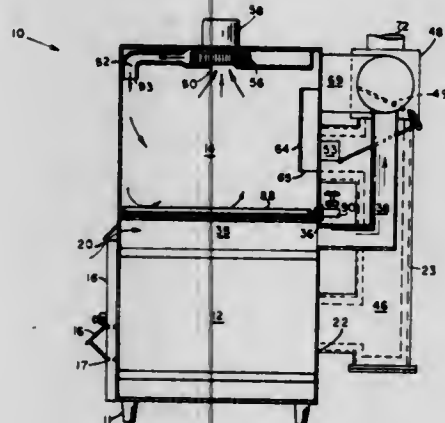
access door, said cooking chamber having an inlet port and a first and second cooking chamber outlet port on opposite sides of said cooking chamber inlet port;

a joiner flue connected at a lower end to said firebox and at an intermediate end to said cooking chamber for the passage of smoke from said firebox through said firebox outlet port into said cooking chamber through said cooking chamber inlet port;

a plenum chamber connected to said joiner flue at an upper end of said joiner flue, said plenum chamber having a dual function bypass damper means therein capable of alternatively directing smoke from said firebox into said cooking chamber or permitting direct exhaust of smoke from said firebox;

a baffle secured within said cooking chamber adjacent to said cooking chamber inlet port for urging smoke from said joiner flue upward within said cooking chamber;

a discharge duct mounted to the ceiling of said cooking chamber comprising a suction port, a discharge vent, and a convection fan mounted within said discharge duct above said suction port, said discharge duct shaped to urge smoke forward within said discharge duct in a line



parallel to the ceiling of said cooking chamber and then downward through said discharge vent in a line parallel to said cooking chamber access door;

a first outlet duct secured within said cooking chamber adjacent to said first cooking chamber outlet port and a second outlet duct secured within said cooking chamber adjacent to said second cooking chamber outlet port for withdrawing smoke from the bottom of said cooking chamber on either side of said baffle;

a first cooking chamber outlet flue connected at a first end to said cooking chamber and at a second end to said plenum chamber and a second cooking chamber outlet flue connected at a first end to said cooking chamber and at a second end to said plenum chamber for receiving smoke from said cooking chamber through said first and second outlet ports and channeling said smoke into said plenum chamber;

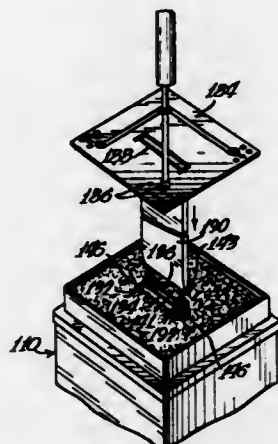
an exhaust stack secured to said plenum chamber, said exhaust stack having mounted therein a stack fan for urging smoke from said plenum chamber through said exhaust stack; and

thermostatically controlled gas burner means capable of emitting a forced air flame into said firebox.

4,418,616

# **METHOD AND APPARATUS FOR DRAINING WHEY FOR MAKING LARGE SIZED BLOCKS OF CHEESE** Robert R. Streeter; Vincent J. Whitehorn, both of Pollock, S. Dak., and Earl C. Nicholas, Carthage, Mo., assignors to L. D. Schreiber Cheese Co., Inc., Green Bay, Wis.

Division of Ser. No. 56,088, Jul. 9, 1979, Pat. No. 4,263,330.  
This application Mar. 30, 1981, Ser. No. 249,222  
Int. Cl.<sup>3</sup> A01J 25/11, 25/13, 25/15  
U.S. Cl. 99—458 25 Claims



1. An apparatus for manufacturing blocks of cheese from cheese curd particles containing whey comprising:  
an open ended container for holding the cheese curd particles,  
a drain plate enclosing the bottom of said container, said drain plate having a plurality of perforations,  
drain screen means positioned in said container, said drain screen means including two substantially parallel, narrowly spaced-apart sidewalls having a multiplicity of openings,  
spacing means defined by at least one of said sidewalls of said drain screen means comprising a plurality of integrally formed dimples that protrude outwardly and are adapted to engage the opposing sidewall for maintaining said two sidewalls in parallel, spaced-apart relation when said drain screen means is positioned in said container, said sidewalls being separable from each other by relative generally outward movement when removed from said container to facilitate assembly and disassembly of said drain screen means,  
said drain screen means being positioned in said container wherein the space between said sidewalls is in communication with at least some of said perforations in said drain plate, said drain screen means being of substantially parallel construction throughout its extent in the container and being of sufficient width and height in relation to the container such that the whey has a relatively short distance to travel to said drain screen means and thus is easily drainable over substantially the entire volume of said cheese curd whereby whey received in said drain screen means is allowed to flow out of said container.

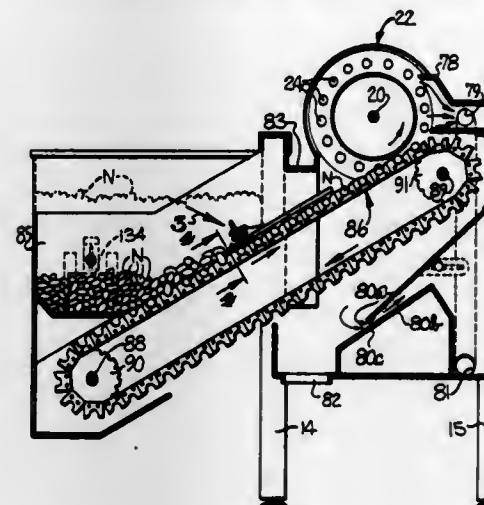
4,418,617

# **APPARATUS FOR CRACKING NUTS AT HIGH PRODUCTION RATES**

James B. Quantz, Columbia, S.C., assignor to Machine Design Incorporated, Columbia, S.C.  
Division of Ser. No. 199,743, Oct. 23, 1980, Pat. No. 4,332,827.  
This application Apr. 27, 1982, Ser. No. 372,305  
Int. Cl.<sup>3</sup> A23N 5/02  
U.S. Cl. 99—571 25 Claims

1. A high production nutcracking apparatus comprising, means for advancing a plurality of nuts individually in succession along a first path of travel with at least substan-

tially all of the advancing nuts being disposed in a predetermined orientation,  
means for removing the advancing nuts in succession from the first path of travel at the terminal end thereof and advancing the removed nuts in succession along a generally curvilinear second path of travel, and including means for clampingly engaging each nut during its removal from

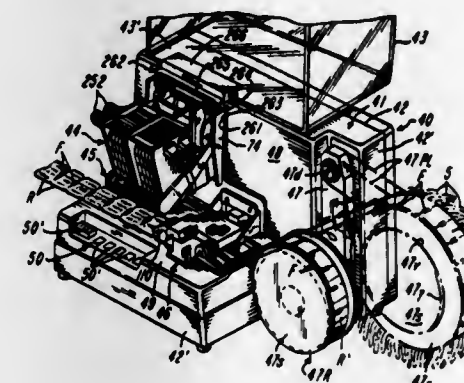


the first path of travel and advance along the second path of travel so as to preserve the predetermined orientation of each nut, and  
means for imparting a cracking force to each nut while being advanced along the second path of travel, and with the cracking force being applied in a direction corresponding to the clamping engagement of the nut.

4,418,618

# **LABEL PRINTING APPARATUS WITH CONSTANT PRESSURE PRINTING MECHANISM**

Orville C. Huggins, Dayton, and John D. Mlsturik, Tipp City, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio  
Filed Feb. 17, 1982, Ser. No. 349,495  
Int. Cl.<sup>3</sup> B41K 45/00  
U.S. Cl. 101—68 6 Claims



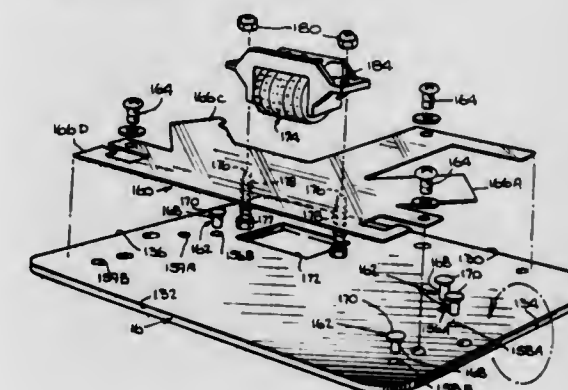
1. Printing apparatus, comprising: a platen, a print head, means for guiding the print head for straight line movement, means for driving the print head into and out of printing cooperation with the platen, an impression control device including a stop movable between effective and ineffective positions, the stop preventing movement of the print head toward the platen in its effective position, a spring loaded by the driving means when the print head is stopped by the stop, an interposer in contact with the stop to hold the stop in its effective position, the driving means being effective after the driving means has moved through a predetermined distance to shift the interposer and to enable the stop to move to its ineffective position to cause the print head to be driven into printing cooperation with the platen, wherein the interposer includes a bar, a pair of tension springs for urging the bar in one direction, means for guiding the bar, wherein the stop includes a pair of spaced

latches having stop faces, means pivotally mounting the latches about a common pivot axis, the latches having respective shoulders for limiting the movement of the bar against the urging of the springs, the stop faces being in a path adjacent the print head, the stop faces being located offset from the pivot axis to cause the latches to be cammed out of the path when the bar is in its ineffective position, and the drive means including a member movable in the space between the latch members for shifting the bar in the opposite direction against the action of the springs to enable pivotal movement of the latch members and release of the print head.

4,418,619

# **IMPRINTING APPARATUS WITH RELOCATABLE PRINTING DEVICE**

Paul A. Diel, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.  
Filed Jan. 11, 1982, Ser. No. 338,699  
Int. Cl.<sup>3</sup> B41F 3/04  
U.S. Cl. 101—269 12 Claims



1. Imprinting apparatus comprising:  
a. framework;  
b. a printing device;  
c. a roller platen movably attached to the framework, said roller platen being movable from a print ready position to a home position, said roller platen disposed for urging a pressure sensitive medium into imprinting engagement with the printing device in the course of movement thereof; and  
d. means for supporting said printing device, said supporting means including an anvil, said anvil having opposed major surfaces, said supporting means including means removably attaching said anvil to said framework for carrying said printing device in either of two different locations relative to the print-ready position of said roller platen, and said carrying means attaching said anvil to said framework to permit facing either of said major surfaces toward said roller platen for carrying said printing device in one of said locations when one of said major surfaces is so faced and in the other of said locations when the other of said major surfaces is so faced.



4,418,620

**OFFSET PRINTING MACHINE INK DISTRIBUTION AND DRYING SYSTEM**

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany  
Continuation of Ser. No. 186,423, Sep. 12, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,239

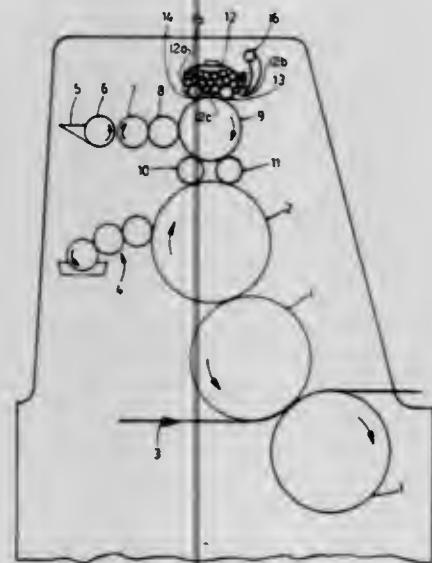
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942691

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B41F 31/10, 7/12

U.S. Cl. 101—350

15 Claims



1. In an offset printing machine having a plate cylinder (2) and an inking system including:  
an ink trough (5);  
an ink duct roller (6) receiving ink from the ink trough (5);  
an ink distribution roller (9);  
and a plurality of ink rollers (7, 8, 10, 11) conducting ink from the ink duct roller to the ink distribution roller and from the ink distribution roller to the plate cylinder (2) and forming, with said ink distribution roller, an ink roller train,  
apparatus for distributing and drying ink in the ink roller train comprising  
a cage-like holder (12) open to the atmosphere having confining side walls and a closed bottom wall (12c);  
two ink transferring rollers (13, 14) having an ink accepting surface projecting from the cage-like holder,  
and a plurality of loose roller elements (15) freely centerless floatingly located in the cage-like holder (12), for centerless, self-positioned rolling movement between the confining side walls and the bottom wall of the cage, some of the roller elements being in surface engagement with said ink transferring rollers and some of the roller elements being in surface engagement with each other to increase the surface area of ink transported in the ink train,  
the plurality of roller elements being of such number that the distance between the ink transferring rollers (13, 14) within the cage-like holder (12) is spanned by at least one of the roller elements, and which will assume positions between the ink transferring rollers, the plurality of roller elements (15) being rotated by surface frictional engagement with the ink transferring rollers (13, 14);  
and wherein said cage-like holder (12) is positioned in said printing machine for engagement of both of the ink transferring rollers (13, 14) with spaced circumferential surface portions of said ink distribution roller (9) forming a single one of the rollers in the ink roller train,  
said ink transferring rollers (13, 14) having a diameter substantially less than the diameter of said one ink distribution roller (9) and being positioned to span a portion of the circumference thereof.

4,418,621

**MECHANISM FOR A ROTATING PROJECTILE FUZE**

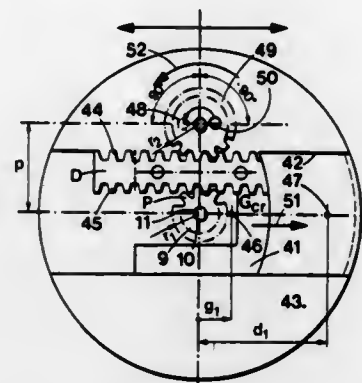
Jean Rosselet, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland  
Filed Mar. 23, 1981, Ser. No. 246,159

Claims priority, application Switzerland, Apr. 1, 1980, 2553/80

Int. Cl.<sup>3</sup> F42C 15/22

U.S. Cl. 102—238

4 Claims



1. Driving means for the timing fuze of a gyrotory shell adapted primarily to cooperate with control, security and delay devices by providing them with a predetermined couple under the action of centrifugal force, said driving means comprising a primary movable body and at least one secondary movable body, said bodies meshing directly or indirectly with each other, each of said bodies provided with a center of gravity eccentric with respect to the axis of gyration of said shell and a toothed pinion for actuating said control, security and delay devices meshing with at least one of said two movable bodies, said two movable bodies driving said toothed pinion simultaneously in the same direction.

4,418,622

**MUNROE EFFECT BREACHING DEVICE**

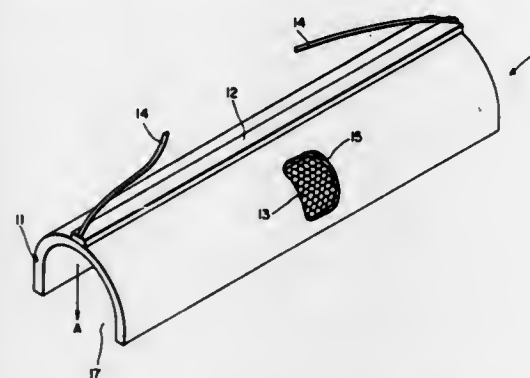
John S. Foster, Fredericksburg, and John A. M. Zehmer, III, Newport News, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1982, Ser. No. 394,975

Int. Cl.<sup>3</sup> F42B 1/02

U.S. Cl. 102—307

10 Claims



1. A Munroe Effect device for breaching walls in urban terrain, comprising:  
a metallic, honeycombed support structure formed to have concavo-convex surfaces over a linear extent; and  
an explosive material completely covering said metallic, honeycombed support structure and filling the interstices thereof to define an unlined shaped charge;  
whereby, upon detonation of said explosive material, the detonation wave melts said metallic, honeycombed support structure to produce a high velocity jet of molten metal directed outwardly from the concave surface for breaching walls in urban terrain.

4,418,623

**APPARATUS FOR DISPERSING LIQUIDS**

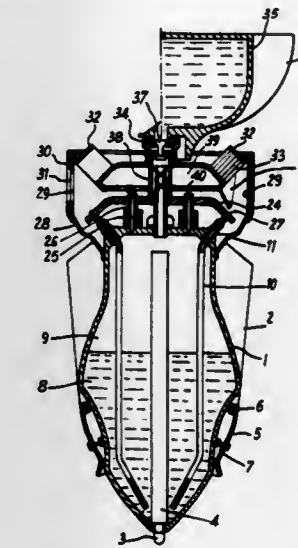
Fernand Gauchard, 87 Boulevard du Montparnasse, 75006 Paris, France  
Filed Jul. 9, 1981, Ser. No. 281,879

Claims priority, application France, Jul. 9, 1980, 80 15255

Int. Cl.<sup>3</sup> F42B 25/12

U.S. Cl. 102—369

6 Claims



1. Apparatus for dispersing liquids, comprising a casing, a reservoir inside the casing for the liquid to be dispersed, at least one dispersing nozzle for the liquid in communication with the reservoir, means to place the liquid in the reservoir under pressure to ensure its atomization by said at least one nozzle, means to initiate dispensing of the liquid through the nozzles, and direct outlets for the atomized liquid, means for closing said direct outlets, and means to direct the atomized liquid through filter means when said outlets are closed, thereby to produce an aerosol.

4,418,624

**AERODYNAMIC BRAKING ARRANGEMENT FOR PROJECTILE COMPONENTS WHICH ARE TO BE SALVAGED**

Rauschert Willi, Altensitten; Bock Erich, and Rieger Gerald, both of Nuremberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

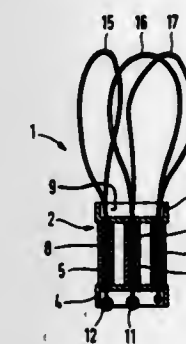
Filed Jul. 30, 1981, Ser. No. 288,475

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029914

Int. Cl.<sup>3</sup> F42B 5/26

U.S. Cl. 102—473

12 Claims



1. In an aerodynamic braking arrangement for projectile components which are to be salvaged, such as detonators; including a drag parachute having a high air-resistance index; and cables interconnecting said projectile components with said drag parachute; the improvement comprising: said drag parachute being a brake basket having two cup-shaped tops at the ends thereof; at least one spacer separating said tops along

the axial direction of said projectile, said cables being fastened to one of said tops.

4,418,625

**BIDIRECTIONALLY OPERATIVE TIE EXCHANGING APPARATUS**

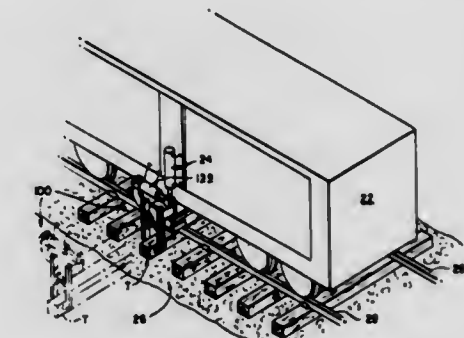
Franz Allmer, Sophia, N.C., assignor to Canon Corporation, West Columbia, S.C.

Continuation-in-part of Ser. No. 274,768, Jun. 18, 1981. This application Apr. 13, 1982, Ser. No. 367,936

Int. Cl.<sup>3</sup> B61D 15/00; B01B 29/06, 29/10

U.S. Cl. 104—9

21 Claims



1. A railway tie removing apparatus comprising:  
an extensible beam means including first and second beams, one telescopically received within the other;  
an adjustable support means for supporting said beam means relative to a support vehicle, said support means selectively adjustable to position said beam means relative to the axis of the tie to be removed;  
selectively actuatable lock means for locking a selected one of said first and second beams to said support means;  
tie gripping means mounted on said first and said second beams for selectively gripping a railway cross tie; and  
force actuator means connected to said first and to said second beams for causing said first and said second beams to telescopically extend relative one another;  
whereby actuating said locking means to lock one of the first and second beams to the support means and unlock the other and operating the force actuator means causes the unlocked other of the first and second beams to extend relative to the locked beam, and actuating said locking means to lock the other of the first and second beams to the support means and unlock the one and operating the force actuator means causes the unlocked one of the first and second beams to extend relative to the locked other beam.

4,418,626

**ARTICLE TRAY FOR AUTOMOBILES**

George A. Semien, 2961 Dublin Dr., South San Francisco, Calif. 94080

Filed Mar. 12, 1981, Ser. No. 242,956

Int. Cl.<sup>3</sup> A47F 5/12; A47B 9/00

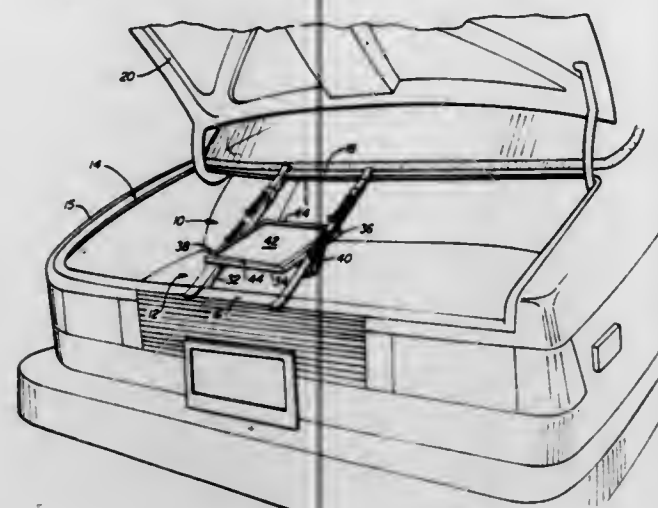
U.S. Cl. 108—8

5 Claims

1. A tray mountable in an opening of a luggage compartment of an automotive vehicle, comprising:  
tray structure including a planar outer surface;  
a pair of elongate, longitudinally adjustable leg elements, each having an adjusted lengthwise dimension sufficient to extend between confronting peripheral portions of said luggage compartment opening, each leg element terminating in end structure configured to be placed in releasable, holding engagement with the periphery of the luggage compartment opening; and

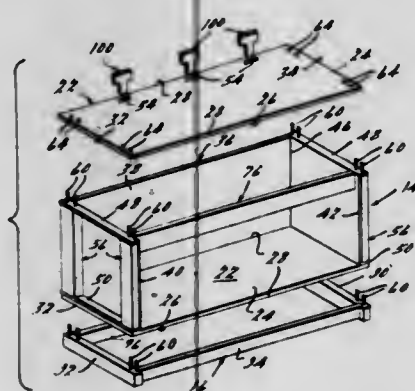


means for pivotally coupling said leg elements to opposing lateral sides of said tray structure and in generally parallel



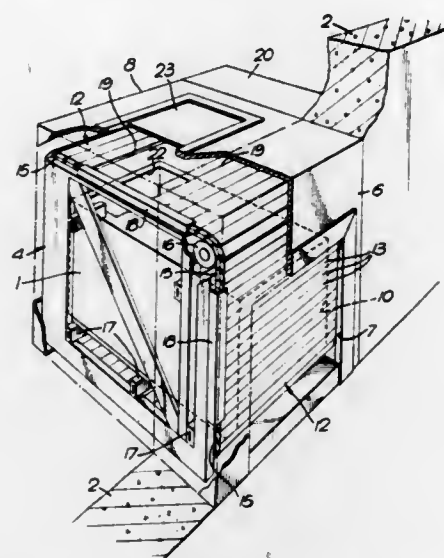
relation to one another, including means for releasably inhibiting relative movement therebetween.

**4,418,627**  
**SHELF-TYPE STORAGE SYSTEM**  
Edward A. Baker, 35992 Woodridge Cir., Apt. 107, Farmington Hills, Mich. 48018  
Filed Jan. 21, 1981, Ser. No. 226,634  
Int. Cl. A47B 7/00  
U.S. Cl. 108—91 24 Claims



1. A shelf-type storage system comprising, a plurality of vertically stackable individual shelf units, each of said units including a generally rectangular-shaped, horizontally arranged shelf member, a one-piece vertical liner member comprising spaced parallel end sections and a back section extending between and connected integrally to said end sections, said liner member closing the ends and back of said shelf unit and providing a front opening to said unit through which objects may be placed upon and removed from said shelf member, a plurality of four vertically extending post members disposed one on each corner of said shelf unit, and alignment means extending generally vertically from selected ends of said post members and coacting with said liner member and said shelf member for securing said shelf member, liner member and post members in a unitized assembly adapted for vertical stacking on like units.

**4,418,628**  
**SECURITY TRANSFER ARRANGEMENTS**  
Dermot J. Cahill, Bedford, England, assignor to Chubb Security Installations Limited, London, England  
Filed Sep. 1, 1981, Ser. No. 298,543  
Claims priority, application United Kingdom, Sep. 10, 1980, 8029302  
Int. Cl. E05G 7/00  
U.S. Cl. 109—19 10 Claims

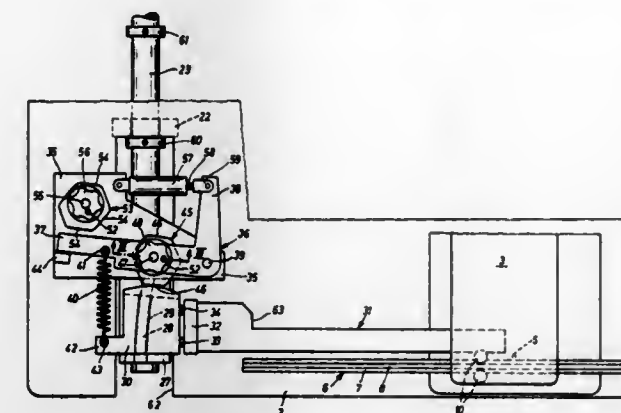


1. A security transfer unit comprising means defining a chamber for receiving items to be transferred, casing means to enclose said chamber, said casing means having two manually-spaced openings therein to enable access to be gained for entering items into, and removing them from, said chamber, a flexible shutter encircling said chamber within said casing means for at times blocking access to said chamber through both openings, said shutter having at least one aperture therein, means mounting said shutter for displacement round said chamber within said casing means between a first position in which a said aperture in the shutter is located in register with a first of said openings while the second opening is blocked by the shutter, and a second position in which a said aperture in the shutter is located in register with the second opening while the first opening is blocked by the shutter, and means selectively operable externally of said casing means for displacing said shutter from one to the other of its first and second positions.

**4,418,629**  
**DEVICE FOR MAKING DARTS ON CUT PARTS OF GARMENTS**  
Günther Mall, and Willi Stephan, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany  
Filed Feb. 17, 1981, Ser. No. 234,756  
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 8027080[U]  
Int. Cl. D05B 35/08  
U.S. Cl. 112—146 7 Claims

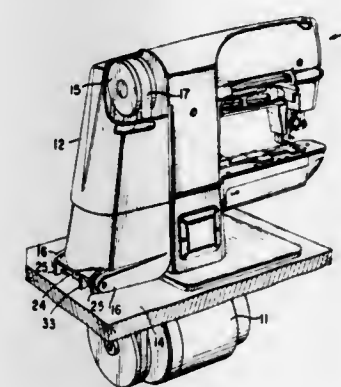
4. A device for making darts on cut parts for use with a sewing machine having a reciprocating needle mounted over a support table for engagement with the material to be sewn which is moved along the table by a feeding mechanism, comprising, a pleating bar support plate, means mounting said support plate for movement around the needle, a pleating bar carried by said support plate and being movable therewith for adjustable positioning in respect to the table, at least one stop mounted adjacent said pleating bar support plate and being adjustably positionable relative to said support table in the path of movement of said support plate to vary the end position of movement of said support plate which occurs when said support plate contacts said stop, said stop comprising a multi-step stop, a lever member pivotally mounted adjacent said pleating

bar and having first and second arm portions, said first arm portion carrying said stop, and a second stop mounted along-



side said lever arm and being adjustably positionable relative to said lever arm to limit the movement of said lever arm.

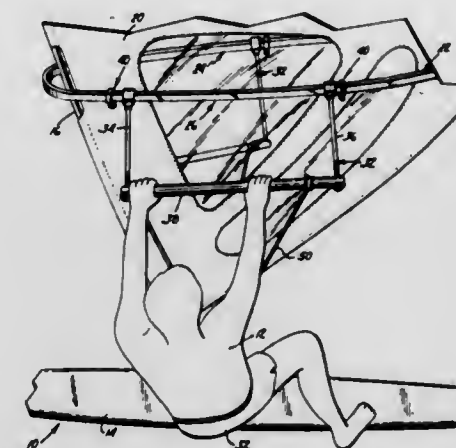
**4,418,630**  
**BELT GUARD LOCK**  
Richard P. Graham, Westfield, N.J., assignor to The Singer Company, Stamford, Conn.  
Filed Mar. 6, 1981, Ser. No. 241,329  
Int. Cl. D05B 83/00  
U.S. Cl. 112—261 3 Claims



1. A belt guard for a sewing machine adopted for support in a sewing table having an upward facing surface, said sewing machine having a pulley supported at an end thereof, said sewing table supporting a drive motor therein, said drive motor being connected to said sewing machine pulley by at least one drive belt, guard means for preventing in a first position access to said pulley and said drive belt connection, means supported by said table for selectively pivotally supporting said guard in said first position for preventing an access to said drive belt connection of said sewing machine and in a second position for providing access to said drive belt connection, said supporting means being implemented by a pivot shaft affixed to said guard means and a pivot frame affixed to said sewing table, said pivot frame having an aperture for receiving said pivot shaft, said guard means having a lower edge spaced from said table surface in said first position and adjacent said table surface in said second position, wherein the improvement comprises:

means carried by said belt guard for selectively preventing and permitting rotation of said belt guard from said first position to said second position, said preventing means further comprising a collar slidable on said pivot shaft, a flange affixed to said collar and extending in said first position between said table surface and said guard means edge whereby said guard means is prevented from rotation about said pivot shaft to said second position; means for retaining said preventing means in an effective rotation preventing position against movement by tools available to a sewing machine operator.

**4,418,631**  
**APPARATUS FOR CONTROLLING A WIND PROPELLED SAILING DEVICE**  
Louis A. Frohbach, 7333 Oaklawn Ave., Edina, Minn. 55435  
Filed Oct. 26, 1981, Ser. No. 314,731  
Int. Cl. B63H 9/04  
U.S. Cl. 114—39 8 Claims



1. An apparatus for aiding a sailer in controlling a wind propelled sailing device, the wind propelled sailing device including a water engaging hull means and a sail means having a sail for receiving wind for motive power pivotally attached to the hull means and universally pivotable with respect to the hull means and having a substantially lateral boom for controlling the sail means, the boom being positioned about a lower end of the sail and along both sides of the sail, the apparatus comprising:

a substantially rigid U-shaped control member for transmitting forces from the sailer to the boom to control the steering of the sailing device, the control member having a pair of spaced-apart legs with spaced-apart first ends and having a handle portion extending between second ends of the legs, the handle portion being of sufficient length to permit grasping thereof by a pair of hands of the sailer so that the sailer can apply forces to the control member; and connecting means for pivotally connecting the spaced-apart first ends of the spaced-apart legs to the boom to permit pivotal movement of the control member about an axis of the boom and to transmit forces perpendicularly to the axis from the handle portion through the spaced-apart legs to the boom.

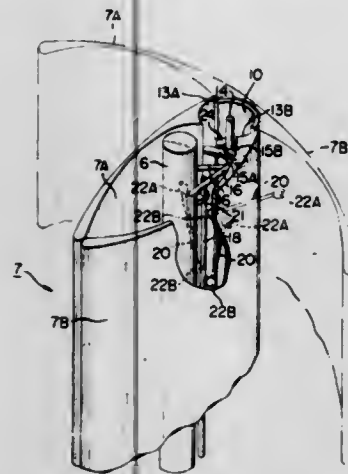
**4,418,632**  
**METHOD FOR OPERATING A RIGID MARINE SAIL**  
Kazuhiko Yoshimi, Yokohama; Kazuyuki Shimizu, Fujisawa; Takashi Watari, Kamakura, and Katsunori Kusumoto, Yokosuka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Japan Marine Machinery Development Association, both of Tokyo, Japan  
Filed Apr. 28, 1981, Ser. No. 258,543  
Int. Cl. B63H 9/06  
U.S. Cl. 114—102 2 Claims

1. Method for operating a rigid marine sail having a rigid left sail portion and a rigid right sail portion, each of said rigid left and right sail portions having an inboard end and an outboard end, comprising:

providing a mast on a ship; pivotally securing said left and right sail portions to said mast so as to be pivotable about one common pivot axis which extends substantially parallel to said mast, said one common pivot axis being spaced ahead of said mast with respect to the direction of intended movement of the ship; selectively extending said left and right sail portions to an unfolded operable position by controllably pivoting said left and right sail portions about said one common pivot axis and selectively folding said left and right sail portions



to a streamlined folded inoperable position by controllably pivoting said left and right sail portions toward each other about said one common pivot axis so as to locate said mast between said left and right sail portions when said left and right sail portions are at said folded inoperable position, said left and right sail portions when being at



said folded inoperable position defining an essentially closed wing-shaped streamlined member wherein the inboard ends of said left and right sail portions are close to each other and face each other and the outboard ends of said left and right sail portions closely face each other to present a substantially streamlined form.

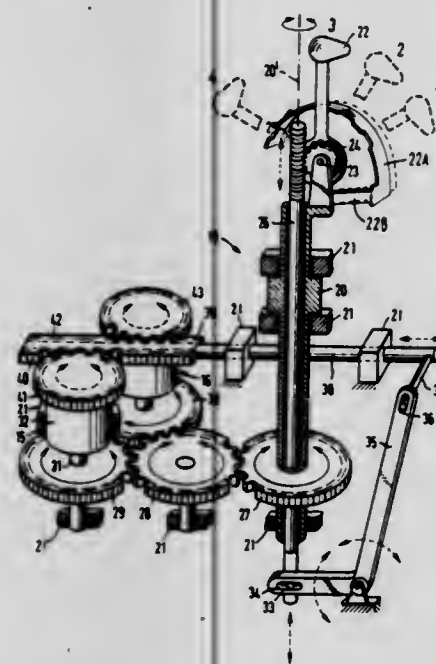
4,418,633

**APPARATUS FOR CONTROLLING A WATERCRAFT**  
Franz Krautkremer, Spay, and Juergen Issleib, Hamburg, both of Fed. Rep. of Germany, assignors to Schottel-Werft, Josef Becker GmbH & Co. KG, Spay, Fed. Rep. of Germany  
Filed Apr. 2, 1981, Ser. No. 250,486  
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013654

Int. Cl.<sup>3</sup> B63H 25/00

U.S. Cl. 114—144 E

5 Claims



2. An apparatus for driving and controlling a watercraft, comprising:

at least one pair of steerable propellers, the steerable propellers of each pair being located substantially symmetrically on opposite sides of the center plane of the watercraft, said center plane extending through the center of lateral resistance of the watercraft, said steerable propellers each being drivable to produce a directed thrust upon the watercraft for moving the latter;

a single control element for carrying out control movements in two degrees of freedom in relation to a common axis; transmitters responsive to positioning of said control element to direct the thrust of respective ones of said steerable propellers;

means for presetting the locations of at least first and second fixed alternatively selectable positions of said control element in one of said two degrees of freedom;

means establishing a first path of actuation from said single control element to said transmitters and responsive to movement of said control element in the other said degree of freedom for pivoting of said steerable propellers of each pair in the same angular direction by the same angular amount;

the propellers of each pair having thrust directions which are parallel in said first fixed position of said control element, independent of pivoting of the steerable propellers by said movement of said control element in said second degree of freedom, for normal driving and maneuvering of said watercraft by said movement of said control element in said second degree of freedom;

means establishing a second path of actuation from said single control element to said transmitters and responsive to movement of said control element in said one degree of freedom from said first fixed position to said second fixed position for pivoting of said steerable propellers of each pair in opposite angular directions out of parallelism with each by a preselected angular amount for traversing movement of the watercraft in a direction changeable by movement of said control element in said second degree of freedom, said transmitters each comprising first and second members which are movable rotatably relative to one another to direct the thrust of the corresponding steerable propeller, the single control element acting during its movement in both its degrees of freedom onto said first members of the transmitters of both propellers but through independent mechanical motion transfer modes defining said first and second paths of actuation.

4,418,634

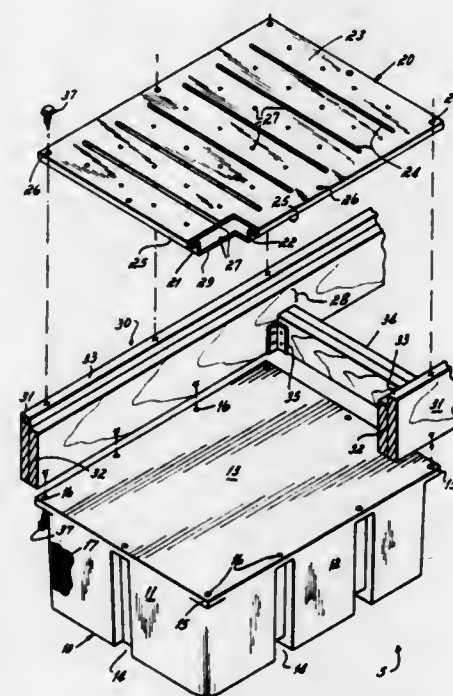
**MARINE FLOAT**

Leo H. Gerbus, 824 Kingfisher Dr., Cincinnati, Ohio 45202  
Filed Oct. 23, 1981, Ser. No. 314,369

Int. Cl.<sup>3</sup> B63B 35/38

U.S. Cl. 114—263

5 Claims



1. A marine float structure comprising a one piece, molded hollow, buoyant, rectangular box-shaped float unit of high strength, durable polymeric material, said float unit having end, side, top and bottom walls, the top wall of which is

flanged at a 90° angle at least at one point with respect to each side and end wall; a one piece, molded hollow, buoyant, rectangular box-shaped deck unit of high strength, durable polymeric material, said deck unit having end, side, top and bottom walls, the dimensions of which are essentially the same as those of the float unit except that the height of said side walls is substantially less than that of the float unit, the top wall of the deck unit being flanged at a 90° angle to the side and end walls thereof; a framework of connecting members sandwiched between the flanges of the float and deck units; and means connecting the float and deck units to the framework connecting members.

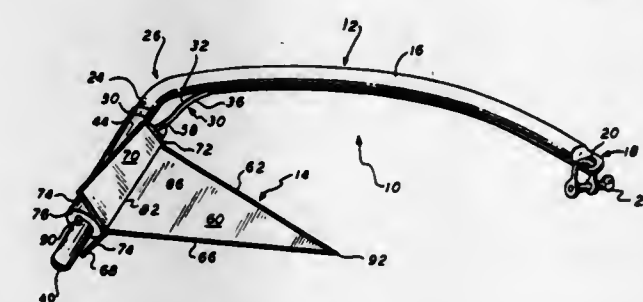
4,418,635

**SINGLE-FLUKE ANCHOR**

James M. Taylor, Box 4216, West Palm Beach, Fla. 33402  
Continuation-in-part of Ser. No. 25,335, Mar. 30, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,484  
Int. Cl.<sup>3</sup> B63B 21/40

U.S. Cl. 114—304

30 Claims



1. An anchor of the type intended to be connected by a cable to a craft so as to be engaged in a bed and thereby to releasably moor a craft, said anchor comprising:

- a shank, the shank having a major leg and a shorter leg, the major leg having a forward and a rearward end, the legs being angularly joined at a juncture located at the rearward end of the major leg;
- the shank having a connection means, the shank being engaged by the cable at the forward end of the major leg by the connection means;
- a fluke pivotally secured for pivotal movement about an axis extending along said shorter leg, said fluke being pivotal with respect to said shank so as to be capable of moving said rearward end upward with respect to said bed, and at least a part of said fluke being engageable with the bed thereby causing force which is applied by the cable to the connection means to be transferred to the fluke;
- a part of the shank at said forward end curving away from the fluke so that it extends in a plane defined by the major and shorter legs, and extends away from the fluke, and said part being substantially prevented from pivoting about the shorter leg axis by said cable, causing said shank to pivot with said fluke in at least one plane about said part so as to substantially be capable, in response to the cable pulling upon the forward end, of moving in an oscillatory path in said one plane to thereby cause the fluke to more readily enter the bed.

4,418,636

**POSITION INDICATOR FOR A TRUCK BODY**

Harlow H. Piper, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/01198, § 371 Date Sep. 8, 1981, § 102(e) Date Sep. 8, 1981, PCT Pub. No. WO83/00848, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 8, 1981, Ser. No. 305,742

Int. Cl.<sup>3</sup> B60Q 11/00; B60P 1/28

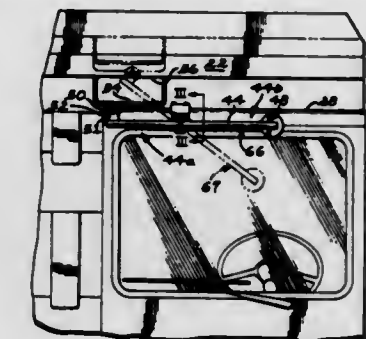
U.S. Cl. 116—28 R

9 Claims

1. An indicating apparatus (24) for use in a vehicle (10) having a frame (12) and a body (14) pivotally mounted on the

frame (12) and being movable between a lowered position and an elevated position (17,18) with respect to the frame (12), comprising:

means (44,48,50) positioned between said frame (12) and body (14) for mechanically indicating the positioning of said body, said positioning means including an indicator



member (44) adapted to be pivotally connected to the frame (12) and being biased for movement from a visually obscured position to a position that is visible from within said vehicle in response to the elevation of said body from said frame so as (14) to indicate the positioning of said body (14) in said elevated position (18).

4,418,637

**AUDIBLE SIGNAL VALVE KNOB**

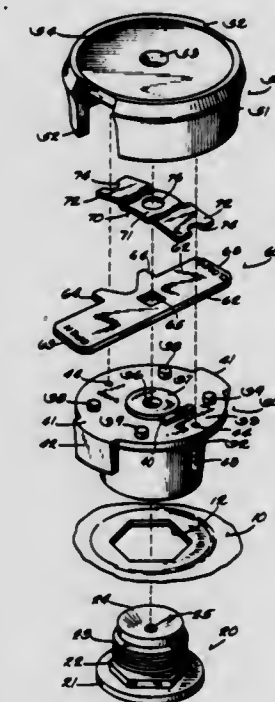
Thomas W. Heermans, West Bend, Wis., assignor to Regal Ware, Inc., Kewaskum, Wis.

Filed Apr. 21, 1981, Ser. No. 256,208

Int. Cl.<sup>3</sup> G01L 19/12; A47J 27/52

U.S. Cl. 116—70

15 Claims



1. In a knob for a cooking vessel, a knob base projecting through the vessel and provided with a first whistle orifice and a surrounding lower resonance chamber portion; an outer knob abutting the vessel, removably secured to said knob base, and disposed outside the vessel, said outer knob comprising a resonance chamber upper wall having a second orifice therein, said lower resonance chamber portion and upper resonance resonance chamber wall defining a resonance chamber between them; a path area defined by abutments on the top of said outer knob, between which valve slide means slides, said path area crossing said second orifice; said valve slide means having abutments projecting from one side thereof, said projecting abutments limiting the travel of said valve slide means with respect to said abutments on the top of said outer knob; said



valve slide means having first and second positions in said path area and being provided with a third orifice aligned with said second whistle orifice when said slide is in said first position and non-aligned therewith when said slide is in said second position; a knob cover removably secured to said outer knob and having a fourth orifice communicating with said third orifice; and a separate biasing means positioned between said valve slide means and knob cover to urge said valve slide means into good contact with a circular boss disposed on a valve supporting surface of said outer knob and surrounding said second whistle orifice.

4,418,638

## WINDOW-DOOR ALARM

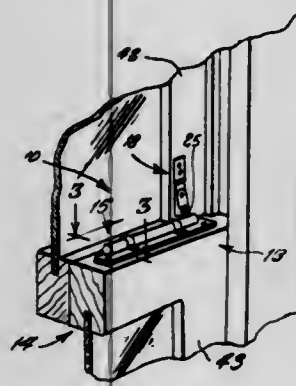
Michel Lesly, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Dec. 10, 1979, Ser. No. 102,020

Int. Cl.<sup>3</sup> F41F 27/00; G08B 13/08

U.S. Cl. 116—87

1 Claim



1. A protection device for a movable closure comprising in combination a firing mechanism unit mounted on said closure, a triggering unit for activating said firing mechanism unit mounted on a fixed member and a gun-powder loaded firing cap wherein, said firing mechanism unit comprises a barrel containing a compression coil spring bearing against a closed end of said barrel and a hammer slidably mounted in said barrel, said cap being squeezed into an open end of said barrel, said spring bearing against a rear end of said hammer urging said hammer toward said cap including a sideward pin extending from said hammer slidable in a slot along a side of said barrel parallel to the barrel axis wherein said triggering unit comprises a fixed plate secured to said fixed member said plate having means retaining said pin in a cocked position compressing said spring when the closure is closed, whereby said means is adapted to release said pin when the closure is moved towards an open position thus permitting the pin to slide in said slot wherein said means comprises a retainer plate pivotally secured to said fixed plate having a retaining slot for receiving said pin, whereby said pin pivotally slidable from a transverse extension of the barrel slot retaining said pin in cocked position, to a released position aligned with the barrel slot, whereby movement of said closure member towards an open position causes the pin to pivot to said released position.

4,418,639

## APPARATUS FOR TREATING SEMICONDUCTOR WAFERS

James C. Wills, Los Altos, and Douglas S. Spenser, Santa Clara, both of Calif., assignors to Solitec, Inc., Santa Clara, Calif.

Filed May 19, 1981, Ser. No. 265,185

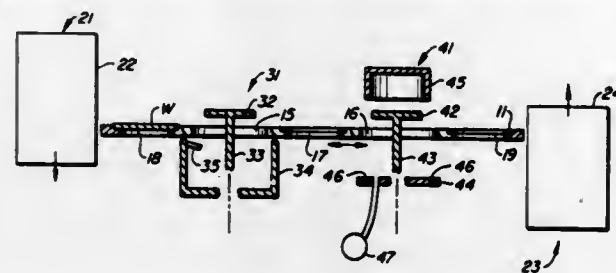
Int. Cl.<sup>3</sup> B05C 11/02, 13/02

U.S. Cl. 118—50

1 Claim

1. Apparatus for treating semiconductor wafers comprising a reciprocating wafer tray having at least three wafer carrying apertures, at least a pair of operating apertures each one located inbetween a differ-

ent adjacent pair of said three wafer carrying apertures, and slots in the tray providing open access between at least certain of operating and carrying apertures; means for reciprocating said tray back and forth between an input loading station and an output unloading station; at least first and second treating stations inbetween said loading and unloading stations, each treating station having



a wafer chuck vertically reciprocal through said operating apertures in said tray; said first treating station having means for applying photoresist to a wafer; and said second treating station having means for evacuating the space surrounding a wafer with applied photoresist and simultaneously conducting heat to the wafer from the wafer chuck.

4,418,640

## APPLICATOR FOR APPLYING ADHESIVE TO A WORK PIECE

Alfred Dettelbach, Stuttgart, and Roland Henzler, Nuertingen-Raidwangen, both of Fed. Rep. of Germany, assignors to Reich Spezialmaschinen GmbH, Nuertingen, Fed. Rep. of Germany

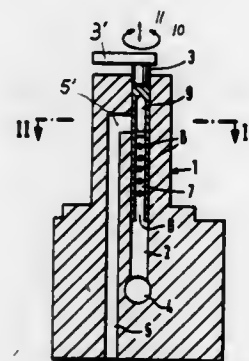
Filed Apr. 6, 1982, Ser. No. 366,051

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115418

Int. Cl.<sup>3</sup> B05C 5/02

U.S. Cl. 118—411

6 Claims



1. An applicator for applying adhesive to work pieces, especially in an edge gluing machine through which the work pieces travel, comprising an upright nozzle body (1) having an upper end and a lower end, adhesive supply conduit means (2, 4) entering into said nozzle body (1) at its lower end and extending toward its upper end, adhesive discharge hole means (6) connecting said supply conduit means to an external adhesive applicator surface (1') intermediate the lower and upper ends of the nozzle body (1), slide valve means (3) slidably inserted in at least a portion of said supply conduit means (2) for opening said adhesive discharge hole means (6) to a desired extent in different positions of the slide valve means (3) and for closing said adhesive discharge hole means (6) in a further position of said slide valve means (3) which is operable from the outside of said nozzle body (1), and scavenging duct means (5, 5') operatively connected to said adhesive supply conduit means above said adhesive discharge hole means (6) in said nozzle body (1) for collecting contaminants above said adhe-

sive discharge hole means (6) when said slide valve means separates said scavenging duct means from said supply conduit means, said slide valve means (3) having an opening (9) above said adhesive discharge hole means (6) for connecting said scavenging duct means (5, 5') to said supply conduit means (2, 4) when said slide valve means is in a third position for discharging from said supply conduit means a quantity of adhesive with contaminants collected therein into said scavenging duct means above said adhesive discharge hole means (6).

4,418,641

## DIP-COATING APPARATUS

Atushi Nakashima; Michisuke Edamatsu, and Kenji Kushi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

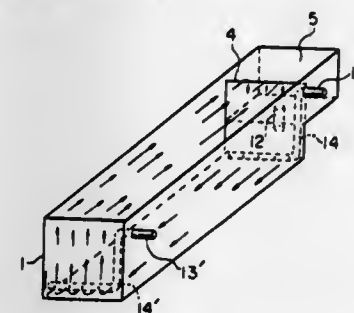
Division of Ser. No. 163,360, Jun. 26, 1980, Pat. No. 4,353,934.

This application Apr. 5, 1982, Ser. No. 365,761

Claims priority, application Japan, Jul. 9, 1979, 54-86722; Jul. 10, 1979, 54-87232

Int. Cl.<sup>3</sup> B05C 3/00

U.S. Cl. 118—429



1. A dip-coating apparatus for obtaining a coated film on the surface of an article by dipping the article in a coating solution in a tank in which a coating solution is circulated and the article is pulled up out of the solution, characterized in that an ultrasonic wave oscillator is provided and a nozzle which can jet the coating solution uniformly and parallelly with the bottom of the solution tank from the side on which the coating solution overflows toward the side opposite it is provided at the bottom of the coating solution tank.

4,418,642

## BUILD CONTROL APPARATUS AND METHOD

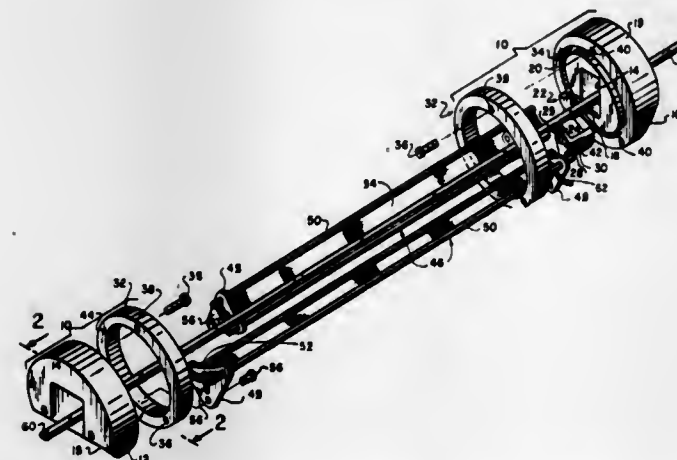
Donald J. Gillette, Guilford, and Bedrich Hajek, New Haven, both of Conn., assignors to Electrostatic Equipment Corporation, New Haven, Conn.

Filed Nov. 20, 1981, Ser. No. 302,200

Int. Cl.<sup>3</sup> B05D 1/06

U.S. Cl. 118—624

15 Claims



1. Adjustable build control means for electrostatic cloud coating apparatus, comprising a pair of fixtures, each fixture having an opening therein to permit passage of a workpiece therethrough and an engagement portion extending at least partially about said opening of said fixture; at least one build

control member; and means for securing said build control member to said engagement portions of said fixtures to extend therebetween, said engagement portions being so configured as to permit variation of the angular relationship of all parts of said build control member to the workpiece by movement of said build control members angularly as a unit to any of a multiplicity of positions about said openings thereof, said fixtures being adapted for mounting at spaced locations in the coating apparatus, with said openings thereof in axial alignment to define a workpiece travel path therethrough, whereby said build control member can be disposed in any of a multiplicity of angularly displaced positions about the axis of said travel path.

4,418,643

## FEED HOPPER ASSEMBLY FOR PARTICULATE MATERIAL AND PRINTER

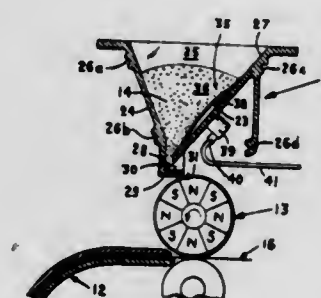
Robert M. Barto, Jr., Wyckoff, N.J., and Ira Lopata, New York, N.Y., assignors to Ragen Precision Industries, Inc., North Arlington, N.J.

Continuation of Ser. No. 289,760, Aug. 3, 1981, abandoned. This application Nov. 22, 1982, Ser. No. 443,634

Int. Cl.<sup>3</sup> G03G 15/09

U.S. Cl. 118—657

4 Claims



1. A feed hopper assembly for particulate material comprising:

- wall means including spaced and converging side walls each respectively having an inner surface and an outer surface, and spaced end walls at opposite ends of said wall to define therewith a storage chamber having an upper opening for charging particulate material therein,
- one of said converging side walls having a length longer than that of the other shorter converging side wall,
- said longer converging side wall having, a shelf means formed at the lower end disposed to extend transversely through and in relatively close proximity below the other shorter side wall to form therewith a sized discharged outlet means,
- flexible diaphragm means connected to the inner face of at least one of said converging side walls to form an expansible chamber disposed for operative communication with the particulate material charged into the storage chamber formed in the feed hopper,
- pneumatic pulsating means connected to the outer face of said one side wall having the flexible diaphragm means connected to the inner face thereof including, means in the side wall forming an air passage therethrough communicating at one end with the expansible chamber, a pumping means for pumping air, conduit means connected at one end to the air inlet means and at the opposite end to said pumping means for delivering and removing air to and from said expansible chamber for expanding and deflating the flexible diaphragm means, and means for driving the pumping means for intermittently expanding the flexible diaphragm means to undulate the particulate material charged into the storage chamber and to cause the same to flow directly and freely through said discharge outlet means to said shelf means, and
- bleed means connected in said pneumatic pulsating means for bleeding air from the pneumatic pulsating means above a predetermined pressure.



3. In an electrostatic printer having a rotatable magnetic toning roller for delivering electrostatic/magnetic toner for the printing cycle therein, rotatable pressure fusing rollers, means for driving the magnetic toning roller, and means for driving the rotatable pressure fusing rollers, the combination with said rotatable magnetic toning roller of, a feed hopper assembly comprising:

- a wall means including spaced and converging side walls each respectively having an inner surface and an outer surface, and spaced end walls at opposite ends of said wall to define therewith a storage chamber having an upper opening for charging particulate material therein,
- one of said converging side walls having a length longer than that of the other shorter converging side wall,
- said longer converging side wall having, a shelf means formed at the lower end disposed to extend transversely through and in relatively close proximity below the other shorter side wall to form therewith a sized discharged outlet means,
- flexible diaphragm means connected to the inner face of at least one of said converging side walls to form an expansible chamber disposed for operative communication with the particulate material charged into the storage chamber formed in the feed hopper,
- pneumatic pulsating means connected to the outer face of said one side wall having the flexible diaphragm means connected to the inner face thereof including, means in the side wall forming an air passage therethrough communicating at one end with the expansible chamber, a pumping means for pumping air, conduit means connected at one end to the air inlet means and at the opposite end to said pumping means for delivering and removing air to and from said expansible chamber for expanding and deflating the flexible diaphragm means, and means for driving the pumping means for intermittently expanding the flexible diaphragm means to undulate the particulate material charged into the storage chamber and to cause the same to flow directly and freely through said discharge outlet means to said shelf means, and
- bleed means connected in said pneumatic pulsating means for bleeding air from the pneumatic pulsating means above a predetermined pressure,
- said shelf means operatively associated with the magnetic toning roller to deliver the metered amount of particulate material discharged thereon when the magnetic toning roller is rotated, and
- the means for driving the pressure fusion rollers operatively connected to said pump means for synchronous and intermittent operation thereof to enable the delivery of air to the flexible diaphragm means in accordance with the operation of the electrostatic printer.

4,418,644

## OBJECT PROCESSING APPARATUS

Jerry W. Young, Weston, Mo., assignor to Sealright Co. Inc., Kansas City, Mich.

Continuation of Ser. No. 924,331, Jul. 13, 1978, abandoned. This application Dec. 1, 1980, Ser. No. 211,870

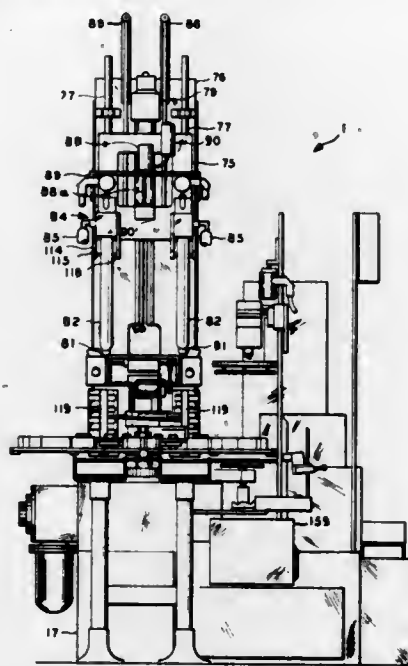
Int. Cl.<sup>3</sup> B05C 7/02

U.S. Cl. 118—669

20 Claims

9. A container processing apparatus including:
- first motor means operable for rotating the container;
  - first counter means for counting pulse signals;
  - first detecting means positioned adjacent said first motor means, said first detecting means being operably connected to said first counter means and operable for providing to the first counter means a first enabling signal representative of a rotational position of the container as the container is rotated by said first motor means;
  - encoder means operably connected to the first motor means and to said first counter means, said encoder means being operable for providing a plurality of pulse signals, each pulse signal being representative of an increment of rotation of the container by said first motor means, said first

counter means being activated by the enabling signal to start counting the pulse signals, and said first counter means being operable for deenergizing the first motor means for forward rotation of the container after counting a first predetermined number of pulse signals so that the container decelerates to a nonrotating condition at a predetermined rotational position;



first sealant dispensing means; and sealant dispensing control means operably connected to said first sealant dispensing means and operable for controlling the operation of the first sealant dispensing means for applying sealant to a selected area of the container while the container is oriented by said predetermined rotational position.

4,418,645

## GLOW DISCHARGE APPARATUS WITH SQUIRREL CAGE ELECTRODE

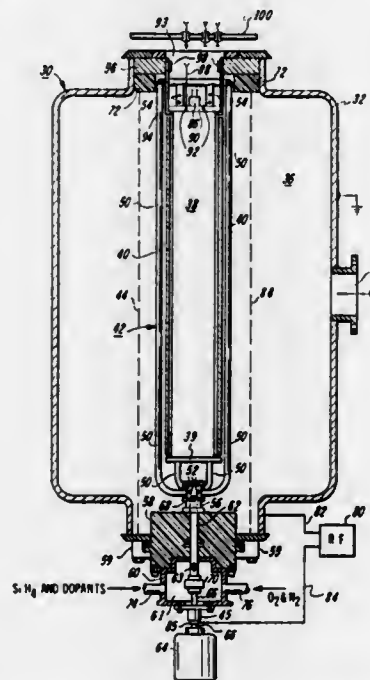
John C. Knights, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1982, Ser. No. 362,343

Int. Cl.<sup>3</sup> C23C 13/08

U.S. Cl. 118—715

6 Claims



1. In an r.f. glow discharge system, the combination comprising:
- a plurality of elongated hollow electrodes positioned cir-

cumferentially about a central point forming a circular array, said array coupled to one lead of an r.f. source, means to supply reactant gases to the interior of said hollow electrodes, mounting means for supporting a workpiece within the confines of said electrode circular array, a second electrode exterior of said electrode circular array and coupled to the other lead of said r.f. source, means to provide relative rotational movement between said electrode array and said mounting means, and a plurality of apertures along the length of said array electrodes and aligned toward the surface of said workpiece for the exposure of said reactant gases toward a mounted workpiece.

4,418,646

## LOAD LOCK VALVE

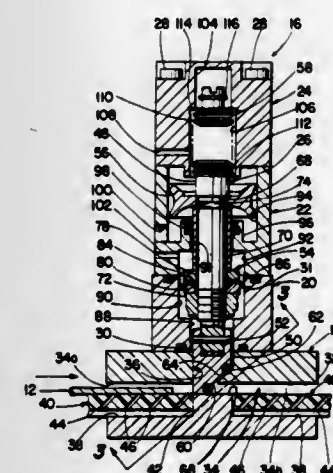
John Zajac, San Jose, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 29, 1982, Ser. No. 362,929

Int. Cl.<sup>3</sup> C23C 13/08

U.S. Cl. 118—733

10 Claims



1. In apparatus for processing semiconductor wafers including a first chamber operable at a first pressure, a second chamber operable at a second pressure, and a conduit for the passage of semiconductor wafers from said first chamber to said second chamber; a valve operable to selectively open and close said conduit comprising a base; a first passage formed through said base defining a portion of said conduit; a seat surface formed on a wall of said first passage over which said wafers pass; a second passage substantially perpendicular to and intersecting said first passage; a valve element received in said second passage and movable between a first position closing said first passage and a second position opening said first passage, said valve element having a seal element thereon having a first sealing surface engageable with said seat surface and a second sealing surface engageable with a wall of said substantially perpendicular second passage when said valve element is in its first position; and actuating means operable to move said valve element between said first and second positions.

4,418,647

## ARTIFICIAL HOST EGG FOR REARING TRICHOGRAMMA

Jarett D. Hoffman, Columbia, Mo., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 20, 1982, Ser. No. 380,375

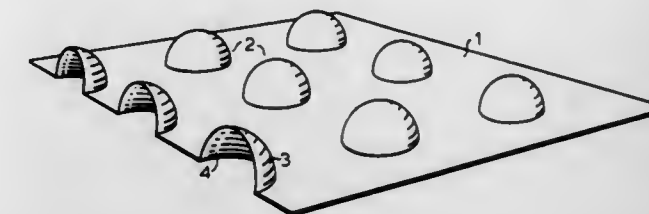
Int. Cl.<sup>3</sup> A01K 67/00

U.S. Cl. 119—1

9 Claims

1. A substrate for use in the in vitro rearing of Trichogramma wasps and adapted for oviposition therein by mature females, said substrate comprising an artificial membrane having an outer surface and an inner surface and at least one curvilinear surface region extending through an arc of at least about 90°, said region being convex on the outer surface of said

membrane and concave on the inner surface of said membrane, wherein the membrane in said region is characterized by a thickness, curvature, and outer surface texture suitable to



induce oviposition by said females, and wherein the membrane on the inner surface of said region defines a semienclosed cavity.

4,418,648

## PROCESS FOR THE REDUCTION OF GILL DISEASE IN SHRIMP

Donald V. Lightner, Tucson, Ariz., assignor to Marine Culture Enterprises, Atlanta, Ga.

Continuation of Ser. No. 31,555, Apr. 19, 1979, abandoned. This application Sep. 25, 1981, Ser. No. 305,434

Int. Cl.<sup>3</sup> A01K 61/00

U.S. Cl. 119—2

7 Claims

2. A process for reducing gill disease in shrimp in controlled environment aquaculture comprising introducing into the water constituting said environment a source of permanganate ion in sufficient quantity to yield a permanganate ion concentration in the water of from about 1 p.p.m. to about 10 p.p.m., and a sufficient amount of triethanolamine copper (II) to provide a CU (II) concentration in the water of from about 0.1 p.p.m. to about 5.0 p.p.m.

4,418,649

## BOILER STRUCTURE

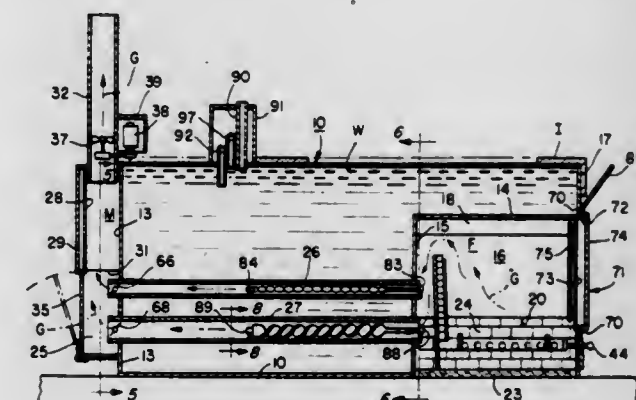
James E. Purvis, Rte. 2, P.O. Box 374, Adel, Ga. 31620

Filed Nov. 2, 1982, Ser. No. 438,435

Int. Cl.<sup>3</sup> F22B 5/00

U.S. Cl. 122—15

18 Claims



1. An improved boiler for burning fuel to heat water, comprising:

- a horizontal water tank having a rear bulkhead at its rear end, having a second bulkhead which is recessed in the tank spaced from its front end to form a fire box, the second bulkhead extending partway up the height of the tank to leave a top portion of the tank overhanging said fire box and closed by a horizontal plate, the tank having spaced opposed side portions extending on both sides of the fire box from the second bulkhead to the front of the tank, the side and top portions of the tank being substantially water filled and communicating with the water in the tank, and the tank having multiple horizontal flue tubes extending longitudinally through the tank below its center and through the bulkheads and sealed thereto;

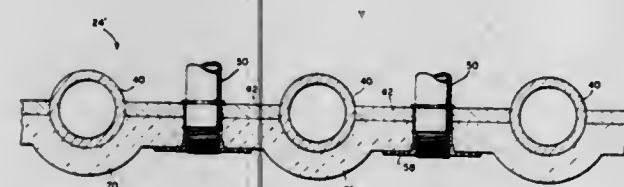
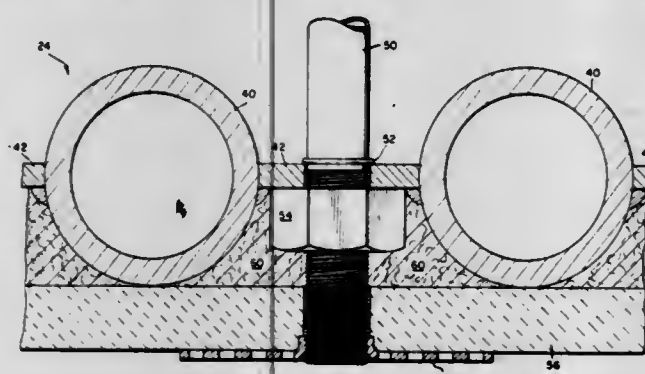


- (b) a hollow water filled grate in the fire box located between the tank side portions and below its top portion, and means to circulate water from the tank through the grate;
- (c) a front partition extending down from said top portion and transversely between said side portions and closing the front of the tank and the fire box, said front partition having doors located between said side portions and disposed for access to the fire box to load fuel on said grate, the doors being water filled and having means to circulate water from the tank through the doors, and the front partition having ash clean-out doors located below said grate;
- (d) a gas manifold chamber enclosing said rear bulkhead of the tank and having a smoke stack extending therethrough above the tank; and
- (e) an upright baffle extending transversely across the fire box and located between the grate and the second bulkhead and extending from the bottom of the fire box above the grate to a level higher than the level of the highest flue tube but below the level of said horizontal plate, whereby hot gases from the fire box will collect and mix near the level of the plate in front of the baffle before being drawn downwardly again to enter the flue tubes to the rear of the baffle.

**4,418,650**  
**FLUIDIZED BED HEAT EXCHANGER HAVING AN INSULATED FLUID COOLED AIR DISTRIBUTOR PLATE ASSEMBLY**

Richard C. Johnson, Dansville, N.Y.; Venkatraman Seshamani, Gillette, N.J., and Leigh B. Egbert, Dansville, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.  
 Filed Sep. 20, 1982, Ser. No. 420,445  
 Int. Cl.<sup>3</sup> F22B 1/00; F28D 13/00  
 U.S. Cl. 122-4 D

15 Claims

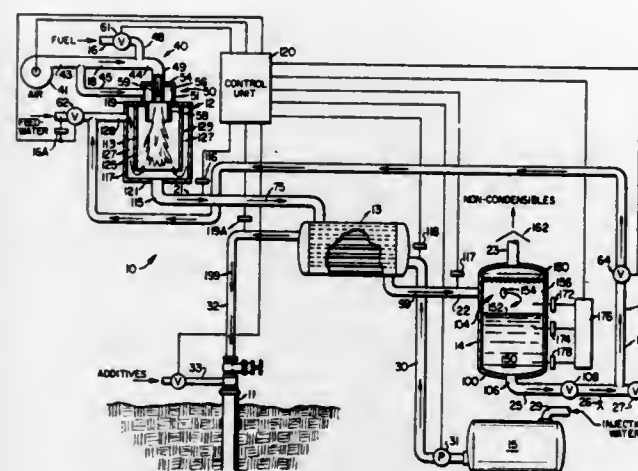


1. A fluidized bed heat exchanger comprising a plate assembly including a plurality of spaced parallel horizontal tubes, said plate assembly extending in a substantially horizontal plate to support a bed of particulate material, means for passing a cooling fluid through said tubes, a plurality of openings formed through said plate assembly, an air plenum located below said plate assembly for introducing heated air into said openings, said air passing through said openings to fluidize said particulate material, and means for insulating the lower surface of said plate assembly from the heat of said air.

**4,418,651**  
**SYSTEM FOR HEATING AND UTILIZING FLUIDS**  
 William G. Wyatt, Arlington, Tex., assignor to Vapor Energy, Inc., Grand Prairie, Tex.  
 Filed Jul. 2, 1982, Ser. No. 394,721  
 Int. Cl.<sup>3</sup> F22B 1/02

U.S. Cl. 122-31 R

26 Claims



1. A hot water supply system utilizing a combustion of fuel and air and the mixture of water, steam and non-combustibles to provide resultant hot water at a select temperature, said system comprising:

- a vapor generator of the type having a chamber for the receipt and combustion of a fuel-air mixture;
- a means for supplying feedwater to said chamber for the conversion of said feedwater, fuel and air to lower pressure steam and non-condensibles therein;
- means for conveying said low pressure steam and non-condensibles away from said vapor generator;
- pump means for delivering a stream of relatively cool water at high pressure from a source thereof;
- a heat exchanger for effecting heat exchange between said low pressure stream of steam and non-condensibles and said stream of cool high pressure water to heat the water stream to a desired temperature without substantially reducing the pressure thereon, while condensing at least some of the steam from said stream of steam and non-condensibles;
- means for sensing the temperature of said resultant heated water and producing an output signal in response thereto; and
- control means for detecting the output of said sensing means and controlling the flow of said feedwater and high pressure cool water for regulating the flow and temperature of said resultant high pressure heated water.

**4,418,652**  
**STEAM GENERATOR HAVING A SUPERHEATER TUBE BANK**

Karl Rees, Ruti, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland  
 Filed Aug. 17, 1982, Ser. No. 408,926  
 Claims priority, application Switzerland, Sep. 15, 1981, 5943/81

Int. Cl.<sup>3</sup> F22G 3/00

U.S. Cl. 122-468

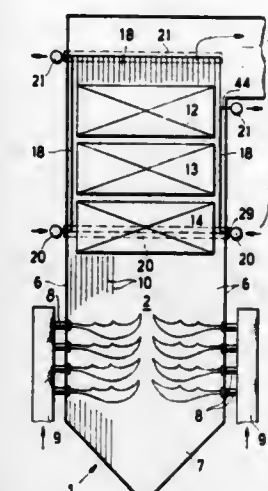
13 Claims

1. In a steam generator, the combination comprising a combustion chamber having at least two walls of evaporator tubes;
- a gas flue above and in communication with said combustion chamber, said flue having at least two walls, each said wall including a plurality of evaporator tubes and webs securing said tubes together in seal-tight manner;
  - a plurality of forked connectors at a lower end of said flue, each connector connecting a respective pair of adjacent

evaporator tubes of said combustion chamber walls to a respective evaporator tube of said gas flue walls;

a bank of vertical superheater tubes disposed in said gas flue over said evaporator tubes; and

a plurality of forked elements at a lower end of said bank of



said superheater tubes, each said forked element having a bend extending through a respective web between an adjacent pair of said evaporator tubes of said gas flue walls and being connected respectively to a pair of said superheater tubes to distribute a working medium therebetween.

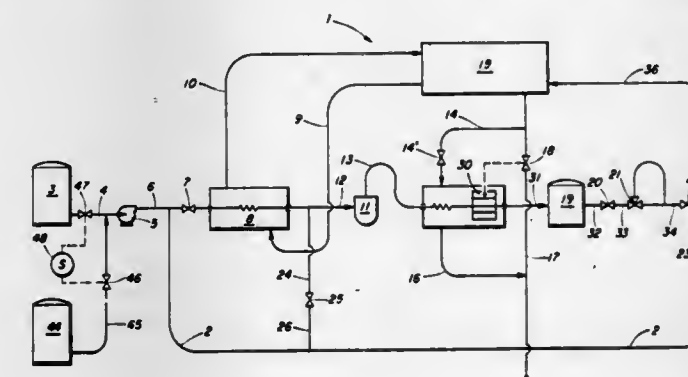
**4,418,653**  
**ALCOHOL FUEL DUAL-CATALYST TREATMENT APPARATUS AND METHOD**  
 Heeyoung Yoon, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Jun. 7, 1982, Ser. No. 385,747

Int. Cl.<sup>3</sup> F02M 27/02

U.S. Cl. 123-3

5 Claims



1. A fuel treatment and distribution apparatus in combination comprising:
- an internal combustion engine
  - an alcohol fuel storage tank,
  - a vaporizer means,
  - a dual catalyst containing reactor means, said catalyst containing reactor comprising a dehydrated catalyst means and a dissociation catalyst means,
  - said dehydration catalyst being active in the catalysis of methanol to form dimethyl ether and water,
  - said dissociation catalyst being active in the catalysis of methanol to form carbon monoxide and hydrogen,
  - said alcohol storage tank being in fluid flow communication with said vaporizer means,
  - said vaporizer being in fluid flow communication with said dual catalyst containing reactor means, so that alcohol vapor from said vaporizer means first passes through said dehydration catalyst means and then passes through said dissociation catalyst means,
  - said catalyst containing reactor means being in fluid flow

communication with said internal combustion engine, whereby at least a portion of the alcohol from said alcohol storage tank is dehydrated to form water and an ether in said dehydration catalyst means and at least a portion of said alcohol is dissociated to  $H_2$  and  $CO$  in said dissociation catalyst means and at least a portion of said water and said  $CO$  reacts to form  $CO_2$  and  $H_2$  prior to being passed to said engine.

5. A method of operating an internal combustion engine comprising in sequence the steps as follows:

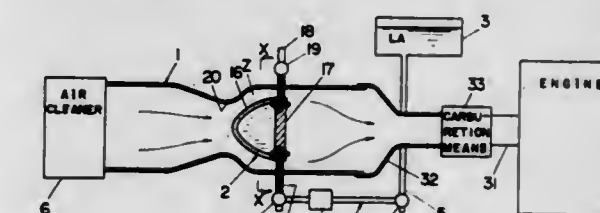
- (a) providing a dual catalyst reactor means having a dehydration catalyst and dissociation catalyst
- said dehydration catalyst being active in the catalysis of methanol to form dimethyl ether and water,
- said dissociation catalyst being active in the catalysis of methanol to form carbon monoxide and hydrogen,
- (b) providing methanol,
- (c) vaporizing said methanol to form methanol vapor,
- (d) dehydrating a portion of said feed methanol vapor over said dehydration catalyst in a first portion of said reactor means, to form carbon monoxide and a portion of the hydrogen of said first portion gaseous mixture said first portion gaseous mixture comprising hydrogen, water, carbon monoxide, dimethyl ether and residual methanol,
- (e) dissociating at least a portion of said residual methanol in a second portion of said reactor means to form carbon monoxide and a portion of the hydrogen of a second portion gaseous mixture,
- (f) forming a portion of the hydrogen of said second portion gaseous mixture by reaction of said water formed in said first reactor portion with carbon monoxide, to form said second portion gaseous mixture comprising hydrogen,
- said second portion gaseous mixture being formed in the presence of said first portion gaseous mixture whereby a combustion feed gaseous mixture comprising hydrogen and dimethyl ether is formed,
- (g) conveying said combustion feed gaseous mixture to said internal combustion engine,
- whereby said engine is operated by combustion of said combustion feed gaseous mixture with air.

**4,418,654**  
**FUEL SUPPLEMENT SUPPLYING DEVICE FOR AN INTERNAL COMBUSTION ENGINE**  
 Kodo Keiun, 1-9, 4-chome, Sakuragaoka, Minoo, Osaka, 562, Japan

Filed May 27, 1982, Ser. No. 382,640  
 Claims priority, application Japan, May 27, 1981, 56-80294  
 Int. Cl.<sup>3</sup> F02M 25/02

U.S. Cl. 123-25 A

7 Claims



1. A fuel supplement supplying device for an internal combustion engine to add a liquid additive into the air being introduced prior to be mixed with fuel comprising:
- an induction duct open at its one end to the atmosphere and communicatively connected at its opposite end to the combustion chamber of the internal combustion engine;



a reservoir disposed outside of said induction duct and adapted to hold a volume of liquid additive such as water and methanol therein;

a hollow vaporizing head disposed within said induction duct upstream of the mixing area where a fuel is mixed with the air passing therethrough to define a constricted annular zone between the head and the induction duct; and

a feed line interconnecting the reservoir and the vaporizing head for feeding said liquid additive into the vaporizing head;

said vaporizing head having at least the wall of porous material extending across the entire periphery thereof and defining the contour of the head, said wall of porous material having per se a large number of minute spaced apart pores which are diffused substantially uniformly across the entire surface thereof and being exposed to said constricted annular zone over the substantially entire circumference of the head, and said reservoir being open to the atmosphere, whereby in response to a vacuum developed upon operation of the engine within the induction duct such liquid additive is fed from the reservoir to said head from where the same is sucked out through the pores of the wall into the stream of the air passing through said annular zone toward said mixing area and is vaporized in said air.

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# CYLINDER HEAD FOR AIR-COMPRESSING, SELF-IGNITING INTERNAL COMBUSTION ENGINE

Richard Henning, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

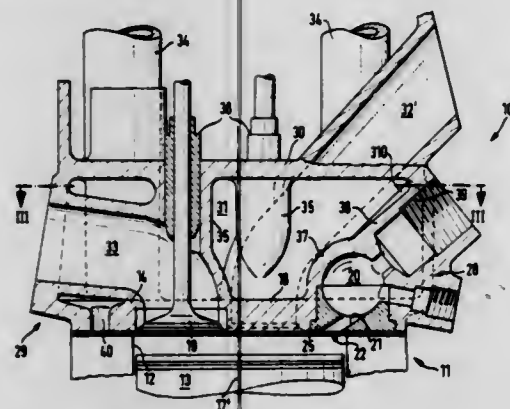
Filed Apr. 2, 1982, Ser. No. 365,042

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113308

Int. Cl.<sup>3</sup> F02F 1/38, 1/42

U.S. Cl. 123—41.82 R

9 Claims



1. A cylinder head for an air-compressing, self-igniting injection internal combustion engine comprising

a substantially plate-shaped cylinder head bottom with adjoining walls of gas exchange ducts of a secondary combustion chamber separated from each other on a coolant side and exhibiting on the combustion chamber side sealing seats for valves, arranged approximately in a common plane, in the orifices of the gas exchange ducts, and wherein the secondary combustion chamber comprises a combustion port of a smaller cross-section as compared with the chamber cross-section and the combustion port is oriented approximately centrally toward a relatively wide main web extending between two inlet valves in the cylinder head bottom,

an outlet valve arranged in the cylinder head bottom essentially diametrically opposite to an orifice of a single combustion port of the secondary combustion chamber, wherein the two inlet valves are arranged on respective sides of a first cylinder plane of symmetry and in an approximately contacting-to-overlapping fashion in regard to a

second cylinder plane of symmetry located perpendicularly to the first, and

wherein the outlet valve and the orifice of the combustion port of the secondary combustion chamber on the cylinder side are arranged centrally in the first cylinder plane of symmetry, respectively close to the periphery of a cylinder projection

whereby a substantially even temperature distribution in the cylinder head bottom is achieved.

4,418,656

# ROTARY MOTION TRANSFORMER

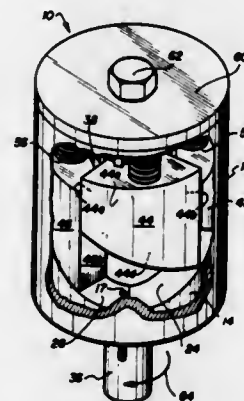
Austin N. Stanton, 4240 Briar Creek La., Dallas, Tex. 75214

Continuation of Ser. No. 126,893, Mar. 3, 1980, abandoned. This application Aug. 24, 1982, Ser. No. 410,966

Int. Cl.<sup>3</sup> F02B 75/26

U.S. Cl. 123—58 AM

21 Claims



1. A rotary motion transformer, comprising:

a housing;

a shaft extending coaxially within said housing and rotatable relative thereto;

a set of n pistons where n is an even number, each piston having an outer surface mating with the interior surface of said housing and an inner surface mating with said shaft;

an annular cam at one end of said housing, said cam having n helicoid surfaces facing said pistons, said surfaces alternating ascending and descending to form n/2 lobes on said cam;

a helicoid surface on the end of each of said pistons facing said cam, said piston helicoid surfaces mating with alternate ones of said helicoid surfaces on said cam, said pistons rotatable relative to said cam; and

port means extending to within said housing for providing fluid communications with said transformer.

4,418,657

# SPLIT CYCLE INTERNAL COMBUSTION ENGINES

John D. Wishart, P.O. Box 171, Blackburn, Victoria, 3130, Australia

PCT No. PCT/AU81/00159, § 371 Date Jun. 11, 1982, § 102(e) Date Jun. 11, 1982, PCT Pub. No. WO82/01741, PCT Pub. Date May 27, 1982

PCT Filed Nov. 6, 1981, Ser. No. 395,087

Claims priority, application Australia, Nov. 13, 1980, PE6471; Apr. 5, 1981, PE8689

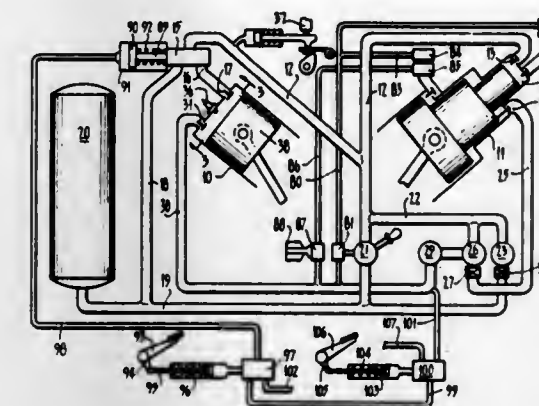
Int. Cl.<sup>3</sup> F02B 1/08, 33/00, 75/00

U.S. Cl. 123—68

4 Claims

1. A spark ignition internal combustion engine comprising a firing cylinder and a compression cylinder having reciprocating therein respectively a power piston and a compression piston connected to a common crankshaft, a combustion chamber defined by the firing cylinder head, at least one recess containing valve heads and spark plug electrodes, and the crown of the moving power piston characterised by means directing into the combustion chamber in advance of the spark as the power piston approaches or reaches top dead centre a

pilot charge composed of spark-ignitable fuel mixed with compressed air from the compression cylinder at a pressure below 2000 kPa, means producing a spark across the electrodes at or near top dead centre, and means directing into the combustion



chamber after the spark and while the piston is moving away from the cylinder head on the first part of the power stroke a second charge composed of fuel and compressed air from the compression cylinder at a pressure greater than 2000 kPa.

4,418,658

# ENGINE VALVE

James DiRoss, 8002 E. Hubbell St., Scottsdale, Ariz. 85257

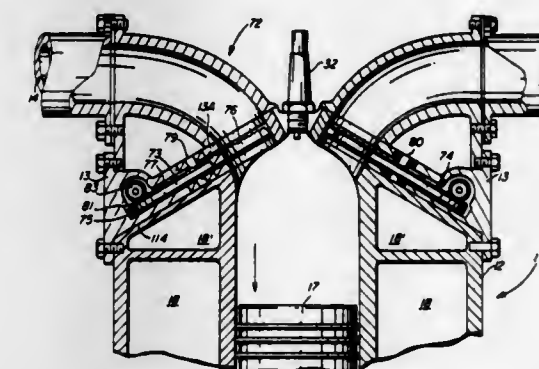
Continuation-in-part of Ser. No. 166,142, Jul. 7, 1980,

abandoned. This application Sep. 20, 1982, Ser. No. 420,015

Int. Cl.<sup>3</sup> F01L 7/06

U.S. Cl. 123—80 D

4 Claims



1. A pressure generating device comprising in combination:

a dome-shaped block,

said block defining a cylinder having input and exhaust ports,

a piston reciprocally mounted in said cylinder,

at least one circular flat rotary valve having flat surfaces on opposite sides thereof and a port extending therethrough for controlling one of said input and exhaust ports,

said rotary valve being mounted on said block for rotation on an outside surface thereof for controlling the associated port,

said block defining a wear surface around the port against which said valve temporarily seats during each cycle of the pressure generating device,

one of the flat surfaces of said valve being provided with a rack of gear teeth on that surface around its periphery at a point near its edge,

a drive gear for meshing engagement with said rack of gear teeth,

means for rotating said drive gear in a timed sequence for controlling the operation of said piston; and

a cooling chamber formed in said block immediately below said outside surface of said block on which said valve rotates for cooling said valve,

said cooling chamber extending over at least one-half of said outside surface of said block on which said valve rotates.

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# PROCESS FOR PREVENTING THE PUMPING OF A HYDRAULIC VALVE CLEARANCE COMPENSATING ELEMENT IN VALVE OPERATING MECHANISMS OR INTERNAL COMBUSTION ENGINES

Georg Gaede, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 100,026, Dec. 3, 1979, Pat. No. 4,359,019.

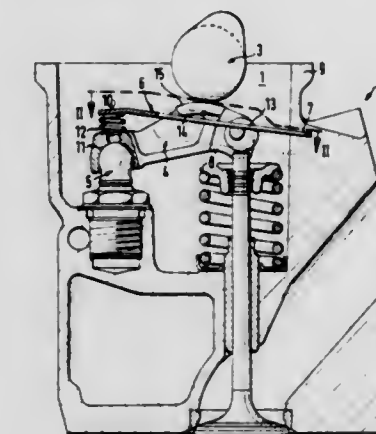
This application Apr. 16, 1982, Ser. No. 369,029

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852293

Int. Cl.<sup>3</sup> F01L 1/18, 1/24

U.S. Cl. 123—90.46

10 Claims



1. In a valve operating mechanism of an internal combustion engine comprising

hydraulic valve clearance compensating means,

a valve actuating lever supported by said valve clearance compensating means in a bearing zone of said lever and cam means for controlling movement of the valve actuating lever, the improvement comprising

means acting upon said bearing zone of said lever for applying an auxiliary force in response to the movement of said cam means to said valve clearance compensating means only during a valve lifting phase of said cam means, said auxiliary force being greater than and directed to counteract a compensating force of said valve clearance compensating means and being independent of a bearing force of said valve actuating lever.

4,418,660

# PLASMA IGNITION SYSTEM USING PHOTOTHYRISTORS FOR INTERNAL COMBUSTION ENGINE

Hiroshi Endo, Masazumi Sone, Iwao Imai, and Yasuki Ishikawa, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Apr. 7, 1982, Ser. No. 367,036

Claims priority, application Japan, Apr. 7, 1981, 56-51262

Int. Cl.<sup>3</sup> F02P 1/00

U.S. Cl. 123—143 B

6 Claims

1. A plasma ignition system for an internal combustion engine having a plurality of cylinders, comprising:

(a) a plasma ignition plug located within each corresponding cylinder and having a central electrode and grounded side electrode;

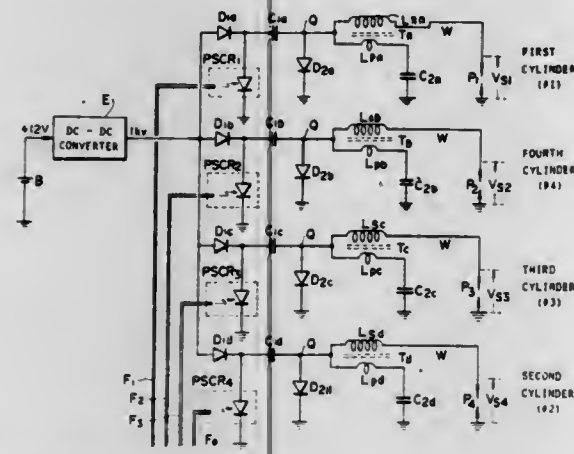
(b) a DC-DC converter for boosting a low DC voltage supplied thereto to a high DC voltage;

(c) a plurality of plasma ignition energy capacitors, each for charging the high DC voltage received from said DC-DC converter;

(d) a plurality of photo-sensitive switching elements, each connected between one terminal of each corresponding plasma ignition energy capacitor and ground which turns on to apply the plasma ignition energy charged within said corresponding plasma ignition energy capacitor to the

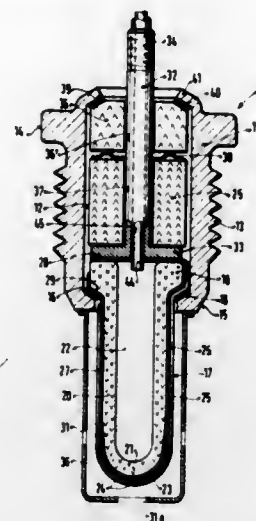


- corresponding plasma ignition plug in response to a light trigger signal received thereat;
- (e) a plurality of voltage-boosting transformers, each having a common terminal of primary and secondary windings connected to the other terminal of each corresponding plasma ignition energy capacitor and another terminal of the primary winding connected to said corresponding plasma ignition plug for boosting the voltage across the corresponding plasma ignition energy capacitor to a still higher voltage at the secondary winding thereof depending on the winding ratio between the primary and secondary windings;
- (f) an auxiliary capacitor connected between another terminal of said secondary winding of each voltageboosting transformer and ground so as to form an oscillation circuit together with the primary winding of said corresponding voltage-boosting transformer;
- (g) an ignition timing signal generator which produces and sequentially outputs an electrical ignition timing signal for each cylinder at a predetermined timing according to the engine revolution; and
- (h) a plurality of light emitting elements, each connected to said ignition timing signal generator and which emits a light signal for triggering said corresponding photo-sensitive switching element to turn on in response to the electrical ignition timing signal from said ignition timing signal generator.



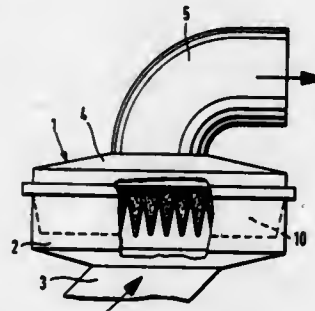
**4,418,661**  
**GLOW PLUG, PARTICULARLY FOR DIESEL ENGINE**  
 Friedrich Esper, Leonberg; Thomas Frey, Rutesheim; Heinz Geier, Gerlingen; Gerhard Holfelder, Ditzingen, and Günther Knoll, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed May 27, 1981, Ser. No. 267,516  
 Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104401

- Int. Cl.<sup>3</sup> F23G 7/00; F02P 19/02  
 U.S. Cl. 123-145 A 23 Claims
1. Glow plug for preheating of gases, particularly for use in an internal combustion engine, having a tubular metal holding plug (11) having an opening (12) therethrough;
- a ceramic tube (20, 20') secured with one end in the opening of the plug;
- an electric heater means (24, 24') located on the surface of said ceramic tube;
- and at least one connecting element (32) extending through the central opening of the plug and insulated therefrom; wherein the ceramic tube has a closed bottom (21) at the other end thereof defining an enclosed hollow interior space (22) within the tube;
- electrical heater current connection means (26, 27; 26', 27') are provided, extending from the region of the holding plug to the heater means (24, 24') and electrically connected thereto, and including an electrical connection to said connecting element (32);



and wherein said heater means (24, 24') is a layer or film of metal located on the tube essentially only in the region of said closed bottom (21).

**4,418,662**  
**ENGINE AIR INTAKE FILTER WITH FUMES-ABSORBING SUBSTANCE**  
 Walter Engler, Bietigheim-Bissingen; Hans Erdmannsdörfer, Ludwigsburg; Heinz Müller, Remseck, and Manfred Wagner, Stuttgart, all of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany  
 Filed Jul. 10, 1981, Ser. No. 282,158  
 Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 8019041[U]  
 Int. Cl.<sup>3</sup> B01D 50/00; F02M 33/02  
 U.S. Cl. 123-198 D 6 Claims

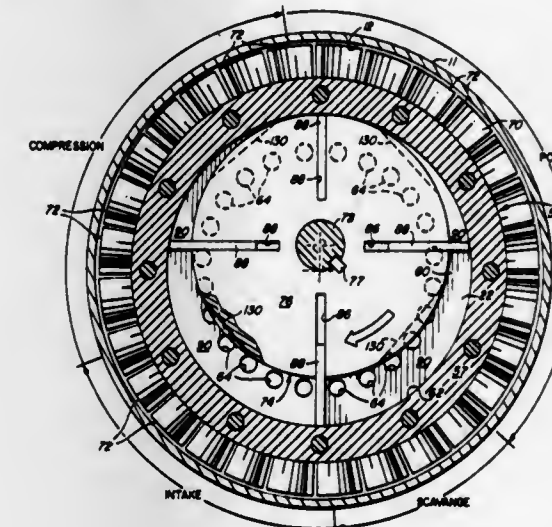


1. An air intake filter for use with an internal combustion engine and designed to prevent the escape through the filter of fuel fumes when the engine is at standstill, the filter comprising in combination:
- a closed filter housing assembly having a raw air inlet and a clean air outlet; and
- a filter cartridge partitioning the interior of the filter housing assembly into a raw air space and a clean air space in such a way that the combustion air which flows through the filter is traversing the filter cartridge in a substantially vertical direction; wherein the filter cartridge comprises:
- a block-shaped filter body of zigzag-folded filter paper having fold edges at the top and bottom of the filter body oriented within an angular range of 30° from a horizontal plane and defining generally wedge-shaped fold cavities upstream and downstream of the filter paper;
- an air-permeable bed of a granular fuel-absorbant material filling the downstream fold cavities to a level at which the downstream fold edges are submerged a small distance in said bed;
- an air permeable cover layer on the downstream side of the fuel-absorbant bed, the cover layer having air passages

which are smaller than the fuel-absorbant granules, thereby holding the latter in place; and

a sealing collar surrounding the filter body and the cover layer in the manner of a frame, the sealing collar serving to attach the cover layer to the filter body and to position the filter cartridge inside the filter housing assembly.

**4,418,663**  
**ROTARY ENGINE**  
 Arthur P. Bentley, P.O. Box 1952, Roswell, N. Mex. 88201  
 Filed Dec. 21, 1981, Ser. No. 332,539  
 Int. Cl.<sup>3</sup> F02B 53/00  
 U.S. Cl. 123-243 10 Claims



1. A rotary internal combustion engine comprising:
- (a) an engine housing including:
- I. a main body portion having a bore which forms a rotation chamber;
- II. an end plate mounted on one end of the main body portion for closing thereof, said end plate having a fuel inlet passage formed therethrough for receiving a fuel mixture from an external supply thereof and directing it into the rotation chamber, said end plate having an exhaust port formed therethrough through which spent exhaust gases exit said engine housing;
- III. a fuel porting partition mounted at the opposite end of said main body portion and having a first plurality of fuel transfer ports formed therethrough which are disposed to lie in spaced increments on a circular centerline adjacent the periphery of said fuel porting partition and having a second plurality of fuel transfer ports formed therethrough which are disposed to lie in spaced increments about a circular centerline of reduced diameter;
- IV. a support partition mounted on the opposite end of said main body portion with said fuel porting partition interposed therebetween, said support partition configured to provide a fuel induction chamber between said fuel porting partition and said support partition, said fuel induction chamber for receiving the fuel mixture from said rotation chamber through the first plurality of fuel transfer ports of said fuel porting partition and directing the received fuel mixture into said second plurality of fuel transfer ports of said fuel porting partition;
- V. an end cover mounted on the opposite end of said main body portion with said fuel porting partition and said support partition interposed therebetween, said end cover configured to form a chamber between said support partition and said end cover;
- (b) a rotor chamber casing having a rotor chamber therein, said rotor chamber casing journaled for rotation within the rotation chamber of said engine housing;
- (c) a rotor assembly journaled for rotation about an axis

which is eccentric with respect to the rotational axis of said rotor chamber casing, said rotor assembly including:

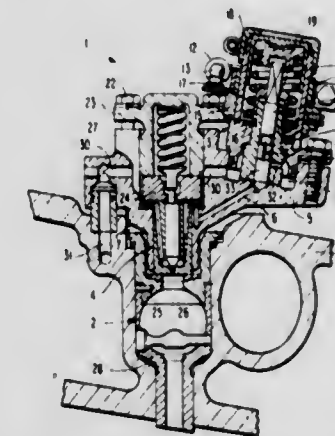
I. a rotor body positioned within the rotor chamber of said rotor chamber casing;

II. at least a spaced pair of radially reciprocal vanes mounted in said rotor body to form a combustion chamber therebetween;

III. an output shaft fast with said rotor body for rotation therewith and extending axially from said rotor body, said output shaft having an elongated power output end; and

(d) means connected between said rotor assembly and said rotor chamber casing for coupling combustion induced rotary motion of said rotor assembly to said rotor chamber casing so that said rotor chamber casing is driven at the same speed as said rotor assembly.

**4,418,664**  
**MODULAR PUMP-NOZZLE UNIT FOR AN INTERNAL COMBUSTION ENGINE**  
 Walter Bellmann, Esslingen-Sulgries, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany  
 Filed Dec. 1, 1980, Ser. No. 211,904  
 Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948407  
 Int. Cl.<sup>3</sup> F02M 47/02  
 U.S. Cl. 123-273 14 Claims



1. A pump-nozzle unit for internal combustion engines combined into one individual unit having a pump element with a pump piston, having an injection nozzle disposed next to said pump element, and having a basic unit serving as the support for the pump element and the injection nozzle, with said basic unit being firmly inserted in a recess disposed in the cylinder head, and having a spring housing located in the injection nozzle at the level of the pump piston, with said spring housing having a pressure spring interacting with a nozzle needle of the injection nozzle, characterized in that the injection nozzle as a whole can be removed separately from the pump element from the basic unit remaining at the cylinder head.

**4,418,665**  
**METHOD OF AND APPARATUS FOR CONTROLLING THE AIR INTAKE OF AN INTERNAL COMBUSTION ENGINE**

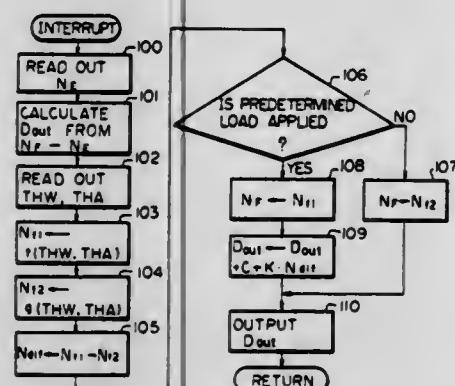
Masaomi Nagase, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan  
 Filed Sep. 17, 1981, Ser. No. 303,108  
 Claims priority, application Japan, Sep. 24, 1980, 55-131461  
 Int. Cl.<sup>3</sup> F02M 23/06  
 U.S. Cl. 123-339 10 Claims

1. A method of controlling the air intake of an internal combustion engine having an intake passage, a throttle valve disposed in the intake passage, and an air bypass passage which interconnects the intake passage at a position located upstream



of the throttle valve with the intake passage at a position located downstream of the throttle valve, said method comprising the steps of:

monitoring whether at least one predetermined load is applied to the engine, to produce at least one load discrimination signal which indicates the monitored result;  
detecting the actual rotational speed of the engine to produce a rotational speed signal which corresponds to the detected rotational speed;  
comparing said produced rotational speed signal with a variable reference rotational speed signal which indicates a desired idling rotational speed of the engine, to generate a control output signal for adjusting the bypassed section of the air bypass passage, said desired idling rotational



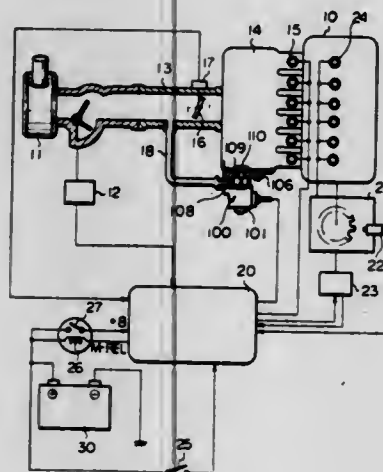
speed being determined depending upon said load discrimination signal;

additionally changing, in response to said load discrimination signal, said control output signal by a value which corresponds to the difference between a first value related to a desired idling rotational speed when said predetermined load is applied to the engine and a second value related to a desired idling rotational speed when said predetermined load is not applied to the engine; and

adjusting, in response to the control output signal, the sectional area of said air bypass passage to control the flow rate of air drawn through said air bypass passage so as to reduce the difference between the actual rotational speed signal and the reference rotational speed signal.

**4,418,666**  
**DEVICE FOR CONTROLLING THE IDLING SPEED OF**  
**AN ENGINE**

**Yasutaka Yamauchi, Toyota, and Hiroshi Ito, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan**  
**Filed Jun. 22, 1982, Ser. No. 391,474**  
**Claims priority, application Japan, Aug. 7, 1981, 56-124238**  
**Int. Cl.<sup>3</sup> F02B 33/00; F02D 11/10**  
**U.S. Cl. 123—339** **7 Claims**



### 1. A device for controlling the idling speed of an engine

comprising a main intake passage, a throttle valve arranged in the main intake passage, a bypass passage branching off from the main intake passage upstream of the throttle valve and being connected to the main intake passage downstream of the throttle valve, and a control valve arranged in the bypass passage, said device comprising:

- a step motor actuating the control valve and having a plurality of step positions which are changed in accordance with the rotating motion of said step motor;
- a plurality of memories each storing data which indicates the step position at which said step motor is positioned;
- first means for comparing the step positions stored in said memories and determining the actual step position of said step motor;
- second means for detecting the operating condition of the engine to produce an output signal indicating that the engine is idling; and
- electronic control means operated in response to the output signal of said second means and producing a step motor drive signal for rotating said step motor until said actual step position becomes equal to a predetermined desired step position when the engine is idling.

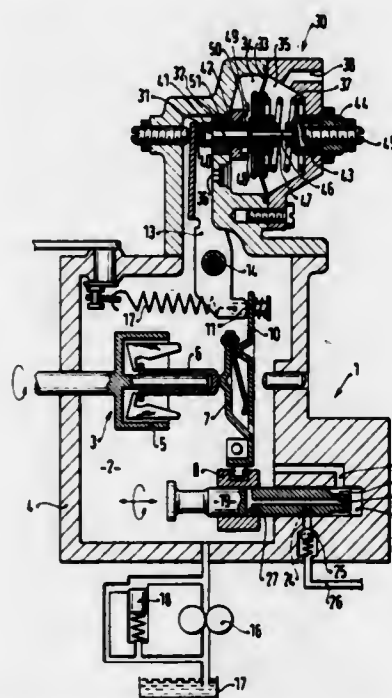
**4,418,667**  
**FUEL INJECTION PUMP FOR INTERNAL**  
**COMBUSTION ENGINES**

**Ilija Djordjevic, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**  
Filed Sep. 7, 1982, Ser. No. 415,215  
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147220

U.S. Cl. 123-387

Int. Cl.<sup>3</sup> F02D 1/06

### 3 Claims



1. A fuel injection pump for an internal combustion engine, more specifically a distributor injection pump having a pump housing defining therewithin an inner chamber, said inner chamber comprising a suction chamber into which a feed pump supplies fuel at a speed dependent pressure, said injection pump further having a mechanical speed governor which acts upon a regulating lever, said regulating lever being connected with a feed adjustment member of the fuel injection pump and arranged to traverse an adjustment path, said adjustment path of said regulating lever being limited by a full load stop determining a maximum full load fuel quantity, said injection pump being provided with a control device for setting a position of said stop, characterized in that the control device comprises in combination: a slidably mounted stop piston which acts on the full load stop, a control chamber connected with the suction

chamber via a throttle orifice, a spring chamber in which is disposed a work spring urging the stop piston toward the full load stop, a diaphragm separating said control chamber from said spring chamber, said stop piston further being provided with a bore for slidably receiving a control piston, said control piston further having a front face urged by said pressure in the suction chamber in one direction and having an extremity urged by a control spring in the opposite direction, said control chamber being selectively connectable with said spring chamber via a control means actuatable as a function of the positions of the stop piston and the control piston with respect to one another.

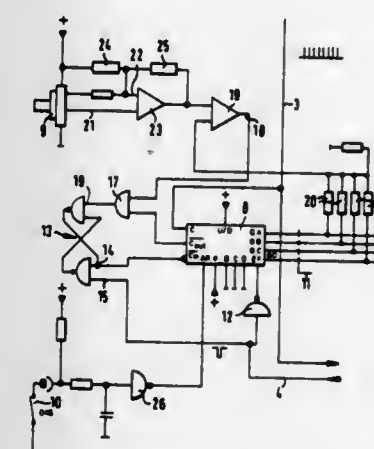
**4,418,668**  
**ELECTRONIC IGNITION PULSE GENERATOR**  
**Burkhard Brandner, Werdohl; Manfred Knüßelmann, Düsseldorf, and Reinhold Blaubach, Eggenstein-Leopoldshafen, all of Fed. Rep. of Germany, assignors to Atlas Aluminium-Fahrzeugtechnik GmbH, Werdohl, Fed. Rep. of Germany**  
**Filed Nov. 30, 1981, Ser. No. 325,734**

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045246

U.S. Cl. 123—416

Int. Cl.<sup>3</sup> F02P 5/04

### 8 Claims



1. An adjustment pulse generator for the electronic ignition pulse generator of an internal combustion engine, particularly of the type which has a carburetor in its fuel system, which ignition pulse generator includes an angle-of-rotation pulse generator producing a sequence of pulses in synchronism with the rotation of a shaft of the engine and a cycle signal of fixed phase value which serves as a reference point in each cycle, and an ignition point computer determining the timing of an ignition signal in terms of a variable phase lag from said cycle signal, in accordance with timing adjustment parameters which reflect changing conditions of engine operation such as engine speed and engine intake pressure, the adjustment pulse generator comprising in combination:

a resettable 2<sup>n</sup>-binary counter adapted to receive and count the angle-of-rotation pulses, the counter including at least one reset entry, a count entry, a count-blocking entry, and a full-count exit, as well as a collection line with n separate conductors for the transmission of an adjustment pulse count to the ignition point computer;

- a digital-to-analog converter connected to the collection line of the binary counter and producing a corresponding incrementally increasing count-reflective analog voltage;
- a pressure transducer measuring the air pressure in the engine intake duct by producing a corresponding pressure-reflective voltage;

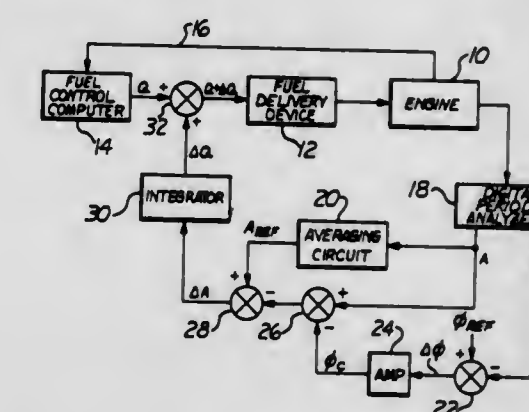
a first voltage comparator comparing the count-reflective and pressure-reflective voltages and producing an output signal corresponding to their difference; and  
an RS flip-flop gate having a set-entry receiving the cycle signal, a set-exit connected to the count-blocking entry of the binary counter, and a reset-entry connected to the exit

of the first voltage comparator and to the full-count exit of the binary counter.

**4,418,669**  
**FUEL DISTRIBUTION CONTROL SYSTEM FOR AN**  
**INTERNAL COMBUSTION ENGINE**  
**Edwin A. Johnson, Clarkston, and Chun K. Leung, Bloomfield**  
**Hills, both of Mich., assignors to The Bendix Corporation,**  
**Southfield, Mich.**

U.S. Cl. 123-436

## 21 Claims



1. A fuel distribution control for an internal combustion engine comprising:

means for computing the phase angle and amplitude signals indicative of the torque impulses applied to a rotary member of the engine by the combustion process in each engine cylinder;

first difference means for comparing said computed phase angle signal with a reference phase angle to generate a phase angle correction signal;

first sum means for summing said computed amplitude signal with said phase angle correction signal to generate a corrected amplitude signal;

second difference means for comparing said corrected amplitude signal with a reference amplitude signal to generate an amplitude error signal:

integrator means for integrating said amplitude error signals to generate a fuel quantity correction signal for each engine cylinder;

**fuel control computer means** for generating a fuel quantity signal for each engine cylinder in response to detected engine parameters; and

second sum means for summing said fuel quantity signals with said fuel quantity correction signals to change the quantity of fuel delivered to the engine tending to equalize the amplitude of the torque impulses generated by the individual engine cylinder.

4,418,670

**FUEL INJECTION PUMPING APPARATUS**

David F. Lakin, London, England, assignor to Lucas Industries  
Limited, Birmingham, England

Filed Sep. 10, 1981, Ser. No. 301,019  
Claims priority, application United Kingdom, Oct. 10, 1980,  
8032778

Int. Cl.<sup>3</sup> F02D 1/02

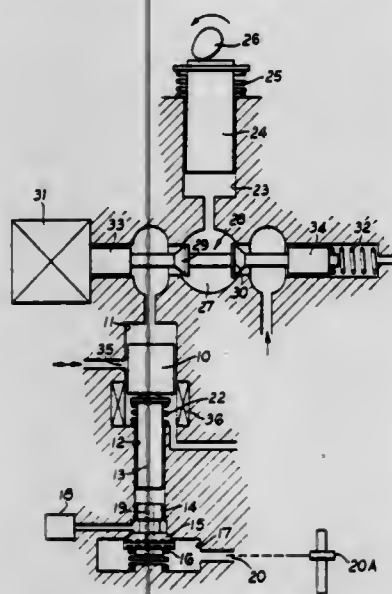
U.S. Cl. 123-446

### 3 Claims

1. A fuel injection pumping apparatus for supplying fuel to an injection nozzle of an internal combustion engine comprising piston means contained within a bore, an outlet from one end of the bore, said outlet in use communicating with an inlet of the nozzle, a fuel inlet to said one end of the bore connected in use to a source of fuel under pressure, a valve operable to prevent flow of fuel through said inlet during delivery of fuel through said outlet, a reciprocable plunger contained within a cylinder, engine operated cam means for urging the plunger



towards one end of the cylinder, passage means connecting said one end of the cylinder with the other end of said bore whereby liquid displaced during movement of the plunger by the cam will act on said piston means to urge the piston means to displace fuel through said outlet, a solenoid controlled two-way valve operable to permit liquid flow in one position between the bore and the cylinder and in the other position between the cylinder and a source of liquid, a transducer for providing a signal indicative of the position of said piston means, and a control circuit for controlling the operation of said valve whereby in use, during inward movement of the plunger by the cam the valve is moved to said one position when delivery of fuel is required and is returned to the other



position after said piston means has moved a predetermined extent during the time when the plunger is allowed to move outwardly by the cam, said two way valve comprising a valve chamber, first passage means connecting said valve chamber with said cylinder, a second passage means extending from said chamber and communicating with said bore, a third passage means extending from said chamber for connection to a source of liquid under pressure, first and second seatings disposed about said second and third passage means respectively, a valve member disposed in said chamber, said valve member mounting first and second valve heads for cooperation with said first and second seatings respectively, and pressure balancing pistons being exposed to the pressure in said bore and the pressure of liquid supplied from said source respectively.

4,418,671

**DUAL SOLENOID DISTRIBUTOR PUMP**

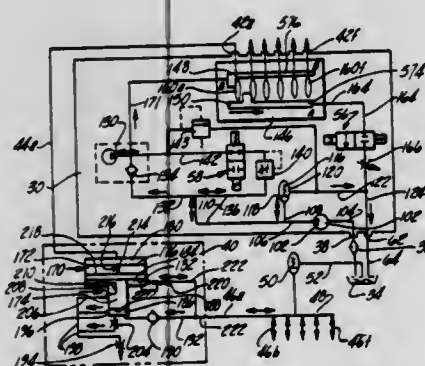
Charles R. Kelso, Farmington, and Richard P. Walter, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 17, 1980, Ser. No. 217,352

Int. Cl.<sup>3</sup> F02M 59/42; F02B 77/00

U.S. Cl. 123—450

9 Claims



1. A distributor pump having a metering and an injection mode of operation and adapted to receive electric control signals from a controller and further adapted to receive fluid

from a fluid reservoir for supplying pressurized fluid comprising:

a housing having a return port adapted to be connected to the reservoir, an input port adapted to receive fluid from the reservoir and further having a plurality of output ports;

first pressure source means for supplying pressurized fluid at a determinable first pressure level;

timing valve means, that is normally open, for diverting the output of said first pressure source means to a distributor valve means during the injection mode of operation and for diverting the output of said first pressure source means to said return port during the metering mode of operation, said timing valve means adapted to receive electrical signals in timed relationship to the combustion process within the engine;

metering valve means, that is normally closed, connected between said distributor valve means and said return port for controlling the duration of fluid flow from said distributor valve means to said return port during the metering mode in correspondence with the combustion process within said engine and wherein said metering valve means is adapted to receive electrical signals in timed sequence to the combustion process within an engine;

distributor valve means for receiving fluid under pressure from said first pressure source means including first distributor means for sequentially connecting the pressurized fluid to a particular one of said output ports in timed sequence with the operation of said timing valve means and with the combustion process within the engine, said distributor valve means further including second distributor means for sequentially connecting said particular one of said output ports to said metering valve means for a determinable length of time prior to the time said particular one of said output ports is connected to said first pressure source means; and

first orifice means located between said metering valve means and said return port for regulating the rate at which fluid flows from said distributor valve means to said return port.

4,418,672

**FUEL SUPPLY SYSTEM**

Klaus Müller, Tamm; Franz Rieger, Aalen, and Ernst Linder, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

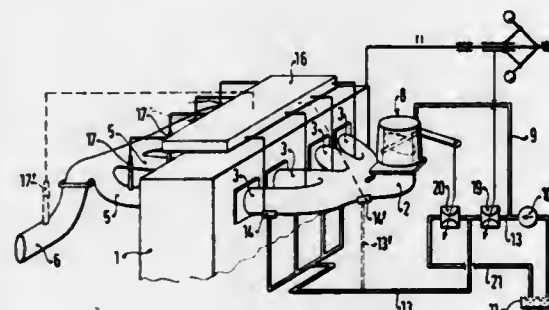
Filed Mar. 6, 1981, Ser. No. 241,332

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008618

Int. Cl.<sup>3</sup> F01N 3/15

U.S. Cl. 123—478

6 Claims



1. A fuel supply system for a mixture-compressing internal combustion plural cylinder engine having internally-supplied ignition, and including a primary mixture formation unit disposed in a common intake tube having branches leading to individual cylinders of said engine and at least one supplementary mixture formation unit also disposed in each of the branches thereof, characterized in that at least one ultrasonic atomizer nozzle serves as said supplementary mixture forma-

tion unit and is disposed in said intake tube branch downstream of said primary mixture formation unit, triggering of each of said ultrasonic atomizer nozzles is effected by programmable means stored in a memory of an electronic control device, said memory having stored therein a performance graph showing the non-uniform distribution of the mixture to the individual cylinders of said engine, and said engine further including individual exhaust manifold lines, and exhaust sensor means in each of said lines for detecting oxygen content in the exhaust gas, and for controlling said at least one ultrasonic atomizer nozzle via said electronic control device.

4,418,673

**ELECTRONIC CONTROL FUEL INJECTION SYSTEM FOR SPARK IGNITION INTERNAL COMBUSTION ENGINE**

Noboru Tominari, Tokyo, and Takashi Ishida, Ohi, both of Japan, assignors to Mikuni Kogyo Co., Ltd. and Noboru Tominari, both of Tokyo, Japan

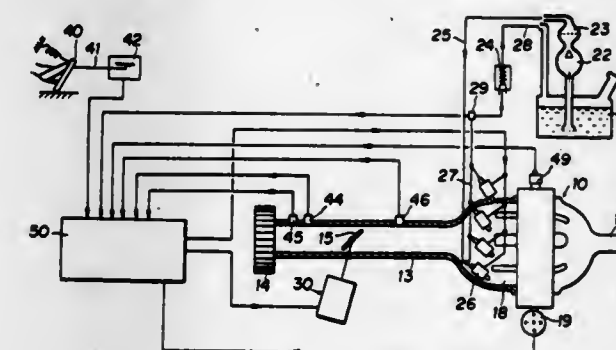
Filed Nov. 6, 1981, Ser. No. 318,867

Claims priority, application Japan, Nov. 28, 1980, 55-168361

Int. Cl.<sup>3</sup> F02M 31/00

U.S. Cl. 123—478

18 Claims



1. An electronic control fuel injection system for an internal combustion engine for preferentially determining a fuel flow rate according to the stroke of an accelerator pedal and subordinately determining an air flow rate in response to the engine operating state comprising:

a fuel metering mechanism for selecting a fuel discharge amount in accordance with the depression stroke of an accelerator pedal and feeding said selected fuel discharge amount through an injector mechanism to said engine, an air flow sensor for detecting the intake air flow rate to said engine,

a fuel pressure detector provided in a fuel supply line feeding said injector mechanism for detecting fuel pressure in said line,

an air pressure detector for detecting air pressure in the vicinity of said injector mechanism,

means for correcting said selected fuel discharge amount in accordance with the outputs of said fuel pressure detector and air pressure detector to achieve a predetermined fuel pressure difference across said injector mechanism, at least one engine parameter sensor,

a computer receiving output signals from said fuel metering mechanism, said air flow sensor and said engine parameter sensor and determining therefrom an optimum air flow rate and producing an air flow rate control signal in accordance with a desired operating state of the engine, and a throttle valve control mechanism for setting the opening of a throttle valve of said engine in accordance with the air flow rate control signal produced by said computer.

4,418,674

**ELECTRONIC FUEL INJECTION CONTROL SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES**

Shumpei Hasegawa, Niiza, and Akihiro Yamato, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

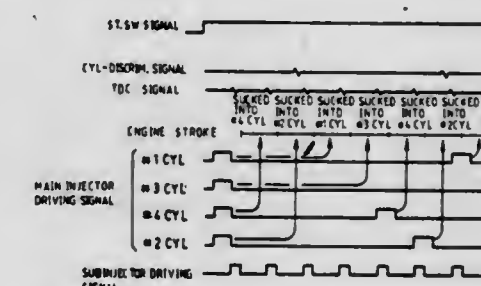
Filed Jun. 3, 1982, Ser. No. 384,608

Claims priority, application Japan, Jun. 10, 1981, 56-89025

Int. Cl.<sup>3</sup> F02D 5/02

U.S. Cl. 123—491

3 Claims



1. An electronic fuel injection control system for electronically controlling the quantity of fuel being supplied to an internal combustion engine having a plurality of cylinders, an output shaft, and a starter, comprising: a sensor for detecting at least one predetermined angular position of said output shaft of said engine to generate a signal indicative of a detected angular position; a plurality of fuel injection valves corresponding in number to said cylinders, each provided for each of said cylinders; a control circuit adapted to cause opening of said fuel injection valves in synchronism with generation of said angular position signal, for supplying a controlled amount of fuel into said cylinders; and a starting switch adapted to actuate said starter of said engine when closed; said control circuit being operable to cause opening of all said fuel injection valves at the same time to supply fuel into respective ones of said cylinders immediately upon closing of said starting switch, keep closing of all said fuel injection valves until after all said cylinders have pistons thereof complete respective first suction strokes thereof after said closing of said starting switch, and upon completion of said first suction strokes of all said cylinders, cause successive opening of said fuel injection valves in predetermined sequence in synchronism with subsequent generation of said angular position signal occurring after the completion of said first suction strokes of all said cylinders to supply fuel to respective ones of said cylinders.

4,418,675

**ADJUSTING DEVICE FOR A FUEL-INJECTION PUMP OF AN INTERNAL COMBUSTION ENGINE**

Gerd Niemeier, Stuttgart, and Ulrich Conrad, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 17, 1982, Ser. No. 349,518

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105738

Int. Cl.<sup>3</sup> F02M 59/20

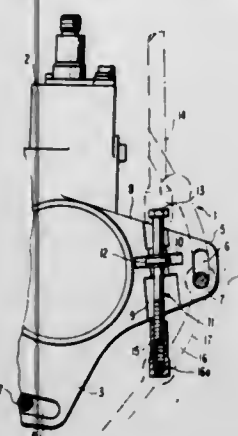
U.S. Cl. 123—501

6 Claims

1. A device for adjusting a start time of fuel delivery of a fuel-injection pump, comprising a fuel-injection pump including a flange means for enabling a mounting of the fuel-injection pump on an internal combustion engine, the adjusting device includes an adjusting member, guide means being provided in the flange means for rotatably and nonaxially displaceably receiving the adjusting member, mounting means adapted to be secured on the engine for adjustably accommodating the adjusting member so as to enable an adjustment of the fuel-injection pump upon an adjustment of the adjusting member with respect to the mounting means, the guide means including a



recess formed in the flange means, and an annular slot formed in the recess, and the adjusting member including a collar



means adapted to be disposed in the annular slot so as to prevent an axial displacement of the adjusting member.

4,418,676

### CARBURETION SYSTEM FOR A V-TYPE INTERNAL COMBUSTION ENGINE

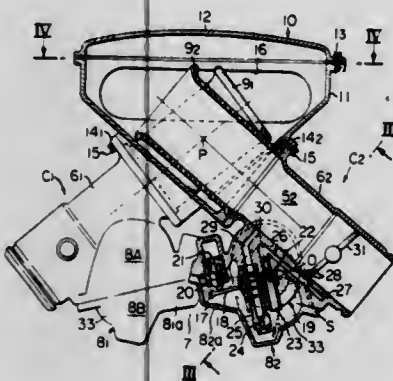
Suminari Iwao, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1982, Ser. No. 409,530

Claims priority, application Japan, Aug. 19, 1981, 56-130585 Int. Cl.<sup>3</sup> F02B 13/00

U.S. Cl. 123-580

4 Claims



1. In an improved carburetion system for a V-type internal combustion engine comprising a first carburetor and a second carburetor disposed in a space between a first cylinder and a second cylinder arranged in the form of V-shape and adapted to supply an air-fuel mixture to the respective cylinders, said carburetors each including an intake barrel and a float chamber in which fuel to be supplied to said intake barrel is stored, said intake barrel having an inlet port and an outlet port and defining an intake passage leading to the associated cylinder, the improvement wherein the intake barrels of both the carburetors are arranged in the ultimate proximity of one another in such a manner that they intersect one another and a point of intersection of the intake barrels is offset from the middle part of the intake barrels toward the inlet port of the latter so that the float chambers are located in a space between both the intake barrels below the point of intersection.

4,418,677

### ALTERNATOR FOR IGNITION SYSTEM AND AUXILIARY POWER

Gloris R. Hofmann, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 3, 1981, Ser. No. 317,827

Int. Cl.<sup>3</sup> F02P 1/02, 5/04, 3/06

U.S. Cl. 123-599

4 Claims

1. An alternator apparatus for supplying electrical power to a capacitor discharge ignition system of an internal combustion

engine and for supplying electrical power to a separate power load, said alternator apparatus comprising:

- (A) an engine driven flywheel mounted for rotation on said engine, said flywheel including a circumferential flange;
- (B) a plurality of circumferentially spaced magnets mounted on the flange of said flywheel and lying in a common plane; and
- (C) a stator assembly mounted on said engine concentrically with said flywheel and radially inward of said flange, said stator assembly including
  - (1) a circular magnetic core having a plurality of circum-



ferentially spaced radial power poles lying in the plane of said magnets and at least two radial ignition poles offset from said plane,

- (2) power windings mounted on each of said power poles, and
- (3) ignition windings on each of said ignition poles, said ignition windings including a high speed winding and a low speed winding with said high speed winding having a substantially smaller number of turns of heavier wire than said low speed winding, all of said windings responding to the magnetic field created by said magnets to generate electrical outputs.

4,418,678

### INSULATED BARBEQUE UNIT

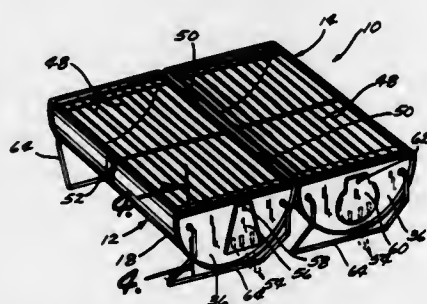
Frederick J. Erickson, Des Moines, Iowa, assignor to Ehco, Inc., De Moines, Iowa

Filed Nov. 16, 1981, Ser. No. 321,741

Int. Cl.<sup>3</sup> A47J 37/00; F24C 1/16

U.S. Cl. 126-9 R

7 Claims



1. A barbecue unit comprising:

- a rectangular inner wall having opposite side edges and opposite end edges, said inner wall being curved so that said side edges are presented upwardly, thereby forming an upwardly presented concave surface and a downwardly presented convex surface;
- a rectangular outer wall having opposite side edges and opposite end edges, said side edges of said outer wall being curved upwardly so that said outer wall forms an upwardly presented concave surface and a downwardly presented convex surface;
- an inner end connecting means joining said upper edges of said inner and outer walls and holding said inner and outer walls together in nested relationship with at least a portion of said convex surface of said inner wall being spaced from at least a portion of said concave surface of said outer wall to define a cavity therebetween;

grate means extending between said opposite edges of said inner and outer walls and bridging across and above said upwardly presented concave surface of said inner member;

a pair of spaced apart end walls each extending in a plane perpendicular to said inner and outer walls and each being joined to one of said end edges of said inner and outer walls;

heat insulating material filling said cavity whereby heat from coals resting on said concave surface of said inner wall will be substantially insulated from said outer wall, said concave surface of said outer wall forming one-half of a circular cylinder and said end walls being shaped in a semi-circle and forming the axial ends of said one half of said circular cylinder, and

a second outer wall forming a second half cylinder identical to said first half cylinder formed by said first mentioned outer wall, a second pair of endwalls being joined to said second outer wall to form axial ends of said second half cylinder, hinge means interconnecting one of said edges of said first outer wall to one of said edges of said second outer wall to permit said first and second cylinder halves to pivot about a horizontal axis therebetween from a joined position wherein said first and second half cylinders form a complete circular cylinder to a spread position approximately 180° therefrom.

4,418,679

### CERAMIC WALL SPACER KIT

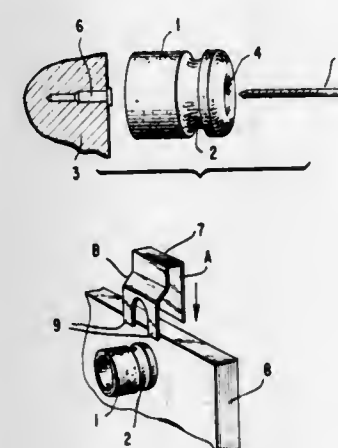
Roy N. Grayson, Aristo-mat, Inc., 1718 E. 75th St., Chicago, Ill. 60649

Filed Jun. 5, 1980, Ser. No. 156,672

Int. Cl.<sup>3</sup> F24C 15/36

U.S. Cl. 126-201

3 Claims



1. A ceramic wall spacer kit for mounting a stove board comprising:

- at least one ceramic spacer separating the stove board from a wall, said spacer having about its periphery a groove;
- means for mounting said spacer to a wall; and
- a bracket for affixing said spacer to the stove board, said bracket having two portions, one portion being a rectangular shaped channel that snaps down over the top of the stove board, and extending therefrom to the wall side, the other portion being a yoke having two downward directed prongs that engage the groove in the spacer, thus affixing the board to the spacer.

4,418,680

### FIREPLACE DAMPER AND AIR FLOW CONTROL

Lynn C. Broadbent, Utah County, Utah, assignor to Merle Y. Broadbent, Alpine, Utah, a part interest

Filed May 6, 1981, Ser. No. 261,049

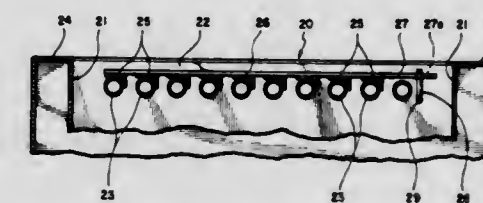
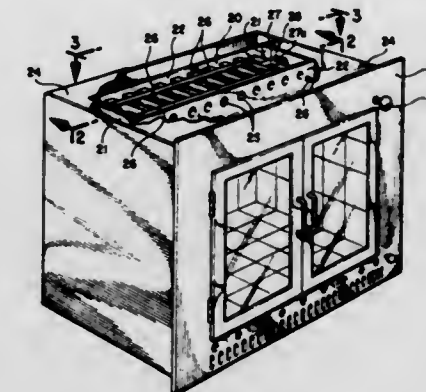
Int. Cl.<sup>3</sup> F23L 3/00

U.S. Cl. 126-289

6 Claims

1. A fireplace damper and airflow control for use with fireplaces or stoves having a plurality of heat tubes extending through the exhaust passage for smoke and other products of

combustion, comprising a plurality of slats secured in spaced, side-by-side relation to one another, each slat being adapted to be positioned above a heat tube when the damper is in open position so as to leave the spaces between the heat tubes substantially unobstructed, and each slat having a width greater than the space between the heat tube over which it is positioned when the damper is open and an immediately adjacent



heat tube; and means for moving the slats in unison from position over the heat tubes to position where the slats block or partially block the spaces between the heat tubes, the slats being arranged so that, when in closed position, the slats substantially block the spaces between the heat tubes but the spaces between the outside heat tubes and the opposite edges of the exhaust passage remain at least partially open.

4,418,681

### ASPHALT HEATING KETTLE APPARATUS

Albert L. Moody, Lawrenceville, Ga., assignor to F. C. Brown Rentals, Inc., Smyrna, Ga.

Filed Dec. 10, 1980, Ser. No. 214,631

Int. Cl.<sup>3</sup> F24H 1/00; E01C 19/45

U.S. Cl. 126-343.5 R

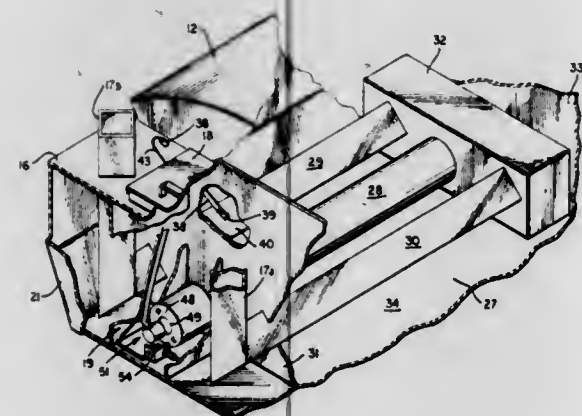
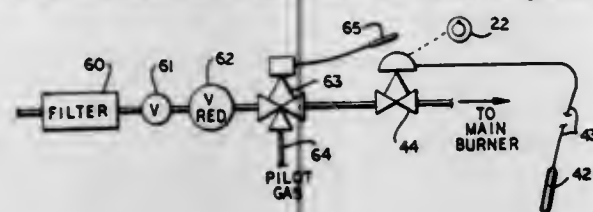
8 Claims

1. Apparatus for heating a quantity of normally solid material to maintain the material in a liquid state without overheating the material to an excessive temperature which may ignite the material, comprising in combination:

- means defining a chamber to receive a quantity of material to be heated;
- means defining a flue in heat transfer relation with the material in said chamber;
- heater means selectively operative to introduce hot gas to said flue, so as to heat the material in said chamber;
- temperature responsive means operative to sense the temperature of the material in said chamber and also responsive to the temperature of said flue in said chamber; and
- said heater means being operatively associated with said temperature responsive means to reduce the temperature of said heater means in response to a sensed predetermined



maximum temperature either of said flue in said chamber or of the material in said chamber, so as to prevent either



the flue or the material in said chamber from exceeding said maximum temperature.

4,418,682

## ASPHALT RECLAMATION UNIT

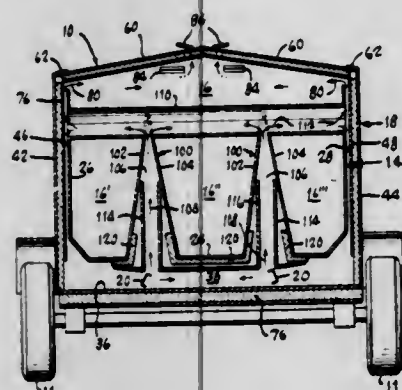
Anton H. Heller, Levittown, N.Y., assignor to Poweray Infrared Corporation, Amityville, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,661

Int. Cl.<sup>3</sup> E01C 19/08

U.S. Cl. 126-343.5 A

8 Claims



1. An asphalt reclamation unit for heating initially solid asphaltic material from ambient atmospheric temperature to an elevated temperature between about 275° F. and about 300° F. and thereafter maintaining the material at the elevated temperature to provide asphaltic concrete in a condition suitable for paving application or the like, comprising:

- (a) an upwardly open inner enclosure defining a volume for containing asphaltic material to be heated, and including a floor, end walls, and side walls;
- (b) an outer enclosure surrounding said inner enclosure and including a floor, end walls, and side walls respectively disposed in adjacent spaced relation to the floor, end walls, and side walls of said inner enclosure to define a gas space between the inner and outer enclosure floors and end and side wall gas passages between the inner enclosure walls and the outer enclosure walls respectively adjacent thereto, said outer enclosure further including door means for closing the top of the unit, said gas space communicating with the outside atmosphere, said passages communicating with said gas space and with the

uppermost portion of said volume, and said upper portion of said volume being vented to the outside atmosphere, for enabling continuous air flow into said gas space and thence through said passages and said upper portion of said volume;

- (c) at least one source of infrared energy disposed in said gas space for heating air entering said gas space from the outside atmosphere;
- (d) heating chamber means comprising at least one heating chamber projecting upwardly from the floor of the inner enclosure into an upper portion of said volume at a locality intermediate and spaced from the side walls of said inner enclosure, said one heating chamber extending from end to end of said inner enclosure and comprising thermally conductive wall portions of said inner enclosure defining a gas flow region isolated by the wall portions from said volume and opening into and extending upwardly from said gas space above said one infrared energy source; and
- (e) flue means, comprising at least one flue extending from side to side of said inner enclosure and spaced away from both ends thereof, for conducting heated air from the uppermost portion of said gas flow region transversely across said upper portion of said volume to said side wall passages, such that air heated by said source flows upwardly through said gas flow region and thence through said flue means to the side wall passages;
- (f) said walls of said inner enclosure, said heating chamber means, and said flue means being mutually disposed to enable delivery of solid pieces of the asphaltic material downwardly from the top of the unit into the lowermost portion of said volume.

4,418,683

## SEPARATED PHASE THERMAL STORAGE SYSTEM

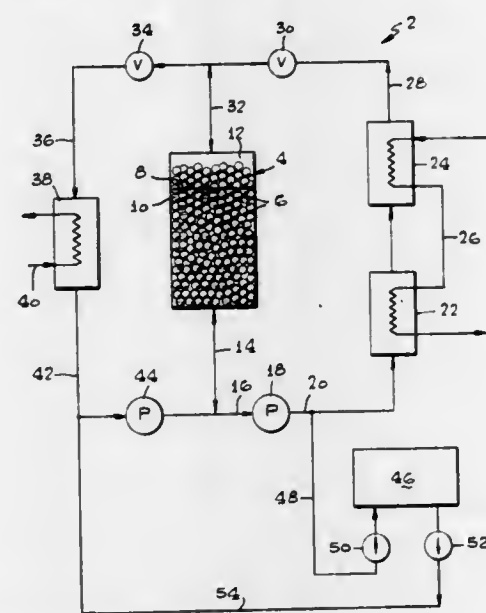
Jerome M. Friefeld, Agoura, and Joseph Friedman, Encino, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 23, 1981, Ser. No. 256,641

Int. Cl.<sup>3</sup> F24H 7/00; F28D 13/00; C09K 5/00

U.S. Cl. 126-400

2 Claims



1. A thermal storage system comprising:

- a storage tank;
- a quantity of particulate iron pyrite situated within said storage tank as a heat storage material; and
- a quantity of sulfur located within said storage tank in contact with said pyrite as a heat exchange material.

4,418,684

# ROOF APERTURE SYSTEM FOR SELECTIVE COLLECTION AND CONTROL OF SOLAR ENERGY FOR BUILDING HEATING, COOLING AND DAYLIGHTING

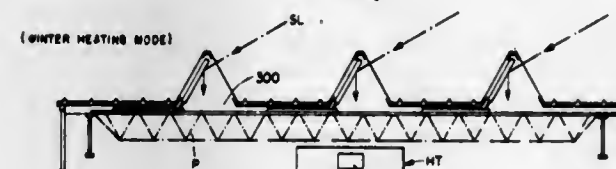
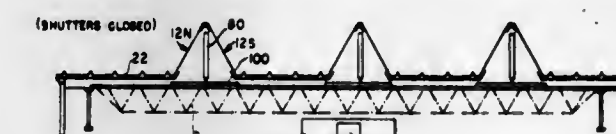
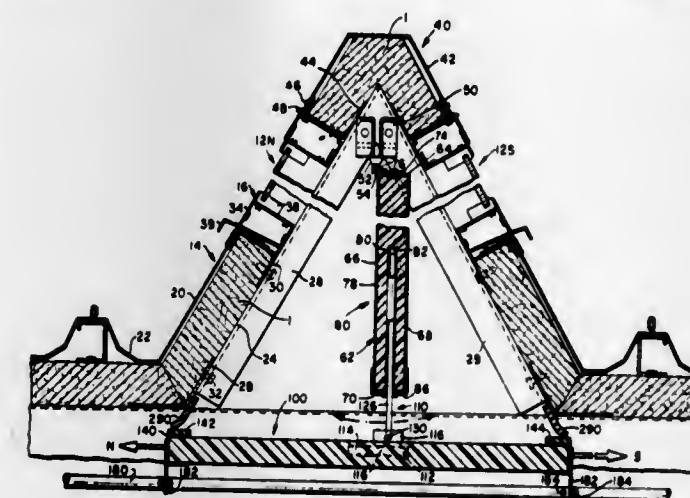
William J. Sanders, Kansas City; Marvin K. Snyder, Overland Park, both of Kans., and James W. Harter, Independence, Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Aug. 18, 1981, Ser. No. 293,998

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-419

20 Claims



1. A roof aperture system for selective collection and control of solar energy for heating, cooling and daylighting a building comprising:

- a pair of solar energy and daylight transmitting panels mounted on a frame to cover an aperture in a roof of a building, each of said panels being exposed to a separate direction of sun incidence;
- heat storage means located below said panels to have solar energy directed thereto after such solar energy has passed through said panels;
- closure means mounted adjacent said panels for controlling the amount of solar energy passing into the building aperture via said panels, said closure means including a shutter rectilinearly movably mounted on said roof adjacent said panels, a shade pivotally suspended from said frame, connecting means connecting said shutter to said shade in a manner which causes said shade to move in cooperation with said shutter, and shutter moving means connected to said shutter for moving said shutter so that the amount of solar energy passing into a building through said panels can be controlled.

4,418,685

## ROOF-MOUNTED SOLAR COLLECTOR DEVICE

Wallace N. Frazier, 15919 Notting Hill Dr., Lutz, Fla. 33549

Filed Jul. 8, 1981, Ser. No. 281,471

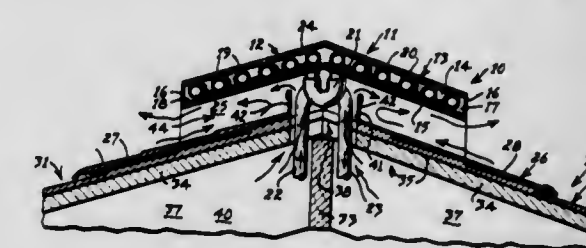
Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-428

5 Claims

- 1. A passive solar collector device adapted to be mounted in operative position on the roof of a building having an interior air space beneath the roof and a vent opening through the roof in fluid communication with the interior air space,
- (a) a solar collector panel comprising an elongated solar collecting chamber having opposite end portions and

- opposite side portions and an uninsulated thermal-conductive bottom wall of pre-determined substantial area,
- (b) means for conducting a heat transfer fluid through said collecting chamber in heat-transfer relationship with said bottom wall, including a fluid inlet and a fluid outlet,
- (c) an uninsulated thermal-conductive bearing plate beneath, and at least co-extensive with, said bottom wall, said bearing plate being adapted to seat flush against, and in thermal-conductive relationship with, a portion of a roof upon which the solar collector device is mounted in operative position, (d) thermally conductive end members spaced apart longitudinally of and fixed to said bearing plate, and in thermal-conductive relationship between said bottom wall and said bearing plate, said end members supporting said solar collector panel in spaced relationship above said bearing plate and said bottom wall,
- (e) an air inlet port extending through said bearing plate and adapted to register with the vent opening through the



roof, when the solar collector device is mounted in its operative position upon the roof, said air inlet port being in fluid communication between said air space and the interior air space beneath the roof,

- (f) opposed side openings between the respective side portions of said bottom wall and said bearing plate and between said end members in open fluid communication with said air space to permit the free passage of ambient air transversely through said air space and across said air inlet port, so that air in said air space is in heat transfer relationship with said bottom wall, said bearing plate and said end members, and is in fluid communication with the atmospheric air outside said solar collector panel and the interior air space beneath the roof, when the solar collector device is in said operative position.

4,418,686

## IMPLANT FOR INHIBITING MASTITIS IN DAIRY CATTLE

Francis W. Child, Cody, Wyo., assignor to Child Laboratories Inc., Cody, Wyo.

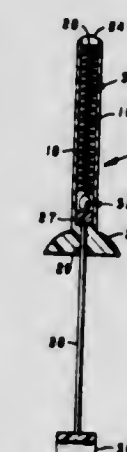
Division of Ser. No. 62,707, Aug. 1, 1979, Pat. No. 4,308,859.

This application Jul. 20, 1981, Ser. No. 285,259

Int. Cl.<sup>3</sup> A61B 19/00

U.S. Cl. 128-1 R

10 Claims



- 1. An implant for insertion through the teat milk duct and into the udder of an animal having an udder and teat attached



thereto in inhibiting growth of mastitis causing bacteria in the udder and milk duct comprising: a non-electrically conductive flexible core of a size allowing insertion through the teat milk duct for placement in the udder of an animal, said core being an elongated continuous flexible plastic string, a plurality of bands surrounding and attached to the core, adjacent bands being spaced from each other and having no electrically mechanical connection therebetween, and metal means covering each band, said metal means on some of the bands including metallic silver for generating silver ions having bactericidal action when located in the udder to inhibit growth of mastitis causing bacteria in the udder and milk duct.

4,418,687

**ELECTRIC SLEEP INDUCER**

Junji Matsumoto, Tokushima; Shohei Kamiya, and Yasuhiko Sugihara, both of Tokyo, all of Japan, assignors to Homer Ion Laboratory Co., Ltd., Japan

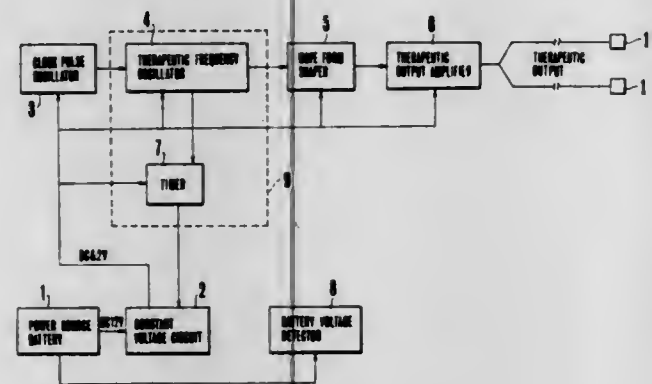
Filed Mar. 4, 1982, Ser. No. 354,626

Claims priority, application Japan, Mar. 27, 1981, 56-44882

Int. Cl.<sup>3</sup> A61N 1/34

U.S. Cl. 128—1 C

5 Claims



1. An electric sleep inducer comprising: a control circuit means for producing a therapeutic wave-form output which is applied at frequency values controlled non-stepwise to gradually decrease from 14 Hz to 0 Hz in a non-stepwise manner and adapted to a sleeping electroencephalogram; and cathode and anode conductor means for applying the therapeutic wave-form output of the control circuit to the head.

4,418,688

**MICROCATHETER HAVING DIRECTABLE LASER AND EXPANDABLE WALLS**

Marvin P. Loeb, Chicago, Ill., assignor to Laserscope, Inc., Arlington Heights, Ill.

Filed Jul. 6, 1981, Ser. No. 280,247

Int. Cl.<sup>3</sup> A61B 1/00

U.S. Cl. 128—6

22 Claims



1. A fiber optic microcatheter device suitable for performing medical procedures in a lumen within a patient, the microcatheter device comprising:

- (a) an elongated external tube constructed of a flexible material, having a distal end and a peripheral elastic, expandable zone spaced from the distal end;
- (b) an elongated flexible internal conduit having a distal end proximate to the distal end of the external tube and positioned within the external tube;

- (c) at least one fiber optic viewing bundle located within the internal conduit and substantially coterminous with the distal end of the internal conduit to permit viewing within the lumen;
- (d) at least one laser light transmitting fiber located within the internal conduit and substantially coterminous with the distal end of the internal conduit to permit propagation of laser light through the conduit to a site within the lumen;
- (e) expanding means associated with the elastic, expandable zone for increasing the outside diameter of the zone so as to form a liquid seal with the lumen;
- (f) a substantially rigid collar inside and in contact with the external tube, the collar located between the elastic zone and the distal end of the external tube; and
- (g) a conduit directing system including at least one cable having a directing length portion between the internal conduit and the collar such that shortening of the directing length portion tilts the distal end of the internal conduit with respect to the external tube, the cable also including a control length portion attached to the directing length portion to shorten the directing length portion.

4,418,689

**LASER DEVICE FOR AN ENDOSCOPE**

Akira Kanazawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

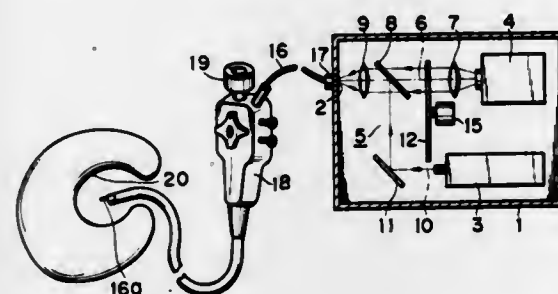
Filed Sep. 15, 1981, Ser. No. 302,468

Claims priority, application Japan, Sep. 22, 1980, 55-132196; Oct. 24, 1980, 55-151734[U]

Int. Cl.<sup>3</sup> A61B 1/00

U.S. Cl. 128—6

3 Claims



1. A combination of an endoscope and laser device, wherein the endoscope comprises an insertable channel, a laser probe which is detachably taken into the insertable channel and is provided with a light-emitting member projecting from the insertable channel, and an observation section; and the laser device emits medical treatment laser beams and illumination light beams into the endoscope through the laser probe, and comprises a housing provided with a light-emitting section to which the laser probe can be connected, a medical treatment laser beam oscillator held in the housing comprising an infrared laser beam oscillator which can emit laser beams, a light source means received in the housing which can selectively emit at least two visible rays having different colors, said light source means being capable of issuing nonmonochromatic light beam and having means for selectively converting said nonmonochromatic light beams into light beams having at least two different colors comprising two different colored filters and means for selectively setting said two filters on the optical axis of the nonmonochromatic light beams, and an optical system which converges laser beams emitted from the medical treatment laser beam oscillator and visible rays sent forth from the assembly of illumination light sources, thereby conducting said laser beams and illumination light beams to the light-emitting section.

4,418,690

**APPARATUS AND METHOD FOR APPLYING A DYNAMIC PRESSURE WAVE TO AN EXTREMITY**

Thomas A. Mummert, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

Filed Aug. 3, 1981, Ser. No. 289,380

Int. Cl.<sup>3</sup> A61H 1/00

U.S. Cl. 128—24 R

13 Claims



1. An apparatus for applying a dynamic pressure wave against a mammal extremity comprising: an inflatable cylindrical cone chamber tapering from a larger diameter outer end to a smaller diameter inner end, said cone chamber adaptable for surrounding the extremity without applying any pressure thereto when inflated; an inflatable sleeve chamber enclosing said cone chamber, said sleeve chamber adaptable for exerting a compressive force against the exterior of said cone chamber and the extremity surrounded therein when inflated; and pneumatic control means pneumatically connected to said cone chamber and said sleeve chamber for inflating and deflating said chambers according to a predetermined sequence, whereby said compressive force is applied to the extremity as a dynamic pressure wave.

4,418,691

**METHOD OF PROMOTING THE REGENERATION OF TISSUE AT A WOUND**

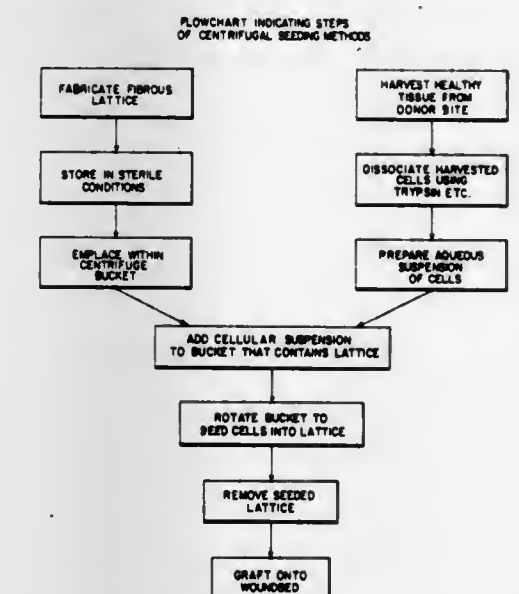
Ioannis V. Yannas, Newton Center; John F. Burke, Belmont; Dennis P. Orgill, Cambridge, and Eugene M. Skrabut, Beverly, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 26, 1981, Ser. No. 315,234

Int. Cl.<sup>3</sup> A61L 15/00

U.S. Cl. 128—156

18 Claims



14. A method of promoting the regeneration of damaged or removed tissue at a wound, comprising the following steps:

- a. creating a suspension of cells in a liquid that has a lower density than said cells;
- b. placing said suspension of cells in contact with a fibrous lattice within a container that is suitable for centrifugal rotation;
- c. rotating said container at a speed and duration sufficient to embed a substantial number of cells into said lattice;

- d. securing said lattice in contact with said wound;
- e. monitoring the growth of cells within or upon said lattice;
- f. distributing a quantity of an aqueous suspension of said cells of the desired variety into or upon the regions of said lattice where the centrifugally seeded cells are not growing adequately.

4,418,692

**DEVICE FOR TREATING LIVING TISSUE WITH AN ELECTRIC CURRENT**

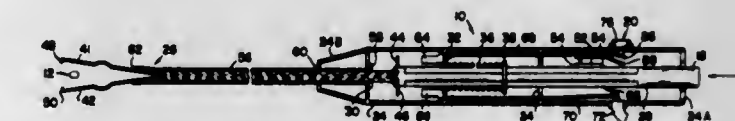
Jean-Louis Guay, 8770 Moorhead Cir., E., Boulder, Colo. 80303

Filed Nov. 17, 1978, Ser. No. 961,569

Int. Cl.<sup>3</sup> A61B 17/39

U.S. Cl. 128—303.14

19 Claims



1. A device for treating living tissue with an electrical current from a power source, comprising in combination: a substantially cylindrical body member having a first end and a second end; a sleeve, having one end disposed within said second end of said body member and a terminal end extending therefrom; means for fixably mounting said one end of said sleeve within said second end of said body member; a piston, slidably mounted relative to said body member and slidably received within said sleeve; urging means for urging said piston to a first position relative to said body member and said sleeve; means for moving said piston to a second position relative to said body member and said sleeve against said urging means; a first and a second electrode element; means for mounting at least one of said first and second electrode elements, for movement in accordance with the movement of said piston; means to control the divergence and convergence of said first and second electrode elements upon a reciprocating longitudinal movement of said piston; said first and second electrode elements disposed to grasp the living tissue when said piston is in said first position and disposed to release the living tissue when the piston is in said second position; and means for connecting said first and second electrode elements to the electrical power source to provide an electrical current flow relative to the living tissue; said connecting means including switch means mounted on said body member and means mounted on said piston cooperating with said switch means, to allow said electrical current flow only when said piston is in said first position.

4,418,693

**VEIN AND TUBING PASSER SURGICAL INSTRUMENT**

Eric G. LeVeen, 3-3 Woodlake Rd., Albany, N.Y.; Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147, and Jeanette L. Rubricus, 321 Confederate Cir., Charleston, S.C. 29407

Filed Dec. 10, 1980, Ser. No. 215,047

Int. Cl.<sup>3</sup> A61B 17/00

U.S. Cl. 128—303 R

11 Claims

1. An apparatus for vessel transfer comprising a tubular outer member and an inner slidable member, one of which is rigid and one of which is flexible, said tubular outer member and inner slidable member being adapted to be passed through body tissue to an elected distant site which has been surgically exposed, a handle means extending aside and fixed to one end of said outer member, said handle means being adapted to insert said tubular outer member containing said inner slidable



member into body tissue and to pull said tubular outer member from body tissue leaving said inner slidable member in body tissue, and attaching means adapted to attach a hollow vein, prosthesis or elastomeric tubing to one end of the flexible member after removing the outer member from the body tissue so that the flexible member can be used to pull said hollow



vein, prosthesis or elastomeric tubing through the body tissue to said elected distant site, said attaching means comprising a body adapted to be inserted into said hollow vein, prosthesis or elastomeric tubing, said body having a diameter of at least a portion of its surface greater than the interior diameter of said hollow vein, prosthesis or elastomeric tubing.

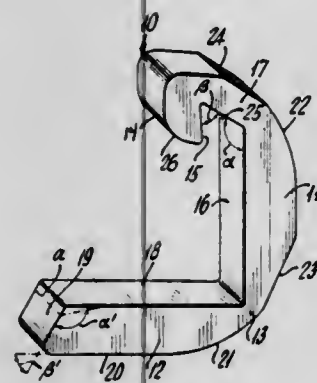
#### 4,418,694 NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIPS

Howard Beroff, Bridgewater; Namassivaya Doddi, Manville, and Stephen J. Jewusiak, Denville, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 49,376, Jun. 18, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 282,461  
Int. Cl.<sup>3</sup> A61B 17/12, 17/00

U.S. Cl. 128—326

4 Claims



1. A sterile, plastic, hemostatic clip comprising: first and second leg members joined at their proximal ends by resilient hinge means and terminating at their distal ends in latch means, each leg member having an outer surface and a vessel clamping inner face, said vessel clamping inner face being in opposition to the vessel clamping inner face of the other leg member; said first leg member having a body portion and a latch portion, said latch portion being disposed at the distal end of said leg member, said latch portion comprising a deflectable hook member extending from the inner face of said first leg member, said hook member having an inner face spaced from the inner face of said first leg member and substantially parallel thereto, said hook member having a connecting face, said connecting face being disposed at an acute angle to the inner face of said hook member and connecting to the inner face of said first leg member at an obtuse angle therewith, said hook member having an end face extending from the inner face of said hook member and beveled so as to form an acute angle with the inner face of said hook member, the portion of said hook member containing said connecting surface immediately adjacent the body portion of said first leg member having a reduced thickness as compared to the thickness of the first leg member to improve the deflectability of said hook member; the body portion of said first leg member between said latch portion and said hinge means comprising a center section

and two side sections, said center section being the thickest part of said body portion, the outer surface of said center section being parallel to the vessel clamping inner face of said first leg member, a first side section connecting said center section to said latch portion, the outer surface of said first side section having a substantially constant radius of curvature extending from said center section to said latch portion and a second side section connecting said center section to said hinge means, the outer surface of said second side section being tapered from the center section to the resilient hinge means; said second leg member terminating at the distal end thereof in a complementary locking portion of the latch means, said locking portion comprising an end face of said second leg member, said end face having a bevel complementary to the bevel on the end face of said hook member, said complementary bevel forming an obtuse angle with the inner face of said second leg member and adapted to deflect the said hook member and enter the space between the inner face of said hook member and the inner face of said first leg member, the greater portion of the outer surface of said leg member being substantially parallel to the inner face of said member;

whereby when said first and second leg members are pivoted about said hinge means the distal end of said second leg member deflects and engages the hook member of the first leg member to lock the clip in a closed position.

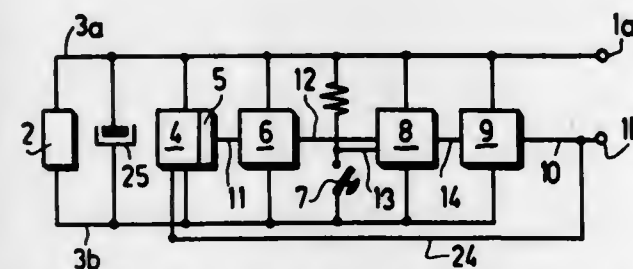
#### 4,418,695 IMPLANTABLE CARDIAC STIMULATOR HAVING THERAPEUTIC DIAGNOSTIC FUNCTIONS

Jacques Buffet, 28 avenue Thiers, 93340 Le Raincy, France  
Continuation-in-part of Ser. No. 160,168, Jun. 17, 1980, abandoned, which is a continuation of Ser. No. 20,841, Mar. 15, 1979, abandoned. This application Feb. 18, 1981, Ser. No. 235,553

Claims priority, application France, Mar. 14, 1978, 78 07270  
Int. Cl.<sup>3</sup> A61N 1/36

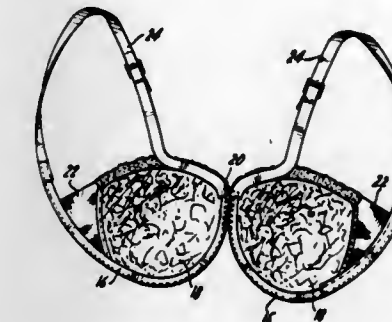
U.S. Cl. 128—419 PG

7 Claims



1. An implantable cardiac stimulator adapted to be associated with a cardiac probe, comprising terminals for connections with said probe, amplifier means connected with said terminals to receive and amplify a signal therefrom, band pass filter means for filtering the output of said amplifier means, level detector means receiving the filtered output signal of said filter means and operable to respond to a predetermined signal level, a logic module connected with the output of said level detector means, switch means operable by external magnetic means, said logic module comprising a central unit comprising microprocessor means including register means for recording isolated pulses and successive pulses, clock means providing a time base for said microprocessor, an OR gate having inputs connected with said level detector means and with said switch means and an output connected with said central unit, and memory means connected by a bus with said central unit, and an output stage connected with said logic module and with said terminals.

4,418,696  
SUPPORT BRASSIERE  
Victoria Delet, 60 West 57 St., New York, N.Y. 10019  
Continuation of Ser. No. 67,514, Aug. 17, 1979. This application  
Nov. 23, 1981, Ser. No. 324,157  
Int. Cl.<sup>3</sup> A41C 1/14  
U.S. Cl. 128—476



1. A brassiere comprising a pair of bust cups, said bust cups being secured together adjacent to the inner edge, a semi-rigid support member secured along the inner and lower portions of each of said bust cups and extending outwardly from the lower portion of each bust cup to a position beneath the wearer's arm, strap means extending at least from a position adjacent to the outer edge of said semi-rigid support member to a position on the upper portion of one of said bust cups forming a loop extending over the wearer's shoulder, and a flexible side panel secured at the outer edge of each of said bust cups and extending outwardly therefrom to engage the outwardly extending portion of said support member for retaining the outer edge of the cup against the wearer's body.

4,418,697  
ELECTRODE ATTACHMENT METHOD  
Francine Tama, 48 E. Riding Dr., Cherry Hill, N.J. 08003  
Filed Aug. 17, 1981, Ser. No. 293,518  
Int. Cl.<sup>3</sup> A61B 5/04  
U.S. Cl. 128—640

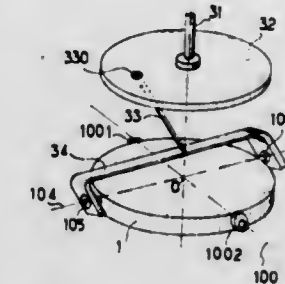
4 Claims



1. A method of securing an electrode to the skin of a human body for treatment or diagnostic purposes, said method being characterized by the steps of: positioning a surface of the electrode in contact with a desired skin area from which, or into which electrical impulses are to be directed; and maintaining the electrode in its desired position by confining it within the periphery of a pliable, moldable and stretchable adhesive putty including silicone polymer conforming to the configuration of the electrode and having a peripheral region surrounding the periphery of the electrode and being secured to the skin.

4,418,698  
ULTRASONIC SCANNING PROBE WITH MECHANICAL SECTOR SCANNING MEANS  
Jacques Dory, 91 rue des Molvaux, 77450 Esbly, France  
Filed Jul. 28, 1981, Ser. No. 287,678  
Claims priority, application France, Jul. 29, 1980, 80 16717;  
Jul. 29, 1980, 80 16718  
Int. Cl.<sup>3</sup> A61B 10/00  
U.S. Cl. 128—660

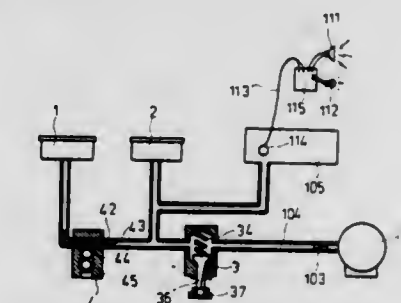
9 Claims



1. An ultrasonic probe comprising an elongated casing containing a couplant liquid and fitted at one end with an ultrasonically transmissive window having a substantially plane surface portion, a disc-shaped piezoelectric transducer having a center and immersed in said couplant liquid, electric motor means having a shaft arranged perpendicular to said plane surface portion, mechanical means for coupling said shaft to said piezoelectric transducer, means for energizing the said motor means with an energizing signal at a first frequency whereby an oscillating motion of the shaft is obtained and resetting torque generating means for resetting the said shaft into a reference angular position when the motor means is not energized with the said first frequency, said mechanical coupling means comprising: a connecting rod having first and second ends, linkage means coupled to the first end of said connecting rod for driving the said connecting rod in a conical motion about the first axis in which the connecting rod rotates upon itself without being allowed to effect any translation along its own length, means for rotatably supporting the said piezoelectric transducer about a diametrical axis fixedly positioned with respect to the said casing, the said first axis and the said diametrical axis being located in the same plane and perpendicular to one another, a yoke member, means for rotatably supporting said yoke member about an axis which is fixedly positioned with respect to the transducer and passes through the center of the transducer and perpendicular to the said diametrical axis, the said yoke member having a bracket fastened to the said second end of the connecting rod.

4,418,699  
TWIN GAUGE AND TWIN NEEDLE SPHYGMOMANOMETERS  
Hsu C. Chen, 4th Fl., 11, Lane 132, Sung-Chiang Rd., Taipei, Taiwan  
Continuation of Ser. No. 64,529, Aug. 7, 1979, abandoned. This application Feb. 25, 1982, Ser. No. 352,099  
Int. Cl.<sup>3</sup> A61B 5/02  
U.S. Cl. 28—685

4 Claims



1. A sphygmomanometer, comprising: a pressure cuff adapted to be worn by a patient;







4,418,704

**INTRAVENOUS PACEMAKER ELECTRODE**

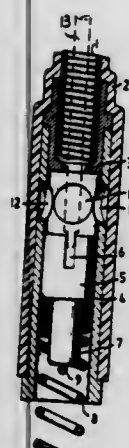
Peter Theisen, and Klaus-Dieter Riechert, both of Berlin, Fed. Rep. of Germany, assignors to Biotronik Mess- und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin, Berlin, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,477

Int. Cl.<sup>3</sup> A61N 1/04

U.S. Cl. 128—785

9 Claims



1. In a pacemaker electrode including an axially open, hollow cylinder having a cylindrical wall; a plunger axially displaceably received in said cylinder and being substantially impervious to X-rays; a securing element for attaching said electrode to the heart; said securing element being mounted on said plunger for movement therewith; said securing element and said plunger having a withdrawn position in which said securing element is in a substantially fully retracted state within said cylinder; said securing element and said plunger having an advanced position in which said securing element projects from said cylinder; the improvement wherein said cylindrical wall comprises a first portion forming a path which is substantially pervious to X-rays and a second portion axially adjoining said first portion and being substantially impervious to X-rays; said plunger substantially blocking said path for X-rays through said first portion in a direction transverse to said cylinder when said plunger and said securing element are in said withdrawn position and said plunger being substantially clear of said path in said advanced position of said plunger and said securing element, whereby the position of said plunger with respect to said first portion being determinable by an X-ray monitor.

4,418,705

**METHOD AND RELATIVE MANUFACTURING MACHINE FOR SIMULTANEOUSLY PRODUCING TWO CONTINUOUS CIGARETTE RODS**

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Società per Azioni, Bologna, Italy

Division of Ser. No. 149,000, May 12, 1980, Pat. No. 4,336,812.

This application Dec. 14, 1981, Ser. No. 330,564

Claims priority, application Italy, May 22, 1979, 49133 A/69

Int. Cl.<sup>3</sup> A24C 5/14, 5/18, 5/39

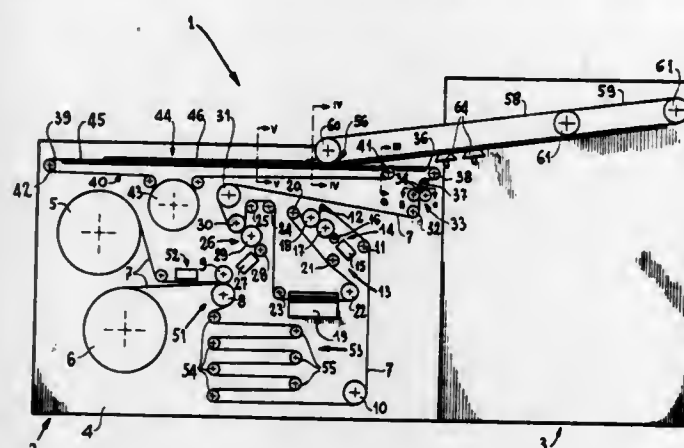
U.S. Cl. 131—84 R

8 Claims

1. A method for simultaneously producing two continuous cigarette rods, characterized by comprising two simultaneous successions of stages, the first for forming two equal strips (36) of paper starting from a single continuous web (7), and the second for forming two substantially uniform and equal fillers (57) of shredded tobacco starting from a single inlet hopper (68); said first succession comprising the following stages:

feeding said continuous paper web (7) along a determined path to a cutting position (33);  
marking equal graphical signs on said web upstream of said cutting position (33) on each side of the longitudinal axis through the web (7);

longitudinally cutting said web at said cutting position (33) into two equal strips (36);  
feeding said two strips (36) along separate paths through respective loading positions (56) at which a respective said filler (57) of shredded tobacco is fed on to each of said strips (36); and turning the opposing lateral edges of each of said strips (36) towards each other and then joining them together;  
and said second succession comprising the following stages:



withdrawing the shredded tobacco from said hopper (68) in such a manner as to provide a continuous substantially uniform stream of tobacco;  
dividing said stream into two substantially equal streams;  
feeding each of said two streams to below a respective suction conveyor belt (58-59) to form said two uniform fillers (57) of shredded tobacco; and  
feeding said two fillers to said respective loading positions (56).

4,418,706

**METHOD FOR EXPANDING TOBACCO AND APPARATUS THEREFOR**

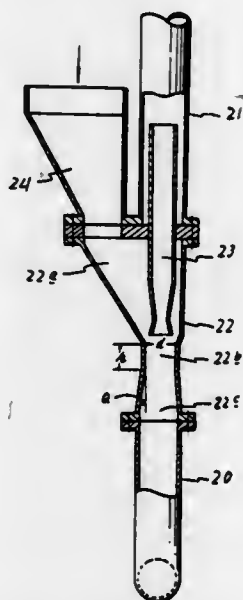
Ki-Hwan Kim; Kwang-Keun Yoo, and Tae-Ho Lee, all of Seoul, Rep. of Korea, assignors to Office of Monopoly, Seoul, Rep. of Korea

Filed Sep. 21, 1981, Ser. No. 304,057

Int. Cl.<sup>3</sup> A24B 3/18

U.S. Cl. 131—296

15 Claims



1. A process for expanding tobacco stems with superheated steam which comprises:  
preparing rolled, cut tobacco stems having a desired particle size and moisture content; supplying said stems into a U-shaped, tubular expansion device by means of a suction force produced by superheated steam being ejected down-

ward from a steam nozzle positioned in a venturi tube, said tube being present in position between the bottom end of a hopper for said stems and the upper end of the inlet of said expansion device;  
subjecting momentarily said stems to the action of the steam pressure and heat to expand said stems to a certain extent in said expansion device;  
exposing suddenly the expanded stems to an atmospheric pressure for further expansion; and  
removing moisture from the mixture of said stems and steam by means of hot air flowing through the stream of said mixture.

4,418,707

**LOCKING DEVICE OF AN AUTOMATIC OPENING UMBRELLA**

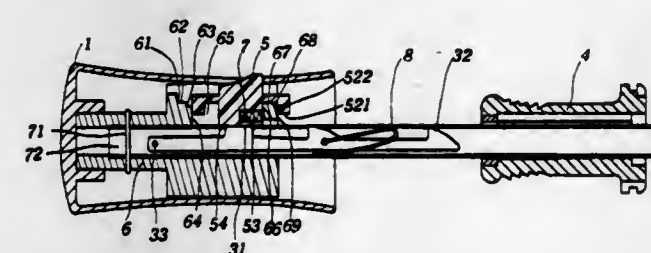
Tsun Z. Wu, No. 15, Lane 52, Ho-Ping West Rd., Section 3, Taipei, Taiwan

Filed Feb. 4, 1982, Ser. No. 345,587

Int. Cl.<sup>3</sup> A45B 25/14

U.S. Cl. 135—24

8 Claims



1. A locking device for an automatic opening umbrella comprising:  
a seat housed within a handle of the umbrella, said seat having a recess communicating with an opening formed in said handle for receiving a button, and having a plurality of guide planes able to guide said button;  
a button having an arm extending from each side thereof formed to fit with said guide planes;  
an elastic spring interposed between the button and the seat;  
a plate spring having an extension and a claw, said claw being coupled with a lower notch cylinder of the umbrella; and  
said button and said plate spring being arranged to define under normal conditions a clearance between the bottom of said button and the top of said extension of said plate spring;  
whereby on application of a force in the forward and downward direction against the longitudinal axis of the umbrella, said arms of the button will be moved along said guide planes of said seat and thereafter depress the extension of said plate spring to produce a pivotal rotation therein so as to disengage the retaining claw from said lower notch cylinder.

4,418,708

**TWO-DIMENSIONAL, UNILATERAL OBLIQUE SHOCK DIFFUSER AS THE AIR INLET FOR A GAS TURBINE JET ENGINE FOR THE PROPULSION OF HEAVY-DUTY AIRCRAFT**

Carsten Schulze, Götting; Kurt Lotter, Riemerling, and Jakob Malefakis, Putzbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Ottobrunn, Fed. Rep. of Germany

Filed Feb. 24, 1981, Ser. No. 239,021

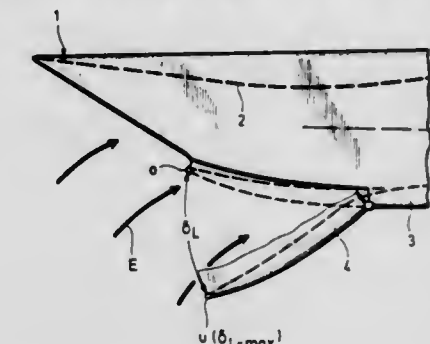
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009340

Int. Cl.<sup>3</sup> F02C 7/042

U.S. Cl. 137—15.2

1 Claim

1. Two-dimensional, unidirectional oblique air impact diffuser as an air inlet for a gas turbine jet engine for the propul-



sion of a high-performance aircraft operationable in the subsonic, transonic, and supersonic ranges, comprising a rigid upper air inlet ramp forming the upper side of the air inlet, said air inlet ramp having a leading edge facing in the direction of flight, an air inlet bottom spaced downwardly from said air inlet ramp and forming the lower side of the air inlet, said air inlet bottom having a leading edge facing in the direction of flight and spaced rearwardly of the leading edge of said air inlet ramp, characterized by an air scoop lip (4) pivotally attached to the leading edge of said air inlet bottom and extending in the direction toward the leading edge of said air inlet ramp with the leading edge of said air scoop lip spaced

4,418,709

**UNLOADING VALVE FOR HI-LO-HYDRAULIC SYSTEM**

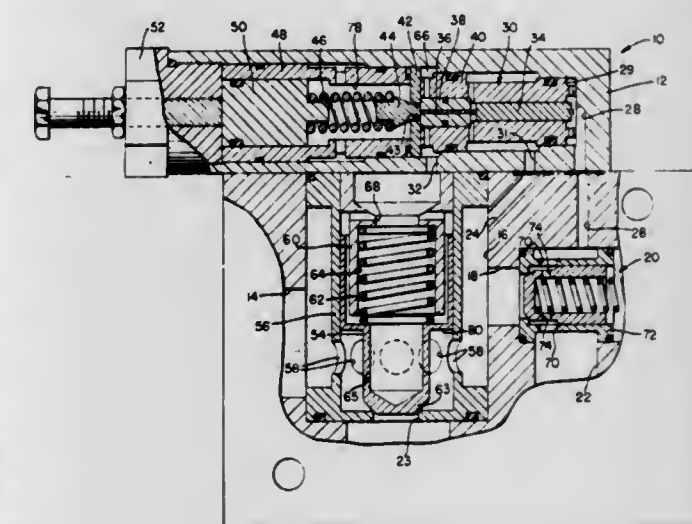
Arthur E. Hirsch, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 19, 1981, Ser. No. 323,001

Int. Cl.<sup>3</sup> G05D 16/10; F16K 17/20

U.S. Cl. 137—115

1 Claim



1. An unloading valve for satisfying the requirements of a hydraulic system while minimizing transient pressure fluctuations, the unloading valve including a valve body having an inlet port connected to a pump for receiving the fluid output of the pump, an intermediate relief chamber within said valve body connected to said inlet port, and check valve means for



permitting the full fluid flow from said pump to pass through a discharge port in said valve body to said hydraulic system; a locking spool slidably mounted within a sleeve in said valve body, fluid pressure from said hydraulic system being communicated into a first fluid chamber adjacent one end of said locking spool within said valve body for causing it to operate against an unloading pin, said unloading pin mounted within a mounting plug, an orifice plate mounted in the valve body adjacent to the unloading pin with an opening through the orifice plate being closed by a spring biased unloading poppet having an end seated within said opening, the cross-sectional area of said unloading pin being uniform and relatively small compared to the cross-sectional area of said unloading poppet, and fluid pressure from said intermediate relief chamber being communicated into a second fluid chamber adjacent the opposite end of said locking spool for holding said locking spool in a first position until the hydraulic system pressure reaches a predetermined unload pressure value;

a relief poppet mounted within said intermediate relief chamber of the valve body, said relief poppet being spring biased towards a seated position within a drainage port, fluid pressure being communicated between the interior of said relief poppet and a third fluid chamber between said mounting plug and said seated end of said unloading poppet, said first, second and third fluid chambers being located on one side of said orifice plate and said unloading poppet being located on the opposite side of said orifice plate; and

said unloading poppet being unseated when the pressure in the hydraulic system exceeds the spring force against the unloading poppet thereby permitting pilot flow to a reservoir, a further increasing system pressure resulting in the unseating of said relief poppet thereby permitting flow through said drainage port to said reservoir until all the fluid entering said inlet port being discharged to said reservoir, the hydraulic system pressure upon reaching said predetermined unload pressure value causing said locking spool to shift from said first position against said unloading pin and unloading poppet until said unloading poppet is fully opened and said relief poppet is moved away from its seat to the limit of its travel, and a reduction of system pressure below said predetermined unload pressure value resulting in the reloading of the valve and shifting of said locking spool back to its first position until the pressure in said system again rises to said unload pressure.

4,418,710

### PILOT CONTROL VALVE FOR LOAD SENSING HYDRAULIC SYSTEM

Oliver W. Johnson, Chaska, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 5, 1981, Ser. No. 308,347

Int. Cl.<sup>3</sup> F15B 13/06

U.S. Cl. 137-117

5 Claims

1. A flow control arrangement for use in a system including a fluid source having an output flow which is variable in response to changes in pressure in a load signal chamber and a flow path, including a flow orifice, connected in series flow relation with the fluid source, said flow control arrangement comprising:

(a) a valve housing defining a valve bore, a feed passage in fluid communication with the flow path, upstream of the flow orifice, a load passage in fluid communication with the flow path, downstream of the flow orifice, a load signal passage in fluid communication with the load signal chamber, and a drain passage in fluid communication with the system drain, said feed, load, load signal, and drain passages being in fluid communication with said valve bore; and

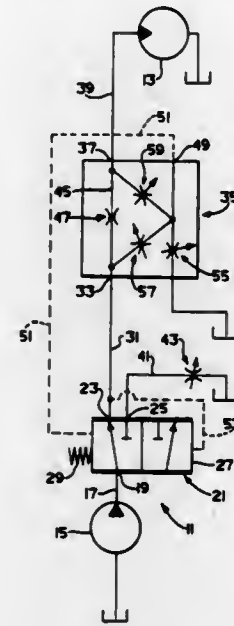
(b) a movable valve member disposed in said valve bore and having a plurality of control positions, including:

(i) a first position providing a fluid communication between said drain passage and said load signal passage while

blocking communication through said feed and load passages;

(ii) a second position providing simultaneous fluid communication between said load signal passage and said drain and load passages while blocking communication through said feed passage;

(iii) a third position providing communication between said load signal passage and said load passage while blocking communication through said drain and feed passages;



(iv) a fourth position providing simultaneous fluid communication between said load signal passage and said load and feed passages while blocking communication through said drain passage; and

(v) a fifth position providing fluid communication between said load signal passage and said feed passage while blocking communication through said drain and load passages.

4,418,711

### VALVE INSERT AND VALVES DESIGNED THEREWITH

Kurt Stoll, Esslingen, and Manfred Rüdle, Esslingen-Berkheim, both of Fed. Rep. of Germany

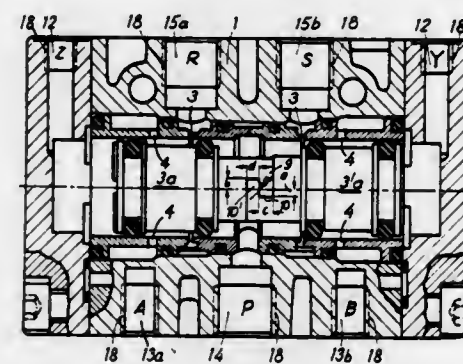
Filed Mar. 24, 1981, Ser. No. 246,966

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011791

Int. Cl.<sup>3</sup> F15B 13/042

U.S. Cl. 137-269

7 Claims



1. In a five-way slide valve device which includes a valve casing having a bore therein, a sleeve which is fixedly arranged in said bore in said valve casing, is open at its ends, and has several radial openings therethrough which are separated by first annular seals provided around said sleeve and sealingly engaging said sleeve and casing, said radial openings communicating with respective bores provided in said valve casing, and a slide valve axially slidably supported in said sleeve and having second annular seals therearound which are movable therewith and sealingly engage said sleeve and said slide valve, wherein one said radial opening is a pressure medium inlet and

said slide valve device is symmetric about a radial plane which contains said pressure medium inlet, the improvement comprising wherein said sleeve and said slide valve each include two identical parts which are arranged in mirror-image relationship with respect to said radial plane which contains said pressure medium inlet, said slide valve parts each having a hook on the end thereof adjacent the other slide valve part, said hooks being identical and said slide valve parts being releasably connected by said hooks, said hooks having means for substantially preventing relative axial movement between said slide valve parts but permitting relative radial movement therebetween.

4,418,712

### OVERFLOW CONTROL SYSTEM

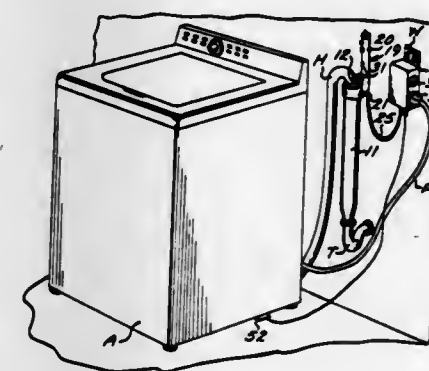
Charles A. Braley, P.O. Box 3960, Torrance, Calif. 90510

Division of Ser. No. 112,641, Jan. 16, 1980, Pat. No. 4,380,243.

This application Jun. 13, 1981, Ser. No. 282,499

Int. Cl.<sup>3</sup> H01H 35/18, 29/06

U.S. Cl. 137-312



1. In an appliance adapted to be powered by an electrical outlet and conformed to receive from a water supply predetermined amounts of water at automated first intervals and to drain into a drainage system said amounts of water at automated second intervals, the improvement comprising:

a stand pipe interposed between said appliance and said drainage system and aligned in a substantially vertical direction above said drainage system, for conveying said amounts of water therethrough;

a displacement weight suspended in said stand pipe from a spring loaded switch and conformed to articulate said switch upon immersion in water for producing a switching signal indicative of the collection of liquids in said standpipe above a selected level;

interrupting means interposed between said appliance and said electrical outlet and connected to receive said switching signal for disrupting the receipt of electrical power upon the occurrence of said switching signal; and moisture sensing means deployed subjacent said appliance and connected in parallel with said switching signal for disrupting said electrical power upon the leakage of water thereupon.

4,418,713

### CONCRETE PUMP TRACTOR TRAILER ASSEMBLY

Karl Schlecht, Hainbuchenweg 47, 7000 Stuttgart 70, Fed. Rep. of Germany

Filed Apr. 27, 1981, Ser. No. 257,856

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016232

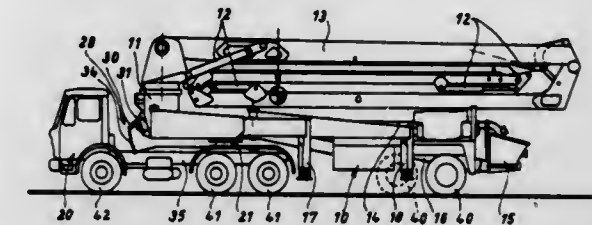
Int. Cl.<sup>3</sup> B62D 53/06; E04G 21/04

U.S. Cl. 137-351

14 Claims

1. A vehicular concrete pumping rig for conveying concrete at a construction site comprising: a semitrailer; extendable support means for bracing said semitrailer at a ground location; an articulated concrete distribution pole including a concrete line for distribution of concrete; means operably mounting said distribution pole on said semitrailer rotatably about a generally vertical axis; concrete pump means on said semitrailer for pumping concrete to said concrete line; a truck tractor for

driving said semitrailer; coupling means interconnecting said semitrailer and said tractor; and raising and securing means on said semitrailer for elevating said truck tractor and supporting it in a raised position while said semitrailer is braced by said extendable support means thereby to enable utilization of said raised truck tractor as ballast to stabilize said semitrailer against the weight of said distribution pole, said raising and securing means comprising at least one pulling member located



1 Claim forwardly of said coupling means taken in the driving direction of said rig, said pulling member being adapted to be fastened between said semitrailer and at least one location on said truck tractor, said location being situated lower than said semitrailer, said truck tractor being thereby adapted to be raised entirely off the ground with front and rear wheels thereof when said coupling means is engaged and when said extendable support means are extended.

4,418,714

### BLOW DOWN RING LOCKING DEVICE

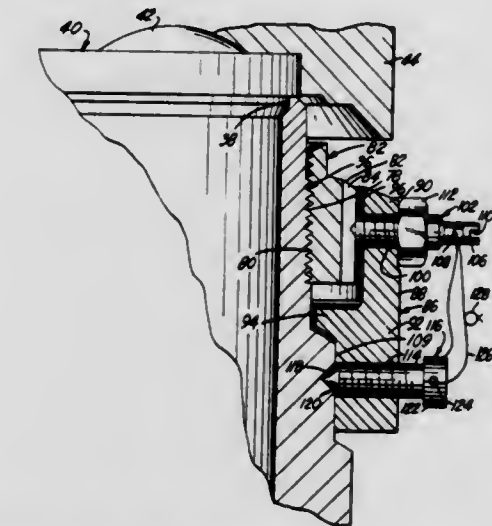
Eugene C. Cullie, Tappan, N.Y., assignor to Teledyne Farris Engineering, Palisades Park, N.J.

Filed Jun. 24, 1981, Ser. No. 276,934

Int. Cl.<sup>3</sup> F16K 17/20

U.S. Cl. 137-478

7 Claims



1. A safety relief valve comprising:

(a) a valve housing;

(b) a nozzle enclosed within said housing, said nozzle having external threading;

(c) a blowdown ring threaded to said nozzle, said blowdown ring including serrations;

(d) means disposed about the top of said nozzle to maintain said nozzle closed until a predetermined pressure is reached within said nozzle and to open said nozzle thereafter;

(e) a collar disposed about said blowdown ring and said nozzle and enclosed within said valve body, said collar having a first section proximate said blowdown ring, said collar having a second section proximate said nozzle;

(f) position securing means disposed at said first section of said collar for being releasably disposed between the serrations of said blowdown ring to prevent said blowdown ring from being turned; and

(g) fastening means disposed at said second section of said collar for fixing said collar to said nozzle.



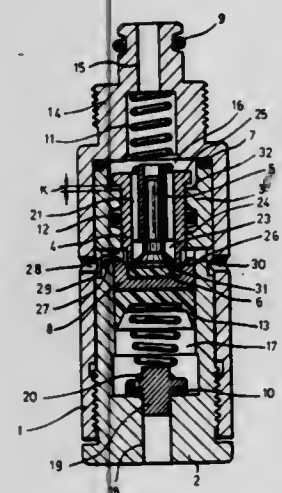
# 4,418,715 PRESSURE LIMITING VALVE, PARTICULARLY FOR HYDRAULIC MINE PROPS

Karoly Balazs, Budapest, Hungary; Vladislav D. Firstov, Moscow, U.S.S.R.; Miklos Frcska, Budapest, Hungary; Laszlo Gal; Sador Hlavay, both of Balassagyarmat, Hungary; Lajos Huber, Budapest, Hungary; Jozsef Korbuly, Budapest, Hungary; Laszlo Mahig, Budapest, Hungary, and Juri F. Ponomarenko; Juri G. Shein, both of Moscow, U.S.S.R.; Ferenc Simon, Budapest, Hungary, assignors to Központi Banyaszati Fejlesztési Intezet; Magyar Alumíniumipari Troszt, both of Budapest, Hungary and Skotchinsky Institut Gornogo Dela, Moscow, U.S.S.R.

Filed Aug. 12, 1981, Ser. No. 292,195  
Int. Cl.<sup>3</sup> F16K 31/12

U.S. Cl. 137—508

4 Claims



1. A pressure limiting valve comprising:
  - a elongated housing having an axially spaced apart high pressure fluid inlet opening and a fluid outlet opening;
  - a flat valve seat axially displaceable in said housing and disposed between said inlet and outlet openings;
  - a first chamber formed in said housing on one side of said valve seat and provided with an inlet passage for the introduction of a pressurized gas into said first chamber, said inlet passage being provided with a spring-loaded closure member for retaining said pressurized gas within said first chamber to act against said valve seat;
  - a first limitedly axially displaceable valve member provided on the other side of said valve seat from said first chamber between said seat and said inlet opening, said first valve member being formed with an annular axial flange portion biased against said valve seat in an outlet blocking position by a spring bearing against said first member, said annular axial flange defining with said valve seat a second chamber, said second chamber communicating with said inlet opening through a plurality of axial passageways formed in said first valve member; and
  - a second axially displaceable valve member guided in said first member and having a frustoconical head disposed in said second chamber concentrically with said annular axial flange, said head having a flat end engageable with said valve seat for displacing same against the force of the pressurized gas in said first chamber out of engagement with said first valve member to unblock said outlet opening for enabling high pressure fluid to flow from said inlet opening to said outlet opening.

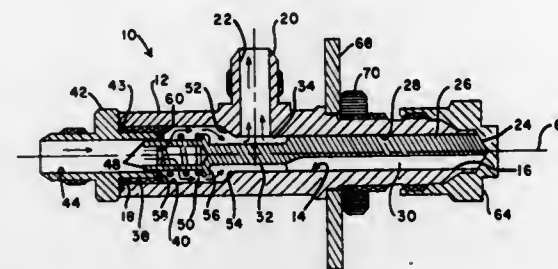
# 4,418,716 TWO-WAY FLOW VALVE

Roy R. Starke, Lake Park, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 10, 1981, Ser. No. 291,863  
Int. Cl.<sup>3</sup> F16K 11/00

U.S. Cl. 137—605

3 Claims



1. A two-way flow valve, comprising:
  - (a) a generally hollow valve body having first and second internal cylindrical surface portions defining a cavity open at both ends and an outlet port from said cavity located intermediate its ends, said first cylindrical surface portion extending from said outlet port to one end of said cavity;
  - (b) a valve stem having a body portion which is generally cylindrical in shape and movably mounted within said cavity for longitudinal sliding engagement with said first cylindrical surface portion of said valve body, said stem body portion having a longitudinally-extending segment thereof which is cut away so as to define a first inlet port at one of said cavity ends, said valve stem also having a recessed neck portion merging from said body portion and located adjacent said outlet port in said valve body, said recessed neck portion of said valve stem and said first cylindrical surface portion of said valve body together defining therebetween a first fluid flow path through said first inlet port to said outlet port;
  - (c) means defining a second inlet port at the other of said cavity ends;
  - (d) said valve stem further having a pair of parallel, longitudinally-extending tabs merging from said recessed neck portion to adjacent said second inlet port, said tabs of said stem and said second cylindrical surface portion of said valve body together defining therebetween a second fluid flow path through said second inlet port to said outlet port;
  - (e) means encircling said tabs of said valve stem and mounted within said valve body cavity for biasing said stem to move toward a first position in which said fluid flow along said second flow path is obstructed, while fluid flow along said first flow path is allowed; and
  - (f) means for closing said first inlet port and thereby obstructing fluid flow along said first flow path, said means when closing said first inlet port also causing said stem to move to a second position against said biasing means in which fluid flow along said second path is allowed.

# 4,418,717

## MODULAR PRESSURE LETDOWN VALVE

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

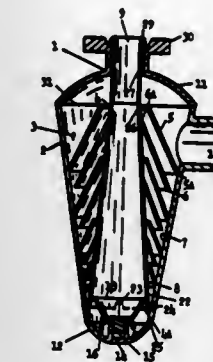
Continuation-in-part of Ser. No. 55,470, Jul. 6, 1979, Pat. No. 4,270,571. This application Dec. 8, 1980, Ser. No. 213,932  
Int. Cl.<sup>3</sup> F16K 47/04

U.S. Cl. 137—614.2

10 Claims

1. A modular pressure letdown valve comprising:
  - a valve housing with a bore passing therethrough having fluid supply and exhaust port means incorporated therein including two concentric sets comprising a plurality of circular dished baffles spaced detachably inside said bore in an interjacent relationship so as to accomplish throttling

of high pressure fluid entering said bore via said fluid supply port means to exit at substantially lower pressure via said fluid exhaust port means after flowing over said plurality of said baffles arranged so as to provide an alternating valve and baffle flow structure with a multitude of flow reversals, a coaxial central tube delivering said fluid from said fluid



supply port means adjacent a first bore end of said housing for discharge therefrom into said baffles adjacent a second bore end of said housing, said circular baffles alternatingly secured to said housing bore and said central tube both tapered in opposite directions so as to have a first set sealing on said bore while a second set is sealing on an outside diameter of said central tube.

# 4,418,718

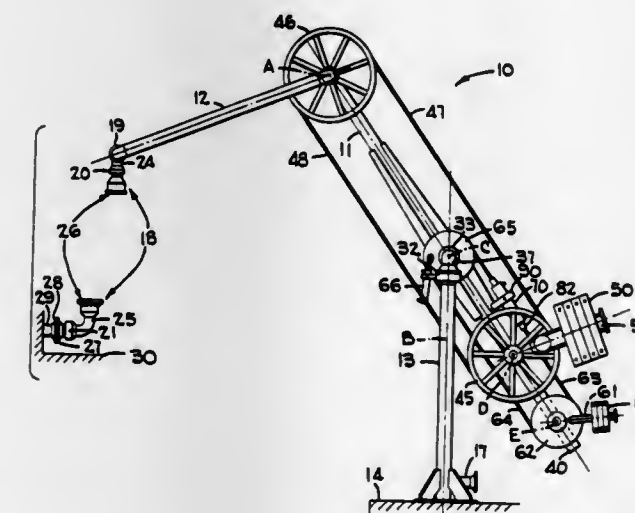
## METHOD AND APPARATUS FOR CONTROLLING ARTICULATED FLUID LOADING ARMS UPON EMERGENCY DISCONNECTION

Joel L. Fusy, Sens, France, assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 15, 1981, Ser. No. 283,584  
Claims priority, application France, Jul. 28, 1980, 80 16565  
Int. Cl.<sup>3</sup> B65B 3/04

U.S. Cl. 137—615

7 Claims



1. An articulated loading arm for transferring fluid from one fluid handling means to another and for quickly moving the outer end of the loading arm away from an adjacent handling means during an emergency disconnection, said arm comprising:
  - an inner arm member;
  - means mounting said inner arm member for pivotal movement about a first horizontal axis;
  - an outer arm member pivotally connected at one of its ends to the outer end of said inner arm member for movement about a second horizontal axis;
  - a primary counterweight pivotally mounted on a support fixed to and extending rearwardly from said inner arm member, said primary counterweight coupled to said outer arm member to counterbalance said loading arm

about said first horizontal axis and said outer arm member about said second horizontal axis; an auxiliary counterweight pivotally mounted on said support to confine elevational movement of the outer end of said loading arm in a safe path upon emergency disconnection thereof from said adjacent fluid handling means; means for transferring the moment generated by said auxiliary counterweight from said support to said mounting means; and control means cooperating with said transferring means and said mounting means for controlling pivotal movement of said auxiliary counterweight with respect to said support.

# 4,418,719

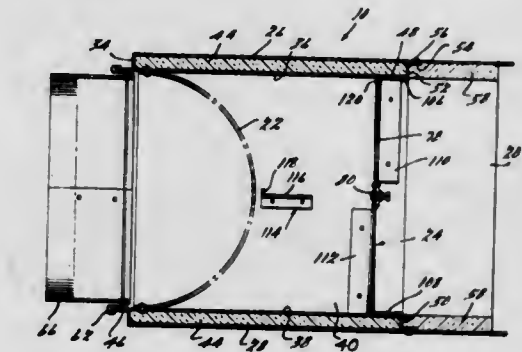
## AIR CONTROL APPARATUS

Edward T. Downs, Jr., 5873 Trotter La., West Bloomfield, Mich. 48033, and Julius Komorek, 15658 Williams, Livonia, Mich. 48154

Filed Nov. 26, 1980, Ser. No. 210,848  
Int. Cl.<sup>3</sup> F16K 47/14

U.S. Cl. 137—625.31

15 Claims



1. An air distribution apparatus for providing and controlling a supply of conditioned air to one or more spaces, said apparatus comprising:
  - an air receiving chamber having an inlet and an outlet spaced from said inlet, said chamber having a cross sectional size substantially larger than the cross section of said inlet and including a pair of spaced substantially parallel wall portions, a pair of spaced sidewall portions extending between said parallel wall portions;
  - control means within said chamber operative to control air flow from said inlet to said outlet, said control means being pivotally supported about a laterally extending axis positioned approximately midway between said wall portions; and
  - diffusion means positioned within said chamber between said inlet and said control means, said diffusion means comprising an arcuate perforated member extending between said wall portions and having a concave surface facing said inlet whereby said diffusion means may operate to distribute air flow from said inlet over substantially the entire transverse cross sectional area of said chamber with a maximum velocity air flow rate extending laterally approximately midway between said wall portions so as to facilitate control of said air flow to said outlet by said control means.

# 4,418,720

## SOLENOID OPERATED DIRECTIONAL VALVES HAVING MODULAR CONSTRUCTION

Curtis H. Day, Manchester, and Ronald L. Loup, Clarkston, both of Mich., assignors to Double A Products Company, Manchester, Mich.

Filed Mar. 6, 1981, Ser. No. 241,355  
Int. Cl.<sup>3</sup> F15B 13/044

U.S. Cl. 137—625.65

17 Claims

8. In a solenoid operated directional valve comprising a

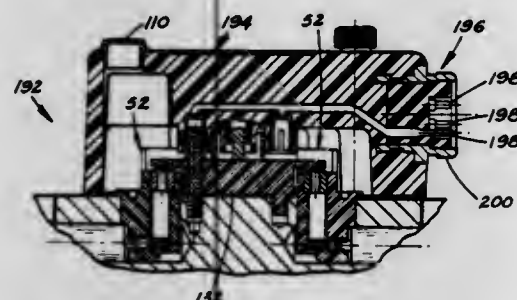


valve assembly and a solenoid assembly assembled together, said valve assembly including a valve body and electrical means thereon via which energizing current for said solenoid assembly flows, an improved electrical connection between said solenoid assembly and said electrical means for effecting electrical connection of said solenoid assembly to said electrical means integral and concurrent with the act of moving the two assemblies along a given direction into assembly with each other comprising;

at least one electrically conductive terminal on said solenoid assembly via which energizing current for the solenoid assembly flows;

at least one electrically conductive terminal on said valve assembly each of which corresponds to and is mated with a corresponding one of said terminals on said solenoid assembly;

each such pair of mated terminals comprising mated elongate



gate portions which are elongate in the direction via which the two assemblies are moved into assembly with each other;

one terminal of each such pair of mated terminals being mounted on an electrically non-conductive terminal block which is mounted on the corresponding assembly;

said one terminal of each such pair comprising a strip one lengthwise end of which is fixedly mounted on the terminal block and the opposite lengthwise end of which is free and curled to form the elongate portion of said one terminal with the direction of elongation being transverse to the length of said strip, said strip including a compliant portion between said ends thereof which permits limited movement of its free end relative to its fixed end whereby the elongate portions of each such pair of terminals are readily mated during assembly of the solenoid assembly and valve assembly and are rendered substantially immune to relative movement when the valve is in use.

4,418,721

## FLUIDIC VALVE AND PULSING DEVICE

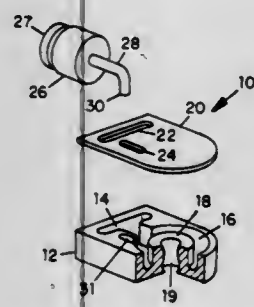
Allen B. Holmes, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 12, 1981, Ser. No. 273,170

Int. Cl.<sup>3</sup> E21B 47/12; G01V 1/40

U.S. Cl. 137—810

13 Claims



1. Means for controlling the flow of a fluid comprising essentially, a vortex chamber having a radial inlet thereto for said flow,

and a centrally located outlet from said chamber, whereby flow into said chamber flows radially to said outlet, and a movable barrier within said vortex chamber for selectively altering said flow from radial to vortical within said chamber;

wherein said movable barrier comprises a tab within said vortex chamber, said vortex chamber comprising a recess in a peripheral wall thereof, and said tab is movable between a first position located within said recess and a second position in said chamber exterior of said recess.

4,418,722

## PRESSURE LETDOWN METHOD AND DEVICE FOR COAL CONVERSION SYSTEMS

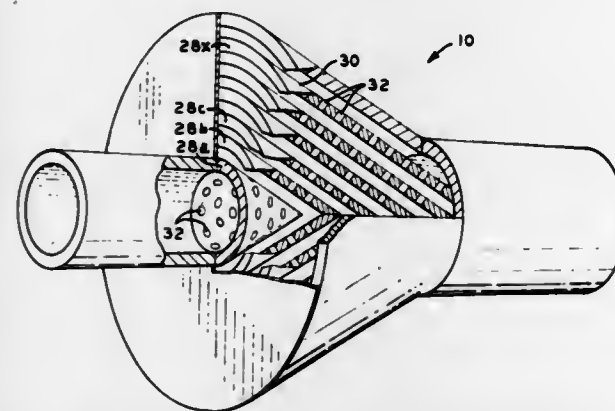
James M. Kendall, Pasadena, and John V. Walsh, Glendora, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 30, 1981, Ser. No. 259,211

Int. Cl.<sup>3</sup> G05D 16/00

U.S. Cl. 138—42

2 Claims



1. In combination with a source of polyphase fluid having a discharge outlet for discharging a stream of fluid characterized by a first pressure greater than a second pressure and flowing at a substantially constant flow rate, a pressure letdown device for dropping the pressure of the fluid, comprising in combination:

A. means defining in said device an intake port, a discharge port, and a flow path extending between said ports for a stream of fluid flowing at a constant rate, said flow path being caused to communicate with said discharge outlet via said intake port for accepting said stream of fluid at the intake port and for causing the stream to flow at a constant velocity along said flow path from said intake port to said discharge port; and

B. pressure dropping means disposed in said flow path for dropping the pressure of the fluid without reducing the velocity thereof, as the stream is caused to flow between said intake and discharge ports;

said pressure dropping means including a series of pressure letdown stages including a plurality of baffles of similar conical configurations disposed in coaxially nested alignment, and means defining in each of said baffles a plurality of apertures of uniform dimensions, the number of apertures for each baffle of said plurality of baffles being unique with respect to the number of apertures for each of the other baffles of said plurality.

4,418,723

## FLOW RESTRICTOR

Tsuyoshi Koni, and Yoshihisa Urushida, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1981, Ser. No. 289,243

Claims priority, application Japan, Aug. 12, 1980, 55-110747

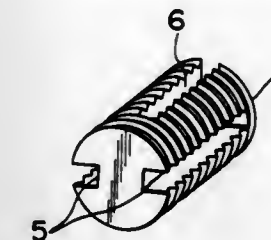
Int. Cl.<sup>3</sup> F15D 1/00; G01F 1/40

U.S. Cl. 138—42

3 Claims

1. A flow restrictor for use in a flowmeter utilizing pressure

drop caused by laminar flow comprising a cylindrical member, and a housing having a fluid inlet and a fluid outlet for accommodating said cylindrical member comprising at least one groove disposed spiral in the peripheral direction of the cylindrical surface thereof, at least one endless inlet channel, at least



one endless outlet channel in the longitudinal direction thereof and end plates secured to the ends thereof, one of said plates having at least one inlet opening corresponding to said at least one endless inlet channel and the other of said plates having at least one outlet opening corresponding to said at least one endless outlet channel.

4,418,724

## HEAT INSULATING CASING

Wolfgang-Peter Fricker, Freinsheim, and Manfred Scholz, Erlangen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr and Grünzweig & Hartmann Montage GmbH, Ludwigshafen, both of, Fed. Rep. of Germany

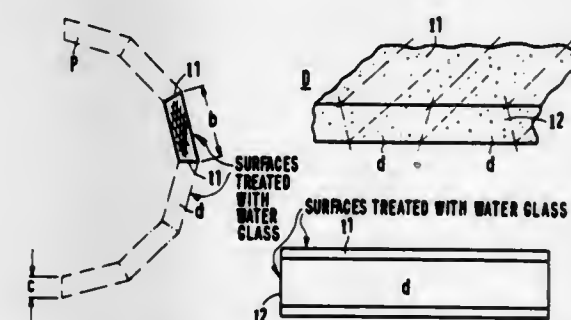
Filed Apr. 13, 1981, Ser. No. 253,565

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014453; Mar. 10, 1981, 3049871

Int. Cl.<sup>3</sup> F16L 59/14

U.S. Cl. 138—149

15 Claims



1. Heat insulating casing for structural components having curved surfaces, comprising insulating plates formed of compressed material based on pyrogenic silica, reinforcement fibers and an opacifier, said insulating plates being divided into insulating elements having trapezoidal cross sections, said insulating elements being combined to form a polygonal insulating shell, said polygonal insulating shell being in the form of a tubular heat insulating casing for insulating structural components having substantially cylindrical peripheries, said shell being divided into at least two half-shell casing parts defining parting gap regions and including an inner steel shell, ring-shaped end plates, an outer steel shell, and a moisture-proof connection between said outer shell, inner shell and end plates.

4,418,725

## HOOK FOR JACQUARD MACHINE

Pierre Mousterde, Le Cartaillet - Eyzin Pinet, 38780 Pont Eveque, and Ulrich Mutschler, 41A rue Pasteur, 69300 Caluire, both of France

Filed Nov. 3, 1981, Ser. No. 318,073

Claims priority, application France, Nov. 3, 1980, 80 23665

Int. Cl.<sup>3</sup> D03C 3/00

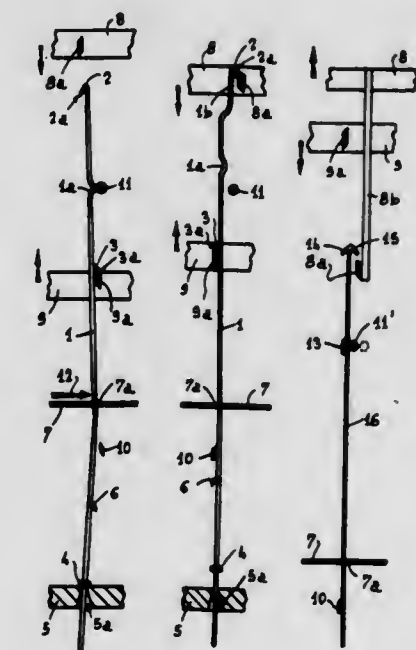
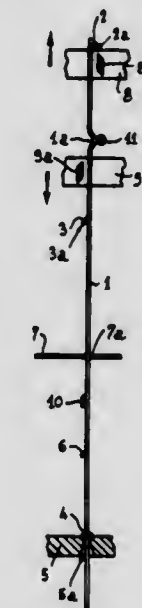
U.S. Cl. 139—59

7 Claims

1. An improved hook mechanism for a double-lift open shed Jacquard machine of the type having upper and lower frames

reciprocated vertically in opposition to one-another and respectively having grippers for engaging catches on the hooks for raising the hooks to raised positions, the machine having Jacquard needles extending across the hooks and respectively operative to displace the hooks laterally to select engagements of the grippers with the catches to control the weaving pattern, the hooks normally resting in their low positions on a bottom board having perforations for receiving the lower ends of the hooks, the improvements wherein:

(a) each hook comprises a linear rod extending vertically through a needle and having a lower end extending through a perforation in the bottom board and having a stop operative to support the hook in said low position, the hook having a first catch near the top of the rod and having a second catch on the opposite side of the rod, and



the hook having a laterally offset boss located below the first catch and extending away from the rod in the plane of the catches; and

(b) the machine having finger means extending laterally across the hooks at the level of their bosses when the hooks are in low position, and the finger means engaging the boss of a hook in low position and orienting the hook such that, in cooperation with the press of an associated needle in one direction or in the opposite direction, one of the first or second catches of said hook will be offset with respect to a gripper of an associated one of the frames and not raised thereby and the other catch of the hook will be oriented to be engaged by an associated gripper of the other frame, the bosses being so located with respect to said finger means that engagement therebetween occurs



only in said low position when the stops of the hooks are resting on the bottom board.

4,418,726

**DOUBLE LOOP SEAM FOR CORRUGATOR BELTS**

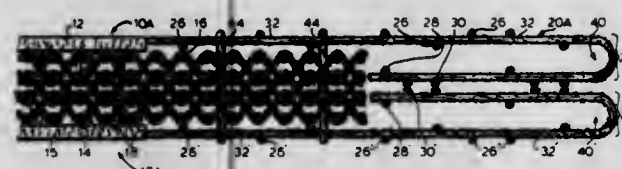
Michael J. Josef, Clifton Park, N.Y., and Joseph D. Lanthier, Watervliet, N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,148

Int. Cl.<sup>3</sup> D03D 25/00; D21F 1/12, 7/10

U.S. Cl. 139—383 A

1 Claim



1. A seam construction joining together two ends of a multilayered corrugator belt fabric, which comprises: a first end and a second end of a multilayered corrugator belt fabric, said multilayers including an upper layer and a lower layer, said ends each having an upper and a lower step therein by absence of portions of said upper and lower layers, each step being of a size adapted to mate with a corresponding step in a fabric seam-half connector described below; a first fabric seam-half upper connector attached to the first end upper step, second fabric seam-half upper connector attached to the second end upper step, a first fabric seam-half lower connector attached to the first end lower step, and a second fabric seam-half lower connector attached to the second end lower step, said connectors each containing first, second and third warp systems and a single filling system, the first and second warp systems respectively providing with the filling, face and back weaves, the face weave covering the back weave for a portion thereof providing a double layer zone of an outer layer and an inner layer and the third warp system binding the face and back weaves together in the double layer zone, and the filling system woven in the folded position along an edge to enable said face weave to cover said back weave and to form alternately displaced protruding loops along said edge for intermeshing with like loops formed along the edge of the other of the first and second seam-half connectors attached to a corresponding step for receipt of a pintle through the intermeshed loops, each of the seam-half connectors having a step therein along the side opposite to the protruding loops, said step being effected by the absence of a portion of said inner layer of the double layer zone, each seam-half connector step being of a size adapted to mate with a corresponding step in one of the ends; said seam-halves being joined by a pintle through the intermeshed loops of each of the upper and lower connectors; the upper step of the first end being joined to the opposite step of the first fabric seam-half upper connector, the upper step of the second end being joined to the opposite step of the second fabric seam-half upper connector, the lower step of the first end being joined to the opposite step of the first fabric seam-half lower connector and the lower step of the second end being joined to the opposite step of the second fabric seam-half lower connector; said seam construction having a thickness about equal to the thickness of the corrugator belt fabric.

4,418,727

**WEFT INSERTION DEVICES ON LOOMS HAVING A MOTIONLESS WEFT RESERVE**

Nicola Santucci, Schio, Italy, assignor to Nuovo Pignone S.p.A., Firenze, Italy

Continuation-in-part of Ser. No. 259,978, May 4, 1981, which is a continuation of Ser. No. 145,039, Apr. 30, 1980, which is a continuation of Ser. No. 26,313, Apr. 2, 1979, which is a continuation of Ser. No. 901,790, May 1, 1978, which is a continuation of Ser. No. 725,345, Sep. 21, 1976. This application Jul. 1, 1981, Ser. No. 279,321

Claims priority, application Italy, Oct. 3, 1979, 27952 A/75

Int. Cl.<sup>3</sup> D03D 47/18

U.S. Cl. 139—448

3 Claims



1. A pair of pincers for looms having a stationary weft reserve and shift of the wefts in the middle of the warp shed in which the leading pincer of said pair of pincers is formed by a boxlike member shaped in the front portion for receiving high speed input of the weft arranged diagonally of said pincer and for smooth and bumpless sliding of the warp threads and having milled on a side wall, a narrow longitudinal slot the lower plane of which is a rigid plane for grasping the weft and on which rests one weft-clamping blade of semi-rigid structure and curved upwardly away from said rigid plane at the forward end of said blade and affixed at the rear end of said blade to the pincer body and pressed at its top and adjacent its two side edges by a spaced pair of leaf springs each spring of said pair of springs being independent of the other spring of said pair and being independently loaded, the first of said springs applying a pressing force to one side edge of said blade adjacent the curved forward end of said blade, the other of said springs applying a pressing force to the other side edge of said blade and spaced along said blade rearwardly to the point where the force of said first spring is applied to said blade so that the longitudinal load diagram between the blade and the grasping plane applied by said pair of leaf springs is adjusted by said independent loading of said leaf springs, the drawing pincer of said pair of pincers including a lower fixed branch and a hook-carrying movable branch pivotal mounted on said drawing pincer and urged by a sturdy spring into pivotal engagement at one of its ends with a specially provided abutment of the fixed branch for locking engagement therewith during grasping and transfer of the weft, the fixed branch having at the front portion of said abutment a short and lightweight resilient portion terminated by a narrow and lightweight widening portion having a lower grasping surface urged towards the corresponding grasping surface of the hook by a resilient blade of which it is a part and which is depressed by insertion of the weft.

4,418,728

**WEFT THREAD-STORAGE APPARATUS FOR A LOOM, ESPECIALLY A GRIPPER LOOM**

Anton Lucian, Arbon, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Nov. 9, 1981, Ser. No. 319,807

Claims priority, application Switzerland, Dec. 17, 1980, 9297/80

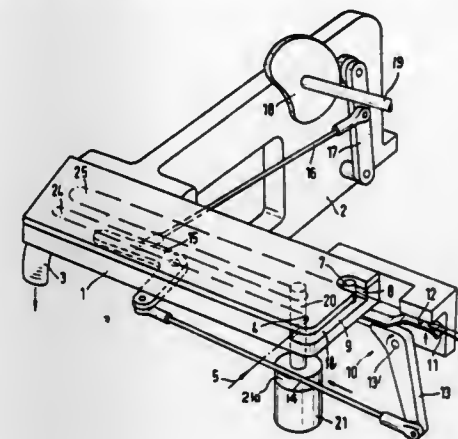
Int. Cl.<sup>3</sup> D03D 47/36

U.S. Cl. 139—452

8 Claims

1. A weft thread-storage apparatus for a loom, especially a gripper loom, comprising: a storage for the temporary storage of a weft thread which is to be inserted into a weaving shed; means defining a source of suction air with which there can be connected said storage; said storage having an end region which is open practically

over its entire width and possesses a substantially slot-shaped configuration defining a slotted opening; a substantially central loop divider for laying adjacently situated and mutually parallel extending partial thread loops; said loop divider being arranged in an internal space of said storage at the neighborhood of said slotted opening;



said loop divider comprising a motor-driven roll having a rotational axis; the rotational axis of said roll extending substantially perpendicular to a base surface of said storage; and the direction of rotation of said roll corresponding to an infed direction of the thread into said storage.

4,418,729

**SHUTTLELESS LOOM WEFT DETAINING DEVICE**

Yoshiharu Chiba; Hidetsugu Umezawa; Takao Sakabe, and Ryuji Arai, all of Mitaka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

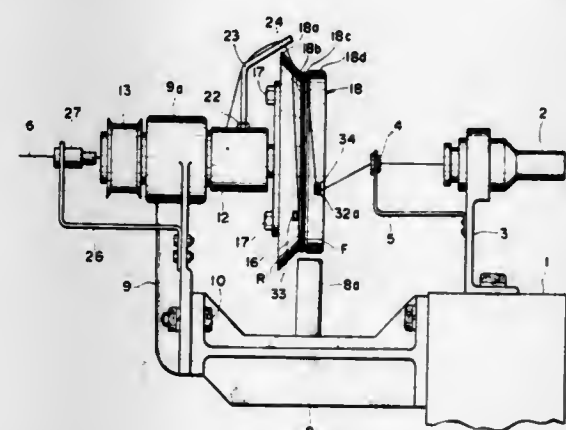
Filed Dec. 2, 1981, Ser. No. 326,568

Claims priority, application Japan, Dec. 11, 1980, 55-173748

Int. Cl.<sup>3</sup> D03D 47/36

U.S. Cl. 139—452

13 Claims



1. A weft detaining device of a shuttleless loom having a weft inserting means, comprising: a drum around which a weft yarn is wound prior to its introduction to the weft inserting means, said drum including: a first frustoconical section tapered generally toward the weft inserting means, a first cylindrical section integral with said frustoconical section at the smallest diameter part, a projecting section radially and outwardly projecting over the radial level of said first cylindrical section, said projecting section being spaced from said first frustoconical section in the axial direction of said drum, and a connecting section integral with said projecting section to connect the radial top level of said projecting section with the radial level of said cylindrical section, said connecting

section being located to leave said first cylindrical section between it and said first frustoconical section; and means for catching the weft yarn in association with the peripheral surface of said drum to detain a predetermined length of the weft yarn on the drum peripheral surface prior to a weft picking through the weft inserting means.

4,418,730

**AUTOMATIC SHUT-OFF NOZZLE WITH VAPOR RETURN SEAL**

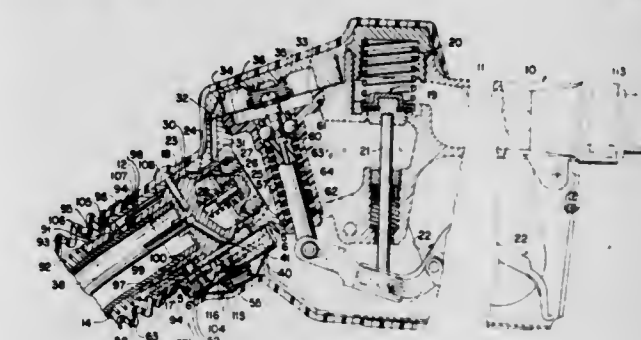
Jack A. McMath, Fort Thomas, Ky., assignor to Dover Corporation, N.Y.

Continuation of Ser. No. 197,630, Oct. 16, 1980, abandoned, which is a continuation of Ser. No. 59,970, Jul. 23, 1979, abandoned, which is a continuation of Ser. No. 943,326, Sep. 18, 1977, abandoned, which is a continuation of Ser. No. 856,108, Nov. 30, 1976, abandoned, which is a continuation of Ser. No. 66,441, May 7, 1976, abandoned. This application Mar. 12, 1982, Ser. No. 357,692

Int. Cl.<sup>3</sup> B65B 3/18

U.S. Cl. 141—207

8 Claims



1. An automatic shut-off dispensing nozzle, comprising: (a) a body, said body having an inlet and an outlet and an internal flow passage therebetween; (b) a flow control valve disposed in said internal flow passage for controlling flow of liquid from said inlet to said outlet; (c) manually operated means for controlling the operation of said flow control valve, said manually operated means being movably secured with respect to said body; (d) a spout secured to said outlet of said body and having its free end for disposition into an opening of a fill tank of a vehicle tank or the like, said spout being in fluid communication with said internal flow passage to receive liquid discharged from said outlet; (e) means for selectively releasing said manually operated means in response to predetermined conditions to allow closing of said flow control valve and stoppage of liquid flow through said internal passage immediately of said manually operated means, said releasing means including a venturi proximally disposed with respect to said internal flow passage and an air passage in gaseous communication between said venturi and an opening in said spout; (f) a vapor return passage for returning vapor from a vehicle tank or the like when said spout is disposed in the vehicle tank's fill pipe; (g) means for establishing a seal between the fill tank opening and the vapor return passage when said spout is inserted into the fill pipe opening; (h) a divided housing secured to said body, said divided housing including a first chamber in open gaseous communication with the opening in said spout, a second chamber in open gaseous communication with said venturi, a third chamber in selective gaseous communication with said first and second chambers; (i) an interlock valve disposed between said first and third chambers to selectively block gaseous flow therebetween, said interlock valve being responsive to movement of said spout into the fill pipe after said seal establishing means



establishes a seal between the fill tank opening and the vapor return passage; and  
(j) an excess pressure valve disposed between said second and third chambers to selectively block gaseous flow between said second and third chambers, said excess pressure valve being closable in response to a predetermined gaseous pressure in the fill tank.

4,418,731

## ADAPTER FRAME FOR ROTO-TILLERS

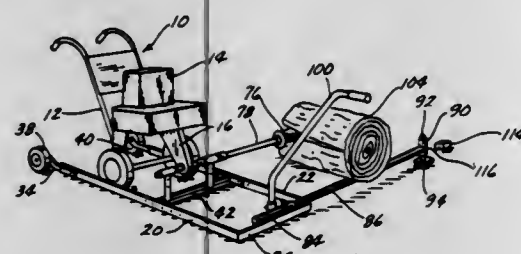
Roger M. Smith, 205 Prospect St., and Steven J. Smith, R.R. 1, both of Shell Rock, Iowa 50670

Filed Jan. 29, 1979, Ser. No. 6,996

Int. Cl.<sup>3</sup> B27L 7/00

U.S. Cl. 144—194

10 Claims



1. A log splitter attachment for use with garden tillers having a tiller frame, a tiller power drive means and a tiller drive shaft, said splitter attachment comprising:

a ground supported frame portion, attachment means, mounted on said frame portion, for rotatably receiving said tiller drive shaft, thereby operatively connecting said garden tiller to said log splitter attachment,

said attachment means being vertically adjustable to vary the operative height of said tiller drive shaft relative to the ground,

a log splitting screw having means attached thereto for releasable attachment to said tiller drive shaft to allow for rotational movement of said splitting screw in unison with said tiller drive shaft and in generally axial alignment therewith, and

a log support bar attached to said frame portion and extending outwardly therefrom for ground engaging support, to provide support for logs during use and to stabilize said frame portion and said tiller

said attachment means being laterally adjustably mounted on said frame portion relative to the axes of said tiller drive shaft and log splitting screw whereby the distance between said log splitting screw and log support bar may be varied to accommodate logs of various lengths.

4,418,732

## HAND TOOL AND A CORE REINFORCED MOLDED SYNTHETIC MATERIAL HANDLE THEREFOR

Robert A. Kolonia, R.D. #3, Agnes Rd., Box 318, Milford, N.J. 08848

Filed Sep. 24, 1980, Ser. No. 190,539

Int. Cl.<sup>3</sup> B26B 23/00

U.S. Cl. 145—2 R

17 Claims

1. A molded synthetic tool handle comprising:

(a) a synthetic material molded around an elongated reinforcing core which has a free end,

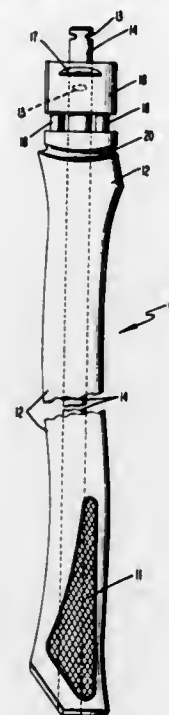
(b) said synthetic material having an outer shape conforming to a handle designed for the specific tool for which it is to be used,

(c) said molded synthetic material forming a tool carrying section at one end of the handle and a hand holding section extending from the tool carrying section,

(d) said tool carrying section including a separator portion having a shaped outer surface and being longitudinally spaced along the reinforcing core at a location between

the end of the hand holding section and the free end of the core to form laterally spaced bonding material fill areas located on opposed sides of the separator portion,

(e) said tool carrying section including means to mechanically interlock the molded synthetic material of the separator portion with the rigid, reinforcing core,



(f) said hand holding section being free of any additional mechanical interlock relative to the core adjacent the separator portion thereby having freedom for expansion and contraction along the core and thereby being movable with respect to the separator portion.

4,418,733

## HOLDING DEVICE

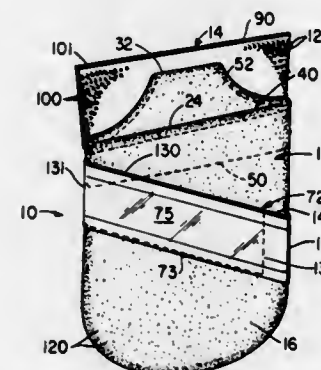
Robert A. Kallman, 2030 Haring St., Brooklyn, N.Y. 11229

Filed Dec. 7, 1981, Ser. No. 328,370

Int. Cl.<sup>3</sup> B65D 30/10

U.S. Cl. 383—11

9 Claims



1. A device for holding objects, said device being substantially flat when empty of said objects, comprising:

a receptacle having flexible front and rear panels, said front and rear panels being secured to each other along the respective sides and bottoms to form a first compartment; said rear panel having an extension piece extending above said first compartment;

a fastener having first means on one side thereof for attachment to a base object and second means on a second side thereof for securing said receptacle to said fastener, said extension piece and said second means of said fastener being comprised of complementary materials which are secured together when pressed; and

wherein said receptacle's front and rear panel bottoms are rounded for encasing a cylindrical object, whereby said

compartment substantially conforms to a cylindrical object inserted therein.

4,418,734

## SAFETY SUPPORT SYSTEM

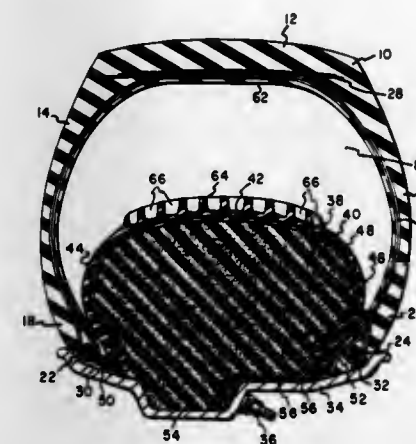
Robert L. Dobson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 19, 1982, Ser. No. 359,772

Int. Cl.<sup>3</sup> B60C 17/00

U.S. Cl. 152—158

9 Claims



1. A safety support system for a tire and rim assembly in which the tire is a tubeless tire having a tread, sidewalls and bead portions mounted on bead seats of a rim comprising a safety support with a toroidal safety support body of resilient foam material for positioning within said tire, said safety support having a predetermined radially outer diameter less than the radially inner diameter of said tire, a pair of reinforcing bead rings positioned at the surface and at each side of said body, at least one ply of reinforcing fabric wrapped around a radially outer wall of said safety support and extending between said bead rings for reinforcing said sidewalls and said outer wall to control expansion of said safety support beyond said outer diameter, said safety support body having a radially inner diameter substantially the same as the diameter of said rim, said resilient foam material of said safety support body containing cells of gas under pressure for expanding said body in an axial direction and exerting an axial force against said bead portions of said tire seated in said bead seats of said rim to provide cushioning and support of said tire and resist circumferential movement of said bead portions of said tire relative to said rim upon deflation of said tire.

4,418,735

## TIRE, PARTICULARLY FOR AIRPLANES, HAVING A CROWN REINFORCEMENT WITH EXTENSIBLE EDGES AND METHOD OF MANUFACTURING SAME

Jacques Musy, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Feb. 5, 1982, Ser. No. 346,128

Claims priority, application France, Feb. 12, 1981, 81 02788; Dec. 23, 1981, 81 24263

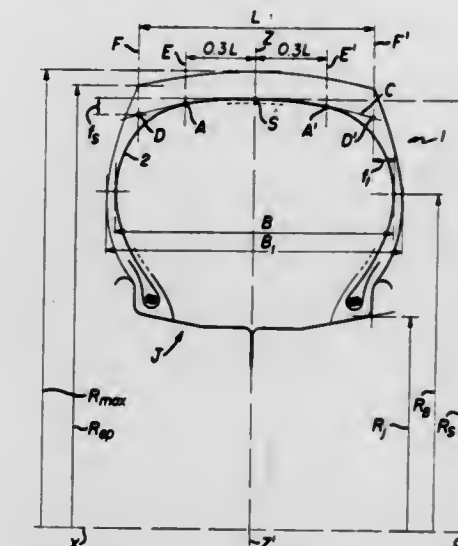
Int. Cl.<sup>3</sup> B60C 9/00

U.S. Cl. 152—200

18 Claims

1. A tire for airplanes having a carcass reinforcement formed of at least one ply of radial cables which is anchored to at least one bead ring in each bead and a tripartite crown reinforcement composed of a median portion and two lateral portions, each of the edges of the median portion being in contact with a lateral portion, each of these three portions being formed of at least one ply of textile cables forming an angle of between 0° and 30° with the circumferential direction of the tire, the relative camber of convexity of the carcass reinforcement in the crown being at most 0.12, preferably between 0.04 and 0.10, and the relative camber of convexity of the carcass reinforcement in the sidewalls being at most 0.14 when the tire is mounted on its service rim and inflated to its service pressure

but not under load, the tire thus having a quasi-rectangular meridian profile, this tire being characterized by the fact that when it is mounted on its service rim but not inflated, its carcass reinforcement has a relative camber of convexity in the crown of at most 0.20, preferably between 0.08 and 0.15, and a relative camber of convexity in the sidewalls of at most 0.25



and a length such that after inflation of the tire to its service pressure its equilibrium curve at the level of the shoulders is located radially outwards of its curve in the uninflated tire, and by the fact that the median portion of the crown reinforcement is formed of cables whose extensibility is low, preferably close to zero, while the lateral portions of the crown reinforcement are formed of cables of very great extensibility.

4,418,736

## VEHICLE TIRE

Garret K. Vandenburg, 1008 Grove St., Winnetka, Ill. 60093

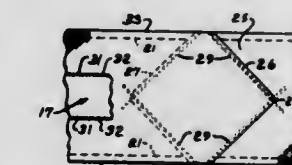
Division of Ser. No. 786,068, Apr. 11, 1977, Pat. No. 4,341,577.

This application Jan. 18, 1982, Ser. No. 339,905

Int. Cl.<sup>3</sup> B60C 9/02

U.S. Cl. 152—354 R

6 Claims



1. In a high performance tire for mounting on a rim and comprising a casing in the form of a toroid which encompasses an inner tube inflated to a pressure of at least seventy-five pounds per square inch and wherein the casing is formed of a fabric which is continuous in a direction circumferentially of the outside of said toroid, the improvement wherein said casing consists essentially of a woven fabric, said fabric having wool and warp threads and being substantially free of binder therein, said wool and warp threads being positioned in a bias alignment with respect to said circumferential direction.



4,418,737

**AUTOMATIC TIRE INFLATION SYSTEM**

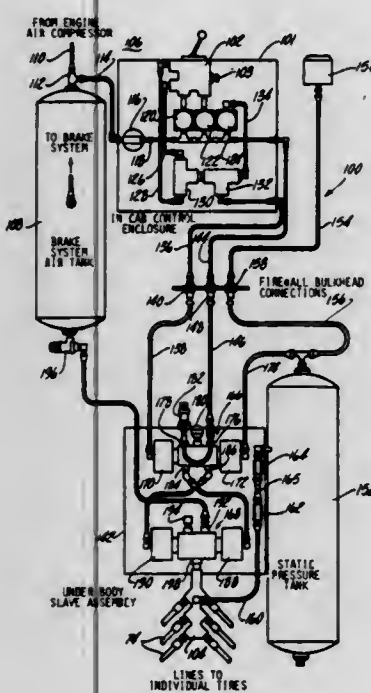
Fred L. Goodell, Grosse Ile, and Michael J. Ellison, Canton, both of Mich., assignors to AM General Corporation, Detroit, Mich.

Filed Jul. 31, 1981, Ser. No. 288,834

Int. Cl.<sup>3</sup> B60C 29/00

U.S. Cl. 152-416

14 Claims



1. In an automatic tire inflation system for a vehicle, the improvement comprising:  
first means coupled to the tires for providing an output associated with the actual tire pressure;  
manually actuable selector means in the vehicle cabin for generating an output associated with one of a plurality of tire pressures that may be desired for the vehicle under various operating conditions;  
control means adapted to receive the outputs from the first means and selector means, operative to automatically adjust and constantly maintain the pressure in the tires at the desired pressure without further manual intervention as a function of the differential between said outputs associated with the actual and desired pressures.

4,418,738

**DEVICE FOR AUTOMATICALLY TIGHTENING SPOKES IN SPOKE WHEELS**

Roland Kaufeldt, Bovägen 6, Tyresö, Sweden

Filed Apr. 13, 1981, Ser. No. 253,219

Claims priority, application Sweden, Oct. 17, 1979, 7908635

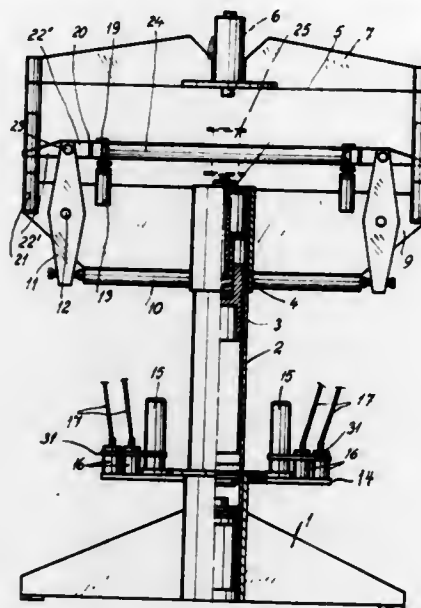
Int. Cl.<sup>3</sup> B60B 1/04

U.S. Cl. 157-1.55

7 Claims

1. A device for automatically tightening spokes in spoke wheels consisting of a hub, a plurality of spokes, and a wheel rim, said spokes being passed through apertures in said hub and wheel rim, respectively, and being provided with loosely threaded spoke nipples outside the periphery of the wheel rim, said device comprising  
clamping means,  
wheel hub support means,  
said clamping means being disposed to clamp the hub of a wheel to said wheel hub support means,  
wheel rim support means,  
said wheel rim support means being disposed to support the rim of the wheel,  
wheel rim engagement means comprising a plurality of segment blocks disposed along the periphery of the wheel rim, each of said segment blocks being actuable by a respective rocker arm,  
said wheel rim engagement means being further disposed to engage substantially the entire periphery of the wheel rim radially from the outside for causing said periphery to

become accurately round and for urging the wheel rim toward the wheel hub,  
wheel rim urging means,  
said wheel rim urging means being disposed to urge the wheel rim toward said wheel rim support means, and



automatic spoke nipple tightening means,  
said spoke nipple tightening means being disposed to tighten all of the spoke nipples of the wheel automatically and simultaneously, each with an individual predetermined torque.

4,418,739

**INSULATING WINDOW COVERING**

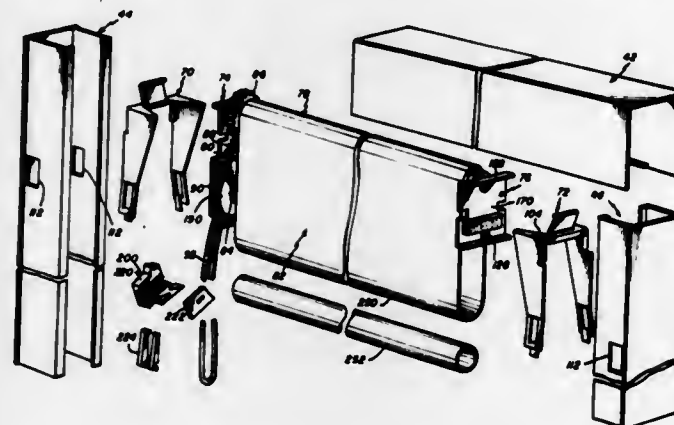
James Woolnough, Brattleboro; Bruce Gardner, Guilford, both of Vt., and David A. May, Brookline, Mass., assignors to Appropriate Technology Corporation, Brattleboro, Vt.

Filed Jan. 15, 1982, Ser. No. 339,334

Int. Cl.<sup>3</sup> A47H 11/06; E06B 9/171

U.S. Cl. 160-120

13 Claims



10. An insulating window shade assembly comprising:  
a top channel and a pair of opposed, inwardly open U-shaped side channels intended to be permanently secured on the inside of a window about the window opening,  
a sub-assembly including  
a pair of parallel rollers each carrying a shade panel of flexible material wound in opposite directions on the rollers,  
spur gears mounted on the rollers and engaging each other causing the rollers to rotate simultaneously and in opposite directions when one is rotated, bearing plates supporting the ends of the rollers,  
a cord and pulley supported by one of the bearing plates and having a gear registering with one of the gears on the rollers to impart rotation to the rollers,  
and a pair of mounting brackets each supporting one of the bearing plates,

and means provided in the side channels and the brackets enabling the subassembly to be snapped as a unit in place within the channels.

4,418,740

**CENTRIFUGAL CASTER**

Ronald Friedrich, Kamp-Lintfort, Fed. Rep. of Germany, and Werner Hammecke, deceased, late of Bohmte, Fed. Rep. of Germany (by Marie Elise Gisela Hammecke, heiress), assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

PCT No. PCT/DE80/00114, § 371 Date Mar. 26, 1981, § 102(e)

Date Mar. 26, 1981, PCT Pub. No. WO81/00366, PCT Pub.

Date Feb. 19, 1981

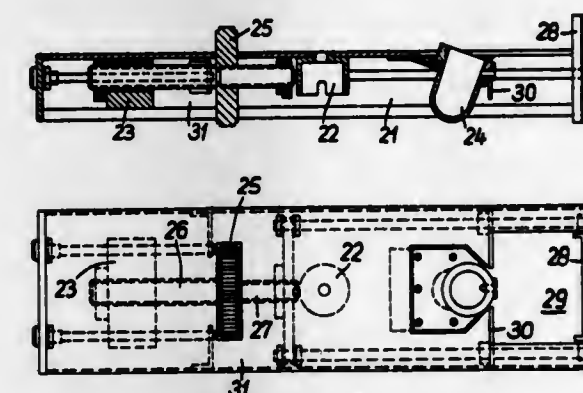
PCT Filed Aug. 2, 1980, Ser. No. 247,292

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932681

Int. Cl.<sup>3</sup> B22D 13/00

U.S. Cl. 164-287

1 Claim



1. A centrifugal caster comprising: a motor driven centrifuge arm; a weight arm connected to said centrifuge arm, both said arms being rotatable about a vertical axis; a counterweight mounted to said weight arm for horizontal movement relative to said weight arm; a casting muffle; a casting chamber connected to said centrifuge arm, said casting chamber being provided with a region for mounting said casting muffle; a melting crucible disposed in said casting chamber; a guide carriage accommodating said casting muffle for horizontal movement relative to said centrifuge arm; first and second spindles having different, oppositely oriented threads; and a hand wheel coupled with said carriage and said counterweight via a respective one of said first and second spindles for horizontally displacing said casting muffle and said counterweight with respect to said centrifuge arm and said weight arm, respectively.

4,418,741

**METHOD OF CONTROLLING RELATIVE MOVEMENT BETWEEN AN INGOT AND A MOLD**

Oleg P. Bondarenko, ulitsa Kreschatik, 15, kv. 36; Igor A. Genis, ulitsa Nischinskogo, 5, kv. 39; Vitaly M. Baglai, bulvar Lesi Ukrainki, 2, kv. 51; Boris B. Fedorovsky, ulitsa Mechnikova, 7a, kv. 26; Boris I. Medovar, ulitsa Anri Barbjusa, 22/26, kv. 109; Grigory A. Timashov, bulvar Davydova, 7, kv. 143; Vasily I. Ua, ulitsa Saxaganskogo, 58, kv. 12; Georgy S. Pavlichenko, ulitsa B. Kitaevskaya, 61a, kv. 18, and Igor G. Sidorenko, ulitsa Bereznyakovskaya, 24, kv. 104, all of Kiev, U.S.S.R.

Filed Nov. 26, 1979, Ser. No. 97,216

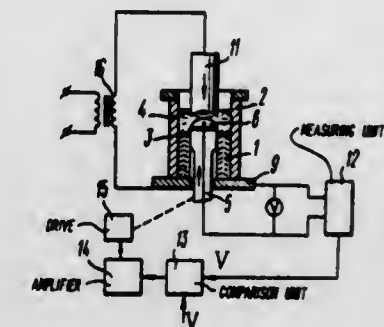
Int. Cl.<sup>3</sup> B22D 11/16, 27/02

U.S. Cl. 164-454

9 Claims

1. A method of controlling the relative movement between an ingot and a mold, comprising the steps of:  
preparing a molten metal pool covered with a bath of molten slag in a melting space, defined by a base plate and said mold, by melting a consumable electrode;  
monitoring the level of said molten metal pool in said mold by measuring the voltage between said ingot and an insu-

lated section of said mold, said insulated section of said mold being disposed above said metal pool and in contact with said bath of molten slag and being electrically insulated from said ingot and an ingot-forming section of said mold;



comparing an instantaneous value of said voltage with a predetermined value of said voltage; and  
varying the relative speed of the ingot and the mold depending on a signal proportional to the difference between said instantaneous and said predetermined values of said voltage, to restore a predetermined level of said metal pool.

4,418,742

**ROTOR CONSTRUCTION FOR ROTARY REGENERATIVE AIR HEATER**

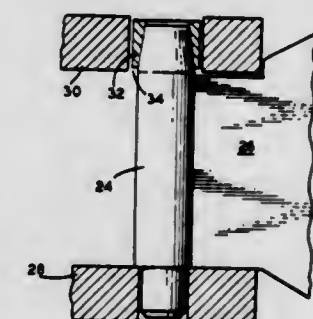
James C. Conde, North Royalton, and Paul S. Larsen, Canal Fulton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 7, 1982, Ser. No. 386,169

Int. Cl.<sup>3</sup> F28D 19/04

U.S. Cl. 165-8

3 Claims



1. A rotary regenerative heat exchanger comprising:  
(a) a plurality of radial plates connected to a plurality of radial plate pins which engage an upper and lower core plate, each core plate concentrically surrounding and attached to a rotor shaft;  
(b) a plurality of bushings inserted into apertures in the upper core plate, each bushing engaging the upper terminus of a corresponding radial plate pin, the lower core plate having apertures which engage the lower terminus of a corresponding radial plate pin;  
(c) a plurality of full-sector baskets stacked vertically and retained within compartments formed by adjacent pairs of the radial plates, the baskets containing heat-absorbent material;  
(d) means for passing heating and cooling fluids through the rotor; and  
(e) means for rotating the rotor about its axis.



**4,418,743**  
**ELECTRONIC CIRCUIT FOR CONTROLLING A HEATING OR AIR-CONDITIONING APPARATUS IN A MOTOR VEHICLE**

Kurt Dietzsch, Leonberg-Eltingen, and Rainer Knoblauch, Stuttgart, both of Fed. Rep. of Germany, assignors to Süddeutsche K hlerfabrik Julius Fr. Behr GmbH & Co. K.G., Stuttgart, Fed. Rep. of Germany

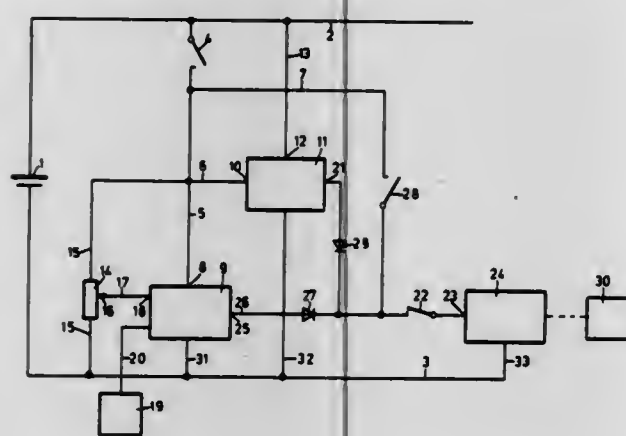
Filed Apr. 17, 1981, Ser. No. 255,261

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3015921

Int. Cl.<sup>3</sup> F28D 21/00; F28F 27/00

U.S. Cl. 165-12

5 Claims



1. In an electronic circuit for controlling the heating or air conditioning apparatus in a motor vehicle having its own power system, an ignition switch, an electronic thermostat, a manually adjustable temperature setting means, a valve activating device and valve means for controlling the flow of conditioning medium within the heating or air conditioning apparatus, said arrangement comprising said ignition switch, said thermostat and said valve activating device being connected in series with the vehicle's power system in a first circuit, said thermostat being controlled by said manually adjustable temperature setting means, and said valve means being controlled by said valve activating device, whereby current to said thermostat and said valve activating device is interrupted when said ignition switch is open,

the improvement wherein said motor vehicle further includes a timing element means for switching on to allow flow of current therethrough for a predetermined time after said ignition switch has been opened, and two limit switch means for permitting said valve activating device to be actuated or deactivated, respectively, independently of said ignition switch and said timing element means, and wherein said arrangement further comprises said valve activating device being simultaneously connected into a second circuit connected to the vehicle's power system in parallel with said ignition switch, said second circuit including said timing element means, such that flow of current to said valve activating device is permitted through said timing element means for a predetermined time after said ignition switch has been opened, and has turned off said first circuit, and wherein said two limit switch means are controllable by means of said temperature setting means.

**4,418,744**  
**AIR CONDITIONING CONTROL SYSTEM WITH USER POWER UP MODE SELECTION**

Donald L. Sidebottom, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 5, 1982, Ser. No. 365,766

Int. Cl.<sup>3</sup> F25B 29/00; H03K 17/00

U.S. Cl. 165-25

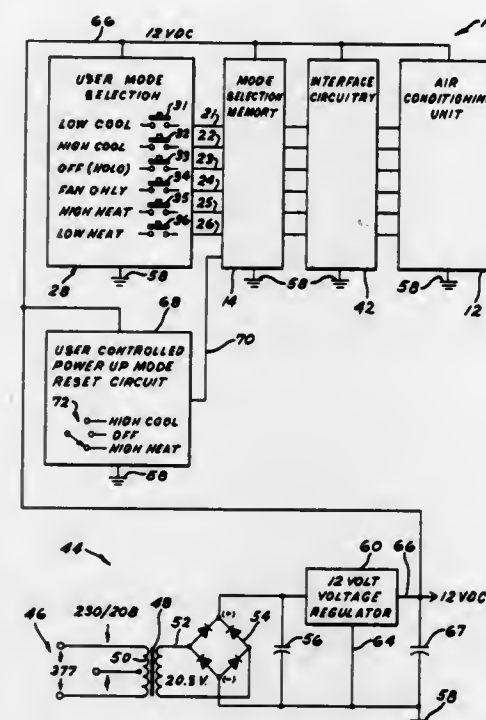
5 Claims

1. An electronic control system for an air conditioning unit having a plurality of operational modes, said control system

adapted for operation from a power source subject to interruption, and comprising:

a volatile mode selection memory capable of storing representations corresponding to each of the operational modes, said memory having mode selection inputs responsive to momentary actuations;

an operative connection between said memory and the air conditioning unit to effect operation of the air conditioning unit in the mode corresponding to any particular stored representation; and



a power on reset circuit connected to said mode selection memory and arranged to cause the air conditioning unit to resume operation in a particular selected mode upon restoration of power following a power interruption; said power on reset circuit including a user operable power up mode selection switch for allowing user selection of the particular mode in which operation resumes, the user power up mode selections including at least a plurality of the operational modes.

**4,418,745**  
**APPARATUS FOR HEATING PERSONS TRAVELLING IN OR ON OPEN VEHICLES HAVING INTERNAL COMBUSTION ENGINES**

Oskar W. K. Roehr, Windm hlenstieg 15, 2000 Hamburg 52, Fed. Rep. of Germany

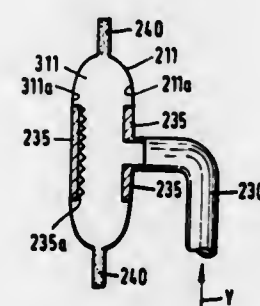
Filed Apr. 8, 1981, Ser. No. 252,068

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 8027178; Oct. 15, 1980, 8027524; Oct. 7, 1980, 8029729; Nov. 25, 1980, 8031329

Int. Cl.<sup>3</sup> B60H 1/18

U.S. Cl. 165-46

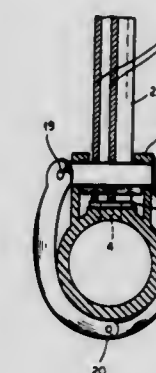
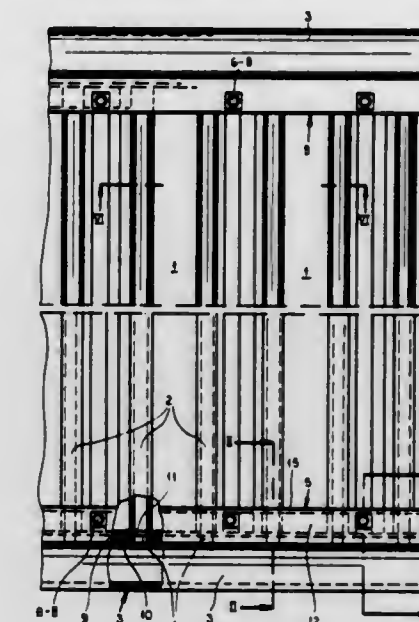
22 Claims



1. An apparatus for heating persons, comprising a hot air generator arranged to be supplied with heat from an internal combustion engine, an article of clothing including an air

carrying system with hot air outlet openings in said article of clothing facing the body of the person to be heated, said air carrying system is connected to said hot air generator, said article of clothing is made of an air-impermeable material and comprises at least two layers including an inner layer closer to the body of the person to be heated and an outer layer, said inner layer and outer layer each having an inner surface facing the inner surface of the other, said inner and outer layers are connected together at spaced locations and between the spaced locations form air ducts forming said air carrying system, wherein the improvement comprises that said inner and outer layers of said article of clothing are welded together at the spaced locations, said air outlet openings facing the body of the person to be heated are located in said inner layer adjacent to the location where said inner and outer layers are welded together, a hot air inlet nozzle opens into said air carrying system into the space between said inner and outer layers with said nozzle extending through one of said inner and outer layers, an insulating layer extending around the air inlet nozzle on the inside surface of the one of the inner and outer layers through which said air inlet nozzle extends into the space between said layers, and an insulating layer on the inside surface of the other one of said inner and outer layers located opposite the opening from said air inlet nozzle.

means including a plurality of holders engageable transversely through the aligned guide and plate holes for



securing said plate to said manifold pipe for fluid flow between said passages and the interior of said pipe.

**4,418,746**  
**PLATE-TYPE HEAT-EXCHANGER AND MANIFOLD ASSEMBLY**

G nter Langenhorst, and Christoph Langenhorst, both of Bad Sassendorf, Fed. Rep. of Germany, assignors to Top-Element Bauelemente f r Innenausbau und Raumgestaltung GmbH & Co. KG, Hamm, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,264

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133790

Int. Cl.<sup>3</sup> F28F 9/04, 9/14

U.S. Cl. 165-76

10 Claims

1. A heat exchanger comprising:  
 a heat-exchange plate having an edge and formed with a plurality of parallel spaced-apart longitudinal passages opening at said edge and with a plurality of transversely throughgoing plate holes at said edge between said passages;  
 a manifold pipe formed with a row of manifold holes all opening in the same direction and spaced apart the same as said passages at said edge, whereby said edge can be fitted over said row of manifold holes with each of said passages aligned longitudinally with a respective one of said manifold holes; a pair of L-section guides fixed on said pipe flanking said row of manifold holes and defining a gap corresponding to the shape of said plate at said edge, said guides being formed between said manifold holes with laterally throughgoing guide holes transversely alignable with said plate holes when said edge is fitted over said row of manifold holes; and

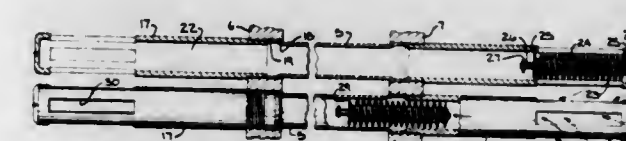
**4,418,747**  
**SHUTTLE CLEANING OF HEAT EXCHANGER TUBES**  
 Walter J. Baron, and Laird C. Cleaver, both of Milwaukee, Wis., assignors to Water Services of America, Inc., Milwaukee, Wis.

Filed Feb. 16, 1982, Ser. No. 348,742

Int. Cl.<sup>3</sup> F28F 5/00

U.S. Cl. 165-95

9 Claims



1. For use in cleaning a heat exchanger tube adapted to have a fluid reversably flowable therethrough and having capturing devices disposed at each end, and with said capturing devices having abutments thereon, a shuttle assembly for making back-and-forth passes through said tube between said capturing devices in response to fluid flow, said shuttle assembly comprising:

- (a) a spring tube cleaning element,
- (b) a pair of rigid longitudinally spaced mounting members secured to said spring,
- (c) a rod disposed coaxially with and longer than said spring and with said rod having said mounting members and said spring freely shiftable thereon,
- (d) and stop members disposed at each end of said rod,
- (e) the ends of said rod being adapted to engage the abutments of said capturing devices when said shuttle assembly is in position.

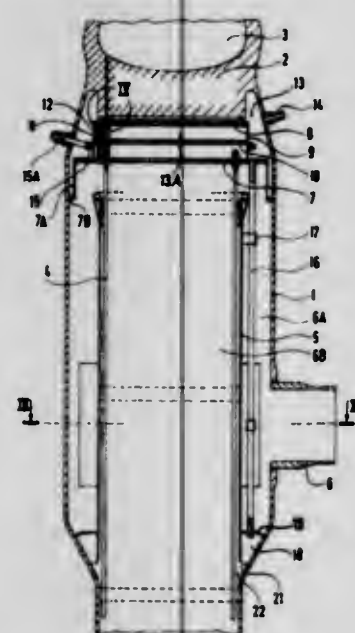


bly reaches the ends of said tubes so that said spring and mounting members freely shift on said rod until one of said mounting members engages one of said stop members.

#### 4,418,748 HEAT EXCHANGER WHOSE HOT END HAS A DEVICE FOR PROTECTING THE TUBE PLATE

Pierre Poudroux, Meudon la Foret; Guy Salon, Parly II, and Thong Nguyen-Thanh, Cernay-la-Ville, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Stein Industri, Velizy Villacoublay, both of, France

Filed Jan. 27, 1982, Ser. No. 343,246  
Claims priority, application France, Feb. 2, 1981, 81 01954  
Int. Cl.<sup>3</sup> F28D 7/00; F28F 9/22, 13/06; F22B 1/06  
U.S. Cl. 165—134 R 5 Claims



1. A heat exchanger comprising an outer casing closed at its hot and cool ends by two tube plates, a cluster of tubes which is connected to the tube plates to discharge into inlet and outlet collectors of a fluid flowing inside the tubes, and inlet and outlet tubings of a liquid flowing in the casing and around the tubes, wherein the exchanger comprises at its hot end a device for protecting the tube plate, such device comprising two plates united by a casing to define a first zone filled with such liquid in the static state forming a thermal screen, such plates being substantially parallel with the tube plate and a first one of such plates being disposed adjacent the tube plate, the protective device also comprising passages extending through such zone from one plate to another, and means for setting up a negative pressure between such first plate and the tube plates, to ensure that such liquid flows towards the tube plate inside such passages.

#### 4,418,749 HEAT EXCHANGER

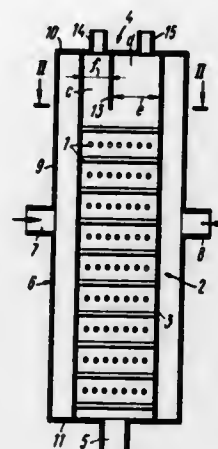
Boris P. Vasiliev; Nikolai L. Borisov; Mikhail K. Semenov; Ivan K. Ponomarev; Galina B. Tyryshkina, and Igor V. Gorbatenko, all of Belgorod, U.S.S.R., assignors to Belgorodsky Zavod Energeticheskogo Mashinostroenia, U.S.S.R.

Filed Oct. 30, 1981, Ser. No. 316,877  
Int. Cl.<sup>3</sup> F28F 7/00 1 Claim

U.S. Cl. 165—139

1. In a heat exchanger for the recovery of heat from shale ashes in a process for the continuous retorting of oil shale, the ashes incoming as at least two flows under different pressures, having a plurality of tubes arranged in at least two horizontal side-by-side planes and serving to conduct a fluid for heat exchange, the tubes in one plane being transverse to those of the other plane, said tubes being held at their ends in the side walls of a frame open at two sides transverse to the side walls to form an inlet and outlet for hot shale ashes, and a housing surrounding said frame and having an inlet and outlet, said

housing engaging the frame to form with the housing inlet and outlet a flow path for said fluid through the plurality of tubes in said side-by-side planes the improvement which comprises the side walls of said frame, having portions extending above the tubes in the upper one of said at least two horizontal side-by-side planes and up to the upper portion of said housing, which upper portion having at least two inlets for hot shale



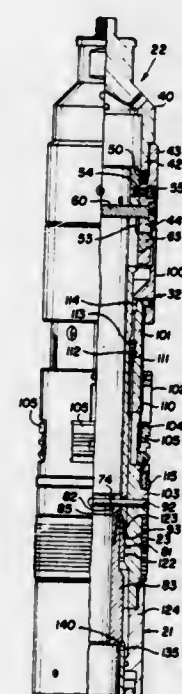
ashes, and defining an inlet space, at least one partition plate attached to the upper portion of said housing between said inlets for hot shale ashes and extending downwardly, thereby providing at least two compartments each having a cross-sectional area in proportion to the amount of shale ashes incoming through said inlets, said partition plate extending downwardly for an amount sufficient to equalize pressure in the adjacent compartments.

#### 4,418,750 WELL TOOL

James H. Paschal, Jr., Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 13, 1981, Ser. No. 310,823  
Int. Cl.<sup>3</sup> E21B 23/00, 34/14 12 Claims

U.S. Cl. 166—214



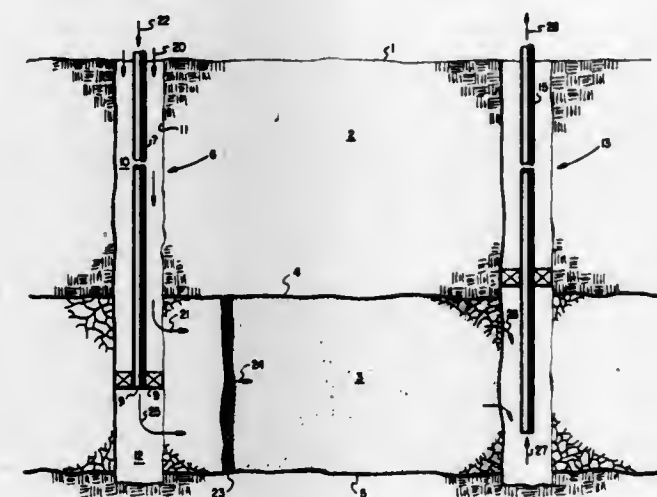
1. A running tool for installing a spring operated safety valve in a landing nipple of a well tubing string comprising: a body having means for connection with a handling tool string and means for connection with a lock mandrel connected with said safety valve; a core connected with said body and connectible with said lock mandrel for applying forces to drive said lock mandrel and safety valve into said landing nipple; and a spring isolator tube assembly connected with said core and engageable with a spring operator tube of said safety valve to com-

press the spring of said valve and isolate said tube from said forces directed toward said mandrel and safety valve.

#### 4,418,751 IN-SITU COMBUSTION PROCESS

Leonard W. Emery, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 31, 1982, Ser. No. 364,116  
Int. Cl.<sup>3</sup> E21B 43/243 6 Claims  
U.S. Cl. 166—261

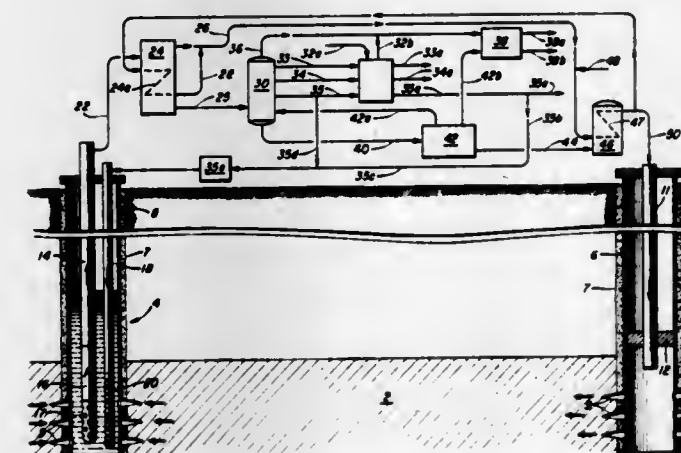


1. A method for conducting an in situ combustion process in a hydrocarbon-bearing subsurface geologic formation comprising providing at least one wellbore having a tubing string in the interior thereof extending for a portion of the length thereof to the vicinity of said formation and an annulus between the exterior of said tubing and interior of said wellbore, the portion of said wellbore below the end of said tubing being physically separated from said annulus, injecting water into said annulus and from there into an upper portion of said formation, at essentially the same time as said water injection injecting essentially pure oxygen into said tubing and from there into a lower portion of the same said formation for in situ combustion of said oxygen and part of the hydrocarbon already present in said formation, whereby said water and oxygen are separately injected into said formation without prior mixing of same in said wellbore.

#### 4,418,752 THERMAL OIL RECOVERY WITH SOLVENT RECIRCULATION

Lyndon D. Boyer; Ardis L. Anderson, both of Ponca City, Okla., and Michael W. Britton, Corpus Christi, Tex., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 7, 1982, Ser. No. 337,799  
Int. Cl.<sup>3</sup> E21B 43/24, 43/40 10 Claims  
U.S. Cl. 166—267



1. In a method for the recovery of oil from a subterranean

reservoir containing oil therein having a density greater than the density of water and penetrated by a production well, wherein a hot aqueous fluid is injected into said reservoir to reduce the viscosity of oil within said reservoir to facilitate the flow of oil into said well and a diluent solvent is circulated down said well to produce a solvent-oil blend of decreased viscosity which is produced from said well in admixture with water, the improvement comprising:

- employing a diluent having a density such that the density of the resulting oil-solvent blend is greater than the density of the water produced from said well along with said blend,
- separating said water from said oil-solvent blend,
- fractionating the oil-solvent blend to recover a solvent fraction having a density as set forth in step (a), and
- circulating said solvent fraction down said production well in accordance with step (a).

#### 4,418,753 METHOD OF ENHANCED OIL RECOVERY EMPLOYING NITROGEN INJECTION

Thomas J. Morel, and Stewart Haynes, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,804  
Int. Cl.<sup>3</sup> E21B 43/22 24 Claims

U.S. Cl. 166—273

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the steps comprising:

- injecting into said reservoir via said injection system a light hydrocarbon slug at a rate sufficient to cause fingering of said light hydrocarbon through the oil in said reservoir to formulate a mixture of said light hydrocarbon and said reservoir oil adjacent said injection system,
- thereafter, injecting into said reservoir via said injection system a predominantly nitrogen-containing gas at a rate to produce a flow velocity which is less than the flow velocity of said light hydrocarbon slug and in an amount sufficient to strip previously-injected light hydrocarbon from said reservoir oil to form a transition zone of conditional miscibility;
- injecting a driving fluid into said reservoir via said injection system to drive said transition zone through said reservoir and displace oil to said production system; and
- recovering oil from said production system.

#### 4,418,754 METHOD AND APPARATUS FOR GRAVEL PACKING A ZONE IN A WELL

Lee W. Stepp, Comanche, Okla., assignor to Halliburton Company, Duncan, Okla.

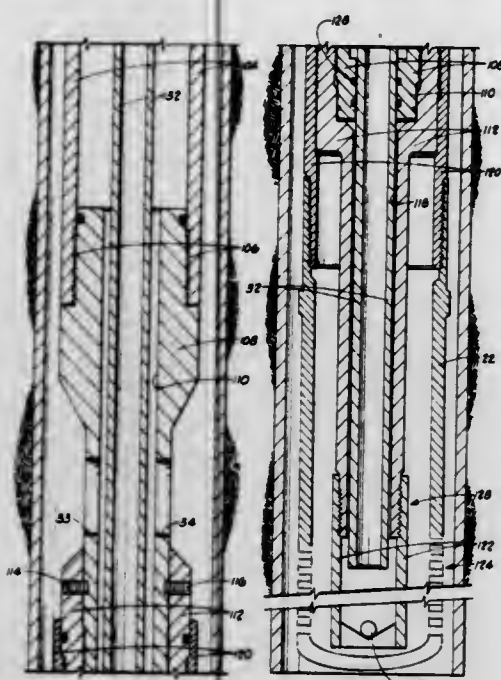
Filed Dec. 2, 1981, Ser. No. 326,681  
Int. Cl.<sup>3</sup> E21B 43/04 16 Claims  
U.S. Cl. 166—278

7. Apparatus adapted to be lowered on tubing into a well bore for setting a gravel pack at the bottom of the well, said apparatus comprising,

- a screen having an open top and perforated side,
- screen support means for supporting said screen, said screen support means including screen releasing means for disconnecting said screen from said screen support means;
- a gravel packing port in said screen support means;
- conduit means for providing a gravel slurry flow path from the tubing to said gravel packing port, through the outside of said screen to the inside, and from thence to the bore annulus;
- packer means mounted around said conduit means between said gravel port and said tubing, said packer means adapted to be set into sealing engagement with the well bore responsive to longitudinal and rotational movement of said tubing; and
- clutch means operatively connecting said screen support



means to said conduit means, said clutch means, when in an engaged condition, transmitting longitudinal and rotational tubing movement to said screen support means and,



when in a disengaged condition, permitting such tubing movement without movement of said screen support means.

4,418,755

#### METHODS OF INHIBITING THE FLOW OF WATER IN SUBTERRANEAN FORMATIONS

Thomas R. Sifferman, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 121,551, Feb. 14, 1979, abandoned.

This application Aug. 17, 1981, Ser. No. 293,746

Int. Cl.<sup>3</sup> E21B 33/138

U.S. Cl. 166—281

16 Claims

1. A method of inhibiting the flow of water in a subterranean formation comprising introducing a gelling agent into said formation having the property of forming a highly viscous gel in the presence of water, wherein said gelling agent is a surface active agent selected from the group consisting of ethoxylated alcohols, ethoxylated aliphatics, amido betaines, polyoxyethylene oleyl ether, polyoxyethylene 20 sorbitan mono-oleate, and polyoxyethylene fatty glyceride and mixtures of such agents.

4,418,756

#### METHOD AND APPARATUS FOR PERFORMING OPERATIONS IN WELL TUBING

John H. Yonker, Carrollton, and Henry P. Arendt, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 8, 1981, Ser. No. 299,931

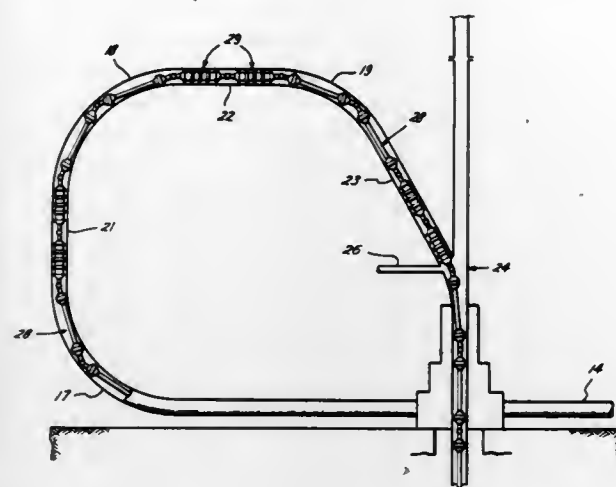
Int. Cl.<sup>3</sup> E21B 23/08

U.S. Cl. 166—383

13 Claims

1. The method of performing operations in a well having an entry loop of pipe at the wellhead comprising; establishing reverse fluid communication with the loop on the wellhead side of the loop; making up a TFL train with a tool, spacer bars and pistons with said spacer bars having a length between the pistons and tool which will position pistons in the loop and on the loop side of the point of reversing fluid communication with the tool positioned to do work in the well; running said TFL train into the loop and well;

loading all of said pistons with pressure fluid so that all pistons will exert a force on the TFL train; and



performing the desired operation while said pistons are in said loop.

4,418,757

#### STORAGE RACK STRUCTURAL SPRINKLER SYSTEM

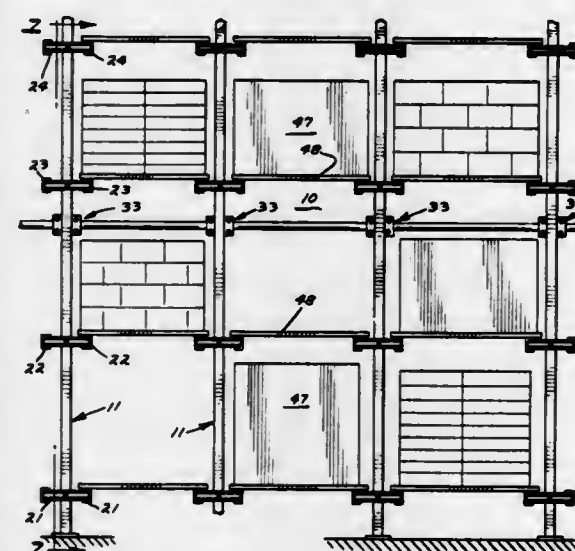
Jerome P. Merkel, Plymouth, Minn., assignor to United Sprinkler, Inc., Hamel, Minn.

Filed Dec. 8, 1980, Ser. No. 213,855

Int. Cl.<sup>3</sup> A62C 37/00

U.S. Cl. 169—54

9 Claims



1. A fire protection and structural storage rack system which supports vertically spaced apart load support means, comprising in combination;

a plurality of like, horizontally spaced apart vertical side frame members;

a plurality of open ended sprinkler conduits disposed in horizontal axial alignment intermediate adjacent vertical side frame members, each of said plurality of sprinkler conduits having ends which are rigidly and structurally connected to and at said vertical side frame members in cooperable supporting relationship with said vertical side frame members to form said storage rack system for supporting the vertically spaced apart load support means while said ends of adjacent sprinkler conduits are in axially spaced apart relationship at said vertical side frame members; and

fluid coupling means joining each said axially spaced apart ends of said conduits independently of said vertical side frame members.

4,418,758

#### TRACTIVE FORCE SENSING SYSTEM FOR TRACTOR

Tsutomu Fujimoto, Fujiidera, Japan, assignor to Kubota, Ltd., Osaka, Japan

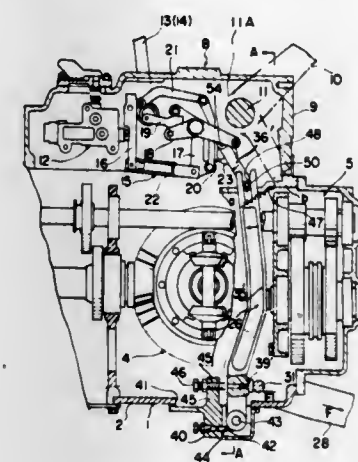
Filed Mar. 16, 1981, Ser. No. 244,120

Claims priority, application Japan, Jul. 16, 1980, 55-101089[U]

Int. Cl.<sup>3</sup> A01B 63/112; B60D 1/00

U.S. Cl. 172—7

2 Claims



1. A tractive force sensing system for a tractor provided with a hydraulic device (8) having a draft control function to actuate an oil pressure control valve (12) through a draft cam (23) by tractive force (F) from a pair of lower links (28), said system comprising:

a lower link support (31) passing transversely through the inside of a lower portion of a transmission case of a vehicle body (1), and adapted to be resiliently bent and deformed by said tractive load (F),

a first feedback link (35') having a cam follower (39') in contact with an axially central region of said lower link support (31) and a bifurcated upper end defining an engagement groove, and

a second feedback link (36') having an engagement member (50) engaging said groove, and operatively and directly connected to said draft cam (23),

said transmission case (2) including an opening (41) in a bottom wall thereof, a box (40) being removably attached to said bottom wall across said opening such that said box (40) projects downwardly from said bottom wall, said first feedback link (35') having a lower end pivotally connected to said box (40) at a position below said lower link support (31), said box (40) including at least one stopper means (46) for restricting swinging movement of said first feedback link (35') in a predetermined range.

4,418,759

#### SOIL LEVELING APPARATUS

Orlan H. Mork, 6029 225th St. West, Farmington, Minn. 55024

Continuation-in-part of Ser. No. 224,458, Jan. 12, 1981. This

application Aug. 28, 1981, Ser. No. 297,133

Int. Cl.<sup>3</sup> E02F 3/64

U.S. Cl. 172—197

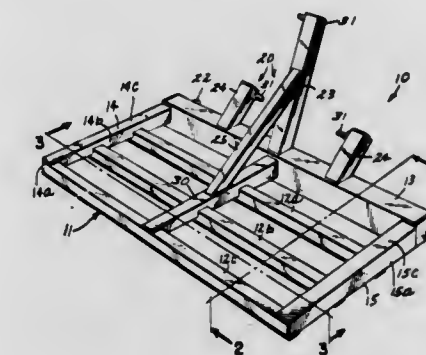
20 Claims

1. An apparatus for leveling soil and the like, comprising: a generally rectangular frame including a leading transverse, elongate scraper member and a plurality of trailing transverse elongate ground-engaging members fixedly secured in mutually spaced-apart relationship between a pair of longitudinal side members and at least one longitudinal intermediate member;

the scraper member including a lower edge and each ground-engaging member including a lower surface, with the lower edge of the scraper member and the lower surfaces of the ground-engaging members of said frame being substantially co-planar;

means mounted on said frame for releasably connecting the apparatus to a draft means;

a plurality of scarifiers depending in mutually spaced apart relationship adjacent to the scraper member of said frame; means for supporting said scarifiers on said frame for pivotal movement between forward and rearward positions, the scraper member and adjacent ground-engaging member of said frame being spaced apart sufficiently to permit forward pivoting of said scarifiers out of ground engagement upon reversal of the apparatus;



means for supporting said scarifiers for vertical movement between raised and lowered positions;

means associated with said scarifiers for controlling pivotal orientation of said scarifiers in the rearward positions during vertical positioning thereof; and

means connected to said support means for selectively adjusting vertical positioning and thus penetration depth of said scarifiers relative to the soil between the raised and lowered positions.

4,418,760

#### SUBSOIL PLANAR TOOL AND SHEAR BOLT THEREFOR

Cornells van der Lely, 7, Brüschenrain, Zug, Switzerland

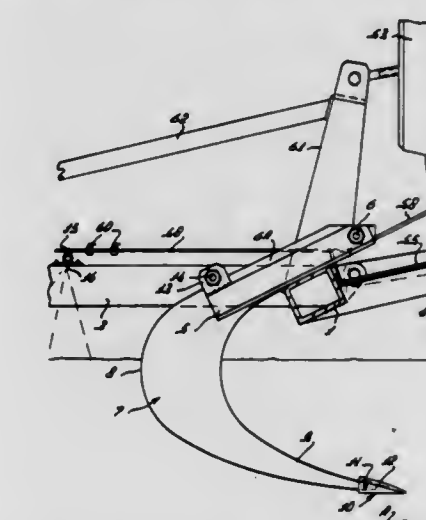
Filed Aug. 8, 1978, Ser. No. 932,135

Claims priority, application Netherlands, Aug. 15, 1977, 7708954

Int. Cl.<sup>3</sup> A01B 61/04

U.S. Cl. 172—271

6 Claims



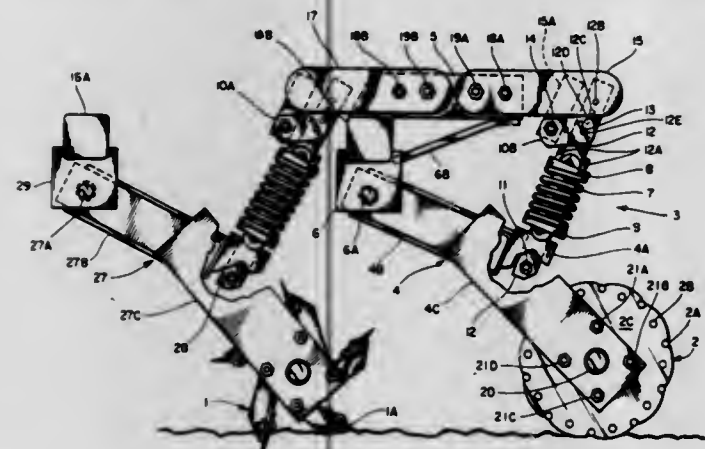
6. A subsoiler comprising a frame and at least one subsoil planar tool mounted on a support, said support being channel-shaped with upwardly extending limbs and connected to the upper surface of a transverse beam of said frame, said limbs extending a substantial distance in front of and to the rear of said beam, said tool being hook-shaped when viewed from aside and including a forwardly extending upper fastening portion, a curved central portion and a lower soil penetrating portion, said fastening portion having an upper edge and extending for substantially the whole length of said support, a pivot interconnecting the fastening portion to said support



adjacent the forward end thereof and said pivot being located a substantial distance in front of said transverse beam, a shear bolt bridging the limbs adjacent the rear ends thereof and said bolt being located a substantial distance to the rear of said transverse beam and immediately above the upper edge of said fastening portion.

#### 4,418,761 ADJUSTABLE TILLAGE IMPLEMENT POSITIONING APPARATUS

William J. Dietrich, Sr., Congerville, and Cary L. Sizelove, Eureka, both of Ill., assignors to DMI, Inc., Goodfield, Ill.  
Filed Sep. 22, 1981, Ser. No. 304,584  
Int. Cl.<sup>3</sup> A01B 61/04, 29/00, 35/28  
U.S. Cl. 172-271 13 Claims



11. An apparatus for mounting and positioning a rotary agricultural implement on a horizontal mounting bar of a tillage machine, said apparatus comprising:

- first and second lateral arms rotationally coupled respectively to first and second end portions of said implement and pivotally coupled to said horizontal mounting bar for mounting said implement thereto;
- cross member means positioned generally parallel to said mounting bar for rigidly coupling said first and second lateral arms;
- support means rigidly coupled to said mounting bar and extending rearward therefrom;
- variable length strut means in combination with linearly compressible spring means connected to said cross member means for urging said rotary implement in a downward direction and in contact with the ground being tilled; and
- hinged coupling means for pivotally coupling said variable length strut means to said support means for selectively controlling the downward force applied to said implement by said variable length strut means and linearly compressible spring means combination and wherein the upward displacement of said implement is limited by the rotational impact of said hinged coupling means with said support means.

#### 4,418,762 BALANCED IMPLEMENT TRANSPORT VEHICLE

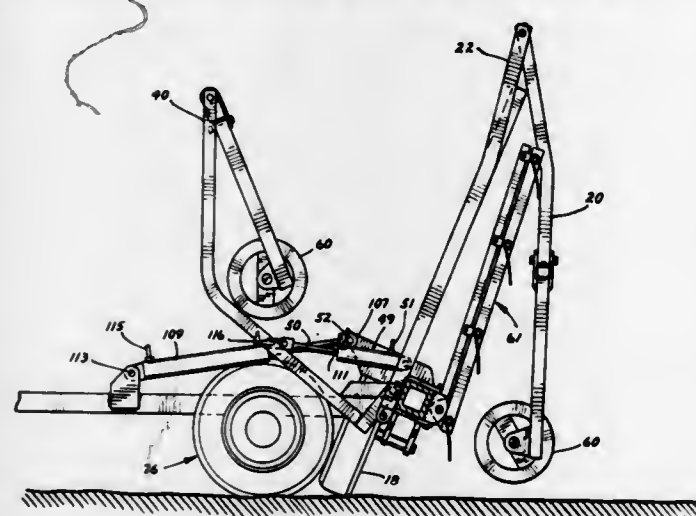
James H. Page, Bottineau, N. Dak., assignor to Western Manufacturing Company, Inc., Bottineau, N. Dak.  
Filed Jul. 20, 1981, Ser. No. 285,141  
Int. Cl.<sup>3</sup> A01B 73/00

U.S. Cl. 172-311 8 Claims

1. An implement drawbar and transport comprising in combination:
  - an elongated drawbar means;
  - dirigible support means adapted for connection to a prime mover and including means for rotatably mounting said drawbar for movement between working and transport positions and in lateral transverse relationship with the line of draft on said support means;
  - a first plurality of implement draft connection means

mounted on said drawbar for rotation therewith for operation between a generally horizontal working position and a generally vertical transport position;

- a second plurality of implement draft connection means rotatably mounted on said drawbar means for rotation therewith for operation between a generally horizontal working position, a balanced lifting position and a generally vertical transport position;
- first means connected to said second plurality of implement draft means and second means connected to said drawbar means for, said first means independently rotating said second plurality of implement draft means with respect to said drawbar means and said second means rotating said drawbar means and disposing said first plurality of implement draft connection means in a balanced position with respect to said second plurality of draft connection means with said first and second pluralities of draft connection means being on either side of said drawbar as said drawbar is rotated between working and transport positions.



7. The method of lifting and transporting a plurality of earth working implements on a rotatable drawbar which comprises the steps of:

- fixedly attaching one half of a plurality of earth working implements to a drawbar rotatable between working and transport positions;
- adjustably, rotatively, rigidly attaching the other half of a plurality of earth working implements to said drawbar; positioning said one half and said other half of said plurality of earth working implements on one side of said drawbar in the working position thereof;
- rotating said other half of said plurality of earth working implements to a balancing position on the opposite side of said drawbar from said working position;
- rotating said drawbar from said working to said transport position; and thereby
- rotating said one half of said plurality of earth working implements to a raised transport position on the same side of said drawbar as said working position while maintaining said other half of said plurality of earth working implements on the opposite side of said drawbar.

#### 4,418,763 AGRICULTURAL FOLDING TOOL BAR

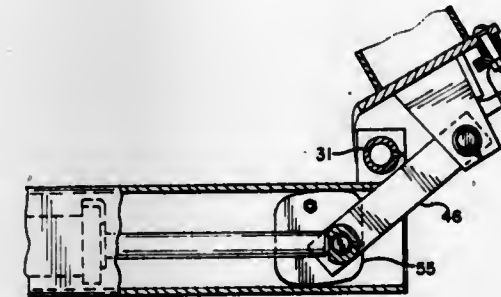
Charles Boetto, Naperville, Ill., assignor to International Harvester Co., Chicago, Ill.  
Filed Oct. 1, 1981, Ser. No. 307,394  
Int. Cl.<sup>3</sup> A01B 73/00

U.S. Cl. 172-776 8 Claims

1. A folding tool bar adapted to support ground working tools and comprising:
  - (a) a normally horizontal, hollow central section;
  - (b) an outer wing section pivotally connected to said central section about an offset axis for movement between a working position in general alignment with said central

section and a folded transport position on said central section, said pivotal connection providing a fulcrum for a portion of said movement;

- (c) a hydraulic cylinder mounted in said central section;
- (d) a pair of spaced support means substantially spanning the interior of said central section and pivotally connected to the rod end of the cylinder, said connection being sufficiently below the center of said means to effectively increase the lever arm when the wing section is extended; and



- (e) a pair of links pivotally connected to said rod end by slotted openings, said wing having an ear, said ear being pivotally connected to said links, said links upon cylinder actuation, moving said wing upward until said wing passes inwardly over center of said axis and said links contact said fulcrum and pivot thereabout as the wing moves to the transport position, said support means relieving wing fall and said links slotted connection preventing support means binding in said central section in the movement between working and transport and vice versa.

#### 4,418,764 FLUID IMPULSE TORQUE TOOL

Masatoshi Mizobe, Nara, Japan, assignor to Giken Kogyo Kabushiki Kaisha, Osaka, Japan  
Filed Jul. 14, 1981, Ser. No. 283,152  
Int. Cl.<sup>3</sup> B23Q 5/06

U.S. Cl. 173-12

7 Claims



1. In a fluid driven torque tool having motor means for generating torque pulses, fluid passageways for conducting a driving fluid to said motor means, moveable pressure relief means coupled with said motor means for maintaining pressure in said motor means below a predetermined amount, an elongated member coupled to, and moveable with, said pressure relief means, for controlling fluid flow through said passageways, and means for automatically blocking flow of said fluid to said motor means when said pressure exceeds said predetermined amount, the improvement comprising:

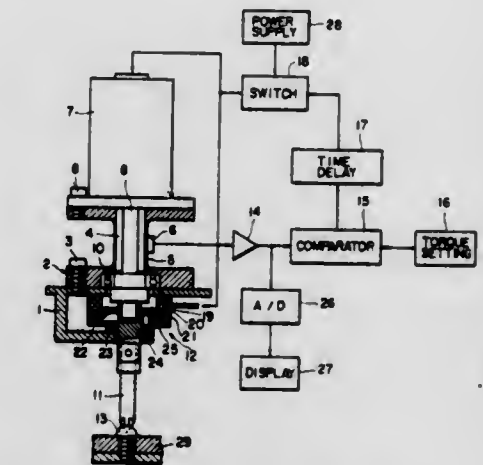
said blocking means comprising a valve having a moveable portion continuously engaging a portion of said elongated member, said elongated member and said valve moveable portion being moveable in directions normal to each other.

#### 4,418,765 POWER-DRIVEN SCREWDRIVER WITH A TORQUE CONTROL

Takashi Mori, Yamatokohriyama; Shuichi Hosokawa, Habikino, and Takao Naito, Katano, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan  
Filed Jan. 12, 1982, Ser. No. 338,996  
Claims priority, application Japan, Jan. 16, 1981, 56-5279  
Int. Cl.<sup>3</sup> B25B 21/00

U.S. Cl. 173-12

6 Claims

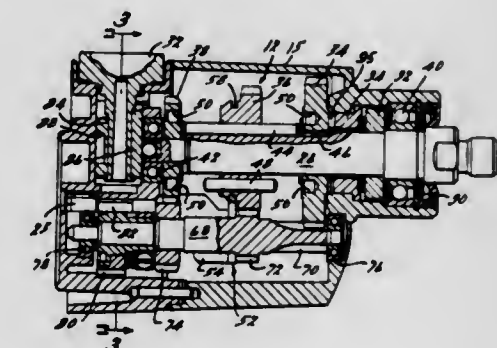


1. A power-driven screwdriver comprising:
  - a base;
  - a motor mounted on said base;
  - a screwdriver bit mounted on said base and rotatably drivable by said motor to tighten a screw with a tightening torque;
  - a torque detector mounted on said base for producing a signal representative of said tightening torque;
  - a torque setting device for generating a signal indicative of a desired tightening torque with which the screw is to be tightened;
  - a comparator for generating a comparator output signal when said torque representative signal is within a range defined by the signal from said torque setting device;
  - a switch responsive to said comparator output signal for de-energizing said motor; and
  - a time-delay circuit interposed between said comparator and said switch for introducing a delay time to said comparator output signal applied to said switch.

#### 4,418,766 COMPACT MULTI-SPEED HAMMER-DRILL

Horst Grossmann, Huenfelden, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.  
Continuation-in-part of Ser. No. 297,015, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 60,437, Jul. 25, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,803  
Int. Cl.<sup>3</sup> B23B 45/02, 45/16; B23Q 5/027  
U.S. Cl. 173-13

7 Claims



1. In a compact multi-speed hammer-drill having a housing



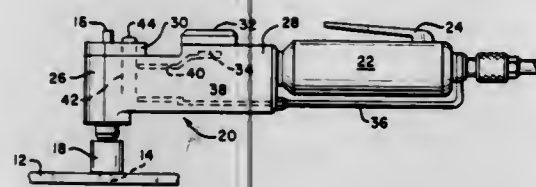
with a motor therein, the hammer-drill having a "drilling" mode of operation and a "hammer drilling" mode, the combination of a rotary-reciprocal output spindle journaled in the housing and having a limited axial floating movement therein, a fixed hammer member mounted concentrically about the spindle and retained in a forward portion of the housing, a movable hammer member carried on the spindle, concentrically therewith, and cooperating with the fixed hammer member to deliver vibratory impacts to the spindle in the hammer-drilling mode of operation, shiftable means mounted in the housing and engaging an inner portion of the spindle remote from the hammer members for switching from the drilling mode to the hammer-drilling mode, and vice versa, and a three-speed transmission comprising an intermediate shaft journaled in the housing, respective first, second and third idler gears of different sizes on the shaft for conjoint rotation therewith, respective first, second and third output gears of different sizes on the spindle, the first and third output gears being freely rotatably mounted on the spindle, the first output gear being disposed adjacent to the cooperating hammer members and being constantly in mesh with the third idler gear, the second output gear being in mesh with the second idler gear in one of the three speeds of operation, keying means between the second output gear and the spindle for conjoint rotation therewith in all three speeds of operation, means for moving the second output gear axially in either direction along the spindle in juxtaposition to the first and third output gears, respectively, and means responsive to the juxtaposition of the second output gear to either the first and third output gears, respectively, for coupling either the first or third output gears to the spindle, respectively, thereby providing for two additional speeds of operation.

4,418,767

**INTERCHANGEABLE VALVE SYSTEM FOR HYDRAULIC REVERSAL OF POSITIVE FEED DRILL**  
Pierre G. Vindez, Redondo Beach, Calif., assignor to P. V. Tool Inc., Gardena, Calif.

Filed Mar. 17, 1981, Ser. No. 244,673  
Int. Cl.<sup>3</sup> B23B 47/22; B23Q 5/20  
U.S. Cl. 173—19

2 Claims



1. In a positive feed power drill having both a spindle drive gear train and a spindle feed gear train in a housing, and having hydraulic means for actuating a piston in a cylinder to the feed gear train for automatic retraction of the spindle, an improvement comprised of a valve in said hydraulic means utilizing a sleeve parallel to said spindle having only two axially displaced orifices, a first orifice connected to a passage from a source of fluid under pressure, and a second orifice connected to a passage from said sleeve to said cylinder to drive said piston therein, said valve having a valve stem with a reduced diameter portion between ends thereof, said reduced diameter portion being of a length sufficient to span both orifices, said valve stem having said reduced diameter portion at one end to span both orifices upon being moved in one direction, and further comprising valve actuating means at an upper end of said housing for moving said valve stem from a position having said reduced diameter portion over only orifice to a position over both orifices to automatically lock the feed gear train when the spindle has been driven a predetermined extent while counter-

sinking, said one of two interchangeable valve stems being comprised of a collar supported on a shoulder of a spindle feed gear, and lever means over said collar for moving said valve stem in said opposite direction when said spindle feed gear causes said collar to move up on said spindle as said spindle feed gear threads upwardly on said spindle once said spindle is constrained from being fed further relative to said housing.

2. In a positive feed power drill having both a spindle drive gear train and a spindle feed gear train in a housing, and having hydraulic means for actuating a piston in a cylinder to the feed gear train for automatic retraction of the spindle, an improvement comprised of a valve in said hydraulic means utilizing a sleeve parallel to said spindle having only two axially displaced orifices, a first orifice connected to a passage from a source of fluid under pressure, and a second orifice connected to a passage from said sleeve to said cylinder to drive said piston therein, said valve having one of two interchangeable valve stems, each valve stem having a reduced diameter portion between ends thereof, said reduced diameter portion being of a length sufficient to span both orifices, one valve stem having said reduced diameter portion at one end to span both orifices upon being moved in one direction, and the other valve stem having said reduced diameter portion at the other end to span both orifices upon being moved in a direction opposite said one direction, and further comprising separate interchangeable valve actuating means at an upper end of said housing for moving said one of two interchangeable valve stems from a position having said reduced diameter portion over only one orifice to a position over both orifices to automatically lock the feed gear train when the spindle has been driven a predetermined extent while drilling and while countersinking, respectively, said one valve stem being selected for drilling with its relative valve actuating means, said valve actuating means for drilling being comprised of an arm extending from an upper end of said one valve stem and means adjusted in height on the upper end of said spindle corresponding to the extent of spindle travel desired before retraction for engaging said arm as said spindle is fed, thereby causing said spindle to be retracted when said arm is engaged by said means on said spindle, said other valve stem being selected for countersinking with its respective valve actuating means, said valve actuating means for countersinking being comprised of a collar supported on a shoulder of a spindle feed gear, and lever means over said collar for moving said valve stem in said opposite direction when said spindle feed gear causes said collar to move up on said spindle as said spindle feed gear threads upwardly on said spindle once said spindle is constrained from being fed further relative to said housing.

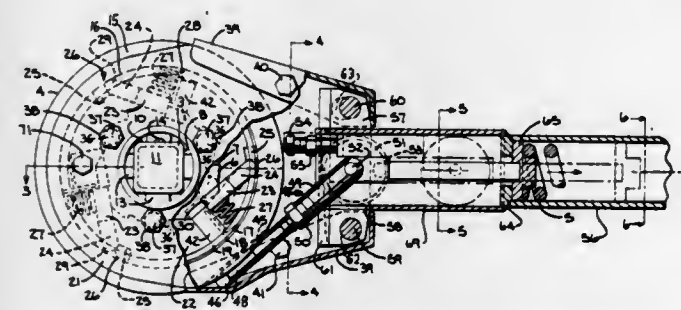
4,418,768

**MANUAL TORQUE MAGNIFYING IMPACT TOOL**  
Oscar J. Swenson, 630 S. Poplar Way, Denver, Colo. 80224  
Filed Sep. 2, 1982, Ser. No. 414,021

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.  
Int. Cl.<sup>3</sup> B25P 15/02

U.S. Cl. 173—93.5

13 Claims



1. A manually operable torque magnifying impact tool comprising a rotary tool head, an annular inertia member around said tool head on a common axis therewith, a frame member

transverse the common axis at each end of the inertia member, a torque input handle extending transversely of said axis and connected to said frame member, bearing means coaxial with said axis and attached to said frame member guiding said tool head, inertia member, frame member and handle for relative angular movement about said axis, an elongated power spring within said handle, coupling means between said inertia member and said power spring for storing and releasing energy, said tool head including a cylindrical portion having a series of circumferentially equally spaced elongated ratchet teeth around its cylindrical surface parallel to said axis, a pawl pivotally seated at one edge in a seat on said inertia member, said pawl biased by pawl spring means for engagement of its unseated edge with said ratchet teeth, cam means rigid with said frame member around said axis operatively contacting said pawl for its disengagement from and reengagement with said ratchet teeth to impart torque producing impact to said tool head on movement of said handle angularly in a predetermined direction about said axis relative to said tool head, a stop member on said frame member at times contacted forcibly by said unseated edge of said pawl following said disengagement of said pawl to stop rotation of said inertia member, a pivotal connection between said handle and same frame member to allow limited angular movement of said handle in one direction about said pivotal connection relative to said frame member about an axis parallel to the axis of said inertia member and remote from the longitudinal axis of said handle, said coupling means between said inertia member and said power spring including a spring stop member on said handle to limit decompressive movement of said power spring and including a pitman acting pivotally on said inertia member near the peripheral surface thereof and connected pivotally to a compression and recoil member in contact with said power spring, the combination of said pitman, said spring stop, and said compression and recoil member providing for compression and decompression of said power spring on said movement of said handle about said axis relative to said tool head in said predetermined direction, for interaction between said compression and recoil member and said handle on movement of the handle about said axis relative to said tool head in the direction opposite to the said predetermined direction to preclude forcible contact of said unseated end of said pawl with said stop on said frame member, and for said interaction responsive to said pivotal movement of the handle relative to said frame member following forcible engagement of said unseated edge of said pawl with said stop on said frame member to compress said power spring to stop rotation of said inertia member by absorbing kinetic energy of rotation therefrom.

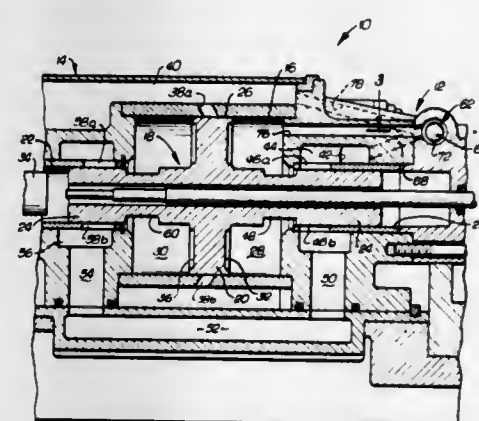
4,418,769

**HAMMER STARTING MECHANISM**  
Robert R. Vincent, Denver, and James T. Clemenson, Littleton, both of Colo., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 12, 1981, Ser. No. 243,076  
Int. Cl.<sup>3</sup> B25D 9/04

U.S. Cl. 173—134

7 Claims



1. In a pneumatic hammer for repeatedly impacting a tool,

said hammer having a housing which defines a chamber, a piston reciprocally carried within the chamber, said piston defining an impact subchamber of the chamber wherein pneumatic fluid supplied under pressure to the impact subchamber from an outside source drives the piston to impact the tool, the piston also defining a retracting subchamber of the chamber wherein pneumatic fluid supplied under pressure to the retracting subchamber drives the piston back from the tool, an exhaust port in the housing which provides an outlet from the chamber, said piston having a first position wherein the exhaust port is coupled to the impact subchamber so as to exhaust pneumatic fluid under pressure from the impact subchamber, a second position wherein the exhaust port is coupled to the retracting subchamber so as to exhaust pneumatic fluid under pressure from the retracting subchamber, and a third position intermediate the first and second positions in which the exhaust port is uncoupled from both subchambers, the improvement comprising:

a passageway located in the housing operably connecting one of the subchambers to an external outlet;  
a valve located in the passageway, said valve having an open position in which said one subchamber is coupled through the open valve to the external outlet and a closed position in which the passageway is closed off;  
means for biasing the valve in the open position at the start of the hammer operation wherein pneumatic fluid may be exhausted from said one subchamber to prevent the piston from centering in the intermediate position; and  
means for moving the valve from the open position to the closed position after the piston has started moving, said valve remaining in the closed position while the hammer is in operation.

4,418,770

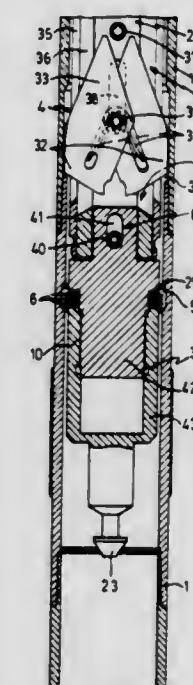
**PROCESS FOR RETRIEVING A CORING BARREL COMPRISING TWO TUBES AND RETRIEVING DEVICE FOR SUCH A PROCESS**

Honore J. Lambot, Wauthier-Braine, Belgium, assignor to Societe Anonyme Diamant Boart, Brussels, Belgium

Filed Nov. 17, 1981, Ser. No. 322,130  
Claims priority, application European Pat. Off., Nov. 21, 1980, 80201101.5

Int. Cl.<sup>3</sup> E21B 49/00  
U.S. Cl. 175—58

9 Claims



1. A process for retrieving a double tube coring barrel including an outer tube (1) and an inner tube (2) which is pushed into a desired position, in an ascending boring, by a column of water acting on a sealing piston within the outer tube, the



pressure in a lower part of the column being regulated above the hydrostatic pressure increased by the weight of said inner tube until said desired position is reached, comprising the steps of: increasing the pressure to circulate boring liquid toward a drilling crown and thereby take a core sample in the coring barrel, reducing the pressure in the lower part of the column to allow a retrieving head (3) to drop by gravity and seal off the outer tube, unclamping the inner tube of the coring barrel from the outer tube by allowing boring liquid in an upper part of the column to exert a traction force on the retrieving head, and allowing the unclamped inner tube and core sample to slide by gravity down through the outer tube to a retrieval site by draining boring liquid from the lower part of the column.

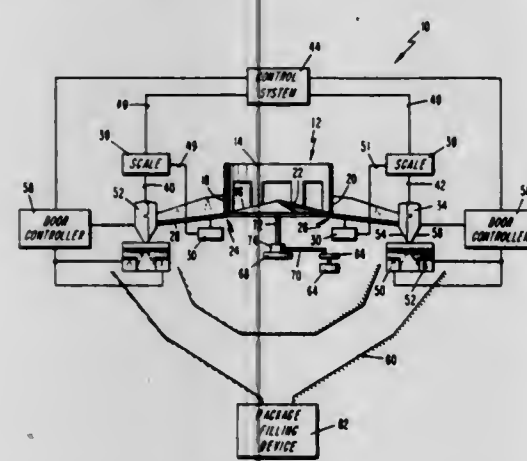
#### 4,418,771 METHOD AND APPARATUS FOR COMBINATION WEIGHING

Nelson R. Henry, Decatur; Duncan B. Cutler, Dunwoody, and William L. Warner, Grayson, all of Ga., assignors to The Woodman Company, Decatur, Ga.

Filed Feb. 1, 1982, Ser. No. 344,630  
Int. Cl.<sup>3</sup> G01G 13/02

U.S. Cl. 177-1

26 Claims



1. A method for making up a desired weight of a solid flowing product as a combination of contents of a predetermined number of storage cups comprising the steps of:

- establishing acceptable upper and lower limits for an acceptable range of product weight to be achieved;
- distributing quantities of the product to a plurality of scale hoppers;
- terminating the distribution of the product to each hopper in accordance with a determination by the scale associated therewith that a predetermined weight has been distributed thereto;
- feeding the product from each hopper to a storage cup associated with that particular hopper;
- registering the weight of product stored in each of the storage cups of the system;
- calculating the total weight of successive combinations of the registered product weights of said predetermined number of storage cups; and
- making the desired weight by selecting a combination of storage cups having a total product weight within the established acceptable limits.

#### 4,418,772 COMBINATORIAL WEIGHING METHOD AND APPARATUS THEREFOR

Masao Fukuda, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Apr. 13, 1982, Ser. No. 368,004  
Claims priority, application Japan, Apr. 14, 1981, 56-56672  
Int. Cl.<sup>3</sup> G01G 13/00

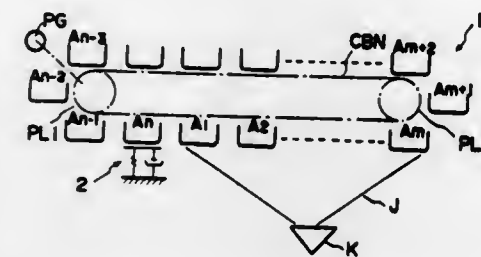
U.S. Cl. 177-1

6 Claims

1. A combinatorial weighing method in a combinatorial weighing apparatus of the type having a plurality of buckets

for carrying articles to be weighed, a conveyor for conveying each of the buckets, and a weight sensor for sensing the weight of each bucket, which method comprises the steps of:

- storing in memory the empty weight of each bucket following the measurement thereof by the weight sensor;
- storing in memory the total weight of each bucket and the articles introduced into said bucket, said total weight of the bucket and its articles being measured by the weight sensor;



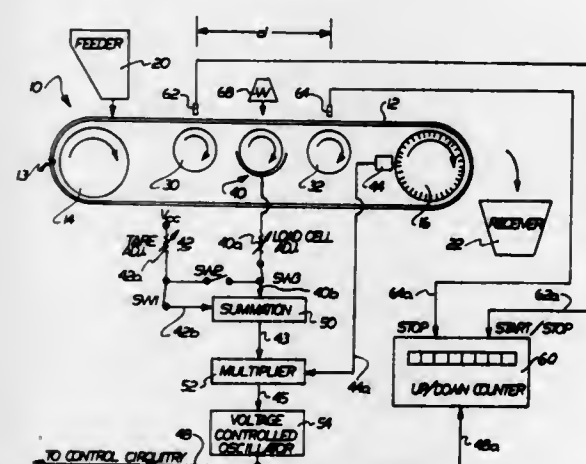
- producing a signal indicative of the weight of the articles in each bucket by subtracting from said total weight of the bucket and its articles the empty weight of the bucket;
- selecting the combination of articles whose overall weight is equal or closest to a preset target weight; and
- releasing the selected articles from the buckets which carry them.

#### 4,418,773 CONVEYOR CALIBRATION TECHNIQUE

Alain Finet, Newbury; Louis R. Nerone, Cleveland, and Michael J. Zenisek, Hiram, all of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Filed Dec. 17, 1980, Ser. No. 217,241  
Int. Cl.<sup>3</sup> G01G 11/14, 23/14; G01L 25/00; B67D 5/08  
U.S. Cl. 177-16

6 Claims



1. For a bulk material weighing and metering conveyor of the endless belt type providing a belt speed pulse signal and a tare-adjusted bulk material weight analog signal, the speed signal and the adjusted weight signal being multiplied to provide a product signal that is converted into a periodic pulse signal of constant amplitude whose frequency indicates the feed rate (net weight per unit of time) of the material being metered by the conveyor, a method of tare weight calibration comprising the steps of:

- counting the periods of the periodic pulse signal for at least one revolution of the empty conveyor belt without tare weight adjustment to the weight signal;
- removing the weight signal and substituting in its place a preselected tare compensation signal;
- counting the periods of the periodic pulse signal for at least one revolution of the conveyor belt with the tare compensation signal substituted in place of the weight signal without tare adjustment; and

comparing the counts to determine the difference between them, the degree of difference between the counts indicating the accuracy of the tare compensation signal relative to the actual tare weight of the empty conveyor belt and related tare weight elements.

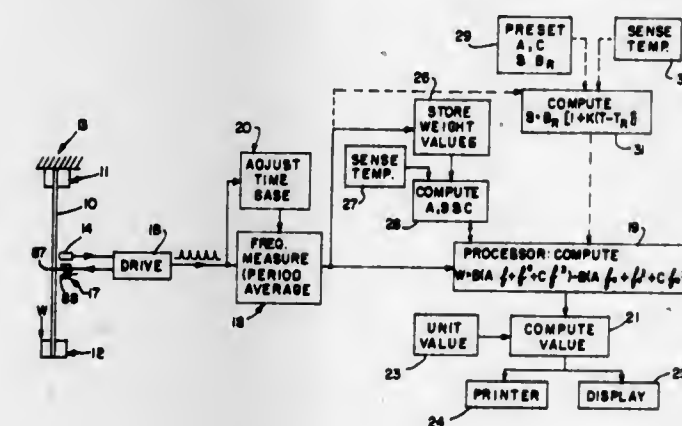
#### 4,418,774 WEIGHT OR FORCE MEASURING APPARATUS

John A. Whitney; Daniel T. Dwyer, and Peter F. Sorenson, all of Fort Wayne, Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Dec. 8, 1981, Ser. No. 328,746  
Int. Cl.<sup>3</sup> G01G 3/14, 21/10

U.S. Cl. 177-210 FP

10 Claims



1. Apparatus for measuring a force, comprising a wire, support means rigidly supporting both ends of said wire, force receiving means connected to said wire and tensioning said wire along its length, the amount of said tension being a function of said force, vibration sensor-driver means mounted adjacent said wire for sensing the frequency of vibration of said wire and for driving said wire in vibration at substantially its natural frequency, and means connected to said support and said weight receiving means for damping and absorbing vibrations, said force receiving means comprising a movable support connected to said wire, pan support means adapted to receive said force to be measured, and said vibration damping and absorbing means including resilient means connecting said pan support means to said movable support, said movable support and said pan support having adjacent sides that are generally parallel to the length and the direction of tension of said wire, and said resilient means being between and attached to said parallel sides and said force is transferred by shear stresses.

#### 4,418,775 ENDLESS TRACK DRIVE DEVICE

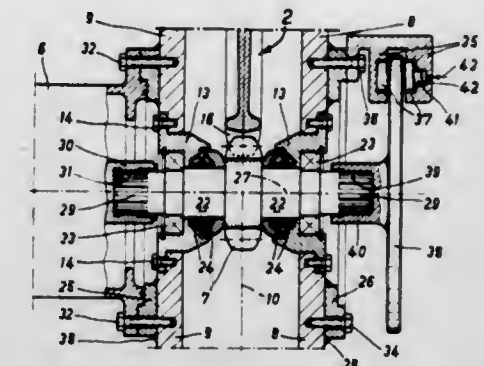
Jean E. Leroux, Le Plessis Belleville, France, assignor to Po-clain, Le Plessis Belleville, France

Filed Jul. 10, 1980, Ser. No. 168,252  
Claims priority, application France, Jul. 24, 1979, 79 19064  
Int. Cl.<sup>3</sup> B62D 53/12

U.S. Cl. 180-9.62

2 Claims

1. A drive device for the endless tracks of a machine such as a hydraulic shovel, comprising endless tracks having driving fingers projecting therefrom, an endless track driving sprocket having a plurality of teeth along the external periphery thereof, a pinion having outer teeth cooperating with the plurality of teeth of said driving sprocket and said outer teeth having a shape corresponding to that of said driving fingers of said endless tracks, said driving sprocket being, on the one hand, mounted for rotation on a support secured to the chassis of the machine and being, on the other hand, coupled to a motor which is mounted on the said support and drives the sprocket in rotation by said pinion, said driving motor having an output shaft coupled to said pinion which is fixed against relative rotation with the pinion, and said driving pinion having a shaft





of its first position between the wheels and does not interfere with the wheels of the cart; and means for biasing said pinion against the first wheel when said supporting means is in said first position.

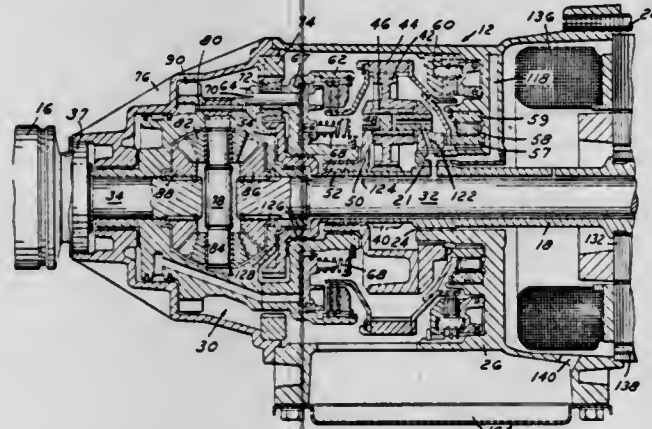
#### 4,418,777 TRANSMISSION LUBRICATION AND MOTOR COOLING SYSTEM

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 11, 1981, Ser. No. 301,167  
Int. Cl.<sup>3</sup> H02K 9/00

U.S. Cl. 180—65 E

7 Claims



1. In an electric motor and mechanical transmission assembly, a system for supplying fluid that lubricates the transmission and cools the motor comprising:

- a hollow rotor shaft connecting the rotor of the electric motor to the transmission input having radially directed holes located along its length;
- a differential mechanism driven by the transmission adapted to transmit power to first and second driveshafts that extend outward from the differential mechanism, at least one of said driveshafts and the rotor shaft defining an annular passage therebetween through which the fluid passes from the fluid source to the transmission and to the motor;
- a multiple speed ratio power transmission connected to the driveshaft having fluid ducts connecting the annular passage to meshing gear surfaces and bearing support surfaces;
- a source of pressurized fluid;
- an electric motor having a rotor formed with an axially directed fluid duct and a radial duct for connecting the annular passage to the axial fluid duct, a stator winding located radially outward from and at axially opposite ends of the axial fluid duct and radially outward from the radially directed holes of the rotor shaft, whereby the fluid is thrown by centrifugal force from the annular passage through the radial holes of the rotor shaft and onto the surfaces of the stator winding and the fluid is forced by centrifugal force from the annular passage through the radially and axially directed fluid ducts of the rotor and onto the surfaces of the stator winding; and passage means for directing fluid to a sump from which the source is supplied with fluid.

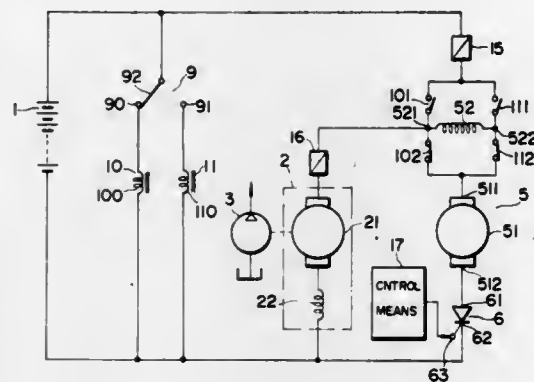
#### 4,418,778 BATTERY OPERATED FORKLIFT WITH A MOTOR DRIVEN POWER STEERING SYSTEM

Norio Sato, Tachikawa, and Shobei Kamimoto, Musashimurayama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 27, 1981, Ser. No. 228,922  
Claims priority, application Japan, Jan. 28, 1980, 55-7785  
Int. Cl.<sup>3</sup> B62D 5/06

U.S. Cl. 180—132

6 Claims



1. An electrical system for a battery operated forklift comprising:

- a storage battery;
  - a wheel drive motor including a field coil having a first and a second terminals and an armature having a first and a second terminals;
  - a power steering motor including a field coil and an armature;
  - a thyristor for controlling a current through said wheel drive motor, interposed between a negative terminal of the storage battery and said second terminal of the armature of said wheel drive motor;
  - a forward movement relay having a relay coil and normally open and normally closed relay contacts; a backward movement relay having a relay coil and normally open and normally closed relay contacts; and
  - a change-over switch having a movable contact and a pair of stationary contacts respectively connected to the relay coils of said forward movement relay and backward movement relay,
- wherein the normally closed contact of said forward movement relay being connected between the first terminal of the field coil and the first terminal of the armature of said wheel drive motor, the normally open relay contact of said forward movement relay being connected between a positive terminal of said storage battery and the first terminal of the field coil of said wheel drive motor, the normally closed contact of said backward movement relay being connected between the second terminal of the field coil and the first terminal of the armature of said wheel drive motor, and the normally open relay contact of said backward movement relay being connected between the positive terminal of said storage battery and the second terminal of the field coil of said wheel drive motor, characterised in that the power steering motor is connected between the first terminal of the field coil of said wheel drive motor and the negative terminal of said storage battery.

#### 4,418,779 CONTROL APPARATUS FOR VEHICLE STEERING SYSTEM

Masafumi Nakayama, Tokiyoshi Yanai, and Masato Fukino, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 27, 1982, Ser. No. 372,446  
Claims priority, application Japan, Jun. 12, 1981, 56-90462  
Int. Cl.<sup>3</sup> B62D 5/08

U.S. Cl. 180—141

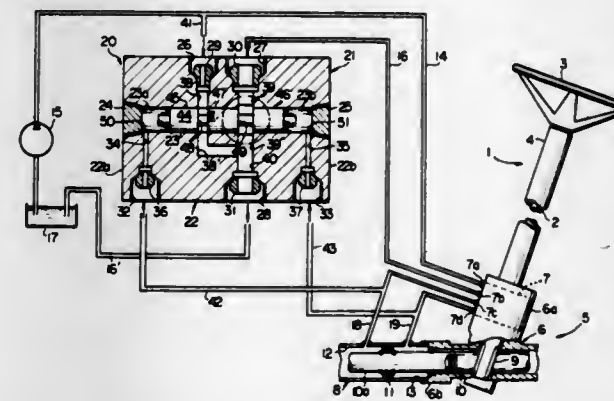
6 Claims

1. A fluid-operated control apparatus for a power-assisted

steering system including a steering wheel and shaft assembly rotatable about an axis therethrough in a steerable vehicle, comprising:

- fluid-displacement means including a suction port to suck in supplied fluid and a delivery port to deliver fluid under pressure therefrom;
- a steering pressure control valve responsive to turning motion of said steering wheel and shaft assembly and having fluid inlet and outlet ports respectively communicable with the delivery and suction ports of said fluid displacement means, and two control fluid ports, the control valve being shiftable between a condition providing communication between the fluid inlet and outlet ports and having said control fluid ports isolated from the fluid inlet and outlet ports, and a condition providing communication between the fluid inlet port and one of the control fluid ports and between the fluid outlet port and the other of the control fluid ports;
- a steering power cylinder assembly comprising a housing and a piston connected to said steering wheel and shaft assembly and movable in the housing for having formed therein two pressure acting chambers separate from each other across the piston and respectively communicating with said control fluid ports; and

first and second fluid-flow control valves each having a valve casing portion formed with a cavity, a fluid inlet port and a fluid discharge port communicating with the suction port of said fluid displacement means, each of the fluid-flow control valves comprising (1) differential pressure producing means operative to develop in said cavity a differential pressure



continuously variable with a differential pressure between the pressure acting chambers of the cylinder assembly, (2) a valve member movable in said cavity and responsive to the differential fluid pressure developed by said differential pressure producing means, and (3) biasing means urging the valve member to stay in a predetermined equilibrium position in the cavity in the absence of a differential fluid pressure acting thereon for providing full communication between the fluid inlet and discharge ports of each fluid-flow control valve when the valve member is in the equilibrium position thereof and being movable from the equilibrium position a distance which is continuously variable with the differential fluid pressure acting on the valve member; the fluid inlet port of the first fluid-flow control valve being in constant communication with the delivery port of said fluid displacement means and with the fluid inlet port of said steering pressure control valve, and the fluid inlet port of the second fluid-flow control valve being in constant communication with the fluid outlet port of the steering pressure control valve, the valve member of the first fluid-flow control valve being operative to block the communication between the fluid inlet and discharge ports of the first fluid-flow control valve when the differential fluid pressure acting thereon is higher than a first predetermined value and the valve member of the second fluid-flow control valve being operative to block the communication between the fluid inlet and discharge ports of the second fluid-flow control valve when the differential

fluid pressure acting thereon is higher than a second predetermined value, said second fluid-flow control valve further comprising bypass means providing constant communication between the fluid outlet port of said steering pressure control valve and the suction port of said fluid displacement means without respect to the position of the valve member of the second fluid-flow control valve in the cavity thereof.

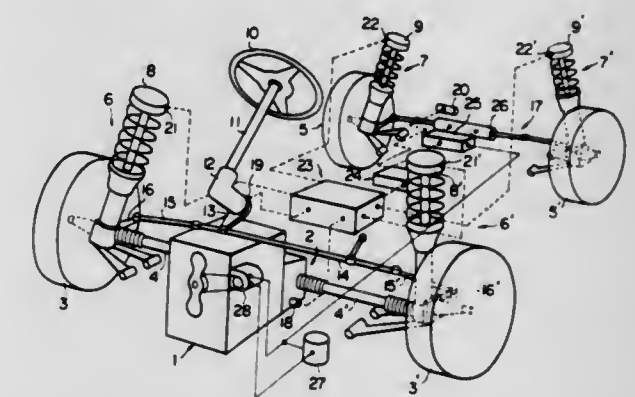
#### 4,418,780 METHOD OF STEERING A WHEELED VEHICLE HAVING AT LEAST TWO PAIRS OF STEERABLE ROAD WHEELS

Hideo Ito, Zushi, and Keiichi Yabuta, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 15, 1981, Ser. No. 273,971  
Claims priority, application Japan, Jun. 24, 1980, 55-84519  
Int. Cl.<sup>3</sup> B62D 5/04

U.S. Cl. 180—142

2 Claims



2. A control device for controlling a steering system of a wheeled vehicle having a first pair of steerable road wheels to be steered by human intervention, a second pair of steerable road wheels to be steered in response to a steering effort applied to the first pair of steerable road wheels, a first wheel axle operatively connected to the first steerable road wheels, and a second wheel axle operatively connected to the second steerable road wheels, comprising:

- a hydraulic drive system which is adapted to develop a fluid pressure variable with a control signal applied thereto and which is operatively connected to the second pair of steerable road wheels for driving the second pair of steerable road wheels to veer through an angle variable with the fluid pressure,
- first means having registered therein values respectively representative of the total sprung mass and the wheel base of the vehicle and the cornering powers of the tires of the first and second steerable road wheels;
- second means operative to detect the vehicle speed and to produce an output signal representative of the detected vehicle speed;
- third means operative to detect the sprung mass carried by each of the first steerable road wheels and to produce a second signal representative of the detected sprung mass of each of the first steerable road wheels;
- fourth means operative to determine the distance between the center of gravity of the vehicle and the center axis of said first wheel axle on the basis of the output signal from the third means and to produce an output signal representative of the distance thus determined;
- fifth means operative to detect the sprung mass carried by each of the second steerable road wheels and to produce an output signal representative of the detected sprung mass of each of the second steerable road wheels;
- sixth means operative to determine the distance between the center of gravity of the vehicle and the center axis of said first wheel axle on the basis of the output signal from the



fifth means and to produce an output signal representative of the distance thus determined; and seventh means responsive to the respective output signals from the second, fourth, and sixth means for calculating the ratio  $k$  between the angle through which the second pair of steerable road wheels is to be steered versus the angle through which the first pair of steerable road wheels is steered, producing an output signal representative of the ratio  $k$  thus calculated and supplying the last named signal to said hydraulic drive system as said control signal, the seventh means being operative to calculate said ratio  $k$  on the basis of said respective output signals and said values registered in said first means in accordance with the equation

$$k = \frac{b \cdot l - M \cdot V^2 (a/C_r)}{a \cdot l + M \cdot V^2 (b/C_r)}$$

wherein  $M$  is the total sprung mass of the vehicle as registered in said means,  $V$  is the vehicle speed represented by the output signal from said second means,  $a$  is the distance represented by the output signal from said fourth means,  $b$  is the distance represented by the output signal from said sixth means,  $C_r$  is the cornering power of the tire of each of said first steerable road wheels as registered in said means,  $C_s$  is the cornering power of the tire of each of said second steerable road wheels as registered in said first means, and  $l$  is the wheel base of the vehicle as registered in said first means.

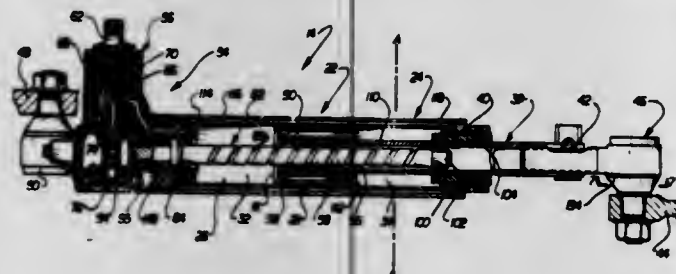
4,418,781

## STEERING APPARATUS

William T. Rabe, and Maurice P. Roberts, both of Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio  
Filed Jun. 10, 1982, Ser. No. 386,907  
Int. Cl.<sup>3</sup> B62D 5/10

U.S. Cl. 180—155

24 Claims



1. An apparatus for use in turning steerable vehicle wheels, said apparatus comprising  
wall means for defining a chamber,  
a piston disposed in said chamber and having first and second end portions, said first end portion of said piston having a first working area,  
a hollow piston rod connected to said second end portion of said piston, said second end portion of said piston having a second working area disposed outside of said piston rod and a third working area at least partially enclosed by said piston rod, the difference in area between said first and third working areas being equal to the sum of said second and third working areas, and  
valve means operable to a first condition to direct fluid pressure against said first and third working areas to effect turning movement of the steerable vehicle wheels in a first direction, said valve means being operable to a second condition to direct fluid pressure against said second and third working areas to effect turning movement of the steerable vehicle wheels in a second direction.

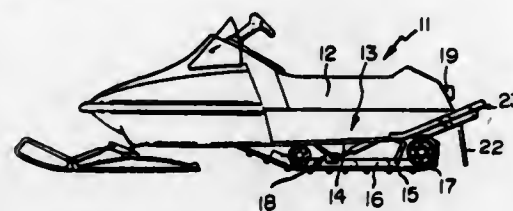
4,418,782

## GUARD DEVICE OF SNOWMOBILE AGAINST SPLASHES OF SNOW

Masatoshi Nakazima, Iwata, Japan, assignor to Yamaha Motor Co., Ltd., Iwata, Japan  
Filed Apr. 20, 1981, Ser. No. 255,737  
Claims priority, application Japan, Apr. 18, 1980, 55-52000  
Int. Cl.<sup>3</sup> B62D 25/16

U.S. Cl. 180—190

4 Claims



1. A protective device for the rear of a snowmobile or the like having a body and a driving tread, said body being configured so that the rear portion of said driving tread is substantially exposed, said protective device comprising a rigid splash guard fixed to the body of the snowmobile contiguously to the exposed rear portion of the driving tread and extending rearwardly and upwardly therefrom a sufficient distance to prevent snow thrown from the driving tread from impinging on the rear of said body and a flexible flap affixed relative to said splash guard forwardly of the rearwardmost termination thereof and depending therefrom.

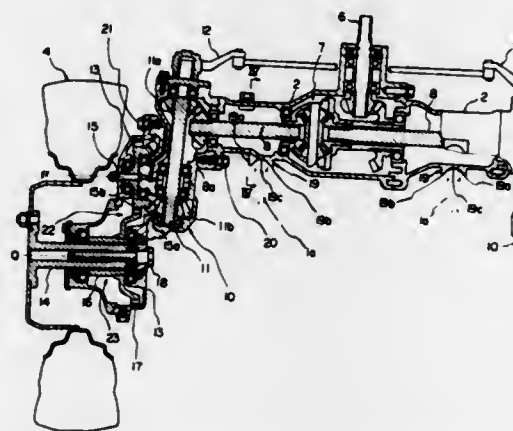
4,418,783

## TRACTOR

Akira Teraoka, Osaka, and Tadashi Nakamura, Kawachinagano, both of Japan, assignors to Kubota, Ltd., Osaka, Japan  
Filed Apr. 20, 1982, Ser. No. 370,068  
Claims priority, application Japan, Sep. 2, 1981, 56-130785[U]  
Int. Cl.<sup>3</sup> B60K 17/00

U.S. Cl. 180—209

3 Claims



1. A tractor comprising:  
a front axle case (2) incorporating a differential gear (7) and front wheel driving shafts (8);  
steering cases (10) incorporating transmission shafts (11) for transmitting power from said front wheel driving shafts (8), said steering cases (10) removably connected to said front axle case (2);  
front wheel housings (13) incorporating gear transmission mechanisms (22) interlockingly connected to said transmission shafts (11), said housings (13) connected to said steering cases (10) such that the mounting positions of said housings (13) can be changed around the gear rotating centers (P) of said gear transmission mechanisms (22);  
front axles (14) adapted to receive power from said gear transmission mechanisms (22) and attached to said front wheel housings (13) such that said axles (14) can move in the axial

directions (Q) thereof and their relative positions with respect to said housings (13) can be fixed;  
front wheels (4) fixed to said front axles (14);  
rear axle cases (2') incorporating rear wheel driving shafts (31);  
rear wheel housings (33) incorporating gear transmission mechanisms (32) interlockingly connected to said rear wheel driving shafts (31), said housings (33) connected to said rear axle cases (2') such that the mounting positions of said housings (33) can be changed around the gear rotating centers (P') of said gear transmission mechanisms (32);  
rear axles (30) adapted to receive power from said gear transmission mechanisms, said rear axles (30) attached to said housings (33) such that said rear axles (30) can move in the axial directions (Q') thereof and their relative positions with respect to said housings (33) can be fixed; and  
rear wheels (5) fixed to said rear axles (30);  
said front axle case (2) and said rear axle cases (2') provided at the lower sides thereof with semi-circular projections (19, 19') separated from each other in the axial direction of said cases (2, 2').

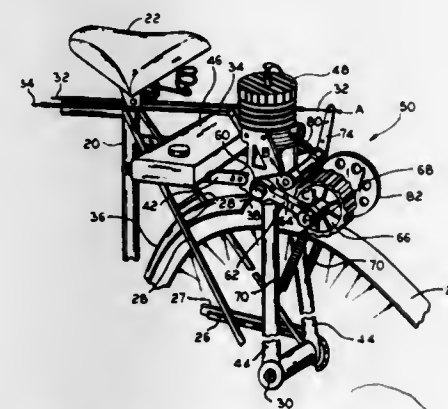
4,418,784

## BICYCLE TRANSMISSION ASSEMBLY

Duke Fox, 5305 Towson Ave., Fort Smith, Ark. 72901  
Filed Jan. 26, 1982, Ser. No. 342,820  
Int. Cl.<sup>3</sup> B62M 13/04

U.S. Cl. 180—221

15 Claims



11. A crank shaft-to-tire drive system comprising power means for driving said crank shaft for generating motive forces for driving a tire, cleated roller means resting on a surface of said tire with a pressure adequate to distort that surface of said tire to form a bulge on the surface of said tire which bulge rises into valleys between the cleats on said roller wherein said cleats are separated from each other by distances which substantially maximize the slope angle of said bulge, means for transferring the motive forces from said power means crank shaft to said roller means, and means for moving said cleated roller means over an arc centered on said crank shaft and into and out of engagement with said tire surface, whereby said motive forces are clutched and declutched.

4,418,785

## STEERED AND DRIVEN AXLE-END ASSEMBLY

Friedrich Ehrlinger, Friedrichshafen; Peter Dziuba, Ueberlingen; Dieter Maurer, and Manfred Goelt, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany  
Filed Jul. 25, 1980, Ser. No. 172,280  
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930298

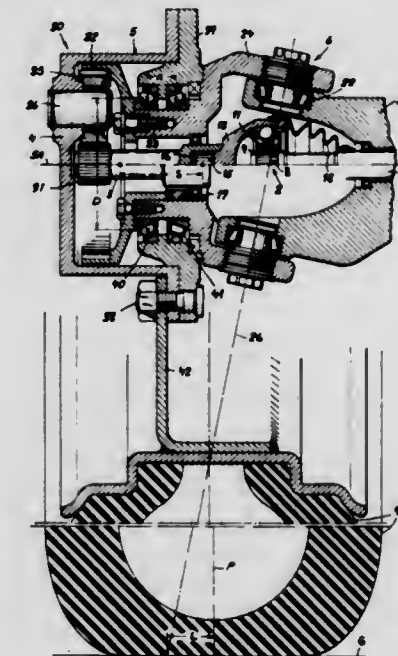
U.S. Cl. 180—255

1 Claim

Int. Cl.<sup>3</sup> B60K 17/30

1. A steered and driven axle-end assembly comprising:  
an inside knuckle half;  
an outside knuckle half pivotal on said inside half about an upright pivot axis;

an axle extending into said inside knuckle half;  
a universal joint having an inner side connected in said inside knuckle half to said axle and an outer side;  
a wheel support rotatable about a horizontal wheel axis;  
a wheel mounted on said support and having a periphery engageable with the ground and centered on a wheel plane perpendicular to said wheel axis, said pivot axis crossing said plane radially within said periphery;  
a pair of tapered-roller bearings centered on said wheel axis and having centers spaced axially apart therealong by a spacing equal to at most half of the axial distance between the intersections of their contact angles and said wheel axis, said roller bearings rotatably supporting said wheel support on said outer knuckle half; and



stepdown gearing connecting said outer side of said universal joint to said wheel support for rotation of said wheel support and said wheel by said axle at a substantially lower rate than said axle, said universal joint, outside knuckle half, and wheel support lying wholly within the vertical projection of said wheel, said gearing including:  
a large-diameter driven gear fixed on said support and centered on said axis and a small-diameter drive gear fixed on said outer side of said universal joint, and  
two further gears flanking said small gear and both meshing with said small gear and with said large gear, whereby said small gear meshes via said further gears with said large gear.

4,418,786

## BOTTOM DIAPHRAGM FOR TRANSPORTER FOR A SEISMIC ENERGY SOURCE

Philip N. Martin, Tulsa, Okla., assignor to Mapco, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 188,370, Sep. 18, 1980, Pat. No. 4,334,591, which is a continuation-in-part of Ser. No. 963,982, Nov. 27, 1978, Pat. No. 4,223,759. This application Jun. 11, 1981, Ser. No. 272,772  
Int. Cl.<sup>3</sup> G01V 1/104

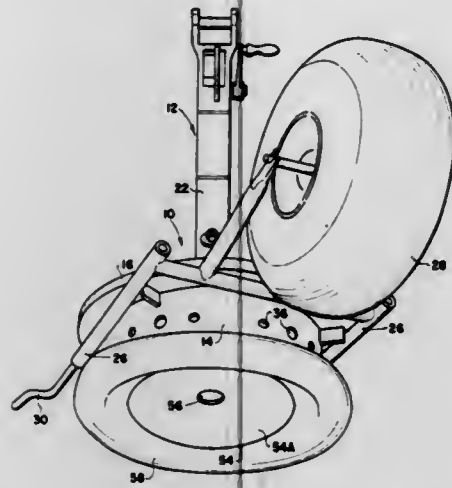
U.S. Cl. 181—116

7 Claims

1. An improved portable seismic energy source comprising:  
a base member having sidewalls, a lower end for resting on the earth's surface and a horizontal baseplate secured to the upper end, the base member having an open bottom and an opening in the horizontal baseplate;  
a gun mounted on said horizontal baseplate for firing a projectile through the opening therein to impact the earth's surface and generate a seismic signal;  
a spatter plate having an upper surface and a lower surface and an opening therethrough, the spatter plate having outside dimensions less than said base member and being



mounted within said base member and having the lower surface spaced above the base member bottom so that the spatter plate is supported above the earth's surface, the spatter plate having a central opening therein in alignment with said baseplate opening; and



a diaphragm of flexible material secured to the periphery of said base member lower end, the diaphragm having a central opening therein and the central portion thereof surrounding the opening being received on the upper surface of said spatter plate, the diaphragm and spatter plate serving to intercept gases, liquids and solids ejected when a projectile engages the earth.

4,418,787

#### HEARING AID WITH AUDIO PATH DUCT EXTENSION ELEMENT, AND EXTENSION ELEMENT ATTACHMENT

Albert Eggert; Erwin Gahleitner, and Joachim Kwiatkowski, all of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

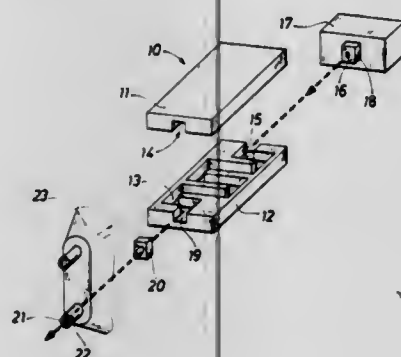
Filed Jun. 23, 1981, Ser. No. 276,520

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023871

Int. Cl.<sup>3</sup> H04R 25/00

U.S. Cl. 181—130

15 Claims



9. In combination with, a hearing aid having, a sound receiving structure, a sound processing structure, separable from the sound receiving structure and means for defining a sound duct or audio path between the sound receiving structure and the sound processing structure, and a removable acoustic path extension element comprising an acoustic wave guide element defining a tortuous or labyrinthine or sinuous audio path for sound transmitted there-through, said element being an elongated body of plastic material having therein a groove or duct longer than the length of said elongated body; said acoustic wave guide element being formed with sound entrance and exit openings which are positioned in axial

alignment, at respective end portions of the elongated body; and wherein said sound receiving structure and said sound processing structure, respectively, is formed with sound receiving openings in matching position with said sound entrance and exit openings of the acoustic wave guide element.

4,418,788

#### BRANCH TAKE-OFF AND SILENCER FOR AN AIR DISTRIBUTION SYSTEM

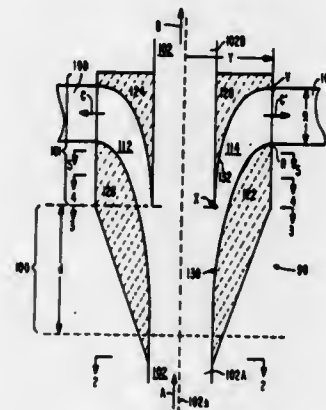
Dimitar Gorchev, Boston, Mass.; Karl U. Ingard, Kittery Point, Me., and Herbert L. Willke, Jr., Cambridge, Mass., assignors to Mitco Corporation, Somerville, Mass.

Filed Apr. 13, 1981, Ser. No. 253,270

Int. Cl.<sup>3</sup> E04F 17/04

U.S. Cl. 181—224

5 Claims



1. A branch take-off and silencing device for coupling an airstream from an input duct to a coaxial output duct and one or more branch ducts angularly offset from said input and output ducts, comprising:

- A. a static pressure regain (SPR) section including
  - i. an input port having a cross-section substantially the same as the cross-section of said input duct, and adapted to receive substantially all the air in said airstream,
  - ii. an output port having a cross-section including at least two parts, the first of said parts being substantially the same as the cross-section of said output duct and the second of said parts being substantially the same as the cross-section of an associated channel, wherein said second part is contiguous to said first part,
  - iii. a first airflow means for passing a first portion of said received air through said first part to said output duct,
  - iv. a second airflow means including an SPR outer wall means for passing a second portion of said received air through said second part to said associated channel,
- B. a channel section including
  - i. a central duct and associated output port coaxial with and having the same cross-section as said input and output ducts, said central duct adapted for coupling at said output port to said output duct,
  - ii. channel means including inner and outer path defining walls for defining a perimeter channel between said second part of said SPR section output port and an associated branch duct, said perimeter channel having the same cross-section as said second part at its upstream end, and having the same cross-section as said associated branch duct at its downstream end,

wherein said SPR outer wall and said outer path-defining wall have a composite cross-section characterized by a continuous curve, wherein said inner path-defining wall has a cross-section characterized by a continuous curve, said continuous curves having a direction component radially away from the central axis of said input duct, and being parallel to the central axis of said input duct at its downstream end, and being parallel to the central axis of said branch duct at its upstream end,

wherein said SPR outer wall and said inner and outer path-defining walls are made of acoustical material.

4,418,789

#### MUFFLER FOR A TEXTILE INTERLACING JET

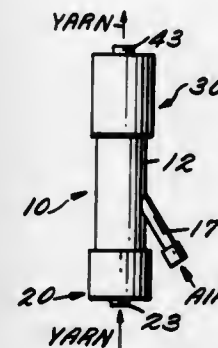
Wayne L. Eckert, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 8, 1982, Ser. No. 356,143

Int. Cl.<sup>3</sup> F01N 1/08

U.S. Cl. 181—255

10 Claims



1. A textile interlacing jet comprising:
  - a main interlacing body portion including a yarn inlet at a first end thereof, a yarn outlet at a second end thereof, and an air inlet intermediate said yarn inlet and outlet, said yarn inlet and outlet being connected by a continuous passageway;
  - first reactive muffler means disposed in operative association with said body portion first end and including an expansion chamber having a substantially larger cross-sectional area than said yarn inlet, and further including a restricted inlet to said expansion chamber, said restricted inlet being large enough for free passage of yarn therethrough, but providing an abrupt cross-sectional area change with said expansion chamber, the ratio of the cross-sectional area of said expansion chamber to that of said restricted inlet being at least about 9:1; and
  - second reactive muffler means disposed in operative association with said body portion second end and including an expansion chamber having a substantially larger cross-sectional area than said yarn outlet, and further including a restricted outlet therefrom, said restricted outlet being large enough for free passage of yarn therethrough, but providing an abrupt cross-sectional area change with said expansion chamber, the ratio of the cross-sectional area of said expansion chamber to that of said restricted outlet being at least about 9:1.

4,418,790

#### METHOD AND APPARATUS FOR ATTENUATING SOUND

Ralph E. Agnew, Gardena, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Nov. 18, 1981, Ser. No. 322,561

Int. Cl.<sup>3</sup> F01N 1/08

U.S. Cl. 181—268

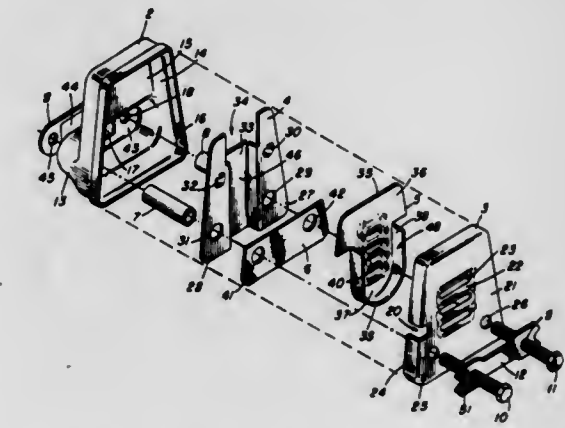
10 Claims

1. A method of attenuating sound levels of exhaust gas issuing from engine exhaust systems, said method comprising: transmitting a flow of engine exhaust gas into muffler means; splitting said exhaust gas flow into first and second, flow paths within said muffler means; recombining exhaust gas from each of said first and second flow path within said muffler means by flowing gas from each of said first and second flow paths generally toward and into each other as mutually opposed gas flows to form a unified exhaust gas flow; and alternately compressing and expanding said exhaust gas flow while concurrently permitting increments of said exhaust gas flow to exit from

said muffler means, sequentially along the flow of said exhaust gas flow; said alternate compression and expansion of said exhaust gas flow comprising passing said exhaust gas flow generally transversely of the general direction of the exit flow direction of said exhaust gas, sequentially and repeatedly restricting and expanding said flow of exhaust gas as said flow passes generally transversely of said general direction of exit flow, and effecting sequential exiting of said exhaust gas at locations spaced along, and directed transversely of, said flow of exhaust gas effecting said alternate compression and expansion.

6. Apparatus for attenuating sound levels of exhaust gas issuing from engine exhaust systems, said apparatus comprising muffler means including:

- means for receiving a flow of engine exhaust gas;
- means for splitting said exhaust gas flow into first and second flow paths within said muffler means;
- means for recombining exhaust gas from each of said first and second flow path within said muffler means by



flowing gas from each of said first and second flow paths generally toward and into each other as mutually opposed gas flows to form a unified exhaust gas flow; means for alternately compressing and expanding said exhaust gas flow while concurrently permitting increments of said exhaust gas flow to exit from said muffler means, sequentially along the flow of said exhaust gas flow; said means for alternately compressing on and expanding said exhaust gas flow comprising means for passing said exhaust gas flow generally transversely of the general direction of the exit flow direction of said exhaust gas, means for sequentially and repeatedly restricting and expanding said flow of exhaust gas as said flow passes generally transversely of said general direction of exit flow, and means for effecting sequential exiting of said exhaust gas at locations spaced along, and directed transversely of, said flow of exhaust gas affecting said alternate compression and expansion.

4,418,791

#### DEVICE FOR ENHANCING THE VERSATILITY OF CRANES OR THE LIKE

Paul Frey-Wigger, Am Zolgerwald, CH-6247 Schütz, Switzerland

Filed Mar. 26, 1981, Ser. No. 247,754

Claims priority, application Switzerland, Mar. 27, 1980, 2414/80

Int. Cl.<sup>3</sup> B66F 9/06, 11/04

U.S. Cl. 182—2

21 Claims

1. In a crane or an analogous machine, the combination of a boom having a free end portion; a pivot bearing mounted on said end portion; a second bearing turnable in said pivot bear-



ing about a substantially horizontal axis; an elongated column mounted in and movable up and down relative to said second bearing at a plurality of speeds; carrier means adjacent to said second bearing; means for monitoring the speed of downward movement of said column relative to said second bearing and said carrier means; braking means mounted on said carrier means, connected with said monitoring means and operable to



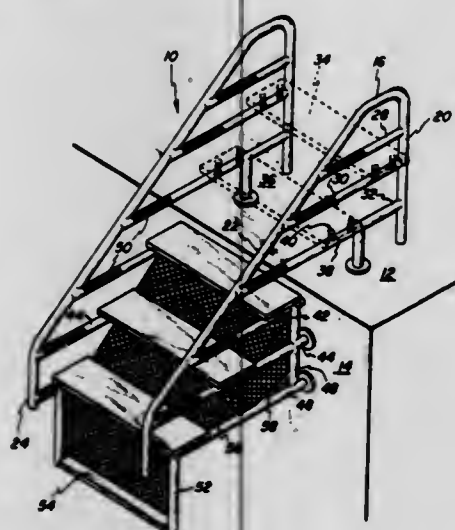
arrest said column when the speed of downward movement of said column rises to a preselected value whereby said carrier means moves relative to said second bearing during deceleration of said column; and shock absorber means interposed between said second bearing and said carrier means to yieldably oppose the movement of said carrier means with reference to said second bearing.

#### 4,418,792 POOL LADDER

Daniel J. Cerone, 17 Bluebird Ct., Waterford, N.Y. 12188  
Filed Mar. 3, 1982, Ser. No. 354,178  
Int. Cl.<sup>3</sup> E06C 9/00

U.S. Cl. 182-93

14 Claims



1. A pool ladder to facilitate the downward movement of an individual from a wheelchair which is positioned on a plane surface, such as a pool deck, into a pool comprising: means for supporting a plurality of steps in the form of a flight of stairs running downwardly from a top step into the pool, the top step being at a position accessible from a wheelchair on the deck; a top step connected to the support means, said top step positioned to be accessible from a wheelchair on the deck and at a height above the deck approximately equal to the height of a wheelchair seat; and a plurality of steps which, together with the top step, form a flight of stairs running downwardly into the pool.

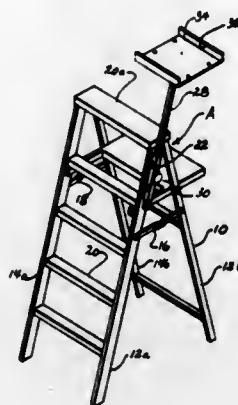
#### 4,418,793

##### LADDER AID DEVICE

William E. Brent, 1 Forest Hill Dr., Taylors, S.C. 29687  
Filed Apr. 13, 1981, Ser. No. 253,201  
Int. Cl.<sup>3</sup> E06C 7/14

U.S. Cl. 182-129

2 Claims



1. In combination with a stepladder of the type having pairs of opposed side legs which pivot from a top platform of the ladder and foldable braces which unfold to brace between front and back side legs to maintain said ladder in a free up-standing configuration, an accessory device comprising:

sleeve means having an elongated bore extending there-through open on distal ends of said sleeve means; attachment means for fixably attaching said sleeve means to one of said ladder legs; a support member slidably received in said bore of said sleeve means; said bore of said sleeve means being defined by walls which intersect one another at well defined angles; said support member including an elongated shank portion generally corresponding in shape with said elongated bore, said shank portion having surfaces intersecting each other at complementary angles to the defined angles of said elongated bore so as to prevent said shank portion from turning in said bore; interlock means for fixing the position of said support member in said sleeve means; tray means carried by said support member for supporting a work article and the like; said tray means and including an open top tray having side walls forming a box and a side portion having a wall with a slot therein for receiving and holding elongated tools and being supportable in a plurality of positions to support said article at a desired height; said interlock means setting and fixing said support members at an infinite number of continuous positions over the length of said support member facilitating adjustment of said support member to hold an article supported on said tray means firmly against an associated structure in a clamping manner.

#### 4,418,794

##### ELECTROMECHANICAL CONTROL FOR HYDRAULIC ELEVATORS

Giuseppe Manco, Carugate, Italy, assignor to Otis Elevator Company, Farmington, Conn.

Filed Mar. 11, 1982, Ser. No. 357,005

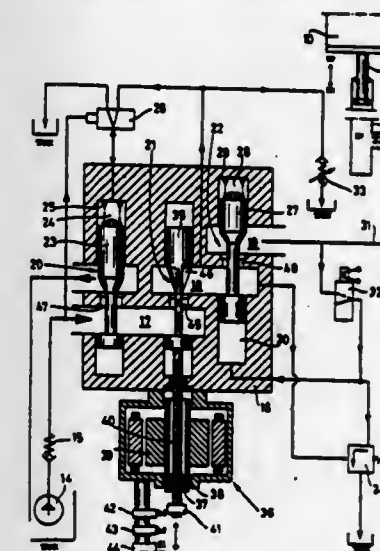
Claims priority, application Italy, Jun. 16, 1981, 22355 A/81  
Int. Cl.<sup>3</sup> B66B 1/04

U.S. Cl. 187-17

13 Claims

1. Apparatus for controlling the flow of a fluid between a pump, a tank containing the fluid, and a cylinder containing a piston that moves in response to the flow of the fluid in and out of the cylinder, characterized by: a bypass valve having an inlet port for receiving fluid from the pump and an outlet port connecting with the tank, said valve being biased to provide progressively more bypass

flow to the tank in direct proportion to the fluid pressure in the inlet port from the pump; an adjustable valve having an inlet port for receiving fluid flow from the inlet port of the bypass valve and an outlet port, said first adjustable valve being adjustable to meter the fluid that flows between its inlet port and its outlet port; an electric motor for adjusting the adjustable valve; a second bypass valve having an inlet port that is connected to the outlet port of said adjustable valve and an outlet port, said second bypass valve being biased to provide progressively more flow between its inlet port and outlet port as the pressure in the inlet port increases; a first control valve for applying fluid pressure to the bypass valve to decrease the bypass flow in proportion to the fluid pressure in the outlet of the adjustable valve; and



a second control valve that is selectively operable for applying fluid pressure to the second bypass valve to open the second bypass valve in direct proportion to the fluid pressure in the cylinder; whereby said apparatus allows, when the pump is operating, fluid to flow from the pump through the bypass valve, the adjustable valve and the second bypass valve to the cylinder, whereby the piston is moved in one direction; whereby, upon the operation of the second control valve, when the pump is not operating, the second bypass valve is moved to a position at which fluid may flow from the cylinder through the second bypass valve, the adjustable valve and the bypass valve to the tank to move the piston in the opposite direction; and whereby the motion of the piston in each direction can be controlled by the operation of the electric motor.

#### 4,418,795

ELEVATOR SERVICING METHODS AND APPARATUS  
William J. Trosky, Pittsburgh; Kenneth M. Elchler, N. Versailles; Alan F. Mandel, Scott Township, Allegheny County, all of Pa., and William H. Moore, Bridgewater, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1981, Ser. No. 284,843

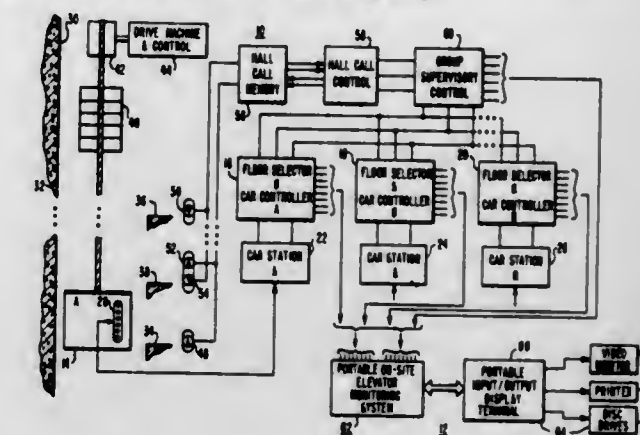
Int. Cl.<sup>3</sup> B66B 3/00

U.S. Cl. 187-29 R

28 Claims

1. A method of servicing an elevator system having a plurality of control elements operable between first and second states, comprising the steps of: providing monitoring means having storage means and a plurality of input leads, storing definitions in the storage means to said monitoring means for at least certain ones of said plurality of input leads, with each of said definitions being associated with a control element of the elevator system, selecting which control elements of the stored definitions, and the states thereof, are to signify the occurrence of an

event by the simultaneous occurrence of the specified states, connecting said at least certain ones of said plurality of input leads to be responsive to the state of the associated control element set forth in the storing step,



detecting the occurrence of the event defined in the selecting step, storing the fact that the event occurred, and reproducing the information stored by the storing step relative to the occurrence of the event.

#### 4,418,796

##### TRANSMISSION AND DISC BRAKE

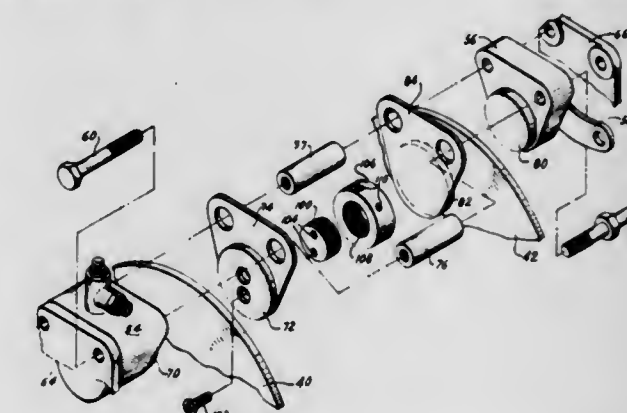
Udo Rittmann, Mulheim, Fed. Rep. of Germany, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 29, 1979, Ser. No. 7,483

Int. Cl.<sup>3</sup> F16D 55/36

U.S. Cl. 188-71.5

8 Claims



1. A brake system for a vehicle having an axle housing, two independently driven wheels and two opposed shafts in alignment with one another and operatively connected to separate wheels: said system comprising a brake disc mounted on one of said opposed shafts, a second disc mounted on the other of said opposed shafts, said discs being movable axially relative to one another, a brake actuator disposed at one side of said first disc and rigidly connected to said housing, a puck disposed between said actuator and said first disc for engagement therewith, first and second support members slidably disposed between said discs and movable relative to one another, support means for said members, a puck on said first member for engagement with said first disc, a puck on said second member for engagement with said second disc, an abutment disposed on the side of said discs opposite said actuator, and an adjustment means disposed between said support members and having a threaded hub mounted on one of said members and a ring threadedly mounted on said hub and movable axially thereon and being operatively connected to both of said support members when said brake actuator is energized for varying the minimum spacing between said members to compensate for wear in said pucks resulting from actuating of the brakes.



4,418,797

**SLIDING CALIPER DISC BRAKES**

Fumio Fujimori, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

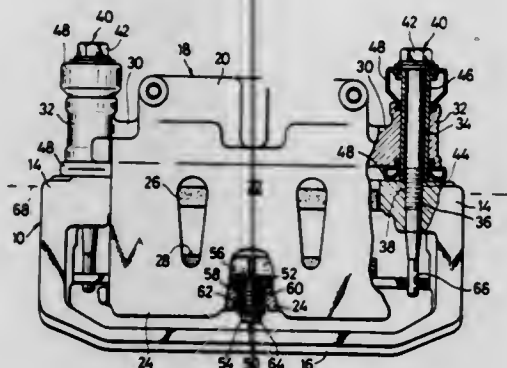
Filed Jun. 18, 1981, Ser. No. 274,887

Claims priority, application Japan, Jun. 26, 1980, 55-88084

Int. Cl.<sup>3</sup> F16D 65/02

U.S. Cl. 188—73.37

4 Claims



1. A sliding caliper disc brake comprising:  
 a rotatable disc;  
 a torque plate member fixed to a body of a vehicle;  
 a caliper member straddling a minor portion of said rotatable disc and slidably carried on said torque plate member, said caliper member having fluid actuated means for urging an inner pad means onto one side of said disc by direct contact therewith and for urging an outer pad means onto the other side of said disc by movement of said caliper relative to said torque plate member, said inner and outer pad means being disposed in slidable direct torque transmitting contact with said torque plate member; and  
 connection means for connecting said outer pad means to said caliper member, said connection means comprising an aperture in said torque plate member, a bolt threaded into said outer pad means and passing through said aperture of said torque plate member, and an elastic bushing disposed between said bolt and said torque plate member in said aperture to ensure a close fitting of the bolt in the aperture and to absorb vibration.

4,418,798

**DISC BRAKE WITH WEDGE PINS**

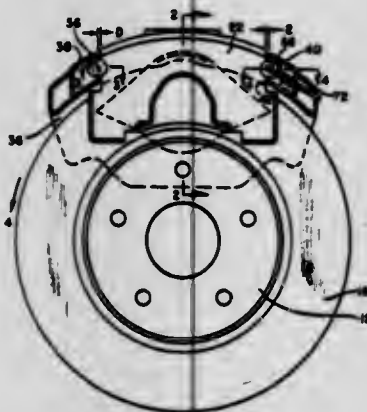
Donald D. Johannesen, and Raymond P. Haluda, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 192,112, Sep. 29, 1980, abandoned. This application Oct. 12, 1982, Ser. No. 433,576

Int. Cl.<sup>3</sup> F16D 65/02

U.S. Cl. 188—73.45

5 Claims



1. A disc brake comprising a rotor having friction faces on opposite sides thereof and rotatable about an axis perpendicular to the plane of said rotor, a caliper cooperating with a pair of friction elements to urge the latter into engagement with the

friction faces on the rotor to retard rotation of said rotor, a non-rotating torque member carrying said caliper in a substantially fixed radial and circumferential position relative to said rotor, said caliper and said torque member having axially-extending grooves in registry, said grooves cooperating to define an axially-extending aperture between said caliper and said torque member, an elongated pin slidably received in said axially-extending aperture for the purpose of movably supporting said caliper relative to said torque member, said pin substantially coinciding in shape to said axially-extending aperture, resilient means engaging said pin for moving said pin within said axially-extending aperture, characterized in that said pin includes a pair of wedge-defining members which slidably engage each other at a wedge surface on each member, said resilient means moving said wedge-defining members relative to each other so as to wedge the members together between said caliper and said torque member in order to accommodate manufacturing tolerances between said caliper and said torque member.

4,418,799

**COMBINED AIR RESERVOIR/BRAKE CYLINDER DEVICE**

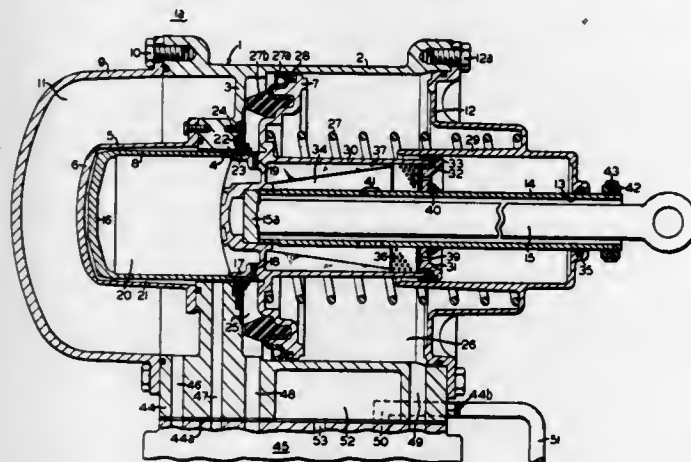
James E. Hart, Trafford; Willard P. Spalding, Penn Hills, and Allen W. Kyllonen, Plum, all of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Aug. 7, 1981, Ser. No. 290,756

Int. Cl.<sup>3</sup> B60T 11/10

U.S. Cl. 188—153 R

43 Claims



1. A fluid pressure actuator device comprising:  
 (a) a cylinder including application and release portions;  
 (b) a piston slidably operable in said cylinder between application and release positions, said piston including a push rod having one end engageable with said piston and the other end arranged to operate working apparatus;  
 (c) first seal means engaging said piston and said cylinder for separating said cylinder into said respective application and release portions on opposite sides of said piston;  
 (d) second seal means for separating said application portion into an application chamber that delimits an application pressure area on one side of said piston and a positioning chamber that delimits a positioning pressure area of said piston on the same side thereof as said application pressure area;  
 (e) third seal means for forming a release chamber in said release portion of said cylinder that delimits a release pressure area of said piston on the side opposite said one side and for establishing a return pressure area on said opposite side of said piston external to said release chamber;  
 (f) means for introducing fluid under pressure to said release chamber to urge said piston toward said release position;  
 (g) means for introducing fluid under pressure to said application chamber to urge said piston toward said application position; and  
 (h) means for introducing fluid under pressure to said posi-

tioning chamber to urge said piston toward said application position.

4,418,800

**MOTORCYCLE BRAKING SYSTEM HAVING LOAD SENSITIVE PRESSURE CONTROL VALVE**

Wolfgang Hess, Koblenz, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

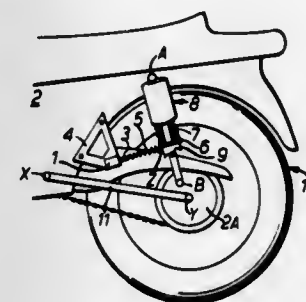
Filed Jun. 8, 1981, Ser. No. 271,104

Claims priority, application United Kingdom, Jun. 12, 1980, 8019269

Int. Cl.<sup>3</sup> B60T 8/22

U.S. Cl. 188—195

6 Claims



1. A control valve arrangement for a braking system of a motorcycle having a manually adjustable suspension strut connected between the sprung and unsprung parts of the motorcycle, the strut having an adjustable spring support for a suspension spring, said arrangement comprising a control valve for controlling fluid pressure applied to a wheel brake, the control valve being separate from the strut and being rigidly mounted on the frame of the motorcycle, and coupling means connected between the control valve and the adjustable spring support applying a force to the control valve, the coupling means including a tension spring operable to vary the force applied to the control valve in dependence upon the relative position of the sprung and unsprung parts of the motorcycle.

4,418,801

**RAIL VEHICLE SLACK ADJUSTER**

Lars M. Severinsson, Hishult; Peter Beijbom, Lund, and Anders K. Martensson, Bjärred, all of Sweden, assignors to SAB Industri AB, Landskrona, Sweden

Filed Jun. 10, 1981, Ser. No. 272,181

Claims priority, application Sweden, Jun. 24, 1980, 8004670

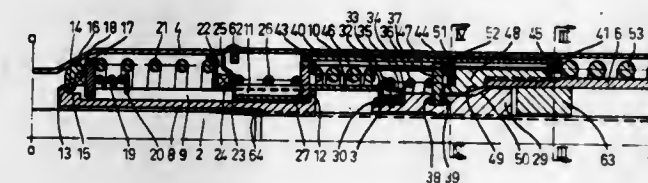
Int. Cl.<sup>3</sup> F16D 65/66

U.S. Cl. 188—202

1 Claim

U.S. Cl. 188—352

21 Claims



1. A rail vehicle slack adjuster of the axial type, comprising an elongated barrel, a non-rotatable pull means extending out of the barrel from one of its ends, a non-rotatable spindle extending out of the barrel from its opposite end, a barrel spring of the helical compression type acting between the barrel and the pull means, and an adjuster nut in non-self-locking engagement with the spindle and capable of being clutched to the pull means, characterized in that the barrel has a lock sleeve positioned thereon, and that the spindle is provided with a stop ring carried by the spindle and axially located thereon so that at a prolongation of the adjuster the stop ring will force-transmittingly contact the lock sleeve part of the barrel with the spindle still in thread engagement in the adjuster nut.

4,418,802

**SHOCK ABSORBER**

Naoto Fukushima, Fujisawa; Kazuroh Iwata, Kamakura, and Kunihiko Hidaka, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

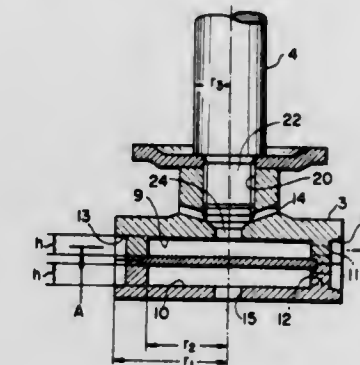
Filed Jul. 20, 1981, Ser. No. 285,049

Claims priority, application Japan, Aug. 7, 1980, 55-108965

Int. Cl.<sup>3</sup> F16F 9/34

U.S. Cl. 188—282

7 Claims



1. A hydraulic shock absorber including a piston disposed within a hollow cylinder in movable position responsive to a shock applied thereto, said piston defining a hollow vortex chamber therein, said vortex chamber being communicated with fluid chambers defined in the hollow cylinder to introduce a working fluid and to generate a vortex-type fluid flow therein for producing an absorbing force, wherein the vortex chamber is sized to satisfy the specific relationship

$$1 \leq h \cdot S_v / S_o \leq 6$$

where:

h is the depth of the vortex chamber;  
 $S_v$  is the cross-sectional area of the vortex chamber; and  
 $S_o$  is the effective cross-sectional area of the piston acting on the fluid to increase or decrease the pressure thereof.

4,418,803

**METHOD AND MEANS FOR BLEEDING HYDRAULIC BRAKES**

Willard L. Chichester, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

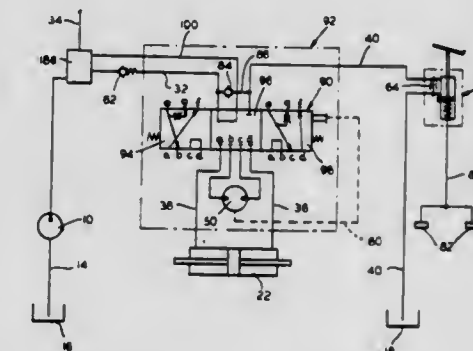
Filed May 26, 1981, Ser. No. 267,145

Int. Cl.<sup>3</sup> B60T 11/30

1 Claim

U.S. Cl. 188—352

21 Claims



6. In a main hydraulic system for vehicles a supply pump, a control valve for controlling the operation of a hydraulic component of the vehicle adapted to operatively connect the pump to a sump by way of a fluid return conduit which connects the control valve to the sump, a hydraulic brake system operatively connected to said return conduit including a master control cylinder means and air bleed valves operatively connected to said cylinder means, and a restriction in said fluid



return conduit for generating a flow of fluid through said brake system which purges entrained air from the brake system through the bleed valves when the bleed valves are open and fluid is flowing, in said return conduit.

#### 4,418,804 REINFORCED SOFT-SIDED LUGGAGE HAVING GROUND SUPPORT WHEELS

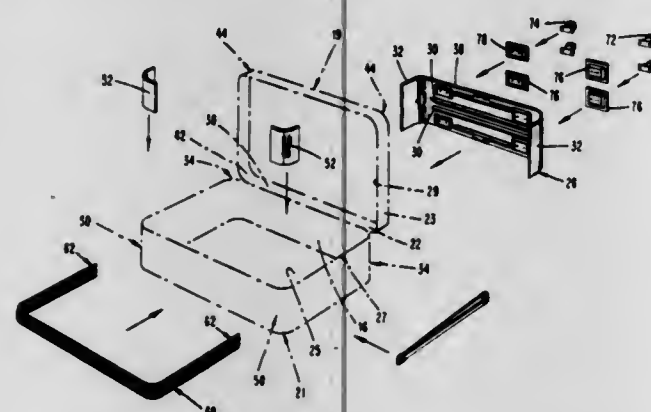
Leonard R. Bradley, Cumberland; Wayne I. Schmitt, Bristol, and Antone F. Macedo, Jr., Manville, all of R.I., assignors to American Tourister, Inc., Warren, R.I.

Filed Dec. 22, 1981, Ser. No. 333,562

Int. Cl.<sup>3</sup> A45C 13/36, 13/26; B62B 11/00; A45C 5/14

U.S. Cl. 190—18 A

4 Claims



1. In a soft-sided piece of luggage comprising a container and a cover formed of a soft material; said container including a rear wall and rear corners at opposite ends thereof; said cover being hingedly connected to said rear wall and including a main portion and a skirt depending laterally therefrom; said skirt having a first peripheral edge defining a single plane, and a first zipper track extending around said first peripheral edge, said container including a second peripheral edge defining a single track; a one-piece molded plastic floor plate positioned along the inside of said rear wall and including curved ends extending around said rear corners and terminating adjacent said rear corners, said curved ends projecting beyond said peripheral edge of said container to shape respective rear corners of said skirt when said cover is closed; said one-piece floor plate including a plurality of inwardly protruding wheel wells which open outwardly in a direction away from the interior of said container; each wheel well including a base wall and side walls formed by portions of said floor plate, and a plurality of wheel assemblies mounted in respective ones of said wheel wells, each wheel assembly comprising a yoke mounted to said base wall of its respective wheel well and projecting outwardly therefrom and a wheel rotatably mounted on said yoke.

#### 4,418,805 HINGE MEANS AND LUGGAGE COMBINED THEREWITH

Robert C. Wolff, 955 Crystal Ct., New Orleans, La. 70124

Filed Jul. 9, 1981, Ser. No. 281,591

Int. Cl.<sup>3</sup> A45C 3/00; E05D 1/04

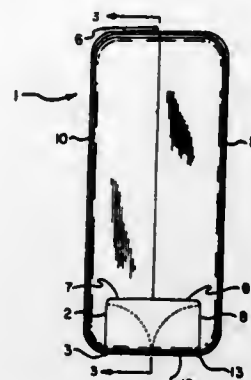
U.S. Cl. 206—279

12 Claims

5. In a full length garment suitcase having garment containing halves which are operably connected to each other, the improvement which comprises:

providing butt plate portion operably connected to each half by retro fit hinge means comprising stationary inner segment means rigidly affixed to said butt plate portion; intermediate wedged shaped segment means slidably attached to said inner segment means; and outer segment

means slidably attached to said intermediate wedge shaped means, rigidly affixed to an adjoining suitcase half



allowing action of said outer segment means relative to said inner segment means.

#### 4,418,806 THREE COMPARTMENT TRAVEL BAG

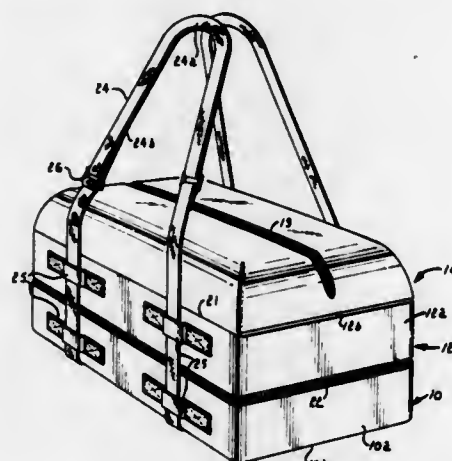
Rheuben C. Johnson, 8904 Pawnee, Leawood, Kans. 66206

Filed Aug. 20, 1982, Ser. No. 409,954

Int. Cl.<sup>3</sup> A45C 3/00, 13/00, 13/26

U.S. Cl. 190—111

9 Claims



1. A travel bag for carrying clothing and the like comprising: at least three separate sections providing separate storage compartments having generally similar sidewall outlines, the sections being stacked on one another to provide a top section, a bottom section and an intermediate section between the top and bottom sections, the bottom and intermediate sections each having sidewalls providing upper and lower sidewall edges, the lower sidewall edges of the intermediate section registering with the upper sidewall edges of the lower section, the intermediate section has a closed top panel bordered by its upper sidewall edges, the bottom section has a closed bottom panel bordered by its lower sidewall edges, displaceable partition means separating the compartment formed within the intermediate section from that formed within the bottom section when the sections are in the stacked condition, means connecting the intermediate section to the bottom section whereby to permit swinging movement of said intermediate section from the stacked position thereon to an inverted position to one side of said bottom section thus to uncover the top of said bottom section, means connecting the top section to the intermediate section whereby to permit swinging movement of the top section relative to the intermediate section to one side of said intermediate section which side of said intermediate section is opposite from the connection with the bottom section,

displaceable closure means for the top section permitting access to the top section compartment in either the stacked or side by side disposition of the sections, and a flexible carrier strap associated with the bottom and intermediate sections and providing hand grip portions which can be gripped and positioned above the top section for lifting the bag when the sections are in the stacked condition.

#### 4,418,807 FRICTION INTERFACE UNIT FOR A CLUTCH AND A BRAKE

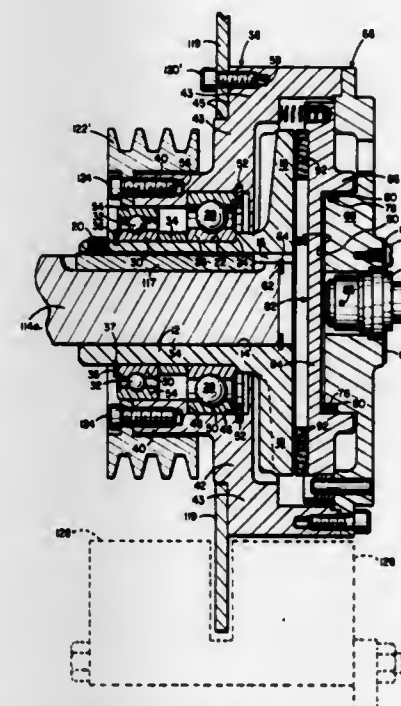
Charles D. Raines, Bethel, Minn., assignor to Horton Industries, Inc., Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,407

Int. Cl.<sup>3</sup> B60K 41/24

U.S. Cl. 192—18 A

5 Claims



1. A friction interface unit for use with a clutch, a brake or a clutch-brake, comprising:

- (a) a hub adapted to receive a shaft,
- (b) said hub having an annular friction flange extending radially therefrom;
- (c) a first housing portion including a cylindrical hollow base portion,
- (d) bearing means interposed between and in radial alignment with said hub and said hollow base portion of said first housing portion,
- (e) said hollow base portion having means for mounting a sheave thereon in radial alignment with said hub and said bearing means with the unit as a clutch or a clutch-brake or for mounting on an anchor mount with the unit as a brake,
- (f) said hollow base portion terminating in a radially extended annular wall,
- (g) means for mounting a ring disc on said annular wall adapted for engagement of the ring by a caliper brake,
- (h) a second housing portion having a central circular portion terminating at a portion of its periphery in
- (i) an annular flange portion,
- (j) means for securing the second housing portion to the first housing portion thereby forming a full housing for the unit,
- (k) an annular piston,
- (l) means mounting said piston on said circular portion to form a cylinder,
- (m) a friction ring mounted on said piston opposite to and for engagement with said annular friction flange,
- (n) said second housing portion having a series of spaced

torque pins carried thereby and slideably mounted in said annular piston,

(o) said central circular portion having means mounted thereon and in communication with said cylinder for introducing fluid pressure into said cylinder to thereby activate said piston to cause said friction facing thereon to engage said annular friction flange.

#### 4,418,808 CENTRIFUGAL CLUTCH BRAKE ARRANGEMENT FOR FARM WORK MACHINERY OR OTHER APPARATUS

Shigeo Nagai, Sanada, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Nagano, Japan

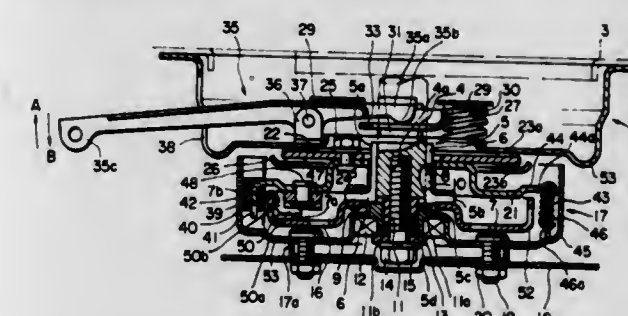
Filed May 20, 1981, Ser. No. 265,808

Claims priority, application Japan, May 21, 1980, 55-67561; May 22, 1980, 55-70691[U]; May 29, 1980, 55-71766; May 29, 1980, 55-74108[U]; May 29, 1980, 55-74109[U]

Int. Cl.<sup>3</sup> B60K 41/24

U.S. Cl. 192—18 R

6 Claims



1. A centrifugal clutch brake arrangement for farm work machinery or other apparatus comprising a member attached rotatably to an output shaft extending from a member fixed to an engine mounting, a drum fixed to said shaft for rotation therewith, a clutch plate disposed between said drum and said fixed member, a disc plate fixedly mounted on said clutch plate in face-to-face relation to said fixed member, a brake plate disposed between said disc plate and said clutch plate and engaging said disc plate, a pair of guide pieces formed on said brake plate, supportably inserted through said fixed member and terminating in a retainer, a pressure spring interposed between said fixed member and said retainer for biasing said brake plate toward said fixed member, a clutch spring interposed between said clutch plate and said first mentioned member for biasing said clutch plate toward said drum whereby the peripheral edge of said clutch plate is placed in slidable engagement with said drum in the direction of the output shaft of said rotatable member, said fixed member, drum, clutch plate, disc plate, brake plate, and shaft being coaxial, and an arcuate fly-weight pivotally mounted at one end thereof on said clutch plate such that the other end moves outwardly by centrifugal force until said fly-weight engages said drum, so that when a push is given to said brake plate against said pressure spring, said disc plate is caused to move away from said fixed member with subsequent disengagement of said brake plate out of said disc plate, thereby urging said fly-weight upon said drum.

#### 4,418,809 COMBINATION HANDWHEEL AND HANDWHEEL CLUTCH FOR SEWING MACHINES

Boleslaw Kornatowski, Elizabeth, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 9, 1981, Ser. No. 319,828

Int. Cl.<sup>3</sup> F16D 11/00, 13/60; D05B 59/00

U.S. Cl. 192—67 R

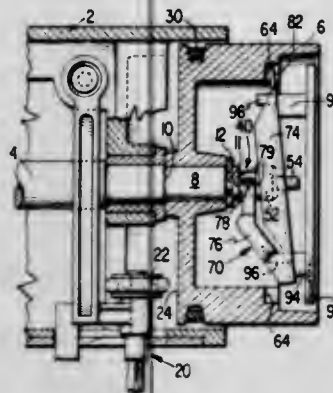
5 Claims

1. In a sewing machine having an arm shaft, a handwheel, and a drive means for rotating said hand wheel, a clutch means for drivingly coupling said handwheel to said arm shaft comprising:

- a. a drive notch formed in said handwheel and
- b. a driving element supported on said arm shaft for rotation



therewith and arranged to tilt between each of two bistable positions, when in the first of said bistable positions said driving element is in driving engagement with said drive notch and when in the second of said bistable positions said driving element is not in driving engagement with said drive notch, wherein said driving element comprises an elongated portion having a centrally located



discontinuity for tiltably engaging the end of said arm shaft and a leaf spring arranged adjacent to and on one side of said discontinuity to interferingly engage said arm shaft, the arm shaft including a flat surface parallel to the axis thereof, and the driving element including a side wall which is arranged to loosely contact the arm shaft to thereby effect a rotational couple between the arm shaft and said driving element.

4,418,810

**CLUTCH CONTROL SYSTEM**

Harry M. Windsor, Harbury, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

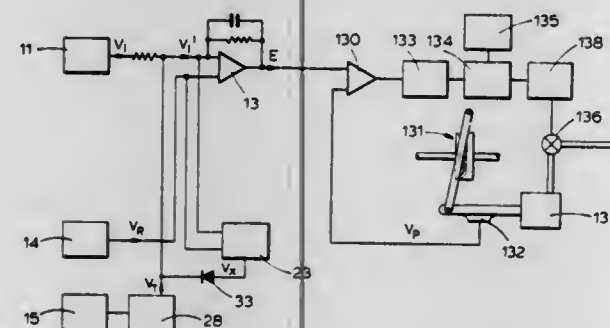
Filed Jun. 30, 1981, Ser. No. 279,085

Claims priority, application United Kingdom, Jul. 8, 1980, 8022348

Int. Cl.<sup>3</sup> B60K 41/02

U.S. Cl. 192-0.076

3 Claims



1. A vehicle transmission clutch electronic control system comprising:
  - generator means producing an electrical reference signal;
  - sensor means for producing a signal representative of engine speed;
  - a throttle position sensor means which produces a throttle signal indicative of throttle opening, said throttle signal and engine speed signal being combined to form a modified engine speed signal;
  - comparator means arranged to receive and compare the modified engine speed and reference signals and produce a consequent error signal;
  - a clutch actuator that operates the vehicle clutch and a control means responsive to the error signal and which causes the actuator to vary the state of engagement of the clutch to equalize the modified engine speed signal and reference signal.

4,418,811

**CLUTCH WITH FAIL-SAFE HELICAL SPRING**

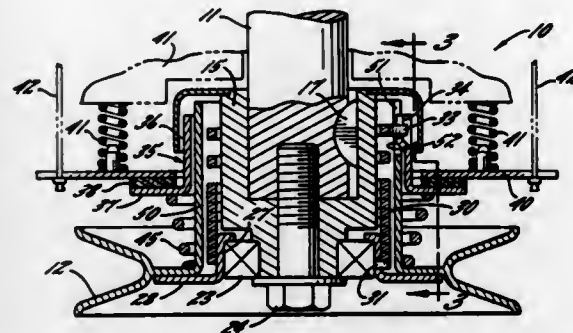
J. G. Fraser MacDonald, Detroit, Mich., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed May 4, 1981, Ser. No. 260,413

Int. Cl.<sup>3</sup> F16D 13/08, 67/02

U.S. Cl. 192-81 C

5 Claims



1. A clutch comprising rotatably mounted input and output hubs, a radially contractible helical spring telescoped over said hubs and having one end turnable with said output hub, said spring having a relaxed inner diameter which is greater than the outer diameter of said input hub whereby the spring loosely surrounds the input hub when the spring is relaxed, an actuator movable axially of said hubs between a clutch-engaged position and a clutch-disengaged position, means for turning said actuator as said actuator is moved axially between said positions, the other end of said spring being connected to said actuator and turning in a direction to cause said spring to contract around and grip said input hub when said actuator turns upon being moved axially to said clutch-engaged position, and a second spring acting on said actuator and biasing said actuator axially toward said clutch-engaged position.

4,418,812

**CLUTCH DRIVEN PLATE ASSEMBLY WITH A FLOATING HUB**

Thaddeus Lech, Jr., Sterling Heights, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 27, 1981, Ser. No. 248,106

Int. Cl.<sup>3</sup> F16D 3/14

U.S. Cl. 192-106.2

13 Claims



1. A clutch driven plate assembly for an automotive vehicle clutch driving a transmission input shaft, comprising a multi-part hub assembly including an inner hub operatively connected to the transmission input shaft, an outer hub encompassing said inner hub and having an integral radial flange operatively connected to friction facings located between a engine

flywheel and a clutch pressure plate, said inner hub having a radial flange at one end and a stop ring adjacent the opposite end, said radial flange having a surface facing the outer hub flange, a back plate positioned on said inner hub adjacent said stop ring, a plurality of intermeshing camming surfaces formed on the flange surface and facing surface of the outer hub so that relative rotation between the hubs will result in axial motion of the inner hub on the transmission shaft, and resilient means between said back plate and outer hub to yieldably bias the camming surfaces into engagement.

4,418,813

**MODULAR OPEN CHUTING**

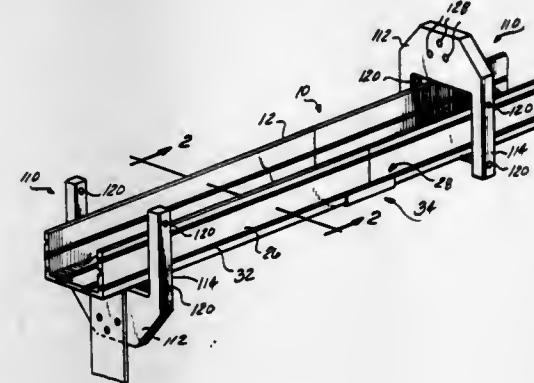
John T. Leininger, Pontiac, Mich., assignor to Modular Automation, Inc., Clarkston, Mich.

Continuation-in-part of Ser. No. 265,664, May 20, 1981, Pat. No. 4,381,834. This application Oct. 19, 1981, Ser. No. 312,541

Int. Cl.<sup>3</sup> B65G 13/11

U.S. Cl. 193-35 J

9 Claims



1. A modular chute with open top and bottom for passing a work piece therealong comprising:
  - a pair of spaced apart sidewalls having an upper edge and a lower edge;
  - a plurality of clips deployed along said upper and lower edges to secure said sidewalls in the spaced apart position; and
  - means for releasably securing a wear resistant workpiece support member to said clips;
 and wherein said clips include means for snappedly securing said clips to the sidewalls.

4,418,814

**FINGER COOKIE ORIENTING APPARATUS**

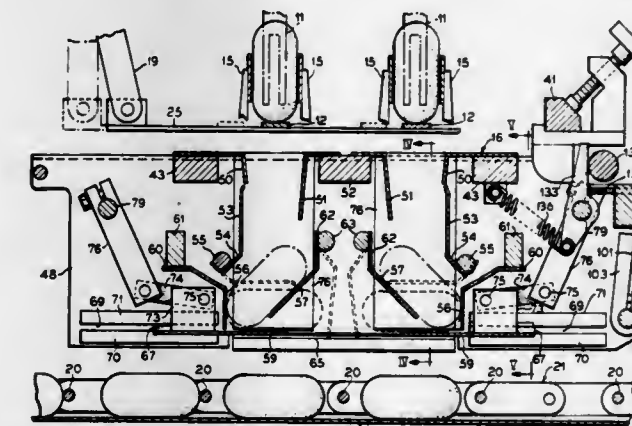
Edward Rose, Skokie, Ill., assignor to Peters Machinery Company, Subsidiary of Katy Industries, Inc., Chicago, Ill.

Filed Feb. 20, 1981, Ser. No. 236,636

Int. Cl.<sup>3</sup> B65G 47/24

U.S. Cl. 198-406

12 Claims



1. In an apparatus for conveying and orienting elongated finger cookies or other bakery products in groups for packaging, at least one drop gate, conveying means for conveying

counted groups of cookies along said drop gate with their longest dimensions extending vertically, a drop chute assembly extending beneath and in cookie receiving relation with respect to said drop gate, a retractible support plate in cookie receiving relation with respect to said drop gate, means moving said drop gate out of supporting engagement with a group of cookies to accommodate dropping of the group of cookies along said drop chute assembly, a cookie orienting extension at the lower end of said drop chute assembly for turning each counted group of cookies from an upright position to a flat position on said retractible support plate, said cookie orienting extension including a retractible orienting wall extending along one side of said drop chute assembly and angularly downwardly relative thereto, a stop wall at the opposite side of said drop chute assembly from said cookie orienting wall, and means for pivotally moving said cookie orienting wall out of supporting engagement with the cookies engaging said stop wall to accommodate the cookies on the cookie orienting wall and engaging said stop wall to be lowered onto said retractible plate upon movement of said cookie orienting wall in a direction away from said drop chute assembly to a position 90 degrees from their positions on said drop gate as said cookie orienting wall pivotally moves outwardly of said drop chute assembly.

4,418,815

**NONMAGNETIC LEAD HANDLING SYSTEM**

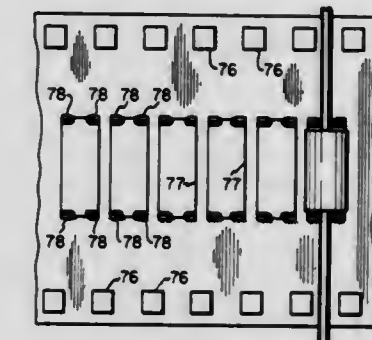
Gary W. Anderson, Transfer, and Dennis G. Stake, Greenville, both of Pa., assignors to Electronic Equipment Development Ltd., Toluca Lake, Calif.

Filed Aug. 7, 1981, Ser. No. 291,028

Int. Cl.<sup>3</sup> B65G 47/84

U.S. Cl. 198-476

14 Claims



1. A tape for receiving axial lead components comprising an elongate strip of flexible metal tape successively die punched to provide a plurality of sprocket receiving holes along each edge, a plurality of component receiving holes spaced along the center line of the tape, bounded by spaced pairs of tabs rising from a base only at each lateral end of the component receiving holes, each opposed end pair of tabs defining therebetween an open slot extending to the base of the tabs, said slot being narrower at the top than at the base.

4,418,816

**INERTIAL CONVEYOR**

Lev Kropp, 2178 W. Marne Ave., Milwaukee, Wis. 53209

Filed Oct. 19, 1981, Ser. No. 312,399

Int. Cl.<sup>3</sup> B65G 25/00

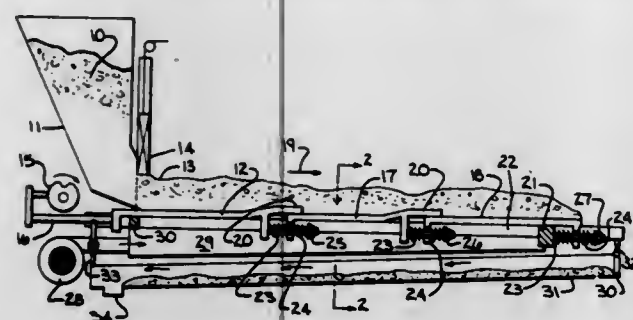
U.S. Cl. 198-773

4 Claims

1. An inertial conveyor having an immovable rest, a plurality of consecutive conveying surface sections slidably mounted on parallel rails for lateral movement toward said rest, the rear end of each of said sections covering the front end of the next section and the rear end of the last section covering the front end of the immovable rest, a plurality of springs operatively connected to said sections, said springs permitting said sections to shift back and forth towards each other and the immovable rest, and drive means for delivering lateral driving impulses to



the sections thus forcing any material on the conveying surfaces of said sections to move by inertia towards the immovable rest, said drive means being operatively connected to only



the first section and each of said sections other than the first section receiving lateral driving impulses from the previous section through said springs.

4,418,817

**CONVEYOR CHAIN HAVING CARRIER ROLLERS**

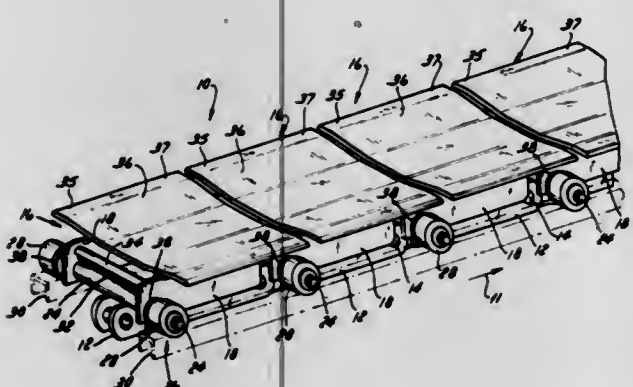
Donald E. Martin, Waukesha, and Victor D. Petershack, Elm Grove, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Jul. 17, 1981, Ser. No. 284,263

Int. Cl.<sup>3</sup> B65G 39/20

U.S. Cl. 198—845

11 Claims



1. A conveyor chain, comprising:
  - a plurality of chain links;
  - a plurality of pins interconnecting said chain links;
  - a plurality of cart carriers mounted on top of said chain links, each cart carrier comprising:
    - a. a pair of frame members defining a pair of apertures toward one end;
    - b. an axle extending between said frame members and through said apertures;
    - c. a pair of carrier rollers rotatably mounted on said axle;
    - d. a top plate support bar extending between said pair of frame members above said axle and attached at each end to one of said frame members; and
    - e. a top plate lying on top of and attached to said pair of frame members, the front end of said top plate extending beyond said frame members so as to be supported by the top plate support bar of the preceding cart carrier.

4,418,818

**BASKET CARRIER FOR BOTTLES HAVING TRANSVERSE DIVIDERS INSERTED THROUGH THE BOTTOM WALL**

Orison W. Stone, Middlebury, Vt., assignor to Pack Image, Inc., Middlebury, Vt.

Filed Aug. 23, 1982, Ser. No. 410,824

Int. Cl.<sup>3</sup> C23F 13/00

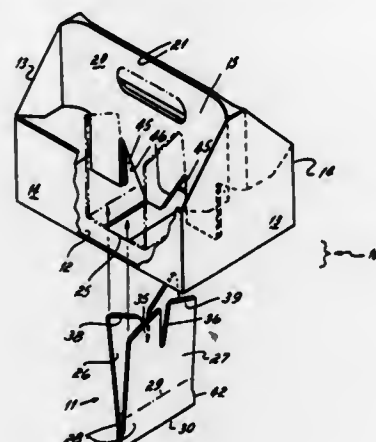
U.S. Cl. 206—196

8 Claims

1. In a basket carrier for bottles and having a bottom wall, opposed end walls, opposed side walls and a central longitudi-

nal divider, the improvement comprising a transverse divider structure comprising,

- a transverse slot formed across a major portion of said bottom wall,
- two inverted V-shaped slots in the lower portion of said central divider,
- a transverse divider element, said divider element being U-shaped and having vertical divider walls containing V-shaped slots which engage the central divider V-shaped slots to hold said divider walls in a vertical attitude,



said transverse divider having a horizontal wall whose longitudinal dimension is substantially greater than the width of the slot in said bottom wall, said horizontal wall being transversely creased to permit the divider to be folded into a V for insertion into said carrier through said slot, after said transverse divider is inserted in said carrier, said horizontal wall spreads beyond said slot and a substantial portion of it overlies said bottom wall where it is retained by the weight of bottles on it.

4,418,819

**DUAL CONTAINER APPARATUS**

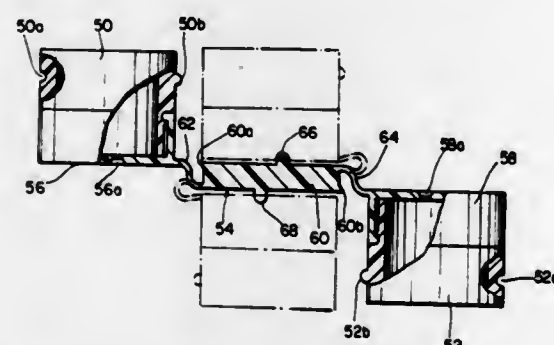
Richard N. Shapiro, 512 N. Oakland St., Arlington, Va. 22203

Filed Sep. 30, 1982, Ser. No. 431,056

Int. Cl.<sup>3</sup> B65D 77/00

U.S. Cl. 206—216

10 Claims



1. A container apparatus for separately housing at least two materials, said apparatus comprising:

- a first container having an opening in one end thereof;
- a second container having an opening in one end thereof;
- a first cover for said opening of said first container;
- a second cover for said opening of said second container;
- a further cover means which is adapted to be selectively and detachably connected to each of said first and second covers so as to form an integral unit with said covers when connected thereto; and
- means for hingedly connecting said first and second covers to said further cover means;
- said covers and said further cover means including projection and socket means for detachably connecting said

further cover means to said covers such that when said covers are so connected to said cover means said containers are supported in stacked relationship to one another.

4,418,820

**CIRCUIT BOARD CASE**

Joseph J. Nagle, 165 Ten Rod Rd., Rochester, N.H. 03867, and

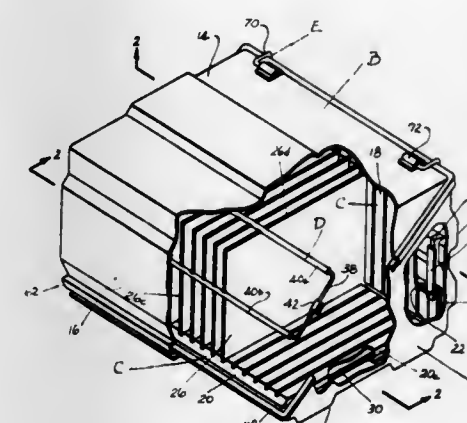
Joseph Vitko, Jr., 32 Lexington St., Dover, N.H. 03820

Filed Oct. 23, 1981, Ser. No. 314,182

Int. Cl.<sup>3</sup> B65D 73/02; H02B 1/04

U.S. Cl. 206—334

11 Claims



1. A carrying case for printed circuit boards and the like comprising:

- a case;
- a cover forming a closed container when fitted together with said case;
- interchangeable insert means carried in an interior of said case including groove means receiving and supporting side edges of two intersecting sides of said boards;
- fastening means securing said insert means in said case;
- a clamp assembly carried by said case engaging remaining sides of said boards clamping same tightly in said case;
- attachment means interconnecting said case and cover;
- said case and cover having a configuration permitting nesting of said case within said cover;
- closure means carried by said cover having a first operable position securing said case and cover together in said container configuration and a second operable position providing a base support for said case and cover in said nester configuration supporting same on a table surface and the like in a working position.

4,418,821

**DISPOSABLE SURGICAL INSTRUMENT PLATFORM AND CONTAINER**

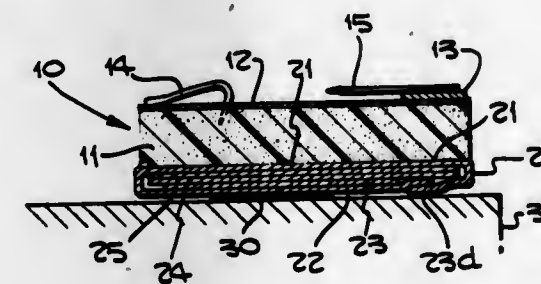
Dan S. Sandel, 19524 Halsted St., Northridge, Calif. 91324

Filed Dec. 31, 1981, Ser. No. 336,034

Int. Cl.<sup>3</sup> B65D 83/10

U.S. Cl. 206—370

16 Claims



1. A disposable surgical instrument platform and container comprising:

an individual platform for receiving surgical instruments thereon and

a folded container means for providing a supporting base for said platform while said platform receives surgical instruments thereon and for providing an enveloping container for said platform and surgical instruments for disposal thereof by being folded up about said platform, said container means comprising a one piece sheet of foldable panels including a center panel, a pair of side panels and a pair of end panels, all foldable into a first position of use wherein all of said panels are in a vertically aligned, stacked relation directly under and supporting said platform and being foldable into a second position of use wherein said center panel underlies said platform, said pair of side panels are foldable up about sides of said platform and said pair of end panels are foldable up about ends of said platform with said panels providing panel portions overlying and covering said platform upper surface.

4,418,822

**SEALED PACKAGE FOR WOUND DRESSING ADHESIVE TAPE**

Angelo Dotta, Via Altabella 10, Bologna, Italy

Filed Jun. 3, 1982, Ser. No. 384,531

Claims priority, application Italy, Jun. 11, 1981, 67812 A/81

Int. Cl.<sup>3</sup> A61F 13/02

U.S. Cl. 206—441

4 Claims



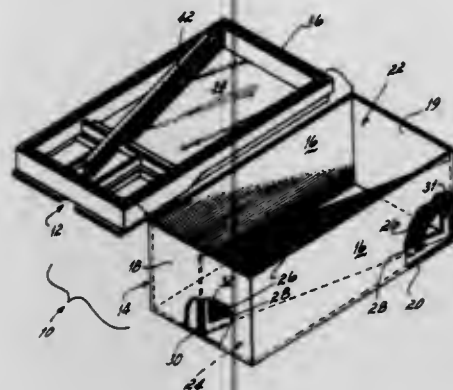
1. A rapidly opening sealed package for wound dressing adhesive tape, comprising an adhesive support having a non-adhesive wound dressing area carrying a wound dressing pad, a pair of protective films attached to said adhesive support, and an outer wrapper formed substantially of a pair of flat tubular outer sheaths closed at their peripheral edges and having adjacent ends adhesively sealingly connected to one another but separable by pulling them apart, characterized in that said pair of protective films have a small degree of adhesion only at their inner surfaces attached to said adhesive support and each of them is adhesively connected to a separable portion of said wrapper by means of an adhesive layer provided between a portion of an outer surface of each protective film and a corresponding adjacent portion of an inner surface of said wrapper in an area in the vicinity of said wound dressing pad, the overall assembly being of a generally flat configuration and such that when pulling apart said tubular sheaths of said wrapper said protective sheaths will remain adherent in the portion thereof adhesively connected to the corresponding separated portions of said wrapper and will be folded back upon themselves in opposed S and Z shapes and will be detached from said wound dressing pad by sliding within said wrapper formed of said pair of tubular sheaths, exposing said wound dressing pad ready for application.



**4,418,823**  
**MEDICATION HANDLING SYSTEM AND REUSABLE DISPENSING CONTAINER**  
 Jerome M. Romick, 5191 Etna Rd., Columbus, Ohio 43213  
 Filed Mar. 4, 1981, Ser. No. 240,266  
 Int. Cl.<sup>3</sup> B65D 69/00, 83/00

U.S. Cl. 206—538

3 Claims



1. A reusable medication dispenser comprising a bottom part, said bottom part having a plurality of walls including sidewalls, a bottom wall and end walls,

a divider wall extending between said end walls dividing said dispenser into two chambers, one of said chambers comprising a large chamber and the other a reserve chamber, said divider wall being positioned so that the large chamber is larger than the reserve chamber, said reserve chamber providing a chamber for a reserve supply of medication, said divider wall being nonparallel to the side walls and readily removable from the dispenser to permit clearing, and said divider wall being approximately as high as said side walls,

a removable closure top which can cover said bottom part, said closure top having top and bottom surfaces, said upper surface having openings one of which overlies the reserve chamber and the other overlies the large chamber permitting medication contained in the large chamber to be dispensed until depleted and then dispensed from the reserve chamber, each opening being provided with a hinged flap, said bottom surface having a circumferential channel adapted to receive the side walls and end walls of said top part whereby said closure top is held securely in place.

**4,418,824**  
**DUAL STACKER FOR SLOT ACCEPTOR**  
 Robert L. Gorgone, Mentor, and Anthony H. Dolejs, Bedford Heights, both of Ohio, assignors to Ardac, Inc., Eastlake, Ohio

Filed Jul. 8, 1981, Ser. No. 281,326  
 Int. Cl.<sup>3</sup> B07C 5/36; B65H 31/06

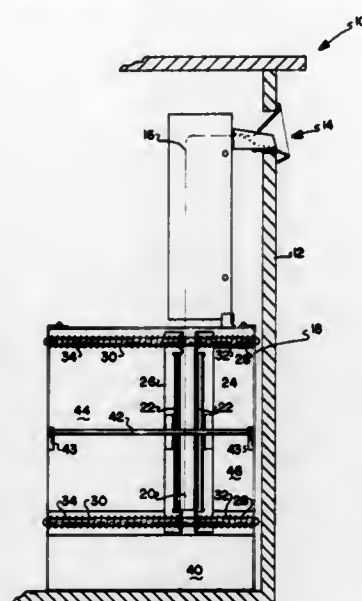
U.S. Cl. 209—534

10 Claims

1. Apparatus for receiving and storing notes of different denominations in a note acceptor, comprising:

a receptacle for temporarily receiving a note;  
 a punch reciprocally removable through said receptacle; receiving means on either side of said receptacle, one for each denomination of note to be stored, for receiving notes moved by said punch from said receptacle; and position sensing means operatively connected to said punch for monitoring the positional relationship of said punch with respect to said receptacle, said position sensing means comprising photodetectors interconnected with

said punch, said photodetectors sensing predetermined positions of said punch, and a pair of disks interposed

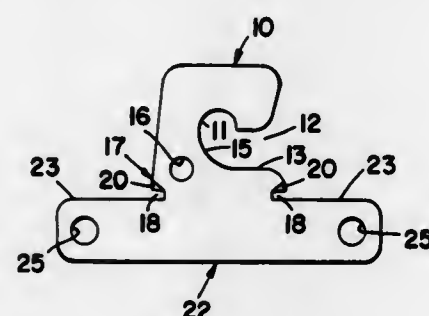


between said photodetectors, said disks having openings therein in communication with said detectors.

**4,418,825**  
**DEVICE FOR HOLDING SOFT-COVERED BOOKS**  
 John E. Mahowald, 1401 Klepper Ave., Kingsburg, Calif. 93631  
 Filed Nov. 5, 1981, Ser. No. 318,325  
 Int. Cl.<sup>3</sup> A47B 65/00

U.S. Cl. 211—42

5 Claims



1. A device to suspend a soft-cover book having a stiff spine from a rod comprising:

A. a hook element having an interior rounded opening with a radius larger than the radius of said rod, having a side opening from said interior opening through a side of said hook element, said side opening being large enough to admit said rod, with said hook element being narrower at the top than at the base thereof;

B. a locking element adjacent the base of the hook element, said locking element having an upper portion at least as wide as the base of said hook element and having a lower recess adapted to embrace the spine of said book;

C. a supporting element adjacent said locking element, said supporting element being wider than said locking element, extending laterally from both sides of said locking element, and having an upper edge that is perpendicular to the vertical axis of said hook element;

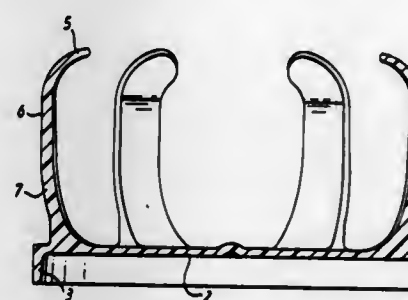
D. all of said elements being thinner than about 0.05 inches and lying substantially in the same plane; and

E. an ear adjacent said recess portion bent out from the plane in which all of the elements lie.

**4,418,826**  
**CONTAINER SPACE FILLER**  
 Gerardo Mancini; Richard J. Searle, both of London, and Eugene E. Davis, Ilford, all of England, assignors to Johnsen & Jorgensen Limited, London, England  
 Filed Apr. 6, 1982, Ser. No. 365,900  
 Claims priority, application United Kingdom, Apr. 7, 1981, 8110814; Jun. 9, 1981, 8117549  
 Int. Cl.<sup>3</sup> B65D 25/10

U.S. Cl. 215—231

4 Claims

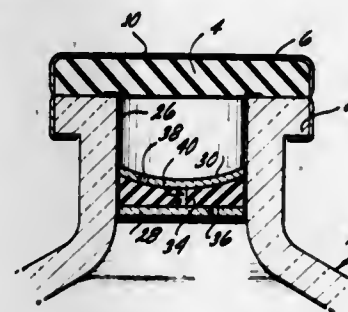


1. A space filler designed to be disposed within a space in a filled container between the top of the contents of the container, the inner surface of the closure cap for the container and the inside side surface of the container to minimize unwanted movement of the contents of the container, said space filler comprising a base member adapted to rest on said top of the contents of the container and a plurality of resilient spacer arms projecting upwardly from said base member so that when in use at least some of said spacer arms are compressed and deformed and make contact with said inner surface of the closure cap and with said inside side surface of the container, said spacer arms are disposed adjacent to the periphery of said base member and are curved inwardly towards the centre thereof so that in operation on compression of the spacer arms during closure of said container the arms bow outwardly to press against said inside side surface of the container as well as being pressed downwardly by said inner surface of the closure cap.

**4,418,827**  
**TAMPER-ALERTING DEVICE FOR VIALS AND SYRINGES**  
 Ida M. Butterfield, Santa Maria, Calif., assignor to Butterfield Group, Santa Maria, Calif.  
 Filed Mar. 31, 1982, Ser. No. 363,906  
 Int. Cl.<sup>3</sup> B65D 41/20

U.S. Cl. 215—247

7 Claims



1. In a container of the type having a mouth sealed by a diaphragm that in normal use is penetrated by a hypodermic needle to permit the fluid contents of the container to be removed, the improvement comprising:

an insert mounted in the mouth of the container and defining a central opening; and,

an object retained by a friction fit within the central opening of said insert in a position immediately adjacent the inwardly-facing surface of the diaphragm, so that said object will be dislodged from said insert by a hypodermic needle inserted through the diaphragm.

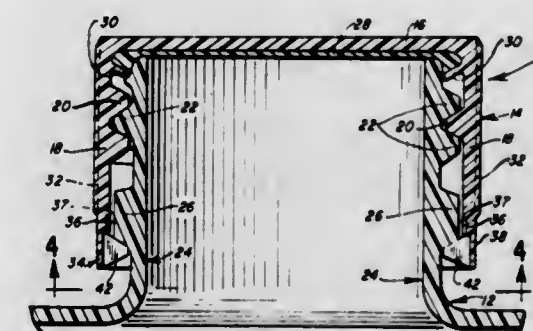
1037 O.G.—6

**4,418,828**  
**PLASTIC CLOSURE WITH MECHANICAL PILFER BAND**  
 Sheldon L. Wilde, and Thomas J. McCandless, both of Crawfordsville, Ind., assignors to H-C Industries, Inc., Crawfordsville, Ind.

Filed Jul. 24, 1981, Ser. No. 286,375  
 Int. Cl.<sup>3</sup> B65D 41/34

U.S. Cl. 215—252

57 Claims



1. A closure for a container having a threaded neck including an annular locking ring portion comprising:

a cap having a top wall portion, and a cylindrical threaded skirt portion depending from said top wall portion, and pilfer band means depending from said skirt portion and distinguished therefrom by a fracturable area,

said pilfer band means including an annular band portion and a plurality of wing means each extending integrally inwardly of said band portion, and each being adapted to flex generally about an axis disposed at an acute angle to the axis of said cap during application of said closure to said container, whereby after said closure is applied to said container, said wing means are adapted to engage a lower surface of said locking ring portion when said closure is rotated for removal from said container thereby fracturing said fracturable area.

**4,418,829**  
**WASHING AND RINSING VESSEL WITH DEBRIS CATCHING CHANNEL**

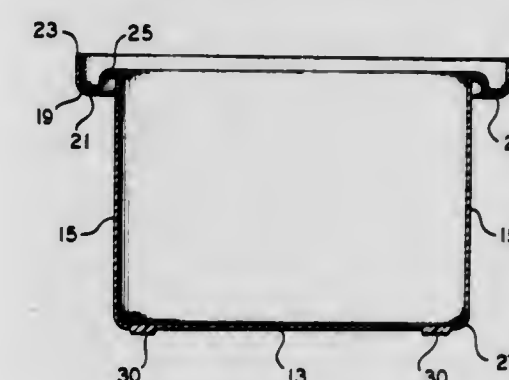
Irene Clay, Rte. 2, Box 481, South Boston, Va. 24592

Filed Nov. 16, 1981, Ser. No. 322,054

Int. Cl.<sup>3</sup> B65D 1/34, 1/46, 43/06; B08B 9/08

U.S. Cl. 220—74

1 Claim



1. A vessel for washing and rinsing produce which leaves the produce virtually free of debris, said vessel comprising:

a bottom wall and side walls surrounding said bottom wall and extending upward from said bottom wall, said bottom wall and side walls defining a cavity adapted to contain said produce and to have a washing liquid introduced therein, said side walls having an outwardly extending flange about the entire periphery of said vessel at the upper extremity of said side walls, said flange being joined to channel depending immediately from the outermost



edge of said flange and extending about the entire periphery of said vessel, said channel having a plurality of drain holes in the bottom of said channel, said channel terminating in an outer peripheral wall having an upper terminal edge higher than said flange, and said outer peripheral wall being joined to said side walls so that washing liquid and debris unrestrictedly overflow said outwardly extending flange of said side walls into said channel while restricted in movement therefrom by said outer wall, and said washing liquid in said channel is being constantly drained through said drain holes in said channel and while said debris is retained in said channel.

4,418,830

# MOISTURE AND DUST SEAL ARRANGEMENT FOR A PORTABLE RADIO OR THE LIKE

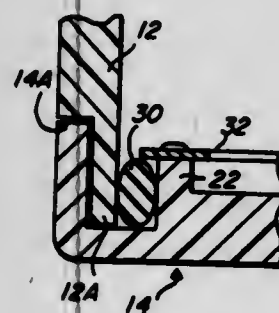
John C. Dzong, Sunrise; Harry J. Perkey, Tamarac, and George J. Schmitz, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1981, Ser. No. 296,718

Int. Cl.<sup>3</sup> B65D 53/02, 43/06

U.S. Cl. 220—81 R

4 Claims



1. An improved moisture and dust seal arrangement for an apparatus having a molded plastic enclosure formed by first and second mating members, including in combination: an intumed lip and an inwardly spaced upstanding vertical wall included on one of the enclosure members in the form of a closed loop configuration and spaced from the outer edge of said one enclosure member, a plurality of right angle corners and a plurality of stake posts positioned about said closed loop vertical wall; an O-ring positioned about the upstanding vertical wall and retained thereon by the elasticity of the O-ring; and a flat ribbon-like member in the form of a closed loop overlying said vertical wall and cooperating with said stake posts to comprise an assembly wherein a portion extends outwardly a predetermined distance from the edge of said wall in a manner to form a groove-like space to retain said O-ring; and said other enclosure member having an outer edge lip portion received in said space between said intumed lip of said one enclosure member and said O-ring positioned about said upstanding vertical wall to compress said O-ring in a lateral direction and form an effective moisture and dust seal.

4,418,831

# CONTAINER CLOSURE AND A FRANGIBLE INNER CLOSURE

Walter Schellenberg, Unterdorf 624, Diepoldsau, Switzerland Division of Ser. No. 143,463, Apr. 24, 1980, Pat. No. 4,365,457. This application Jul. 19, 1982, Ser. No. 399,828

Claims priority, application Switzerland, Jun. 18, 1979, 5674/79

Int. Cl.<sup>3</sup> B65D 51/22

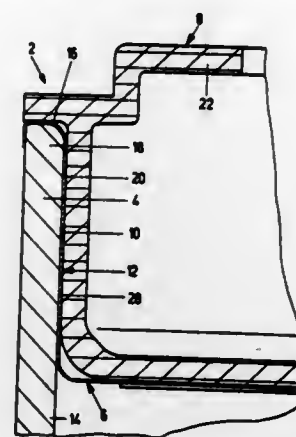
U.S. Cl. 220—258

4 Claims

1. An improved container closure comprising a lid at least partially insertable into an end of a container and a metal foil seal of the type including a cylindrical portion adhered to the inner surface of the container, a diaphragm portion recessed

inwardly from the container end and extending across the container interior, and a tear-open tab affixed to the diaphragm, the improvement wherein

said foil seal includes means defining a groove-like circumferential region in said cylindrical portion between said



diaphragm and the end of said container separating said cylindrical portion into a removable section and a permanent section whereby, when said tab is pulled to rupture and remove said diaphragm and open the container, said seal separates along said region to facilitate removal only of the seal portion inward of said region.

4,418,832

# CONTAINER WHICH CAN BE OPENED WITH ONE HAND

Helmut Schneider, Baar, Switzerland, assignor to Inkare AG, Zug, Switzerland

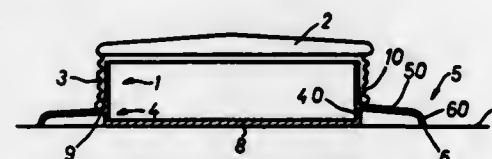
Filed Jun. 4, 1982, Ser. No. 385,213

Claims priority, application Switzerland, Jun. 25, 1981, 4209/81

Int. Cl.<sup>3</sup> B65D 17/50, 41/02

U.S. Cl. 220—260

18 Claims



18. A container comprising a receptacle portion for containing a product to be dispensed; a cover disposed on top of said receptacle portion for covering the contents disposed in said receptacle portion; said cover being secured to said receptacle portion in such a manner as to require movement in a direction away from said receptacle portion for purposes of removing said cover from said receptacle portion; finger support means secured to and disposed about at least a portion of the periphery of said receptacle portion and located adjacent said cover in the normal position of container assembly so as to provide a finger-supporting base whereby the cover may be moved away from the receptacle portion by the fingers of one hand for purposes of removing said cover from said receptacle portion.

4,418,833

# LARGE VOLUME CONTAINER WITH GASKETLESS SEAL

H. Richard Landis, Oak Lawn, Ill., assignor to Landis Plastics Inc., Chicago Ridge, Ill.

Filed Dec. 14, 1981, Ser. No. 330,194

Int. Cl.<sup>3</sup> B65D 41/16, 41/18

U.S. Cl. 220—306

2 Claims

1. A plastic molded container and closure assembly for holding large volume contents comprising:

a container having an encircling container wall, an annular rim on an upper open end of said container wall; a one-piece closure molded of resilient flexible plastic material having a top wall for covering the open end of the container wall; an interlocking flexible bead on said closure and a rigid bead on said container for interlocking engagement with each other to secure the closure onto the container; an annular sealing bead on said rim projecting upwardly; inner and outer sealing flanges on said closure depending from the underside of said closure, said sealing flanges being spaced apart a predetermined distance to receive

being bonded to the undersurface of said paperboard substrate, and  
(d) a second coating layer having first and second surfaces, the first surface thereof being bonded to said second surface of said conductive layer;  
said overcap ring being injection molded to said laminated structure to provide an integral peelable laminated structure; and  
interlocking engagement means disposed on said overcap ring and said container body for maintaining said overcap ring and container body in sealing engagement.

4,418,835

# TRASH CONTAINER APPARATUS

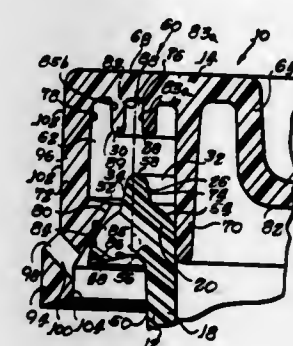
Abner W. Watts, 7231 W. Bayaud Pl., Lakewood, Colo. 80226

Filed Oct. 18, 1982, Ser. No. 437,850

Int. Cl.<sup>3</sup> B65D 90/04

U.S. Cl. 220—404

2 Claims



and to abut said sealing bead when said closure is secured onto said container;  
said sealing bead being tapered in an upward direction to a rounded free end, said sealing bead being centered between said sealing flanges and having a width greater than said predetermined distance for being abutted by said flanges and for spreading said flanges in a radial direction; said inner and outer sealing flanges being depending rings integral with a top rim portion of said closure and being substantially longer in their downward direction than in their cross-section thickness for easy deflection by the sealing bead and for deflection by internal or external pressure to more tightly abut a side of said sealing bead.

4,418,834

# OVERCAP RING WITH AN INTEGRAL PEELABLE LAMINATED STRUCTURE

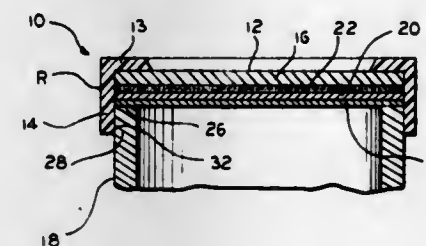
Charles R. Helms, Malvern, and Richard L. Bell, Exton, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Sep. 13, 1982, Ser. No. 416,948

Int. Cl.<sup>3</sup> B65D 41/00

U.S. Cl. 220—359

15 Claims



1. The closure assembly for a container comprising: a container body having an upper, open marginal portion; an overcap ring adapted for engagement with said container body and including a generally planar portion and a downwardly depending flange portion; a laminated structure consisting of  
(a) a paperboard substrate having an undersurface,  
(b) an electrically conductive layer having first and second surfaces,  
(c) a first coating layer having first and second surfaces, the first surface thereof being bonded to the first surface of said conductive layer, and the second surface thereof

1. An improved trash container apparatus comprising:  
(a) outer container means for structurally supporting and enclosing other container elements positioned therein, said outer container means comprising a generally rectangular bottom wall, positioned substantially in a horizontal plane, first, second, third and fourth generally trapezoidal side walls integrally formed therewith, said first wall being opposite said third wall, said second wall being opposite said fourth wall, said sidewalls having intersecting upper edge surfaces positioned substantially in a plane parallel to said bottom wall, said four intersecting upper edge surface forming a substantially rectangular figure having an area greater than said bottom wall defining a planar mouth of said outer container means, said walls and said planar mouth defining an outer container means cavity;  
(b) flexible plastic inner container means operably positioned within said outer container means cavity for receiving material to be disposed of therein, said flexible plastic inner container means being formed from a flexible extensible plastic film material constructed and arranged to form a deformable enclosing envelope having an envelope cavity, said envelope comprising insertion opening means therein for inserting material to be disposed of into said enclosing envelope cavity and comprising handle opening means therein for removably mounting said flexible plastic inner container means on bracket means;  
(c) first bracket means for removably supporting said flexible plastic inner container means within said outer container means cavity, comprising a single length of elongate cylindrical material having two spaced apart outer vertical portions, the lower end of each said outer vertical portion being integrally formed with a first end of an associated, transversely extending, spacer portion so that each said lower end is spaced from said outer container means; each spacer portion being integrally formed at a second end thereof with an associated downwardly extending attachment portion, each said attachment portion extending downwardly in abutting contact along the length thereof with said first wall of said outer container means, each said



attachment portion having a circular configuration at a lower end thereof; each said outer vertical portion being integrally connected at the upper end thereof with a first end of an ear horizontally extending portion; each ear horizontally extending portion extending inwardly of an associated connected outer vertical portion in a direction substantially perpendicular said spacer portions; each said ear horizontally extending portion having a second end integrally connected to an upper end of an associated inner vertical portion; each inner vertical portion having a lower end integrally connected to opposite ends of an inner horizontally extending portion extending horizontally between said inner vertical portions in parallel relationship with said ear horizontal portions; said ear horizontally extending portions being of equal relatively small lengths and said inner horizontally extending portion being of a relatively large length; said outer vertical portions being spaced apart a sufficient distance whereby tension is produced in said flexible plastic inner container means about a handle opening when said handle opening is positioned in encompassing relationship about said outside vertical portions, said inner container means being vertically supported by said spacer portions, said spacer portions providing sufficient space between said first wall and said outer vertical portions for permitting grasping of a portion of said inner container stretched between said outer vertical portions, said inner horizontally extending portion being positioned at least as low as said spacer portion whereby said inner horizontally extending portion does not interfere with removal of said inner container portion;

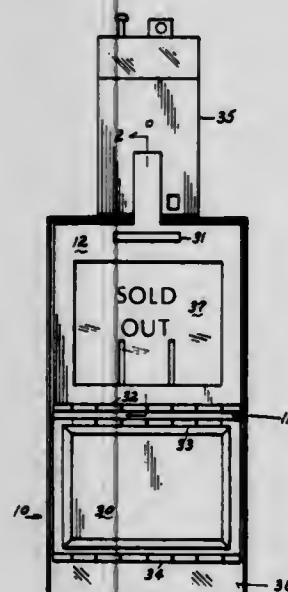
- (d) second bracket means having an identical size and configuration as said first bracket means attached to said third wall in mirror image relationship with said first bracket means;
- (e) connector bolts for boltingly attaching said first and second bracket means to said outer container.

**4,418,836**  
**VENDING MACHINE FOR NEWSPAPER, MAGAZINES AND THE LIKE**  
 Donald K. Christian, 119 Woodbine Ter., Spartanburg, S.C. 29301

Filed Jul. 23, 1981, Ser. No. 286,336  
 Int. Cl.<sup>3</sup> G07F 11/14

U.S. Cl. 221—37

4 Claims



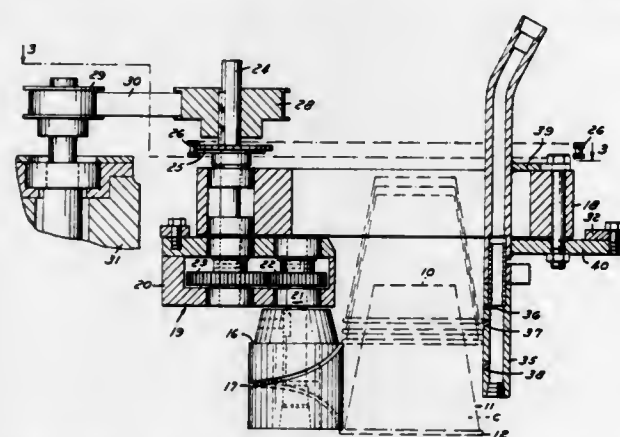
1. A vending machine to dispense single copies of a newspaper, magazine or the like comprising:
- (a) a cabinet, said cabinet having a storage area associated therewith;
- (b) a coin mechanism assembly mounted thereon, said mechanism having a coin receiving means therein and a release

- means to permit purchaser access to a chamber wherein is contained a single copy thereof;
- (c) a hinged purchaser access door;
- (d) a separation device associated with the storage area, operatively associated with said door in such manner that opening of said door will effect the separation of a single copy by inserting a portion of said separation device generally between the topmost and secondmost copy therein; said separation device moving from the back generally toward the purchaser;
- (e) an elevator so oriented as to continue presenting copies of the publication to said separation device.

**4,418,837**  
**AUTOMATIC CUP DISPENSING APPARATUS**  
 Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 6, 1981, Ser. No. 280,046  
 Int. Cl.<sup>3</sup> B65H 3/28, 5/22; B65G 59/06  
 U.S. Cl. 221—222

4 Claims



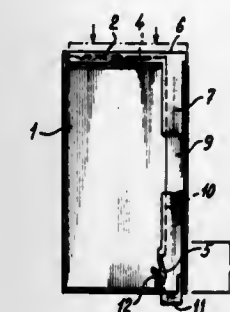
4. An automatic cup dispenser for dispensing cups at high speeds and at predetermined intervals from a stack of cups wherein each cup includes a bottom wall, a side wall and a substantially circular peripheral top rim comprising means for guiding a stack of inverted cups downwardly, a frame about said stack, a plurality of pairs of cylindrical rotors each having an annular shoulder and a helical groove extending from said shoulder for engaging the lip of the lowermost cup in a stack, the helical groove of adjacent rotors extending oppositely, the length of each said groove being such that upon rotation of the rotors in unison, the lip of the lowermost cup is engaged and moved downwardly out of the stack while the remainder of the cups in the stack are held by the rotor shoulders, means for supporting said rotors on said frame in positions such that the upper end of each said rotor engages the lip of the lowermost cup in the stack, said support means comprising a gear case for each rotor and including a shaft, mounting the rotor for rotation thereby, a first gear connected on said shaft, an input shaft, a second gear in mesh with the first gear and connected on said input shaft, each said input shaft being rotatably mounted in said frame, a sprocket connected on said input shaft externally of the gear case, a chain drive member including chain idlers arranged and connected for said chain to engage the sprockets and drive all of them, but alternately in opposite directions of rotation, and a drive motor, one of said input shafts being driveably connected to said motor.

**4,418,838**  
**SINGLE TABLET DISPENSING BOX**  
 Ferenc Gallina, Bötzingen, Fed. Rep. of Germany, assignor to Van Leer Verpackungen GmbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,052  
 Int. Cl.<sup>3</sup> B65H 3/00

U.S. Cl. 221—246

5 Claims



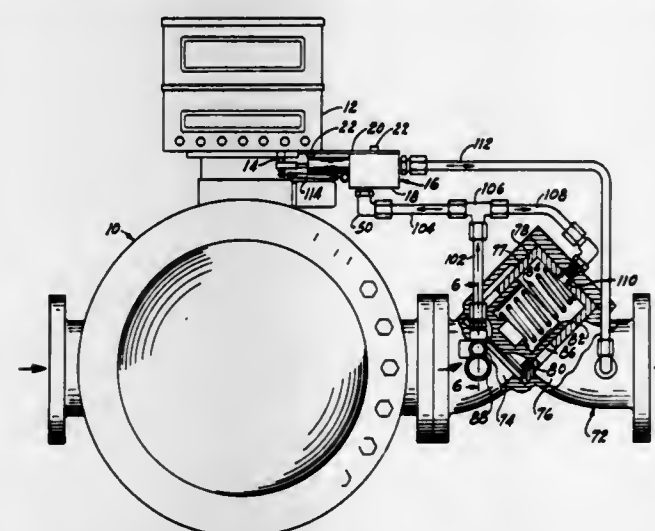
1. A single tablet dispensing box for tablets comprising a flat box-shaped container having side walls, a bottom and a cover and defining a storage space for tablets, an L-shaped sliding element movable against spring pressure along a rectilinear path defined by guiding walls in the container, wherein the short leg of the L-shaped sliding element forms a press surface for operating the element through an opening in a side wall of the container, and wherein the long leg of the L-shaped sliding element extends perpendicular to a flat, main wall of the container and has at its outer end a slanting surface controlling an outlet opening of the container, the space between said leg and said wall forming a collecting trough which is slightly larger than the thickness of a tablet so as to form a row of tablets on said leg, said container and said long leg having cooperating means adjacent the slanting surface which upon movement of the element narrows the space above the slanting surface to a dimension smaller than the dimension of a tablet.

**4,418,839**  
**METER CONTROLLED DISPENSING APPARATUS**  
 Jimmy B. Nichols, Statesboro Township, Bulloch County, Ga., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 29, 1981, Ser. No. 278,891  
 Int. Cl.<sup>3</sup> B67D 5/30

U.S. Cl. 222—14

5 Claims



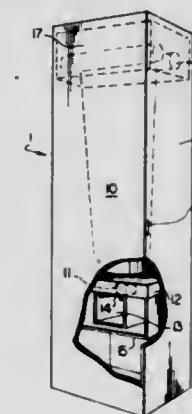
1. In apparatus for dispensing a predetermined quantity of liquid wherein a hydraulically operated main valve has a valve body and a valve element therein which is biased closed when inlet pressure is applied equally to both sides thereof and is moved openward by inlet pressure as the inlet pressure on its downstream side is progressively exhausted downstream of the valve element through a pilot valve operatively connected to a meter actuated preset mechanism; the improvement which consists in providing a pilot valve having a body spaced from

said main valve and rigidly mounted on a casing enclosing said meter actuated preset mechanism, said pilot body having an inlet and an outlet and a single valve element therein operatively connected to said preset mechanism and movable thereby to three discriminate positions i.e., a first closed position in said pilot body in which no inlet pressure applied to the outlet side of said main valve element is exhausted therethrough, a second open position in which sufficient inlet pressure being applied to the outlet side of said main valve element is exhausted therethrough to effect full opening of said main valve element, and a third partially open position in which just sufficient inlet pressure is exhausted therethrough to effect a partial opening of said main valve element, and in connecting the pilot valve body to the body of said main valve body by detachably connected conduits thereby to provide communication between said main and pilot valves.

**4,418,840**  
**AUTOMATIC TOOTHPASTE DISPENSER**  
 David P. Gardner, Sr., Box 1927, Parkville, B.C., Canada V0R 2S0

Filed Feb. 23, 1981, Ser. No. 236,851  
 Int. Cl.<sup>3</sup> B65D 35/28; B65G 27/18  
 U.S. Cl. 222—96

8 Claims



1. A dispenser for automatically dispensing semi-fluid material from a compressible tube having an outlet in the form of an opening, comprising:
- (a) means for holding the tube with the outlet directed downwardly so that gravity urges the contents to move toward the outlet;
- (b) a slidable closure for the opening in the tube;
- (c) agitating means for agitating the tube and semi-fluid contents to induce the contents to flow from the tube outlet when the outlet is open;
- (d) means operable when actuated for withdrawing the slidable closure from the opening and to initiate operation of said agitating means to agitate the tube and contents and thereby effect flow of the contents from the tube;
- (e) the tube holding means (a) comprising a pair of parallel rollers which between them hold the end of the tube opposite end and upon agitation are caused to roll under the influence of gravity down either side of the tube to aid in dispensing the semi-fluid contents of the tube; and
- (f) an opening receiving collar which holds therein the open end of the tube.

**4,418,841**  
**MULTIPLE LAYER FLEXIBLE SHEET STRUCTURE**  
 John P. Eckstein, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Sep. 29, 1981, Ser. No. 306,675  
 Int. Cl.<sup>3</sup> B65D 35/08; B32B 15/08, 27/08

U.S. Cl. 222—107

33 Claims

1. A multiple layer sheet structure wherein the layers are firmly adhered to each other to make a unitary sheet structure

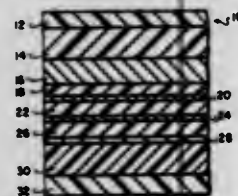


having two exterior surface layers and a plurality of interior layers, the layers comprising, in order:

- (a) a heat sealable polymeric layer on a first one of said exterior surfaces of said structure;
- (b) a first adhesive layer;
- (c) layer of metal foil 0.35 to 2.0 mils thick;
- (d) a second adhesive layer;
- (e) an OPP layer at least 0.65 mil thick; and
- (f) a polyethylene layer;

said second adhesive layer and said polyethylene layer, acting in an adhesive capacity, being effective collectively, to join said OPP layer into the structure with adhesion of at least 54 grams per inch width at each interface with said OPP layer.

20. A flexible dispensing tube made of multiple layer sheet material wherein the layers are firmly adhered to each other to



make a unitary sheet structure having two exterior surface layers and a plurality of interior layers, said sheet structure comprising consecutive layers of, in order:

- (a) a first heat sealable polymer layer on a first exterior surface of the structure;
- (b) a first adhesive layer;
- (c) a metal foil layer 0.35 to 2.0 mils thick;
- (d) a second adhesive layer;
- (e) an OPP layer at least 0.65 mil thick;
- (f) a third adhesive layer;
- (g) a paper layer; and
- (h) a second heat sealable polymer layer on the second exterior surface of the structure, said second and third adhesive layers being effective collectively to join said OPP layer into the structure with adhesion of at least 54 grams per inch at each interface with said OPP layer.

4,418,842

## CHILD RESISTANT CLOSURE

Joseph Di Loreto, Yonkers, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed Mar. 31, 1981, Ser. No. 249,630

Int. Cl.<sup>3</sup> B65D 83/14; B67D 5/32

U.S. Cl. 222-153

5 Claims

1. A child resistant closure for a pressurized aerosol dispenser comprising an actuator cap rotatable with respect to the dispenser container and a collar affixed to the container, the collar having a plurality of circumferentially arranged detents, a blank space having no detents, a shoulder, and a vertical slot associated with a predetermined detent and extending through the shoulder, said cap having a flexible blade arranged to

cooperate with the collar detents to produce clicks as the collar is rotated, said cap having means to abut the shoulder



which means cooperate with the collar slot when aligned with the slot to permit actuation of the dispenser.

4,418,843

## SINGLE-MOUTH SQUEEZE-BOTTLE DISPENSING CONTAINER

Anthony D. Jackman, Weybridge, England, assignor to Bettix Limited, New Malden, England

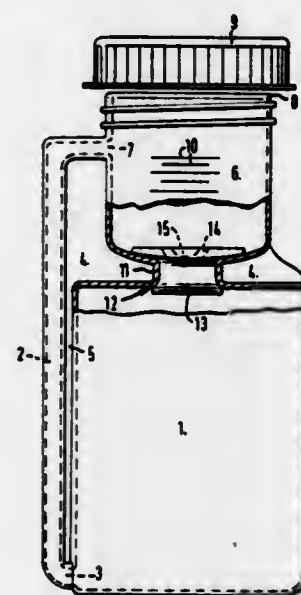
Filed Feb. 23, 1982, Ser. No. 351,461

Claims priority, application United Kingdom, Mar. 2, 1981, 8106546; May 8, 1981, 8114203; May 29, 1981, 8116550

Int. Cl.<sup>3</sup> G01F 11/26, 11/08

U.S. Cl. 222-158

10 Claims



1. A squeeze-bottle liquid-dispensing container having a single mouth and comprising a liquid-holding bottle having a neck defining a throat in alignment with said mouth, a measuring and dispensing receptacle in fluid connection with said mouth, a liquid-transfer duct extending from close to the bottom of the bottle to the receptacle, all moulded as an integral whole from resiliently flexible material, and a plug, insertable through the mouth of the container, completely closing the throat of said neck of the bottle, whereby liquid can be transferred from the bottle through the duct to the receptacle by squeezing the bottle to reduce its volume.

4,418,844

## MOVABLE GRANULATE HOPPER FOR INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

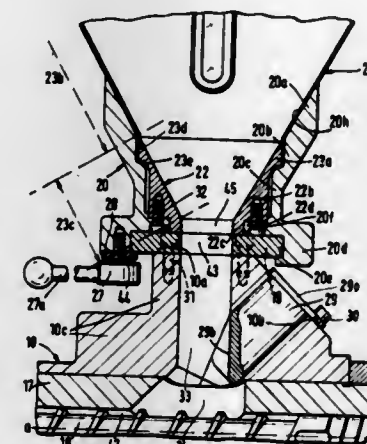
Filed Dec. 9, 1981, Ser. No. 329,067

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046348

Int. Cl.<sup>3</sup> B29F 1/00

U.S. Cl. 222-162

8 Claims



1. A structure supporting a raw material hopper on the injection unit of an injection molding machine, for the gravity feed of granulate raw material from the hopper into the plastification cylinder of the injection unit, the hopper supporting structure comprising in combination:

- a mounting hub on the injection unit having an upwardly facing mounting face and a charge chute in the form of a bore which extends from the mounting face into the plastification cylinder;
- a lower section on the hopper in the form of a truncated sheet metal cone;
- a hopper extension at the lower end of the cone forming an outwardly recessed continuation of the hopper wall;
- a cup-shaped hopper base having on its upper end a supporting collar with a conical inner surface engaging a portion of the outer surface of the lower hopper section just above the hopper extension and, therebelow, a recessed inner surface portion engaging the hopper extension;
- a clamping bell arranged inside the hopper base, the clamping bell having a central opening forming a conical downward continuation of the inner surface of the lower hopper section, the clamping bell including an annular clamping collar which fits against the outwardly recessed wall of the hopper extension;
- means for constraining the clamping bell downwardly against the hopper base so as to clamp the hopper extension between the clamping collar of the clamping bell and the recessed inner surface of the hopper base; and
- means for releasably securing the hopper base on the mounting hub of the injection unit.

4,418,845

## GRANULATE HOPPER FOR HORIZONTALLY AND VERTICALLY INJECTING INJECTION MOLDING MACHINES

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,068

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046387

Int. Cl.<sup>3</sup> B29B 5/02; B67C 9/00

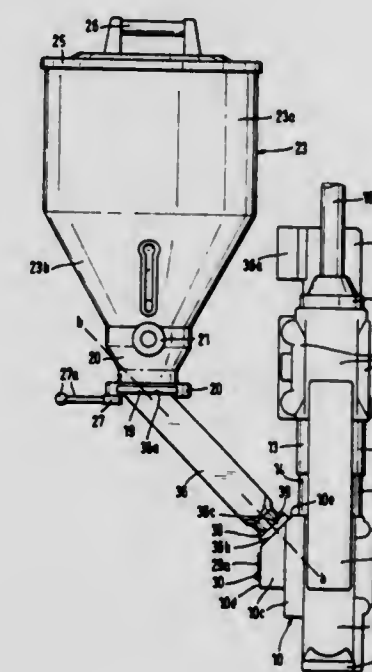
U.S. Cl. 222-162

10 Claims

1. A structure for mounting a raw material hopper on the injection unit of an injection molding machine in such a way that it is possible for the normally horizontally oriented injection unit to be reoriented vertically, for vertical injection, and

for the hopper attachment to be converted from its normal configuration in which the hopper is perpendicular to the horizontal plastification cylinder to a configuration in which the hopper is parallel to the vertical plastification cylinder, for a gravity flow of raw material from the hopper into the plastification cylinder in either orientation, the hopper mounting structure, as seen in the normal orientation, comprising in combination:

- a mounting hub associated with a rearward portion of the plastification cylinder of the injection unit, the mounting hub having an upwardly facing primary mounting face surrounding a vertical primary charge chute in the form of a bore which leads from the primary mounting face into the plastification cylinder, and the mounting hub further having a secondary mounting face arranged to the rear of the primary mounting face and surrounding a secondary charge chute which is inclined rearwardly from the primary charge chute by an acute angle of at least approximately 45 degrees and leads from the secondary mounting face into the plastification cylinder;



a hopper base formation arranged at the discharge end of the hopper by means of which the hopper is attachable to the primary mounting face of the mounting hub, so that the discharge opening of the hopper is connected to the primary charge chute of the mounting hub; and

an adapter post in the form of a straight hollow member, the adapter post having a lower attachment face by which it is attachable to the secondary mounting face of the mounting hub in such a way that its bore forms an inclined adapter chute in communication with the inclined secondary charge chute, the adapter post having an upper attachment face which is inclined to the axis of the adapter post by approximately the same acute angle by which the secondary charge chute is inclined to the primary charge chute, so as to be oriented substantially perpendicularly to the axis of the plastification cylinder, whereby the upper attachment face of the adapter post is capable of serving as a raised horizontal mounting face for the hopper base formation, when the injection unit is reoriented for vertical injection.



4,418,846

**AEROSOL DISPENSING SYSTEM**

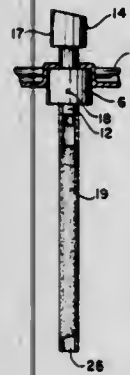
Richard G. S. Pong, Passaic Park; Arun Nandagiri, Dover; Oleh M. Bilynskyj, East Hanover, and Le Roy Hunter, Randolph, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 136,206, Apr. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 84,687, Oct. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 973,261, Dec. 26, 1978, abandoned. This application Dec. 29, 1980, Ser. No. 221,234

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.  
Int. Cl.<sup>3</sup> B67D 5/58

U.S. Cl. 222—189

13 Claims



1. A dispenser adapted to dispense a pressurized aerosol comprising a valve means and a tubular diptube means, said tubular diptube having an open lower end and being (1) in fluid communication with said valve means and (2) formed of a lipophilic material having multidirectional pores randomly distributed throughout at least a substantial portion of its mass, characterized in that said pores permit the passage substantially only of lipophilic liquid therethrough.

4,418,847

**TIP SEALING TILT VALVE STRUCTURE FOR VISCOUS FLOW LIQUIDS**

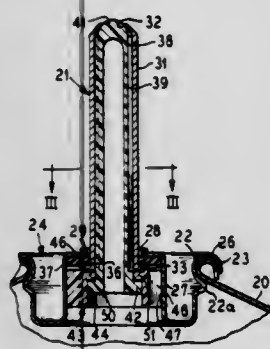
Walter C. Beard, South St., Middlebury, Conn. 06762

Filed Jul. 2, 1982, Ser. No. 394,517

Int. Cl.<sup>3</sup> B65D 83/14

U.S. Cl. 222—402.23

9 Claims



1. A fluid dispensing valve structure for dispensing the contents of a pressurized container comprising:  
a mounting cup member secured to said pressurized container and having communications with the pressurized contents of said container,  
a resilient seal member carried in said mounting cup member, an elongated tubular nozzle means having a dispensing orifice in one end thereof and having a second end supported in said mounting cup member by said resilient seal member in a generally straight upright extended position,  
a moveable valve cup member axially slidably carried within said mounting cup member and normally being biased against said resilient seal member to form a first seal means for the contents of said container, said moveable cup mem-

ber includes a flexible valve stem member extending through said tubular nozzle means and having a tip portion being normally biased in a sealing orientation relative to said dispensing orifice to form a second tip seal means for the contents of said container, and

means to open both said first and said second seal means to dispense the contents of said pressurized container when said elongated tubular nozzle means is tiltably displaced relative to its generally straight upright extended position, thereby concurrently flexing said flexible valve stem member.

4,418,848

**ELECTRICALLY CONTROLLED IN-LINE DISPENSING FAUCET**

John A. Lunau, Pfaffenberger Weg. 270, Bruhler Str. 49-51, D-5650 Solingen, Fed. Rep. of Germany

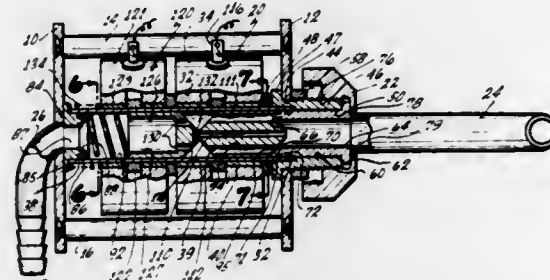
Division of Ser. No. 108,372, Dec. 31, 1979, Pat. No. 4,336,896.

This application Sep. 21, 1981, Ser. No. 304,186

Int. Cl.<sup>3</sup> B67D 3/00; F16K 31/02

U.S. Cl. 222—504

1 Claim



1. In an electrically operated in-line dispensing faucet, in combination, tubular means having an inlet flow tube and outlet flow tube, means forming a valve seat in the tubular means, valve means including at least one valve in the form of a plunger which is reciprocable in the tubular means, said plunger being in the form of a hollow cylinder having a tapered nose part, the nose part having flow channel means formed in it spaced from the central axis of the plunger, and electromagnetic means positioned around the tubular means for producing reciprocating movement of the said plunger means, including a second plunger having a nose part cooperable with the said valve seat and having flow channel means through it, the said nose part of said first mentioned plunger having cooperative engagement with the second plunger, the flow channel means being provided for a flow through the first plunger and then through the second plunger.

4,418,849

**BASEBALL GLOVE FORMER & CARRIER**

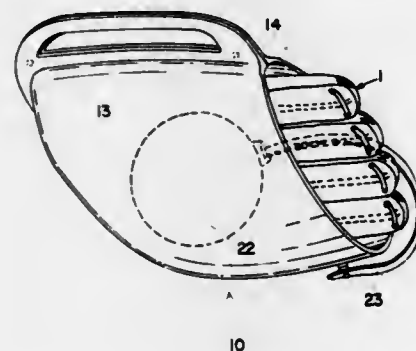
Richard E. Santa, 217 West End Ave., San Rafael, Calif. 94901

Filed Sep. 24, 1981, Ser. No. 305,123

Int. Cl.<sup>3</sup> A41D 1/00; D06C 15/00; A41D 13/10

U.S. Cl. 223—78

6 Claims



1. A former and carrier for baseball glove formed in two sections hinges about a natural crease extending downward

4,418,851

**VEHICLE SPARE TIRE CARRIER**

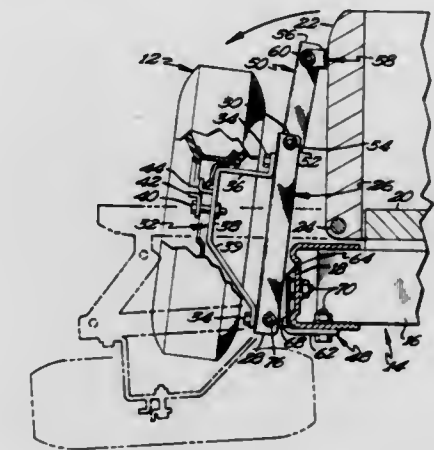
V. Scott Ankeny, Blue Earth, Minn., assignor to Tafco Equipment Company, Blue Earth, Minn.

Filed Nov. 27, 1981, Ser. No. 325,478

Int. Cl.<sup>3</sup> B62D 43/02

U.S. Cl. 224—42.06

12 Claims



from between thumb and forefinger to the heel thereof, said former end carrier comprising:

a clam shell-like, integrally molded, elastic plastic body, having opposing side panels and an intermediate hinge portion; each of said panels being of a size and shape to accommodate one section only of a baseball glove folded about said natural crease with the back of said glove along said natural crease overlying and disposed along said hinge portion; and means forcing said side panels toward each other so that sufficient pressure is applied and maintained upon a glove contained therebetween to preserve the location and integrity of said natural crease.

4,418,850

**PANNIER AND MOUNTING ARRANGEMENT FOR CYCLES**

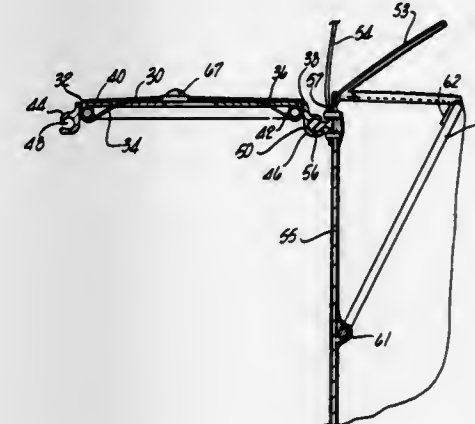
W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich. 48104, and Leslie E. Bohm, 29560 Rutherford, North, Southfield, Mich. 48076

Continuation of Ser. No. 84,400, Oct. 24, 1979, abandoned, Continuation-in-part of Ser. No. 768,467, Feb. 14, 1977, Pat. No. 4,174,795. This application Jan. 15, 1982, Ser. No. 339,273

Int. Cl.<sup>3</sup> B62J 9/00

U.S. Cl. 224—32 A

4 Claims



1. A pannier adapted to be secured to the side of a cycle vehicle, said vehicle including a longitudinally extending fastener on the side thereof for mounting said pannier on said vehicle, comprising:

a generally rectangular bag formed of flexible sheet material, said bag having a top provided with an access opening therein and a plurality of sidewalls, and a flap pivotally joined to one of the sidewalls along a hinge line for selectively covering the access opening;

a substantially rigid panel disposed within said bag and secured to one of the sidewalls of said bag, the upper extremity of said panel being disposed below said hinge line;

a generally U-shaped bar disposed within said bag and having the opposite ends thereof pivotally mounted on one side of said panel at a location spaced below said top of said bag, said bar having an intermediate section secured to another of said sidewalls adjacent said top, said bar extending upwardly and outwardly from said panel whereby to maintain said top of said bag in an extended position, said bar being pivotable toward said panel to hold said top of said bag into a retracted position; and

a longitudinally oriented, elongate slide member secured to the other side of said panel adjacent said top of said bag, said slide member extending laterally from said bag and matingly engaging said slide fastener for suspending said bag on said vehicle, essentially the entire weight of the pannier being distributed along the length of said slide member.

4,418,852

**SPARE WHEEL-TIRE CARRIER**

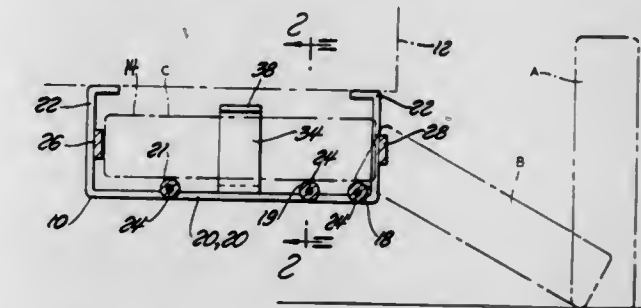
Israel M. Grinwald, Southfield, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 17, 1982, Ser. No. 389,198

Int. Cl.<sup>3</sup> B62D 43/04

U.S. Cl. 224—42.23

1 Claim



1. A carrier for wheel-mounted tires that attaches to the undersurface of a vehicle comprising:

a frame structure that includes two horizontal bars parallel to each other, said bars being widely spaced apart by a distance approximately the same as the diameter of the tire to be supported, an upstanding suspension arm at each end of each bar, means at the upper end of each suspension arm for affixing the carrier to the vehicle; the suspension arms being rigidly affixed to the horizontal bars and to the vehicle so that the defined frame structure is immovable relative to the vehicle;

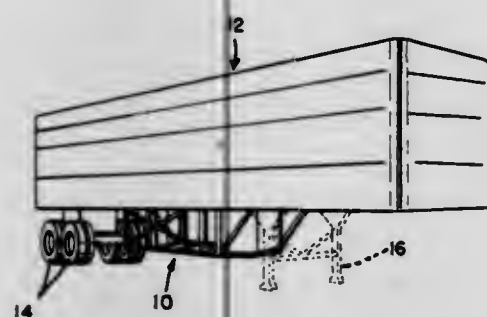
first, second and third circular rods extending transversely



between the horizontal bars, each rod having its ends rigidly to the associated horizontal bars such that the rods act as structural reinforcements for the frame structure; first, second and third roller sleeves freely rotatable encircling respective ones of the rods, the roller sleeves being slightly shorter than the space between the parallel bars, whereby each roller sleeve can slide a limited distance along its rod parallel to the rod axis to accommodate slight off-center positions of a tire; the first roller sleeve being located in close proximity to one set of suspension arms at the outermost ends of the horizontal bars, whereby a mounted tire can be positioned in an inclined attitude resting partly on the ground and partly on the first roller sleeve, after which the mounted tire can be lifted to a horizontal attitude and then moved over the three roller sleeves to a retained position within the space circumscribed by the upstanding suspension arms, said three roller sleeves providing the entire support for a mounted tire inserted into the space above the roller sleeves; the second and third roller sleeves being spaced equal distances from an imaginary transverse line through the geometrical center of the mounted tire when it is supported on the roller sleeves, said second and third roller sleeves being widely spaced from the center of gravity of the supported tire;

two upstanding bars carried by respective ones of the aforementioned horizontal bars, said upstanding bars being located on the aforementioned transverse line through the geometric center of the mounted tire, the upstanding bars being spaced apart a distance slightly greater than the diameter of the tire in its retained position, whereby lateral motion of the tire is prevented; each upstanding bar having an intumed flange at its upper end to closely overlie the tire whereby vertical jarring forces associated with a moving vehicle are prevented from disturbing the tire position.

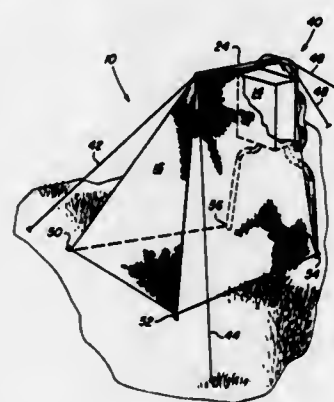
**4,418,853**  
**PALLET CARRIER**  
James D. Shaffer, Mechanicsburg, Pa., assignor to Goodway Transport, Inc., York, Pa.  
Filed Aug. 30, 1982, Ser. No. 412,582  
Int. Cl.<sup>3</sup> B60R 9/00; B62D 25/20  
U.S. Cl. 224—42.41 11 Claims



1. An open frame carrier adapted to be suspended from the bottom of a semi-trailer forward of the rear wheels for transporting pallets or the like, the carrier comprising a support frame having a width approximating the width of the trailer and a plurality of support bars secured to and extending upwardly from the support frame, the bars being arranged in transverse rows across the width of the support frame and each including connection means on the upper end for attaching the bar to the bottom of the trailer, the rows of bars being spaced along the front-to-back length of the support frame to define a plurality of bays opening on both sides of the carrier, the support frame including longitudinally extended outer rails, a center rail located below the outer rails and a plurality of transversely extending support bars joining the outer rails and center rail so that the support bars angle downwardly from the outer rails to the center rail to aid in retaining pallets or the like in the bays, each bay including at least two spaced support bars

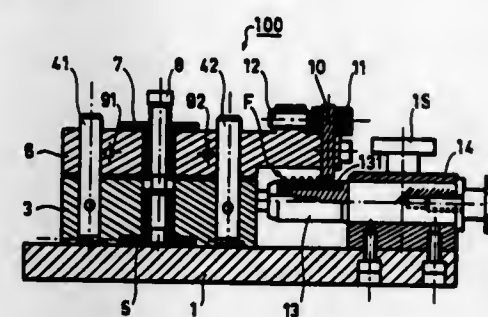
for supporting a plurality of pallets or the like loaded in the bay, means for selectively opening or closing the bays on the lateral sides of the carrier to permit either loading, unloading or retention of pallets or the like into or from the bays, and a first stiffening member secured at a lower end to the support frame and angling upwardly to an upper end adapted to be secured to the bottom of the trailer to stiffen the carrier against front and back movement and a second stiffening member secured at a lower end to the support frame and angling upwardly therefrom across the width of the carrier to an upper end permanently secured to stiffen the carrier against lateral movement.

**4,418,854**  
**BACKPACK SHELTER APPARATUS**  
Joseph Genovese, 156 West Ivanhoe, Chandler, Ariz. 85224  
Filed Nov. 25, 1981, Ser. No. 325,091  
Int. Cl.<sup>3</sup> A45F 4/04  
U.S. Cl. 224—154 9 Claims



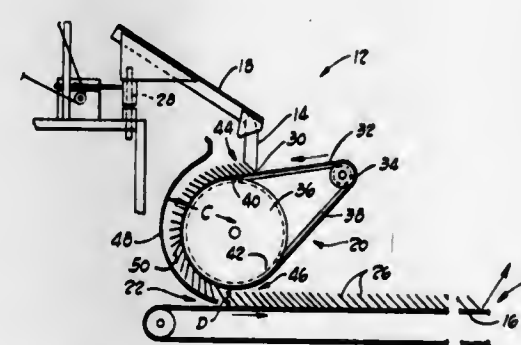
1. A backpack shelter apparatus, comprising:  
foldable shelter means adapted for folding into said backpack for storage;  
a frame having a pair of legs and member means that are foldable about said shelter means when in the folded position for permitting said backpack, frame and shelter means to be mounted on the back of a person and for forming a cantilever with said shelter means adapted for placement over said frame and said cantilever to form an enclosure wherein said backpack remains connected to said frame;  
said pair of legs each including double elbow means operably disposed proximate the midsection of said legs, said double elbow means being operatively rotatable in any rotational direction for forming said pair of legs into a collapsed U-shaped configuration adapted for retainably receiving said folded shelter means therein and said member means being hingedly secured to said pair of legs for closing over the top of said folded shelter means and for extending downwardly between the ends of said legs and substantially parallel thereto for removably retaining said folded shelter means in a portable backpack configuration, said double elbow means being further operative for rotating said pair of legs for forming a pair of elongated extended S-shaped members and said member means folding upward such that said cantilever formed by said member means extends substantially horizontally outward from the plane of the upper portion of said pair of legs and is substantially perpendicular to said plane, said cantilever means and said legs forming a frame over which said unfolded shelter means is supported for forming a tent-like shelter or the like; and  
means for fixedly locating the lower distal end of said pair of legs when in said elongated, extended, S-shaped configuration, on the ground.

**4,418,855**  
**TOOL UNIT FOR COLLECTIVE BREAKING OF OPTICAL FIBRES**  
Dominique Lamarche, and Marie C. Soster, both of Suresnes, France, assignors to SOCAPEX, Suresnes, France  
Filed Jul. 29, 1981, Ser. No. 287,945  
Claims priority, application France, Jul. 31, 1980, 80 16917  
Int. Cl.<sup>3</sup> C03B 37/16  
U.S. Cl. 225—96 12 Claims



1. A tool unit for the collective breaking of optical fibers comprising:  
first means defining a reference plane and a direction of translational motion parallel to the reference plane;  
second means defining a straight bearing line for supporting the optical fibers at the apex of a convex surface, the straight bearing line being parallel to the direction of translational motion;  
third means for placing a cutting-tool above the reference plane while permitting translational movement of said tool along a straight line parallel to the bearing line so that the cutting portion of the tool is consequently capable of scoring all the fibers which are located on the straight bearing line; wherein  
said first means includes a platform rigidly fixed to a translational-motion guide strip having one face parallel to said translational-motion line; wherein  
said second means includes at least one clamping means for clamping the fibers in a plane containing the bearing line; and wherein  
said third means includes a cutting-tool support means for supporting said cutting tool and for permitting sliding movement thereof along said guide strip, and fine adjustment means for establishing the optimum height of the cutting-tool above said reference plane.

**4,418,856**  
**APPARATUS FOR PLAINTING TOW ONTO A CONVEYOR**  
Kurudamannil A. George, Philadelphia, Pa., assignor to Proctor & Schwartz, Inc., Horsham, Pa.  
Filed Jan. 14, 1980, Ser. No. 111,544  
Int. Cl.<sup>3</sup> B65H 17/42  
U.S. Cl. 226—118 6 Claims

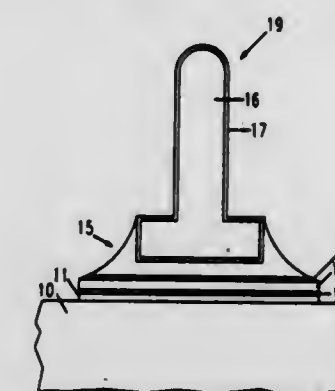


1. An inverting tow plaiter for handling at least one continuous length of tow and for depositing said tow onto a receiving end of a main conveyor, in such orientation as to permit trouble-free removal of said tow from an opposite discharge end of

said main conveyor, the combination with said main conveyor comprising

(a) means defining an elongated transversely extending upper tow receiving area and an elongated transversely extending lower tow discharge area, said discharge area being substantially contiguous with said main conveyor receiving end;  
(b) a continuously moving roughened surface defined by a rough belt running on a cylindrical drum and extending along a semi-circular path between said tow receiving area and said tow discharge area;  
(c) means for laying down tow in said tow receiving area in overlying laps extending back and forth in an axial direction relative to said drum on said roughened surface, said roughened surface having an axial length sufficient to accommodate the tow laps;  
(d) a generally semi-circular housing having an axis parallel to and generally in the same vertical plane as the axis of said drum, said housing axis being located above the axis of said drum, said housing being spaced from said roughened surface and generally axially coextensive therewith, and extending from at least near said tow receiving area to said tow discharge area, whereby said housing defines with the roughened surface a curved chute of continuously narrowing cross-section having a wider gap in the tow receiving area than in the tow discharge area, the radial gap in the tow discharge area being at least one third the tow average width but sufficiently small to maintain contact of the tow with the roughened surface to said discharge area;  
(e) said roughened surface having a speed of rotation approximately the same as the main conveyor;  
(f) said laps inverting in orientation by rotation about a longitudinal marginal edge of said tow in passage in said curved chute between the receiving area and the tow discharge area.

**4,418,857**  
**HIGH MELTING POINT PROCESS FOR AU:SN:80:20 BRAZING ALLOY FOR CHIP CARRIERS**  
Norman G. Ainslie, Croton-on-Hudson, N.Y.; James E. Krzanowski, Watertown, Mass., and Paul H. Palmateer, Wappingers Falls, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.  
Filed Dec. 31, 1980, Ser. No. 221,606  
Int. Cl.<sup>3</sup> B23K 31/02  
U.S. Cl. 228—124 18 Claims



1. In a process of brazing metallic elements to a substrate in a thin film electronic circuit package wherein said substrate carries said metallic elements and solder connections supporting a plurality of chips on said substrate, with the metallic elements brazed to said substrate by means of a gold tin brazing solder, the improvement comprising providing a source of a Group IB metal and a thin film source of a Group VIII metal within a thickness of up to about 1.25  $\mu$ m thick coating said Group IB metal, said Group VIII metal being adjacent to said gold tin solder, said Group IB metal, said Group VIII metal in combination with said brazing solder coming into contact with

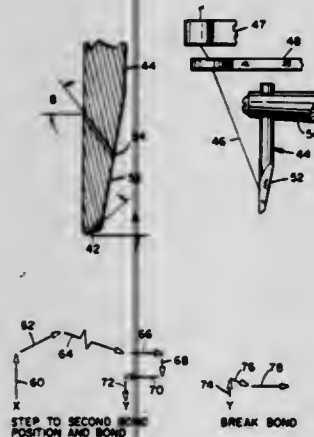


said metallic elements during brazing, whereby the melting temperature of said brazing solder is raised substantially during brazing to a value above the melting temperature of said solder connections.

**4,418,858**  
**DEEP BONDING METHODS AND APPARATUS**  
 C. Fredrick Miller, 2165 N. Glassell, Orange, Calif. 92665  
 Filed Jan. 23, 1981, Ser. No. 227,806  
 Int. Cl.<sup>3</sup> H01L 21/90

U.S. Cl. 228—159

10 Claims



1. A deep bonding tool for use in a sonic, wire bonding machine, said tool comprising:
  - a body including a shank section;
  - a tapered section extending from the shank section to an end which is smaller in cross-sectional area than the shank section;
  - said end being formed with a first anvil-shaped end portion extending beyond a second end portion;
  - a wire feed hole of size to accommodate a bonding wire and extending from a first opening at said end of the body between said first anvil-shaped end portion and said second end portion to a second opening at the side of said body in said tapered section; and
  - wire bow preventing means for cooperation with said feed hole to prevent lateral bowing of the wire at the side of the feed hole toward said shank when the wire is forced in the direction toward said feed hole, said bow preventing means being formed as a passage of size to accommodate the bonding wire and extending through the shank of the tool and an opening at the juncture of said tapered section and said shank section.
7. In a wire bonding process conducted with a sonic bonding tool having an anvil end and a feed hole for a bonding wire which extends through the feed hole and emerges at the anvil end of the tool and in which the wire is to be broken, after being bonded to a second circuit point, the step of breaking the wire adjacent said second point by:
  - pulling out a length of wire sufficient to underlie said anvil end and bending the end of the wire under the anvil end by raising the tool vertically from the second bond point while permitting the tool to move over the wire relative to the wire on said feed hole;
  - thereafter moving the tool downwardly and away from and not toward the second circuit point; and
  - thereafter moving the tool away from said second circuit point while holding the wire against motion relative to the tool at said feed hole.

**4,418,859**  
**METHOD OF MAKING APPARATUS FOR THE EXCHANGE OF HEAT USING ZIRCONIUM STABILIZED FERRITIC STAINLESS STEELS**  
 Thomas M. Devine, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
 Continuation of Ser. No. 268,458, May 29, 1981, abandoned.  
 This application Sep. 30, 1982, Ser. No. 429,750  
 Int. Cl.<sup>3</sup> B23K 31/06; C22C 38/28

U.S. Cl. 228—183

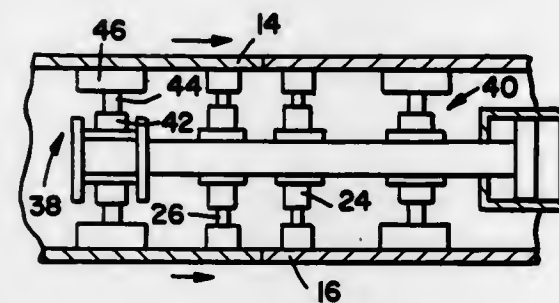
3 Claims

1. In the method for making an apparatus for the exchange of heat in which a plurality of thin walled tubular metal members are formed, finned and welded to tube sheets in an array with gaps between said members, the improvement of using as the metal for the walls of said members a zirconium stabilized corrosion resistant ferritic stainless steel consisting essentially of, in weight percent:
  - Carbon=0.025% max
  - Nitrogen=0.025% max
  - Carbon+Nitrogen=0.045% max
  - Silicon=1.0% max
  - Manganese=1.0% max
  - Phosphorous=0.04% max
  - Sulfur=0.03% max
  - Chromium=18-20%
  - Molybdenum=1.75-2.25%
  - (Zirconium/Carbon)  $\geq 18$
 the balance being iron and incidental impurities.

**4,418,860**  
**CLAMPING METHOD AND APPARATUS FOR SOLID PHASE WELDING**  
 Jean LaForce, Inverness, Calif., assignor to Carl Stringer, Pearl; Stringer Oil and Gas Company, Inc., San Angelo and Carl T. Stringer, Houston, all of, Tex.  
 Filed Jun. 29, 1981, Ser. No. 278,488  
 Int. Cl.<sup>3</sup> B23K 37/04

U.S. Cl. 228—196

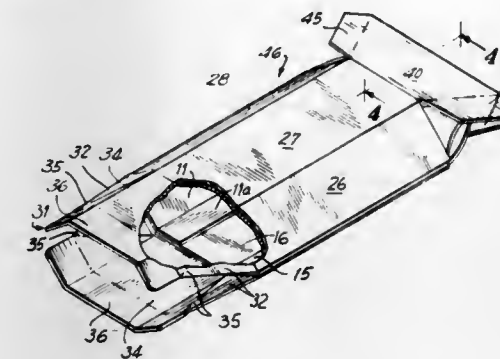
7 Claims



1. A method of solid phase welding adjacent ends of axially aligned pipes which include placing the ends of two pipes into substantially axial alignment and into adjacent relationship, placing within each pipe substantially immediately adjacent its end a first plurality of circumferentially spaced pipe bore engaging pads secured to a first set of radially extensible elements, effecting radial outward pressure on said elements causing said first pads to exert like pressure on said pipe adjacent its end and causing such end to assume a circular configuration, said first pads having a first dimension extending axially of said pipe, placing a second set of radially extensible elements axially inwardly of said first set adjacent the wall of each pipe, said second set of elements having pipe engaging pads secured to said second set of radially extensible elements, with said second pads having a second dimension extending axially of said pipe substantially greater than said first dimension, effecting radial pressure on said second elements causing said second pads to clamp the wall of its associated pipe, and then moving at least one group of said second elements axially inwardly and towards the other group of said second elements to bring said pipe ends into forcible engagement.

**4,418,861**  
**HEXAGONAL CONTAINER**  
 William W. McFarland, Georgetown, and Baxter Beavers, Pawley's Island, both of S.C., assignors to International Paper Company, New York, N.Y.  
 Filed Feb. 23, 1982, Ser. No. 351,395  
 Int. Cl.<sup>3</sup> B65D 13/00, 5/32  
 U.S. Cl. 229—23 A

6 Claims



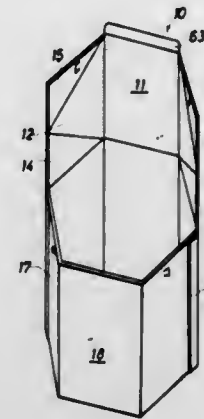
1. A hexagonal paperboard container, which comprises:
  - (a) a one-piece, upstanding, generally tubular, reinforcing member consisting of six, foldably connected, substantially rectangular, upstanding, reinforcing panels;
  - (b) a one-piece body member having two sets of three, substantially rectangular, foldably connected, upstanding side wall panels and a bottom wall foldably connected along its opposite sides to the central side wall panel of each set of side wall panels;
  - (c) the sets of side wall panels being located on opposite sides of the tubular reinforcing member and the side wall panels being bonded to the reinforcing panels;
  - (d) two of said reinforcing panels which are bonded to the central side wall panels having abutting major flaps foldably connected thereto at the bottom edges thereof;
  - (e) the four remaining reinforcing panels having minor flaps foldably connected thereto at the bottom edges thereof;
  - (f) said major and minor flaps extending substantially horizontally and interengaging and fitting together non-overlappingly to form an integral, coplanar, unsecured bottom wall for the reinforcing member which lies above and completely covers the bottom wall of the body member whereby a double-thickness container bottom wall is formed.

**4,418,862**  
**HEXAGONAL BOX**  
 Steen Vesborg, Copenhagen, Denmark, assignor to Colgate-Palmolive Company, New York, N.Y.  
 PCT No. PCT/DK80/00079, § 371 Date Jul. 20, 1981, § 102(e)  
 Date Jul. 20, 1981, PCT Pub. No. WO81/01694, PCT Pub. Date Jun. 25, 1981  
 PCT Filed Dec. 5, 1980, Ser. No. 285,130  
 Claims priority, application Denmark, Dec. 7, 1979, 5215/79  
 Int. Cl.<sup>3</sup> B65D 5/08, 5/36  
 U.S. Cl. 229—41 C

6 Claims

1. A cut and scored blank suitable for producing a hexagonal box comprising
  - a first side wall section having three rectangular panels articulated in succession by parallel fold lines,
  - a second side wall section having three rectangular panels articulated in succession by parallel fold lines,
  - a top cover section having a central rectangular flap and two rectangular side flaps articulated in extension from said first side wall section on the first parallel fold lines over a fold line perpendicular to the first parallel fold lines, the rectangular side flaps being scored to enable folding each of the side flaps to form one larger triangular area and two smaller triangular areas,

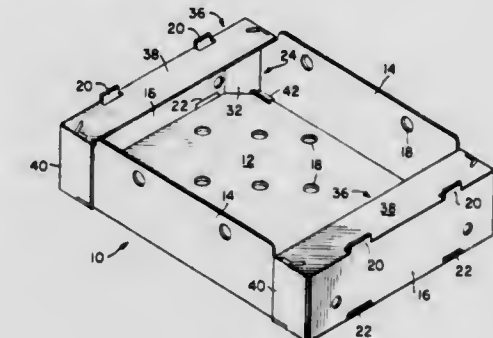
such that, upon folding of the blank to form a hexagonal box, the distal end of the central rectangular flap is in abutment with



the free end of the center rectangular panel of the second side wall section.

**4,418,863**  
**PRODUCE TRAY WITH REINFORCED CORNER CONSTRUCTION**  
 Melvin D. Kimbrell, Sr., deceased, late of Burlingame, Calif. (by Melvin D. Kimbrell Jr., executor), assignor to Georgia-Pacific Corporation, Portland, Oreg.  
 Filed Sep. 2, 1982, Ser. No. 414,496  
 Int. Cl.<sup>3</sup> B65D 5/22, 5/26  
 U.S. Cl. 229—49

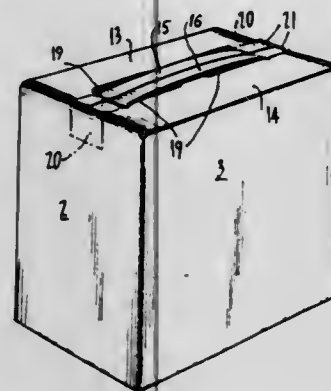
7 Claims



1. A rectangular tray suitable for produce such as cauliflower and the like comprising:
  - a panel blank providing pairs of opposed side and end walls hingedly connected to and extending upwardly from the edges of a bottom wall to substantially define the dimensions of said tray;
  - a corner flap extending longitudinally from a first of said side walls, said flap being folded into a columnar configuration at the end of said side wall;
  - a top flap extending upwardly from one of said end walls that adjoins said first side wall, said top flap being folded down to provide a partial top wall overlying said columnar configuration;
  - a locking flap extending longitudinally from said top flap and having a holding tab on an edge thereof, said locking flap being folded down to lie along the outside of said first side wall;
  - a slot formed on said panel blank with said holding tab being engaged in said slot to maintain said walls in the tray configuration; and
  - retaining means cooperating with said corner flap to retain said columnar configuration disposed between said bottom wall and said partial top wall, the free edge of said corner flap being notched to accommodate said holding tab.

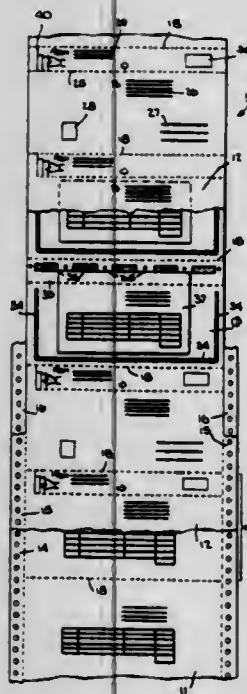


**4,418,864**  
**CARTON WITH HANDLE**  
 John C. Nielsen, St. Clair, Australia, assignor to Visymonde Investment PTE Ltd., Singapore, Japan  
 Filed Sep. 24, 1982, Ser. No. 423,470  
 Claims priority, application Australia, Dec. 21, 1981, PF2026  
 Int. Cl.<sup>3</sup> B65D 5/46, 25/28  
 U.S. Cl. 229—52 B 9 Claims



1. A carton having side walls and end closing flaps, said carton including at one end a pair of inner closing flaps and a pair of outer covering flaps, said outer covering flaps having their edges in substantially abutting relationship along a line extending substantially across the middle of the carton, said outer flaps each having portions adjacent their free edges which are at least substantially separable from said flaps, and a strip of reinforcing tape overlying said portions of said outer flaps and secured to the side walls of said carton to define with said portions a carrying handle for said carton.

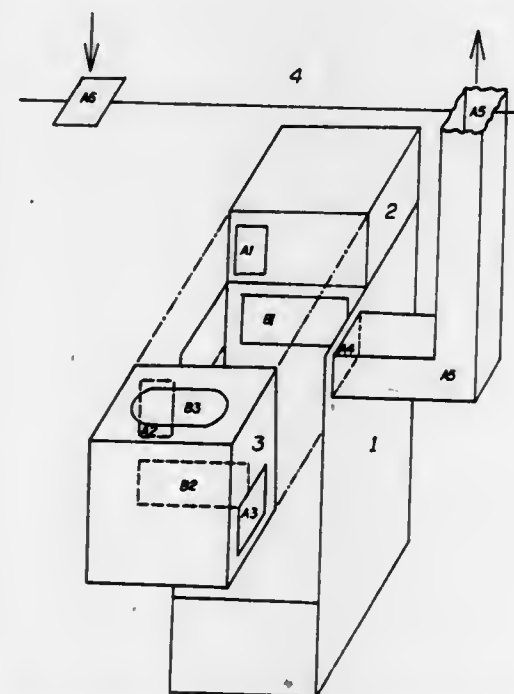
**4,418,865**  
**CONTINUOUS MAILER ASSEMBLY**  
 Charles G. Bowen, Patterson, N.Y., assignor to Transkrit Corporation, Elmsford, N.Y.  
 Filed Aug. 5, 1981, Ser. No. 290,318  
 Int. Cl.<sup>3</sup> B65D 27/10  
 U.S. Cl. 229—69 17 Claims



1. A mailer consisting of a front ply for receiving information thereon, said front ply including a body portion having a designated address area thereon and a removable tab portion adjacent said body portion; a back ply peripherally secured to said front ply with a U-pattern of adhesive inserted after "front ply"; to define a first enclosed pocket therewith, said back ply having a

main portion secured to said body portion of said front ply to define a return mail pocket therewith, and a flap portion underlying said tab portion for folding over onto said body portion after removal of said tab portion; at least one insert message ply within said first pocket and within, and free of attachment to, said U-pattern of adhesive and extending outwardly of said first pocket to be between said tab portion and said first portion; releasable glue spots releasably securing said tab portion to said flap portion; and adhesive means on said flap portion for sealing against said body portion.

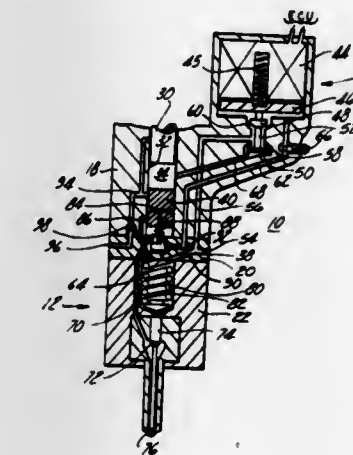
**4,418,866**  
**HEAT RECOVERY**  
 Theodore W. Workman, P.O. Box 828, Parsons, Kans. 67357  
 Continuation-in-part of Ser. No. 158,527, Jun. 11, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 312,544  
 Int. Cl.<sup>3</sup> F24B 7/00  
 U.S. Cl. 237—55 3 Claims



1. In a room space heating method wherein air is cyclically blown from an initial position into and through a furnace heating zone and thence passing as heated air along a heated air path to enter a room space, with air from the room space passing along a return path to the initial position, and wherein air is heated in the furnace heating zone by heat exchange with a furnace combustion zone with combustion products produced in the latter being vented to atmosphere along a flue gas path, the improvement comprising diverting a portion only of the heated air passing along the heated air path to pass along a separate auxiliary heated air path to enter a room space, and effecting a heat exchange between combustion products traveling along the flue gas path with diverted heated air traveling along the auxiliary path, whereby a portion of the furnace heated air is diverted from passing to the room space to pass in heat exchange relation with hot combustion products for additional heating prior to entering a room space, wherein the separate auxiliary heated air path comprises a secondary heat exchanger at an upper side part of said furnace, wherein said furnace includes a base portion (2) at the top thereof having an opening (A1) in a side wall, said furnace further including a secondary heat exchanger (3) having an opening (A2) in a side wall to receive air from said base portion, said furnace having a flue gas outlet (B1) in a side wall thereof to receive flue gas from a primary heat exchanger, said secondary heat exchanger further including an opening to receive flue gas (B2) in a side wall thereof and an opening to exit flue gas in a top wall (B3) thereof, said secondary heat exchanger further including an

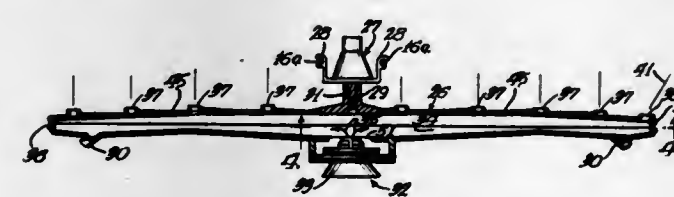
opening (A3) in a side wall thereof wherein heated air is supplied to a supply run (A5), wherein the heated air and the auxiliary heated air paths direct heated air entry into the room space at positions remote from each other.

**4,418,867**  
**ELECTRICALLY CONTROLLED UNIT INJECTOR**  
 Albert E. Sisson, Farmington Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.  
 Filed Apr. 2, 1982, Ser. No. 364,813  
 Int. Cl.<sup>3</sup> F02M 47/02  
 U.S. Cl. 239—88 12 Claims



1. An integer for controlling the flow of fuel from a source to an internal combustion engine having a body having a bore formed therein, a primary plunger actuated in response to engine rotation and a metering plunger, means for reciprocating said primary plunger; a timing chamber formed between the primary plunger and said metering plunger, a metering chamber partially defined by said metering plunger; said injector comprising: a three way valve means for controlling the flow of fuel to said timing and metering chambers comprising a first valve means for controlling fuel flow to the timing chamber, and a second valve means controlling fuel flow to the metering chamber, said first valve means being in one position to admit fuel to said timing chamber and in a second position to seal said timing chamber, said second valve means being in a first position to permit the flow of fuel to said metering chamber and being in a second position to shut off the flow of fuel to said metering chamber.

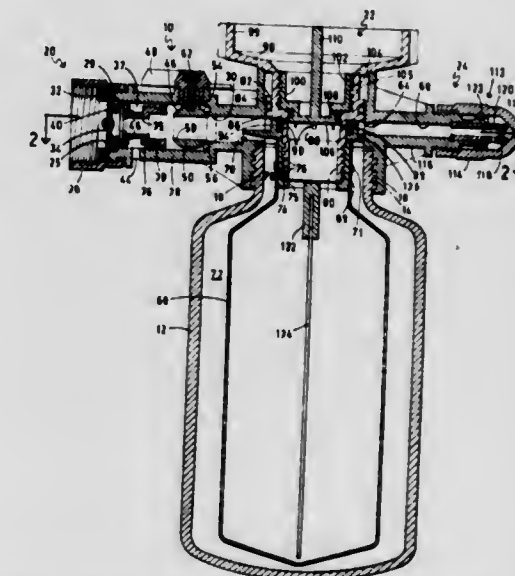
**4,418,868**  
**DISHWASHER UPPER SPRAY ARM**  
 Vincent P. Gurubatham, St. Joseph, and James G. Ruspino, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.  
 Filed May 29, 1981, Ser. No. 268,290  
 Int. Cl.<sup>3</sup> B05B 3/00, 3/02  
 U.S. Cl. 239—228 8 Claims



1. A rotary spray means for an article washing apparatus comprising: an elongated hollow interior structure having a central axis of rotation and a plurality of arms extending from said axis, said arms having a hollow interior constricting from adjacent said central axis to an outer end of each arm, and each arm having an upper portion; entrance passage means to said hollow interior coinciding with

said axis of rotation for receiving a pressurized stream of liquid; a plurality of nozzles spaced from said axis of rotation along said upper portion of each said arm, each nozzle extending transversely to the direction of elongation of said arms and having an entrance end opening to said hollow interior, and an exit end, said entrance end having a cross sectional dimension transversely to the longitudinal extent of said arms less than the transverse width of the arms thereat; and a plurality of liquid supply ramp means each leading from the said hollow interior to the inner entrance end of a corresponding one of a plurality of said nozzles, each said ramp means comprising a groove in said arm upper portions and having a width substantially equal to the cross-sectional dimension of the nozzle entrance end, said groove being angled outwardly from said hollow interior and extending to and through one side of said entrance end of said one nozzle, and the opposite side of said one nozzle forming a solid wall angled thereto so as to redirect the liquid from said groove outwardly through said one nozzle.

**4,418,869**  
**HOSE MOUNTED FLUID MIXING SPRAYER**  
 James W. Healy, 54 Plymouth Rd., Wakefield, Mass. 01880  
 Continuation-in-part of Ser. No. 78,246, Sep. 24, 1979, abandoned. This application Jan. 15, 1981, Ser. No. 225,208  
 Int. Cl.<sup>3</sup> B05B 7/30  
 U.S. Cl. 239—317 2 Claims



1. A sprayer having means for attaching it to the neck of a bottle comprising a hollow body defining a water inlet passage for connection to a water supply under line pressure, a rectilinear mixing passage and an outlet passage from said mixing passage to a nozzle, adjustable metering means adjacent and in communication with said mixing passage, said metering means comprising an apertured ring integral with a sub-assembly insertable within said hollow body and having a series of metering apertures of predetermined size, said sub-assembly being provided with means for manually rotating said sub-assembly to place a desired metering aperture in communication with said mixing passage, a bladder located below and in communication with said metering means for containing an additive to be metered into the water stream in said mixing passage through said metering means, said bladder being adapted to be inserted within said bottle when said sprayer is attached thereto so as to define with the interior surface of said bottle an enclosed space, means for supplying water under line pressure from said inlet passage to said enclosed space, and



means for reducing the pressure within said body and said enclosed space to that of the atmosphere when said water supply is turned off and for restoring to and maintaining said pressure at line pressure when said water supply is turned on,

said means for manually rotating said sub-assembly comprising a funnel shaped portion of said sub-assembly extending upwardly from said apertured ring and above said hollow body and including removable closure means in the bottom of said funnel shaped portion for closing and opening the mouth of said bladder permitting, when removed, the filling of said bladder with a desired additive without disconnecting said sprayer from said bottle.

4,418,870

## FUEL INJECTION NOZZLES

Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries plc, Birmingham, England

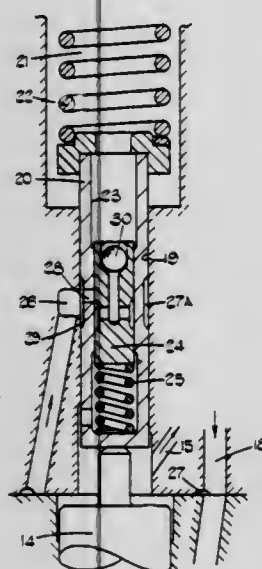
Filed Jun. 18, 1982, Ser. No. 390,040

Claims priority, application United Kingdom, Jul. 9, 1981, 8121231

Int. Cl.<sup>3</sup> F02M 47/00

U.S. Cl. 239—533.8

4 Claims



1. A fuel injection nozzle comprising a fluid pressure operable valve member slidable within a bore, a seating located at one end of the bore, the valve member being shaped for cooperation with said seating to prevent fuel flow from an inlet to an outlet, resilient means biasing the valve member into contact with the seating, a chamber, a valve means through which fuel under pressure can flow to said chamber, a surface in said chamber, the fuel pressure in said chamber acting on said surface to create a force which assists the action of said resilient means, said surface being defined upon a piston member which engages said valve member, said valve means including a bore formed in the piston member, one end of the bore being open to said chamber and the other end of the bore communicating with a drain, a valve element slidable in the bore, a spring biasing the valve element towards said one end of the bore whereby the position of the valve element within the bore will be dependent upon the pressure in said chamber, passage means defined by the piston and valve element, said passage means connecting said inlet with said chamber, the flow of fuel through said passage means into said chamber being prevented when the pressure of fuel in the chamber attains a predetermined value, and a non-return valve in said passage means, said non-return valve acting to prevent fuel flow through said passage means from the chamber.

4,418,871  
METHOD AND APPARATUS FOR REDUCING AND CLASSIFYING MINERAL CRYSTALLINE AND BRITTLE NONCRYSTALLINE MATERIAL

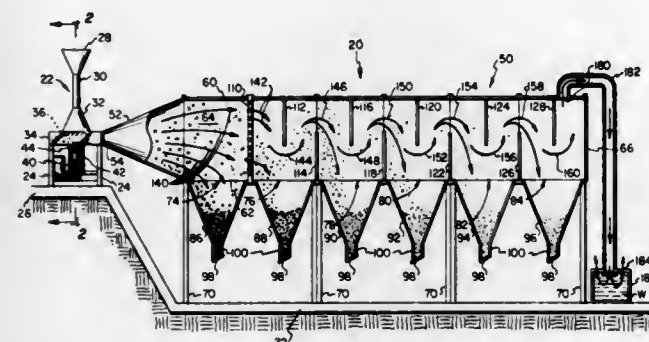
Stuart A. Powell, Englewood, Colo., assignor to P.V. Machining, Inc., Santa Fe, N. Mex.

Filed Jul. 15, 1981, Ser. No. 283,746

Int. Cl.<sup>3</sup> B02C 23/08

U.S. Cl. 241—1

27 Claims



1. A method of classifying crystalline material comprising: reducing said crystalline material to a predetermined size by using a centrifugal type turbine to draw said material through an expansion cone such that a standing shock wave is set up in the expansion cone resulting in attrition grinding of the material, directing said reduced material along a course through a classifier unit having a plurality of baffles extending alternately from the bottom and from the top of said unit into the body of the unit, thereby defining a plurality of vertical motion reverses through the unit, and collecting the material which falls from the course at each vertical reverse, thereby classifying said material.

4,418,872

## FEEDER/CRUSHER MACHINE

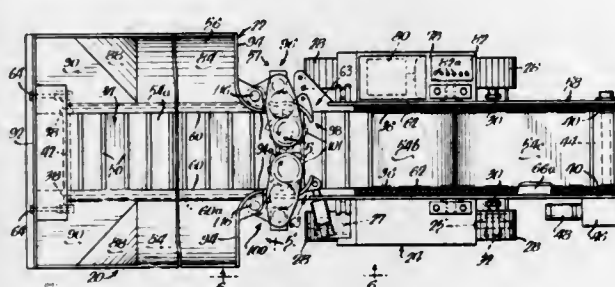
Robert C. Nelson, Bluefield, W. Va., assignor to Baker Mine Services, Inc., Glen Lyn, Va.

Continuation of Ser. No. 55,684, Jul. 6, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,413

Int. Cl.<sup>3</sup> B02C 13/20

U.S. Cl. 241—187

6 Claims



1. A feeder/crusher machine for use in underground mines comprising: an elongated body with horizontally spaced receiving and discharge sections at opposite ends and a crushing section intermediate the receiving and discharge sections; conveying means having a carrying run directly, horizontally movable from the receiving section through the crushing and discharge sections; the receiving section having non-apertured floor portions including portions disposed outwardly of each side of the conveying means and upstanding sideboards along the outer edges thereof thereby functioning as a surge bin with the conveying run moving directly along the floor thereof, said receiving section having transverse vertical walls at the outlet end of the receiving section extending inwardly from the sideboards toward the conveying

means to define a restricted outlet regulating the flow of material into the crushing section; the crushing section having side walls with gaps therein and arms extending through said gaps; a pair of breaker drums having peripheral breaker elements supported on said arms adjacent opposite sides of said crushing section immediately above and adjacent to said carrying run and continuously rotatable about spaced vertical axes in a direction to move coal or mineral material on the receiving sides of said drums toward the center of the crushing section, said drums being spaced apart to provide a nip space at the center of the crushing section between said peripheral breaker elements on the respective drums for coal or mineral material to be seized by said breaker elements and crushed into lumps determined by the size of the nip space by horizontal forces reacting solely between the drums and not against the conveyor means carrying run; guide plates supported on said arms externally of the breaker drums and located in said gaps to prevent loss of material from the crushing section; said breaker drums being sufficiently closely adjacent to the respective sides of the crushing section and to the carrying run to limit movement of material by the conveying means past the breaker drums only through the nip space, the movement of the breaker elements in the nip space being in the same direction as the carrying run; power means for rotating said drums simultaneously to move the breaking elements on the nip sides of the drums in the direction of movement of the carrying run to move material from the receiving section through the nip space into the discharge section; and the portion of said conveying means in said receiving section being at a level closely adjacent the ground to maximize the volume of the receiving section for use as a surge bin, the portion of said conveying means in said discharge section being at a level substantially elevated above the ground so it can readily overhang a discharge point, and the intermediate portion of said conveyor means in said crushing section being inclined in a direction ascending from the level in the receiving section to the level in the discharge section.

4,418,873

## CUTTING CYLINDER HAVING KNIFE POSITION ADJUSTMENT

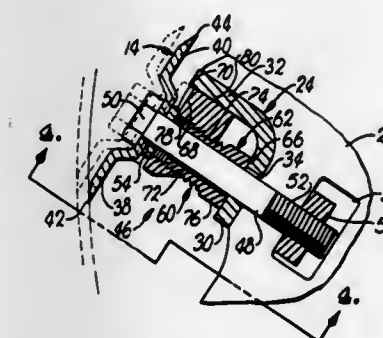
Bruce L. Lutz, Hesston; Harold W. Voth, Newton, and Amos G. Hill, Hesston, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 3, 1981, Ser. No. 326,844

Int. Cl.<sup>3</sup> B02C 18/18

U.S. Cl. 241—294

8 Claims



1. In a rotary cutter for reducing crop material into segments, the improvement comprising: a generally flat knife having a longitudinal cutting edge; a rotary support for the knife; and means mounting said knife on the support with said cutting edge leading with respect to the direction of rotation of the support, said mounting means including structure rendering the knife adjustably shiftable in a direction substantially normal to

the flat plane of the knife for selective repositioning of said cutting edge with respect to the axis of rotation of the cutter, said structure including a releasable retainer holding said knife on the support, and a shifter operably coupled with the knife for effecting said adjustable shifting of the knife when said retainer is released, said shifter including a pair of interengaged relatively expandable and retractable components positioned between said knife and the support, said components being threadably interengaged whereby relative rotation between the same produces said expansion or retraction of the shifter, each of said components being provided with a bore there-through which is coaxially aligned with the bore of the other component, said retainer including an elongated, threaded member passing through said bores and through said knife, said member having an enlargement at the outer end thereof and a matingly threaded element at the inner end thereof engageable with said support and operable to cause said enlargement to be drawn tightly against said knife when the member and the element are relatively rotated in a certain direction.

4,418,874

## METHOD AND APPARATUS FOR STORING A LENGTH OF WEB

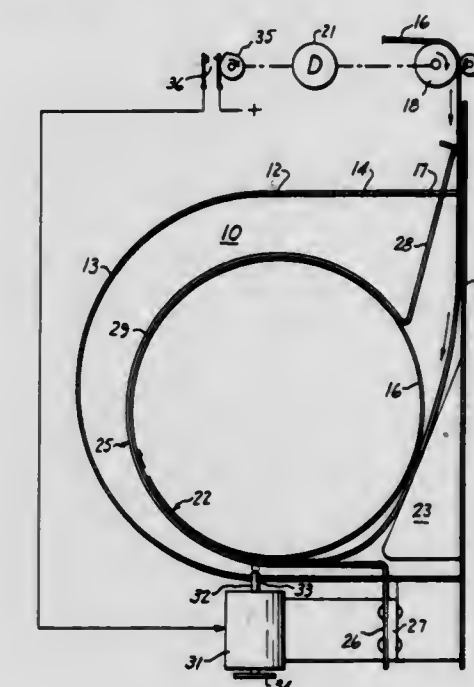
Bayani E. Roldan, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sep. 16, 1981, Ser. No. 302,872

Int. Cl.<sup>3</sup> B65H 27/00

U.S. Cl. 242—76

15 Claims



4. In apparatus for storing a length of web, the improvement comprising in combination: means for receiving said web in a hollow space and for promptly said web into a coiled form, whereby adhesion tends to develop between turns of said web in the coiled form, effectively limiting attainable minimum web coil diameter; means for breaking up said adhesion at least intermittently; and means for pushing said length of web into said receiving means to form a coil of said web having a minimum diameter smaller than said limited diameter, including means for imposing on said length of web a curl assisting coiling thereof.



4,418,875

## THREADING TOOL

Terence J. Brine, Haslemere, England, assignor to Roadrunner Electronic Products Limited, Surrey, England

Filed Sep. 28, 1981, Ser. No. 306,470

Claims priority, application United Kingdom, Sep. 30, 1980, 8031522

Int. Cl.<sup>3</sup> H01B 13/00; B21F 15/00; B65H 49/00

U.S. Cl. 242—7.06

6 Claims



1. A threading tool for dispensing filament material comprising an elongate body, an internal passageway extending the length of the elongate body for guiding filament material between one end of the body and the other end of the body, a dispensing nozzle at the other end of the body, the dispensing nozzle having a chamfer forming a cutting edge for the filament material, a spool for holding a supply of filament material, the spool having a pair of side discs, first means rotatably mounting said spool at said one end of the body and a manually operable brake member extending the major part of the length of the body and having a braking portion at said one end of the body and a finger pad at said other end, and second means mounting said member for movement relative to said body from a first position in which said braking portion is out of engagement with said spool to a second position in which said braking portion frictionally engages edges of said side discs of said spool to restrain rotation of said spool, this movement being able to take place by pressure on said finger pad as filament material is dispensed and a longitudinal internal channel is formed in the body, said channel housing said brake member.

4,418,876

## METHOD OF WINDING A STRAND OF RELATIVELY RIGID GLASS FIBER ONTO A ROTATING STRAND WINDING SLEEVE

Michio Sato; Shin Kasai, and Yutaka Kawaguchi, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

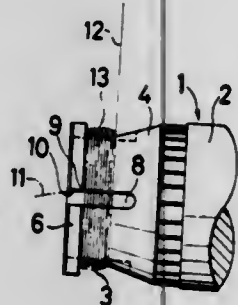
Division of Ser. No. 96,121, Nov. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 919,647, Jun. 28, 1978, abandoned. This application May 1, 1981, Ser. No. 259,689

Claims priority, application Japan, Jun. 28, 1977, 52-85629

Int. Cl.<sup>3</sup> B65H 54/02

U.S. Cl. 242—18 G

3 Claims



1. A method of winding a strand of relatively rigid glass fiber having large diameter filaments onto a rotating strand winding sleeve including a primary strand winding portion and a preliminary strand winding portion where the preliminary strand winding portion has (a) a flanged portion formed on the outer peripheral end surface thereof having a diameter which is greater than that of the preliminary winding portion, (b) at least one first groove axially provided therein, and (c) at least one second groove axially provided in the flanged portion, said first and second grooves being continuous and formed in a

straight line and extending radially inward of the surface of said preliminary winding portion, said method comprising the steps of

winding the strand of relatively rigid glass fiber onto the preliminary winding portion so that the strand is slightly deformed from an arc to a straight line as it passes over said first groove to thereby enhance the frictional force between edge corners of the first groove and the wound strand, axially pulling the first portion of the strand wound on the preliminary winding portion through the second groove in the flanged portion to effect cutting and removal thereof by one of the edge corners of the second groove, leading the strand to the primary strand winding portion; winding the strand onto said primary strand winding portion; and inserting a knife into said first groove to cut the strand wound on the preliminary winding portion.

4,418,877

## FISHING REEL

Hideki Nakajima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

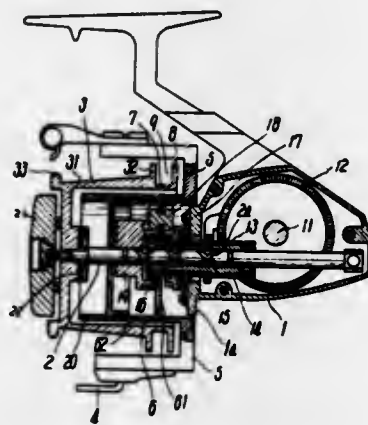
Filed Nov. 9, 1981, Ser. No. 319,285

Claims priority, application Japan, Nov. 15, 1980, 55-163672[U]

Int. Cl.<sup>3</sup> A01K 89/01

U.S. Cl. 242—84.21 R

5 Claims



1. A fishing reel comprising: a reel body having a handle; a rotary frame comprising a cylindrical portion having a bail arm and being rotatably supported to said reel body at the front thereof; a transmission mechanism for transmitting an operation of said handle to said rotary frame; and a spool provided at the front of said rotary frame, said spool comprising a cylindrical trunk supported about the outer periphery of said cylindrical portion for winding thereon a fishing line, a first flange provided on one end of said trunk at a side closest to said reel body, a second flange provided on another end of said trunk at a side farthest removed from said reel body, a cylindrical extension extending from said first flange toward said reel body, and a third flange provided at one end of said cylindrical extension and extending radially outwardly, said first flange being located closer to said third flange than said second flange to define a wide fishing line winding portion on said trunk between said first and second flanges and a narrower annular groove for receiving a fishing line formed by said first flange, said third flange and the other periphery of said cylindrical extension, said annular groove receiving a fishing line which becomes displaced from said line winding portion during casting and moves toward said reel body to prevent said displaced line from being caught by said rotary frame.

4,418,878

## AUTOMATIC ROLL-UP DEVICE FOR SAFETY BELTS

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

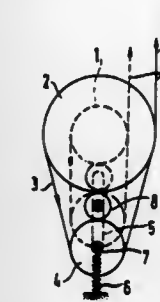
Filed Sep. 4, 1981, Ser. No. 299,517

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033746

Int. Cl.<sup>3</sup> A62B 35/02; B65H 75/48

U.S. Cl. 242—107.3

13 Claims



1. Automatic roll-up device for a safety belt having a winding shaft connected to a roll-up spring and to an automatic locking device and carrying a belt web winding roll, the roll-up device also having a belt brake located downstream of the winding shaft in direction of pull of the belt web, the belt brake being in the form of a movable clamping member partly looped around by the belt web and actuatable for clamping the belt web after actuation of the automatic locking device, said clamping member comprising a brake roller partly looped around by the belt web and being rotatable in the same direction as the winding shaft, when the belt web is being unrolled and rolled-up, a housing for the automatic roll-up device on which said brake roller is movably mounted and, upon actuation of locking action by the automatic locking device, being pressable by the belt web in direction of the belt web winding roll to effect clamping and locking of the belt web winding roll, and a spacer member operatively connected with said brake roller and braced against the belt web winding roll, said brake roller being held by said spacer member at substantially constant spacing from the belt web winding roll, in non-locked condition thereof, for every diameter of the belt web winding roll.

4,418,879

## SCOOP AND INLET FOR AUXILIARY POWER UNITS AND METHOD

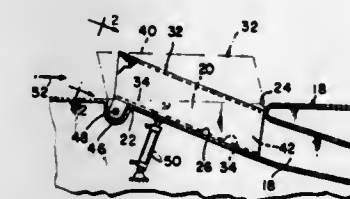
Siebold Vanderleest, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1980, Ser. No. 220,515

Int. Cl.<sup>3</sup> B64D 33/02

U.S. Cl. 244—53 B

15 Claims



1. For use on an aircraft, an air inlet and scoop for an in-flight auxiliary power unit, the scoop being adapted to open and start operation at altitude and on the ground, comprising: an inlet opening contoured along its outer edges to conform to the aircraft fuselage, a ramp trailing inwardly into the opening starting from the fuselage and forming the bottom surface of the inlet;

the inlet opening having generally parallel side walls trailing inwardly along opposite edges of the ramp; the side walls extending inwardly from the fuselage edges along the inlet opening; a scoop hingedly engaged to said aircraft adjacent said fuselage and adjacent one end of said inlet opening; and means in said aircraft to operate said scoop from positions in which said scoop opens and closes said inlet opening; said scoop having a closing wall with respect to said inlet opening, said closing wall closing said opening in the closed position and being contoured to conform with the fuselage surface in the closed position; said closing wall being continuous in the open and closed positions and generally limited to the extent of said inlet opening; said scoop being externally of said aircraft in the closed position; said scoop having a cross section complementary to said inlet to fit therein in the open position; said scoop having a passage therethrough to permit inlet air to move therethrough from outside the fuselage into the inlet.

4,418,880

## FLUID FLOW AUGMENTOR

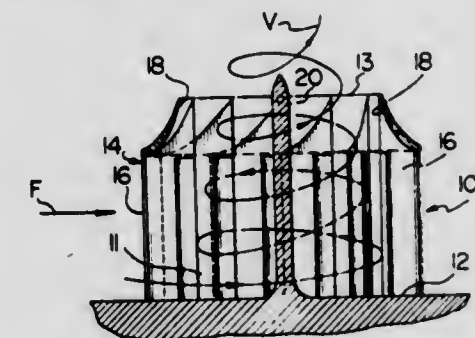
J. F. de Waal, 4 Nicol St., Ottawa, Ontario, Canada K1J 8A5

Filed Nov. 27, 1981, Ser. No. 325,118

Int. Cl.<sup>3</sup> B64C 23/06; B63H 13/00

U.S. Cl. 244—199

24 Claims



1. A fluid flow concentrating device comprising a substantially hollow body substantially closed at one end and open at the other, an axially extending vortex stabilizing column arranged substantially centrally of the hollow body, the body having a fixed circumferential wall means composed of a plurality of fixed spaced vanes and a nozzle located at the open end of said wall means, whereby fluid moving from outside the device substantially radially through said vanes to the inside of said body, creates a vortex within said hollow body and a fluid flow axially of said body through said nozzle.

4,418,881

## RUDDER CONTROL GUST LOCK

Clarence C. Bouldin, Orange, N.J., assignor to C. C. Bouldin Inc., Paterson, N.J.

Filed Jul. 27, 1981, Ser. No. 287,392

Int. Cl.<sup>3</sup> B64C 13/14; B64F 1/00

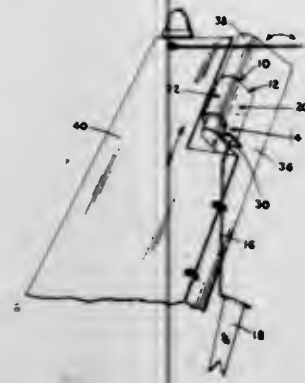
U.S. Cl. 244—224

9 Claims

1. A device for releasably securing the rudder and the vertical stabilizer of an airplane to each other, comprising: (a) a partial collet having a generally U-shaped cross section with an inner surface adapted for wraparound reception of the forward most vertical leading edge of said rudder, said collet adapted to slidably seat on said forward most vertical leading edge and to slide in the vertical direction therealong; and (b) paired, opposed flanges extending from said partial collet, in a direction generally transverse to the plane of said U-shaped cross section, said flanges adapted to slidably engage the broad surfaces of said stabilizer adjacent said



forwardmost vertical leading edge, upon sliding of said partial collet in the vertical direction, to maintain said



rudder and said stabilizer in planar stationary alignment when said airplane is not in use.

4,418,882

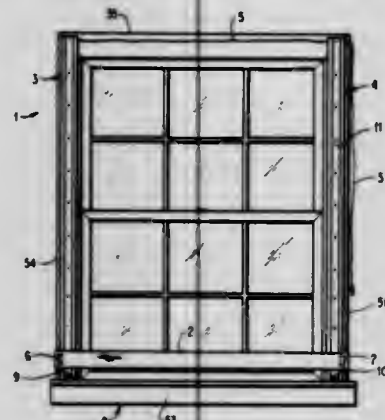
## VARIABLE HEIGHT ROD SUPPORTER

Helen W. Waring, Rt. #2, Box 303, Mt. Pleasant, S.C. 29464  
Filed Oct. 15, 1981, Ser. No. 311,554

Int. Cl.<sup>3</sup> A47H 1/10

U.S. Cl. 248—265

9 Claims



1. An apparatus for supporting a rod at varying heights horizontally along a pre-designated area of a structure comprising:

- a first structure comprising a first roller track and a first pulley track secured onto one vertical side of said pre-designated area;
- a second structure comprising a second roller track and a second pulley track secured onto the second vertical side of said pre-designated area;
- a first guide roller guidable within said first roller track;
- a second guide roller guidable within said second roller track;
- a first support shaft around which said first guide roller is rotatably secured, with first guide roller securing means secured around said first support shaft on both sides of said first guide roller;
- a second support shaft around which said second guide roller is rotatably secured, with second guide roller securing means secured around said second support shaft on both sides of said second guide roller;
- a rod attachment bar rigidly secured to said first support shaft and said second support shaft to which a rod or a plurality of rods may be secured; and
- height adjustment means secured within said apparatus operative to raise or lower said rod attachment bar, whereby when said rod attachment bar is moved, said first guide roller is guided within said first roller track and said second guide roller is guided within said second roller track stabilizing said rod attachment bar during movement, said height adjustment means comprising:
  - a first hoisting pulley rotatably secured around said first support shaft in said first pulley track, with first

hoisting pulley securing means around said first support shaft on both sides of said first hoisting pulley;

- a second hoisting pulley rotatably secured around said second support shaft in said second pulley track, with second hoisting pulley securing means around said second support shaft on both sides of said second hoisting pulley; and

- hoisting means connected around said first hoisting pulley, and therefore around said first support shaft, and said second hoisting pulley, and therefore around said second support shaft, and extending above said pre-designated area, operative to raise or lower said rod attachment bar.

4,418,883

## SELF-SUPPORTING, TABLE-MOUNTED, SUPPORT APPARATUS FOR RECEPTACLES

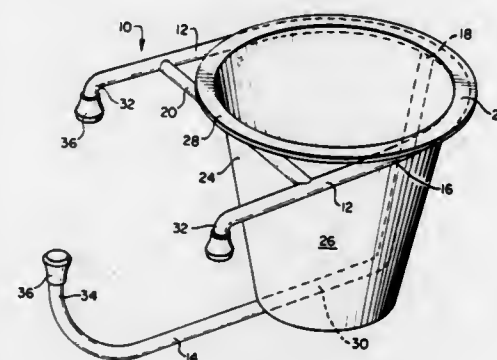
Daniel Cohen, 2515 Cummings Ave., Superior, Wis. 54880

Filed Oct. 14, 1981, Ser. No. 311,419

Int. Cl.<sup>3</sup> A47K 1/08

U.S. Cl. 248—312.1

20 Claims



1. Apparatus for supporting receptacles relative to a horizontally disposed table surface, comprising:

first support arm means, comprising a pair of laterally spaced arms and a cross-bar interconnecting said laterally spaced arms, disposed within a horizontal plane;

substantially J-shaped second support arm means, disposed within a vertical plane, integrally connected to said first support arm means at a location defined within said horizontal plane so as to form therewith a one-piece support arm framework;

said first and second support arm means defining a horizontal channel therebetween within which said table surface is to be disposed and wherein said first and second support arm means engage the upper and under surfaces of said table, respectively; and

annular ring means operatively connected to said one-piece support arm framework for supporting a receptacle relative to said table surface.

4,418,884

## DOUBLE-HINGE CORNER FOR A CONCRETE FORMING STRUCTURE

Vernon R. Schimmel, Lincolnwood, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed May 13, 1982, Ser. No. 377,977

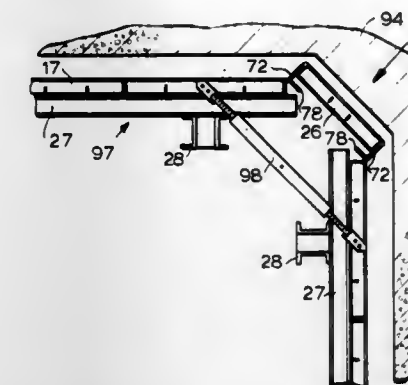
Int. Cl.<sup>3</sup> E21D 10/00

U.S. Cl. 249—11

18 Claims

15. An inside articulated and collapsible concrete form for forming a concrete wall structure having chamfered concrete corners, the form having spaced panel sections and a chamfered corner positioned in inclined relation between said spaced panel sections, and panel sections and said corner having forming faces and marginal frame edges, and means for releasably positioning and holding said panel sections and said corner in predetermined positions to facilitate the pouring of concrete, and a pair of double hinge corner assemblies defining a total of four pivot points and being secured with opposite

ends of said chamfered corner, and the double hinge corner assemblies also each being secured to an associated one of said panel sections, the panel sections being bodily movable with



4,418,885

## NOZZLE HOOD FOR Moulding PIPES

Angel B. Serrano, c/o Encomienda de Placios No. 183, Madrid, Spain

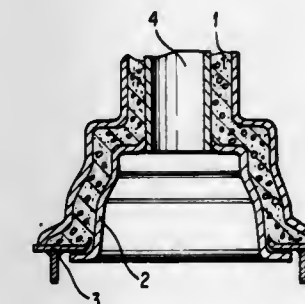
Filed Nov. 24, 1981, Ser. No. 324,596

Claims priority, application Spain, Nov. 24, 1980, 254,608

Int. Cl.<sup>3</sup> B28B 21/04

U.S. Cl. 249—100

2 Claims



1. Apparatus for moulding pipes having a flared nozzle comprising:

a hood of generally convex shape having an outer surface corresponding to the shape of the interior of a pipe to be moulded, said hood including an annular rim on the periphery of the widest part thereof;

a moulding shank rigidly attached to the narrowest part of said hood and extending within the hollow interior of said pipe; and

a flat annular washer supported on said annular rim and separable therefrom said hood being removable from said moulded pipe said washer remaining to form a flat terminal end for said pipe.

4,418,886

## ELECTRO-MAGNETIC VALVES PARTICULARLY FOR HOUSEHOLD APPLIANCES

Walter Holzer, Drosteweg 19, 7758 Meersburg, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,714

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108693

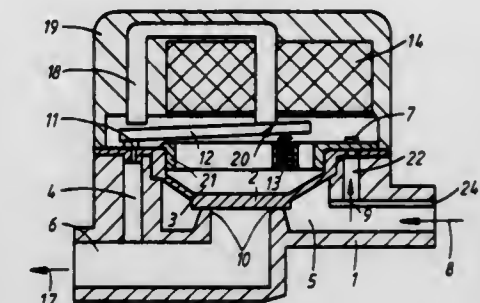
Int. Cl.<sup>3</sup> F16K 31/02

U.S. Cl. 251—30

10 Claims

1. An electro-magnetic valve having hydraulic control consisting of a valve body having an inlet and an outlet, a valve seat sealable by a flexible diaphragm, in which both the inlet and the outlet are arranged on a first side of the diaphragm, a hydraulic pressure chamber on a second side of the diaphragm,

a filling aperture from the inlet to the pressure chamber and a pressure-relief aperture from the pressure chamber to the outlet, an armature which, when unenergized, closes the pressure-relief aperture under spring pressure, wherein the improvement comprises said hinged armature being positioned entirely within the pressure chamber and said pressure-relief aperture



4,418,887

## PLUG VALVE

Bruno Tubaro, 76/2, Via Solimano, Sori(Genova), Italy

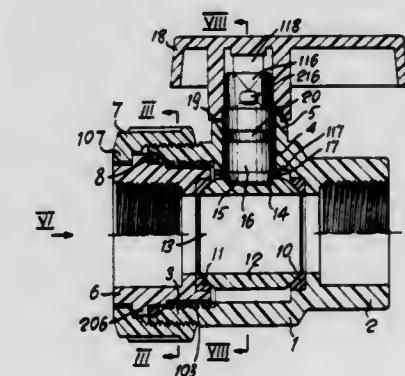
Filed Oct. 26, 1981, Ser. No. 315,023

Claims priority, application Italy, Oct. 31, 1980, 15244 B/80[U]

Int. Cl.<sup>3</sup> F16K 51/00

U.S. Cl. 251—152

3 Claims



1. A plug valve made of plastics material, particularly adapted for water ducts, irrigation systems and the like, comprising:

a valve body (1) having two tubular coaxial extensions (2, 3); a spherical plug (12) housed in said valve body (1) between said two tubular extensions (2, 3) and having a diametral through bore (13) and a groove (14) on the periphery thereof extending transversely to said diametral through bore (13), said spherical plug (12) being rotatable in said valve body around an axis which is perpendicular to the common axis of said two coaxial tubular extensions (2, 3); said valve body having a transverse bore (4) through one side thereof with an inner outlet between said two tubular extensions (2, 3), the transverse bore having an axis that is coaxial with said perpendicular axis of said spherical plug (12);

a control stem (16) rotatably mounted in said transverse bore (4), seal means (19, 20) connected between said control stem and said transverse bore (4), a radial rib (15) projecting from the inner end of said control stem (16) and engaged in said groove (14) on the periphery of said spherical plug to operatively couple said control stem (16) to said spherical plug (12), a flat abutment and sliding surface



(117) formed in the valve body (1) surrounding the inner outlet of the transverse bore (4), an annular flange (17) integral with the said inner end of said control stem (16) positioned adjacent to and cooperating with said flat abutment and sliding surface (117);

at least one connector sleeve (6) axially slidably inserted into the interior of one of the said two tubular extensions (2,3) of the valve body (1), a coaxial annular packing (11) on the inner end of said connector sleeve (6) adapted to be compressed in a tight manner against said spherical plug (12); an annular peripheral exterior projection (206) on said connector sleeve (6), a conical flaring enlargement (9) on the mouth of said one of the said two tubular extensions (3) of the valve body, an annular packing (8) adapted to be compressed into said conical flaring enlargement (9) by said annular projection (206);

a plurality of longitudinal cogs (103) on the inner wall of said one of said two tubular extensions (3), plural external longitudinal mating cogs (106) on said connector sleeve (6) adapted to engage with said plurality of longitudinal cogs (103) on said one of said two tubular extensions (3); a locking ring nut (7), external threading on the said one of said two tubular extensions (3) onto which said locking ring nut (7) is screwed, said locking ring nut (7) being superimposed over said connector sleeve (6) so as to cover and surround the said peripheral exterior annular projection (206) on said connector sleeve (6); said locking ring nut (7) having an inner projection portion (107), said locking ring nut (7) adapted to be screwed onto said one of said two tubular extensions (3) to such an extent that the inner projection portion (107) axially moves into substantially flush contact with said annular projection (206) of said connector sleeve (6) causing said annular projection (206) to compress said annular packing (8), a small annular radial clearance being provided between the said connector sleeve (6) and the said ring nut (7) whereby said ring nut can be easily superimposedly fitted onto said connector sleeve (6) and screwed onto the said external threading on said tubular extension (3) of the valve body (1), whereby when said connector sleeve (6) is subjected to radial expansion it abuts against said ring nut.

4,418,888

## ANGLE COCK VALVE

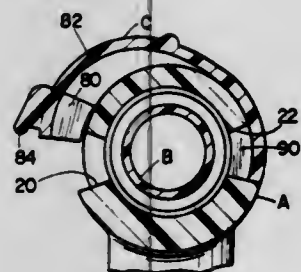
Irvin D. Jacobson, Bratenah; Frank R. Volstadt, Madison, and David P. Passerelli, Geneva, all of Ohio, assignors to Perfection Corporation, Madison, Ohio

Filed Jun. 8, 1981, Ser. No. 271,281

Int. Cl.<sup>3</sup> F16K 31/44

U.S. Cl. 251-216

16 Claims



1. A drain valve comprising:  
a valve body having an externally threaded first end which is adapted to be threadingly received in a female fitting, a second end opposite the first end, a linear bore extending linearly through the valve body from the first end to the second end, an annular seat disposed in said linear bore mediate the first and second ends, an internally threaded portion disposed in said linear bore mediate the annular seat and the second end, a smooth, cylindrical portion in said linear bore mediate the annular seat and the second

end, and an outlet spout having an internal outlet bore which is connected with said linear bore;

a valve stem having an enlarged handle portion and a cylindrical section dimensioned to be received in said linear bore from the second end, a seat seal mounting means disposed on the cylindrical section for mounting a seat seal, an externally threaded portion on the cylindrical section for engaging the internally threaded portion of said linear bore such that rotation of the valve stem relative to the valve body moves the seat seal in and out of fluid flow sealing engagement with said annular seat, and an annular seal for engaging the cylindrical section of said valve stem and said cylindrical portion of said linear bore in a fluid sealing relationship; and

a stem retainer received on the valve body for releasably retaining the stem in said linear bore, said stem retainer including a projection adapted to extend through an aperture in the valve body and biasing means for resiliently biasing the projection into said valve body aperture, said projection being adapted to cooperate with an adjacent portion of the valve body when the projection is removed from the aperture for maintaining the stem retainer in a stable disabled condition while the stem retainer remains associated with the valve body.

4,418,889

## FIRE SAFE SEAT FOR A VALVE

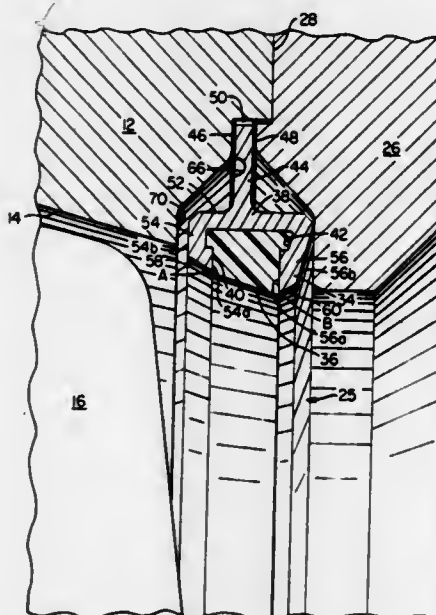
Bernd Krause, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Mar. 16, 1981, Ser. No. 244,091

Int. Cl.<sup>3</sup> F16K 1/22

U.S. Cl. 251-306

22 Claims



1. A fire-safe valve, comprising:  
(a) a valve body having a bore therethrough;  
(b) a valve closure member mounted in said bore and movable between open and closed positions about an axis substantially transverse to said bore, said closure member having a peripheral sealing surface;  
(c) an annular recess circumscribing said bore and disposed in radial alignment with said peripheral sealing surface of said closure member when said closure member is in the closed position;  
(d) a seat member adapted to selectively interface with said sealing surfaces of said closure member supported in said annular recess and extending radially inward therefrom, said seat member including:  
(i) an annular metal flange secured to said valve body and extending radially inward into said bore, said flange being pliant in at least one axial direction;  
(ii) a metal seat ring extending radially inward from said metal flange having an axial dimension which is sub-

stantially greater than the corresponding axial dimension of said metal flange, said metal seat ring having radially extending axial sidewalls which at least partially define an annular flanged groove within said seat ring, the radial end surfaces of said groove defining sidewalls being axially converged toward the groove; and

(e) an annular sealing surface formed of material softer than the metal of the metal seat ring snugly fitted within said annular flanged groove, said sealing surface of softer material extending radially beyond the radial extension of the metal seat ring and being resiliently radially deformable to a position corresponding to the radial extension of the axial sidewalls of said metal seat ring under the influence of an interface force with the closure member.

4,418,890

## WEDGE WITH FLANGES

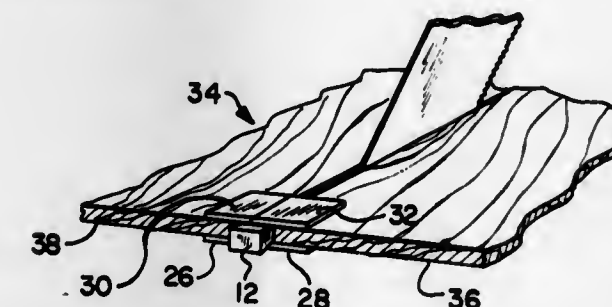
Alan Knight, 1349 Hanover Ct., Circleville, Ohio 43113

Filed Oct. 16, 1981, Ser. No. 311,859

Int. Cl.<sup>3</sup> B66F 11/00

U.S. Cl. 254-104

12 Claims



1. A flanged wedge having a wedge body with two converging flat sides, two parallel planar surfaces, a blunt end, and a chisel end, said blunt end of said wedge body being of relatively greater thickness between said two converging flat sides than the opposite chisel end thereof which is relatively narrowed, wherein the improvement comprises:

at least two non-cutting, support flanges, a first one of said flanges extending transversely of the longitudinal axis of the wedge body and away from the first of said converging sides at or near the first of said parallel planar surfaces and a second one of said flanges extending transversely of the longitudinal axis of the wedge body in a direction opposite said first one of said flanges and away from the second of said converging sides at or near the second of said planar surfaces, each said flange at the leading edge extending away from said longitudinal axis of the wedge body a distance which is greater than one-half the thickness of said wedge body at said blunt end.

4,418,891

## DEVICE FOR TENSIONING CHAINS

Elis Kallae, and Karl-Erik Starrell, both of Orsa, Sweden, assignors to Orsa Kattingfabrik AB, Stockholm, Sweden

Continuation of Ser. No. 207,659, Nov. 17, 1980, abandoned.

This application Dec. 14, 1982, Ser. No. 449,625

Claims priority, application Sweden, Nov. 23, 1979, 7909717; Sep. 11, 1980, 8006371

Int. Cl.<sup>3</sup> B21F 9/00

U.S. Cl. 254-260

13 Claims

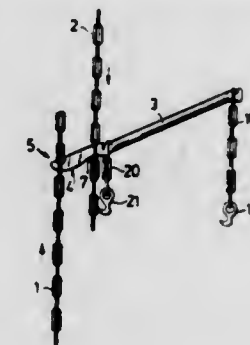
1. A device for tensioning chains comprising a shank having a body and opposite first and second integral end portions, the first end portion being flattened for receiving a link of a first chain and a link of a second chain, the first end portion having a free end and opposite first and second narrow edges, at least the first narrow edge being substantially straight along its length and extending substantially parallel with the body from

the tip of the free end to the point where the flattened end portion joins the body of the shank;

a first recess on the first edge near the free end for engaging a link of the first chain;

a second recess on the second edge and laterally spaced from the first recess toward the body for receiving a link of the second chain;

a locking chain swivelably attached around the second end portion and including a hook for fastening the locking chain to either the first chain or the second chain to mutually tension the first and second chains;



a take-up chain having a first link swivelably attached around without passing through the shank between the second recess and the body and including a hook for removably fastening into a link of the first chain to permit movement of the first recess into a different link of the first chain for adjusting the device while maintaining mutual tension between the first and second chains; and

material projections on the shank between the second recess and the body for limiting lateral movement of the first link of the take-up chain along the shank between the body and such material projections thereby to prevent the take-up chain from engaging the second recess.

4,418,892

## ALUMINUM FURNACE SKIM RECOVERY SYSTEM

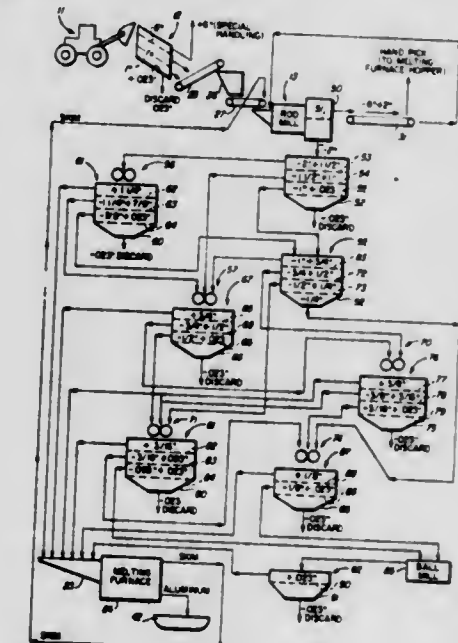
Frank H. Howell, 150 S. Detroit St., Los Angeles, Calif. 90036

Filed May 10, 1982, Ser. No. 376,665

Int. Cl.<sup>3</sup> F27B 14/02

U.S. Cl. 266-137

5 Claims



1. A reclaiming system for recovering aluminum from skim material of an aluminum furnace comprising:  
first, second and third screening means,  
said first screening means comprising two vertically positioned screens with the first screen positioned to receive the skim material and retaining on its surface a first size fraction of the material for movement into an aluminum



furnace and passing therethrough and onto the second screen a first remainder of the material, said second screen retaining on its surface a second size fraction of the material for movement into a rod mill and passing therethrough a second, aluminum poor remainder of the material which is discarded, a rod mill, said rod mill discharging the second size fraction of the material received into said second screening means, said second screening means comprising third and fourth vertically positioned screens with the third screen positioned for receiving said second size fraction and retaining on its surface a third size fraction and passing therethrough onto said fourth screen a third remainder, said third size fraction being moved back into said rod mill for further elongation, flattening and widening of aluminum particles forming a part thereof, said fourth screen retaining on its surface a fourth size fraction and passing through a fourth, aluminum poor remainder of the material which is discarded, said fourth size fraction being conveyed into a crushing means, a crushing means, said crushing means discharging said fourth fraction into said third screening means, said third screening means comprising a fifth screen for receiving thereon said fourth size fraction received from said crushing means, said fifth screen retaining thereon a fifth size fraction and passing therethrough a fourth remainder which is aluminum poor and is discarded, a hopper and an associated processing furnace, said fifth size fraction being moved into said hopper, said hopper discharging said fifth size fraction into said processing furnace, said processing furnace discharging a fifth remainder which is aluminum rich, and means for receiving said fifth remainder for converting it into molten aluminum.

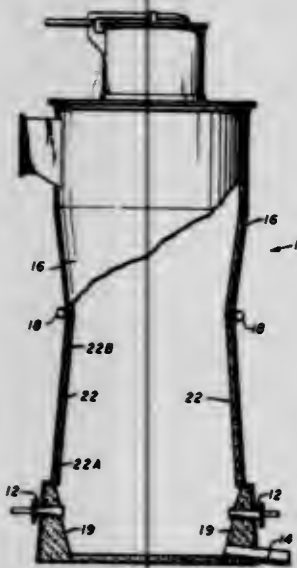
4,418,893

**WATER-COOLED REFRACTORY LINED FURNACES**  
John A. Middleton, Eagleville, and Thomas L. O'Dwyer, Berwyn, both of Pa., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 16, 1981, Ser. No. 331,040  
Int. Cl.<sup>3</sup> C21B 7/04, 7/10; C21D 1/00

U.S. Cl. 266—192

3 Claims



1. In a water cooled furnace including a metal furnace shell and means for water cooling the exterior surface of said shell, the improvement comprising a relatively uniformly thick lining of prefired refractory blocks lining the interior surface of said shell and means mechanically attaching said refractory blocks to said shell wherein said refractory blocks have a thermal conductivity of between 15 and 100 BTU/sq.ft./hr./in.<sup>2</sup>/°F. and a thickness of about three inches such that a

significant portion of the thickness of said refractory blocks will remain when equilibrium conditions have been reached and said refractory lining will maintain its mechanical integrity.

3. In a water cooled cupola including a metal shell and means for water cooling the exterior surface of said metal shell wherein said cupola has at least one high temperature region and at least one low temperature region vertically spaced in said cupola, the improvement comprising a relatively uniformly thick lining of prefired refractory blocks lining the interior surface of said metal shell and means mechanically attaching said refractory blocks to said shell, said refractory blocks comprising:

- a first set of refractory blocks in the high temperature region having a thermal conductivity between 15 and 100 BTU/sq.ft./hr./in.<sup>2</sup>/°F. such that the interior surface of said first set of refractory blocks will be maintained at about a preselected temperature; and
- a second set of refractory blocks in the lower temperature region having thermal conductivity lower than that of said first set of refractory blocks and between 0.4 and 20 BTU/sq.ft./hr./in.<sup>2</sup>/°F. such that heat conductivity through said second set of refractory blocks will be lower than through said first set of refractory blocks and such that the interior surface of said second set of refractory blocks will not exceed said preselected temperature; whereby a significant portion of the thickness of said refractory blocks will remain when equilibrium conditions have been reached and said refractory blocks will maintain their mechanical integrity.

4,418,894

**FURNACE TAPHOLE DRILLING APPARATUS AND METHOD**

Pierre Mailliet, Howald, Luxembourg, assignor to Paul Wurth S.A., Luxembourg, Luxembourg

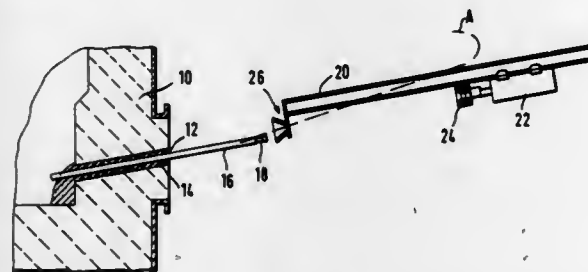
Filed Nov. 3, 1981, Ser. No. 317,767

Claims priority, application Luxembourg, Nov. 17, 1980, 82943

Int. Cl.<sup>3</sup> C21B 7/12

U.S. Cl. 266—271

6 Claims



1. A support device affixed to the leading end of a movable support bar along which a percussive taphole drill moves, said support device locating the end of a drill rod which is inserted through a hardened clay plug of a taphole and positioning the end of the drill rod so that it can be received and gripped by a coupling device of the percussive taphole drill, said support device comprising:

guide member means, said guide member means having an alignment portion which is dimensioned so as to allow passage of said drill rod therethrough, said alignment portion aligning the end of said drill rod with the coupling device of said percussive taphole drill, said guide member means further including a locating and adjusting portion, said locating and adjusting portion engaging the end of said drill rod and guiding it to said alignment portion; said locating and adjusting portion being a partial hollow frustoconical shaped member having its narrow end juxtapositioned and aligned with said alignment means, said frustoconical shaped member further being provided with an open lateral groove extending out from said alignment portion; and . .

means for mounting said guide member to the leading end of the movable support bar.

4,418,895

**ELASTIC SUPPORTS, NOTABLY FOR VEHICLE ENGINE SUSPENSION**

Jacques Bertin, Asnières; Michel Pompel, Paris, and Jean-Pierre Valjent, Ris-Orengis, all of France, assignors to Hutchinson-Mapa, France

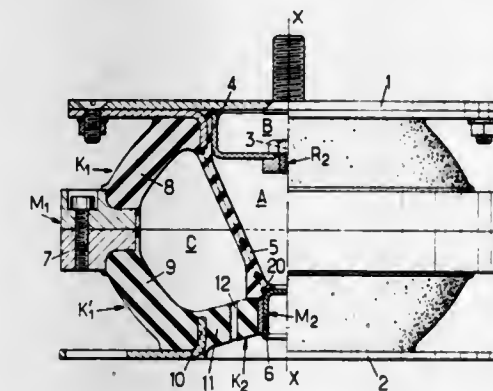
Continuation of Ser. No. 70,113, Aug. 27, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,522

Claims priority, application France, Sep. 6, 1978, 78 25681

Int. Cl.<sup>3</sup> F16M 5/00; F16F 15/00

U.S. Cl. 267—140.1

12 Claims



1. A damped elastic support, for insertion between two bases to be supported on one another, comprising:

- a damper device formed by first and second chambers connected by a restriction means for providing restricted flow therebetween, one of said first and second chambers comprising a rigid member affixed to one of said bases,
- a first spring means formed at least partially of elastomer, and being arranged in a path in series with the damper device between said bases so as to form a damper device-first spring means assembly,
- a second spring means arranged between said bases in a path in parallel with the path containing the damper device and first spring means, said second spring means comprising an annular shaped elastomer member which totally surrounds the assembly formed by said damper device and said first spring means and defining with said assembly, between said bases, a third chamber which is independent of said first and second chambers,
- at least one of the first and second chambers being bounded by a flexible wall having a shape of revolution such that deformation of said flexible wall, due to deformation of the said first and second spring means, causes a damper fluid to flow between the first and second chambers through the restriction means, said flexible wall being directly joined to the abovementioned rigid member and to a further rigid member and said first spring means joining said further rigid member to the other of said bases.

4,418,896

**APPARATUS FOR CONTROLLING THE FRICTION BETWEEN THE LEAF SPRINGS OF A LAMINATED LEAF SPRING ASSEMBLY**

Takeyoshi Shinbori, Yokosuka, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jul. 30, 1982, Ser. No. 403,868

Claims priority, application Japan, Aug. 10, 1981, 56-125125

Int. Cl.<sup>3</sup> B60G 11/02; F16F 1/18

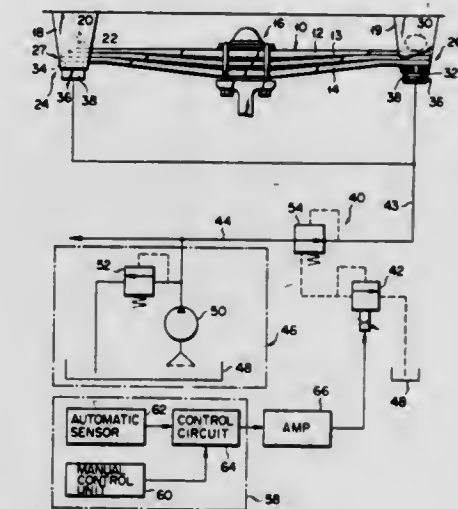
U.S. Cl. 267—36 R

3 Claims

1. An apparatus for controlling the friction between leaf springs of a laminated leaf spring assembly, comprising: clamping means mounted on the laminated leaf spring assembly which is attached at both ends to a body, thus supporting the body, for clamping the laminated leaf spring as-

sembly, said clamping means including a guide member and a press member which clamp the laminated leaf spring assembly;

hydraulic cylinder means for pressing said press member to thereby urge said laminated leaf spring assembly against said guide member, said hydraulic cylinder means including a cylinder and a piston which is movable in the cylinder and one end of which is connected to said press member;



hydraulic control means including a pressure reducing valve and a control valve for controlling the pilot pressure of said pressure reducing valve; and detecting means for detecting the values of the predetermined factors of the body and supplying signals representing the values detected to said control valve so as to control the pilot pressure of said pressure reducing valve.

4,418,897

**TWO-CHAMBER MOTOR MOUNT WITH HYDRAULIC DAMPING**

Volker Härtel, Vallendar, and Manfred Hofmann, Hünfelden, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

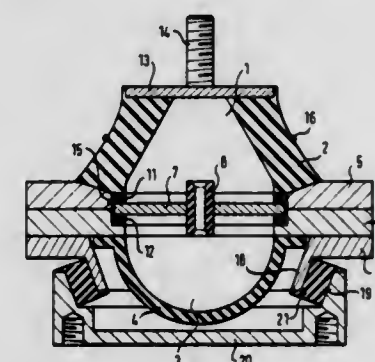
Filed Mar. 17, 1981, Ser. No. 244,652

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027742

Int. Cl.<sup>3</sup> F16F 9/10, 15/04

U.S. Cl. 267—140.1

8 Claims



1. Two-chamber motor mount with hydraulic damping, especially for motor vehicles, comprising an upper and a lower chamber having rubber-elastic walls and being filled with liquid, said upper chamber being of hollow conical construction, a holding flange disposed between said walls of said upper and lower chambers, an intermediate plate with a throttle orifice located in vicinity of and sealingly secured at the outer edge thereof to said holding flange, said throttle orifice being defined by a tube-shaped rubber insert extending substantially perpendicularly through said intermediate plate and having a substantially oval inner cross section said upper and said lower



chambers being connected to one another through said intermediate plate solely via said throttle orifice for preventing an hydraulic response for high frequency vibrations of small amplitude, said intermediate plate being responsive to high frequency vibrations of small amplitude for closing said throttle orifice at high pressures.

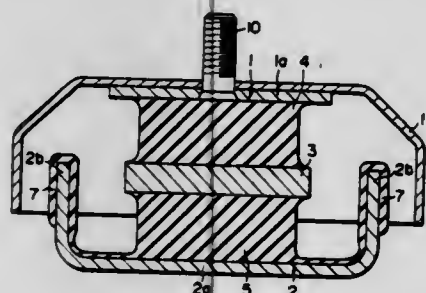
**4,418,898**  
**CUSHIONED MOUNTING DEVICE WITH A MASS MEMBER FORMING A SUB-OSCILLATION SYSTEM AND MEANS FOR RESTRICTING CUSHIONING MOVEMENT**

Tomiaki Atsumi; Kazumasa Kuse, and Junji Deto, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 9, 1981, Ser. No. 281,779

Int. Cl.<sup>3</sup> B60G 11/22; F16F 1/36

U.S. Cl. 267—63 R



1. A cushioned mounting device, comprising:
  - a first frame member of an inverted bowl-like shape including a central flat portion and an annular side wall portion extending outwardly from said central flat portion therearound;
  - a second frame member of a substantially U-shaped cross section including a middle flat portion and two flange portions extending outwardly from opposite ends of said middle flat portion;
  - a flat plate mass member; and
  - a first and a second flat cushion member;
 said first frame member, said second frame member, said flat plate mass member, said first cushion member and said second cushion member being so assembled together that said central flat portion of said first frame member and said middle flat portion of said second frame member are opposed to one another with interposition of a piled up assembly of said flat plate mass member and said first and second cushion members with said flat plate mass member being sandwiched between and bonded on opposite sides thereof with said first cushion member and said second cushion member, while said first and second cushion members are bonded with said central flat portion of said first frame member and said middle flat portion of said second frame member, respectively,
- wherein said two flange portions of said second frame member are housed within said annular side wall portion of said first frame member so that each of said two flange portions of said second frame member opposes each adjacent inside surface portion of said annular side wall portion of said first frame member with each predetermined clearance left therebetween.

**4,418,899**  
**PNEUMATICALLY DRIVEN CLAMPING DEVICE, IN PARTICULAR A MACHINE VICE**

Hanns Zimmermann, Memmingen, and Peter Preisenhammer, Kempten, both of Fed. Rep. of Germany, assignors to Saurer-Allma GmbH, Kempten, Fed. Rep. of Germany

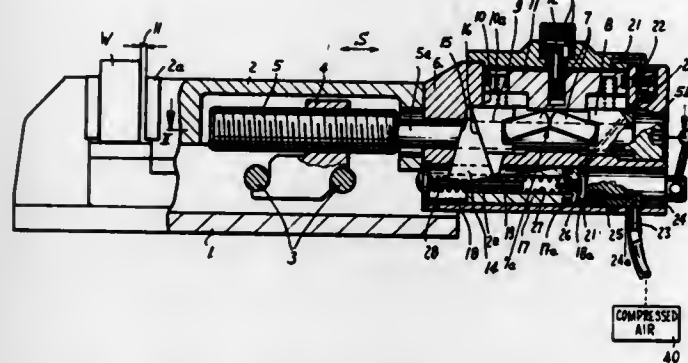
Filed Sep. 21, 1981, Ser. No. 304,283

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 8028201

Int. Cl.<sup>3</sup> B25B 1/14

U.S. Cl. 269—32

14 Claims



1. A fluid actuated clamping device, comprising a base, a clamping member supported for movement relative to said base in a first direction and having a first surface thereon, an element supported for movement in said first direction independently of said base and clamping member and having a second surface thereon, a wedge supported for movement in a second direction transverse to said first direction and having third and fourth surfaces thereon which converge substantially in said second direction and which respectively slidably engage said first and second surfaces, first fluid actuated means for effecting movement of said wedge in said second direction, power amplifier means cooperable with said base and said element for causing movement of said element relative to said base in said first direction, second fluid actuated means for actuating said power amplifier means, means for selectively supplying a pressurized fluid to said first fluid actuated means, means defining a connecting duct for supplying said pressurized fluid from said first fluid actuated means to said second fluid actuated means, and excess pressure valve means disposed in said connecting duct for obstructing fluid flow therethrough until said pressurized fluid supplied to said first fluid actuated means exceeds a predetermined value.

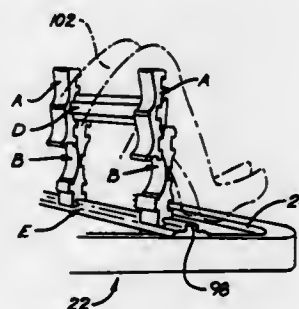
**4,418,900**  
**CORPSE POSITIONING SYSTEM**  
Theodore D. Ricke, 710 E. 4th, Holsington, Kans. 67544

Filed Mar. 3, 1981, Ser. No. 240,217

Int. Cl.<sup>3</sup> A61G 13/00

U.S. Cl. 269—45

4 Claims



1. A corpse positioning system including:
  - a pair of first blocks, identical in configuration;
  - said pair of first blocks each being in the form of a polygonal body having spaced, identical areas on one surface thereof

and grooves in the surface thereof opposite to said indented areas;  
a pair of second blocks, identical in configuration;  
a pair of third blocks, identical in configuration;  
an embalming table for supporting the corpse in a generally prone position; and  
means on the blocks for interlocking the first, second and third blocks in various arrangements to support and retain the corpse in the proper position on the embalming table for embalming purposes.

**4,418,901**  
**VICE SYSTEM**

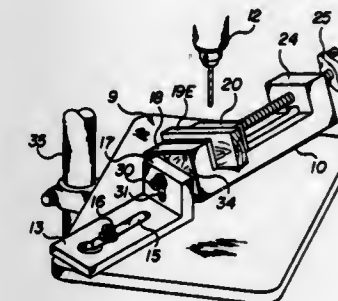
William D. Woods, and John H. Pigman, both of Phoenix, Ariz., assignors to International Design Corporation, Phoenix, Ariz.

Filed Apr. 22, 1981, Ser. No. 256,258

Int. Cl.<sup>3</sup> B23Q 1/04

U.S. Cl. 269—71

11 Claims

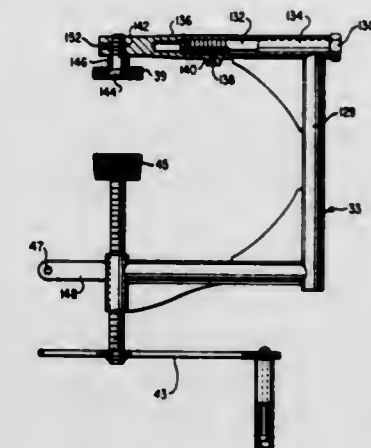


1. A clamping device to be used in connection with a flat work surface, including in combination:
  - a. an L-shaped bracket section having an end piece with a flat end surface oriented perpendicular to the work surface when the base of the bracket section is resting thereon;
  - b. means for attaching the base of the bracket section to the work surface in a manner to allow the position of the bracket section to be rotatably adjustable in the plane of, and rigidly tightenable against, the work surface;
  - c. a vise section for adjustably holding a work piece, comprising:
    - i. a mating surface oriented perpendicular to the work surface when the vise section is resting thereon;
    - ii. a pair of jaw members mounted for relative movement toward and away from one another for clamping a work piece therebetween;
    - iii. at least first, second, and third flat surfaces on the vise section each perpendicular to the mating surface for abutment against the flat work surface, said first and third surfaces being parallel to one another and perpendicular to said second surface;
    - iv. a pair of parallel spaced apart way members having coplanar jaw slide surfaces thereon parallel to the second flat surface on the vise section, wherein the relative movement of the jaws is upon the coplanar jaw slide surfaces, which jaw slide surfaces extend between the jaws and constitute a flat reference surface for receiving a flat surface of a work piece; and
  - d. means for releasably connecting the vise section to the end piece of the bracket section on the side opposite the base thereof, so that the mating surface of the vise section contacts the flat end surface of the end piece of the bracket section and the vise section is rotatably adjustable in the plane of the flat end surface of the bracket section and is rigidly tightenable against the bracket section in various rotational positions to cause different ones of said first, second, and third surfaces of said vise section to abut the flat work surface to thereby accurately index work pieces clamped between the jaw members to the flat work surface.

**4,418,902**  
**ADJUSTABLE PORTABLE SAW GUIDE DEVICE**  
Charles A. Genge, 108 Regent St., Apt. 6, Kingston, Ontario, Canada K7L 4J8  
Division of Ser. No. 158,202, Jun. 10, 1980, Pat. No. 4,307,513.  
This application Dec. 10, 1981, Ser. No. 329,583  
Int. Cl.<sup>3</sup> B25B 1/10

U.S. Cl. 269—258

3 Claims



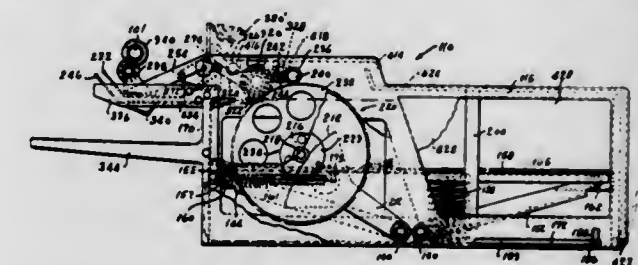
1. A clamp for use with a power saw guide assembly, which assembly is adapted to rest upon a generally flat work piece which includes an elongate trackway on an upper side thereof, said clamp being generally C-shape and having speed elongate arms extending outwardly from an arm-connecting member, one of said arms having thereon clamp screw means with a work-engaging end portion disposed toward the other arm, a trackway-engaging member on an outer end portion of said other arm, said trackway-engaging member extending from an outer end portion of other arm in a direction transverse to the lengthwise axis thereof, and means for angularly adjusting said outer end portion of the other arm about the lengthwise axis of said other arm.

**4,418,903**  
**LARGE CAPACITY COMBINATION MAGAZINE AND SHEET FEEDER FOR COPYING MACHINES**  
Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.  
Continuation of Ser. No. 110,924, Jan. 10, 1980, abandoned, which is a division of Ser. No. 898,139, Apr. 20, 1978, abandoned, which is a continuation of Ser. No. 269,774, Jun. 3, 1981, Pat. No. 4,362,297. This application Dec. 31, 1981, Ser. No. 336,033

Int. Cl.<sup>3</sup> B65H 5/00

U.S. Cl. 271—10

3 Claims



1. In a magazine and automatic sheet feeder for successively delivering sheets from a delivery end of said magazine in which the improvement comprises biasing means for raising said stack with its top sheets adjacent said discharge end, a one-way clutch brake for restraining said stack against upward movement when the top sheets are at a predetermined location adjacent to said discharge end, a feed roller, means mounting said feed roller on said magazine for swinging movement into engagement with the top sheet, means responsive to movement



of said roller after a sheet is fed from said magazine for releasing said brake, an inertial damper, and a one-way clutch coupling said inertial damper to said stack to limit the rate of upward movement of said stack.

4,418,904

## SHEET FEEDING APPARATUS

Sakae Fujimoto, Chofu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

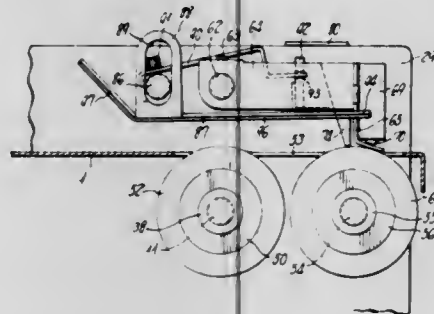
Filed Aug. 26, 1980, Ser. No. 181,631

Claims priority, application Japan, Aug. 27, 1979, 54-108873

Int. Cl.<sup>3</sup> B65H 3/06, 3/52, 3/54

U.S. Cl. 271—37

31 Claims



1. An apparatus for individually feeding a plurality of sheets, comprising:

- a tray for receiving a stack of sheets thereon;
- means including at least one sheet separation roller having a portion of its peripheral surface extending upwardly through said tray and a brake member urged against the peripheral surface of said sheet separation roller for feeding sheets individually from beneath said brake member;
- means including at least one sheet feed roller located upstream from said sheet separation roller and having a peripheral surface extending upwardly through said tray for feeding sheets stacked on said tray to said sheet separating roller;
- means including a pressure plate movable into a first position pressing sheets stacked on said tray against said sheet feed roller for feeding said sheets toward said sheet separation roller and thereafter into a second position away from said sheet feed roller for releasing said sheets from pressure contact with said sheet feed roller; and
- drive means associated with said pressure plate for moving said pressure plate into its second position during the period of time the leading edge of a sheet between said sheet separation roller and said brake member.

4,418,905

## SHEET FEEDING APPARATUS

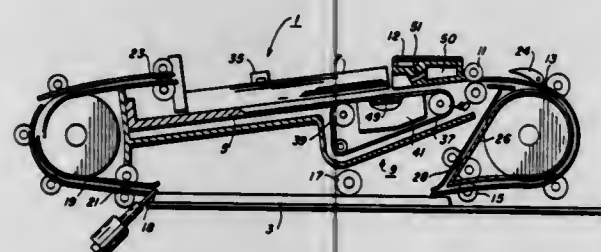
Gerald M. Garavuso, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1981, Ser. No. 317,219

Int. Cl.<sup>3</sup> B65H 3/14

U.S. Cl. 271—98

20 Claims



1. A sheet feeding apparatus for feeding sheets from a stack of sheets comprising a sheet stack supporting tray, means to feed a sheet from a stack of sheets, and air injection means disposed adjacent an edge of said tray to inject air between the sheet in the stack to be separated and the remainder of the

stack, said air injection means including means to inject a substantially planar stream of air between the sheet to be separated and the remainder of the stack, said planar stream of air having portions at its sides which converge toward the center of the planar air stream thereby providing both convergence in the planar stream and expansion in a direction perpendicular to that of the air stream to facilitate separation of the sheet to be separated from the remainder of the stack.

4,418,906

## SHEET STOCK TRANSFER APPARATUS

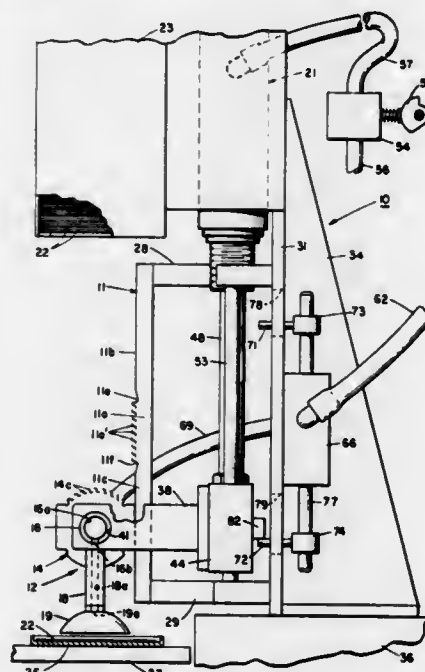
Richard H. Scott, Columbus, Ohio, assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,805

Int. Cl.<sup>3</sup> B65H 3/08

U.S. Cl. 271—99

15 Claims



1. An apparatus for transferring piece parts from a dispensing station to a receiving station, said apparatus comprising: means for releasably grasping a lowermost one of a stack of piece-parts when positioned at a dispensing station, and for positioning and releasing each such grasped piece-part at a receiving station, after having been transferred thereto;

means, connected to said grasping means, for reciprocally driving said grasping means sequentially along separate discontinuous linear paths of predetermined lengths while said grasping means approaches, arrives at, and is withdrawn from said dispensing and receiving stations, respectively, and for rotating said grasping means, and a piece-part when grasped thereby, along an arcuate path defined by a predetermined number of degrees of rotation while being transferred alternately from one of said linear paths to the other thereof;

said separate linear paths defined by said drive means, and along which said grasping means is sequentially driven, are co-linear, and separated by said arcuate transfer path, and wherein said rotation imparted to said grasping means by said drive means encompasses an arc of 180 degrees, thus effecting the complete inversion of a piece-part when transferred from said dispensing station to said receiving station by said releasable grasping means; and

said drive means includes a specially constructed rack and pinion, each of the latter two elements being formed with specially contoured transition regions that selectively cooperate to impart linear-to compound linear and rotational-to linear displacement to said pinion and, in turn, to said connected piece-part grasping means, when the latter is driven from said dispensing station to said receiving station, and vice versa, by said drive means.

4,418,907

## AUTOMATIC RELOADER-ELEVATOR FOR CUT SHEET PRINTING APPARATUS

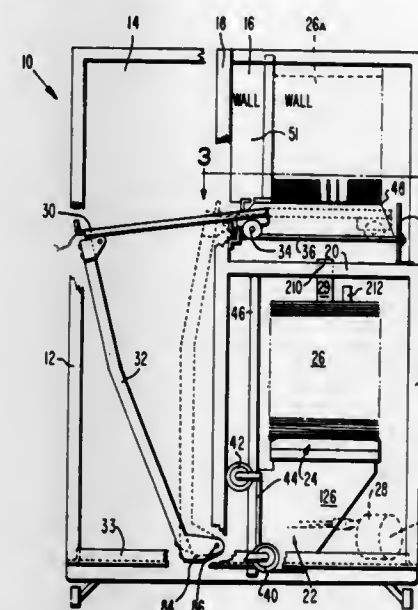
Richard E. Shultz, Maitland, and William E. Voecks, Jr., Winter Park, both of Fla., assignors to Burroughs Corporation, Orlando, Fla.

Filed Sep. 16, 1981, Ser. No. 302,953

Int. Cl.<sup>3</sup> B65H 1/26, 1/14

U.S. Cl. 271—157

7 Claims



1. Modular automatic reloader-elevator for cut sheet printing/copying apparatus wherein individual sheets of paper are fed from a stack to a feeding device and wherein fresh sheets are automatically reloaded momentarily interrupting the operation of the apparatus, comprising,

a main item feeding tray centrally, vertically, cantilever mounted for movement relative to a base support member, drive means for raising and lowering said feeding tray on demand along a vertical guide relative to said base support member;

means for sensing when said tray is exhausted of paper items; an item reloader tray arcuately, pivotally mounted so as to be movable normal to and into and out of the path of movement of said main item tray;

means for temporarily locking said item reloader tray in position in the path of movement of said main item tray so that said main item tray can engage said reloader tray for loading of items therefrom, and

means responsive to said sensing means for energizing said drive means effectively raising said main item tray into engagement with said reloader tray thereby unlocking said reloader tray and causing the paper items on said paper reloader tray to seat upon said main item tray simultaneously moving said reloader tray out of the path of movement of said main item tray enabling the item feeding to resume.

4,418,908

## ACTION GAME

Benjamin Kinberg, 425 Riverside Dr., New York, N.Y. 10025

Filed May 13, 1982, Ser. No. 377,709

Int. Cl.<sup>3</sup> A63F 7/00, 7/24, 7/30

U.S. Cl. 273—1 GE

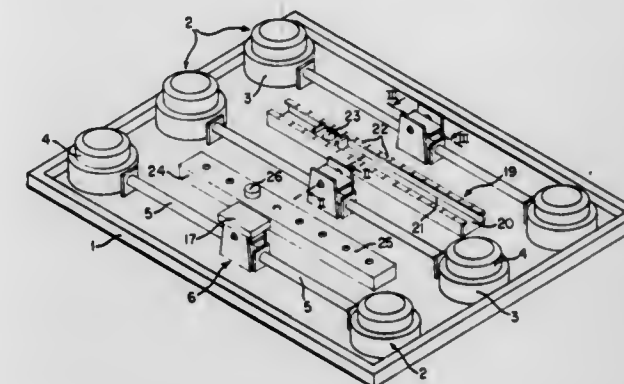
10 Claims

1. An action game for two or more players, comprising a base;

at least one set composed of at least two cooperating player stations on said base, each of said stations including a gas-containing elastically deformable volume-changing receptacle, a tube sealingly connected with the receptacle and having an open end, and a plunger fluid-tightly received in and reciprocable lengthwise of the tube, the tubes of said stations being axially aligned with one an-

other and the open ends thereof being somewhat spaced from each other;

at least one perch, including an element which is rockable about a pivot normal to the elongation of said tubes and including a normally horizontal cross-member and an upright member depending therefrom and located intermediate said open ends so that an impact upon said upright



member by one of said plungers which is propelled by gas expelled from a respective one of said receptacles, causes said element to rock about said pivot; and at least one figure adapted to rest on said perch and to be dislodged therefrom by rocking of said element in a direction towards whichever one of said plungers impacts said upright member first.

4,418,909

## GOLF TEE

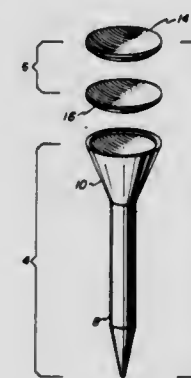
Anthony Messana, 2720 N. Ocean Blvd., Ft. Lauderdale, Fla. 33308

Filed Jun. 28, 1982, Ser. No. 392,644

Int. Cl.<sup>3</sup> A63B 57/00

U.S. Cl. 273—33

6 Claims



1. An improved golf tee for reducing undesirable golf ball rotation during flight after being struck by a golf club, said tee comprising:

- a golf tee having a head portion and an elongated stem portion;
- said head portion having an upwardly concaved socket portion for supporting a golf ball;
- said stem portion positioned beneath said head portion for penetration into and support from the ground; and
- an adhesive means;
- said adhesive means attached to at least a portion of said socket portion; p1 said adhesive means for releasable attachment to a golf ball placed on said tee;
- said adhesive means for effecting said reduction in golf ball rotation.



4,418,910

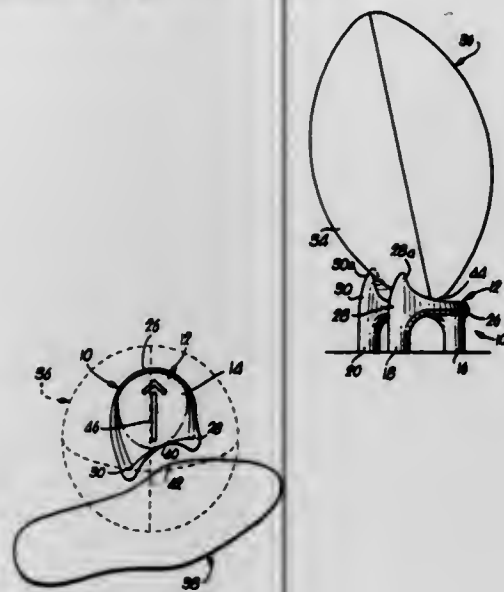
## FOOTBALL KICKING TEE

Jan Stenerud, Overland Park, Kans., assignor to Jan Stenerud and Company, Inc., Shawnee Mission, Kans.

Continuation-in-part of Ser. No. 234,425, Feb. 13, 1981, abandoned. This application Apr. 23, 1982, Ser. No. 370,782  
Int. Cl.<sup>3</sup> A63B 67/00

U.S. Cl. 273—55 B

21 Claims



1. A tee for supporting a football to be kicked soccer style comprising:

an upwardly facing platform for receiving the toe of a football to be kicked;

means for supporting the platform in an elevated, generally horizontal position above the football field, said platform having a forwardmost portion when oriented for normal use by a soccer style kicker and a rear portion located rearwardly of said forwardmost portion; and

structure projecting upwardly from the platform generally at said rear portion of the platform and of an effective height and located in disposition to engage the sidewall of a football placed on the platform to thereby maintain the football in a desired upright position as it is approached and then impacted by the upper instep side of the kicker's foot in performing a soccer style kick,

said structure including a pair of upstanding, upright elements projecting upwardly from the platform, spaced apart a distance less than the maximum width of the kicker's foot and located on opposite sides of the section of the platform upon which the toe of the football normally rests, means on said platform defining a forward-rearward axis for said platform,

one of the elements being positioned in closer spaced relationship to said forwardmost portion of the platform than the other element whereby a straight line between said pair of elements will intersect said axis at an acute angle thereto,

said one element being that element which is in closer proximal relationship to the kicker's toe when his foot is in normal instep impacting relationship to a football supported on said platform, than to the heel of the kicker's foot.

4,418,911

## VIDEO GAME PLATFORM PROVIDING SPATIAL DISORIENTATION

John B. Bowers, 126 Vine St., Chesterfield, Ind. 46017, and Rex A. Bowers, 2234 Urban-Dale, Shreveport, La. 71118

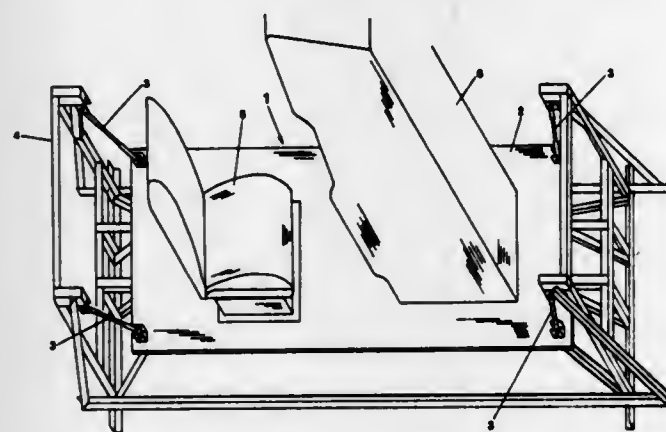
Filed Oct. 19, 1981, Ser. No. 313,056  
Int. Cl.<sup>3</sup> A63G 9/18; G09B 9/08

U.S. Cl. 273—85 G

1 Claim

1. A swivable platform apparatus comprising a rectangular frame assembly adapted to stand on a floor and having a support post attached to and extending upward from each corner thereof wherein each of the said posts has mounted at the top thereof an inward extending support arm comprising a rectan-

gular tubular member joined at one end to the said post and having attached to the other end thereof a downward opening channel bracket adapted to receive any of a plurality of like upper rod ends coupled thereto; a rectangular platform adapted to be suspended lengthwise of and above the frame assembly and adapted to receive a video game apparatus and an operator seat mounted thereon and adapted to support a video game apparatus, an operator seat, and an operator, and having bracket means attached thereto which bracket means are adapted to restrain and hold a video game apparatus and having an operator seat mounted thereon and having attached at each corner thereof an upward opening channel bracket adapted to receive any of a plurality of like lower rod ends coupled thereto; a plurality of like rod ends wherein each of the said rod ends is provided with an internally threaded barrel portion adapted to be coupled to a threaded end of a suspension rod and each of the said rod ends is swingably coupled by bolt means to one of the channel brackets; a plurality of like suspension rods, each rod having a plurality of right-hand threads at one end and a plurality of left-hand threads at the other end wherein each rod is adapted to be simultaneously coupled at one end to any of the upper rod ends and at the other end to any of the lower rod ends and is adapted to swingingly support a corner of the platform above the frame assembly; a downward opening cam follower assembly vertically mounted by bolt means to the bottom of the platform, comprising a cylindrical member externally threaded at the upper end



thereof and adapted for attachment to an internally threaded flange mounting and an internally threaded flange mounting attached to the threaded end of the cylindrical member and attached by bolt means to the platform, which downward opening cam follower assembly is adapted to receive a cam slidably and removably inserted therein; motor mounting means mounted on the frame assembly and adapted to support a vertically positioned motor comprising a pair of parallel and elevated motor mounting rails joined at their ends to a lengthwise extension of the frame assembly and having provided therebetween a motor mounting plate adapted to receive a motor mounted thereto; a vertically oriented motor mounted to the motor mounting means and having extending out of the top thereof a motor shaft adapted to receive a cam drive arm attached thereto; coupling means for coupling the motor to the motor mounting means; a horizontally mounted cam drive arm attached at one end to the motor shaft and adapted at its other free end to be coupled to a cam vertically displaced from the horizontal plane of the cam drive arm by a spacer; coupling means for coupling the cam drive arm to the motor shaft; a cam spacer attached to the free end of the cam drive arm which cam spacer is adapted to vertically displace a cam above the horizontal plane of the cam drive arm; a cam mounted to and above the free end of the cam drive arm and adapted to be slidably and removably inserted into the downward opening cam follower; and coupling means for coupling the cam spacer and cam to the free end of the cam drive arm.

4,418,912

## AMUSEMENT DEVICE

Robert Tottey, Lansing North Apts., 211-D, Ithaca, N.Y. 14850

Filed Aug. 13, 1982, Ser. No. 407,932

Int. Cl.<sup>3</sup> A63F 9/00

U.S. Cl. 273—138 R

14 Claims



1. A coin-collecting amusement device in the form of an animal, comprising:

a. a hollow body capable of being substantially filled with a liquid having a top, a flat base, an opening located above the flat base, and at least one transparent side portion;

b. a target adapted to receiving a coin located inside the hollow body, on the flat base and disposed substantially under the opening;

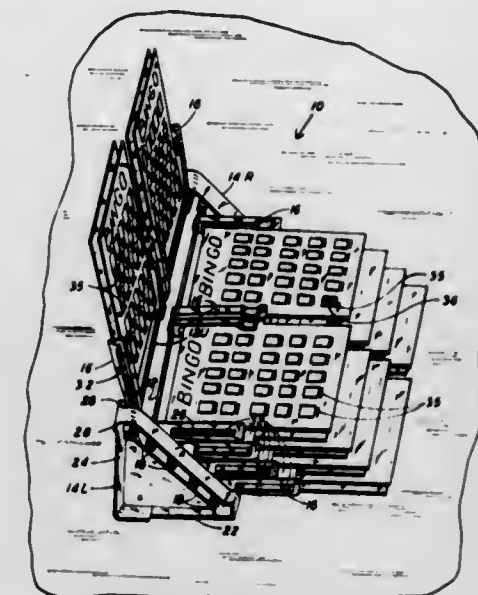
c. coin path means for guiding a coin into the body having an upper slot end adapted to receiving a coin and a lower end communicating with the opening in the body, whereby the coin is guided from the slot into the body;

d. delay means in the coin path means for slowing the passage of the coin through the coin path means;

e. covering means for simulating an animal, substantially hiding the body, coin path means and delay means, whereby the amusement device is caused to appear in the shape of an animal;

f. said covering means revealing at least enough to the transparent side portion of the body to allow the target to be seen from outside the body.

similar objects, and a pair of spring members to releasably restrain said cards in the pocket, said pair of clips being spaced



apart along said pivot pin to receive a pair of opposed such marginal portions.

4,418,914

## TOY PUZZLE ARRANGEMENT

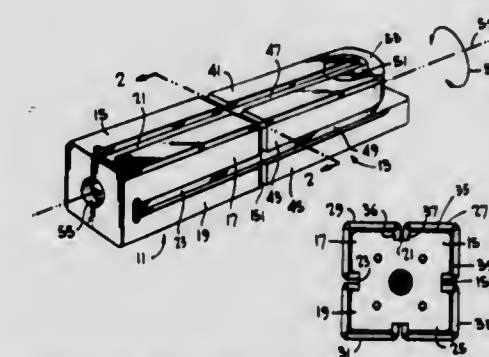
Peter Bauer, 13921 Eaworthy Rd., Germantown, Md. 20874

Filed Jan. 11, 1982, Ser. No. 338,722

Int. Cl.<sup>3</sup> A63F 9/08

U.S. Cl. 273—153 S

11 Claims



8. A toy puzzle arrangement comprising in combination: a base member formed to have a plurality of rail-like means as part thereof, said rail-like means bidirectionally oriented along first and second directions; a plurality of movable members each of which bears at least one indicium, said movable members formed and disposed to be slideably mounted on said rail-like means; turntable means formed to receive a movable member and enable it to be substantially rotated so that the indicium that it bears has its orientation changed; and positioning means formed and disposed to operate with said base member to receive a movable member and enable it to be moved in a third direction and further enable it to be transferred to said turntable means and selectively returned to said base member in seeking a solution to said puzzle; said base member and said positioning member being coupled by coupling means whereby said positioning member can be rotated orthogonally to said first and second directions.

4,418,913

## BINGO CARDS RACK AND CARD CLIP

Norman L. Hamilton, P.O. Box 391, Oilfield Rd., Cold Spring, Tex. 77331, and Charles B. Carpenter, San Leon, Tex., assignors to Norman L. Hamilton, Cold Spring, Tex.

Filed Apr. 26, 1982, Ser. No. 371,787

Int. Cl.<sup>3</sup> A63F 3/06

U.S. Cl. 273—150

13 Claims

1. A rack for holding bingo cards and similar objects of generally rectangular shape, said rack including a multiplicity of horizontal pivot pins disposed and supported parallel to one another in ascending staircase relationship, and a subassembly pivotally mounted on each pivot pin and having two stable positions at the extremes of its rotary motion, an approximately vertical position and an approximately horizontal position, each said subassembly comprising a pair of clips received on said pivot pin through a transverse opening in one end of the clip, pocket-defining end and side members to receive and hold a marginal portion of a pair of back-to-back bingo cards or

4,418,915

## PUZZLE OF STACKED SEGMENTS

Robert A. Calebs, 7406 Cross Creek Blvd., Louisville, Ky. 40228

Filed Jun. 11, 1982, Ser. No. 387,384

Int. Cl.<sup>3</sup> A63F 9/08

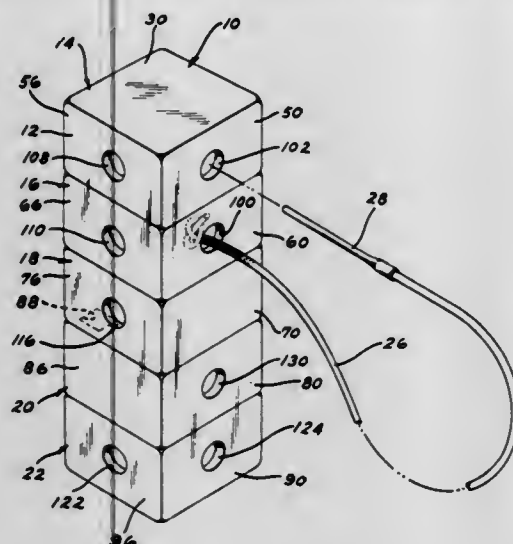
U.S. Cl. 273—159

15 Claims

1. A puzzle having a series of hollow segments in combination with a separate flexible connection comprising:



- a. the series of hollow segments being arranged in a unitary stack and having assembly means joining the segments together about a longitudinal axis of the stack so that each segment is adapted to be turned about this longitudinal axis;
- b. each hollow segment having certain side walls thereof formed with at least one hole, certain of the top and bottom walls of the segments having at least one corner hole;
- c. all of the holes in the said side walls being visible on the



- exterior of the puzzle at all times, while the holes of the top and bottom walls are visible after turning adjacent segments relative to each other to expose certain of the said corner holes;
- d. the flexible connection being adapted to be threaded in a particular order through certain of said holes one time only, so that all visible holes in the segments are traversed by the flexible connection without running out of the necessary length of the flexible connection in order to solve the puzzle correctly.

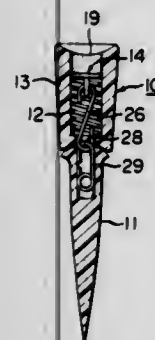
#### 4,418,916 TILT TOP GOLF TEE

Norio Matsuura, 6-10-16, Mino-o, Mino-o city, Osaka, Japan (562)

Filed Jun. 8, 1981, Ser. No. 271,547  
Claims priority, application Japan, Mar. 13, 1981, 56-20904  
Int. Cl.<sup>3</sup> A63B 57/00

U.S. Cl. 273—207

1 Claim



1. In a golf tee having a peg member including an elongated one end to be thrust into the ground, a head member for placement of a golf ball thereon, said head member having an axial bore formed therein, an elastic member disposed between the peg member and the head member, said elastic member being inserted in said bore, and, a pressure member which presses on said elastic member, and one end of said pressure member being secured to said peg member so that the lower surface of said head member and the upper surface of said peg member abut against each other, the improvement therein in which the pressure member comprises a stopper of a T-shape in cross section, a connecting element of a S-shape having one end

hooked to said stopper, and a spring hook hooked to said connecting element.

4,418,917

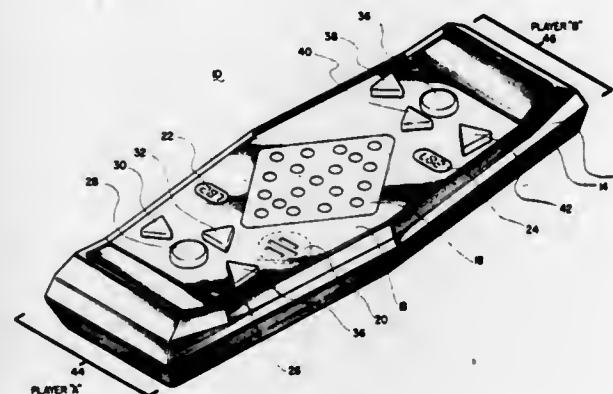
#### ELECTRONIC TARGET GAME

Bijan Jalali, Huntington Beach, and Luan G. Tran, Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 29, 1980, Ser. No. 220,623  
Int. Cl.<sup>3</sup> A63F 9/02

U.S. Cl. 273—313

7 Claims



1. An electronic game comprising:  
a display including first, second and third sets of indicia;  
input means responsive to commands from a player;  
first control means responsive to the input means for causing the first set of indicia to represent a first moving projectile;  
second control means responsive to the input means for causing the second set of indicia to represent a second moving projectile;  
third control means responsive to the input means for causing the third set of indicia to represent a moving target;  
first detection means for detecting a collision between either the first or second projectile and the moving target;  
fourth control means responsive to the first detection means for causing the third set of indicia to represent a moving obstacle; and  
fifth control means responsive to the first detection means for causing either the first or second set of indicia to represent a moving ball.

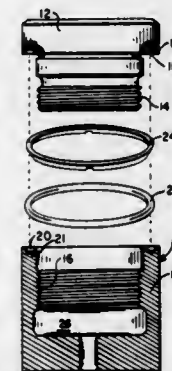
#### 4,418,918 STATIC SEAL DEVICE WITH PLASTICALLY DEFORMABLE METAL FOR CRYOGENIC REFRIGERATORS

Harry G. Nicoll, Norwell, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Mar. 14, 1983, Ser. No. 475,239  
Int. Cl.<sup>3</sup> F16J 15/08; F16L 19/02

U.S. Cl. 277—1

24 Claims



1. A face seal for sealing first and second components of a cryogenic refrigerator which define an enclosed chamber for the containment of pressurized gas comprising:

- a. the first component having an annular recess on a mating face at a radius from a center line;
- b. the second component having a mating face which forms a seal space with the first member when the mating faces of the two components are brought together;
- c. a packing member comprising an annulus of material at the same radius as the seal space; and
- d. an anti-rotation ring of the same radius as the annular seal space for insertion into said seal space, said ring having a bearing surface to allow rotation of one of the first and second components relative thereto and a wedge section for plastically deforming the packing member to form a seal between said first and second components.

4,418,919

#### MECHANICAL SEALS WITH SETTING BLOCK FOR USE WITH SLURRY PUMPS

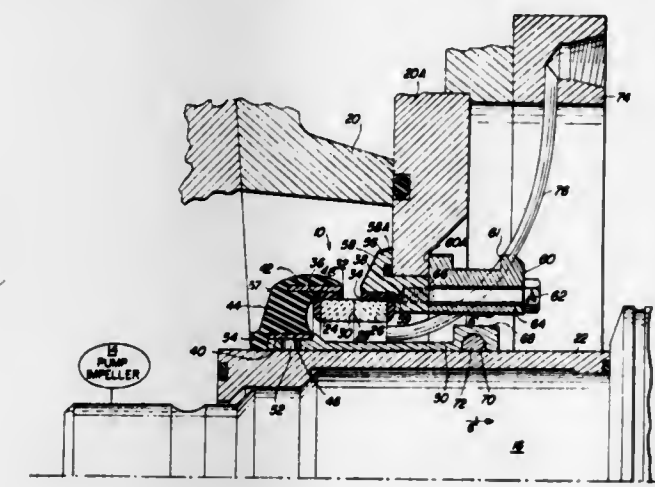
Robert S. Wentworth, Temecula, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 1, 1983, Ser. No. 471,093

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277—40

11 Claims



1. A mechanical seal assembly especially adapted for use with pumps whose pump product is abrasive and which is operatively associated with a pump housing and a motor-drive shaft driving a pump impeller, said seal comprising:  
a rotatable seal ring operatively connected to and driven with said shaft;  
a stationary seal ring operatively connected to said housing, each of said seal rings having a face opposing the face of the other seal ring and adapted to cooperate in sealing relation therewith;  
an elastomeric assembly supporting said rotatable seal ring, said elastomeric assembly including an annular member formed of elastomeric material, and a pair of concentric bands bonded thereto, said bands being axially and radially spaced from each other, said elastomeric assembly, when placed in an operative position on said drive shaft, urging said rotatable seal ring toward said stationary seal ring and being loaded in shear in the zone between said bands.

4,418,920

#### FLUID SEAL FOR ENGINE CRANKSHAFT APPLICATIONS

Jerome G. Belter, Mount Prospect, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 28, 1981, Ser. No. 335,150

Int. Cl.<sup>3</sup> F16J 15/34

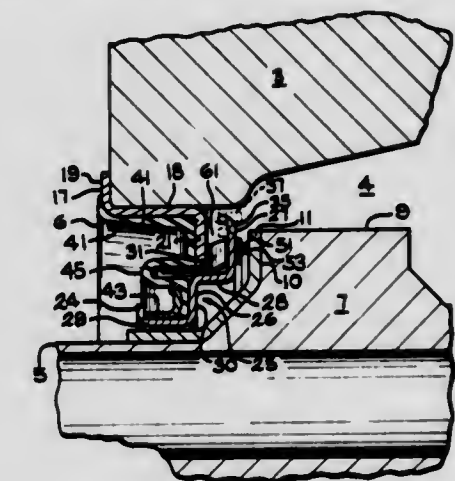
U.S. Cl. 277—50

15 Claims

1. A fluid seal for sealing between a stationary outer housing defining a chamber and a rotatable shaft having a sealing surface positioned in said chamber of said outer housing, said fluid seal comprising:

a raised surface on said shaft, said raised surface extending around the outer periphery of said shaft, said raised sur-

- face having a side that extends from said shaft in a direction substantially perpendicular to the surface of said shaft, said sealing surface located on said raised surface; an outer case for connecting to said outer housing, said case adapted for extending around the outer periphery of said shaft;
- a seal carrier for positioning in said housing, said seal carrier having a surface positioned adjacent said sealing surface on said shaft and an inner member extending around the outer periphery of said shaft, said inner member being in spaced apart relationship with said surface, said inner member positioned in spaced apart relationship to said outer case;
- a elastomeric diaphragm extending from said outer case to said inner member, said diaphragm being spaced apart from said surface of said seal carrier;



- a cavity defined between said outer case and said seal carrier, said cavity acting to insulate said diaphragm to reduce the transfer of heat from said seal to said diaphragm, said cavity being in communication with said chamber in said outer housing whereby fluid in said chamber can flow into said cavity to cool said seal and said diaphragm, said diaphragm forming one wall of said cavity;
- a seal positioned on said surface of said seal carrier for sealingly engaging said sealing surface on said shaft, said seal being spaced apart from said diaphragm whereby heat generated by said seal is not directly transferred to said diaphragm;
- means for biasing said seal into sealing engagement with said sealing surface on said shaft.

4,418,921

#### MECHANICAL SEAL

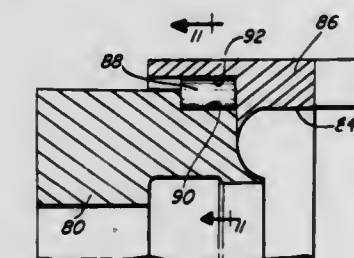
Winfred J. Wiese, Whittier, and Joseph A. Marsl, Rancho Palos Verdes, both of Calif., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 8, 1981, Ser. No. 261,870

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277—96.1

4 Claims

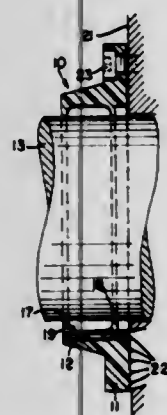


1. A mechanical seal assembly for use with a housing and a rotatable shaft, comprising:



a stationary seal ring connected to said housing and encircling and spaced from said shaft;  
 a rotatable seal ring connected to and encircling said shaft;  
 said seal rings having opposed seal faces;  
 means connecting said rotatable seal ring to said shaft while permitting limited axial movement thereof with respect to said shaft;  
 said connecting means comprising an axially elongated, generally cylindrical drive ring;  
 said drive ring having a first portion closely surrounding at least a part of said rotatable seal ring rearwardly of the seal face thereof and a second portion extending rearwardly of said rotatable seal ring;  
 lug means on said second portion of said drive ring drivingly connecting said drive ring to said shaft;  
 a cavity defined in part by said drive ring in said second part thereof;  
 an elastomer U-cup in said cavity;  
 a U-cup follower engaging said U-cup;  
 spring means urging said U-cup follower and thus said U-cup into said cavity, said U-cup urging said rotatable seal ring toward said stationary seal ring; and  
 means drivingly connecting said drive ring to the outside of said rotatable seal ring.

**4,418,922**  
**TRIPLE CONTACT SEAL**  
 Richard Janzito, St. Clair Shores, Mich., assignor to Martin Distributors, Livonia, Mich.  
 Filed Jan. 12, 1983, Ser. No. 457,496  
 Int. Cl.<sup>3</sup> F16J 15/32  
 U.S. Cl. 277-152

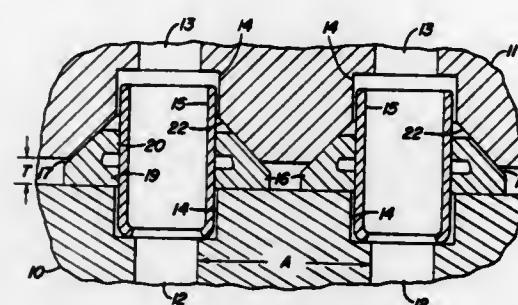


1. A triple contact seal for use on a shaft adjacent to a gear box, said seal including a circumferential body defining an aperture therethrough, a radial flange member, and a seal section connected to said radial flange member, said seal section extending in a direction away from said gear box, said seal section including an outer lip extending radially inwardly adapted to contact said shaft and an inner lip extending radially inwardly adapted to contact said shaft, said inner and outer lips being spaced apart from each other and defining a hollow chamber therebetween, said radial flange member including a sealing surface defined on the face of said flange member adjacent said gear box, said sealing surface including a plurality of circumferentially extending ribs adapted to contact the outer face of said gear box.

**4,418,923**  
**ENGINE OIL PASSAGE SEAL**  
 Sabah Halabiyah, Rheinhausen, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.  
 Filed Feb. 7, 1983, Ser. No. 464,164  
 Claims priority, application European Pat. Off., Feb. 15, 1982, 82300738.0

Int. Cl.<sup>3</sup> F16J 9/00, 15/12  
 U.S. Cl. 277-167.5

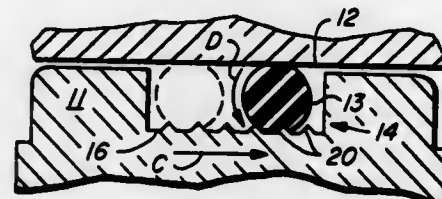
8 Claims



1. An engine oil passage seal of the type comprising a hollow dowel connecting oil passages in two casing parts and a sealing ring compressed around the dowel between the two casing parts, characterized in that the sealing ring has first and second annular webs which are joined at their outer peripheries, each web sealingly engaging a corresponding one of the two casing parts and at least the first web having a frustoconical outer surface which sealingly engages a surface of a frustoconical countersink in the corresponding casing part.

**4,418,924**  
**BI-SURFACE SEALING MECHANISM WITH ROLLING/SLIDING O-RING**  
 James F. Mack, 541 N. Bertrand, Flagstaff, Ariz. 86001  
 Continuation-in-part of Ser. No. 199,112, Oct. 20, 1980, abandoned. This application Jun. 16, 1982, Ser. No. 388,929  
 Int. Cl.<sup>3</sup> F16J 9/00, 15/56  
 U.S. Cl. 277-177

1 Claim

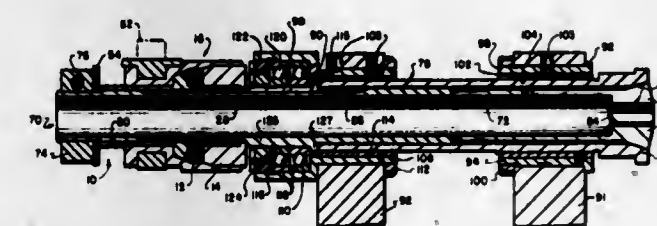


1. In combination with a piston having a cylindrical outer wall, having an imaginary centerline parallel to said cylindrical outer wall, and moving in a direction of travel parallel to said centerline, and a stationary cylinder wall concentric and adjacent to said cylindrical outer wall of said piston,  
 (a) a circumferential groove formed in one of said concentric walls and including  
 (i) a floor having serrations formed therein,  
 (ii) a pair of upstanding generally opposed elongate curved walls,  
 the shortest distance across said groove between said opposed wall thereof being generally constant along the length of said circumferential groove, and  
 (b) an endless annular elastic hose generally having, prior to being compressed in said groove,  
 (i) a constant circular cross-sectional area along the length thereof, and  
 (ii) a smooth continuous cylindrical surface area, said annular elastic hose being positioned in said circumferential groove against one of said opposed walls of said groove and compressed between  
 (c) said serrated floor of said groove, and

(d) a second surface formed integrally on one of said concentric walls,  
 said shortest distance across said groove being such that during movement of said piston in said direction of travel parallel to said centerline, said hose  
 (e) rolls away from one of said opposed walls of said groove and between said floor of said groove and said second surface toward said other of said pair of opposed walls of said groove,  
 (f) rolls to a position against said other of said pair of opposed walls of said groove, and  
 (g) maintains  
 (i) said position against said other of said pair of opposed walls of said groove, and  
 (ii) sliding contact with said second surface formed integrally on one of said concentric walls,  
 while said piston continues to move in said direction parallel to said piston centerline,  
 said serrations maintaining said hose in generally fixed position against said other of said pair of opposed walls of said groove while said piston continues to move in said direction of travel and causing said hose to roll at a generally equivalent rate along the length thereof from said one of said pair of opposed walls of said groove to said other of said pair of opposed walls of said groove.

**4,418,925**  
**COLLET CLOSING MECHANISM**  
 Florian I. Nowak, 16 Dean Dr., Newington, Conn. 06111  
 Continuation-in-part of Ser. No. 312,387, Oct. 19, 1981. This application Mar. 29, 1982, Ser. No. 363,104  
 Int. Cl.<sup>3</sup> B23B 31/20  
 U.S. Cl. 279-50

15 Claims

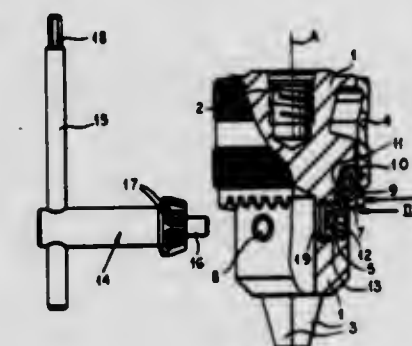


1. In a collet-operating mechanism, the combination comprising: a supporting sleeve member adapted for mounting upon a machine spindle; a flange portion extending circumferentially about said sleeve member and fixed thereon against axial movement in at least the rearward direction, said flange portion having an annular bearing surface on the oppositely directed forward face thereof; a collet-closing member slidably mounted for limited axial movement on said sleeve member and having a generally annular bearing surface disposed in confronting relationship with said flange portion bearing surface, at least one of said bearing surfaces being of generally frusto-conical configuration so as to cooperatively define an inwardly tapered circumferential channel therebetween; a multiplicity of wedge members disposed in a circular array for radial movement within said channel and extending about said sleeve member, said wedge members having a cross-sectional configuration conforming generally to that of said channel and having bearing surfaces on the axially spaced, forward and rearward faces, and the radially outward face thereof, each of said bearing surfaces on said forward and rearward faces being of compound configuration with an outer and inner zone, the inner zones of said compound faces being bevelled with respect to the corresponding outer zones to define ridge lines therebetween upon which said wedge member can pivot against said flange portion and closing member bearing surfaces, the ridge line on said forward face being offset outwardly from that on said rearward face to permit rocking movement of said wedge member; and an operating sleeve member slidably mounted for axial movement on said supporting sleeve member, and having a sidewall portion extending over said outward faces of said wedge members and defining a

compound circular recess therewithin comprised of a relatively large radius forward section, a relatively small radius rearward section, and a transition section therebetween, said operating sleeve member being movable between a rearward, open position in which said forward section of said recess is disposed over said circumferential channel, and a forward, closed position in which said rearward section is so disposed, the relatively large dimensions of said forward section of said recess permitting said wedge members to assume radially outward positions within said channel with said operating sleeve member in said open position, and the relatively small dimensions of said rearward section forcing said wedge members to radially inward positions with said operating sleeve member in said closed position thereof, said wedge members acting upon said bearing surfaces of said flange portion and said closing member to shift said closing member forwardly in said closed position of said operating sleeve member, whereby said closing member can effect closure of a collet operatively connected thereto, movement of said sleeve member from said closed position to said open position thereof promoting pivoting of said wedge members, thereby obviating any tendency for binding thereof in said channel, that might otherwise exist.

**4,418,926**  
**NONLOOSENING DRILL CHUCK**  
 Günter H. Röhm, Heinrich-Röhm-Strasse 50, 7927 Sontheim, Fed. Rep. of Germany  
 Filed Jun. 29, 1981, Ser. No. 278,066  
 Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3025021  
 The portion of the term of this patent subsequent to Jun. 22, 1997, has been disclaimed.  
 Int. Cl.<sup>3</sup> B23B 31/04, 31/12  
 U.S. Cl. 279-62

5 Claims



1. A drill chuck comprising:  
 a chuck body rotatable about a chuck axis and formed with a radially outwardly open threaded bore;  
 a plurality of jaws radially displaceable on said body;  
 a tightening ring rotatable on said body about said axis and at least partially axially overlapping said bore;  
 means including interengaging formations on said jaws and on said ring for radially displacing said jaws inwardly toward one another when said ring is rotated on said body in a tightening direction and for radially displacing said jaws outwardly away from each other when said ring is rotated on said body in a loosening direction opposite said tightening direction; and  
 a screw threaded in said bore and screwable therein in one direction for radial inward displacement in said bore and in the opposite direction for radial outward displacement into engagement with said ring, whereby when said screw is screwed out it engages said ring and blocks rotation of same.



4,418,927

**LOCKABLE DRILL CHUCK**

Günter H. Röhm, Heinrich-Röhm-Strasse 50, 7927 Sontheim,  
Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,430

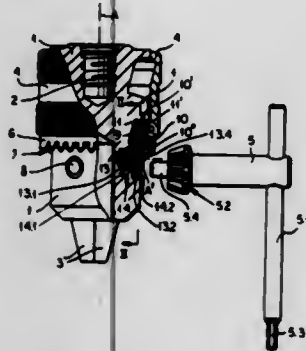
Claims priority, application Fed. Rep. of Germany, Jul. 2,  
1980, 3024996

The portion of the term of this patent subsequent to Jul. 29,  
1997, has been disclaimed.

Int. Cl.<sup>3</sup> B23B 31/04, 31/12

U.S. Cl. 279—62

8 Claims



1. A drill chuck comprising:
  - a chuck body rotatable about a chuck axis and formed with a radially outwardly open groove having a rear surface and with a radially outwardly open recess spaced axially forwardly of said groove and having an inner surface extending generally perpendicularly of said chuck axis and spaced axially from said rear surface;
  - a plurality of jaws radially displaceable on said body;
  - a tightening ring rotatable on said body about said axis, received in said groove, and having a rear edge engaging said rear surface and a front edge spaced axially from said inner surface;
  - means including interengaging formations on said jaws and on said ring for radially displacing said jaws inwardly toward one another when said ring is rotated on said body in a tightening direction and for radially displacing said jaws outwardly away from each other when said ring is rotated on said body in a loosening direction opposite said tightening direction; and
  - a locking element rotatable in said recess about a locking axis transverse to said chuck axis between a locking position wherein said element is, wedged axially tightly between said front edge and said inner surface and an angularly offset unlocked position wherein said element is substantially out of engagement with said front edge, whereby when said locking element is in said locking position it blocks rotation of said tightening ring on said chuck body.

4,418,928  
**ICE SKATE**

Michael W. Cox, P.O. Box 2, Alamo, Calif. 94507

Filed May 18, 1981, Ser. No. 264,454

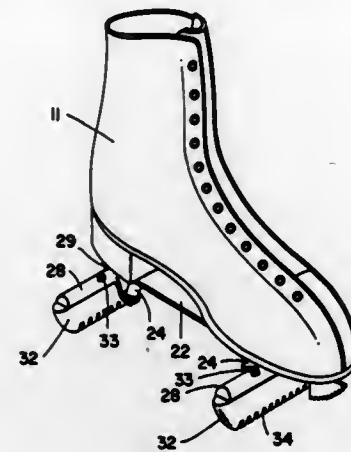
Int. Cl.<sup>3</sup> A63C 1/30

U.S. Cl. 280—11.14

10 Claims

1. An ice skate construction, comprising a longitudinally extending plate, a pair of ice engaging members, each secured to longitudinally opposed ends of said plate, each ice engaging member including a narrow, ice engaging lower surface, said ice engaging lower surface extending laterally and generally disposed transversely to the intended direction of travel, a plurality of recesses extending upwardly from said lower sur-

face and spaced apart laterally therealong, said recesses defining a plurality of ribs, said ribs adapted to impinge on an ice



surface in sliding fashion, and means for securing said plate to the foot of a skater.

4,418,929

**SINGLE ROLLER SKATE**

William J. Gray, 4915 S. Braden, #12-E, Tulsa, Okla. 74135

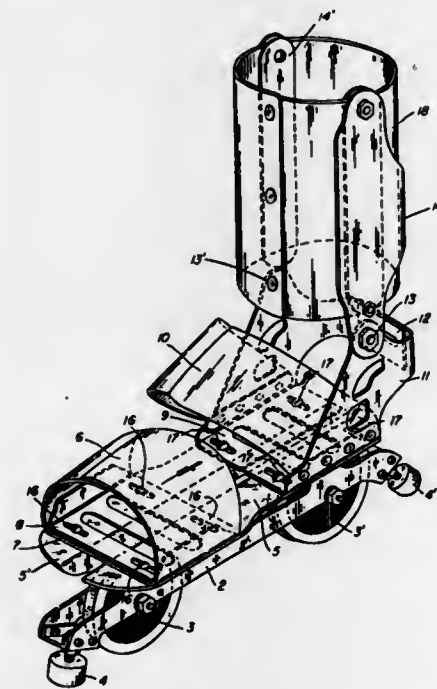
Continuation-in-part of Ser. No. 138,236, Apr. 7, 1980,

abandoned. This application Apr. 26, 1982, Ser. No. 371,660

Int. Cl.<sup>3</sup> A63C 17/06

U.S. Cl. 280—11.23

3 Claims



1. A single tract roller skate comprising,
  - (a) a platform formed from two aligned slotted plate segments having horizontal portions, the said segments extending downwardly and being joined together to form an undercarriage support member having two slots for mounting a front and a rear roller wheel on axles, the said roller wheel axles being directly mounted in the said slots of the said undercarriage, the said platform being slotted in the front part of the said horizontal portion to provide means to fasten
  - (b) a pair of slotted adjustable plates, slidably mounted on the front part of the said platform, the said plates being attached to each other respectfully, and to the said front part of the said platform by at least four screw bolts passing through at least four slotted sections in the said slotted adjustable plates and through four slotted sections in the said front part of the said platform, the said adjustable plates being positioned on the said platform so as to slide inwardly and outwardly across the said front part of the said platform, the said adjustable plates having a foot

support strap positioned between the said front part of the said platform and under the said pair of the said adjustable plates,

- (c) an adjustable rear bracket mounted on the rear surface of the said platform having a base and an upper section, the said base section of said adjustable rear bracket having an adjustable plate mounted on the said base section, the said base section and the said adjustable plate each having slotted sections aligned with four slotted sections located in the said rear surface of the said platform, the said adjustable plate and the said base section of the said adjustable rear bracket both being attached to the said rear surface of the said platform by four screwbolts, the said upper section of the said rear bracket having two adjustable slotted segments lapped over each other to adjust the opening of the said upper section of the said rear bracket, the said rear bracket being adjustable inwardly and outwardly, the said rear bracket having a pair of strap webbing attached thereto with means to secure the said strap webbing in a closed curve.

4,418,930

**BASEBALL/SOFTBALL CART**

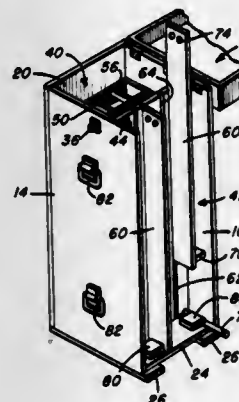
James J. Ryan, Jr., 8816 Rough Rider Rd. NE., Albuquerque, N. Mex. 87109

Filed Jul. 31, 1981, Ser. No. 288,190

Int. Cl.<sup>3</sup> B62B 1/10, 1/26

U.S. Cl. 280—47.19

13 Claims



1. A bat and ball cart comprising peripheral walls defining a vertically elongated housing with an interior, said housing having upper and lower ends, a bottom panel closing said lower end, a vertical partition transversely spanning the interior of the housing and defining two vertical compartments therein, each accessible through the upper end of the housing, said compartments comprising a bat compartment and a ball compartment, means dividing the interior of said bat compartment into a plurality of laterally aligned vertical cells, each cell adapted to vertically receive a bat and individually confining the bat, said ball compartment being adapted to receive balls therein for the full vertical height of the housing, and ball discharge means for vertically elevating balls within the ball compartment to the upper end of the housing for removal therefrom, said ball discharge means being located within said ball compartment and vertically moveable relative thereto, said ball compartment including at least one vertical pocket defined therein for receiving a vertical stack of balls, and means for selectively varying the width of said pocket for the selective accommodation of baseballs or softballs.

4,418,931

**REMOTELY ADJUSTABLE STEERING COMPENSATOR**

Durrell U. Howard, 306 Krameria Dr., San Antonio, Tex. 78213

Continuation-in-part of Ser. No. 93,968, Nov. 14, 1979. This

application Aug. 27, 1981, Ser. No. 296,617

Int. Cl.<sup>3</sup> B62D 5/06, 15/00

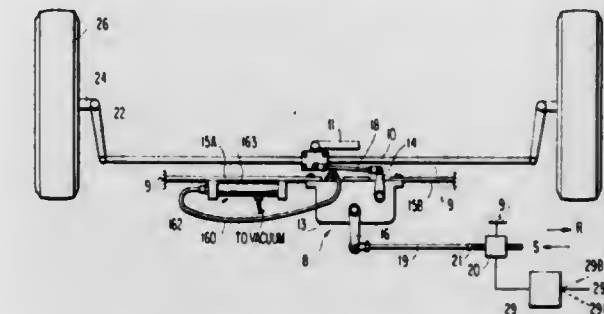
U.S. Cl. 280—94

42 Claims

1. A steering compensator apparatus for use on a vehicle having a steering system for moving at least one steerable

member to either side of a preselected position in response to a steering force transmitted through a reduction gear, said apparatus comprising:

resistance means connected to said steering system at a location between said steerable member and said reduction gear for providing a resistance force preventing substantial movement of said at least one steerable member away from said preselected position until the steering



force on the low ratio side of said reduction gear exceeds a predetermined value;

activating means operable for varying the amount of resistance force provided by said resistance means; and, control means for operating said activating means from a location remote to said resistance means such as a driver's station of said vehicle so as to selectively vary the amount of said resistance force while said vehicle is in operation.

4,418,932

**FRONT AXLE SUSPENSION SYSTEM FOR A VEHICLE CHASSIS**

Paul W. Claar, Ames, Iowa, assignor to Iowa State University

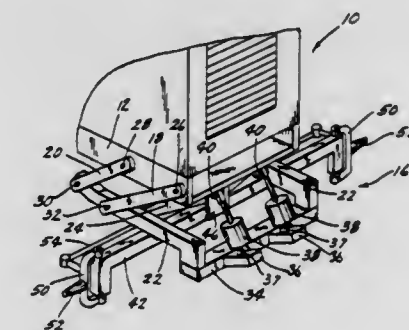
Research Foundation, Inc., Ames, Iowa

Filed Oct. 24, 1980, Ser. No. 200,211

Int. Cl.<sup>3</sup> B60G 9/02

U.S. Cl. 280—112 R

4 Claims



1. A front axle suspension system for an agricultural tractor chassis having forward and rearward ends and a longitudinal axis, comprising,

first and second pairs of links, each link having upper and lower ends and each pair of links being pivotally secured at their upper ends to opposite sides of said chassis and said pairs of links being adapted to pivot in unison about substantially horizontal axes transverse to the longitudinal axis of said chassis, said second pair of links being positioned rearwardly of said first pair of links,

a coupler pivotally connected to the lower ends of said first and second pairs of links and extending forwardly therefrom,

a generally horizontal front axle connected to said coupler link,

means for mounting at least one wheel on said front axle for rotation about a generally horizontal wheel centerline, and

a dampener means interconnecting said coupler link and chassis to yieldably resist movement of said axle relative to said chassis,



the pivotal connections of said first and second pairs of links and said coupler link being so arranged that the instantaneous center of said suspension system in moveable in response to pivotal movement of said first and second pairs of links and said coupler link and will always be below and rearwardly of said wheel centerline and said first and second pairs of links and said coupler link being so arranged that said horizontal axle is reciprocally moveable in an upwardly and rearwardly inclined plane relative to said chassis in response to pivotal movement of said links.

**4,418,933**  
**TRANSPORT FOR TRANSVERSE FARM EQUIPMENT HEAD**

James D. Wilcox, Jr., Rte. #1, Cleghorn, Iowa 51014  
Filed Jul. 16, 1981, Ser. No. 284,109  
Int. Cl.<sup>3</sup> B62D 21/12

U.S. Cl. 280—400

5 Claims

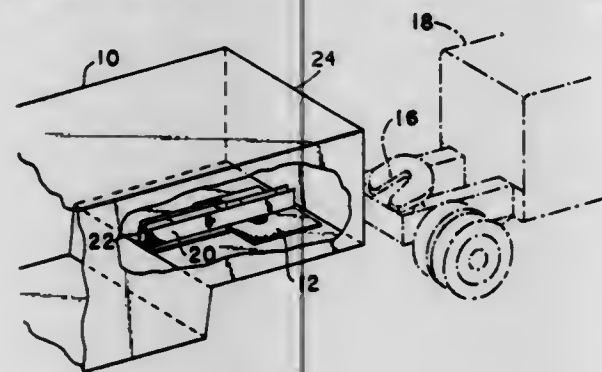


1. In combination with a horizontally elongated farm equipment head adapted to be transversely advanced and having first and second ends and front and rear sides, a mount component semi-permanently supported from said head adjacent but spaced from one end of said head toward the other end thereof and including a first upstanding portion extending upwardly along said rear side and a second elongated horizontal portion including opposite ends, said second portion being carried by the lower end of said first portion with one end of said second portion disposed adjacent the lower end of said first portion and the other end of said second portion projecting transversely beneath said head toward the front side thereof, a pair of right and left elongated axle assemblies each including a mounting end and a wheel journaling end, the opposite ends of said second elongated horizontal portion defining right and left mount portion, said mount portions and said mounting ends including coacting means releasably supporting said mounting portions from said second portion ends with said wheel journaling ends being disposed horizontally and generally parallel each other, and support wheels journalled from the wheel journaling ends of said axle assemblies.

**4,418,934**  
**PIVOTAL BOLSTER PLATE**  
Carl F. Mickey, High Point, N.C., assignor to W. F. Mickey Body Company, Inc., High Point, N.C.  
Filed Apr. 6, 1982, Ser. No. 365,954  
Int. Cl.<sup>3</sup> B62D 53/08

U.S. Cl. 280—438 R

8 Claims



1. A pivotal mounting for a bolster plate on a trailer which has an elongated support extending longitudinally in the center

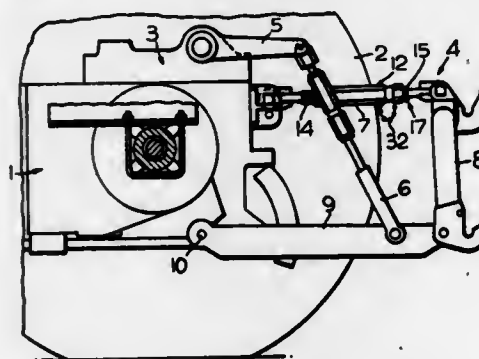
of a bottom of a forward portion of the trailer, the mounting comprising

- a shaft extending parallel to the trailer support,
- a pair of thrust bearings mounted on the support and rotatably supporting opposite ends of the shaft,
- a bolster plate secured for rotation with the shaft on the bottom side of the shaft,
- a king pin mounted on the bolster plate, and
- a center bearing mounted on the support and having bottom groove-like bearing means engaging a center portion of the shaft on the upper side of the shaft.

**4,418,935**  
**PIN LOCK FOR ADJUSTABLE LINK OF A THREE-POINT HITCH**  
John W. O'Connor, Hales Corners, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.  
Filed Dec. 14, 1981, Ser. No. 330,508  
Int. Cl.<sup>3</sup> B60D 1/14

U.S. Cl. 280—461 A

11 Claims

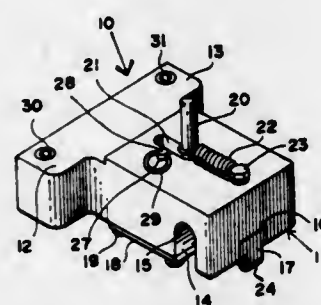


1. A three-point hitch having a lock on an adjustable length link comprising, an internally threaded sleeve threadedly receiving an externally threaded screw member forming a threaded interface between the sleeve and screw member, said sleeve having a shoulder on the end receiving said screw member, means defining a slot interrupting the threaded interface formed by said sleeve and said screw member, a pin received in said slot to prevent relative rotation between said sleeve and said screw member, a latch on said pin including a ring biased toward the side of said pin engaging the shoulder on said sleeve preventing its movement from the slot in said link.

**4,418,936**  
**TOW BAR HEAD FOR AIRCRAFT**  
Kenneth E. Adams, 11021 SW. 44th St., and Bertram C. Adams, 11370 SW. 60th Ter., both of Miami, Fla. 33165  
Filed May 28, 1982, Ser. No. 383,240  
Int. Cl.<sup>3</sup> B60D 1/14

U.S. Cl. 280—493

7 Claims



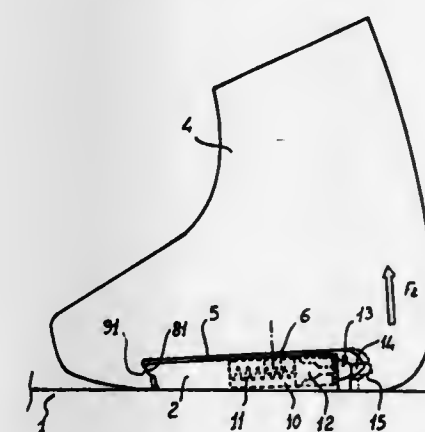
1. In a tow bar coupling head for commercial aircraft of the type equipped with a cylindrical cross pin for tow bar coupling, the combination comprising, a steel tow bar head body member, said body member being of substantially rectangular shape, means for removably joining the rearward end of said body member to a tow bar, and means for releasably intercon-

necting a forward end portion of said body member to an aircraft cross pin, said releasable interconnecting means comprising a transverse slot in the underside of said body member and in spaced relation with respect to said forward end of said body member, the underside of said body member further having a longitudinally-extending recess open at the forward end of said body member, and a slide lock member slidably received within said longitudinal recess and movable between covering and uncovering positions with respect to said transverse slot for selectively locking and unlocking an aircraft towing cross pin received within said transverse slot.

**4,418,937**  
**LATCHING APPARATUS FOR USE WITH SKI BINDING**  
Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, S.A., Annecy, France  
Filed Nov. 25, 1980, Ser. No. 210,222  
Claims priority, application France, Nov. 28, 1979, 79 29807  
Int. Cl.<sup>3</sup> A63C 9/08

U.S. Cl. 280—613

44 Claims



1. A latching apparatus for use with a ski binding, said apparatus comprising:  
(a) a latching element adapted to be pivotable multidirectionally around more than one axis upon the application of an external force, said latching element comprising a shoulder;  
(b) elastic means adapted to bias said latching element and to allow for the multidirectional pivoting thereof;  
(c) support means adapted to support said shoulder with at least a portion of said latching element extending through said support means; and  
wherein said elastic means comprises at least two spring means, each of said spring means being positioned on opposite sides of a plane of symmetry extending through said latching apparatus.

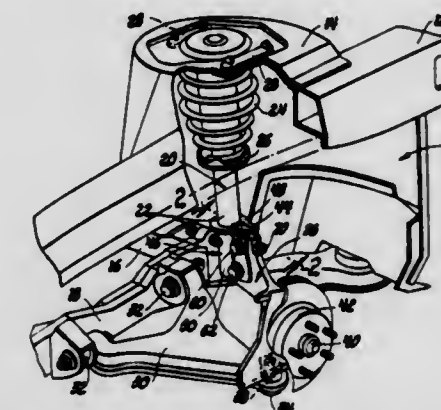
**4,418,938**  
**VEHICLE STRUT SUSPENSION WITH CAMBER ADJUSTMENT**  
Floyd A. Sullivan, Grand Ledge; Arthur H. Elbers, Holt, and Charles M. Trierweiler, Lansing, all of Mich., assignors to General Motors Corporation, Detroit, Mich.  
Filed Sep. 21, 1981, Ser. No. 304,320  
Int. Cl.<sup>3</sup> B62D 17/00

U.S. Cl. 280—661

3 Claims

1. In a vehicle wheel suspension including a wheel support means, a wheel thereon, a strut arranged on a generally upright axis and connected at its upper end to the vehicle sprung mass and at its lower end adapted for connection to the wheel support means, and a lateral arm member swingably mounted at an inner end on the sprung mass and connected at its outboard end by joint means to a lower end of the wheel support means, the improvement which comprises, said axis of said strut being so disposed relative to the median vertical plane of said wheel as to create a force couple urging the top of said wheel inboard of the vehicle sprung mass, a pair of bracket walls on said strut lower end and including upper and lower sets of horizontally

aligned bolt holes, a portion of said wheel support means received between said bracket walls and including upper and lower bolt-receiving apertures each registered in combination with a corresponding said set of bolt holes, bolt fasteners extending through each said bolt hole sets and registered apertures, one of said aperture or bolt hole set of one of said bolt hole set and registered aperture combinations being of enlarged size in direction inboard and outboard the vehicle sprung mass relative to the size of said bolt fastener to permit a limited range of relative movement between said strut lower end and said wheel support portion for wheel camber adjust-

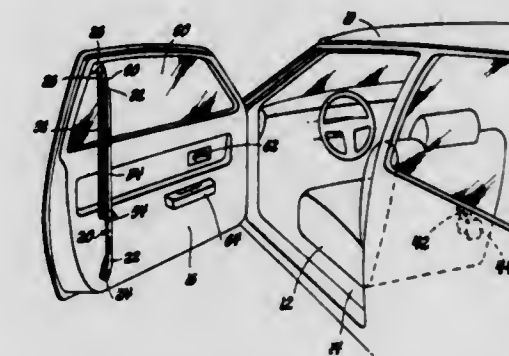


ment, and a set screw otherwise unconstrained but threadedly mounted in one of said wheel support portion or strut lower end adjacent said enlarged aperture or bolt hole set and extending transversely of the vehicle sprung mass, said set screw having its inboard end exposed to be abutted under the urging of said force couple against the other of said strut lower end and wheel support portion whereby to provide thereat a physical stop resisting said force couple, said set screw being threadable transversely to locate said wheel support means at a selected camber setting within the range of movement permitted by said enlarged aperture or bolt hole set.

**4,418,939**  
**STORAGE OF A SEAT BELT ON A DOOR**  
Larry D. Miller, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.  
Filed Feb. 2, 1982, Ser. No. 345,081  
Int. Cl.<sup>3</sup> B60R 21/02

U.S. Cl. 280—803

2 Claims



1. In an occupant restraint system having a shoulder belt end mounted on the upper rear corner of the door and a lap belt end mounted on the lower rear corner of the door and a first buckle element carried by the shoulder belt and lap belt and adapted for engagement within a second buckle element mounted on the vehicle body inboard the occupant seat so that lap and shoulder belt portions are established in restraining positions across the seat when the door is closed, said second buckle element permitting disengagement of the first buckle element therefrom; the improvement comprising:  
an auxiliary storage element mounted on the upper rear corner of the door and adapted for engagement by the first



buckle element so that the lap belt portion and shoulder belt portion are stored in a generally vertically hanging relationship along the door, and a slip ring encircling both the lap and shoulder belts, said slip ring being slidable along the lap and shoulder belts so that the slip ring assumes a position adjacent the first buckle element when the first buckle element is engaged with the second buckle element to enable separate positioning of the lap and shoulder belts across the seat and said slip ring falling along the vertically hanging lap and shoulder belts when the first buckle element is engaged in the auxiliary storage element so that the slip ring couples the shoulder belt and lap belt in overlying neat stored relationship along the door.

4,418,940

# COUPLING ASSEMBLY FOR THE DRIVE DEVICE OF A PASSIVE VEHICLE OCCUPANT RESTRAINT BELT SYSTEM

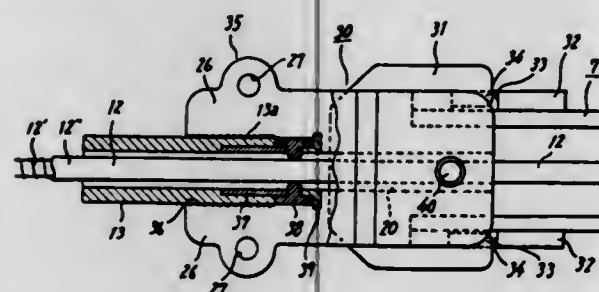
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan  
Filed May 28, 1981, Ser. No. 267,891

Claims priority, application Japan, Jun. 13, 1980, 55-081832[U]

Int. Cl.<sup>3</sup> B60R 21/00

U.S. Cl. 280-804

4 Claims



1. In a passive vehicle occupant restraint belt system having a drive wire received in a casing along the part of its length that is adjacent a guide rail, such part of the drive wire having a covering of polymeric material that carries a lubricant to facilitate movement of the wire longitudinally through the casing, a coupling assembly for joining the casing to the guide rail comprising a coupling member having a socket adapted to receive and retain an end portion of the casing, a connector portion fitted to the guide rail, means for joining the connector portion to the guide rail, a hole through the connector portion communicating the socket with the guide rail and receiving the drive wire for longitudinal movement, and a sealing ring received within the hole in sealing engagement with the drive wire to confine the lubricant to the casing and prevent it from intruding into the guide rail.

4,418,941

# COLOR-FORMING SHEET FOR NO-CARBON COPYING PAPER

Mitsuru Fuchigami; Mamoru Ishiguro, both of Takasago, and Hideo Obye, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 19, 1981, Ser. No. 312,912

Claims priority, application Japan, Oct. 22, 1980, 55-148063

Int. Cl.<sup>3</sup> B41M 5/22

U.S. Cl. 282-27.5

8 Claims

1. No-carbon copying paper with improved edge padding aptitude layered in sets each comprising one color forming upper sheet and one color developing lower sheet, said color-forming sheet being coated with a coating color basically composed of color former-containing synthetic resin microcapsules, a capsule protective agent and an adhesive, said coating color containing a nonionic surface active agent having a hydrophilic-lipophilic balance (HLB) of 10 or above in an amount of 0.1 to 4% by weight based on the microcapsules, the

cut face of the no-carbon copying paper layered in sets being covered with a hydrophilic fan apart adhesive.

4,418,942

# MICROCAPSULE SHEET FOR PRESSURE-SENSITIVE RECORDING PAPER

Noriyuki Hosoi; Yoshiyuki Hoshi, and Hiroharu Matsukawa, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 29, 1981, Ser. No. 335,487

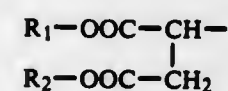
Claims priority, application Japan, Dec. 29, 1980, 55-185667

Int. Cl.<sup>3</sup> B41M 5/22

U.S. Cl. 282-27.5

15 Claims

1. A wrinkle-free pressure-sensitive microcapsule recording paper, prepared by a process comprising the steps of providing a support base paper; coating one surface of said support base paper with a color developer-coating solution wherein said color developer-coating solution is comprised of a color developer dissolved or dispersed in a solvent selected from the group consisting of organic solvents and water; and coating the other surface of said support base paper with a microcapsule coating solution, wherein said microcapsule coating solution is comprised of microcapsules, a binder, a surfactant, and a protective agent, wherein said microcapsules contain an electron-donating color former, said binder has a solid content of 20 to 50 parts by weight per 100 parts by weight of the solid content of said microcapsules, wherein said surfactant is used in an amount such that the solid content is 0.0001 to 10 parts per 100 parts by weight of said solid content of said microcapsules and has a hydrophobic atomic group of the formula:



wherein R<sub>1</sub> and R<sub>2</sub> are each an aliphatic hydrocarbon having 2 to 20 carbon atoms or aromatic hydrocarbon having 6 to 20 carbon atoms.

4,418,943

# DUCT FITTING

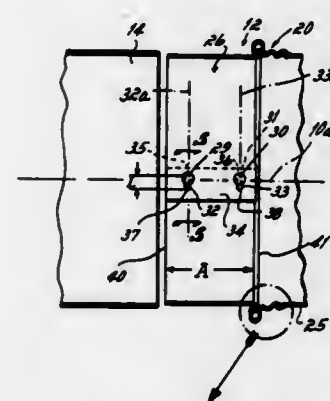
Samuel A. Ionna, Cincinnati, Ohio, assignor to The Williamson Company, Cincinnati, Ohio

Filed Aug. 24, 1981, Ser. No. 295,788

Int. Cl.<sup>3</sup> F16L 25/00

U.S. Cl. 285-12

14 Claims



1. A duct fitting that allows connection of said fitting to either the female or the male end of a duct, said fitting comprising a ring and a collar assembled one with another, said collar being expandable relative to said ring between a maximum circumference position position defining means on said collar defining said minimum and maximum position, and a minimum circumference position, said collar being re-

ceivable over the male end of a duct in said maximum position and being receivable within the female end of a duct in said minimum position, and connector means by which said collar is connected with said ring, said connector means being structured to permit expansion and contraction of said collar rotative to said ring as desired by said fitting's user, said connector means comprising an inwardly turned bead fixed on one of said ring and said collar, and a flange connected to the other of said ring and said collar, said bead and said flange cooperating to permit said collar to be expanded or retracted as desired by said fitting's user without substantial relative axial movement therebetween.

4,418,944

# FLUID COUPLING

Stephen W. Haines, 13616 Utt Dr., Tustin, Calif. 92680; Stephen R. Marshall, 25971 Cordillera Dr., Mission Viejo, Calif. 92675; Mark E. Steen, 3343 Gingham Ct., Chino Hills, Calif. 91710, and Robert C. Swanland, P.O. Box 2815, Riverside, Calif. 92506

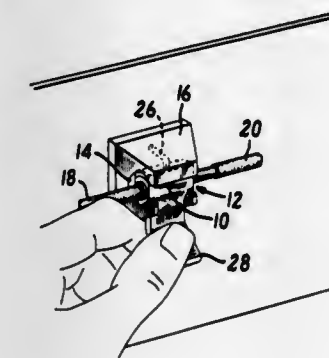
Filed Feb. 11, 1981, Ser. No. 233,360

Int. Cl.<sup>3</sup> F16L 35/00

U.S. Cl. 285-24

11 Claims U.S. Cl. 285-70

29 Claims



1. In a fluid coupling having a male member including a generally rigid base portion and an attached, relatively resilient face portion and a first fluid flow path, having a centerline, extending therethrough from an opening in the resilient face portion, and a female member including a body portion having a generally cylindrical bore extending therethrough with an opening in one wall of the female body portion communicating with the bore along its full length and cooperating therewith to form a generally C-shaped receptacle for receiving and rotatably supporting the male member, the female member having a second fluid flow path opening from a generally arcuate wall of the receptacle for fluid communication with the first fluid flow path in the male member, the improvement comprising, first cam surface means formed on said female member in substantially diametrically opposed relation to said second fluid flow path opening, second cam means on said male member in position to engage and cooperate with said first cam means on said female member, said second cam means being located on said male member on a surface thereof substantially opposite said first fluid flow path opening, said male member being dimensioned when oriented in a first position to be passed through said opening in said one wall of the female member into said receptacle, and to be retained in the receptacle when rotated to a second position, said first fluid flow path opening and said second fluid flow path opening being aligned and in fluid communication when said male member is in said second position, detent means on one of said male and female members and cooperating with the other of said male and female members to releasably retain said male member in said second position, means for aligning said first fluid flow path and said second fluid flow path in said second position, said first and said second cam means being located to urge

said male and female members together whereby said resiliently face portion is forced into sealing engagement with said female member with a sealing force directed along the opening to the fluid flow path in the male member when the male member is rotated to the second position, and a substantially linear third fluid flow path having a centerline and extending through the male member from end portions received at ends of the receptacle and transversely to and in communication with the first fluid flow path, said first fluid flow path and said third fluid flow path being oriented such that the centerlines of said first fluid flow path and said second fluid flow path essentially intersect, whereby the fluid coupling is a T coupling, said rotation being about an axis substantially parallel to said linear third fluid flow path.

4,418,945

# STERILE CONNECTORS

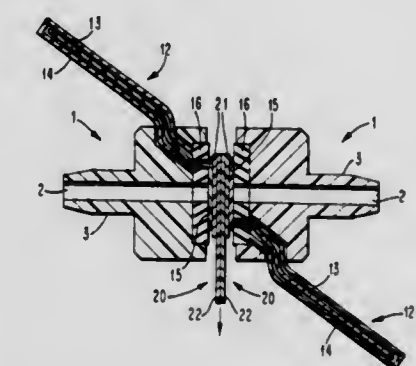
Robert M. Kellogg, Washington Crossing, Pa., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1981, Ser. No. 270,954

Int. Cl.<sup>3</sup> F16L 55/00

U.S. Cl. 285-70

29 Claims



1. A sterile connector comprising: a resilient, deformable washer having an aperture and a passage therein, a continuous, removable, yieldable strip material a portion of which is removably adhered to said washer and overlies said aperture, another portion thereof extending through said passage, means surrounding said another portion of said strip connected to said passage for receiving said a portion of said strip material when a force is applied to said means and said another portion to expose said aperture.

4,418,946

# QUICK ACTING COUPLER

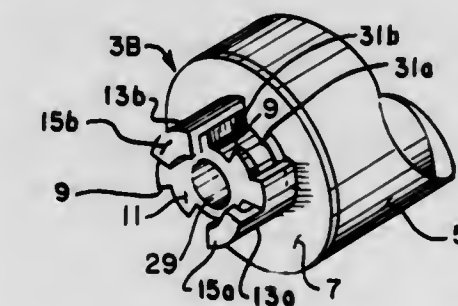
Thomas F. Gambon, 12815 Greenville La., St. Louis, Mo. 63141

Filed Feb. 6, 1981, Ser. No. 232,166

Int. Cl.<sup>3</sup> F16L 37/24

U.S. Cl. 285-73

3 Claims



1. A connector for coupling two objects together and for transmitting axial, shear, and bending loads between the ob-



jects, said connector comprising a pair of identical connector members, one for each said object, each of said connector members being a one piece member capable of being molded in a pull apart mold, each said connector member having a base, a hub projecting axially outwardly from said base, said hub having an end face, a pair of arms integral with said base on generally diametrically opposed sides of the hub extending out beyond the end face of the hub, each of said arms having a flange projecting radially inwardly, and a pair of grooves in the side of the hub, said arms and grooves alternating with one another and being substantially equally angularly spaced relative to one another around the hub, said hub further having a partial flange adjacent the end face of the hub and closing off a portion of each of said axial grooves and having a gap of sufficient distance between the end of the partial flange and the opposite side of the groove to permit said arm and flange of the other connector member to be axially received therein as the connector members are moved axially relative to one another into an interfit position in which said flanges and arms of both of said connector members are received in said axial grooves of the other connector members, said flanges and partial flanges having cooperable surfaces thereon which are cammingly engagable with one another upon rotation of said connector members relative to one another from their interfit position to a coupled position so as to axially draw said connector members together, said base having a pair of part circular openings therethrough adjacent said hub on opposite sides thereof, each of said part circular openings spanning an arc substantially similar to the arc spanned by its respective flange and partial flange enabling a straight through mold part to form portions of said flanges, said partial flanges, and said axial grooves.

4,418,947

# SWIVEL JOINT FOR IMPROVED BEARING AND SEAL LIFE

Larry J. Talafuse, Denver, Colo., assignor to FMC Corporation, Chicago, Ill.

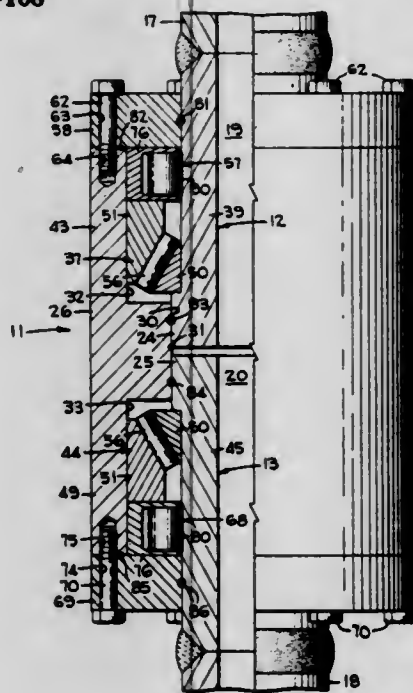
Filed Feb. 19, 1981, Ser. No. 235,865

Claims priority, application United Kingdom, Mar. 21, 1980, 8009731

Int. Cl.<sup>3</sup> F16L 27/00

U.S. Cl. 285—168

5 Claims



1. A swivel joint for connecting two lengths of pipe, said joint having extended bearing and seal life, said joint comprising:
  - an annular sleeve having an axial passage extending through said sleeve;
  - first and second annular inner members each having an axially extending bore therethrough;

means for rotatably mounting said first and second inner members in said axial passage of said annular sleeve;

a first thrust bearing means mounted between said sleeve and said first inner member for absorbing axial thrust between said sleeve and said first inner member;

a second thrust bearing means mounted between said sleeve and said second inner member for absorbing axial thrust between said sleeve and said second inner member;

a first unidirectional unit connected between said sleeve and said first inner member to allow said sleeve to rotate in a first direction relative to said first inner member and prevent said sleeve from rotating in a second direction relative to said first inner member;

a second unidirectional unit connected between said sleeve and said second inner member to allow said sleeve to rotate in said second direction relative to said second inner member and prevent said sleeve from rotating in said first direction relative to said second inner member; and

sealing means mounted between said sleeve, and said first and said second inner members.

4,418,948

# ELASTIC COUPLING FOR PIPES AND TUBES

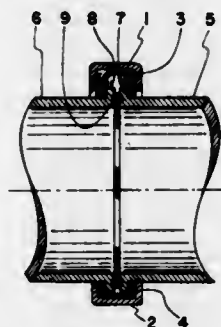
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Ronald R. Chapman, 9425 Calle El Milagro, Tucson, Ariz. 85704

Filed May 6, 1981, Ser. No. 261,042

Int. Cl.<sup>3</sup> F16L 25/00, 17/00, 27/10, 21/00

U.S. Cl. 285—420

3 Claims



1. An elastic coupling for coupling two abutting ends of tubes, said elastic coupling comprising in combination:
  - (a) a rigid clamping collar of substantially closed loop including a groove disposed along the inward side of said rigid clamping collar, said rigid clamping collar constructed in a split structure and having means for clamping down around two tube sections having circumferential flanges at the abutting ends; and
  - (b) a segmented hollow elastic ring of a substantially annular cross section having a slitted opening disposed along the inward side of said segmented hollow elastic ring for receiving and containing a pair of circumferential flanges of two tube sections disposed at the abutting ends, said segmented hollow elastic ring confined circumferentially within said groove included in said clamping collar wherein the clamping down action of said rigid clamping collar generates a hoop compression on said substantially annular cross section of said segmented hollow elastic ring and narrows down said slitted opening included in said hollow elastic ring for compressive coupling of a pair of circumferential flanges of two tube sections disposed at the abutting ends.

4,418,949

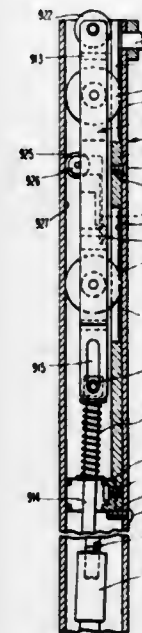
# PANIC HANDLE FOR DOORS

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 185,375, Sep. 8, 1980, which is a continuation-in-part of Ser. No. 152,403, May 22, 1980, Pat. No. 4,366,974. This application Feb. 22, 1983, Ser. No. 468,134 Int. Cl.<sup>3</sup> E05C 15/02

U.S. Cl. 292—92

4 Claims



1. A door and panic handle combination comprising bar means mounted on and extending from a location along an edge of the door to a location inwardly thereof, substantially parallel to the door; said bar means having a means for engagement by a user at the inward location thereof; latch means concealingly housed inside the bar means and terminating in a latch bolt at said location along the edge of the door; with the bar being mounted for limited pivotal movement toward and away from said door between latched and unlatched positions thereof.

4,418,950

# MOTION SENSING APPARATUS

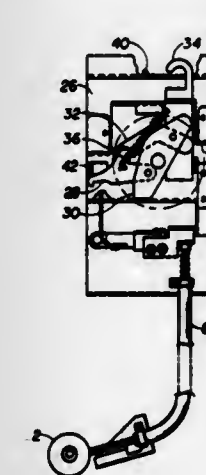
Harry A. Penhasi, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 9, 1981, Ser. No. 223,596

Int. Cl.<sup>3</sup> E05C 3/14

U.S. Cl. 292—144

4 Claims



1. In a safety latching apparatus for a cover of a housing enclosing a round rotatable member including a latch member mounted on one of said cover and said housing and movable between a locked position and an unlocked position, and an elongated flexible control element having one end interacting with said latch member and the other end located adjacent said rotatable member, said control element having a single gener-

ally uniform elongated configuration between said one end and said other end, said control element movable longitudinally so that said other end moves between a first position abutting the surface of said rotatable member when said rotatable member is stationary and a second position deflected to one side of said rotatable member when said rotatable member is rotating, said control element being generally rigid to a force in the longitudinal direction when said other end is in said first position allowing said latch member to move to said unlocked position and presenting no rigidity to a force in the longitudinal direction when said other end is deflected to said second position permitting said one end to recede slightly and thereby preventing said latch member from moving to an unlocked position, the improvement comprising:

means for assuring that said other end remains generally rigid when in said first position abutting the surface of said round rotatable member, said means including an anti-flexing guide member positioned along the side of said other end opposite the direction said other end is intended to be deflected by said rotatable member; and

locating said other end so that the longitudinal axis of said other end is laterally displaced a slight distance in the direction opposite to the direction of intended deflection from a line intersecting the central axis of said rotatable member so that said other end when in said first position is biased toward deflection in the direction of displacement against said anti-flexing guide.

4,418,951

# ROTARY LATCH FOR SCREEN DOOR

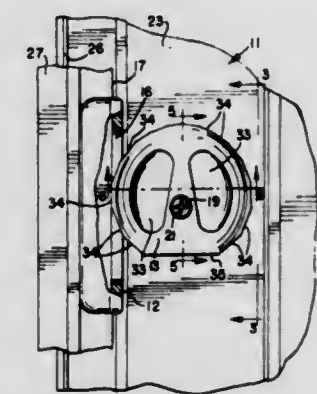
Steven C. Schultz, and Thomas A. Vaughn, both of Rice Lake, Wis., assignors to Nichols-Homeshield, Inc., Aurora, Ill.

Filed Jul. 16, 1981, Ser. No. 283,951

Int. Cl.<sup>3</sup> E05C 3/04

U.S. Cl. 292—202

6 Claims



1. A door latching arrangement including a door pull member mounted on a sliding door and a rotary cam member disposed at a right angle to the door pull member and mounted on a part to provide a locked relationship against relative sliding movement of the members, said door pull member having an open locking slot, said rotary cam member entering through said locking slot to engage said sliding door, said cam member being eccentrically mounted to move toward a locked position and when released to move toward unlocked position, and said cam member being provided with a plurality of flat faces about its periphery adapted to engage said door in a step-by-step movement.

4,418,952

# SEAL DEVICE

Claude D. Y. Wallet, 101 Avenue Charles de Gaulle, 95160 Montmorency, France

Filed Jun. 26, 1981, Ser. No. 277,740

Claims priority, application France, Jun. 27, 1980, 80 14375 Int. Cl.<sup>3</sup> B65D 33/34

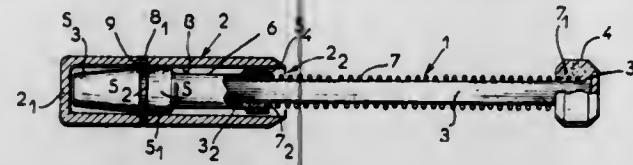
U.S. Cl. 292—327

8 Claims

1. A seal device applicable, especially to closure means for



the doors of wagons, trucks, trailers, containers and the like, comprising a male part and a female part, said male part comprising an elongated shank having first and second ends, protuberant stop means at said first end for preventing withdrawal of said shank from said closure means by said first end, and a male ferrule on said second end having smaller lateral dimensions than said stop means thereby allowing insertion of said shank in said closure means by said second end, said female



part having a socket for reception of said male ferrule, and said device including locking means for cooperating with said male ferrule and said socket to couple said male and female parts within said socket when said male ferrule is inserted in said socket, whereby said female part prevents withdrawal of said shank from said closure means, characterized in that said shank comprises a metal cable and a coil spring surrounding said cable from said stop means to said male ferrule, said spring having close but non-coil bound turns.

4,418,953

## MATERIAL HANDLER

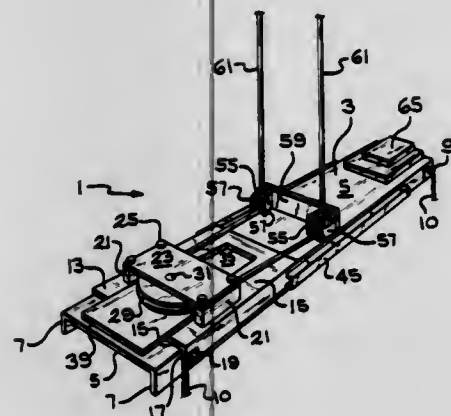
Glenn G. Dunbar, 2608 Overbrook, Toledo, Ohio 43614

Filed Feb. 4, 1981, Ser. No. 231,380

Int. Cl.<sup>3</sup> B66C 19/00, 1/66

U.S. Cl. 294—67 A

5 Claims



1. A material handler comprising:
  - a generally U-shaped first member, said first member having means for supporting a load;
  - a generally U-shaped second member slideably positioned on said first member, said second member having means for supporting a load, said second member containing an opening;
  - a spacer positioned on said first member, said spacer positioned in said opening of said second member, said spacer acting to limit the range of movement of said second member with respect to said first member;
  - biasing means attached to said first and second members, said biasing means acting to maintain said second member in a predetermined position with respect to said first member;
  - means for lifting said material handler, said lifting means being connected to said second member and slideably connected to said first member whereby said lifting means will exert a force on said second member to cause said second member to slide with respect to said first member whereby the position of said support means on said second member will move with respect to the support means on the first member to accommodate various size loads being handled by said material handler.

4,418,954

## FOLDABLE COVER FOR A TRUCK BED

John A. Buckley, 74 Hillside Rd., Sparta, N.J. 07877

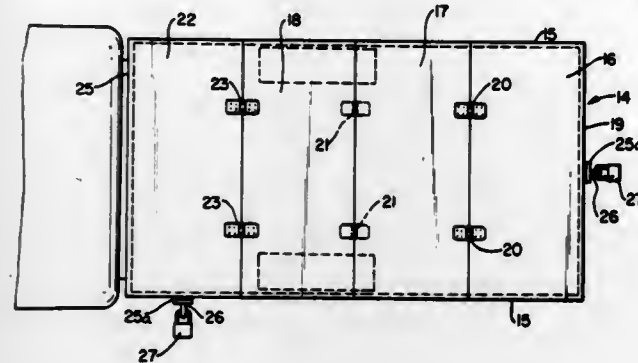
Continuation-in-part of Ser. No. 172,995, Jul. 28, 1980,

abandoned. This application Feb. 22, 1982, Ser. No. 350,732

Int. Cl.<sup>3</sup> B60P 7/02

U.S. Cl. 296—100

8 Claims



1. A foldable cover assembly for a vehicle having a pair of vehicle side walls and a vehicle end wall defining an open bed for carrying articles, said bed having a rear, central and forward section, wherein said cover comprises:
  - (a) a pair of support members mounted lengthwise above each of said vehicle side walls and extending along the rear and central sections of said bed; each support member having a rearward and a forward edge;
  - (b) a rear cover member extending across said support members at the rear section of said bed, said rear cover member having a vertical rear wall abutting the rearward edges of said support members to enclose the rear section of said bed;
  - (c) a first central cover panel extending across said support members adjacent said rear cover member, said first central cover panel pivotably connected to said rear cover member;
  - (d) a second central cover panel extending across said support members adjacent said first central panel, said second central panel pivotably connected to said first central panel, said first and second central cover panels overlying said central section; and
  - (e) a forward cover member enclosing the forward section of said bed having a pair of side walls and a forward end wall, said cover member pivotably connected to said second central panel, said pair of side walls abutting the forward edges of said support members and said forward end wall enclosing the forward section of said bed.

4,418,955

## SUPPORT UNIT FOR A CAB IN UTILITARIAN VEHICLES

Ludwig Muncke, Lohr, and Wolfgang Kaus, Lohr-Wombach, both of Fed. Rep. of Germany, assignors to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,465

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025269

Int. Cl.<sup>3</sup> B60P 3/03

U.S. Cl. 296—190

4 Claims

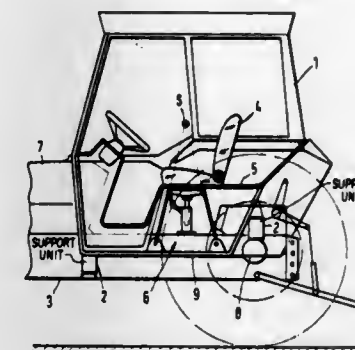
1. A support unit for a cab of a utilitarian vehicle having a separate cab and chassis, said support unit comprising:
  - a hydraulic support cylinder unit including a cylinder, a piston and a spring element, said piston being axially fixed to one of said chassis and said cab, and said spring element being connected to the other of said chassis and said cab;
  - a directional control valve having a housing fixed to said cylinder of said hydraulic support cylinder unit and including a valve body;
  - a first hydraulic line connecting said directional control valve to said hydraulic support cylinder;

a lever pivoted to said cab and having a lever arm to which said valve body is journaled;

a first rod having one end journaled to said lever;

elastic means fixed to said chassis and adjustably fixed to said first rod, said elastic means being adapted to elastically bias said first rod into a predetermined position relative to said elastic means;

an absorber element having an inelastically adjustable length,



said absorber element having one end journaled to said lever and a second end journaled to one of said directional control valve and said chassis;

a hydraulic fluid pressure source connected to said control valve; and

a hydraulic fluid drain connected to said control valve, wherein said control valve body is adapted to selectively connect one of said pressure source and fluid drain to said first hydraulic line.

4,418,956

## EDGE TRIM AND WEATHER SEAL ASSEMBLY

Junji Yamamoto, Nogoya, and Shingo Harada, Yokosuka, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Kanto Jidosha Kogyo Kabushiki Kaisha, Yokosuka, both of Japan

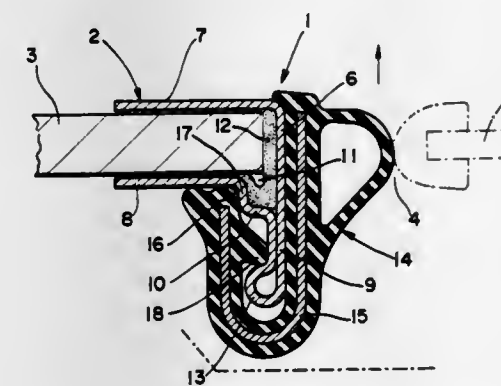
Filed Jan. 23, 1981, Ser. No. 227,932

Claims priority, application Japan, Jan. 24, 1980, 55-7792[U]

Int. Cl.<sup>3</sup> B60J 7/00

U.S. Cl. 296—216

4 Claims



1. An edge trim and weather seal assembly for a movable sun roof panel of a motor vehicle having a roof opening for receiving the panel, comprising:
  - (a) an edge strip adapted to be secured around the upper, lower and side edge portions of an edge of the sun roof panel using a bonding agent, said edge strip having upper and lower flanges for bonding to said upper and lower edge portions, respectively, said lower flange having a stepped portion defining a well for receiving excess bonding agent therein during mounting of said edge strip on said edge of the sun roof panel; and
  - (b) a seal strip for mounting on said edge strip to form a weather seal with the roof opening when the panel is received therein, said seal strip having a locating edge portion for engagement with said stepped portion of said

lower flange of said edge strip for resisting movement of said seal strip relative to said edge strip.

4,418,957

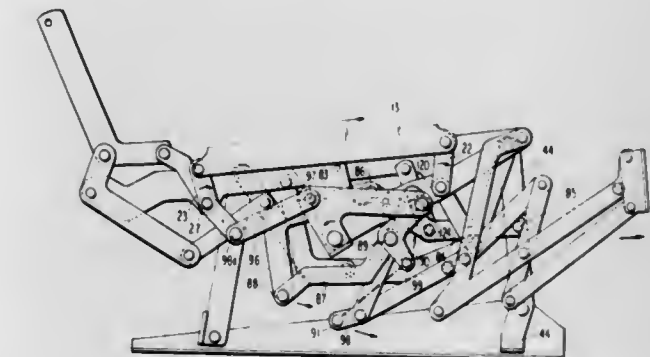
RECLINING CHAIR WITH IMPROVED ACTUATION  
Walter C. Rogers, Jr., Denton, N.C., assignor to Parmé Corporation, Denton, N.C.

Continuation-in-part of Ser. No. 199,595, Oct. 22, 1980. This application Aug. 13, 1981, Ser. No. 292,700

Int. Cl.<sup>3</sup> A47C 1/02

U.S. Cl. 297—85

32 Claims



1. In a wall-avoiding recliner chair having a fixed base, a seat and backrest mounted on the base, a footrest movable between retracted position adjacent the front of the seat and an extended position projected forwardly from the front of the seat; the improvement comprising in combination, a seat linkage mounting the seat relative to the base for movement in response to the weight of an occupant of the chair between a closed position wherein the footrest is retracted and a reclining position with the seat projected forwardly relative to the base and with the footrest extended, a footrest linkage mounting the footrest relative to the seat for movement between said positions thereof, linkage means interconnecting the footrest linkage and the seat linkage for actuating the footrest between extended and retracted positions in response to movement of the seat linkage caused by the weight of the chair occupant, lock means releasably holding the seat linkage in said closed position against movement into a reclining position under the weight of an occupant of the chair; and release means for releasing the lock mechanism to permit the seat linkage to move from said closed position to a reclining position, said release means including a release linkage mounting the seat relative to the seat linkage for movement relative thereto and being operatively connected to said lock means for releasing the same upon movement of said release linkage relative to the seat linkage from the position wherein the seat linkage is in said closed position.

4,418,958

## PLASTICS CHAIR SHELL

Bernard C. Watkin, 32 West Square, London SE11, England  
Filed Jan. 21, 1981, Ser. No. 226,888

Claims priority, application United Kingdom, Jan. 21, 1980, 8001981

Int. Cl.<sup>3</sup> A47C 7/02

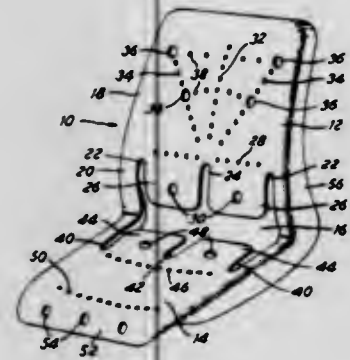
U.S. Cl. 297—457

11 Claims

1. A chair shell of resilient material comprising a back support and a seat, in which:
  - an aperture is formed in the chair shell at the junction of the back support and the seat, the opening extending almost to the lateral edges of the chair shell,
  - the back support has an upper portion and a lower portion, the upper portion of the back support has zones of weakness arranged to modify the deformability of the back support so that when the back support is flexed under pressure from the back of a sitter the said upper part is deformed to a shape which is forwardly convex in vertical section and forwardly concave in horizontal section,

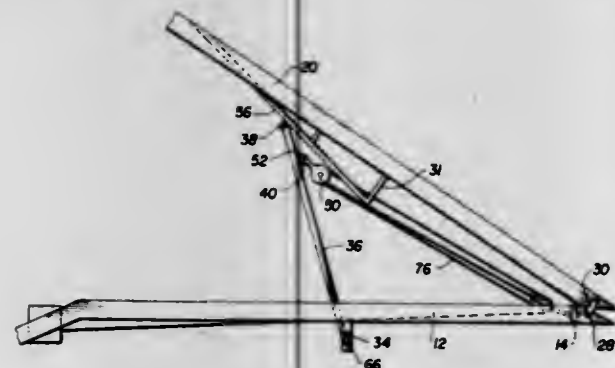


the lower portion of the back support is divided into two portions by a centrally disposed slit which extends upwards from the said aperture, the two portions being adapted to flex under pressure from the back of a sitter in such a manner that the lower edges of the said portions move backwards to increase the convexity of the back support in vertical section and the inner edges of the said portions move backwards to increase the concavity of the back support in horizontal section,



the said seat has a rear portion, a middle portion and a front portion, said rear portion of the seat being constructed to be deformed resiliently backwards under pressure from the ischial tuberosities of the sitter, said front portion of the seat being constructed to be resiliently deformed downwards under pressure from the under-thighs of the sitter.

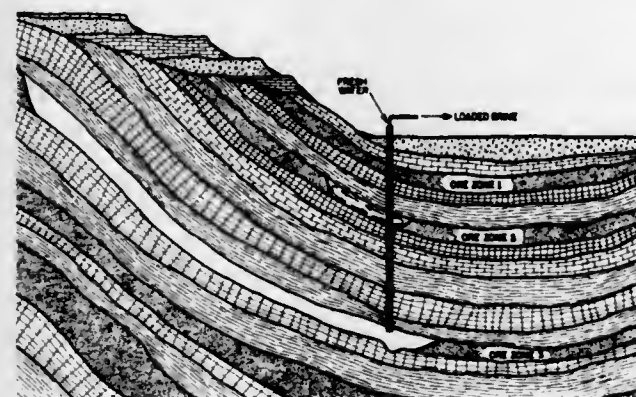
**4,418,959**  
**SCISSOR TAIL DUMP TRAILER APPARATUS**  
James G. Dunlap, 3533 SE. 143rd St., Portland, Oreg. 97236  
Continuation-in-part of Ser. No. 155,017, May 30, 1980, abandoned. This application Feb. 19, 1982, Ser. No. 350,547  
Int. Cl.<sup>3</sup> B60P 1/04  
U.S. Cl. 298—19 V  
8 Claims



1. A scissor tail dump trailer apparatus comprising a platform frame for a dump trailer of generally rectangular configuration and having a rear end portion and a front end portion, a dumping bed frame disposed to generally overlie the platform frame and being of generally rectangular configuration also having a rear end portion and a front end portion, a pivot plate associated with and welded onto a portion of the rear end portion of the dumping bed frame, said pivot plate positioned at each side of the rear end portion of the platform frame for pivotally mounting said bed frame thereon, a pair of inverted channel guides disposed in parallel on one end of the dumping bed frame and having a forward end mounted to the front end of the dumping bed frame and a rear end mounted to a cross support member of the dumping bed frame, a pair of lifting arms disposed in parallel in the interior of the platform frame having rollers mounted on a forward end for engaging respective ones of the pair of inverted chan-

nel guides and a rear end being pivotally mounted on a fulcrum frame mounted to a cross support member of the platform frame, a strut secured between said pair of lift members near the end of which said rollers are mounted, a support rod secured to said strut, said support rod including a hook member centrally secured to said strut intermediate of the pair of lifting arms for receiving a first hook means, a first pulley block comprising a plurality of pulley wheels and said first hook disposed to engage the hook member, a second pulley block including a plurality of pulley wheels and mounted centrally of the rear end portion of the platform frame from an eye bolt, an electric winch generally centrally mounted forward and downwardly of the front end portion of the platform frame for receiving a cable means, said second pulley block having means to secure an end of a cable means which in turn passes through one wheel of the first pulley block returning to one wheel of the second pulley block thence to another wheel of the first pulley block and returning to another wheel of the second pulley block, etc. thence to the electric winch.

**4,418,960**  
**MULTIPLE-BED SOLUTION MINING OF AN INCLINED STRUCTURE**  
Rudolph S. Higgins, Moab, Utah, assignor to Texasgulf Inc., Stamford, Conn.  
Filed Nov. 4, 1981, Ser. No. 318,102  
The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.  
Int. Cl.<sup>3</sup> E21B 43/28  
U.S. Cl. 299—5  
5 Claims



1. A method of solution mining multiple beds of an extractable ore disposed in sloping subterranean strata each disposed beneath an insoluble stratum which comprises the steps of:  
(a) establishing a borehole communicating with said strata at a downdip location therein;  
(b) commencing with the lowermost ore zone, injecting solvent into said borehole in such a manner that the solvent will be directed in an up dip direction along the upper portion of said stratum to develop a cavity with mining face remote from said borehole;  
(c) withdrawing solvent with dissolved ore through said borehole at an exit point disposed vertically downwardly from the entrance point at which the incoming solvent is discharged into the cavity from the borehole;  
(d) adjusting such withdrawal to provide for downflow of the solvent across said mining face and downwardly in a downdip direction along the floor of said cavity to said exit point at a rate sufficient to extract said ore stratum without appreciable mining of vertically adjacent strata;  
(e) after the lowermost ore zone is depleted of recoverable ore, the center extraction pipe is raised, the said borehole is plugged up to the next vertically disposed ore stratum of interest, the casing is perforated or cut away in the said next ore zone, the said extraction pipe is then lowered to

a level slightly below the said next ore zone to form a sump;  
(f) the said next ore stratum is mined by developing a new cavity in said manner as heretofore described in Steps (b) through (d); and,  
(d) each succeeding vertically disposed ore stratum of interest is mined in said manner as heretofore described in Steps (b) through (f).

**4,418,961**  
**METHOD FOR RESTORING CONTAMINANTS TO BASE LEVELS IN PREVIOUSLY LEACHED FORMATIONS**  
E. Thomas Strom, Dallas, and Wilton F. Espenscheid, DeSoto, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.  
Continuation-in-part of Ser. No. 221,726, Dec. 31, 1980, abandoned. This application May 27, 1982, Ser. No. 382,747  
Int. Cl.<sup>3</sup> E21B 43/28  
U.S. Cl. 299—5  
16 Claims

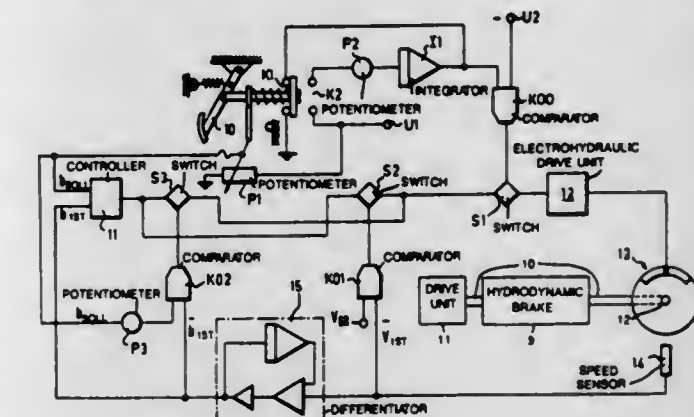
15. A method for restoring to environmentally acceptable levels the soluble molybdenum values in a subterranean formation that has been subject to in situ oxidative leaching wherein said oxidative leaching is carried out in uranium-bearing formations containing little or no calcium carbonate minerals associated with said uranium, which process comprises: introducing soluble calcium values into said leached formation.

**4,418,962**  
**SPOKED WHEEL COVERS**  
Clarence S. Schaffer, Rte. 1, Box 696, Groveland, Fla. 32736  
Filed Oct. 2, 1981, Ser. No. 307,730  
Int. Cl.<sup>3</sup> B60B 7/00  
U.S. Cl. 301—37 P  
7 Claims



1. A spoked wheel cover comprising in combination: a pair of covers sized to cover each side of the spokes on a spoked wheel and having a center axle opening therein for an axle to extend through; attachment means for attaching said covers together through said spokes, said attaching means having a plurality of fasteners extending through the spokes to attach one cover to the other, said attachment means including a plurality of snap fastener portions formed on the perimeter flange of one of said pair of covers and a plurality of mating snap portions formed on the other of said pair of covers perimeter flange, one of said pair of covers being formed of a molded polymer and the snap portions formed thereon being molded polymer male snap portions and the other of said pair of covers being formed of a molded polymer and the snap portions thereon being molded female snap portions; and spacer means for spacing one cover from the other, said spacer means formed into the snap portions formed on one said covers, and one cover of said pair of covers having an opening for a valve stem extension to extend through and a bent valve extension to allow the extension to fit into the opening in said spoked wheel cover, whereby the spokes on a spoked wheel can be covered.

**4,418,963**  
**CONTROL SYSTEM FOR A VEHICULAR BRAKING SYSTEM INCORPORATING A HYDRODYNAMIC BRAKE AND A FRICTION BRAKE**  
Volker Sprockhoff, Aachen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.  
Filed Jun. 29, 1981, Ser. No. 278,122  
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027746  
Int. Cl.<sup>3</sup> B60T 8/08  
U.S. Cl. 303—3  
13 Claims



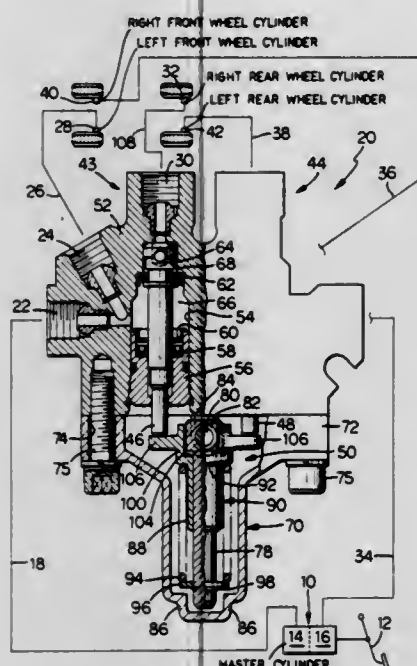
1. A control system for a vehicular braking system incorporating a hydrodynamic brake and a friction brake acting in parallel comprising: first means responsive to movement of a brake pedal to provide a first signal indicating a total required braking torque, said total required braking torque being generated by said hydrodynamic brake with a first priority; and an electronic closed loop having said friction brake therein, said closed loop controlling said friction brake to generate a braking torque equal to said total required braking torque and a braking torque generated by said hydrodynamic brake, said closed loop including second means coupled to said first means and a third means providing a second signal representing an actual deceleration of a vehicle containing said braking system, said second means being responsive to said first and second signals to produce a third signal to control operation of said friction brake, and three logic switches coupled between said second means and said friction brake, each of said three switches being controlled in response to a different one of brake actuation duration, vehicle speed and vehicle deceleration with that one of said three switches responsive to said brake actuating duration being connected to said friction brake and for a logical AND operation with each of the other two of said three switches connected to said second means to provide a logical OR operation.

**4,418,964**  
**BRAKING HYDRAULIC PRESSURE CONTROL VALVE IN A DUAL-CIRCUIT BRAKE SYSTEM**  
Masayoshi Katagiri, Yoshihisa Nomura, both of Toyota; Hiroshi Kawaguchi, Mishima; Shuho Nishina, Susono, and Elji Miura, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Aichi, both of Japan  
Filed Oct. 30, 1981, Ser. No. 316,632  
Claims priority, application Japan, Mar. 6, 1981, 56-31641[U]  
Int. Cl.<sup>3</sup> B60T 8/26  
U.S. Cl. 303—6 C  
15 Claims

15. A device for biasing the projecting ends of a pair of valve pistons retained parallel to one another within a control valve housing, comprising: means for providing a cover for enclosing the projecting ends of said valve pistons; a guide member having first and second end portions and



pivotally coupled to said cover at said first end portion, said second end portion extending within said cover; a sliding member slidably coupled for movement along said guide member and including a first end portion constructed to abut against the projecting ends of the valve pistons;



a spring coupled to the second end of said guide member and enclosed within said cover and positioned to abut against said sliding member in such manner as to provide a biasing force against the projecting ends of said valve pistons; stopper means disposed within said cover for limiting the pivotal movement of said guide member to a predetermined range.

#### 4,418,965 LOAD-CONTROLLED BRAKE PRESSURE CONTROL UNIT

Erich Reinecke, Burgdorf, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

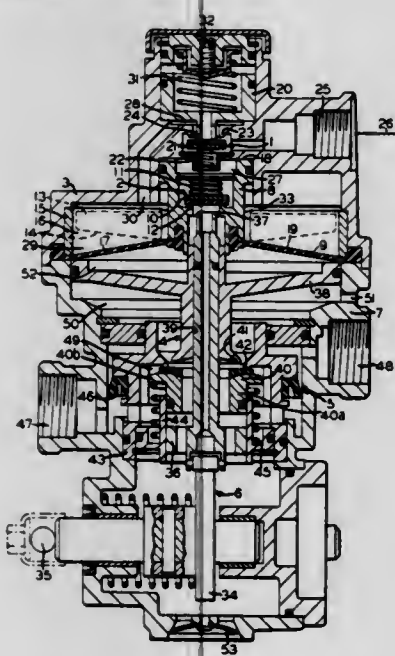
Filed Oct. 26, 1981, Ser. No. 314,349

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3026252

Int. Cl.<sup>3</sup> B60T 8/18

U.S. Cl. 303—22 R

10 Claims



1. A load-controlled brake pressure control unit for pneumatic trailer brake systems, comprising:  
(a) a housing;

- (b) a brake pressure control piston operably disposed in said housing;
- (c) a brake pressure control valve having an intake valve and a discharge valve operable by said control piston;
- (d) a dual valve member operably disposed in the brake pressure control piston and forming, along with a first valve seat located on the control piston, the intake valve;
- (e) said dual valve member, in cooperation with a valve seat formed on an upper end of a tappet member, also forming the discharge valve, said tappet member having an axial passageway and being adjustable axially in relation to the vehicle weight, whereby the dual valve member is unseated from the first valve seat by said tappet member while simultaneously blocking the passageway;
- (f) a relay valve operably disposed in said housing and cooperating with said brake pressure control valve for providing trailer brake-applying pressure via a supply valve;
- (g) said relay valve being operated by a relay piston coaxially aligned with the control piston;
- (h) said tappet member being slidably and sealingly reciprocable coaxially through the relay piston; and
- (i) an emergency brake piston located in a lower housing section to serve as a valve seat for a discharge valve of the relay valve.

#### 4,418,966 PUMP-LESS HYDRAULIC BRAKE SYSTEM FOR AUTOMOBILES

Peter Hattwig, Cremlingen, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

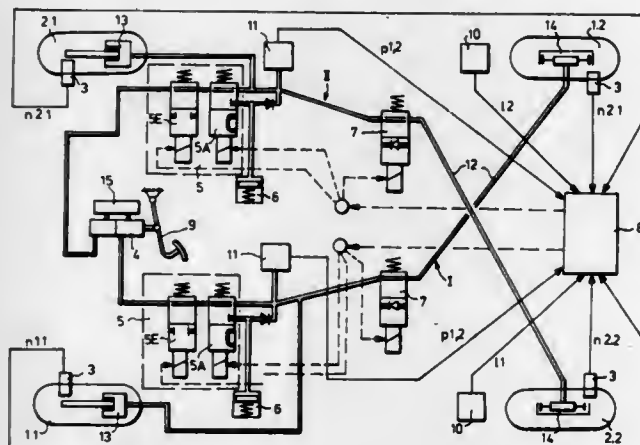
Filed Feb. 25, 1982, Ser. No. 352,169

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109372

Int. Cl.<sup>3</sup> B60T 8/26, 8/02

U.S. Cl. 303—100

6 Claims



1. A pump-less hydraulic brake system for vehicles having a pair of front wheels and a pair of rear wheels, and a pair of front wheel brakes and a pair of rear wheel brakes associated therewith, comprising:

- (a) master brake cylinder means for providing pressurized brake fluid;
- (b) a pair of independent brake lines, each connected to receive pressurized fluid from said master cylinder means, wherein each brake line is connected to deliver fluid to one front wheel brake and has a portion to deliver fluid to a diagonally opposed rear wheel brake;
- (c) a control valve means disposed in each of said brake lines, wherein each said control valve means has an electrically connectable inlet valve and an electrically connectable outlet valve, and said inlet and outlet valves in each said control valve means are actuatable to one of a first combination, in which the fluid pressure in the respective brake line follows the pressure predetermined by the master brake cylinder, a second combination, in which the fluid

pressure in the respective brake line drops, and a third combination, in which the fluid pressure in the respective brake line remains at the pressure prevailing at the start of said third combination;

- (d) a pair of electrically connectable rear brake inlet valves, one disposed in the portion of each brake line leading to its respective rear wheel brake, which when actuated limits the fluid pressure in the associated rear wheel brake to the pressure prevailing when actuated;
- (e) means responsive to vehicle weight for controlling said rear brake inlet valves independent of other control commands to said rear brake inlet valves;
- (f) sensor means associated with each wheel for detecting the respective wheel's rotational speed and angular deceleration; and
- (g) control circuit means for receiving signals from each said sensor means and for selectively actuating the inlet and outlet valves of said control valve means and said rear brake inlet valves as a function of one of the magnitude of said signals and the ratio of said signals, wherein at any single time only one of the two control valve means is actuatable to said second combination.

4,418,967

#### WAFFLE FURNITURE SYSTEM

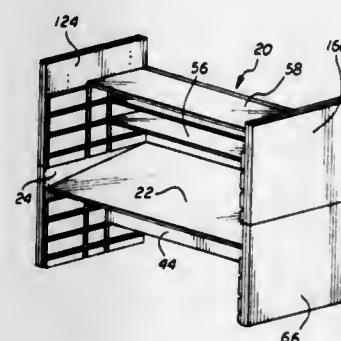
Henry T. Winkelman, Jr., 7405 Maryland Ave., St. Louis, Mo. 63130, and Edward E. Huckaby, 9802 Westview, Houston, Tex. 77050

Filed Jul. 31, 1981, Ser. No. 289,124

Int. Cl.<sup>3</sup> A47B 87/00; F16B 12/00

U.S. Cl. 312—107

7 Claims



1. A furniture system for assembly into various architectural office furniture components including desks, drafting tables, cubicles, stands, and crates, comprising

a plurality of longitudinally extended generally rectangular work panels for work surfaces, desk tops, panels, and structural members;

a plurality of end panels having means for receiving an edge of said work panels at a plurality of horizontally and vertically spaced apart places on said end panel whereby the end panels receive and maintain the work panels in a chosen, fixed, spatial relationship to the end panels, the relationship being changeable by engaging said work panels at different locations with said end panels; and wherein said means for receiving an edge of the work surfaces includes means for receiving an edge of the work surface adjacent an edge of said end panel;

a plurality of longitudinally extended shelf panels having ends formed for engagement with said receiving means in said end panels in a chosen spatial relationship to the work panels and end panels whereby said shelf panels are mountable with said end panels as a shelf or lateral brace; means for fixing said work panels and said shelf panels to said end panels in a chosen spatial relationship, whereby said panels may be assembled into a variety of furniture components; and,

wherein the means for receiving an end of said work panels and said shelf panels comprises a plurality of spaced apart

grooves formed in one side of said end panels for engaging the edge of said work panel and the end of said panel; and, wherein said end panels have a plurality of holes formed therethrough for receiving bolts for connecting the end panels to the work panels and shelf panels, said holes in the end panels being located adjacent said grooves whereby a bolt through the hole may engage and retain a work panel or shelf panel in said groove; and, wherein said shelf panels have at least one hole formed in the end thereof for receiving a bolt situated through said end panels when the shelf panel is engaged with the groove in said end panel and wherein the shelf panel has at least one second hole formed therethrough in the end thereof communicating with the hole formed through said end panel, and wherein the means for connecting said shelf panel to said end panel comprises at least one bolt through said end panel and through said hole formed in the end of said shelf panel and engaging a threaded body mounted in the second opening in said shelf panel.

4,418,968

#### FILING CABINET

Gerhardus A. J. Vrielink, Santpoort, Netherlands, assignor to Handelsmaatschappij Twentex B.V., Haarlem, Netherlands

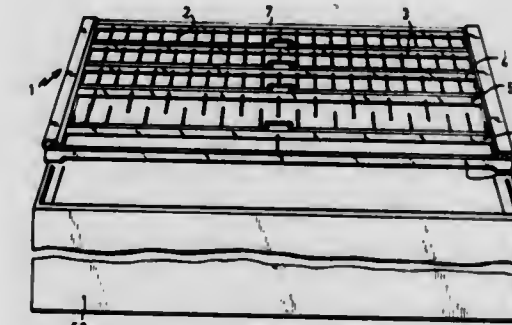
Filed Dec. 24, 1980, Ser. No. 219,898

Claims priority, application Netherlands, Dec. 28, 1979, 7909347

Int. Cl.<sup>3</sup> A47B 63/00, 95/02; A42F 15/00

U.S. Cl. 312—184

9 Claims



1. In apparatus for the suspension filing of sheet articles having perforations extending along their upper edges, a support frame having front and rear portions interconnected at their opposite ends by guide rails, a plurality of racks extending between and movably mounted on said guide rails, suspension carrier pins mounted on said racks positioned to engage the perforations in the articles to be filed, said carrier pins being oppositely directed and in staggered relationship to each other, adjacent racks being movable relative to each other from a closed position in which the said adjacent racks define a suspension compartment therebetween with their respective carrier pins extending across the suspension compartment to an intermediate position in which the carrier pins just overlap each other, and to an open position in which the carrier pins are spaced apart to permit removal of articles suspended on the pins, an actuating rod extending along the length of each rack, means mounting each of said actuating rods for movement in a plurality of directions, an operating handle connected to each actuating rod for moving said rod, and coupling means carried by each rack to detachably connect it to the next rearward rack, said coupling means being operatively connected to said actuating rods, whereby movement of said actuating rods in a first direction will actuate said coupling means to disengage a selected rack from the next adjacent rack, the improvement which comprises locking means carried by the frontmost rack for selectively locking the frontmost rack and any additional racks coupled thereto in either the open or intermediate positions, said locking means comprises at least one end cam mounted on said frame, a hook mounted on the actuating rod of said frontmost rack positioned to releasably engage said cam



to lock said foremost rack in the open position, said hook being displaceable to release said foremost rack for rearward movement upon movement of said rod in a second direction.

4,418,969

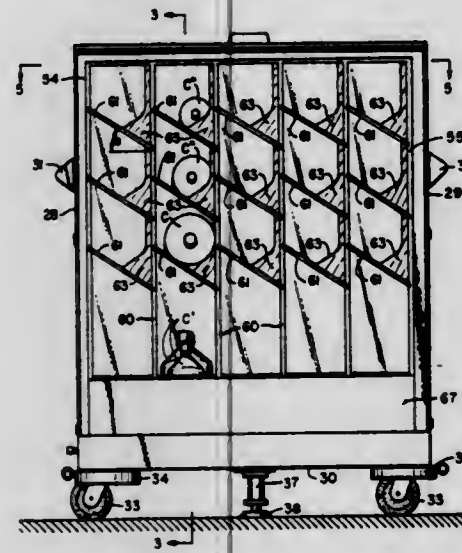
**BOTTLED CHEMICAL HANDLING SYSTEM**

Kenneth R. Hettman, 833 Alpine Ave., Burlingame, Calif. 94010  
Filed Dec. 24, 1980, Ser. No. 219,688

Int. Cl.<sup>3</sup> A47B 73/00, 91/00

U.S. Cl. 312—250

14 Claims



1. A bottle containment module comprising a top, a bottom, a back, and two sides;  
a plurality of laterally spaced partitions vertically arranged within said module;  
a plurality of shelves received between adjacent partitions and arranged at a first predetermined angle with respect to a plane parallel to said bottom and normal to said partitions so that a bottle placed on a shelf normally rests in two point line contact with the shelf and an adjacent partition, said shelves extending toward said back in a downwardly sloping manner at a second predetermined angle so that a bottle placed on a shelf normally rests at said second predetermined angle and is biased backwardly and downwardly of said module by its own weight; and  
means providing a limit stop for bottles to be placed on said shelves.

4,418,970

**ROTARY-POSITION CATCH FOR ROTATABLE SHELF UNITS**

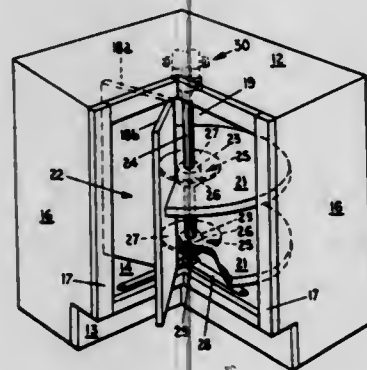
Marvin W. Hyder, Rockford, and Steven F. Weinstock, Ada, both of Mich., assignors to Leslie Metal Arts Company, Grand Rapids, Mich.

Filed Feb. 20, 1981, Ser. No. 236,158

Int. Cl.<sup>3</sup> A47B 81/00; A47F 3/10

U.S. Cl. 312—305

12 Claims



1. A rotary-position catch for holding a shaft in a selected rotary position, the shaft being rotatable about an axis and

supported by bearing means between two surfaces, the catch comprising:

- a hollow prism element made of a flexible plastic material, being coaxial with the shaft and having at least one inwardly-extending dog on at least one side of the element, said at least one side flexing at adjacent corners of said prism element, the distance between the innermost point of the at least one dog and the axis of the prism element being less than the distance between the axis of the prism element and the remaining sides of the prism element;
- an oblong element having at least one recess in a peripheral wall thereof at a major diameter of the oblong element, the distance between the axis of the shaft and the innermost point of the recess being about equal to the distance between the at least one dog of the prism element and the axis of the shaft,
- the at least one recess being adapted to receive the at least one dog in an interference-type fit, the oblong element being concentrically disposed within the prism element, one of the hollow prism elements and the oblong elements being mounted to one end of the shaft, the other of the hollow prism elements and the oblong elements being mounted to one of the surfaces adjacent the one end;
- whereupon rotation of the shaft, the at least one dog is received in the at least one recess in an interference-type fit so as to maintain the shaft in a selected rotary position.

4,418,971

**ELECTRICAL KEYING ARRANGEMENT**

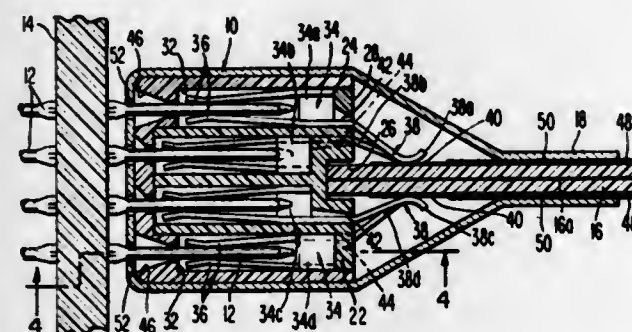
Warren A. Liss, Aurora, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 3, 1981, Ser. No. 289,761

Int. Cl.<sup>3</sup> H05K 1/02

U.S. Cl. 339—17 L

11 Claims



1. An electrical keying arrangement for preventing electrical arcing and related damage when a first and a second electrical component are interconnected, said first and second components being associated, comprising:
  - a first and a second keying terminal positioned on said first component;
  - a third and a fourth keying terminal positioned on said second component, said third and said fourth keying terminals corresponding respectively in position to said first and said second keying terminals;
  - switch means operative to interconnect said third and said fourth keying terminals only when said first and said second components are positioned in a predetermined manner to connect respectively said first and said second to said third and said fourth keying terminals; and
  - a conducting path including in sequence said first and said third keying terminals, said switch means, and said fourth and said second keying terminals and being completed when said components are positioned in said predetermined manner and when said switch means is operated to interconnect said third and said fourth keying terminals.

4,418,972

**ELECTRICAL CONNECTOR FOR PRINTED WIRING BOARD**

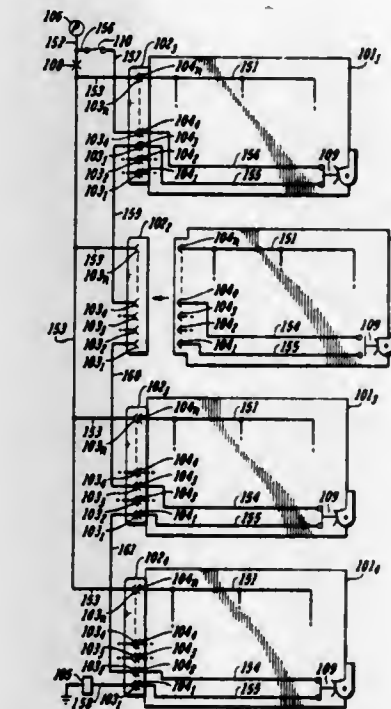
John E. Benasutti, North Wales, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 1, 1982, Ser. No. 344,490

Int. Cl.<sup>3</sup> H01R 9/09

U.S. Cl. 339—14 R

5 Claims U.S. Cl. 339—31 L



1. An electrical connector for use with a printed wiring board which includes a pair of planar surfaces, a plurality of metallized pads disposed adjacent the edge of at least one of said pair of surfaces, and an integral ground conductor plane; said electrical connector comprising:

an inner and an outer member formed of electrically insulative material,

said inner member having a plurality of electrical contacts disposed respectively in said cells, each of said electrical contacts having an elongated tail section, each of said cells having a slot-like aperture in a rearward wall thereof for permitting the tail section of an electrical contact to protrude from said inner member, a longitudinal groove formed in said rearward wall of said inner member for receiving said edge of said printed wiring board, the elongated tail section of each of said contacts engaging one of said plurality of metallized pads of said printed wiring board and being affixed thereto,

said outer member being comprised of a box-like structure open on one side to receive said inner member and having on its opposite side, a plurality of terminal-receiving apertures homologically positioned with respect to said cells in said inner member,

means for fastening said connector to said printed wiring board comprising a ground conductor plane in the form of a metallic shell substantially enclosing said outer member and having a plurality of openings in alignment with said terminal-receiving apertures of said outer member, said metallic shell having a pair of coextensive extremities, said coextensive extremities being affixed to said printed wiring board by at least one metallic fastener, said fastener contacting said ground conductor plane of said printed wiring board, thereby electrically connecting the ground conductor planes of said connector and said printed wiring board.

4,418,973

**WEDGE BASE LAMP SOCKET ASSEMBLY**

Andrew Smetana, Mentor, and James M. Hanson, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,388

Int. Cl.<sup>3</sup> H01R 13/74

3 Claims



1. In a lamp socket for a wedge base incandescent lamp comprising a cylindrical shape plastic body member with a hollow cavity opening at one end into which the lamp is inserted for frictional engagement with a pair of connector elements located at the bottom of said hollow cavity, a first and second pair of slots located in opposing relationship at the other end of said plastic body member, only said first pair of slots communicating with said connector elements but with said second pair of slots being electrically connected to said connector elements with external electrical elements, and electrically conductive metal terminals which are pressed into the slots for electrical contact with said connector elements, the improvements which further include a pair of opposing resilient fingers being integrally formed in the open end of the plastic body member to physically engage external lamp support means and larger size openings at one end of each slot to accommodate external electrical elements frictionally engaged in said larger size openings for electrical contact with the connector elements.

4,418,974

**LOW INSERTION FORCE SOCKET ASSEMBLY**

Alan R. MacDougall, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 229,044, Jan. 28, 1981, Pat. No. 4,377,319. This application Jun. 22, 1981, Ser. No. 276,423

Int. Cl.<sup>3</sup> H01R 13/631

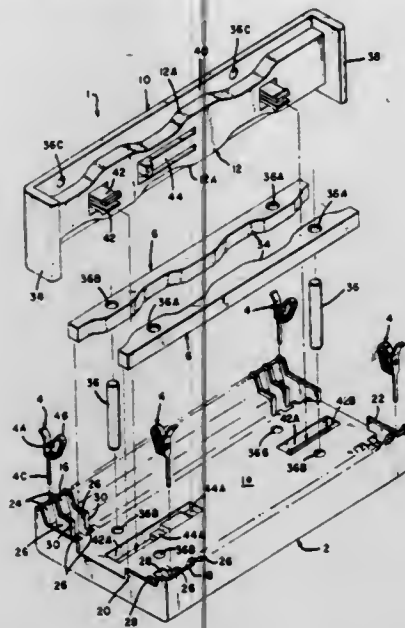
U.S. Cl. 339—75 M

4 Claims

1. A low insertion force socket assembly having a base, contact receiving cavities in the base along sides of the base, an electrical contact in each of the cavities, each of the contacts having a pair of opposed fingers spaced apart for receiving therebetween an electrical terminal, and the fingers of each of the contacts engaging opposite sides of a respective terminal upon resilient deflection of one resilient finger of each contact toward the other finger of the contact, characterized in that;
  - a pair of elongate rails are mounted on the base alongside the resilient fingers of respective contacts, each rail having an elongate sinuous follower surface, a cover overlying the rails, the cam having sinuous edges facing the sinuous follower surfaces of the rails, so that reciprocation of the cam together with the cover causes the sinuous edges of the cam slidably to traverse against the sinuous follower surfaces of the rails, and the rails to deflect the resilient fingers of the contacts toward the opposed fingers; the



base including an elongate slot and the cover including a projecting resilient latch hooked in the slot, for reciprocal



sliding movement along the slot during reciprocation of the cam together with the cover to secure the cover to the base.

4,418,975

### ELECTRICAL CONNECTOR FOR A SLIDE-IN COMPONENT

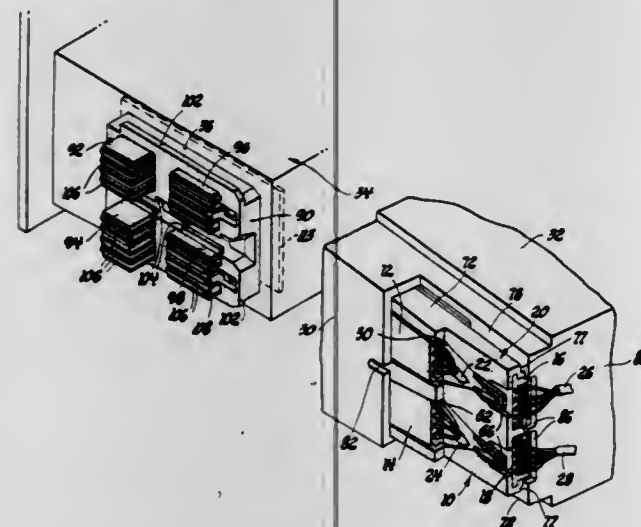
John J. O'Keefe, II, Cortland, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1981, Ser. No. 294,212

Int. Cl.<sup>3</sup> H01R 13/54

U.S. Cl. 339-91 R

3 Claims



1. An electrical connector for connecting a slide-in component to a plurality of related, remotely located components by a plurality of wiring harnesses comprising:

- a terminal block mounted on a side of the slide-in component, said terminal block having a plurality of longitudinally spaced rows of terminal pads with each of the terminal pads being laterally offset from a longitudinally aligned terminal pad in another row, a receptacle for slideably receiving the slide-in component,
- a plurality of connector blocks attached to respective ones of a plurality of wiring harnesses, and
- means for arranging the connector blocks on a side wall of the receptacle in a plurality of longitudinally spaced rows with each of the connector blocks in one row being laterally offset from a longitudinally aligned connector block in another row, and
- said terminal pads and said connector blocks each having a

plurality of terminals which engage terminals of the other when the slide-in component is mounted in the receptacle.

4,418,976

### RETAINING CLIP FOR AN ELECTRICAL CONNECTOR

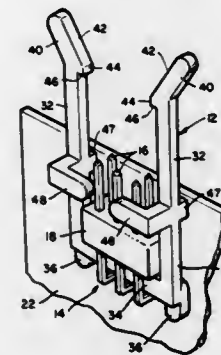
Albert A. Lenzini, Mundelein; Robert C. Swanson; James T. Roberts, both of Chicago, and John A. Pruski, Schiller Park, all of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Oct. 16, 1981, Ser. No. 311,851

Int. Cl.<sup>3</sup> H01R 13/627

U.S. Cl. 339-91 R

6 Claims



1. A retaining clip (12) for releasably maintaining a socket (24) in engagement with a plug (14) securely soldered to a circuit board (22), the plug (14) comprises at least two spaced pins (16) maintained in relative position by a molded strip (18), the pins (16) are bent and soldered to the circuit board (22) so that the free ends thereof extend along a plane generally parallel to the circuit board (22), said retaining clip (12) comprising: a generally "U" shaped body member (30) formed of resilient insulating material and including a pair of extending legs (32) and a base (34), the base (34) of said body member (30) being sized to fit between the spaced pins (16) of the plug (14) prior to connection of the plug (14) to the circuit board (22), the legs (32) of the body member (30) define means (44) thereon for grasping the socket (24) thus securely retaining the socket (24) within the legs (32) of said "U" shaped member (30), and alignment means (48) secured to and extending from said legs (32) toward each other for preventing misalignment between the plug (14) and the socket (24), said alignment means (48), said legs (32) and the circuit board (22) defining an access opening for accurately directing the socket (24) and plug (14) into engagement.

4,418,977

### CONNECTOR STRUCTURE FOR FLAT CABLE

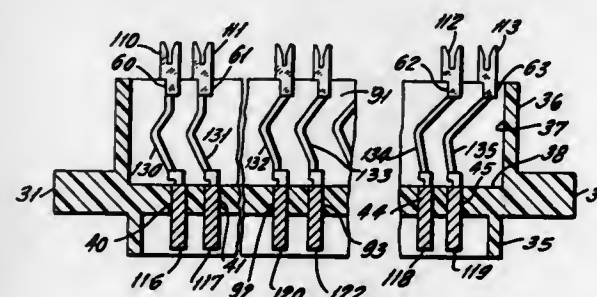
William F. O'Shea, Jr., Hatfield, Pa., assignor to Continental-Wirt Electronics Corporation, Warminster, Pa.

Filed Oct. 16, 1978, Ser. No. 951,746

Int. Cl.<sup>3</sup> H01R 13/38

U.S. Cl. 339-99 R

10 Claims



1. A cable connector for flat cable, comprising: a molded insulation material base having a rectangular well formed therein and at least one upstanding wall; a plurality of equispaced openings formed in and extending

through the bottom of said rectangular well, each of said openings being formed along a straight line;

- a plurality of equispaced contact receiving slots, equal in number to the number of said equispaced openings, formed in said upstanding wall, each of said slots being formed along a line parallel to said straight line and associated with a respective one of said openings, the distance between said slots being different than the distance between said openings;
- a plurality of identical contacts, equal in number to the number of equispaced openings, each of said contacts having a contact nose end, a contact piercing tail end and a connector section connecting said nose end to said tail end, each of said connector sections being prebent at a central location between their ends and easily bendable in a direction parallel to said straight line, said nose end of each of said contacts being fitted through a respective one of said openings, said tail end of each of said contacts being received in that one of said slots which is associated with that one of said openings through which its tail end is fitted whereby at least one of said connector sections is bent by a different amount than at least one other said connector section, the outer ends of each of said tail ends lying in a first flat common plane and the outer ends of said contact noses lying in a second flat common plane which is spaced from and parallel to said first common plane; and
- a plurality of ribs formed integrally with said at least one upstanding wall and disposed in such a manner that a respective pair of said ribs is located on either side of each of said openings, each of said contacts including portions which are received between and guided by that respective pair of ribs which is located on either side of that said opening through which said nose end of said contact is fitted.

4,418,978

### FUSE PLUG

Amos Shamir, Brooklyn, N.Y., assignor to Paramount Die & Machine Products, Brooklyn, N.Y.

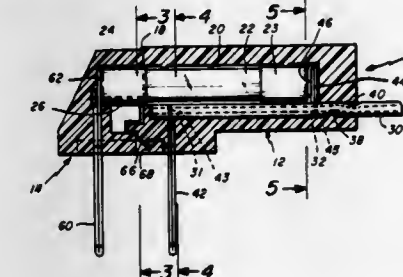
Continuation of Ser. No. 200,456, Oct. 24, 1980, abandoned.

This application Jun. 3, 1982, Ser. No. 384,615

Int. Cl.<sup>3</sup> H01R 13/36

U.S. Cl. 339-99 R

13 Claims



1. A combination plug and fuse holder adapted for receiving a multi-conductor cord and comprising: a first insulated housing member having a passage for receiving the electric cord and a pocket extending substantially parallel to the passage and adapted to receive a fuse, contact means for electrically coupling one conductor of the cord to one side of the fuse, first prong means supported in said first insulated housing member for electrical coupling to the other conductor of the cord, a second insulated housing member including means for permitting the separation apart of the first and second housing members and for further interlocking these members, and a second prong means supported in the second insulated housing member extending in parallel with the first prong

means but only in the interlocked position of the housing members, said second prong means for electrical coupling to the other side of the fuse, said first insulated housing member comprising a base member and a body member, and means for relatively hinging the base and body members with the pocket and passage defined therebetween, means for hinging said second housing member from said base member at the end thereof, said hinging means between the base member and body member, and said hinging means between the base member and second housing member being disposed, respectively, along different sides of the base member, said second insulated housing supporting only the second of the first and second prong means, and the body member supporting only the first of the first and second prong means, said second insulated housing and body member having one of two alternate positions relative to said base member including an interlocked position in which the first and second prong means extend in parallel and an open position in which the second insulated housing and body member are hinged away from the base member displacing the second prong means out of parallel with the first prong means and permitting access to the fuse to enable removal thereof.

4,418,979

### PLUG SOCKET WITH WORKING CONDITION DISPLAY

Kiyoshi Takashima, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

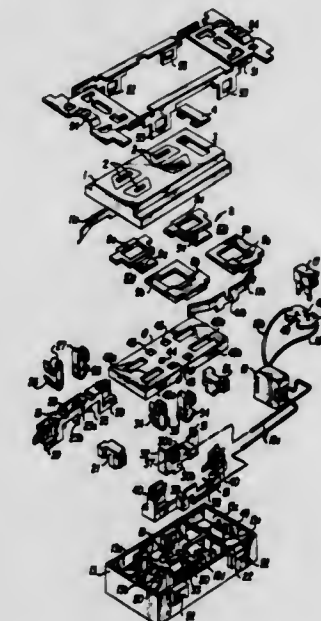
Filed Jan. 15, 1982, Ser. No. 339,721

Claims priority, application Japan, Jan. 21, 1981, 56-8272

Int. Cl.<sup>3</sup> H01R 3/00

U.S. Cl. 339-113 L

2 Claims



1. A plug socket with working condition display comprising: a main body, divided into first, second and third compartments, said compartments arranged in the shape of a U, said second and third compartments being connected by a cut-out; a first blade clip spring member placed in said first compartment, said first blade clip spring member including a terminal and a contact member; a second blade clip spring member placed in said second compartment, said second blade clip spring member including a contact member; a terminal associated with but separate from said second blade clip member; a current transformer placed in said third compartment and having primary and secondary leads;

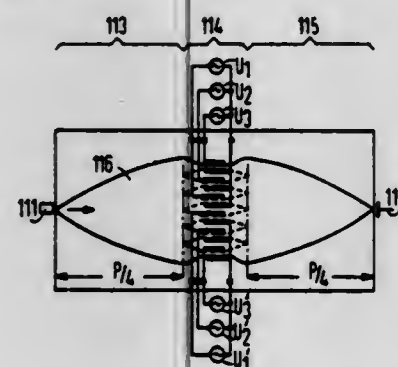


an electrically luminous element connected to the secondary leads of said current transformer;  
 one of said primary leads of said current transformer being connected to said terminal associated with but separate from said second blade clip member;  
 the other of said primary leads of said current transformer being connected to the contact of said second blade clip member;  
 both of said primary leads passing through said cutout;  
 a lid plate engageable with said main body to form a casing, said lid plate including a pair of plug blade insertion slits complementary to said first and second blade clip spring members and a light transmitting portion designed to permit the transmission of light from said electrically luminous element,  
 whereby said plug socket will visually indicate the working condition of a load connected to said plug socket.

**4,418,980**  
**PLANAR WAVEGUIDE LENS, ITS UTILIZATION AND METHOD FOR ITS MANUFACTURE**  
 Rudolf Keil, Munich; Franz Auercher, Baierbrunn, and Michael Stockmann, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,558  
 Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023147

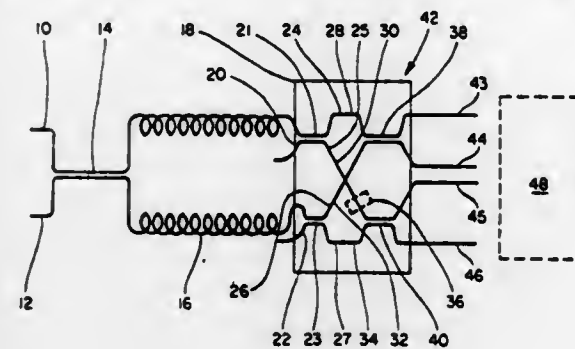
Int. Cl.<sup>3</sup> G02B 5/174  
 U.S. Cl. 350—96.13 17 Claims



11. A planar waveguide lens signal recognition device, comprising:  
 an optical waveguide layer including a longitudinal axis, an approximately parabolic refractive index profile extending transversely of the axis, an input side comprising an input end including an input location for receiving light, and an output side comprising an output end including an output location for emitting light;  
 a central section between said input and output sides;  
 a plurality of tapered transitions connecting said central section to said input and output sides;  
 2×N strip waveguides carried on said central section and having 1-N and 1'-N' electrodes, the 1'-N' electrodes to receive an unknown frequency signal to cause respective phase shifts of the light of the respective strip waveguides and the 1-N electrodes to sequentially receive known reference frequency signals to cause respective phase shifts, so that the intensity of light output at said output location indicates the frequency of the unknown signal.

**4,418,981**  
**QUADRATURE FIBER-OPTIC INTERFEROMETER MATRIX**  
 David W. Stowe, Buffalo Grove, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 19, 1982, Ser. No. 340,672  
 Int. Cl.<sup>3</sup> G01B 9/02  
 U.S. Cl. 350—96.15 19 Claims



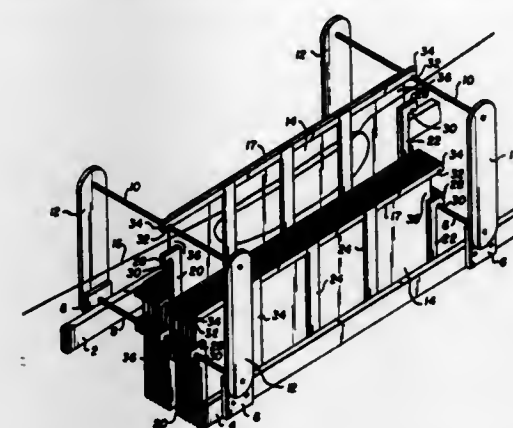
8. An optical interferometer matrix including:  
 first and second waveguides, each having first and second optical signals, respectively, transmitted therethrough, said first signal in said first waveguide being a reference signal, said second signal in said second waveguide differing from said first signal by an optical alteration of the phase of said second signal which is desired to be monitored;  
 a housing encasing a portion of said first and second waveguides;  
 a third waveguide coupled to said first waveguide within said housing at a first preinterferometer coupling location to couple a portion of said first signal into said third waveguide to generate a third signal in said third waveguide differing in phase from said first signal by  $\pi/2$  radians just beyond said first preinterferometer coupling location;  
 a fourth waveguide likewise coupled to said second waveguide within said housing at a second preinterferometer coupling location to couple a portion of said second signal into said fourth waveguide to generate a fourth signal differing in phase from said second signal by  $\pi/2$  radians just beyond said second preinterferometer coupling location;  
 a first preinterferometer having one of said odd-numbered and one of said even-numbered waveguides coupled at a first interferometer coupling location to couple signals from said odd-numbered and even-numbered waveguides to one another; and  
 a second interferometer having the remaining one of said odd-numbered and even-numbered waveguides coupled at a second interferometer coupling location to couple signals from said remaining odd-numbered and even-numbered waveguides, said interferometer coupling locations being positioned within said housing so that corresponding interference components of the outputs from said first and second interferometers have a phase difference of approximately  $\pi/2$  radians from one another.

**4,418,982**  
**SPLICE ORGANIZER**  
 Gary S. Williams, Vancouver, Canada, assignor to Phillips Cables Ltd., Ontario, Canada

Filed Feb. 17, 1981, Ser. No. 235,235  
 Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.20 7 Claims  
 1. A splice holder comprising:  
 a chassis defined by side members spaced from each other, first cross members raised above the side members and spaced from each other and second cross members positionable above the first cross members;  
 a plurality of plates to be received between the side members

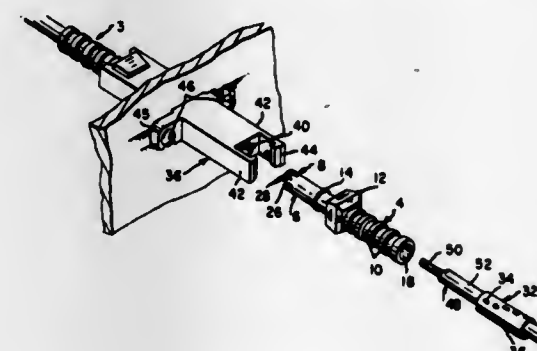
of the chassis and to receive a length of fibre containing a splice;  
 retaining means associated with each plate to hold a length of spliced fibre against the plate;  
 first suspension means at each end of each plate so a plate may be suspended from the first cross members of the chassis to lie substantially vertically in a first position;



second suspension means at each end of each plate so each plate can be suspended from the second cross members to lie substantially vertically in a second position, above the first position;  
 a raised periphery for each plate to protect a length of fibre held against the plate by the retaining means; and  
 at least one break in the periphery to permit the fibre to pass through the periphery.

**4,418,983**  
**OPTICAL WAVEGUIDE CONNECTOR**  
 Terry P. Bowen, Etters; Bernard G. Caron, Harrisburg; Douglas W. Glover, Harrisburg, and John C. Hoffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1981, Ser. No. 244,526  
 Int. Cl.<sup>3</sup> G02B 7/26  
 U.S. Cl. 350—96.21 12 Claims



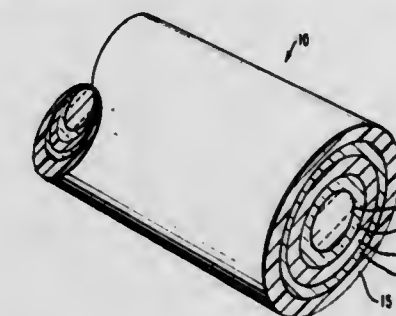
1. A connector for axially aligning a pair of optical waveguides of the type having a waveguide fiber and an outer jacket layer, comprising:  
 a receptacle body having a bore extending therethrough;  
 a pair of plug members for opposed positionment within said receptacle bore, each having an axial passageway adapted to receive one said fiber therein, and a forward alignment nose portion having a profiled opening therethrough communicating with said axial passageway, said opening being defined by upper and lower V-shaped surfaces separated by a transverse slot extending through said nose portion, and said upper and lower surfaces receiving a forward length of the waveguide fiber therebetween;  
 each said plug member having a rearward portion, and at least two compressible protrusions on said alignment nose portion for engaging said receptacle body to radially influence said upper and lower V-shaped surfaces against said waveguide fiber, and each said plug having an annu-

lar flange axially spaced a distance rearward of said protrusions for engaging said receptacle body;  
 a pair of retention sleeves, each positioned within said rearward passageway portion of a respective said plug member and receiving said optical waveguide therethrough, each said retention sleeve having a plurality of resilient outward time projections biased outward and rearward from said sleeve engaging said respective plug member to inhibit rearward withdrawal of said sleeve from said plug member, and each said sleeve having a plurality of resilient inward time projections biased inward and forward of said sleeve, and engaging the jacket layer of said optical waveguide to inhibit rearward withdrawal of said waveguide from said sleeve.

**4,418,984**  
**MULTIPLY COATED METALLIC CLAD FIBER OPTICAL WAVEGUIDE**

Joseph A. Wysocki, Oxnard; George R. Blair, Culver City, and Michael R. Vince, Pollock Pines, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Nov. 3, 1980, Ser. No. 203,762  
 Int. Cl.<sup>3</sup> G02B 1/10, 5/14, 5/172; C03C 25/04  
 U.S. Cl. 350—96.33 35 Claims



1. A flexible fiber optical waveguide for the transmission of optical electromagnetic radiation, said waveguide comprising a glass fiber including a glass core member having a first minimum refractive index for said radiation and a glass cladding concentrically surrounding said core, said glass cladding including at least one layer having a second refractive index for said radiation which is lower than the minimum of said first refractive index by at least 0.1% to produce total internal refraction of said optical radiation at the core/clad interface and to thereby guide said optical radiation along said waveguide, characterized in that said waveguide is provided with at least two metallic claddings with a first metallic cladding in contact with said glass fiber, said first metallic cladding comprising a metal or alloy which is substantially chemically inert with respect to the material comprising the glass fiber at the deposition temperature during coating of said metal or alloy onto said glass fiber, and at least one of said metallic claddings comprising a metal or alloy having a recrystallization temperature greater than room temperature or the anticipated use temperature, whichever is greater.

**4,418,985**  
**MULTI-COMPONENT GLASS OPTICAL FIBER FOR OPTICAL COMMUNICATION**

Mituo Kasori, Kawasaki; Takeshi Takano, Samukawa; Hironori Maki, Kawasaki, and Naohiko Ogino, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 26, 1982, Ser. No. 382,286  
 Claims priority, application Japan, May 30, 1981, 56-83498  
 Int. Cl.<sup>3</sup> C03C 3/08, 13/00; G02B 5/14

U.S. Cl. 350—96.34 6 Claims  
 1. A multi-component system glass fiber for optical communication which comprises:  
 a core of a multi-component system glass having a composition consisting essentially of 35 to 45% by weight of SiO<sub>2</sub>,



35 to 45% by weight of  $\text{BaO}$ , 3 to 7% by weight of  $\text{Al}_2\text{O}_3$ , 9 to 13% by weight of  $\text{B}_2\text{O}_3$ , 1.2 to 4% by weight of at least one alkali metal oxide selected from the group consisting of  $\text{Na}_2\text{O}$ ,  $\text{K}_2\text{O}$  and  $\text{Li}_2\text{O}$ , the content of  $\text{Na}_2\text{O}$  being 2.5% by weight or less, and 4 to 11% by weight of at least one alkaline earth metal oxide selected from the group consisting of  $\text{MgO}$  and  $\text{CaO}$ ; and

a clad layer, on said core, of a multi-component system glass having a composition consisting essentially of 66 to 71% by weight of  $\text{SiO}_2$ , 4 to 7% by weight of  $\text{Al}_2\text{O}_3$ , 7 to 12% by weight of  $\text{B}_2\text{O}_3$ , 12 to 16% by weight of at least one alkali metal oxide selected from the group consisting of  $\text{Na}_2\text{O}$ ,  $\text{K}_2\text{O}$  and  $\text{Li}_2\text{O}$ , 2% by weight or less of at least one alkaline earth metal oxide selected from the group consisting of  $\text{MgO}$  and  $\text{CaO}$ , and 3% by weight or less of at least one of  $\text{ZnO}$ ,  $\text{ZrO}_2$  and  $\text{TiO}_2$ .

4,418,986

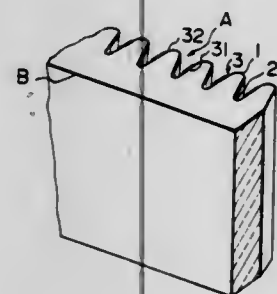
## REAR PROJECTION SCREEN

Yukio Yata, Chiba, and Koichi Inagaki, Hoya, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan  
Filed Mar. 31, 1982, Ser. No. 364,193  
Claims priority, application Japan, Apr. 7, 1981, 56-51194;  
Jun. 12, 1981, 56-90544

Int. Cl.<sup>3</sup> G03B 21/60

U.S. Cl. 350-128

15 Claims



1. A rear projection screen having a viewing side surface, a projection side surface and a medium therebetween and having a plurality of lenticules which are formed on said viewing side surface so as to form a lenticulated surface thereon, said each lenticule comprising a crest and trough portions interconnected by flank portions wherein at least a portion of each flank has a total reflection surface so that all light rays impinging on said flank are reflected by said total reflection surface and emanate through said medium at portions other than said flank portions.

4,418,987

POLARIZER ARRANGEMENT FOR A SIGNIFICANT IMPROVEMENT IN VIEWING ANGLE CHARACTERISTIC IN A LIQUID CRYSTAL DISPLAY

Hiroshi Takanashi, Yamatokoriyama, and Shoichiro Takahara, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1980, Ser. No. 179,501

Claims priority, application Japan, Aug. 21, 1979, 54-106941

Int. Cl.<sup>3</sup> G02F 1/133

U.S. Cl. 350-337

5 Claims

1. A twisted nematic field effect mode liquid crystal display cell comprising:

a liquid crystal layer;

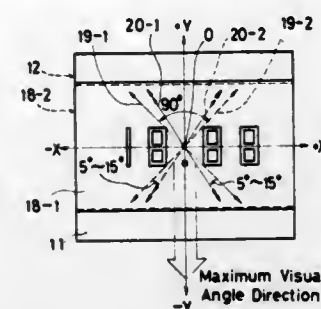
first and second substrates on opposite sides of said liquid crystal layer;

first and second polarizers attached to respective outer surfaces of said first and second substrates, said polarizers having first and second planes of polarization;

first and second orientation films formed on respective inner surfaces of said first and second substrates for orienting molecules of said liquid crystal layer in first and second orientation directions;

wherein each of said planes of polarization is rotated with

respect to one of said first and second orientation directions forming angles therebetween, said angles being



greater than or less than zero degrees and greater than or less than 90 degrees.

4,418,988

## MICROSCOPE OBJECTIVE

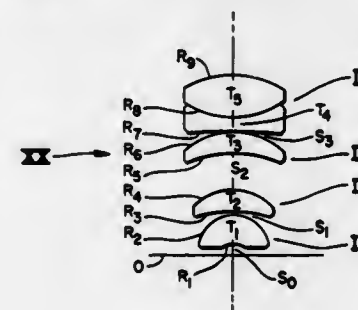
Milton H. Sussman, Amherst, N.Y., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Filed Feb. 19, 1981, Ser. No. 235,786

Int. Cl.<sup>3</sup> G02B 21/02

U.S. Cl. 350-414

2 Claims



1. A microscope objective having an NA of 0.66 consisting essentially of a concavo-hemispherical positive singlet I, a concavo-convex positive singlet II, a concavo-convex positive singlet III and a concavo-convex positive doublet IV wherein the parameters of the respective axial spacings ( $S_0-S_3$ ) in mm, radii ( $R_1-R_9$ ), in mm, with a minus sign (-) indicating a center of curvature on the object side of the lens, thickness ( $T_1-T_5$ ) in mm, indices of refraction ( $ND_1-ND_5$ ) and Abbe numbers ( $v_1-v_5$ ) are determined by the following table:

Lens	Radius (R)	Thickness (T)	Spacing (S)	Refractive Index (ND)	Abbe No (v)
			$S_0 = 0.105f$		
I	$R_1 = -0.473f$				
		$T_1 = 0.493f$		$1.78 < ND_1 < 1.79$	$50 < v_1 < 51$
	$R_2 = -0.595f$				
II			$S_1 = 0.012f$		
	$R_3 = -1.782f$				
		$T_2 = 0.329f$		$1.78 < ND_2 < 1.79$	$50 < v_2 < 51$
III	$R_4 = -0.897f$				
			$S_2 = 0.627f$		
	$R_5 = -2.199f$			$1.615 < ND_3 < 1.65$	$60 < v_3 < 61$
IV					
	$R_6 = -1.239f$				

-continued

Lens	Radius (R)	Thickness (T)	Spacing (S)	Refractive Index (ND)	Abbe No (v)
			$S_3 = 0.014f$		
IV	$R_7 = -21.960f$			$1.75 < ND_4 < 1.76$	$31 < v_4 < 32$
		$T_4 = 0.219f$			
	$R_8 = 1.385f$			$1.49 < ND_5 < 1.50$	$81 < v_5 < 82$
	$R_9 = -1.797f$				

wherein f is 3.5 to 5.5 mm.

4,418,989

## APPARATUS FOR SHIFTING THE WAVELENGTH OF LIGHT

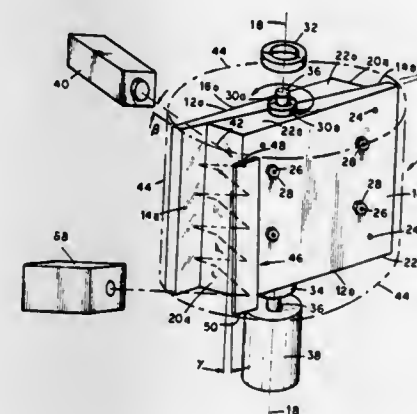
William H. McCulla, Oak Ridge, and John D. Allen, Jr., Knoxville, both of Tenn., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jan. 29, 1982, Ser. No. 343,802

Int. Cl.<sup>3</sup> G02B 5/12, 7/18, 27/00

U.S. Cl. 350-486

8 Claims



1. Apparatus for shifting the wavelength of light, comprising:

a first reflector mounted for rotation about an axis and comprising at least one retroreflection corner having two planar reflecting surfaces disposed substantially perpendicular to each other and extending longitudinally of said axis in spaced relation therewith;

means for rotating said first reflector about said axis;

means for projecting a light beam along a path generally tangent to the cylinder of revolution generated by said first reflector as it rotates; and

a second reflector positioned outside said cylinder of revolution and having a planar reflecting surface oriented relative to said projecting means and said first reflector so that said light beam is repetitively reflected back and forth between said reflecting surface of said second reflector and said reflecting surfaces of said first reflector during a portion of each rotation of said first reflector, said light beam advancing along said reflecting surfaces longitudinally of said axis as it is reflected therebetween.

4,418,990

## EYEGLASSES AND OTHER LENSES OF VARIABLE FOCAL LENGTH AND MEANS AND METHOD FOR VARYING SUCH FOCAL LENGTH

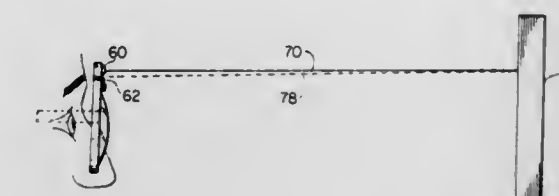
Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.

Filed Jul. 20, 1981, Ser. No. 284,782

Int. Cl.<sup>3</sup> G02C 1/00

U.S. Cl. 351-41

9 Claims



1. A variable focal length lens assembly comprising:

a lens having two lens surfaces and a circumferential marginal portion, said lens consisting of a unitary body of resiliently deformable light conducting material so that the curvature of said two lens surfaces may be varied by varying a pressure applied to said lens along said marginal portion;

a holder substantially surrounding said lens and engaging said marginal portion thereof so as to apply such a pressure to said lens;

means for adjusting said holder to vary said pressure which it applies to said lens; and

a range finder attached to said lens holder, said range finder including

a signal emitter for projecting a distance sensing signal generally along a line toward an object to be brought into focus;

a signal receiver for receiving a portion of said projected signal reflected from said object;

a detector associated with said signal emitter and said signal receiver for producing a distance signal related to the distance between them and said object; and

means for adjusting said holder to vary said pressure which it applies to said lens in response to said distance signal.

4,418,991

## PRESBYOPIC CONTACT LENS

Joseph L. Breger, 511 Ravine Dr., Highland Park, Ill. 60035

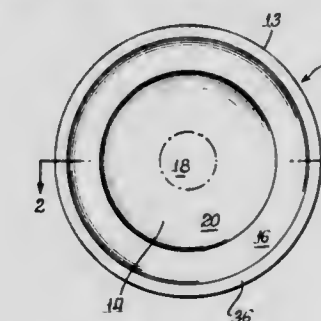
Continuation-in-part of Ser. No. 78,462, Sep. 24, 1979,

abandoned. This application Jun. 9, 1980, Ser. No. 157,399

Int. Cl.<sup>3</sup> G02C 7/04, 7/06

U.S. Cl. 351-161

6 Claims



1. A contact lens for correction of presbyopia having

a generally spherical anterior surface; and

a posterior side including an annular spherical surface which is an outer residual portion of a spherical base curve generally matched in radius of curvature to a portion of the cornea over which said spherical surface lies and a central generated aspherical surface extending from the center of said posterior side substantially beyond the diameter of the pupil,

said generated surface being generated into said base curve



by a continuous operation beginning at the center of the original base curve removing continuously less material from the center outward, said generated surface having a central portion which optically cooperates with said anterior surface to provide an appropriate diopter correction for distance vision; and a paracentral portion of said generated aspherical surface around said central portion having progressively increasing radii of curvature and decreasing eccentricities away from the center, said paracentral portion cooperating with said anterior surface to provide a gradient of appropriate diopter add for close-in and intermediate viewing; said annular spherical surface and a portion of said generated polished surface beyond said paracentral portion fitting closely adjacent the cornea.

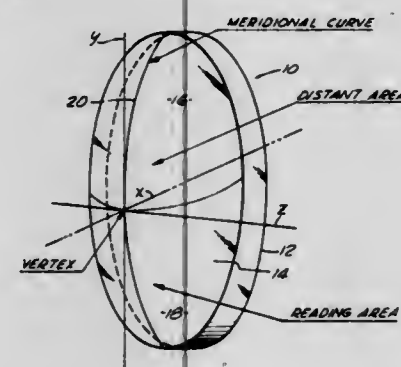
4,418,992

# OPHTHALMIC PROGRESSIVE POWER LENS AND METHOD OF MAKING SAME

Lawrence J. Davenport, deceased, late of Los Angeles, Calif., and Nancy Davenport, executrix, Downey, Calif., assignors to Younger Manufacturing Company, Los Angeles, Calif.  
Filed May 17, 1982, Ser. No. 378,528  
Int. Cl.<sup>3</sup> G02C 7/06

U.S. Cl. 351-169

7 Claims



1. A method of making an improved ophthalmic lens having an x, y and z axis with progressive varying focal length characterized by having two refractive surfaces, one of which is divided into first, second, and third viewing zones intended respectively for distant vision, intermediate vision and near vision said one surface including a meridional curve passing through the optical center of the lens and traversing said zones, said meridional curve being defined by a sequence of points on said one surface, said first and third zones being either spherical, or being aspheric surfaces of revolution, the improvement consisting of a method of generating said second viewing zone which is the progressively powered surface interconnecting said first and third zones, said method comprising the steps of:

- defining the desired contour of the meridional curve;
- dividing the area on a first side of said meridional curve by two planes disposed perpendicularly to the y-z plane of the lens and containing the x axis thereof; and
- defining the progressive lens surface by a method including the steps of:

- defining the angle U as

$$U = (T - A_0 + A_1)/2$$

where T is the angle variable with the values of 0 to A<sub>0</sub> for the distance portion of the lens; A<sub>0</sub> to A<sub>1</sub> for the intermediate portion of the lens; and A<sub>1</sub> to for the near portion of the lens;

it is to be noted that the radius vector from the origin (x,0,0) and the angle T define the contour in the plane x, where x is the sag of the curve and is constant for each contour, the radius being a function of the angle T;

- expressing the radius R as a power series as follows:

$$R = G_0 + G_1U + G_2U^2 + G_3U^3 + G_4U^4$$

and expressing the first and second derivatives with respect to T and also U thusly:

$$dR/dT + dR/du = G_1 + 2G_2U + 3G_3U^2 + 4G_4U^3$$

and

$$d^2R/dT^2 = d^2R/du^2 = 2G_2 + 6G_3U + 12G_4U^2;$$

- establishing boundary conditions as follows:

- At T=A<sub>0</sub>, with the radius of the distant viewing curve being R<sub>0</sub>:

$$R_0 = G_0 + G_1U + G_2U^2 + G_3U^3 + G_4U^4;$$

- At T=A<sub>1</sub>, with the radius of the near viewing circle being R<sub>1</sub>:

$$R_1 = G_0 + G_1U + G_2U^2 + G_3U^3 + G_4U^4;$$

- At T=A<sub>0</sub>, the radius change with angle=0: (arcs tangent at A<sub>0</sub>)

$$dR/dU = 0 = G_1 + 2G_2U + 3G_3U^2 + 4G_4U^3;$$

- At T=A<sub>1</sub>, the radius change with angle in finite: (arcs tangent at A<sub>1</sub>)

$$dR/dU = D_1 = G_1 + 2G_2U + 3G_3U^2 + 4G_4U^3; \text{ and}$$

- At R=A<sub>1</sub> the second derivative dR<sup>2</sup>/dU<sup>2</sup> is finite: (arcs curvature of A<sub>1</sub>)

$$d^2R/dU^2 = D_2 = 2G_2 + 6G_3U + 12G_4U^2;$$

- solving for G<sub>0</sub> through G<sub>4</sub> as follows:

$$G_3 = \frac{1}{40^2} \left( D_1 - \frac{R_0 - R_1}{U} \right)$$

$$G_1 = \frac{D_1}{2} - 3(G_3)U^2$$

$$G_4 = \frac{D_1}{4U^3} + \frac{D_2}{8U^2} - \frac{3(R_0 - R_1)}{16U^4}$$

$$G_2 = -\frac{D_2}{4} - \frac{3D_1}{4U} + \frac{3(R_0 - R_1)}{8U^2}$$

$$G_0 = R_0 - F_1U - G_2U^2 - G_3U^3 - G_4U^4; \text{ and}$$

- solving for D<sub>1</sub> and D<sub>2</sub> as follows:

- letting y<sub>s</sub>=radius position of the center of the near circular arc from (x,0,0) in the y,z plane;

- letting R<sub>3</sub>=circular radius of the near circular arc in the y-z plane;

$$\text{then } D_1 = -Y_5 \sin T - \frac{(\sin T \cos T) Y_5^2}{(R_3^2 - (\sin T)^2 (Y_5^2)^{1/2}}; \text{ and}$$

$$D_2 = -Y_5 \cos T - \frac{(Y_5^2(1 - 2\sin^2 T))}{((R_3)^2 - (\sin T)^2 (Y_5^2)^{1/2}} - \frac{(Y_5^4(\sin T)^2 \cos T^2)}{((R_3)^2 - (\sin T)^2 (Y_5^2)^{3/2}};$$

where the near circular section is defined as:

$$(Y - Y_5)^2 + Z^2 = (R_3)^2.$$

# STEREOSCOPIC ZOOM LENS SYSTEM FOR THREE-DIMENSIONAL MOTION PICTURES AND TELEVISION

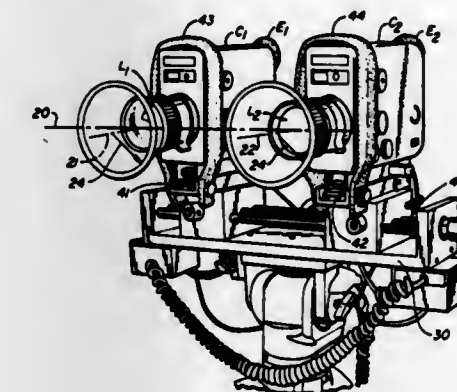
Lenny Lipton, Point Richmond, Calif., assignor to Stereographics Corp., San Rafael, Calif.

Filed May 7, 1981, Ser. No. 305,302

Int. Cl.<sup>3</sup> G03B 35/00

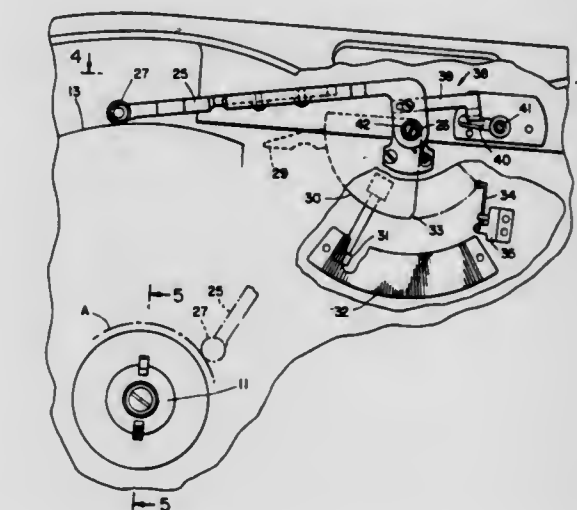
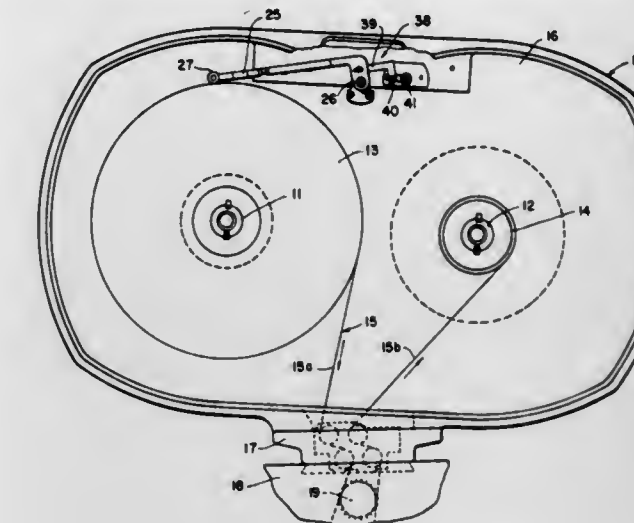
U.S. Cl. 352-57

26 Claims



1. A process for taking stereoscopic zoom three-dimensional pictures comprising the steps of providing first and second cameras spaced a predetermined distance apart for photographing the same scene; mounting to said respective cameras respective first and second substantially identical zoom lenses; synchronizing said cameras to zoom to change focus and/or magnification simultaneously and identically; setting said lenses of each of said cameras to a predetermined distance and aligning the vergence of said respective lenses to coincide on an object in said scene at the desired distance; moving the field of view of at least one camera relative to the field of view of the other camera in a predetermined manner upon change of zoom in focus and/or magnification to maintain centration between said cameras in order to prevent spurious parallax between said respective fields of view.

tive of a full supply reel, and gradually decreasing as the amount of film on the supply reel decreases, and then



# MODULE FOR PROJECTING MOTION PICTURES THROUGH A CAMERA

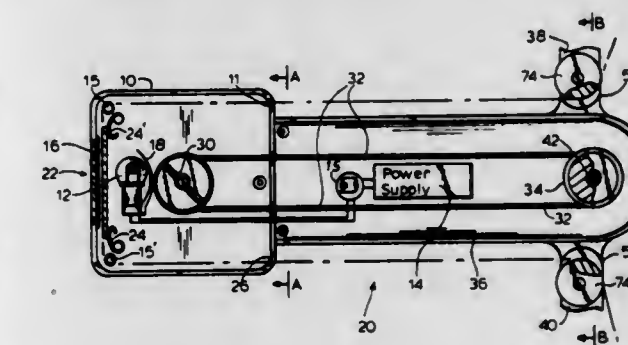
Stanley Mulfeld, 240 E. 76th St., New York, N.Y. 10021

Filed Aug. 24, 1981, Ser. No. 295,718

Int. Cl.<sup>3</sup> G03B 21/00

U.S. Cl. 352-129

5 Claims



# FILM MAGAZINE FOR MOTION PICTURE CAMERA

Robert E. Gottschalk, Los Angeles, and Carl F. Fazekas, Tarzana, both of Calif., assignors to Panavision, Incorporated, Tarzana, Calif.

Filed Oct. 19, 1981, Ser. No. 312,379

Int. Cl.<sup>3</sup> G03B 23/02

U.S. Cl. 352-78 R

6 Claims

1. A film magazine for a motion picture camera comprising: a casing; a supply hub rotatably mounted within said casing, the supply hub adapted to carry a supply reel; a motor-driven take-up hub adapted to carry a take-up reel, so that a film strip may pass from the supply reel, out of the magazine and into a camera, and out of the camera and onto the take-up reel; sensing means for generating a signal indicative of the quantity of film on the supply reel; and braking means coupled to the sensing means for applying a braking torque to the supply reel, the braking torque being greatest when the sensing means generates a signal indica-

1. An apparatus for projecting motion pictures with a standard motion picture camera, which comprises: a lamp housing which fits within a standard motion picture camera film recess having a light transmissive portion that aligns with the camera optical system when the lamp housing is inserted into the camera; an illumination means, disposed within the lamp housing so that light emitted therefrom passes through the light trans-



missive portion of the lamp housing into the camera optical system; and

- a film transport means comprising
- a camera drive engagement whereby the camera's film drive is connected to a main drive pulley within the lamp housing;
- a drive housing extending from the lamp housing having an auxiliary drive pulley mounted on a rotatable spindle within the drive housing, the rotatable spindle having an end portion extending to the drive housing exterior and a reel drive pulley mounted on the exterior portion of the rotatable spindle;
- a main drive belt within the drive housing connecting the main drive pulley and the auxiliary reel drive pulley;
- a supply reel arm extending from the drive housing having a supply reel pulley mounted on a rotatable spindle for receiving a film supply reel;
- a take-up reel arm extending from the drive housing having a take-up reel pulley mounted on a rotatable spindle for receiving a take-up reel; and
- an auxiliary drive belt that may be manually attached between the reel drive pulley and either the take-up reel pulley or supply reel pulley depending on the desired mode of operation.

4,418,996

**COLOR BEAM PROJECTOR APPARATUS**

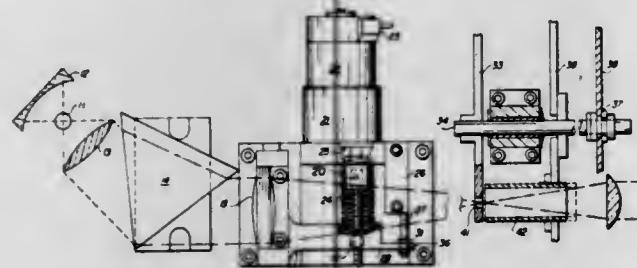
Dennis Bellar, and Thurman Sasser, both of Orlando, Fla., assignors to Laser Photonics, Inc., Orlando, Fla.

Filed Sep. 29, 1982, Ser. No. 426,722

Int. Cl.<sup>3</sup> G03B 21/28

U.S. Cl. 353—33

14 Claims



1. A color beam projector apparatus comprising in combination:

- a light source for producing a beam of light;
- a collimating lens for collimating light from said light source;
- means for receiving light from said light source and dispersing the light into a plurality of spectral color components;
- a movable frame supporting a focusing lens for moving said dispersed, focused light into a plurality of positions;

and

- a movable surface having a plurality of apertures there-through and positioned to allow the position of any one of said apertures adjacent a focal point of the movable frame member focusing lens, thereby selecting color components of light through said aperture responsive to the position of the focusing lens and movable surface.

4,418,997

**SLIDE PROJECTOR WITH CIRCULAR SLIDES MAGAZINE**

Lennart R. Johansson, Landvetter, and Ernst G. K. Hillström, Mölnlycke, both of Sweden, assignors to Victor Hasselblad Aktiebolag, Gothenburg, Sweden

Filed May 6, 1981, Ser. No. 260,886

Claims priority, application Sweden, Jun. 6, 1980, 8004260

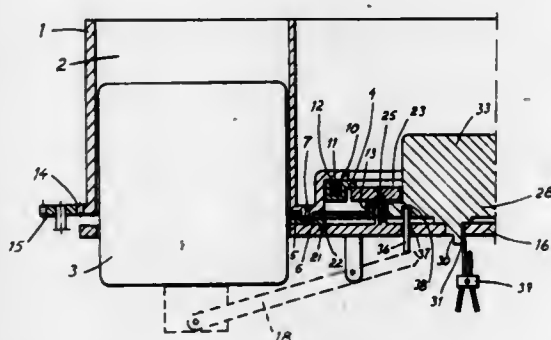
Int. Cl.<sup>3</sup> G03B 23/06

U.S. Cl. 353—111

3 Claims

1. A slides magazine for use with a slide projector having a plurality of downwardly open compartments for the slides and

means for coupling the slide magazine to the projector, the slide magazine comprising a circular frame having a centrally disposed opening to form an inner edge, a geared ring being provided in the outer periphery of the frame to engage a pinion for rotating the magazine, the inner edge being formed into a supporting flange, the frame having mounted thereto, in sequence: an axially movable center ring which is urged away from the circular frame by springs; a radially movable locking ring comprising an upwardly projecting flange along the inner periphery thereof for alignment with the center ring; a centering ring having a downwardly projecting guide edge along the inner periphery thereof; the slide projector having a top sur-



face being provided with a slide aperture and a circular groove for engaging the guide edge in the centering ring in the slide magazine; a center disc having an eccentric guide hole being mounted on the top surface; an eccentric plate being disposed between the center disc and the top surface, the eccentric plate being rotatable between open and closed positions whereby in the closed position the eccentric ring moves radially the locking ring in the slide magazine to release the slide stored in the compartment above the slide aperture, the slide being held within the compartment by the outer edge of the locking ring when the eccentric ring is in an open position, the eccentric plate having a handle portion projecting through the eccentric guide hole in the center disc.

4,418,998

**AUTOMATIC FOCUSING DEVICE FOR THE CAMERA**

Hiroaki Ishida, Chiba, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 143,913, Apr. 25, 1980, abandoned.

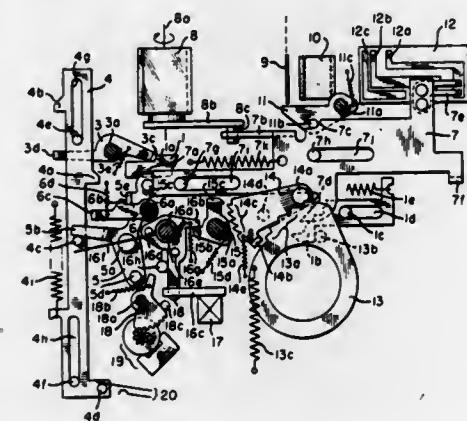
This application May 17, 1982, Ser. No. 379,152

Claims priority, application Japan, Apr. 28, 1979, 54-52861

Int. Cl.<sup>3</sup> G03B 3/00, 17/38

U.S. Cl. 354—405

4 Claims



1. In an automatic focusing camera of the type which automatically regulates the position of a photographing lens to bring the lens into focus with respect to an object field to be photographed by detecting a distance between the object field and the camera: a movable shutter releasing member movable in first and second stages from a rest position, which corresponds to the beginning of the first stage, to a shutter-operating

position for initiating operation of a shutter, which corresponds to the ending of the second stage; detecting means operable when actuated for detecting the distance between an object field to be photographed and the camera; a movable actuating member having a charged position and operable when released from the charged position to undergo movement in one direction to actuate the detecting means; means including a movable stopper operable in response to the movement of the shutter releasing member during the first stage of forward movement thereof and before reaching the second stage of forward movement thereof for permitting the actuating member to move in one direction to thereby enable the actuating member to actuate the detecting means; and means coacting with the shutter releasing member for releasably interlocking the actuating member with the shutter releasing member during the course of return movement of the shutter releasing member to its rest position after the actuation of the detecting means to thereby enable the actuating member to be returned to its charged position in interlocked relationship with the return motion of the shutter releasing member in the event the shutter releasing member is returned to its rest position without having reached its shutter-operating position whereby the camera operator can confirm the focusing range prior to shutter operation.

4,418,999

**SYNCHRONIZING CIRCUIT**

Barry J. Baxter, Werribee, Australia, assignor to Commonwealth of Australia, Canberra, Australia

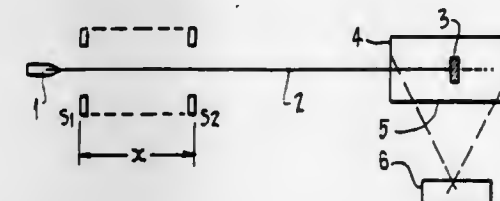
Filed Apr. 1, 1982, Ser. No. 353,170

Claims priority, application Australia, Mar. 26, 1981, PE8168

Int. Cl.<sup>3</sup> G01P 3/66; G03B 15/16

U.S. Cl. 354—132

8 Claims



1. A synchronising circuit for causing a phenomena to occur at a precise point in the path of travel of an article regardless of the speed of movement of the article in that path, comprising first and second spaced sensors upstream of said precise point and each operable to detect the passage of an article therepast and to provide output signals consequent thereon, a counting circuit which provides a count in one direction when the first sensor provides an output signal, and which counts in the opposite direction from the value of the count first counted, when the second sensor provides an output signal and circuit means responsive to the counting circuit returning to a predetermined count value to initiate the occurrence of said phenomena.

4,419,000

**CAMERA CAPABLE OF AUTOMATIC FILM ADVANCING AND REWINDING**

Fumio Yoshida, Osaka; Yukio Miki, Sakai, and Takeshi Egawa, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 19, 1981, Ser. No. 312,569

Claims priority, application Japan, Oct. 27, 1980, 55-149442

Int. Cl.<sup>3</sup> G03B 1/12

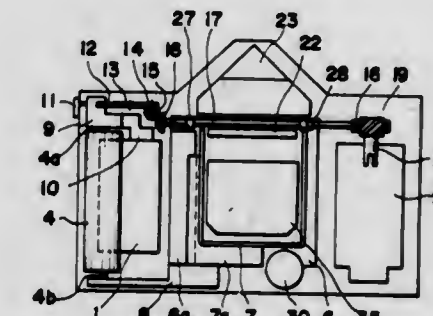
U.S. Cl. 354—173.1

12 Claims

1. A camera having a first box and second and third boxes located at opposite sides of and adjacent to said first box, said first box including a camera obscura and view finder optical elements including a focusing screen, one of said second and third boxes having a film supply chamber for housing therein an un-exposed film and the other of said second and third boxes

having a film takeup chamber for storing therein an exposed film, said camera comprising:

- a film advance mechanism for winding the film, said film advance mechanism being provided in the box wherein said film takeup chamber is housed;
- a film rewind mechanism for rewinding the film stored in said film takeup chamber, said film rewind mechanism being provided in the box wherein said film supply chamber is housed;
- an electric motor provided in said second box;



a rotatable drive shaft connected to one of said advance and rewind mechanisms which is housed in said third box, said rotatable drive shaft traversing an area adjacent to said focusing screen in said first box and out of a finder optical path; and

means for alternatively transmitting the rotation of said electric motor to said drive shaft and said one of said advance mechanism and rewind mechanism which is housed in said second box.

4,419,001

**MOTOR DRIVEN FILM WIND-UP AND REWIND DEVICE FOR CAMERAS**

Shinji Tominaga; Toshinori Imura, and Ikushi Nakamura, all of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

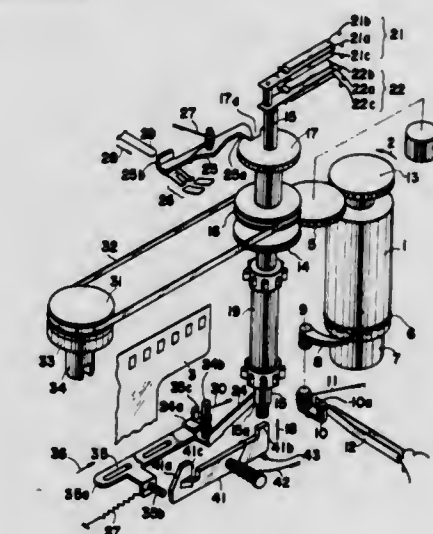
Filed May 24, 1982, Ser. No. 381,717

Claims priority, application Japan, May 29, 1981, 56-83382; Jun. 1, 1981, 56-84737

Int. Cl.<sup>3</sup> G03B 1/18

U.S. Cl. 354—173.1

6 Claims



1. In a camera which is adapted to effect a shutter cocking operation with a film rewind by the length of one frame and which includes a film rewinding sprocket, a film take-up spool and a cartridge chamber for receiving a film cartridge, a film wind-up and rewind device comprising:

- a film drive mechanism including an electric motor rotatable in both normal and reverse directions and rotating said spool in response to the rotation of said motor in the normal direction for wind-up of the entire length of a film on said spool out of said film cartridge while rotating said



sprocket in response to the rotation of said motor in the reverse direction for rewind of the film back into said cartridge;

means urged from a first position for disconnecting said sprocket from said drive mechanism to a second position for connecting said sprocket with said drive mechanism and movable from the first position to the second position immediately after the initiation of the rotation of said motor in the reverse direction;

a motor drive circuit for supplying said motor with first and second currents which serve to rotate said motor in the normal and reverse directions respectively, said motor drive circuit including first switch means which is switched from a first state to a second state in response to the movement of said movable means from the first position to the second position and which remains in the second position with said movable means being in the second position and being adapted to supply said motor with said first current with said first switch means being in the first state and with a camera rear cover closed and to supply said motor with said second current with said first switch means being at the second state; and

means for detecting increase in the first current which occurs with said motor forced to stop due to completion of the wind-up of the entire length of the film, to generate an output which causes said motor drive circuit to supply said motor with said second current even with said first switch means being in the first state.

4,419,002

#### LENS EXTENSION AND RETRACTING MECHANISM FOR USE IN A PHOTOGRAPHIC CAMERA OF FOLDING TYPE

Susumu Fujita, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

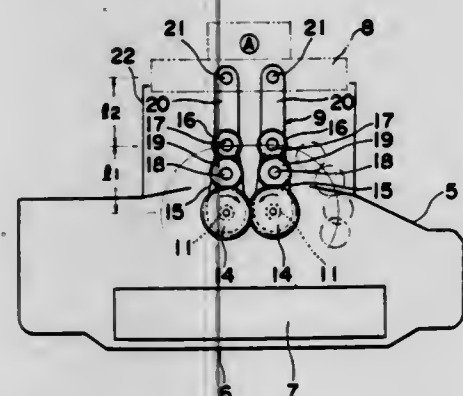
Filed Jun. 14, 1982, Ser. No. 388,303

Claims priority, application Japan, Jun. 16, 1981, 56/93284

Int. Cl.<sup>3</sup> G03B 17/04

U.S. Cl. 354—187

2 Claims



1. A lens extension and retracting mechanism for use in a photographic camera of folding type, which mechanism comprises a lens board member having mounted thereon a photographic lens means for the photographic camera and arranged to be guided between an extended photographing position at a forward portion of a camera body and a retracted accommodating position within the camera body, sun gear means provided on said camera body, planetary arm means coaxially rotating with respect to said sun gear means, planetary gear means rotatably provided on said planetary arm means and engaged with said sun gear means, extension and retracting arm means arranged to rotate simultaneously with said planetary gear means and being pivotally connected to said lens board member, and an operating means for operating said lens extension and retracting arrangement, said lens board member being arranged to be selectively extended into said photographing position or retracted into said accommodating position through said extension and retracting arm means, with said planetary gear means being subjected to planetary revolution

tion through rotation of said planetary arm means of said sun gear means by the operation of said operating means.

4,419,003

#### RECORDING SHEET CONVEYING SYSTEM OF PRESSURE FIXING TYPE ELECTROSTATIC PRINTING APPARATUS

Masakatsu Fujie, Ibaraki; Junichi Matsuno, Toride, and Masao Furuya, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

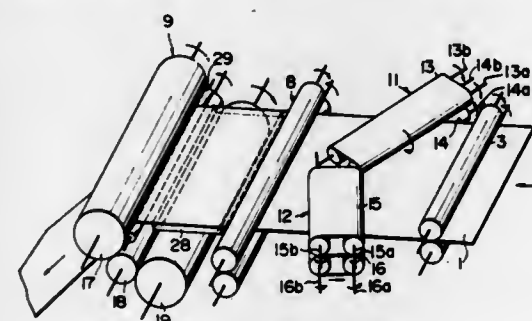
Filed Aug. 6, 1981, Ser. No. 290,563

Claims priority, application Japan, Aug. 27, 1980, 55-117111; Sep. 26, 1980, 55-132898; Oct. 31, 1980, 55-152097; Nov. 12, 1980, 55-158294

Int. Cl.<sup>3</sup> G03G 15/20

U.S. Cl. 355—3 FU

17 Claims



1. A recording sheet conveying system of an electrostatic printing apparatus of the pressure fixing type comprising: developing means for forming a toner image on a recording sheet; conveyor means for conveying the recording sheet having the toner image formed thereon; pressure fixing roller means for fixing by pressure the toner image on the recording sheet; first tension imparting means located anterior to said developing means for imparting to the recording sheet a tension oriented in a direction perpendicular to the direction of travel of the recording sheet, said first tension imparting means comprising at least one conveyor belt means having a tensioning surface area thereof extending laterally so as to at least substantially span the width of a path traveled by said recording sheet; second tension imparting means for imparting to the recording sheet a tension oriented in the direction of travel of the recording sheet; and regulating means located immediately anterior to said pressure fixing roller means for regulating the angle and posture of the leading end of the recording sheet as it is introduced into the pressure fixing roller means.

4,419,004

#### METHOD AND APPARATUS FOR MAKING TRANSPARENCIES ELECTROSTATICALLY

Manfred R. Kuehnle, New London, N.H., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Nov. 2, 1981, Ser. No. 317,446

Int. Cl.<sup>3</sup> G03G 15/00

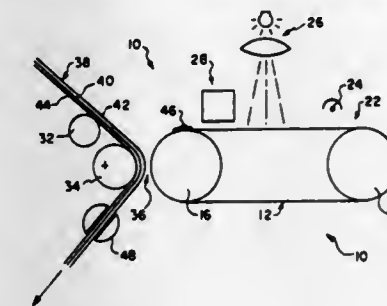
U.S. Cl. 355—3 TR

5 Claims

1. A method of transferring an electrophotographically formed toner image comprising the steps of: electrophotographically forming an electrostatic toner image on a flexible electrophotographic film member by successively charging the photoconductive surface, exposing the charged surface to actinic radiation through an interposed image pattern, forming a latent electrostatic charge image of said pattern on said photoconductive coating surface and toning the latent electrostatic charge image with liquid toner comprising discrete toner particles suspended in an electrically insulating liquid; provid-

ing a transparent transfer sheet consisting of a substrate having a thin ohmic layer and a thin coating of a resinous composition bonded to said ohmic layer, said resinous coating having a softening range lower than the softening range of the substrate; drying the toner image; locally heating the thin resin coating of the transfer sheet melting same, transporting the dry toner image carrying electrophotographic member and the transfer sheet material simultaneously to and through a precise gap defined therebetween with the melted resin coating facing and in prox-

imity to the toner image carrying photoconductive surface, applying an electrical bias voltage across said gap during passage of said electrophotographic film member and said transfer sheet therethrough whereby electrophoretically to transfer said toner image to said sheet member and into the melted resin, separating said transfer sheet from said electrophotographic film, permitting the resin coating of the transfer sheet to cool with transferred toner image embedded within said resin layer whereby said transfer is effected without loss in resolution or optical density.



4,419,006

#### IMAGE PROCESSING APPARATUS UTILIZING DIGITAL DISPLAY MEANS

Nao Nagashima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

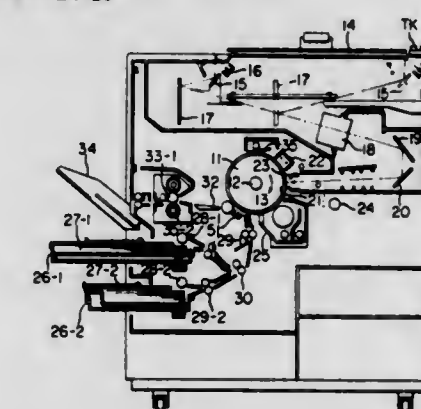
Filed Oct. 7, 1981, Ser. No. 309,381

Claims priority, application Japan, Oct. 15, 1980, 55-144803; Oct. 15, 1980, 55-144809; Oct. 15, 1980, 55-144811

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 R

10 Claims



imity to the toner image carrying photoconductive surface, applying an electrical bias voltage across said gap during passage of said electrophotographic film member and said transfer sheet therethrough whereby electrophoretically to transfer said toner image to said sheet member and into the melted resin, separating said transfer sheet from said electrophotographic film, permitting the resin coating of the transfer sheet to cool with transferred toner image embedded within said resin layer whereby said transfer is effected without loss in resolution or optical density.

4,419,005

#### IMAGING METHOD AND APPARATUS

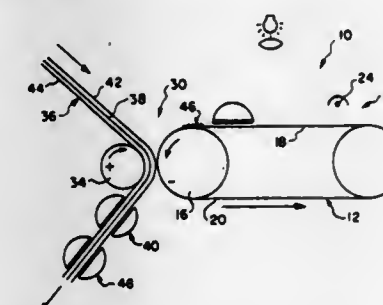
Manfred R. Kuehnle, New London, N.H., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Nov. 2, 1981, Ser. No. 317,448

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—3 TR

5 Claims



1. A method of transferring an electrophotographically formed toner image comprising the steps of: electrophotographically forming a toner image on the photoconductive coating surface of a flexible electrophotographic film member by successively charging the photoconductive surface, exposing the charged surface to actinic radiation representing an image pattern forming a latent electrostatic charge image of said pattern on said photoconductive coating surface and toning the latent electrostatic charge image with liquid toner comprising discrete toner particles suspended in an electrically insulating liquid, providing a transparent transfer sheet material consisting of a substrate having a thin ohmic layer and a thin coating of a resinous composition bonded to said ohmic layer, said resinous coating having a softening range lower than the softening range of the substrate, transporting the wet toner image carrying electrophotographic member and the transfer sheet material simultaneously to and through a precise gap defined therebetween with the resin coating facing and in proximity to the toner image carrying photoconductive surface and while the toner image is wet, applying an electrical bias voltage across said gap during passage of said electropho-

1. An image forming apparatus capable of displaying a numerical value comprising: image forming means for forming images on a recording member, while driving an image forming member; display means normally utilized for displaying a numerical value related to the number of image formation operations by said image forming means; and output means for producing a measured value of the state of said image forming member, said display means further capable of displaying said measured value as on alternative to the displaying of said numerical value related to the number of image formation operations.

4,419,007

#### MULTI-MODE DOCUMENT HANDLING SYSTEM

William Kingsley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 14, 1982, Ser. No. 388,761

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 SH

7 Claims

1. A multi-mode document handling system selectively permitting either simplex mode scanning wherein a first side of a document is scanned or duplex mode scanning wherein both first and second sides of the document are scanned, said system including at least one scanning array and a slit-like viewing area through which said document is viewed by said array, the combination comprising:

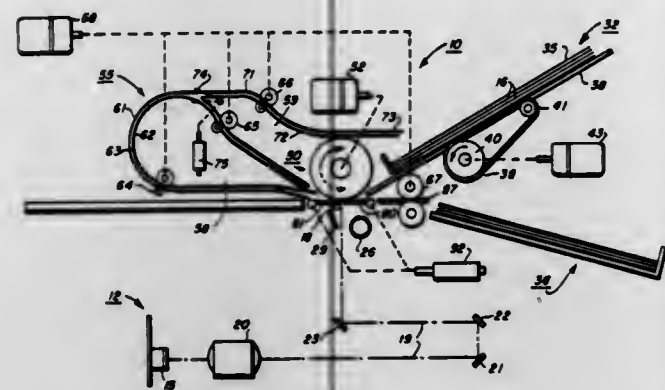
(a) a document supply tray for supporting one or more documents to be scanned;

(b) document transport means for moving the document to be scanned from said tray and across said viewing area for scanning of said document first side by said array;

(c) mode selection means selectively operable to permit either simplex or duplex scanning of said document, said mode selection means including movable simplex and



duplex pinch elements on each side of said viewing area, each of said pinch elements being adapted when moved to an operative position to cooperate with said document transport means to form a nip permitting said transport means to engage said document and move said document across said viewing area for scanning by said array; and



(d) control means for selectively moving one or the other of said simplex and duplex pinch elements to said operative position to provide either simplex or duplex scanning of said document.

4,419,008

## PHOTOGRAPHIC COLOR PRINTER

Kanichi Nishimoto, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

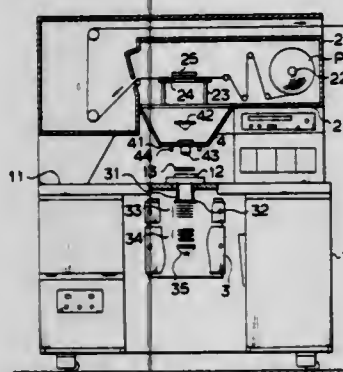
Filed Jun. 9, 1981, Ser. No. 271,947

Claims priority, application Japan, Jun. 16, 1980, 55-80128

Int. Cl.<sup>3</sup> G03B 27/80

U.S. Cl. 355—38

6 Claims



1. A printer for exposing and printing a color printing paper with a certain color balance properly maintained by means of a cut filter assembly comprising three cut filters of a yellow filter, magenta filter and cyan filter each of which is actuated by signals delivered from a plurality of color photo sensors, wherein two light beam flux reducing filters contained in said cut filter assembly are put in use under such an operating condition that the intensity of a light beam coming up from a light source for exposure is previously increased to a predetermined level so as to properly correspond to a negative color film which has an overexposure when a photograph is taken, one of said light beam flux reducing filters being intended for reducing the light beam flux when the negative color film has a normal exposure, while the other one being intended for reducing the light beam flux in cooperation with said first one when the negative color film has an underexposure, said first one being normally inserted into a light beam passage and being adapted to be removed therefrom when printing is performed with a negative color film which has an overexposure, whereby quick printing is ensured with the minimized fluctuation in printing time, maintaining an excellent color balance, irrespective of the fact that the negative color film has either an overexposure or underexposure when the photograph has been taken.

4,419,009  
DATA CONVERTING METHOD FOR REORDERED PRINTS

Tadashi Nakamura, Hino, and Haruo Hara, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

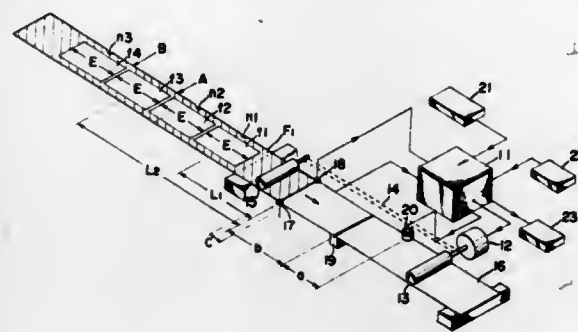
Filed May 6, 1981, Ser. No. 261,251

Claims priority, application Japan, May 20, 1980, 55-66994

Int. Cl.<sup>3</sup> G03B 27/10

U.S. Cl. 355—103

1 Claim



1. A data converting method for reordered prints from a film strip in which print or no print data represented by the distance of a frame from the end of the film strip has been converted into print or no print data determined by a notch on the film strip, which includes the steps of preparing print instructions for reordered prints determined solely by a predetermined distance from the end of the film strip to a desired frame, whereby a notch in the film strip beyond said predetermined distance will result in a no print signal and a notch in the film strip within said predetermined distance will result in a print signal, and forming a notch at an unnotched frame to be printed upon reorder when the desired frame falls within the intended prescribed distance, and using said newly formed notch as a print signal.

4,419,010

## METHOD FOR CONTROLLING THE TONER CONCENTRATION IN AN ELECTROSTATIC COPIER

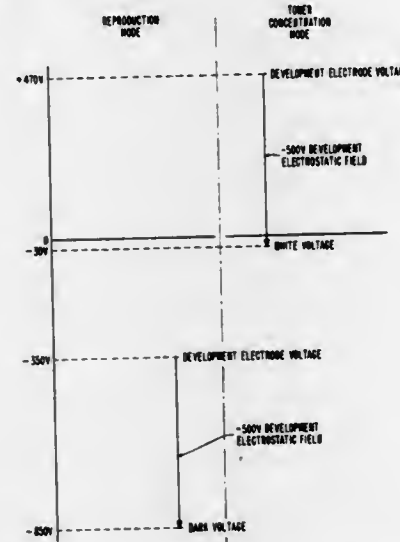
Anthony Grombone, Lafayette, and George W. Van Cleave, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,004

Int. Cl.<sup>3</sup> G03G 15/06, 21/00

U.S. Cl. 355—133

3 Claims



1. A method for maintaining toner concentration in an electrophotographic reproduction machine which includes photoconductor charging means operable to establish a reproduction photoconductor charge of a first polarity, and developer means including a reproduction development electrode voltage of said first polarity and of a magnitude less than the photoconductor charge, wherein the toning of the photoconductor's latent image results from a development electrostatic field

whose magnitude is the magnitude of the photoconductor's latent image voltage minus the magnitude of said development electrode voltage, comprising the ordered steps of:

- (a) reducing said photoconductor charge substantially to zero;
- (b) changing the polarity and the magnitude of said development electrode voltage in a manner to establish an electrostatic field substantially identical to said development electrostatic field, but with the resulting toning of said photoconductor being substantially independent of photoconductor charge; and
- (c) measuring the optical density resulting from said toning of said photoconductor in step (b), and increasing toner concentration in said developer only if said optical density is too low.

4,419,011

## AUTOMATIC RANGE FINDER

Motonobu Matsuda, Kawachinagano, and Yoshihiro Tanaka, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP80/00285, § 371 Date Jul. 20, 1981, § 102(e)

Date Jul. 20, 1981, PCT Pub. No. WO81/01610, PCT Pub.

Date Jun. 11, 1981

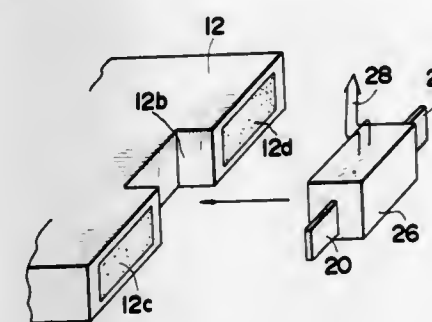
PCT Filed Nov. 21, 1980, Ser. No. 285,109

Claims priority, application Japan, Nov. 26, 1979, 54-153093

Int. Cl.<sup>3</sup> G01C 3/10; H01L 9/00; H05B 33/00; G03B 7/08

U.S. Cl. 356—1

18 Claims



1. A range finder of the type in which light is projected to an object and the reflected light from said object is received by one of a plurality of light receiving elements disposed on a base plate to measure the distance to said object on the principle of triangulation, said range finder comprising a light emitting diode chip composed of two semiconductor layers joined together; first and second electrically conductive frames in planar form are electrically connected respectively to the two semiconductor layers of said chip and extending substantially parallel to the junction surface of said chip, and a package made of a light-transmitting material integrally molding said light emitting diode chip and the electrical connections between said light emitting diode chip and said first and second electrically conductive frames in such a position that the end portions of said electrically conductive frames are exposed; said light emitting diode chip, first second electrically conductive frames and package forming a light source; said light source unit adapted for attachment to said base plate by abutting the projecting portions of said first and second electrically conductive frames extending from said package against the surface of the base plate perpendicular to the base length, said plurality of light receiving elements being fixed and electrically connected to said base plate, whereby the light from the surface extending in a direction substantially perpendicular to the junction surface of said light emitting diode chip is used as the range finding light source.

1037 O.G.—8

4,419,012

## POSITION MEASURING SYSTEM

Michael D. Stephenson, Dole, and Winston A. Waller, Whitstable, both of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

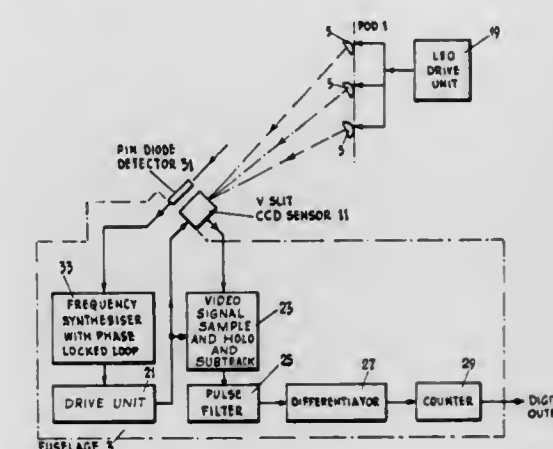
Filed Sep. 3, 1980, Ser. No. 183,805

Claims priority, application United Kingdom, Sep. 11, 1979, 7931493

Int. Cl.<sup>3</sup> G01B 11/26; H01J 40/14

U.S. Cl. 356—141

5 Claims



1. A system for measuring the position of one body with respect to another body, said system comprising a transmitter, an area sensor mounted on said one body, means to mount said transmitter on said other body in a position such as to direct a beam of radiation from said transmitter onto said area sensor, said area sensor forming part of a receiver arranged to produce an output indicative of the position of impingement of the beam on the sensor; wherein the transmitter includes means operative independently of the receiver for repeatedly turning the radiation beam on and off and the receiver includes means for subtracting alternate outputs produced by the sensor from immediately preceding previous outputs produced by the sensor, and wherein the receiver includes a second sensor responsive to the radiation beam, and means utilizing the output of the second sensor to control the receiver so that the subtraction is successively performed when the radiation beam is on and when the radiation beam is off, and the output of the subtracting means relates only to radiation in said beam and not to spurious radiation.

4,419,013

## PHASE CONTRAST ALIGNMENT SYSTEM FOR A SEMICONDUCTOR MANUFACTURING APPARATUS

Richard J. Heimer, Encino, Calif., assignor to TRE Semiconductor Equipment Corporation, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 248,805, Mar. 30, 1981. This application Jul. 6, 1981, Ser. No. 280,878

Int. Cl.<sup>3</sup> G01B 11/27

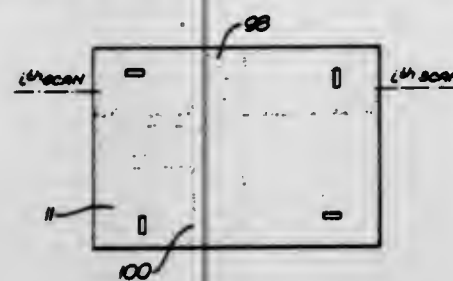
U.S. Cl. 356—400

8 Claims

1. In a semiconductor wafer exposure system of the type in which a semiconductor wafer containing an alignment target is moved into alignment with a reticle containing an image to be photoexposed onto said wafer, said reticle containing an alignment window that is transilluminated by light reflected from said wafer in the region of said target, said system comprising: an incident light phase contrast microscope apparatus arranged for viewing a phase contrast image of the alignment target on said wafer through said reticle alignment window, said phase contrast image being characterized by a bright edge halo surrounding the target, and



video detection apparatus, cooperating with said microscope apparatus, for detecting said image and for produc-



ing a signal indicative of the location of said halo with respect to the location of said alignment window.

4,419,014

**EXTRUDER MIXER**

George M. Gale, Shrewsbury, England, assignor to Rubber and Plastics Research Association of Great Britain, Shrewsbury, England

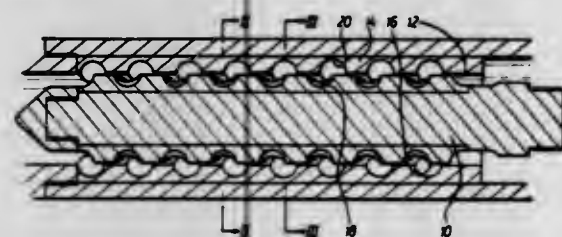
Filed Mar. 31, 1981, Ser. No. 249,303

Claims priority, application United Kingdom, Sep. 23, 1980, 8030586

Int. Cl. B29B 1/06

U.S. Cl. 366—99

7 Claims



5. An extruder mixer comprising a hollow cylindrical stator member, a cylindrical rotor member, means journalling the rotor for rotation within the stator, the facing cylindrical surfaces of the rotor and stator carrying respective pluralities of parallel rows of hemispherical cavities, the rows of hemispherical cavities on the rotor and stator being axially offset and the hemispherical cavities in each pair of adjacent rows on both the rotor and stator being circumferentially offset.

4,419,015

**AGITATOR HAVING DETACHABLE WEAR SLEEVE**

Roy Liddiard, Willowdale, Canada, assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 19, 1981, Ser. No. 235,823

Int. Cl. B01F 15/00

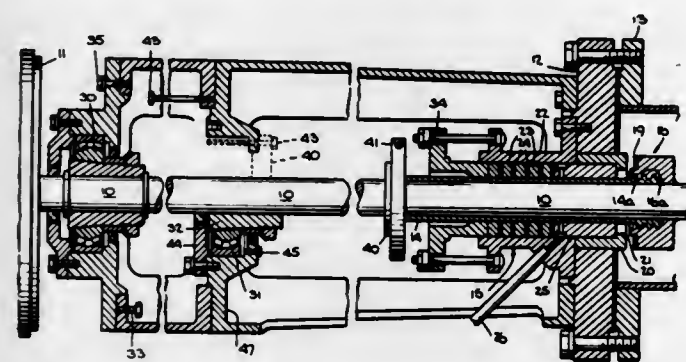
U.S. Cl. 366—349

4 Claims

1. An agitator having a detachable wear sleeve comprising, an agitator drive shaft carrying wear sleeve means secured thereon and extending through an opening in a fixed mounting flange, having detachable stuffing box means secured to one side of the flange opening and axially operable normally open valve means secured to the agitator drive shaft on the other side of the flange opening, having an axially movable element for at times sealing said opening, said element being rotated by

the agitator drive shaft, and being operable to a closed position by axial movement of the agitator drive shaft for sealing the opening in the flange when the stuffing box means is detached therefrom, wherein improved replacement means is provided for the wear sleeve means comprising;

(a) the valve means having an axially operable valve element secured on the agitator drive shaft at a point on said other side of the flange and having internal threads to detachably secure one end of the wear sleeve means to the axially operable valve element, whereby the wear sleeve means is rotated with the agitator drive shaft to prevent wear of the agitator drive shaft by the sleeve, and



(b) the wear sleeve means being a single integral longitudinal sleeve on the agitator drive shaft extending through said opening in the flange and through the stuffing box and having external threads at one end thereof for detachably securing the wear sleeve means to the axially operable valve element, whereby the sleeve means can be detached from the agitator drive shaft for replacement solely by operations from said one side of the flange with the valve means closed to prevent flow of fluid from said other side of the flange through the flange opening, without requiring removal of the shaft from the opening in the flange.

4,419,016

**DEVICE FOR INDICATING LAST MEDICATION USAGE**

Bart J. Zoltan, Old Tappan, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 2, 1982, Ser. No. 394,579

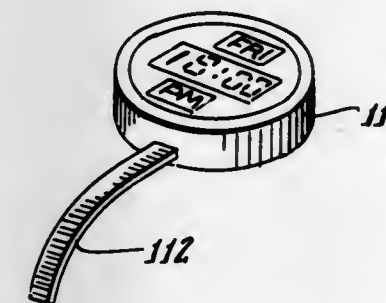
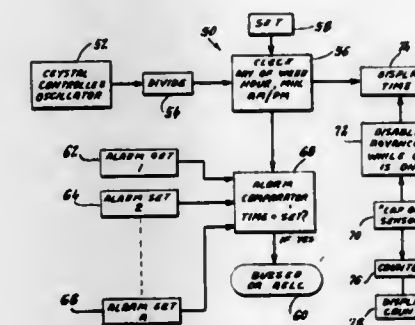
Int. Cl. G04B 47/00

U.S. Cl. 368—10

12 Claims

1. A device for providing medication use information to aid in patient compliance with a medication use regimen involving dispensing of medication from a container comprising a time keeping means for keeping the correct time selected from the group consisting of minutes, hour, day, date, week and month, and, combinations thereof, the time keeping means including display means to indicate time, sensor means for sensing when a medication container has been opened or closed to dispense medication, and said signal sensing means providing a signal to the time keeping means in response thereto, and signal processing means within the time keeping means for receiving the signal from the sensor means and activating the display means to indicate the time of the signal, the signal processing means

including means for maintaining such indication of the time of the signal until a further signal from the sensor means is re-



ceived by which the patient-user is provided with an indication of the last time the container was opened or closed.

4,419,017

**ELECTRONIC CLOCK**

Yasuhiko Okuyama, and Takashi Takezono, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

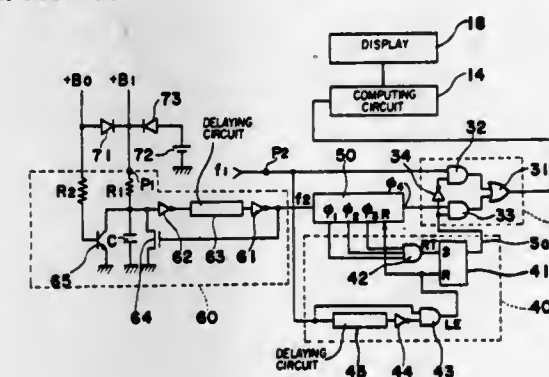
Filed Apr. 14, 1981, Ser. No. 254,072

Claims priority, application Japan, Apr. 24, 1980, 55-54971

Int. Cl. G04B 1/00

U.S. Cl. 368—64

8 Claims



6. An electronic clock comprising:

- (a) clock means;
- (b) an active first standard pulse train means for running said clock means having a first low frequency terminal the output of which is subject to inactivity due to a power failure;
- (c) second standard pulse train means having a time constant circuit including a resistor, a capacitor and a second high frequency terminal the output of which charges the capacitor at an oscillation frequency whose time constant is

defined by the respective values of the resistor and the capacitor to be higher than the oscillation frequency at the first terminal when the same is active;

- (d) an active switching element connected to said second high frequency terminal for stopping the build-up of charge on the capacitor resulting in the stopping of the oscillation thereof when the first low frequency terminal is active;
- (e) control means coupled to said first standard pulse train means, and said second standard pulse train means for detecting the inactivity of the first low frequency terminal without using the second standard pulse train; and
- (f) change-over means responsive to the detection of the inactivity of the first low frequency terminal by the control means for selectively running said clock means with the second standard pulse train means in case of a power failure that inactivates the first low frequency terminal.

4,419,018

**ELECTRONIC WATCH WITH CONTROL MEANS FOR SELECTING AND CORRECTING TIME DATA**

Clement Meyrat, Le Landeron, France, assignor to Ebauches Electroniques, S.A., Switzerland

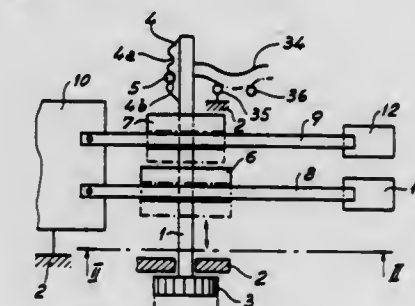
Filed Jan. 29, 1981, Ser. No. 229,726

Claims priority, application Switzerland, Jan. 31, 1980, 766/80

Int. Cl. G04G 5/04

U.S. Cl. 368—69

4 Claims



1. An electronic watch comprising: a plurality of stores, each containing a particular item of time data and each producing an output signal representing the time date therein; a digital display device; and control means comprising a control button displaceable by the user of the watch on the one hand axially between a pushed-in and a pulled-out stable position and on the other hand rotatably, correcting mean responsive to the rotation of the control button while said control button is in said pulled-out position, to provide a correction signal, and selecting means responsive to displacements of said control button from said pushed-in to said pulled-out position to select, from among at least some of said stores, a particular store which is selected as a function of the number of said displacements, to apply the output of the selected store to said display device and to apply said correction signal to said store in order to modify the contents of it.

4,419,019

**ANALOG DISPLAY TYPE ELECTRONIC TIMEPIECE**

Katsuo Nishimura, and Minoru Watanabe, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,325

Claims priority, application Japan, Apr. 14, 1981, 56-055124

Int. Cl. G04B 23/02, 19/04

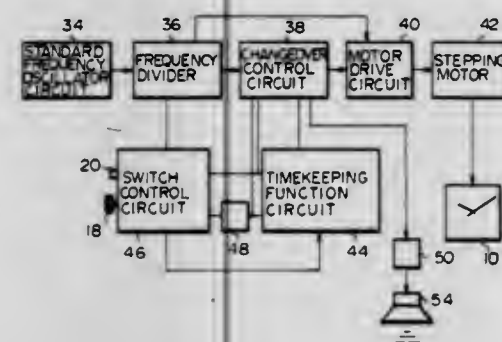
U.S. Cl. 368—74

5 Claims

1. An analog electronic timepiece provided with an alarm function, comprising: display means comprising time indicating hands;



an electro-mechanical transducer coupled to said display means for rotating said hands;  
transducer drive circuit means for generating drive signals to activate said electro-mechanical transducer to rotate said hands;  
circuit means for generating a unit time signal comprising a pulse train of period  $60/n$  seconds, where  $n$  is an integer, and a plurality of timing signal pulse trains of shorter period than said unit time signal;  
externally operable switch means, actuatable for generating signals selectively designating operation in a current time display mode in which current time is indicated by said hands, a current time setting mode in which said current time indication can be corrected, an alarm time display mode in which a preset alarm time is indicated by said hands and an alarm time setting mode in which said preset alarm time can be corrected, and further actuatable in said current time setting mode and alarm time setting mode for generating time setting signal pulses;  
a timekeeping function circuit for storing data representing the difference between said preset alarm time and the current time, and for producing an alarm coincidence signal when said difference becomes zero as the current time reaches coincidence with said alarm time;  
alarm signal generating means for generating an audible alarm signal in response to said alarm coincidence signal;  
changeover control circuit means responsive to signals from said externally operable switch means designating changeover from operation in said current time display mode to said alarm time display mode for generating signals which



are applied to said transducer drive circuit means in accordance with said data in said timekeeping function circuit for thereby driving said electro-mechanical transducer to rotate said hands from positions indicating current time into positions indicating said preset alarm time, and for generating signals which act to rotate said hands into positions indicating current time, from said alarm time indicating positions, when signals from said switch means designate changeover from said alarm time to said current time display mode, said changeover control circuit means operating during said current time display mode to transfer said unit time signal pulses to said drive circuit means, which is responsive thereto for driving said electro-mechanical transducer to advance said hands by one step for each of said unit time signal pulses, and further operating during said current time and alarm time display modes for transferring said unit time signal pulses to said timekeeping function circuit means to thereby successively decrement said data representing the difference between said alarm time and current time; and  
alarm time setting signal generating circuit means responsive to each pulse of said time setting signal during said alarm time setting mode for generating  $n$  alarm time setting pulses, where  $n$  is said integer, said alarm time setting pulses being transferred to said transducer drive circuit means for thereby producing drive signals to rotate said hands by  $n$  steps and therefore by an amount representing one minute, for each of said time setting signal pulses, said alarm time setting pulses being further transferred to said timekeeping function circuit means for correcting said

data held therein representing the difference between the alarm time and current time.

4,419,020

## MOUNTING APPARATUS

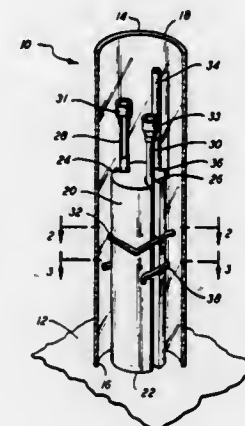
Harold I. Hill, 222 Spring Hill Rd., and Roger W. Targowski, 216 Alma Dr., both of Fairfield, Conn. 06430

Filed Mar. 31, 1981, Ser. No. 249,531

Int. Cl.<sup>3</sup> G01N 25/00; G01K 17/00

U.S. Cl. 374—12

9 Claims



1. Apparatus for use in a thermal analyzer, said apparatus comprising:  
at least two spaced apart columns for supporting sample receiving receptacles extending from a base plate; and  
means for maintaining said columns a preselected distance apart and for providing at least two points of rigid contact with each said column, said means including a support member having longitudinal grooves extending thereto from the periphery thereof; each one of said grooves being adapted to accept one of said columns therinto and make at least two points of rigid contact therewith.

4,419,021

## MULTI-FUNCTIONAL SENSING OR MEASURING SYSTEM

Jiro Terada, and Tsuneharu Nitta, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

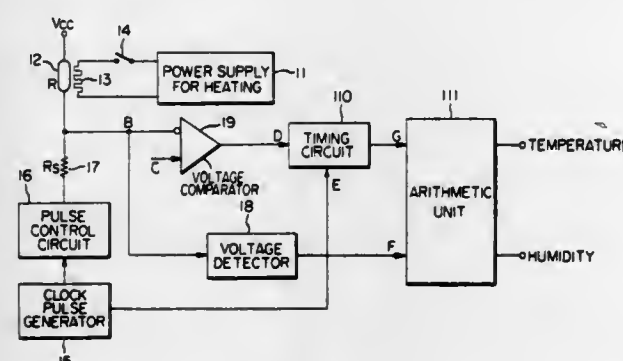
Filed Jan. 28, 1981, Ser. No. 229,185

Claims priority, application Japan, Feb. 4, 1980, 55-12891; May 23, 1980, 55-69392

Int. Cl.<sup>3</sup> G01K 7/00; G01W 27/02

U.S. Cl. 374—101

6 Claims



1. A multi-functional sensing system capable of detecting both the temperature and humidity to which it is subjected, comprising:

(a) a sensing element comprising a porous dielectric metal oxide ceramic plate the dielectric constant of which varies with temperature and the electric resistance of which varies with humidity, the major surfaces of said ceramic plate having a pair of electrodes thereon,

(b) a resistor element connected in series with said sensing element to one of the electrodes of said pair of electrodes on one of the major surfaces,  
(c) a rectangular pulse generator means for supplying rectangular pulses across said sensing element and resistor element,  
(d) means in an electrical circuit connected to the junction of the sensing element and the resistor element for determining temperature by detecting the time difference between the time at which the pulse signal is applied and the time required for the voltage across one of said elements of said series connected elements to reach a reference voltage level, and  
(e) means in the electrical circuit connected to the junction of the sensing element and the resistor element for detecting humidity by determining the amplitude of the steady state voltage across one of said elements of said series connected elements.

4,419,022

## NONCONTACT TEMPERATURE SENSING METHOD AND APPARATUS FOR LADLE PREHEATING

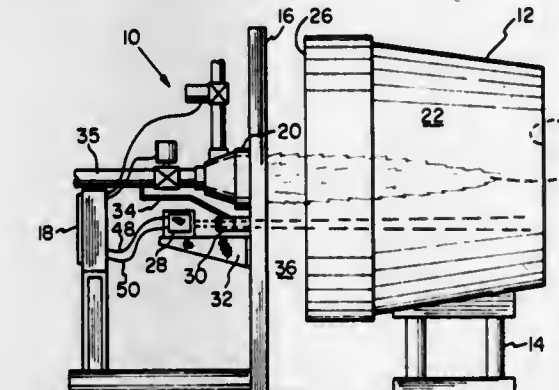
Robert T. Ely, Pittsburgh, Pa., assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Apr. 21, 1982, Ser. No. 370,366

Int. Cl.<sup>3</sup> G01J 5/08

U.S. Cl. 374—125

12 Claims



1. In a ladle heating apparatus in which a ladle and a wall are juxtapositioned so that burner means associated with the wall fire through a ladle opening and into an interior thereof for preheating purposes, the improvement comprising a sight tube extending through said wall and a noncontact radiation pyrometer mounted for sighting through said sight tube and measuring the radiation of a ladle interior surface.

4,419,023

## FAST-RESPONSE THERMOCOUPLE PROBE

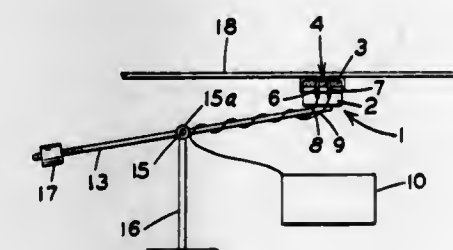
Nathaniel E. Hager, Jr., Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 10, 1981, Ser. No. 291,179

Int. Cl.<sup>3</sup> G01K 1/14, 7/04

U.S. Cl. 374—179

11 Claims



1. A passive fast-response insulated-foil thermocouple probe comprising

(a) a mounting block movable with a handle;  
(b) a layer of insulating material having a low product of

thermal conductivity, density, and specific heat mounted on the upper surface of said mounting block;  
(c) a thin-foil ribbon thermocouple comprising two dissimilar metal foils joined in a junction at corresponding ends thereof and positioned on the upper surface of said layer of insulating material;  
(d) a low-areal-heat-capacity cover film mounted over the upper surface of the insulating layer and the foil ribbon thermocouple thereon and extending at least partially down at least one of the sides of the mounting block;  
(e) electrical connections on each of said two dissimilar metal foil ribbons of the thermocouple at their extremities adapted to electrically connect in series, said thermocouple, a reference junction, and means for sensing electromotive force developed in a circuit, whereby said sensing means responds to the differential between the electromotive force produced by the foil and reference junctions; and  
(f) said probe movable against an object with a preselected amount of force for measuring the temperature of an object without modifying its surface temperature.

4,419,024

## SILICON DIOXIDE INTERMEDIATE LAYER IN THERMAL TRANSFER MEDIUM

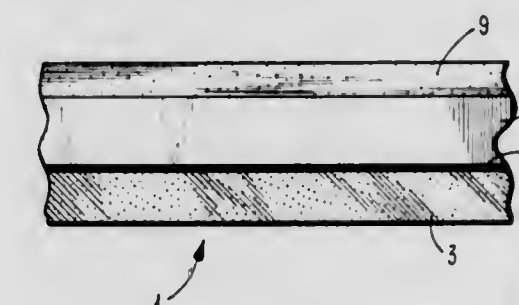
Patsy A. Bowlds, Paris, Ky.; Bruce M. Cassidy, Fairfax, Va.; Arthur E. Graham, Lexington, Ky.; Robert J. Huljak, Lexington, Ky.; Donald W. Stafford, Lexington, Ky., and Deh C. Tao, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,349

Int. Cl.<sup>3</sup> B41J 31/00

U.S. Cl. 400—120

31 Claims



1. A transfer medium for non-impact thermal transfer printing comprising a thermal transfer layer, a resistive layer, and a layer of silicon dioxide on said resistive layer between said resistive layer and said transfer layer.

4,419,025

## LOCKING DEVICE IN A TELESCOPIC TUBULAR TRIPOD LEG ELEMENT ASSEMBLY

Shoichi Takahashi, Yokohama, Japan, assignor to Kenlock Corporation, Yokohama, Japan

Filed Feb. 24, 1982, Ser. No. 351,980

Claims priority, application Japan, Mar. 17, 1981, 56-36308[U]

Int. Cl.<sup>3</sup> B25G 3/00

U.S. Cl. 403—14

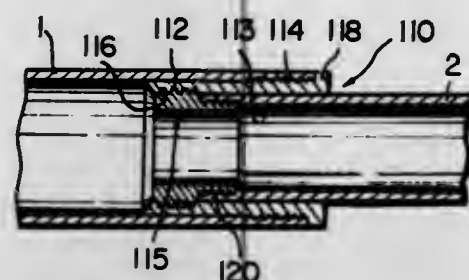
8 Claims

1. A locking device in a telescopic tubular tripod leg element assembly comprising at least inner and outer tubular leg elements of circular cross-section, said locking device comprising a sleeve having at its one end an internal multiple thread and at the other end an inner peripheral face forming a guide face for said inner tubular leg element, said sleeve being fixedly secured to the inner peripheral face of said outer tubular leg element, said inner tubular leg element having an inner end portion with



an enlarged diameter and an external multiple thread provided at the enlarged diameter of the inner end of said inner tubular

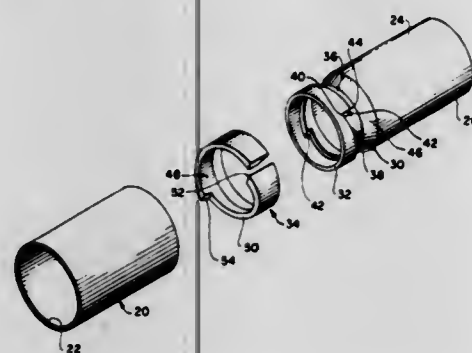
formed such as to radially diverge as said flange extends in the direction of the stud and a resilient tubular body disposed around said stud, wherein said tubular body has an open end



leg element and adapted to be engaged by said internal multiple thread of said sleeve.

**4,419,026**  
**INTERNAL LOCKING DEVICE FOR TELESCOPIC ELEMENTS AND METHOD OF MAKING THE SAME**  
Alfonso Leto, 12255 Gerald Ave., Granada Hills, Calif. 91344  
Filed Aug. 28, 1980, Ser. No. 182,025  
Int. Cl.<sup>3</sup> F16B 7/10; F16D 1/12  
U.S. Cl. 403—104

7 Claims



1. An improved internal releasable locking device for telescoping tubular members wherein there is an outer telescoping member having an internal annular surface wherein the radii extending annularly therearound is equidistant from the central longitudinal axis of the member, and an arcuate locking cam element having an outer periphery generally complementary with the internal annular surface of the outer telescoping member and adapted to interfit within an inner telescoping member, the improvement comprising:

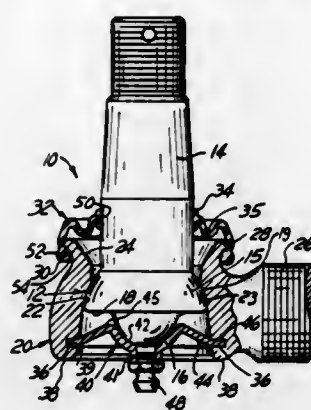
at least one camming groove formed in and as a part of said inner telescoping member adjacent an end thereof;  
said groove having at least one surface spaced annularly inwardly of said outer annular surface that acts as a cam surface to cooperate with and move said arcuate locking cam in a direction radially outwardly from said groove whereby when said outer telescoping member is fitted over said locking cam element and said inner telescoping member, rotation of one of said telescoping members will cammingly urge said locking cam element into tight locking engagement against the internal annular surface of said outer telescoping member.

**4,419,027**  
**BELLOWS SEAL FOR BALL AND SOCKET JOINTS**  
William H. Trudeau, Brighton, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.  
Filed Apr. 6, 1981, Ser. No. 251,253  
Int. Cl.<sup>3</sup> F16C 11/06  
U.S. Cl. 403—134

12 Claims

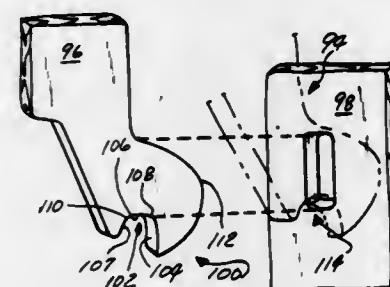
1. In a ball and socket joint comprising a ball and a socket in mutual swivelling sliding engagement, said ball having a stud integrally formed therewith projecting outwardly through one end of said socket, the improvement comprising said socket having at said one end a substantially frusto-conical flange

stretched around said stud and another open end provided with an integral reinforcing bead elastically passed over the largest outside diameter portion of said frusto-conical flange and said flange has an elongated perimeter.



**4,419,028**  
**KNOCK DOWN CHAIR**  
Billy F. Roland, 37805 Maple Hill, Mt. Clemens, Mich. 48043  
Division of Ser. No. 125,691, Feb. 29, 1980, Pat. No. 4,348,052.  
This application Jun. 15, 1981, Ser. No. 273,470  
Int. Cl.<sup>3</sup> F16B 5/00  
U.S. Cl. 403—353

2 Claims



2. A joint for interlocking a pair of intersecting walls comprising:

a first wall and a second wall;  
said first wall comprising a hook projection configured to rotate within an aperture to interlock therewith and an axial flange projection extending from a common edge;  
said second wall having a first polygonal opening with a height approximately the radius of the outside edge of said hook projection to rotatably receive said hook projection, and a second polygonal opening spaced from said first opening to slidably receive said flange projection upon said common edge being engaged with said second wall; and

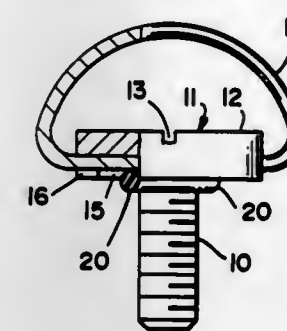
whereby the pair of walls are interlocked when said hook projection is rotatably inserted into said first opening and said flange projection is inserted into said second opening and whereby relative rotation of said first and second walls along an axis normal to said second wall is prevented.

**4,419,029**  
**THREADED FASTENER**  
Michael Wenzel, 2251 Clinton Ave., #5, Alameda, Calif. 94501  
Filed Mar. 22, 1982, Ser. No. 360,803  
Int. Cl.<sup>3</sup> B25G 3/00; F16G 11/00; F16D 1/00  
U.S. Cl. 403—408

5 Claims

5. A device comprising two pieces adapted to be held together with a threaded fastener, including a first piece having threaded means to engage the threaded fastener and a second

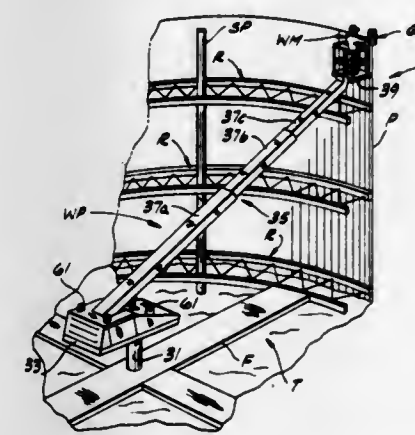
piece having a hole through which the threaded fastener extends, said device including a threaded fastener comprising a threaded shaft, a laterally expanded head connected to one end of the shaft, said head having a ring-shaped cavity surrounding the threaded shaft and two diametrically opposed openings



through the side of said head and into said cavity, a D-ring having opposing ends loosely fitted in said opposed openings, an elastomeric ring surrounding the threaded shaft partly within said ring-shaped cavity, a recess in said first piece having a diameter greater than the diameter of said D-ring and deeper than said ring-shaped cavity.

**4,419,030**  
**APPARATUS FOR AND METHOD OF CONSTRUCTING A SHEET PILING SHORING STRUCTURE**  
Werner W. Burkemper, Manchester, Mo., assignor to Burkemper Methods, Inc., St. Louis, Mo.  
Filed Sep. 14, 1981, Ser. No. 302,073  
Int. Cl.<sup>3</sup> E02D 5/02  
U.S. Cl. 405—278

14 Claims

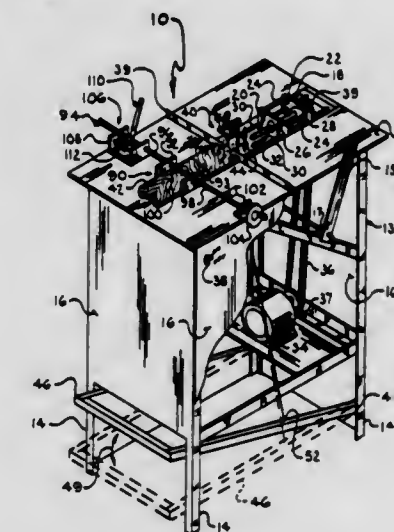


1. A system for the construction of a shoring structure having a substantially vertical wall formed of a plurality of interlocked, elongate piling members driven into the ground, each of said piling members having means along its sides for interconnection with adjacent piling members, said shoring structure being constructed by positioning at least one of said piling members generally vertically and by at least partially imbedding this one piling member into the ground, the next piling member is then hoisted above the upper end of said one vertical piling member and the interconnection means of the one piling member and the hoisted piling member are engaged and the hoisted piling member is lowered relative to said one piling member, said system comprising apparatus for supporting a workman at a desired position adjacent the upper end of said one piling member so as to enable him to guide said hoisted piling member into endwise interlocking relation with said one piling member, said workman support including a base, a spud pile adapted to be imbedded in the earth, said base being removably securable to said spud pile whereby said workman support may be readily attached to and readily removed from said spud pile, a boom coupled to the base and extending upwardly therefrom, a workman support platform carried by the outer end of said boom, said boom including means for selectively positioning said workman support platform at substan-

tially any desired position along said partially imbedded piling members thereby to enable said workman to aid in the interconnection of said piling members.

**4,419,031**  
**APPARATUS AND METHOD FOR DRILLING DOWEL HOLES**  
James F. Palma, Rte. 2, Box 116A, Lonsdale, Minn. 55046  
Filed Oct. 29, 1981, Ser. No. 316,410  
Int. Cl.<sup>3</sup> B23Q 5/22; B23B 49/00  
U.S. Cl. 408—1 R

12 Claims



1. An apparatus for drilling matching dowel holes in a workpiece, the apparatus comprising:

a frame having a top with an upper surface;  
a workpiece positioning bar extending upwardly from said frame top surface;

drilling means for drilling dowel holes, said drilling means being slidably attached to the upper frame top surface and movable along a drilling axis at right angles to said first positioning bar;

centering means for centering a workpiece with respect to the drilling axis, said centering means being movable along a positioning axis;

positioning means for positioning the workpiece through positioning the centering means in at least two dowel hole drilling positions, the positioning means including first and second stop members defining first and second dowel hole drilling positions and a stop engaging member positionable alternatively to engage the first and second stop members and movable therebetween in a direction parallel to the positioning axis; and

a connecting member having opposite ends being connected at one end to the centering means and connected at the other end to the stop engaging member of the positioning means such that when the stop engaging member is moved to engage the first stop member, the centering means is moved to the first dowel hole position and when the stop engaging member is moved to engage the second stop member, the centering means is moved to the second dowel hole position thereby selectively positioning the workpiece, when in contact with said first positioning bar, in the first and second dowel hole drilling positions.

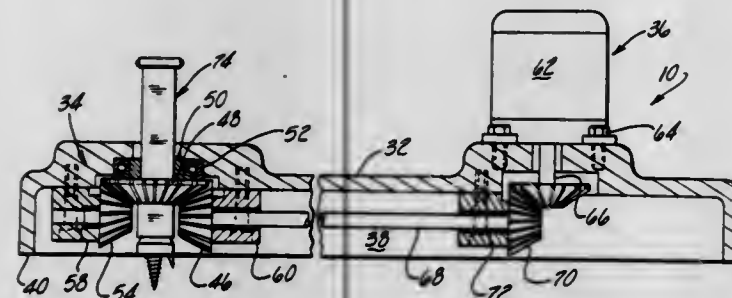
**4,419,032**  
**BORING TOOL**  
Thomas Flowers, 1069 E. York, Flint, Mich. 48505  
Filed Feb. 4, 1981, Ser. No. 231,469  
Int. Cl.<sup>3</sup> B23B 45/14

4 Claims

1. A boring tool adapted for operation in a limited work-space for boring holes through a workpiece against which the tool is placed, said boring tool comprising:  
a elongated rigid housing,



angle drive means mounted adjacent a first end of said housing to deliver rotation about an axis transverse to the length of said housing, a boring bit slidably and drivably mounted on said angle drive means so as to permit axial movement of said boring bit while being rotated about said transverse axis, and transmission means mounted on said housing for transmitting rotation from a power source adjacent the second end of said housing to said angle drive means, said boring bit comprising a shaft via which the boring bit is coupled with said angle drive means, a second shaft telescopically engaged and keyed with said first shaft so as to be axially shiftable relative to the first shaft while being rotatably coupled with the first shaft, a cutting head mounted on the second shaft at the axial end thereof



nearer the workpiece, resiliently yieldable means operatively disposed between the two shafts for biasing the second shaft axially relative to the first shaft away from the workpiece but resiliently yielding during certain boring operations so as to allow the second shaft to advance axially toward the workpiece relative to the first shaft, said first shaft having an axial lost motion connection with said angle drive means limited by stops, said cutting head comprising a screw thread for engaging the workpiece to advance the cutting head into the workpiece upon rotation of said boring bit by said angle drive means so as to bore a hole into the workpiece, said axial lost motion connection providing axial advancement of said first and second shafts in unison during boring operations until said resiliently yieldable means begins to yield.

4,419,033

#### SYSTEM FOR RELEASABLY SECURING MOVABLE SUPPORT ELEMENTS ON SPACE VEHICLES

Martin Roth, Taufkirchen, and Helmut Kiendl, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed May 8, 1981, Ser. No. 261,755

Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018245

Int. Cl.<sup>3</sup> B60P 1/64, 7/06; B63B 25/00

U.S. Cl. 410—32

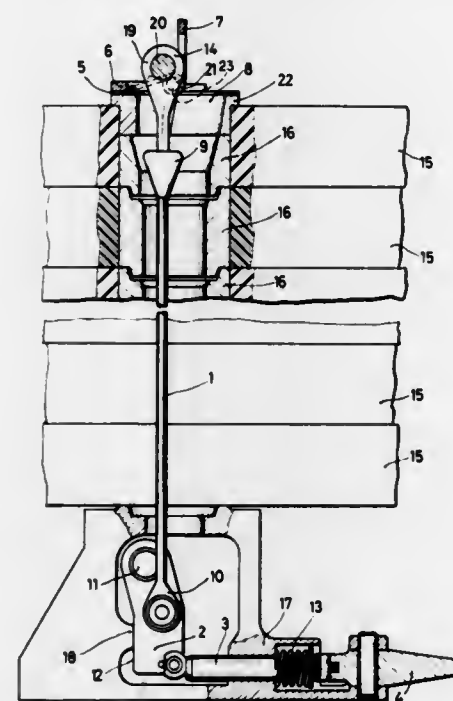
8 Claims

1. A system for releasably securing in place support elements of a space vehicle which are movable when released out of said secured position comprising: a holding element extending through said support elements having an inner end and an outer end; a lever means pivotally mounted about an axis and having said inner end of said holding element pivotally mounted thereto eccentrically relative to said axis; stop means limiting movement of said lever means in one direction; spring loaded piston means adapted to engage with said lever means; a blocking element engaging said spring loaded piston means and blocking movement thereof to hold said means against said stop means, said spring loaded piston means operating to release said lever means to enable pivotal movement of said lever means about said axis away from said stop means when released by said blocking element; a spring loaded release lever engaged by said outer end of said holding element and retained by said holding element in a position releasably securing said support elements; a support bushing having said release lever rotatably mounted thereto; and limitation means limiting to 90°

the movement of said release lever from a position engaging said outer end of said holding element to a position releasing said outer end; said holding element being adapted to slide through an opening in said support bushing to release said support elements when said release lever moves to release said outer end thereof.

5. A system for releasably securing in place support elements, particularly for use in space vehicles, comprising:

- a longitudinal holding element adapted to extend through openings in said support elements from one side thereof to another, said holding element having an inner end and an outer end;
- a holding lever pivotally mounted about a lever axis and having said inner end of said holding element pivotally connected thereto about a pivot axis located eccentrically relative to said lever axis;



release lever means interposed between said support elements and said outer end of said holding element to apply against said support elements a holding force exerted against said release lever means by said holding element when said holding lever is in a pivotal holding position to press said outer end against said release lever;

spring means applying to said release lever a biasing spring force against the holding force of said holding element; and

releasable blocking means operating to apply against said holding lever a blocking force tending to prevent said holding lever from moving away from said pivotal holding position and also operating to release said blocking force to enable said support elements to be released from said holding force applied thereto by said holding lever.

4,419,034

#### TELESCOPABLE RETRACTABLE STACKER KEY LOCKING DEVICE

John M. DiMartino, Sayville, N.Y., assignor to Line Fast Corporation, Holbrook, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,320

Int. Cl.<sup>3</sup> B60P 7/08, 7/13; B61P 49/00

U.S. Cl. 410—83

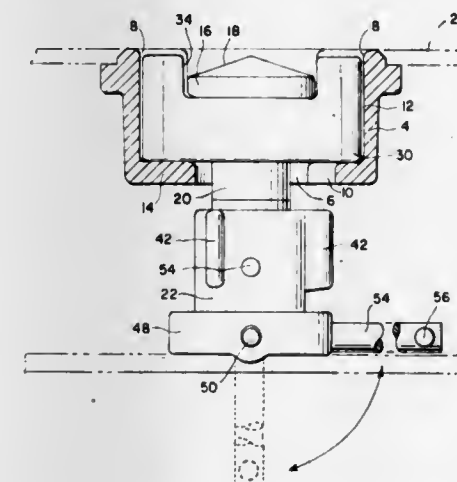
6 Claims

1. A heavy duty retractable selectively operable stacker key locking device adapted to secure a corner fitting of a shipping container to a flat base member wherein the device can be retracted and vertically partially telescoped beneath the base member, the corner fitting having an elongated orifice in the underside thereof for engagement with the locking device comprising:

- (a) a tubular housing having a bottom wall and side walls, depending from the base member forming a vertical pas-

sageway having an upper orifice communicating with the area above the base member;

- (b) a keyway orifice formed in the bottom wall of the housing;
- (c) a shaft member vertically and rotatably mounted in the tubular housing and extending through the keyway orifice;
- (d) a crosshead member fixedly mounted on the upper end of the shaft member;
- (e) a retainer means mounted on the lower end of the shaft member to prevent the shaft member from being drawn upwardly through the keyway orifice of the tubular housing;
- (f) a neck member mounted within the tubular housing and capable of having a portion of said neck member being extended through the upper orifice thereof and of vertical reciprocation with respect to the tubular housing, the crosshead member and the neck member having a lateral cross sectional area similar in size and shape to the elongated orifice of a corner fitting;
- (g) a shaftway extending through the center of the neck of a size sufficient to entrain a portion of the shaft member and to permit the shaft member to move vertically and rotatably with respect to the neck member when entrained therein;



- (h) groove means traversing across the shorter axis of the upper surface of the neck member capable of entraining the crosshead member therein when the elongated axis of the crosshead member is biased across the shorter axis of the neck member when the crosshead member and neck member are fully retracted within the tubular housing;
- (i) key means fixedly mounted on the shaft member shaped and dimensioned to pass vertically through the keyway orifice, the key means being positioned on the shaft member a sufficient distance apart from the crosshead member to allow the key means to be positioned beneath the tubular housing when the device is in a retracted position, the key means having an upper surface area which prevents it from being drawn through the passageway of the neck opening, and a vertical dimension which causes it to raise the neck member partially above the upper orifice of the tubular housing while simultaneously raising the crosshead member to a position such that the underside of the crosshead member is completely above the neck member with the lower side of the key means being above the inner bottom wall of the tubular housing while simultaneously having a rotatable portion of the shaft member entrained within the keyway orifice and having the upper surface of the retainer means abutting against the outside of the bottom wall of the tubular housing;

- (j) lever means fixedly attached to the retainer means to facilitate rotation of the shaft member.

#### 4,419,035 METHOD AND APPARATUS FOR MOVING BUNDLES OF SHEETS

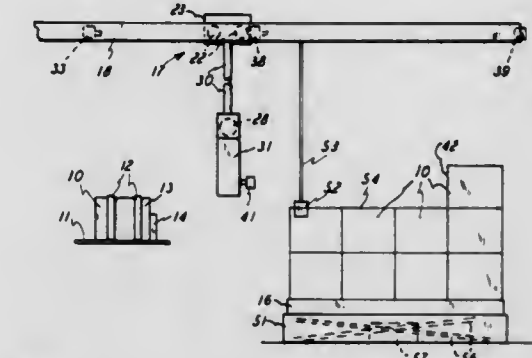
Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Apr. 21, 1982, Ser. No. 370,372

Int. Cl.<sup>3</sup> B65G 57/24

U.S. Cl. 414—71

10 Claims



6. Apparatus for picking up bundles of sheets at a pickup station and stacking the bundles of sheets onto a pallet and with each of the bundles of sheets being bound in an elongated shape and having opposite ends and having open opposite sides in respective vertical planes, comprising a pallet at a pallet location, an electrically operated overhead crane, an electrically operated powered clamp suspended from said overhead crane, electrically powered means connected with said clamp for lowering and raising said clamp relative to said crane and for moving said clamp, said powered clamp including oppositely facing abutments for abutting the opposite ends of the bundle of sheets, a photo-electric sensor operatively connected with said powered means for energizing the latter to move said clamp and a first of the bundles between said pickup station and said pallet, said sensor being mounted on said clamp in a position to sense one of said opposite sides of said first of the bundle of sheets on said pallet and thereby energize said powered means to position a second of the bundle of sheets with its one of said opposite sides thereon in contact with said one side of the first of the bundle of sheets and in side-by-side relation on said pallet.

4,419,036

#### APPARATUS FOR CHARGING A SHAFT FURNACE

Ulrich Beckenbach, Fontanestr. 13, and Helmuth Beckenbach, An den Linden 47, both of D-4005 Meerbusch 1, Fed. Rep. of Germany

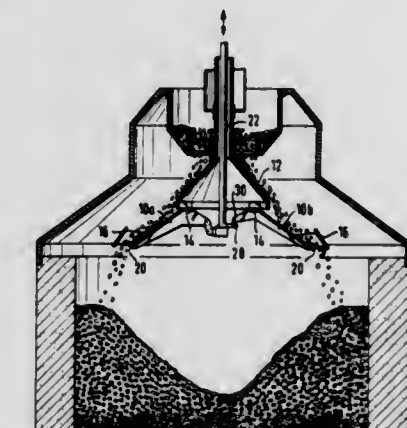
Filed Dec. 24, 1981, Ser. No. 334,430

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125410

Int. Cl.<sup>3</sup> C21B 7/20

U.S. Cl. 414—160

4 Claims



1. In an apparatus for charging a shaft furnace for burning and sintering material in a lump form, which material is se-



lected from a group consisting of limestone, dolomite, magnesite, cement and the like, said apparatus including a distribution cone, a plurality of distribution flaps pivotally mounted adjacent a lower edge of the cone, said flaps having impact surfaces forming a truncated cone which is coaxial to the distribution cone and means for pivoting the flaps between various positions to make it possible to vary the diameter of the base of the truncated cone, said means including a linkage passing axially through the distribution cone, the improvements comprising each of the flaps adjacent an outer end having a deflection plate arranged in spaced relation thereto to form a space therebetween, each of said deflection plates having impact surfaces extending substantially parallel to the impact surfaces of the distribution flap.

4,419,037

**TRUCK AUGER-HOPPER CONSTRUCTION**

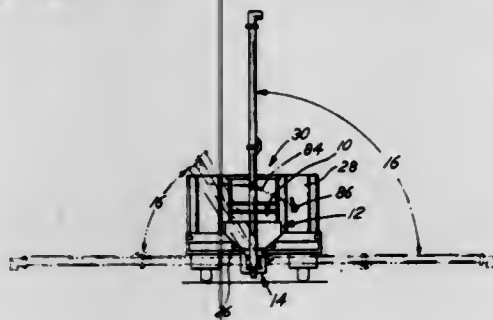
Donald W. Niewold, 149 N. Market St., Paxton, Ill. 60957

Filed Dec. 30, 1980, Ser. No. 221,293

Int. Cl.<sup>3</sup> B60P 1/04, 1/40

U.S. Cl. 414—489

20 Claims



1. An auger-hopper construction for mounting to an inclinable body of a truck to receive material from the truck comprising:

first hopper means, said first hopper means having an opening adjacent the bottom thereof,

first hopper mounting means for mounting said first hopper means to the truck body to incline with the truck body when the body is inclined and in a position to receive the material from the truck body in various positions of inclination of the body,

second hopper means having an opening therein, pivotal mounting means for pivotally mounting said second hopper means to said first hopper means to receive material from said opening in said first hopper means, said pivotal mounting means permitting said second hopper means to pivot about an axis between upper and lower pivot limits, and wherein the lowest portion of said second hopper means does not project substantially beneath said first hopper means when said second hopper means is pivoted about said axis to extend horizontally,

auger tube means,

swivel mounting means mounting one end of said auger tube means to said second hopper means and overlying the opening therein to receive material from said latter opening,

said pivotal mounting means and swivel mounting means cooperating to simultaneously permit inclination of said auger tube means in a plane substantially perpendicular to the axis of the pivotal movement and also in a plane substantially parallel to the axis of the pivotal movement and at substantially all angles of inclination of the truck body when said first hopper means is mounted to the truck body.

4,419,038

**BUMPER MOUNTED FOLDABLE CRANE HOIST**

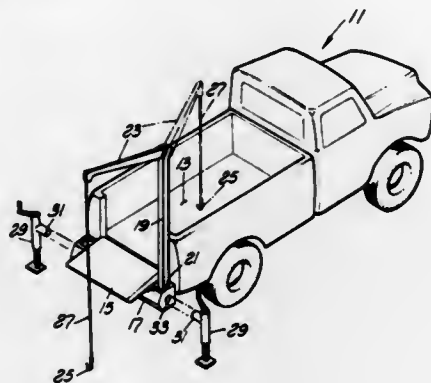
Billy D. Pendergraft, 22321 Vanowen Ave., Canoga Park, Calif. 91303

Continuation of Ser. No. 15,559, Feb. 26, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,919

Int. Cl.<sup>3</sup> B60P 1/00, 1/04; B66C 23/26, 23/64

U.S. Cl. 414—543

9 Claims



1. A bumper mounted foldable crane hoist for vehicles having a chassis and a load bed with a tail gate forming an access opening to said load bed comprising:

an elongated horizontal housing structure having a bottom and spaced apart end and side walls, means affixed to one of said side wall for mounting said housing to the vehicle chassis below the level of the load bed along the edge of the access opening, said housing forming a bumper for the vehicle;

an elongated support column with a base section attached to one end thereof, shaft means pivotally mounting said base section on a horizontal axis between said side walls at one end of said housing structure to facilitate the movement of said support column in a vertical plane relative to said housing structure from a stored horizontal position with said support column lying within and extending along the length of said housing structure to a fixed upright operating position with said support column disposed perpendicular to said housing structure; means on said base section for maintaining said support column in said fixed upright operating position;

an elongated boom pivotally mounted on the other end of said support column opposite said base section to move from a stored position alongside said support column to an operating position extending outwardly from the axis of said support column;

a hoist line mounted on said boom for handling a load; means on said housing for applying a hoisting force to said hoist line, means mounted on said base section which are selectively and operatively connectable with said hoist line to pivot said support column to said upright operating position;

anti-friction bearing means mounted within said support column and base section for supporting said boom for rotation about the central axis of said support column relative to said base section to shift loads suspended by said hoist line over and away from said load bed.

4,419,039

**APPARATUS FOR LOADING OBJECTS**

Bengt A. Bengtsson, 2 Silurvägen, 595 00 Mjölby, Sweden

Filed Mar. 4, 1981, Ser. No. 240,296

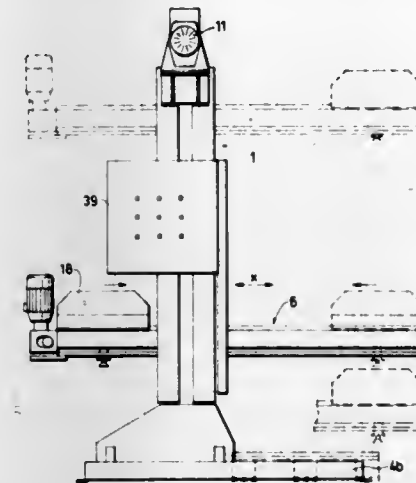
Int. Cl.<sup>3</sup> B66F 9/00

U.S. Cl. 414—590

5 Claims

1. Apparatus for loading objects, comprising in combination a first horizontal frame structure which is movable vertically relative to an upright support structure, said frame structure supporting a second horizontal frame which is movable horizontally relative to the first frame structure in one direction, said second frame supporting a carriage which is movable in a

direction perpendicular to the movement of said second frame and is provided with a catching mechanism such that said catching mechanism by the displacement of the second frame in one horizontal direction and the displacement of the carriage in a horizontal direction perpendicular thereto may be located over an object at a loading area and moved to a desired



position over an unloading area, wherein the first frame structure is rectangular with one side open, two opposite sides thereof being intermediate the ends thereof slidably guided in two spaced apart uprights which latter are mutually connected by means of an upper cross bar, said uprights being each secured to a bottom rail extending perpendicular to said cross bars.

4,419,040

**BACKHOE SWING MECHANISM**

Carl O. Pedersen, and Herman J. Maurer, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

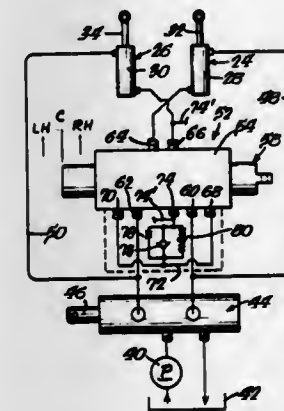
Filed Dec. 10, 1981, Ser. No. 329,349

The portion of the term of this patent subsequent to Jun. 21, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> E02F 3/72

U.S. Cl. 414—687

19 Claims



1. In an implement having a frame attached to a tractor having a hydraulic system, and a swing tower pivotally connected to said frame about a vertical pivot axis and supporting a boom, an arrangement for pivoting said swing tower and said boom through an arc about said vertical axis through an arc of travel, comprising:

(a) two hydraulic motors pivotally interconnected between the frame and the swing tower, each of said motors having a cylinder end and a piston rod end, the extension and contraction of said motors pivoting said swing tower about said vertical pivot axis on the frame, each of said motors being fully extended when its respective centerline intersects said vertical axis;

(b) a hydraulic circuit connected to each motor by conduit means leading from the tractor hydraulic system;

(c) directional flow control means operatively connected to

said conduit means for selectively directing fluid under pressure from said hydraulic system to said two hydraulic motors;

(d) restricting means in said hydraulic circuit for restricting fluid flow from both of said motors during movement of said swing tower and said boom through end portions of their arc of travel prior to reaching the ends of the arc of travel; and

(e) said hydraulic circuit including sequencing valve means hydraulically joined to said motors, said flow control means, and said restricting means, whereby when said flow control means direct fluid to pressurize the piston rod end of one of said motors in pivoting said swing tower through said arc, said sequencing valve means sequentially provides fluid communication between:

said one piston rod end and both the cylinder ends across said restricting means;

said one piston rod end and the cylinder end of the other motor, and between the cylinder end of the one motor and the piston rod end of the other motor; and

both the cylinder ends and the piston rod end of the other motor across said restricting means.

4,419,041

**SPACIAL MECHANISM AND METHOD**

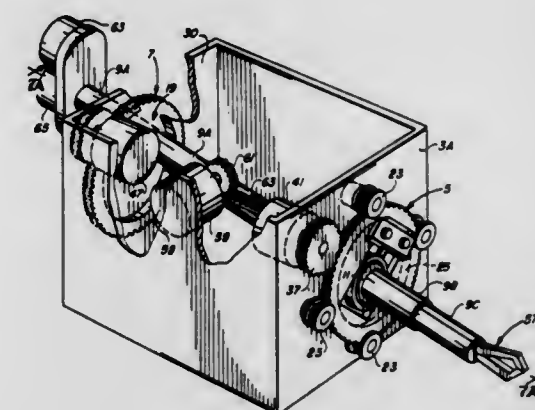
Stanley E. Rose, 3216 E. Sweetwater, Phoenix, Ariz. 85032

Filed Jun. 26, 1981, Ser. No. 277,988

Int. Cl.<sup>3</sup> B66C 1/00

U.S. Cl. 414—739

25 Claims



25. A device for producing controlled spacial movement of a first point, said device comprising in combination:

(a) an arm having first and second spaced support portions, said first point being located on said arm;

(b) first swivel bearing means for supporting said arm at said first support portion;

(c) second swivel bearing means for supporting said arm at said second support portion;

(d) first rotary means supporting said first swivel bearing means for causing said first support portion to move along a first circular path, said first rotary means including a first circular disc and first means peripherally engaging said first circular disc to rotatably support said first circular disc;

(e) second rotary means supporting said second swivel bearing means for causing said second support portion to move along a second circular path, said arm having a longitudinal axis that always extends through said first and second circular paths, said second rotary means including second means peripherally engaging said second circular disc to rotatably support said second circular disc in a fixed relationship with said first circular disc;

(f) first means for causing said first rotary means to rotate at a first rate; and

(g) second means for causing said second rotary means to rotate at a second rate.



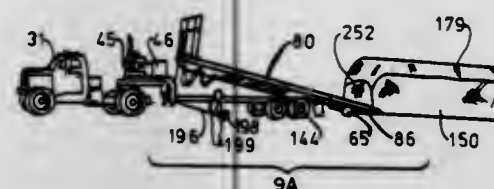
4,419,042

**COTTON MODULE TRANSPORT PROCESSES**

Floyd W. Reed, P.O. Box 130, Glenn Allan, Miss. 38744  
Continuation of Ser. No. 12,146, Feb. 14, 1979, Pat. No. 4,243,353. This application Oct. 8, 1980, Ser. No. 195,105  
Int. Cl.<sup>3</sup> B60P 1/36

U.S. Cl. 414—786

3 Claims



1. Process of loading an elongated cotton module on a mobile support therefor comprising the steps of tilting the bed of a chain bed relative to a moveable support for said bed and bringing the rear portion of said tilted bed close to but spaced away from the ground to the rear of such tilt bed support and applying the weight of said support to wheels at the end of said tilted bed and removing the weight of said support from other wheels of said support and engaging the ground with the said wheels at the end of said tilted bed and actuating a toothed chain drive means and driving the toothed chain upwards along the tilted bed while said bed is moved toward and along and under the length of said cotton module and a plurality of lift wheels are engaged with successive portions of said module, and moving the chains along said bed at a linear speed equal to the linear traversing movement of said bed relative to said module responsive to the movement of the said bed relative to said ground.

4,419,043

**CENTRIFUGAL PUMP**

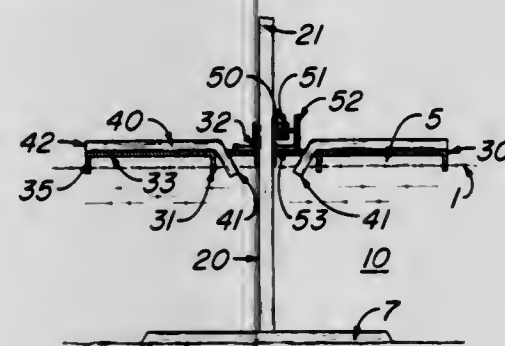
Thomas W. Smith, 2819 Caldwell Blvd. No. 68, Nampa, Id. 83651

Filed Nov. 5, 1981, Ser. No. 318,488

Int. Cl.<sup>3</sup> F04D 1/14

U.S. Cl. 415—7

3 Claims



1. A pump comprising:  
lateral support means:

a rotatable flotation member vertically moveable in relationship to and laterally supported by said support means, said flotation member including a circular horizontal platform and at least two spaced concentric downwardly depending annular flanges sealingly engaging said platform open-ended flotation air tanks therebetween for rotation of said flotation member on a column of air;

at least one radially extending conduit supported by said flotation member, each of said conduits having an inlet port adjacent the vertical axis of said flotation member and an outlet port on the opposing end thereof; and drive means for rotating said flotation member.

4,419,044

**GAS TURBINE ENGINE**

Brian Barry, Duffield; John H. R. Sadler, Aston-on-Trent; Susan M. Allen, Belper, all of England, and David W. Artt, Moira, Northern Ireland, assignors to Rolls-Royce Limited, London, England

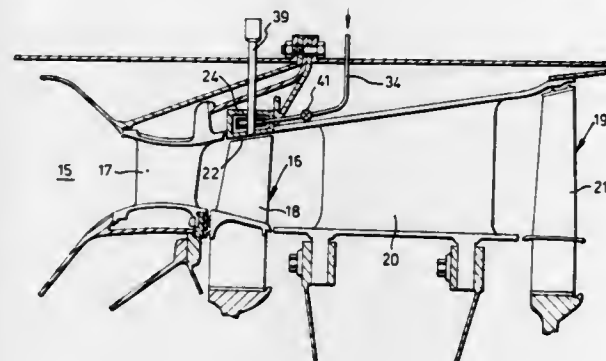
Filed Nov. 6, 1981, Ser. No. 318,851

Claims priority, application United Kingdom, Dec. 18, 1980, 8040500

Int. Cl.<sup>3</sup> F01D 11/08

U.S. Cl. 415—117

10 Claims



1. A turbine suitable for use in a gas turbine engine having varying operating conditions resulting in changes in temperature of hot gases passing therethrough, said turbine comprising:

an annular array of rotary aerofoil blades having tips, said annular array of aerofoil blades being of a comparatively low mass and having a predetermined rate of thermal expansion and contraction from an increase and a decrease in temperature respectively;

an annular shroud member including a portion defining an annular radially inwardly facing surface and at least one heat pipe defining a major portion thereof, said at least one heat pipe including a sealed container with a condensable vapor therein and capillary means for transporting condensed vapor in liquid form from a cooler area to a hotter area of the sealed container of said at least one heat pipe; said annular shroud member being located coaxially with and radially outwardly of said rotary aerofoil blades, said tips of said rotary aerofoil blades and said inwardly facing surface of said annular shroud being positioned adjacent each other but radially spaced apart to provide a radial clearance therebetween;

at least one heat pipe having a high thermal conductivity to thereby provide said shroud member with a rapid rate of thermal expansion and contraction dependent upon an increase or decrease in temperature respectively while being substantially isothermal without thermal gradients caused by localized hot spots;

means for maintaining said radial clearance between said tips of said rotary aerofoil blades and said inwardly facing surface of said annular shroud within a predetermined range of values, said maintaining means comprising:

distance measuring means having an output proportional to said radial clearance between said blade tips and said radially inwardly facing surface of said annular shroud; fluid directing means to direct a temperature regulating fluid onto said at least one heat pipe at least at a position remote from said radially inwardly facing surface of said annular shroud;

flow rate regulating means to regulate the flow rate of said temperature regulating fluid from said fluid directing means onto said at least one heat pipe;

and control means interconnecting said flow rate regulating means and said distance measuring means, said control means reducing the flow rate of the temperature regulating fluid by said flow rate regulating means to said fluid directing means when said radial clearance decreases below the predetermined range of values due to thermal expansion of said annular array of aerofoil blades whereby

said heat pipe is heated up and rapidly thermally expands without distortion thereby maintaining the radial clearance within the predetermined range of values, and said control means increasing the flow rate of the temperature regulating fluid by said flow rate regulating means to said fluid directing means when said radial clearance increases above the predetermined range of values due to thermal contraction of said annular array of aerofoil blades whereby said heat pipe is cooled down and rapidly thermally contracts without distortion thereby maintaining the radial clearance within the predetermined range of values.

sponse to on the passage of the rotor blades past the sensing device.

4,419,046

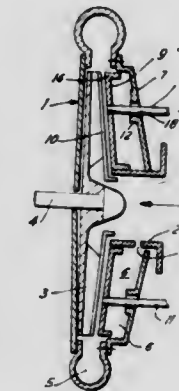
**HIGH PRESSURE CENTRIFUGAL FLUID DELIVERY MACHINE**

Gerardo P. V. Carlini, Gavilan no 4552, Buenos Aires, Argentina  
Filed Jan. 10, 1980, Ser. No. 110,858

Claims priority, application Argentina, May 9, 1979, 37454  
Int. Cl.<sup>3</sup> F04B 27/00

U.S. Cl. 415—127

3 Claims

**METHOD AND DEVICE FOR REDUCING THE NOISE OF TURBO-MACHINES**

Pierre A. Andre, Paris; Jean-Claude P. H. P. Thevenin, Saint-Maur-des-Fosses; Jean-Pierre Y. B. Girault, Dammarie les Lys, and Gerhard Richter, Boissise le Roi, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

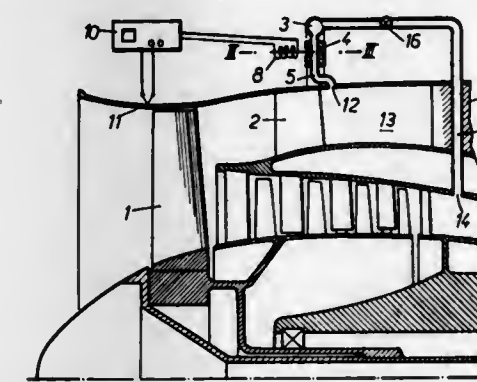
Division of Ser. No. 849,472, Nov. 7, 1977, Pat. No. 4,255,083.

This application Jul. 18, 1980, Ser. No. 170,187

Claims priority, application France, Nov. 5, 1976, 76 34065  
Int. Cl.<sup>3</sup> F04D 29/66

U.S. Cl. 415—119

3 Claims



1. In a turbo-machine which includes an elongated, hollow, stationary outer wall, a rotatable rotor ring mounted centrally inside of said outer wall and comprising an elongated rotor shaft and a number of radial rotor blades extending from said rotor shaft towards said stationary outer wall, and a stationary stator having a number of radial stator vanes extending towards said stationary outer wall, the improvement wherein said turbo-machine includes an apparatus for reducing the noise generated by the interaction of the rotating rotor blades and the stationary stator vanes by creating a counter-noise of opposed phase, this apparatus comprising:

a plurality of injection orifices located in said stationary outer wall and distributed around the circumference thereof, the number of injection orifices being equal to the number of vanes in said stator ring,

means forming a toroidal manifold surrounding said stationary outer wall,

means for supplying a constant flow of fluid to said toroidal manifold,

a plurality of feed pipes distributed around the circumference of said toroidal manifold, each feed pipe interconnecting with a respective injection orifice,

a movable flow regulator shutter in each feed pipe, and means to move said flow regulator shutter in each feed pipe, each said means to move the flow regulator shutter in each feed pipe including a solenoid, a rod connected between the solenoid and the shutter, at least one sensing device mounted in said stationary outer wall responsive to the passage frequency of said moving rotor blades, and means for supplying electrical current in response to said sensing means to each said solenoid to operate said solenoid and move said rod and the attached shutter in re-

1. In a centrifugal fluid delivery machine such as centrifugal pumps or turbo-compressors of the type including a housing, an impeller blade rotor coaxially positioned with an axial inlet of the machine for delivery fluid to the rotor, and a spiral chamber surrounding said housing and communicating an outlet end of the blades of the impeller blade rotor with an outlet of the machine, said impeller blade rotor being formed with an inclined side wall to constitute with said spiral chamber an operating diffuser chamber, the combination comprising: an annular piston member disposed within said housing, said annular piston member including a lateral wall positioned against said side wall of the rotor and having a configuration congruent with that of said side wall, an annular enclosure member formed with an opening communicating with said axial inlet, an outer wall extending between said spiral chamber and said annular enclosure member to form an additional chamber therebetween; and actuating means for moving said annular piston and thus said lateral wall in the axial direction to and from said inclined side wall, said lateral wall of said piston member being so arranged that when said actuating means move said piston in said axial direction to and from said side wall, said lateral wall opens or closes said opening, respectively, and connects said additional chamber to or disconnects said additional chamber from said diffuser chamber respectively, whereby the volume of said diffuser chamber is varied in dependence upon a position of said piston member while maintaining fluid delivery from said inlet constant.

4,419,047

**METHOD OF OPERATION OF A PUMP-TURBINE BETWEEN PART-LOAD OPERATION AND REVERSE PUMPING OPERATION**

Dieter Klemm, and Peter Ulith, both of Heidenheim, Fed. Rep. of Germany, assignors to Voith GmbH, Heidenheim, Fed. Rep. of Germany

Division of Ser. No. 162,584, Jun. 23, 1980, abandoned. This application Jun. 15, 1982, Ser. No. 388,519

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935480

Int. Cl.<sup>3</sup> F01D 17/00

U.S. Cl. 415—150

2 Claims

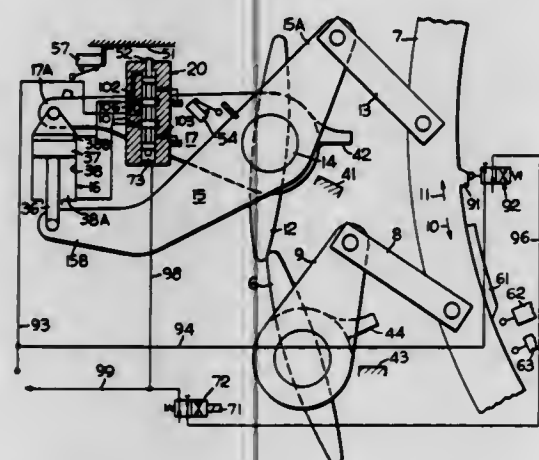
1. In a pump-turbine having impeller means and a plurality of water flow control gates arranged in circular array around the impeller;

a movable gate operating ring;

connecting means operably connecting said gates to said



operating ring for effecting the synchronized movement of said gates in opening and closing movements; and, a first means operably connected to effect the independent movement of at least one of said gates relative to a position that said gate operating ring moves said gate into; control means for selectively controlling the operation of said first means; wherein said connecting means for connecting said gate to said operating ring includes a first lever having one end secured to one of said gates, for effecting its movement; a second lever having a first end connected to said operating



ring and having its second end connectible to the free end of said first lever; an adjustable connection to connect the free end of said first lever with the second end of said second lever to thereby have said first lever and said second lever move in unison through the operation of said operating ring; and, means to effect an adjustment in said adjustable connection to move said first lever relative to said second lever to thereby cause said gate to move an additional amount relative to the position that it is moved to by said operating ring.

4,419,048

## TRASH PUMP WITH RESILIENT LINER

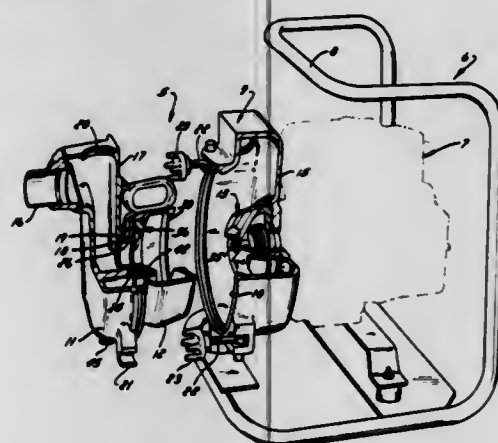
Martin T. Pilachowski, Kewaskum, and Alan J. Ritz, Brookfield, both of Wis., assignors to Wacker Corporation, Milwaukee, Wis.

Filed May 21, 1981, Ser. No. 380,535

Int. Cl. F04D 29/40, 7/06

U.S. Cl. 415-196

5 Claims



1. A trash pump having an impeller that has forwardly projecting vanes and is rotatable on an axis to draw liquid rearwardly towards it and propel the liquid radially outwardly, and a shaft by which the impeller is carried and which projects rearward from the impeller for connection with power drive means, said trash pump being characterized by:

- A. a housing around the impeller having
  - (1) an outlet opening in one side thereof,
  - (2) a large front opening substantially concentric with the shaft, and
  - (3) a rear wall through which the shaft extends;
- B. a volute in the housing wherein the impeller rotates and whereby liquid discharged from the impeller is guided for substantially spiral flow towards said outlet opening in the housing, said volute being removable from the housing through said front opening and having
  - (1) a rear portion which is adjacent to said rear wall of the housing around the shaft and wherein there is an opening through which the impeller can pass, and
  - (2) a front wall wherein there is
    - (a) an inlet opening concentric to the impeller and
    - (b) a rearwardly opening recess of larger diameter than said inlet opening and concentrically surrounding the same;
- C. a cover member detachably secured to the housing at the front thereof as a closure for said front opening and wherein there is a port that is concentric to the impeller;
- D. means securing the volute to the rear of the cover member to be removable from the housing with removal of the cover member therefrom, with said inlet opening in the front wall of the volute in register with said port in the cover member; and
- E. an annular liner of resilient material in said recess in the volute, having a substantially rearwardly facing surface closely adjacent to the orbit of front edge portions of the vanes of the impeller.

4,419,049

## LOW NOISE CENTRIFUGAL BLOWER

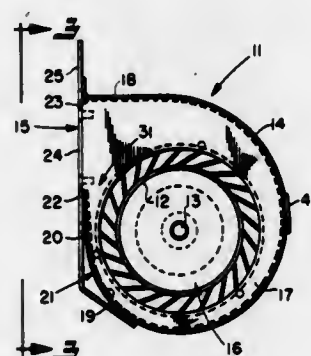
Patrick L. Gerboth, Concord Township, Lake County, and Stanley E. Jozwiak, Jr., Mentor, both of Ohio, assignors to SGM Co., Inc., Mentor, Ohio

Continuation of Ser. No. 58,856, Jul. 19, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,884

Int. Cl. F04D 29/44

U.S. Cl. 415-206

2 Claims



1. A centrifugal blower, comprising generally cylindrical fan wheel means rotatable about its axis for blowing air; housing means for collecting air blown by said fan wheel means, said housing means having a generally spiral shape to direct such collected blown air in a spiral flow path therein, outlet means for receiving such spiral flow of air and for discharging the same from said housing means in a generally straight-line direction, said outlet means comprising a generally planar plate-like member having a planar cross-section outlet opening there-through, said housing means having one wall portion terminating relatively far from the spiral center of said housing means, leading to said outlet means, and terminating at said outlet means in generally perpendicular relation thereto, an involute wall portion terminating relatively proximate such spiral center, and an extension wall portion extending from said involute wall portion toward said outlet means, said extension wall portion comprising a linear wall, having an increasing radial spacing from such spiral center in a direction toward said outlet means from at least one of the juncture of said extension

wall portion and said involute wall portion and of a location on said extension wall portion otherwise most proximate such spiral center, not having a spiral extending cut-off, having an end terminating at said plate-like member opening in nearly parallel relation to the plane of said plate-like member, whereby said outlet opening is substantially fully open and unimpeded by a throat-like passage, having a major portion positioned with respect to said fan wheel means and said outlet means so as to avoid impeding air flow in said housing means and exiting the latter and said extension wall portion being generally tangential to said involute wall portion at a juncture of said involute and extension wall portions.

4,419,050

## METHOD AND APPARATUS FOR CONTROLLING PROPELLER PITCH

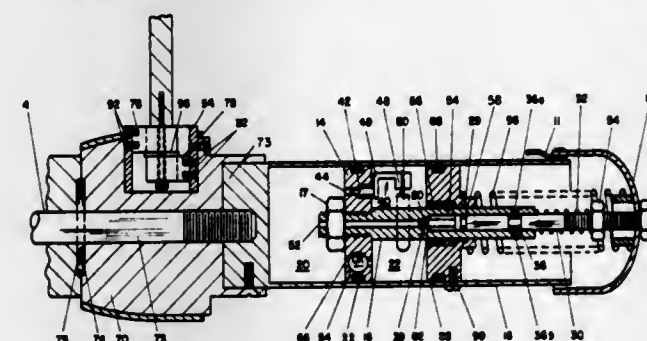
Charles L. Williams, 6 Rowe Ave., Rockport, Mass. 01966

Filed Aug. 18, 1980, Ser. No. 179,047

Int. Cl. F01D 7/02

U.S. Cl. 416-46

4 Claims



1. In a variable pitch control system, the combination comprising a propeller having a radially-extending blade, means for driving said blade, pivot means supporting said blade for angular movement about its radial axis whereby the pitch of said blade is varied, linkage means coupled to said blade and having a predetermined position for each pitch angle of said blade, means responsive to the rotation of said propeller to produce a first force on said linkage means, a cylinder assembly having a pressure chamber and a movable piston sealing said chamber, a reservoir chamber, a channel communicating with said reservoir chamber and said pressure chamber for carrying fluid between said chambers, normally closed valve means arranged to prevent flow through said channel, hydraulic fluid filling said pressure chamber, coupling means connected to said linkage means and said piston and arranged to apply pressure to said fluid in response to said force, control means communicating with said chamber responsive to a predetermined r.p.m. of said propeller to reduce the pressure in said chamber thereby to permit said piston to move in response to said force and said propeller to change pitch, means responsive to a reduction in the r.p.m. of said propeller for opening said normally-closed valve means, and a second valve means arranged to close said channel whenever the pitch of said blade is less than a predetermined angle.

4,419,051

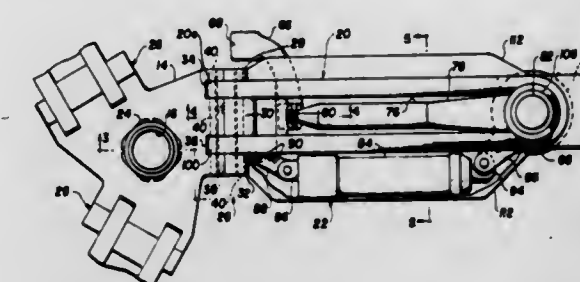
TWIN TENSION/TORSION BEAM ROTOR SYSTEM  
Richard T. DeRosa, Brookhaven, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 16, 1982, Ser. No. 348,889

Int. Cl. B64C 27/38

U.S. Cl. 416-140

14 Claims



1. A rotor system for mounting rotor blades to a helicopter, comprising: a rotor hub having at least two sets of mounting lugs, each set including a plurality of adjacent lugs each containing an aperture; a support fitting for each set of mounting lugs, each said support fitting including a plurality of adjacent lugs each containing an aperture, each set of mounting lugs and the lugs of a respective support fitting being engaged such that their respective apertures are aligned to receive a hinge pin forming thereby a flap hinge; a plurality of elongated blade pitch varying means each connected at one end to a respective support fitting, and each defining a clevis for receiving a rotor blade securing pin forming thereby a fold hinge; and a compound curved, continuous loop twin tension/torsion beam, double wrapped around the flap hinge at one end and double wrapped around the fold hinge.

4,419,052

## TURBINE METER ROTOR

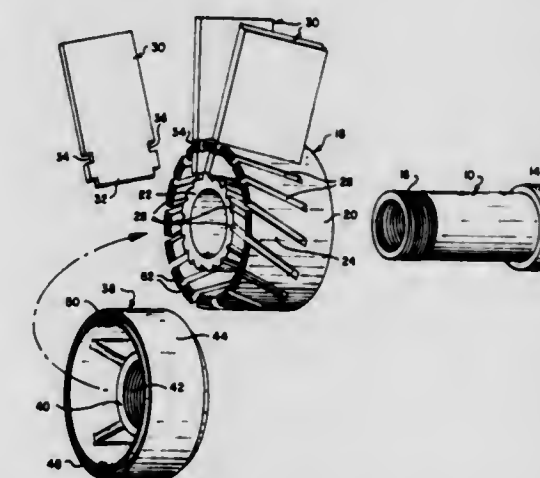
Johann A. Stamm, Export, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 119,343, Feb. 9, 1980. This application Mar. 11, 1982, Ser. No. 357,104

Int. Cl. F01D 5/30

U.S. Cl. 416-214 A

15 Claims



1. A fluid meter having a housing with inlet and outlet openings, a rotor, including vanes, rotatably supported in said housing to be driven by fluid flow therethrough, an improved rotor construction including: (a) a rotor hub rotatably mounted on a shaft having an axis parallel to the direction of fluid flow; and (b) a vane hub mounted on said rotor hub and having a main



body portion with radially spaced inner and outer axially extending cylindrical walls concentric with the axis of rotation of said rotor hub;

- (c) substantially axially extending recesses in said inner wall to receive the ends of vanes;
- (d) substantially axially extending recesses in said outer wall in radial alignment with said recesses in said inner wall;
- (e) said recesses in said inner and outer walls respectively opening to corresponding ends of said inner and outer walls;
- (f) a plurality of vanes each of which has an end supported in a recess in said inner wall and an intermediate portion supported in a corresponding recess in said outer wall;
- (g) retaining means attached to the end of said rotor hub corresponding to said ends of said walls to hold said vanes in said recesses.

4,419,053

## PROPELLER SPINNER

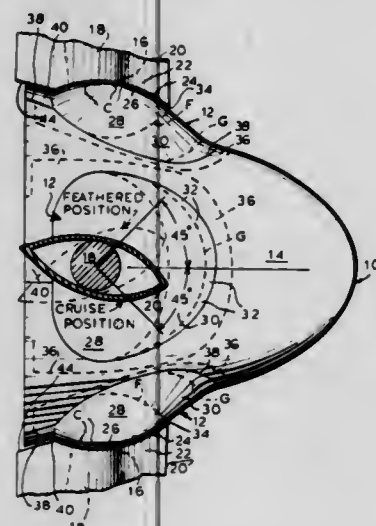
Edward J. Swearingen, Jr., San Antonio, Tex., assignor to Fairchild Swearingen Corporation, San Antonio, Tex.

Filed Nov. 20, 1981, Ser. No. 323,178

Int. Cl.<sup>3</sup> B64C 11/14

U.S. Cl. 416-234

7 Claims



1. Propeller apparatus comprising a propeller spinner having a plurality of spaced protruding surfaces attached to and extending radially outward from the exterior surface of said spinner and an exterior substantially continuous surface except for said protruding surfaces that lacks any substantial depressions, a plurality of variable pitch propeller blades extending radially outward from said spinner through the protruding surfaces of said spinner, said propeller blades each having a long central axis and having a root end portion located outside the exterior surface of said spinner adjacent to the protruding surfaces of said spinner, said root end portion comprising a propeller cuff or a blade portion with an airfoil section, and means located on the root end portion adjacent to the protruding surface of said spinner and on the protruding surface of said spinner for reducing drag between said root end portion and the protruding surface of said spinner while the pitch of said variable pitch propeller blades is varied through at least a portion of the forward operational pitch range of said propeller blades comprising means for eliminating any substantial gap between at least a portion of the protruding surface of said spinner, said gap eliminating means comprising a portion of the protruding surface being curved in three dimensions to form substantially a portion of a sphere with a radius which pivots about a point on the centerline of the central long axis of the propeller blade having a portion thereof located adjacent to the substantially continuous exterior surface of said propeller spinner and the exterior surface of a portion of the root end portion being curved to substantially match the curvature of the adjacent substantially spherical shaped portion of the protruding surface, wherein said protruding surface has a forward sloping portion and the forward portion of the spherical por-

tion terminates at a juncture where the forward portion of the spherical portion intersects the forward sloping portion.

4,419,054

## LIQUID FUEL INJECTION PUMPING APPARATUS

Stanislaw J. A. Sosnowski, London, and Robert T. J. Skinner, High Wycombe, both of England, assignors to Lucas Industries Limited, Birmingham, England

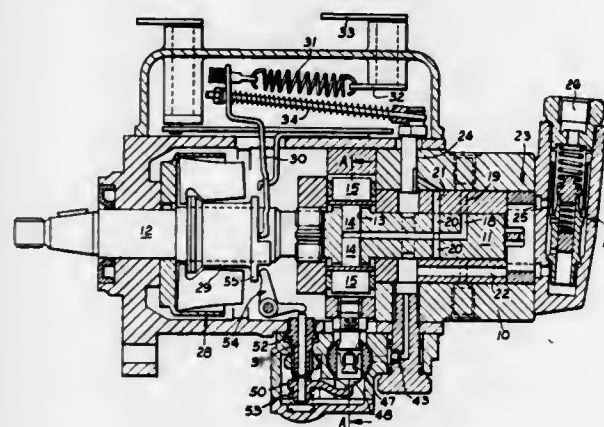
Filed May 7, 1981, Ser. No. 261,150

Claims priority, application United Kingdom, Jul. 2, 1980, 8021634

Int. Cl.<sup>3</sup> F04B 19/02, 29/00

U.S. Cl. 417-294

9 Claims



1. A liquid fuel injection pumping apparatus comprising a body, a rotary distributor member in the body, a drive shaft coupled to the distributor member and arranged in use to be driven in timed relationship with an associated engine, a bore in the distributor member, a plunger in the bore, an annular cam ring surrounding the distributor member and having cam lobes which impart inward movement to the plunger as the distributor member rotates, fluid pressure operable piston means for varying the angular setting of the cam ring about the axis of the distributor member to vary the timing of delivery of fuel by the apparatus, a pump for supplying liquid under pressure to a cylinder containing said piston means, the pressure of liquid supplied by said pump being arranged to vary in accordance with the speed of operation of the apparatus, a governor mechanism including a centrifugal weight unit mounted in the body, the governor mechanism further including an axially movable output member which is movable by said weight unit in opposition to the force exerted by a governor spring, a linkage connecting said output member to a fuel control member the setting of which determines the amount of fuel delivered by the apparatus at each delivery stroke, said piston means comprising a piston, a bore formed in said piston, a servo valve slidable in said bore, said servo valve being subject to the pressure of liquid delivered by the low pressure pump, an axially movable member in said bore, a spring engaging said axially movable member to bias the servo valve against the action of the liquid under pressure, a land on said servo valve, a port formed in the wall of said bore, said port communicating with one end of said cylinder, said land cooperating with said port to control the flow of liquid through the port, to determine the position of the piston in the cylinder, and means coupled to the output member of the governor mechanism for altering in accordance with the position of the output member, the distance between the portion of the land which is cooperating with the port and said axially movable member.

4,419,055

## LOW PRESSURE FLUID SUPPLY SYSTEM

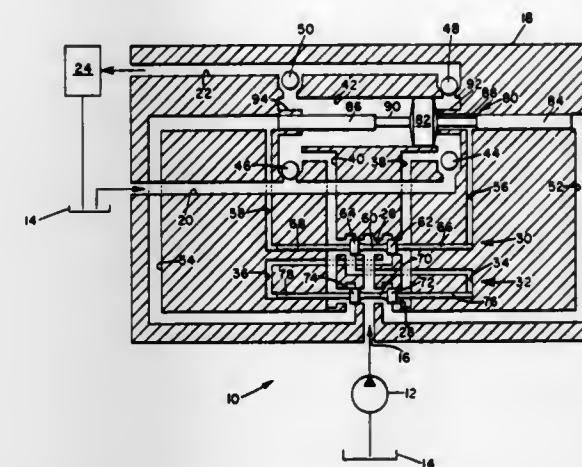
Ronnie F. Burk, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 26, 1980, Ser. No. 191,659

Int. Cl.<sup>3</sup> F04B 17/00

U.S. Cl. 417-396

2 Claims



1. A low pressure fluid supply system connectible to a high pressure fluid source, to a low pressure function and to a non-pressurized fluid reservoir, said low pressure fluid supply system comprising:

- (a) a pump body;
- (b) a main bore enclosed within said pump body having a first and a second end;
- (c) first and second bores enclosed within said pump body having respective first and second ends;
- (d) a high pressure inlet into said pump body connecting said high pressure fluid source to said first and second bores between said respective first and second ends thereof;
- (e) first and second pilot passages enclosed within said pump body respectively connecting said first bore proximate said first end to said second end of said second bore, and connecting said first bore proximate said second end to said first end of said second bore;
- (f) first and second main passages enclosed within said pump body respectively connecting said second bore proximate said first end to said first end of said main bore, and connecting said second bore proximate said second end to said second end of said main bore;
- (g) first and second control passages enclosed within said pump body respectively connecting said first and second ends of said first bore to said first and second main passages approximately at said ends of said main bore;
- (h) first and second relief passages enclosed within said pump body respectively connecting said first end of said main bore to said first ends of both said first and second bores, and connecting said second end of said main bore to said second ends of both said first and second bore;
- (i) a reservoir passage enclosed within said pump body connecting said non-pressurized fluid reservoir to both said first and second ends of said main bore;
- (j) a low pressure passage enclosed within said pump body connecting said low pressure function to both said first and second ends of said main bore;
- (k) first and second check valve means respectively disposed in said first and second ends of said main bore for preventing fluid from flowing from said main bore into said reservoir passage;
- (l) third and fourth check valve means respectively disposed in said first and second ends of said main bore for preventing fluid from flowing from said low pressure passage into said main bore;
- (m) first spool means positioned within said first bore and extending into both said first and second control passages, said first spool means movably responsive to high pressure fluid in said first control passage thereby connecting said high pressure fluid source to said first pilot passage and

connecting said first relief passage to said second pilot passage; and movably responsive to high pressure fluid in said second control passage thereby connecting said high pressure fluid source to said second pilot passage and connecting said second relief passage to said first pilot passage;

(n) second spool means positioned within said second bore and extending into both said first and second pilot passages, said second spool means movably responsive to high pressure fluid in said first pilot passage thereby connecting said high pressure fluid source to said first main passage and connecting said second relief passage to said second main passage, and movably responsive to high pressure fluid in said second pilot passage thereby connecting said high pressure fluid source to said second main passage and connecting said first relief passage to said first main passage; and

(o) free piston means positioned within said main bore and extending in said first and second main passages, said free piston means for responding to high pressure fluid in said first main passage to move from a first position connecting said first control passage to said non-pressurized fluid reservoir and said second main passage to said low pressure fluid function through a series of positions for drawing fluid from said non-pressurized fluid reservoir through said first check valve means into said main bore and for urging fluid out of said main bore through said fourth check valve means to said low pressure fluid function while respectively blocking said first and second control passages from said non-pressurized fluid reservoir and said low pressure fluid function to a second position connecting said first control passage to said high pressure fluid source and said second main passage to said low pressure fluid function, said free piston means responsive to high pressure fluid in said second main passage to move from said second position through a series of positions to said first position thereby drawing fluid from said non-pressurized fluid reservoir through said second check valve means into said main bore and for urging fluid out of said main bore through said third check valve means to said low pressure fluid function.

4,419,056

## BACK-UP FOR HIGH VOLTAGE CABLE PRESSURIZING SYSTEM

Sigmund Ege, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

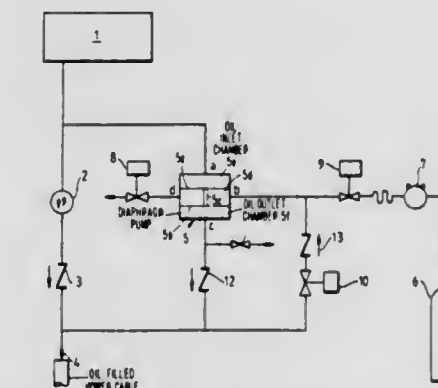
Filed Jul. 22, 1981, Ser. No. 285,700

Claims priority, application Norway, Aug. 4, 1980, 802327

Int. Cl.<sup>3</sup> F04B 23/04, 43/06

U.S. Cl. 417-426

20 Claims



1. In a system for pressurizing oil filled power cables including an electrical insulating oil source coupled to said power cables to fill said power cable with said oil and to maintain oil pressure in said power cable, a back-up system to supply said oil to said power cable in case of a rupture of said power cable causing oil leaks comprising:



a reservoir of said oil;  
 at least one diaphragm-type pump having two spaced diaphragms interconnected by a rod, a gas drive input and a gas drive output coupled to a first chamber disposed between said two diaphragms, a suction input coupled to said oil reservoir and to a second chamber adjacent one of said two diaphragms and an oil output coupled to said power cable and to a third chamber adjacent the other of said two diaphragms, said back-up system having a normal stand-by mode of operation when said power cable is not ruptured, a test mode of operation to enable testing of said diaphragm pump and an operate mode of operation when said rupture occurs; and  
 a first arrangement coupled to said drive input to provide said oil in said first chamber during at least said stand-by mode of operation, said second chamber being coupled to said oil reservoir during all operating modes such that said second chamber and said first chamber have said oil therein simultaneously during at least said stand-by mode of operation.

4,419,057

## ROTARY PISTON MOTOR

Claude C. F. Menioux, Nogent sur Marne, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

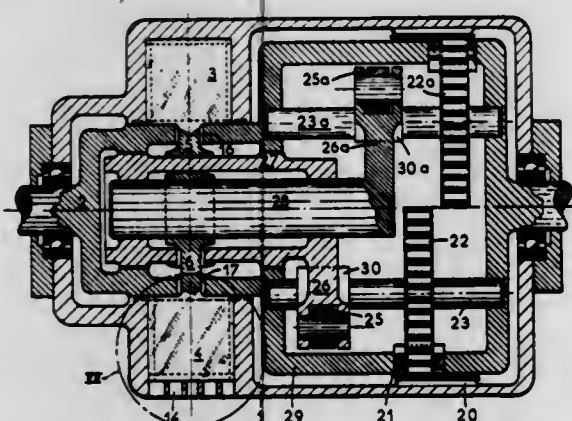
Filed Feb. 3, 1981, Ser. No. 231,107

Claims priority, application France, Feb. 6, 1980, 80 02539

Int. Cl.<sup>3</sup> F01C 1/077

U.S. Cl. 418—36

14 Claims



1. An internal combustion rotary volumetric motor operating on a four stroke cycle, comprising:  
 a fixed exterior housing which delimits an annular space;  
 a plurality of pistons that rotate in the same direction mounted in said annular space;  
 a rod having a shaft integral therewith diametrically connecting said pistons in pairs and propelling said pistons by a cyclical speed variation which causes a volume variation in the space delimited by radial surfaces of the pistons, said spaces between the pistons forming chambers of said motor operating on a four stroke cycle;  
 a rotary crown having a plurality of ports formed therein wherein the annular space within which the pistons move is delimited by the housing and said rotary crown having said ports through which the rods are engaged and which provide an angle of clearance for the rods for advancing and receding of the pistons, said rotary crown forming part of an outlet motor shaft; and  
 a transmission mechanism attaching said rotary crown to the shafts.

4,419,058

## HYDRAULIC PUMP ROTATING GROUP AXIAL ALIGNMENT STRUCTURE

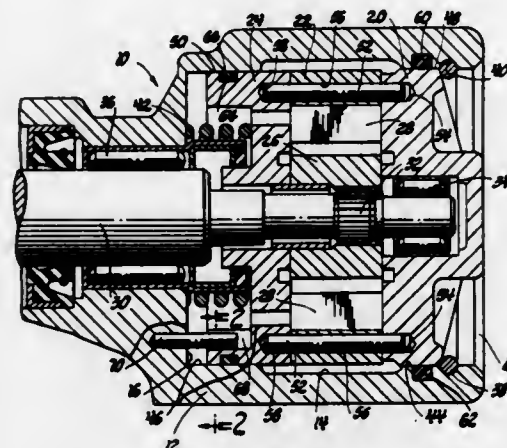
Leonard N. Franklin, Jr., Reese, and Gary G. Hegler, Chesaning, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1981, Ser. No. 271,661

Int. Cl.<sup>3</sup> F04C 2/00, 15/00

U.S. Cl. 418—133

2 Claims



1. A vane pump assembly comprising; a housing, a pressure plate piloted in said housing; a cam ring disposed in said housing adjacent said pressure plate; a thrust plate piloted in said housing adjacent said cam ring; a pair of alignment dowel pins each extending from a close fit in a blind opening in said pressure plate, through a close fit opening in said cam ring and into a close fit blind opening in said thrust plate to maintain axial and angular alignment of said plates and ring; and reaction means extending between said housing and said pressure plate in a loose fit relation in at least the circumferential direction for limiting rotary motion of said pressure plate relative to said housing, and through the alignment pins also limiting rotation of the thrust plate and cam ring.

4,419,059

## NONSYMMETRIC BORE CONTOUR FOR ROTARY COMPRESSOR

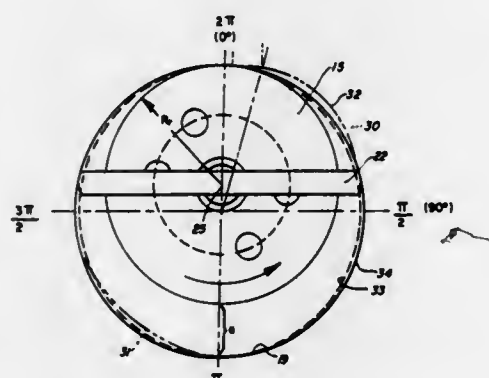
Vincent P. Anderson, Knight Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 10, 1981, Ser. No. 291,791

Int. Cl.<sup>3</sup> F04C 18/00

U.S. Cl. 418—150

11 Claims



1. In a rotary compressor having a wall defining a compression chamber having a discharge opening, a cylindrical rotor eccentrically positioned in said chamber and defining a center and a diametric slot, said rotor engaging the chamber wall at a point of contact adjacent the outlet passage, an onepiece blade longitudinally reciprocally slidably received in said slot and having opposite projecting tips each having a center of curvature on the longitudinal centerline of the blade and being in

sliding contact with the chamber wall for substantially all rotational positions of the rotor, said wall having a contour generally defined by the formula  $R(\theta) = R_0 + R_1 \cos(\theta)$ , where  $R(\theta)$  is the distance from the center of the rotor to the center of the blade tip radius,  $R_0$  is the radius of the rotor minus the blade tip radius plus one-half the distance ("a") between the rotor and the chamber wall at the point opposite the contact point, and

$$R_1 = -\frac{a}{2},$$

and wherein the wall is further defined by a radially outward enlargement of said contour in the quadrant of the chamber containing said discharge opening and radially inward reduction of said contour in the opposite quadrant of the chamber.

4,419,060

## APPARATUS FOR RAPIDLY FREEZING MOLTEN METALS AND METALLOIDS IN PARTICULATE FORM

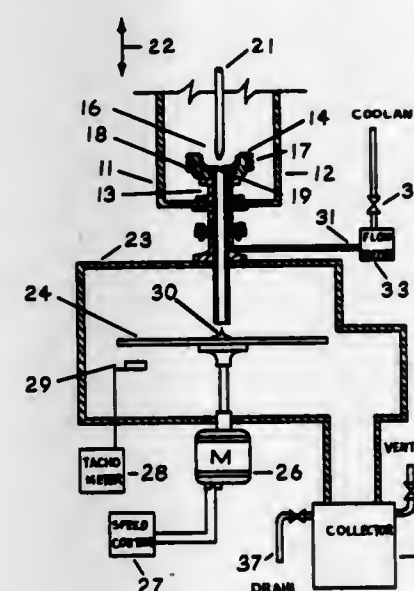
John L. Speler, and Donald T. Liles, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 14, 1983, Ser. No. 474,780

Int. Cl.<sup>3</sup> B01J 2/14

U.S. Cl. 425—8

6 Claims



1. In an apparatus for rapid freezing of metals and metalloids in particulate form from a melt of such materials having a disc-like member mounted substantially horizontally on a centrally located shaft connected to a high rotatable speed power source and inlet means for introducing both a volatile liquid coolant and the molten material to be processed to the disc-like member as it is rotated whereby the molten material is cooled to the solid state by vaporization of the liquid coolant and dispersed by centrifugal forces acting upon the coolant and material, the improvement which comprises:

a generally cone-shaped protrusion located with its apex extending upwardly from the center of rotation of the disc-like member, the inlet means for the molten materials being located vertically above the apex of the protrusion, and the inlet means for said liquid coolant being located sufficiently close to said inlet means for said molten materials to provide cooling for said protrusion and to provide an outwardly flowing film of coolant liquid across the upwardly facing surface of said disc-like member, whereby the molten material dropped to the apex of said protrusion is dispersed thereby into said film of coolant liquid.

4,419,061

## MULTI-PIECE ROTARY ATOMIZER DISK

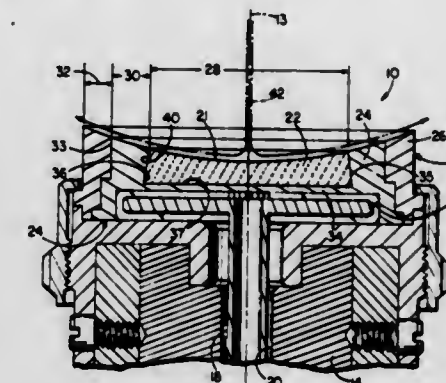
Robert J. Patterson, II, Port St. Lucie, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,189

Int. Cl.<sup>3</sup> B28B 1/54

U.S. Cl. 425—8

8 Claims



1. Rotary atomization means for atomizing molten metal, including a drive shaft having an axis and a cylinder-like atomizer disk mounted on said drive shaft for rotation about said axis, said disk having an upper atomizer surface, the improvement comprising:

said disk comprising at least three elements concentric about said axis, each defining one of a similar number of contiguous, concentric, radially aligned zones of disk material, said concentric zones defining said upper atomizer surface, one of said elements being a central element and defining a central zone of said concentric zones and having a low thermal conductivity, said elements surrounding said central element being made from a high thermal conductivity material, the radially outermost of said elements also being made from a high tensile strength material.

4,419,062

## CONTINUOUS OPERATION PRESS

Albert de Mets, Roeselaere, Belgium, assignor to de Mets N.V., Tzegem, Kachtem, Belgium

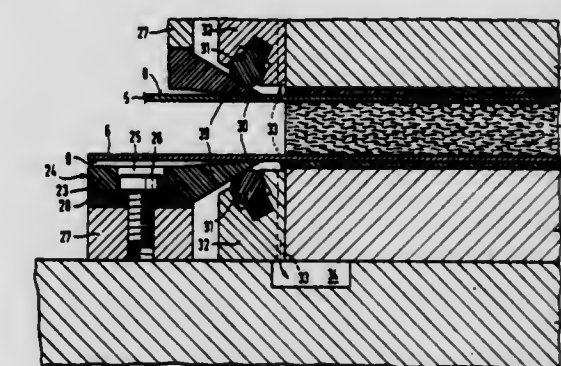
Filed Nov. 16, 1981, Ser. No. 321,608

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 35065

Int. Cl.<sup>3</sup> B30B 5/06

U.S. Cl. 425—101

32 Claims



1. A continuous-operation press for at least one of producing and treating a board web, the press including an upper and lower belt means defining upper and lower carrying runs between which the board web is carried, the upper and lower belts being adapted to continuously circulate at a constant speed, characterized in that support means extending substantially perpendicular to a conveying direction of the board web is provided and extends over an entire width of a press area of the press, the support means is disposed in proximity to an underside of the lower belt, a friction reducing means is ar-



ranged on the support means with the underside of the lower belt resting thereon, means are provided for supplying a lubricant to the friction reducing means, and in that a seal means is fixedly mounted on the press at least in a vicinity of an exit to the press area as viewed in a direction of conveyance of the board web, the seal means extends over an entire width of the press area.

4,419,063

**BLOW MOLDING DETABBER**

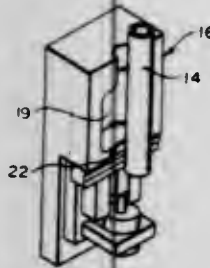
Brooks B. Heise, 14 Westminister Dr., West Hartford, Conn. 06107

Filed Mar. 8, 1982, Ser. No. 356,220

Int. Cl.<sup>3</sup> B29C 17/07, 17/12

U.S. Cl. 425—107

8 Claims



1. Apparatus for use with a blow molding machine to remove a tab formed at one end of a blow-molded object and comprising a mold defining the shape of the object to be blow-molded, a carriage having a fixed frame secured to the mold and a slide supported for movement on the frame, a first jaw and a cooperating second jaw, each jaw being associated with one half of the mold, the first jaw being supported by the carriage slide for movement from a position juxtaposed with the bottom of the mold to a position spaced therefrom, the slide including an axle with rollers at opposite ends, the fixed frame providing a pair of recessed cam grooves embracing the rollers to guide the first jaw for movement in a substantially rectilinear path from a first position juxtaposed with the mold and in close contact with the cooperating second jaw to a second position spaced from the mold and from the cooperating second jaw, and passageways defined in the axle in isolated relation to the first jaw and to the blow-molded object having the tab which is to be removed, the passageways serving to admit lubricant for said rollers and cam grooves.

4,419,064

**APPARATUS FOR PRODUCING MOLDED PLASTIC ARTICLES SUCH AS PACKAGING TUBES**

Karl Mägerle, Im vorderen Erb 1, 8700 Kunsnacht, Switzerland

Division of Ser. No. 165,396, Jul. 2, 1980, Pat. No. 4,352,775.

This application Apr. 2, 1982, Ser. No. 364,792

Claims priority, application Switzerland, Jul. 12, 1979, 6502/79

Int. Cl.<sup>3</sup> B29D 23/04

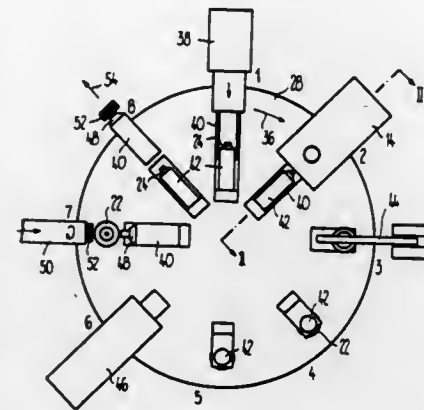
U.S. Cl. 425—256

1 Claim

1. Apparatus for producing a molded article from thermoplastic material, comprising:  
an extrusion head for extruding plasticized thermoplastic material in a vertically downwardly directed annular flow, so that the extruded plasticized thermoplastic material freely depends from said extrusion head;  
said extrusion head including means for shaping the plasticized thermoplastic material that is being extruded in said vertically downwardly directed annular flow into a blank of lenticular, standing oval-resembling longitudinal cross-sectional profile, said shaping means including means for controlling said annular flow while said extruded plasticized material freely depends from said extrusion head;  
means for separating said blank, so shaped, from the extrusion head, at least in part by terminating said annular flow; an upwardly open mold cavity disposed spacedly directly

beneath said extrusion head, so that as said blank is separated from the extrusion head, said blank free falls into and lands in the mold cavity with minimal surface contact with the mold cavity;

said mold cavity including an axially directed pin which projects vertically upwardly, so that as said blank free falls



into and lands in the mold cavity, said blank spacedly rings said pin;  
stamp means movable towards the mold cavity into pressing engagement with said blank so as to form a molded article of the extruded plasticized thermoplastic material of said blank while temporarily closing said mold cavity.

4,419,065

**METHOD AND APPARATUS FOR SHAPING THE EDGES OF GREEN BRICK AND SEPARATING THE SAME**

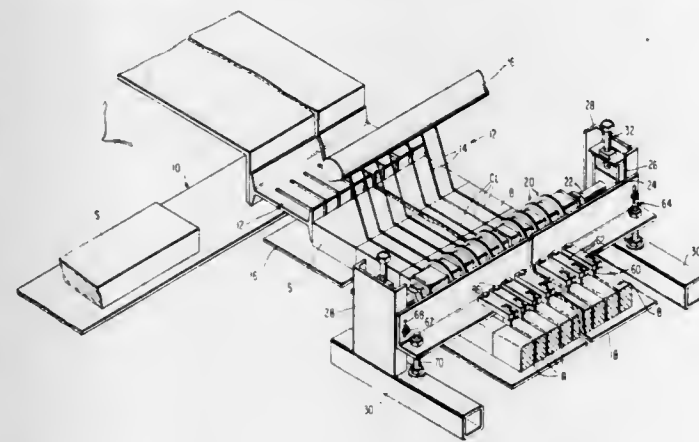
Joseph A. Cox, Fletcher, N.C., assignor to EA Industries, Incorporated, Asheville, N.C.

Filed Aug. 15, 1980, Ser. No. 178,537

Int. Cl.<sup>3</sup> B28B 11/08

U.S. Cl. 425—301

17 Claims



1. In combination with apparatus for cutting slugs into rows of green bricks including a wire cutter having a plurality of horizontally spaced fixed generally vertical wires extending across a path of conveyance in side-by-side relationship, means for shaping the edges of the bricks after leaving the wire cutter including a plurality of rollers mounted for rotation about a horizontal axis extending across the path of conveyance, the rollers being positioned along said axis at fixed locations aligned with said wires, respectively, such that peripheral portions of each roller will simultaneously engage the adjacent edges of adjacent bricks to shape the same, and wherein said rollers have means on their peripheral portions for shaping the edges of the bricks, and wherein the apparatus further includes cutting means positioned along the path of conveyance downstream of the rollers for cutting portions of the bricks located between adjacent rows of bricks for separating the rows of bricks from each other.

4,419,066

**MACHINE FOR CONTINUOUSLY DENSIFYING LIGNO-CELLULOSIC OR LIKE MATERIALS**

Marcel Neuman, Embourg, Belgium, assignor to Biomass Development S.A., Zurich, Switzerland

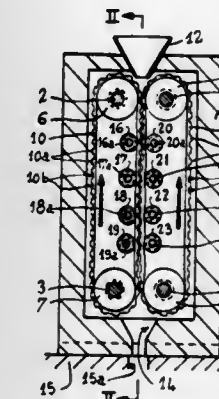
Filed Oct. 27, 1981, Ser. No. 315,442

Claims priority, application France, Oct. 28, 1980, 80 23419

Int. Cl.<sup>3</sup> A01J 21/00

U.S. Cl. 425—371

4 Claims



1. A machine for continuously compacting ligno-cellulosic materials, comprising:

- (a) a frame having an inlet at one end and an outlet at the other end;
- (b) a pair of mutually spaced parallel shafts supported in the frame near its inlet, and a pair of mutually spaced parallel shafts supported in the frame near its outlet;
- (c) two pairs of drums respectively carried by the paired shafts within the frame, and means to drive at least one of said drums;
- (d) two elastomeric toothed belts, each respectively carried by two drums comprising one of the drums at each end of the frame, the belts having inner surfaces engaging the drums and having opposed outer toothed surfaces with the teeth of each belt meshed in the valleys of the opposed belt to synchronize travel of the belts;
- (e) multiple pairs of opposed compression rollers journaled to rotate about their axes in the frame, and being disposed in sequentially adjacent pairs of rollers which are spaced along the belts, and the rollers in each pair being disposed to contact the inner surfaces of the belts respectively on opposite sides of their opposed and meshed toothed surfaces;
- (f) means for introducing said materials between the belts and drums at said inlet end, whereby the materials travel between said toothed and meshed belt surfaces and are discharged therefrom at said outlet end; and
- (g) the compression rollers of each pair being operatively located to compress the elastomeric belts and compact the materials passing between them, and adjacent pairs of rollers being spaced apart to leave uncompressed intervals of belt travel therebetween, whereby alternate pulsating compression and expansion of the belts and materials occurs successively as the belts travel between the pairs of rollers and through the intervals therebetween.

4,419,067

**DEVICE FOR CONNECTING PLASTICS TUBES BY HEATSEALING**

Jurgen Graafmann, Ibbenburen, Fed. Rep. of Germany, assignor to Wavin B.V., Zwolle, Netherlands

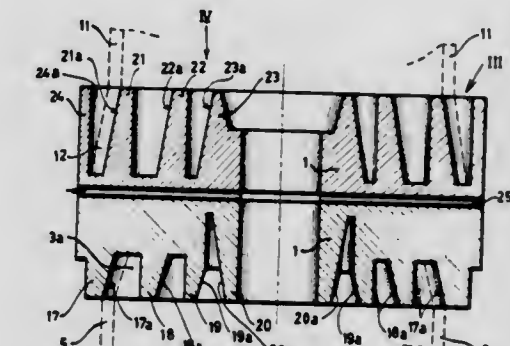
Division of Ser. No. 882,400, Mar. 1, 1978, abandoned, Ser. No. 111,172, Jan. 10, 1980, abandoned, and Ser. No. 257,187, Apr. 24, 1981, abandoned. This application Jun. 24, 1982, Ser. No. 391,724

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2708898

Int. Cl.<sup>3</sup> B29C 17/00

U.S. Cl. 425—392

2 Claims



1. An apparatus for connecting plastic tubes by heat sealing, comprising a plate with at least one heatable widening mandril forming a funnel shaped widening, one side of said plate comprising second annular sections having truncated conical outer walls which widen toward the exterior, the opposite side of said plate comprising first annular sections having inner truncated conical surfaces which taper toward the interior, whereby the smallest diameter of an inner conical surface at the inner extreme end of an annular section is equal to the smallest outer diameter at an outward extremity of an annular section at the opposite side of the plate, the top angle of said second annular conical outer walls [21A] to [24A] of said second annular sections [21], [22], [23], [24] and of the conical inner walls [17A], [18A], [19A] and [20A] of said first annular sections [17], [18], [19], [20] being comprised between 20 and 60 degrees and means connected to simultaneously heat said first and second annular sections.

2. The apparatus of claim 1 wherein there is an insulating layer in between the external part of the truncated conical surfaces and the internal part of the truncated conical surfaces.

4,419,068

**MOLDING APPARATUS HAVING A VENTED FEMALE MOLD MEMBER FOR FORMING FOAMED EGG CARTONS**

Wayne L. Congleton, Walnut, Calif., assignor to Dolco Packaging Corporation, Sherman Oaks, Calif.

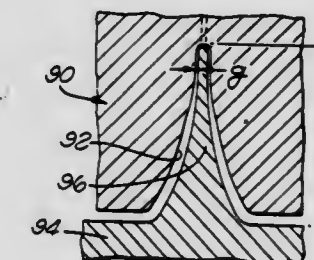
Division of Ser. No. 235,203, Feb. 17, 1981, Pat. No. 4,382,536.

This application Mar. 11, 1982, Ser. No. 356,998

Int. Cl.<sup>3</sup> B29C 17/03; B29D 27/00

U.S. Cl. 425—398

1 Claim



1. A mold for molding a flexible portion in a polystyrene sheet having an expanded foam layer with a nonexpanded polystyrene skin on one side of the foam layer, comprising:



a female mold member having a vented indenture with an outer surface;  
 a male mold member having a protrusion with an outer surface, the protrusion adapted for being intermittently inserted into the indenture with a mold gap between the outer surface of the protrusion and the outer surface of the indenture, wherein the protrusion comprises an upstanding rib with a top edge having at least one corner notched for decreasing the amount by which the skin of a polystyrene sheet placed between the male and female mold members is stretched adjacent the notched corner region whereby the skin is stretched without separating.

4,419,069

## FLAME IGNITER

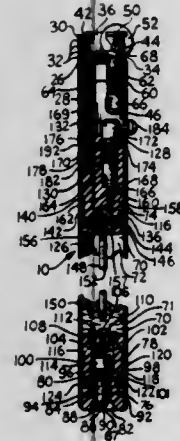
Rodney S. Piffath, Sunland, Calif., assignor to Firelite Products Inc., Alhambra, Calif.

Filed Jul. 31, 1980, Ser. No. 174,273

Int. Cl.<sup>3</sup> F23Q 2/16

U.S. Cl. 431—89

30 Claims



1. A flame igniter including:  
 a chamber for containing liquified gaseous fuel having a top and a bottom;  
 gaseous fuel ignition means;  
 on/off fuel regulator means positioned closer to the top of said chamber than the bottom thereof; and  
 a relatively long, thin, fuel feed tube having a fuel inlet end adjacent said bottom of said chamber and a fuel outlet end which extends to said on/off fuel regulator means, said chamber being defined by:  
 a body tube having top and bottom ends;  
 a bottom plug positioned in said bottom end of said body tube; and  
 a top plug positioned in said top end of said body tube constructed from elastomeric material having a mechanical memory, said top plug having said on/off fuel regulator means positioned therein and defining a passageway for fuel from said feed tube to said on/off fuel regulator means, said on/off fuel regulator means including:  
 a valve needle having a threaded portion and a frustoconical needle portion;  
 a threaded portion of said top plug for threaded engagement with said threaded portion of said valve needle; and  
 a cylindrical surface defined in said top plug positioned for engagement with said frustoconical needle portion which selectively allows and regulates fuel flow therepast.

4,419,070

## DECORATIVE MOLTEN WAX DISPLAY

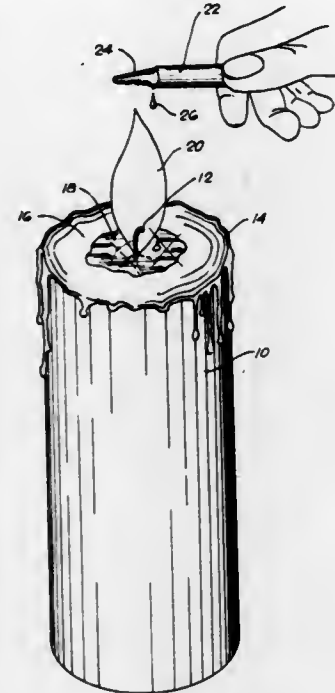
Alexander Z. Gustafson, Chicago, Ill., assignor to Chicago Digital Incorporated, Chicago, Ill.

Filed Apr. 2, 1981, Ser. No. 250,419

Int. Cl.<sup>3</sup> F21Q 3/00; F23Q 2/32

U.S. Cl. 431—126

4 Claims



1. The method of producing a decorative molten wax display comprising the steps of igniting a wick to burn the wax in a wax impregnated wick of a candle to produce a flame, said candle having the wick surrounded by a mass including wax of a particular color, said mass having an upper substantially horizontal surface extending a distance of at least  $\frac{1}{8}$  inch from the wick to the perimeter of the surface, establishing a pool of molten wax in the surface about the wick of the burning candle, said pool extending from the wick and being spaced from the perimeter of the surface, melting a portion of a wax crayon containing metallic particles of a color different than the color of the wax of the candle in the flame of the candle to produce drops containing molten wax of the crayon and particles of the crayon, and directing the drops from the crayon into the pool of the candle to release the metallic particles from the drops into the pool, and observing the movement of the particles in the pool so as to determine the path of currents of molten wax in the pool, said path of currents forming decorative color patterns for observation at the same time.

4,419,071

PORTABLE HIGH-FLOW RATE FLARE FOR  
 SMOKELESS BURNING OF VISCOUS LIQUID FUELS

Robert Schwartz, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Aug. 3, 1981, Ser. No. 289,299

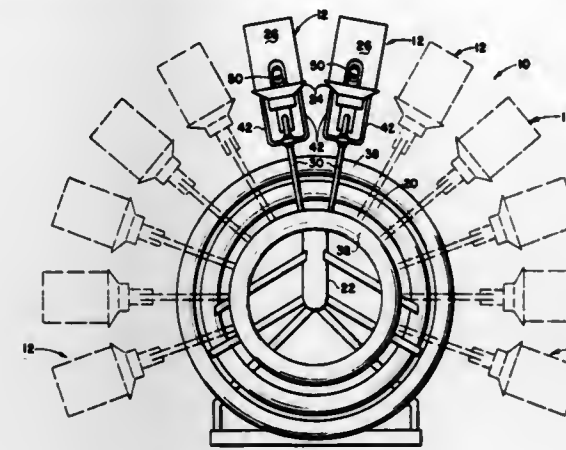
Int. Cl.<sup>3</sup> F23B 5/00

U.S. Cl. 431—202

11 Claims

1. A portable, multi-burner flare for burning of combustible liquid fuel of widely different viscosity, comprising:  
 a framework for supporting in a vertical array;  
 (a) a liquid fuel manifold in the form of at least a portion of a circle, a plurality of first pipes extending along an outward axis from said manifold at spaced locations;  
 (b) a plurality of burner heads mounted on the ends of said first pipes; each of said burner heads having an orifice and means to atomize and direct said liquid fuel through said burner heads from said manifold along said outward axis;  
 (c) a water manifold parallel and coaxial with said liquid fuel manifold, a plurality of second pipes extending outward of said water manifold, a water spray nozzle connected to each of said second pipes and positioned so that its axis is

directed toward said outward axis at a selected distance downstream from said burner head;  
 (d) a gas manifold parallel to and coaxial with said liquid fuel and said water manifolds, a plurality of third pipes spaced



along said gas manifold, and means to connect to pilot burners each of said third pipes which are positioned in the vicinity of said burner heads; and  
 (e) means to supply pressurized liquid fuel, water and gas, to said respective manifolds.

4,419,072

## HANDY TORCH

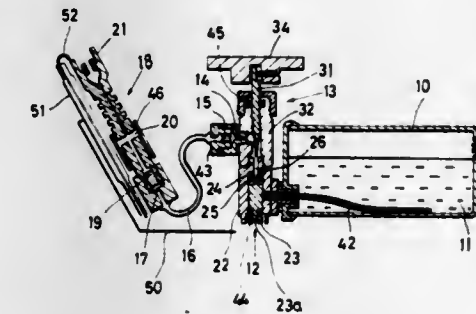
Katsuyuki Nakagawa, Osaka, and Naoki Oda, Ashiya, both of Japan, assignors to Sankin Industry Co., Ltd., Osaka, Japan

Filed Mar. 10, 1982, Ser. No. 356,902

Int. Cl.<sup>3</sup> F23Q 3/00

U.S. Cl. 431—266

8 Claims



1. A handy torch comprising:  
 a tank (10) for containing fuel gas (11) therein in a liquefied state;  
 a first valve mechanism (12) fixed to the tank (10);  
 a second valve mechanism (13) connected to the first valve mechanism (12);  
 a burner (18) having a nozzle (21) at its tip portion and an air-intake opening (20) at its intermediate portion where air is mixed with vaporized gas coming from the second valve mechanism (13);  
 a pipe (16) for connecting the second valve mechanism (13) with the burner (18);  
 the first valve mechanism (12) including:  
 a first valve body (22) having a cylindrical inner wall, a female thread formed in the cylindrical inner wall and a valve seat formed in the first valve body (22);  
 an actuating member (23) having a male thread screwed with the female thread of the first valve body (22) with a small gap for gas flow;  
 a disc (25) positioned downstream of the male thread of the actuating member (23);  
 the disc (25) being set to be moved by the inner end of the actuating member (23) along the cylindrical inner wall in the first valve body (22) in its longitudinal direction with a small gap between the periphery of the disc and the

cylindrical inner wall of the first valve body (22) so that the gas can flow through the gap; and  
 a resilient O-ring (24) disposed between the valve seat and the disc (25) and positioned downstream of the disc (25); the O-ring (24) being designed such that the gas flowing from an entrance of the first valve mechanism (12) can be controlled by the O-ring (24) in cooperation with the disc (25) and the valve seat in such a manner that the gas can be completely vaporized downstream of the O-ring;  
 the actuating member (23) having a driven portion (23a) for turning the actuating member (23) in a desired direction;  
 a suction material (42) arranged through the entrance of the first valve mechanism (12) for feeding the gas from the tank (10) to the male thread of the actuating member (23);  
 the second valve mechanism (13) including:  
 a second valve body (32) having therein a passage formed form an entrance of the second valve mechanism (13) connected with the exit of the first valve mechanism (12) to an exit of the second valve mechanism (13) connected with the pipe (16), and a through-hole formed with a female thread; and  
 a needle (31) having at its intermediate portion a male thread screwed with the female thread of the second valve body (32) for controlling the gas flowing through the passage;  
 a gas adjusting dial member (34) fixed to the needle (31) so that the needle (31) can be turned to move forwards or backwards when the gas adjusting dial member (34) is turned;  
 a piezo-electric unit (53) having an ignition button (53a);  
 an ignition plug (52) placed near the nozzle (21) and electrically connected to the piezo-electric unit (53);  
 means (46) for regulating air to be introduced into the air-intake opening (20);  
 an air control lever (47) for actuating the regulating means (46); and  
 a casing (60) housing therein at least partly the tank (10), the first valve mechanism (12), the second valve mechanism (13), the pipe (16), the piezo-electric unit (53), the burner (18) and the air control lever (47), and having a gripped portion (60a) adapted to be gripped by hands;  
 the gas adjusting dial member (34), the air control lever (47) and the ignition button (53a) being arranged near the gripped portion (60a) of the casing (60);  
 the nozzle (21) being inclined outwardly at an angle between 30 degree and 75 degree in respect of the longitudinal direction of the torch.

4,419,073

## GAS LIGHTER

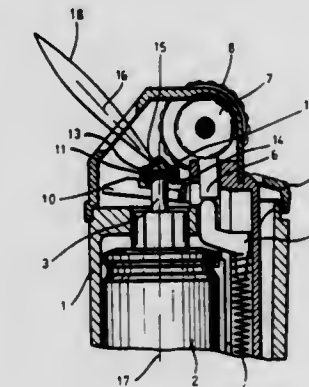
Alfred Racek, Seltengasse 54, 1160 Wien, Austria

Filed Jun. 2, 1981, Ser. No. 269,723

Int. Cl.<sup>3</sup> F23Q 2/16

U.S. Cl. 431—344

1 Claim



1. A gas lighter for emitting a flame angled away from an ignition device thereof, said lighter comprising:  
 a housing having a gas tank;  
 a burner tube in said housing centered on an upright axis and communicating with said gas tank, said burner tube being



formed at the upper end thereof with a flat collar having an upper annular surface lying transverse to said axis and a lower annular surface parallel to said upper annular surface;

a flat annular seal provided on said upper surface of said collar; and

a stamped burner cap provided at the upper end of said burner tube and enclosing said seal, said cap having an upwardly converging conical portion centered on said axis and surrounded by a flat base portion lying parallel to said collar and bearing on an upper surface of said seal, said base portion having a downwardly extending skirt lying parallel to said axis and surrounding said collar, said skirt being formed with inwardly bent shoulders engaging beneath the lower surface of said collar, said conical portion of said cap being formed with a gas orifice at an angle to said axis.

4,419,074

## HIGH EFFICIENCY GAS BURNER

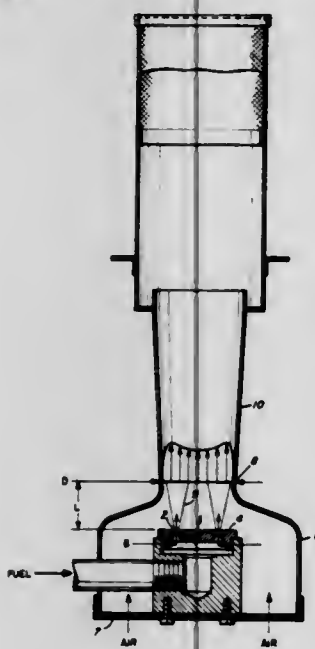
Mark A. Schuetz, Belmont, Mass., assignor to Advanced Mechanical Technology, Inc., Newton, Mass.

Filed Sep. 11, 1981, Ser. No. 301,296

Int. Cl.<sup>3</sup> F23D 13/40; F04F 5/46

U.S. Cl. 431—354

8 Claims



1. A burner assembly having a flame holder and a nozzle assembly for injecting a gaseous fuel from line pressure of 1070 Pascal or less through a throat into a diffuser to aspirate and mix with an amount of air sufficient for complete combustion of the fuel at the flame holder, the burner assembly comprising:

a nozzle assembly having a plurality of nozzles in a generally circular array, the nozzles being angled about 10° relative to the axis of the nozzle assembly and throat to provide swirl of the air fuel mixture, the fuel and aspirated air flowing directly into the throat as a stream having an outer diameter generally matching the throat diameter, the throat having a length of less than about one-half inch.

4,419,075

## BLAST FURNACE STOVE WALL

Jack Hyde, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 19, 1981, Ser. No. 322,744

Int. Cl.<sup>3</sup> C21B 9/00

U.S. Cl. 432—217

23 Claims

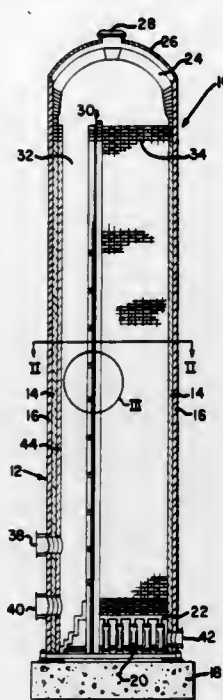
6. A wall for internally partitioning a blast furnace stove into a combustion chamber and a checker chamber comprising:

(a) a first vertical layer of refractory material;

(b) a second vertical layer of refractory material disposed parallel to said first layer of refractory material and having at least two integral, spaced ledges, said ledges projecting

inwardly toward the first layer of refractory materials; and

(c) a vertical layer of insulating material interposed between said first and second layers of refractory material so as to



abut, endwise, said inwardly projecting ledges, such that at least a part of any radially directed pressure resulting from a greater relative thermal expansion of one of said layers of refractory material will be borne by the other of said layers of refractory material.

4,419,076

## WAFER TRAY CONSTRUCTION

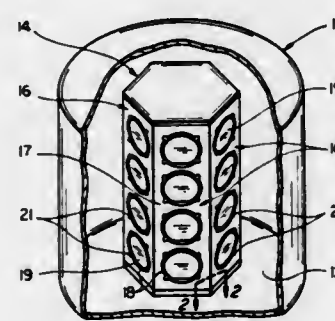
Samson Kirshman, San Jose, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 28, 1982, Ser. No. 343,587

Int. Cl.<sup>3</sup> F27D 5/00

U.S. Cl. 432—253

13 Claims



1. In apparatus for processing wafers in a plasma reactor having a chamber in which a gas plasma is formed and a support for holding trays of wafers to be processed in the chamber: an array of wafer holding trays mounted on the support with an overlap at the adjacent edges of the trays preventing line-of-sight communication between the trays and permitting individual ones of the trays to be removed from the support at random without disturbing the remaining trays in the array.

4,419,077

## ORTHODONTIC FACE-BOW AND METHOD OF PREVENTING INJURIES WITH THE USE OF FACE-BOWS

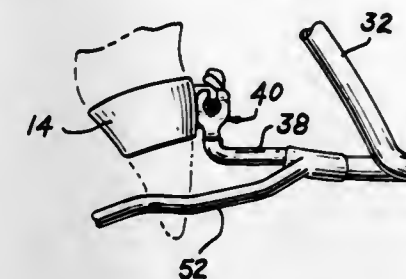
Sidney Asher, 165 Keswick C at Century Blvd., Deerfield Beach, Fla. 33441

Filed Jan. 31, 1983, Ser. No. 462,665

Int. Cl.<sup>3</sup> A61C 7/00

U.S. Cl. 433—5

14 Claims



1. An orthodontic face-bow for preventing facial and eye injury and adapted to apply force to a patient's teeth through an orthodontic arch fixed to the patient's teeth and adapted to be removably connected to said arch, said face-bow comprising a frame having a pair of rearwardly extending arms each terminating in hook means at the rear end and in a central frame portion at their forward ends, spaced levers secured to said frame adjacent said central frame portion, each of said levers extending upwardly and being removably connectable to said arch by a fork portion having a generally rectangular lumen which terminates in a keyhole portion, and an auxiliary arch wire secured to said frame adjacent said central frame portion, said auxiliary arch wire comprising auxiliary arms extending rearwardly from said central frame portion, each auxiliary arm having an end portion adapted to be removably positioned in association with a buccal tube fixed to a molar for securing said face-bow against removal from a patient's mouth.

4,419,078

## ORTHODONTIC BRACKET

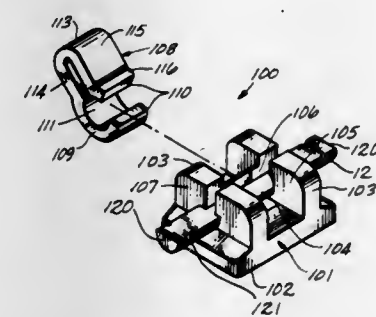
Erwin C. Pletcher, P.O. Box 566, Rancho Santa Fe, Calif. 92067

Continuation-in-part of Ser. No. 265,377, May 20, 1981, abandoned. This application Nov. 18, 1982, Ser. No. 442,753

Int. Cl.<sup>3</sup> A61C 7/00

U.S. Cl. 433—10

7 Claims



1. An orthodontic bracket assembly, comprising:

a base with a rear tooth-facing surface, a pair of mesiodistally spaced-apart support members extending forwardly with respect to the rear surface, and a bearing member extending between the support members, the bearing member defining a base slot to receive an arch wire; and

a locking member with a hub having a mesiodistal passage therethrough, the passage being configured to receive the bearing member so the hub fits captively and rotatably over the bearing member, the hub being deformable to enable installation over the bearing member, the hub further having a mesiodistal slot extending therethrough into communication with the passage;

the locking member being rotatable on the bearing member

between open and closed positions, the open position aligning the slots to enable seating of an arch wire in the base slot, and the closed position placing the hub slot out of alignment with the base slot to capture the arch wire within the bracket assembly.

4,419,079

## AIRCRAFT PILOTING AID SYSTEM

Jean-Francois M. Georges, Ville d'Avray, and Roger Parus, Saint-Remy-les-Chevreuse, both of France, assignors to Avions Marcel Dassault-Breguet Aviation, Vaucresson and Thomson-CSF, Paris, both of France

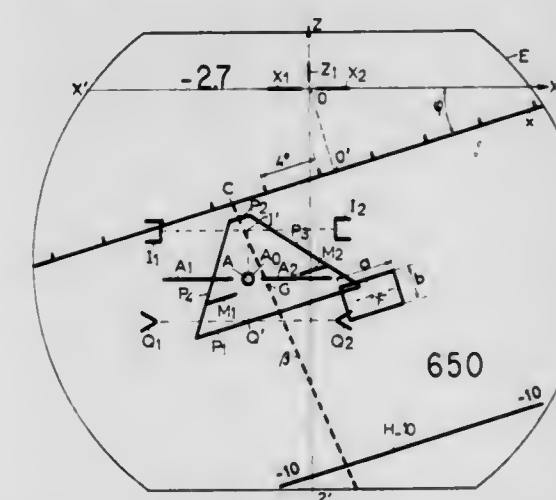
Filed Jul. 20, 1981, Ser. No. 284,666

Claims priority, application France, Jul. 23, 1980, 80 16234

Int. Cl.<sup>3</sup> G09B 9/08

U.S. Cl. 434—43

11 Claims



1. A piloting aid system for aiding in piloting or in simulating the piloting of an aircraft, comprising:

a display unit having a display screen and means for displaying on said display screen symbols representative of a plurality of determined flight and environmental characteristics of said aircraft;

means for determining drift angle  $\delta$  and a slope relative to ground  $\gamma_s$  of a flight path of said aircraft;

means for displaying a symbol representing said aircraft near a point having an abscissa and an ordinate on said display screen, said abscissa and said ordinate of said point with respect to two mutually perpendicular axes on said display screen being respectively proportional to the determined values of  $\delta$  and  $\gamma_s$ ; and

means for displaying a guidance symbol for the aircraft flight path comprising a rectangular guidance window having pairs of sides respectively parallel to said mutually perpendicular axes.

4,419,080

## METHOD AND APPARATUS FOR TEACHING GRAMMAR

Paul R. Erwin, Dallas, Tex., assignor to Class Press, Inc., Dallas, Tex.

Filed Dec. 28, 1981, Ser. No. 335,225

Int. Cl.<sup>3</sup> G09B 1/00

U.S. Cl. 434—172

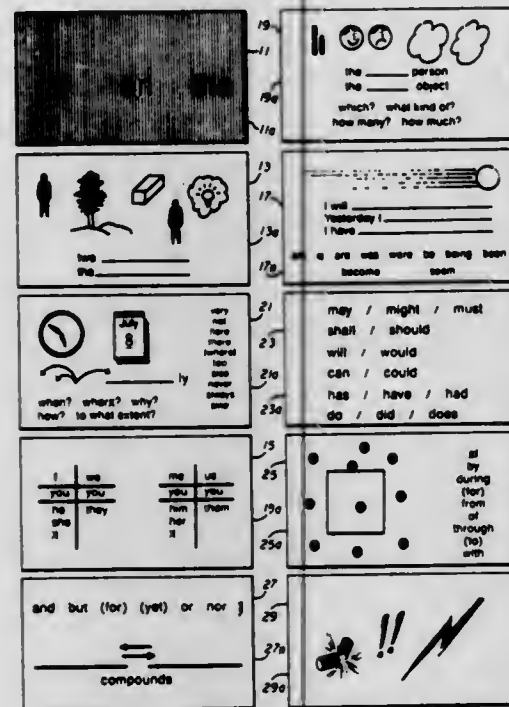
2 Claims

1. A teaching method wherein a student learns to recognize and understand the function of the parts of speech in a sentence, which comprises the steps of:

providing to the student a plurality of sets of parts of speech cards, each set having a part of speech card having a first side having a representation that indicates the function of a part of speech and a second side having the name of the part of speech, the function of which is indicated on the first side, and a direction to mark the part of speech in the sentence in a particular manner;



matching to each word of the sentence a first side of the part of speech card that corresponds to the word; reversing the matched parts of speech cards whereby the second sides of the matched parts of speech cards correspond to the words of the sentence with the name of the part



of speech corresponding to a word in the sentence that functions in that part of speech; and marking the words of the sentence in the manner of the direction on the corresponding matched second side of the part of speech card.

4,419,081

# MATHEMATICAL TEACHING/LEARNING AID AND METHOD OF USE

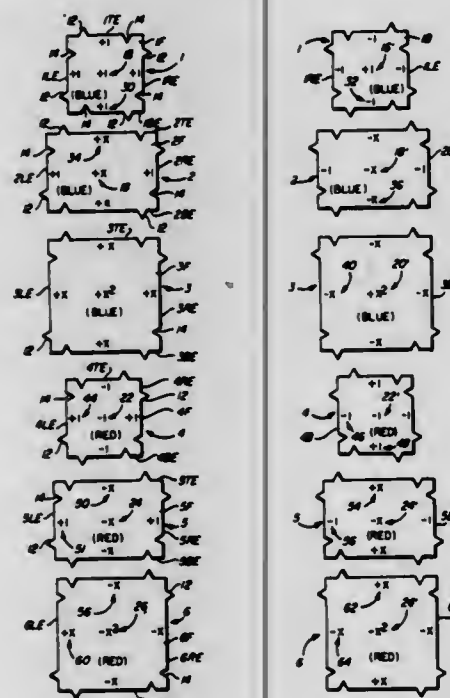
Phyllis R. Steinmann, 6928 E. Sunnyvale Rd., Scottsdale, Ariz. 85253

Filed Aug. 23, 1982, Ser. No. 410,533

Int. Cl.<sup>3</sup> G09B 1/36, 19/02

U.S. Cl. 434-188

9 Claims



1. A set of mathematical blocks useful in teaching and learning mathematics, each of said blocks having a front face, a back face, and, with reference to its front face, a top edge, a right edge, a bottom edge, and a left edge, said set comprising in combination:

a plurality of said blocks that are referred to as +1 blocks,

each having on its front face four edge dimension indicia referred to as +1 dimensions adjacent to its top, right, bottom, and left edges, respectively, and having on its back face four edge dimension indicia referred to as -1 dimensions adjacent to its top, right, bottom, and left edges, respectively;

a plurality of said blocks that are referred to as +X blocks each having on its front face two edge dimension indicia referred to as +X dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as +1 dimensions adjacent to its left and right edges, and having on its back face two edge dimension indicia referred to as -X dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as -1 dimension adjacent to its right and left edges, respectively;

a plurality of said blocks that are referred to as +X<sup>2</sup> blocks each having on its front face four edge dimension indicia referred to as +X dimensions adjacent to its top, right, bottom, and left edges, respectively, and having on its back face a plurality of edge dimension indicia referred to as -X dimensions adjacent to its top, right, bottom and left edges, respectively;

a plurality of said blocks referred to as -1 blocks each having on its front face two edge dimension indicia referred to as -1 dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as +1 dimensions adjacent to its right and left edges, respectively, and having on its back face two edge dimension indicia referred to as +1 edge dimensions adjacent to its top and bottom edges, respectively, and two edge dimension indicia referred to as -1 edge dimensions adjacent to its left and right edges, respectively;

a plurality of said blocks referred to as -X blocks each having on its front face two edge dimension indicia referred to as -X edge dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as +1 dimensions adjacent to its right and left edges and having on its back face two edge dimension indicia referred to as +X edge dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as -1 edge dimensions adjacent to its right and left edges;

a plurality of said blocks referred to as -X<sup>2</sup> blocks each having on its front face two edge dimension indicia referred to as -X edge dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as +X edge dimensions adjacent to its left and right edges and having on its back face two edge dimension indicia referred to as +X edge dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as -X edge dimensions adjacent to its right and left edges;

each of said +1, +X, and +X<sup>2</sup> blocks having at each of its edges and edge alignment means for effecting proper alignment of that edge with only one edge of any of the other blocks, the lengths of each of the edges of said blocks having a +1 edge dimension or a -1 edge dimension being equal, and the lengths of each of the edges of said blocks having a +X edge dimension or a -X edge dimension being different in length than the edges having +1 or -1 edge dimensions, whereby various ones of said blocks can be arranged to form rectangles representing algebraic expressions wherein the sums of the dimension indicia of each side of the formed rectangle represent factors of the algebraic expression.

4,419,082

# WATER-JET DRIVE MECHANISM FOR DRIVING AND CONTROLLING OF PARTICULARLY SHALLOW-DRAUGHT WATERCRAFTS

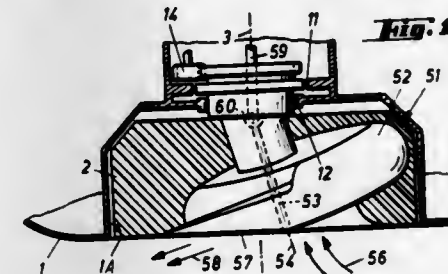
Franz Krautkremer, and Siegfried Lais, both of Spay, Rhein, Fed. Rep. of Germany, assignors to Schottel-Werft Josef Becker GmbH & Co KG, Spay, Rhein, Fed. Rep. of Germany  
Filed Jun. 9, 1981, Ser. No. 271,898

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022903

Int. Cl.<sup>3</sup> B63H 11/02

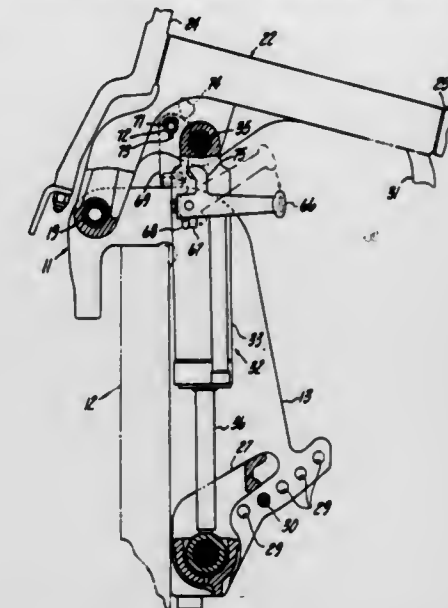
U.S. Cl. 440-42

4 Claims



1. In a water-jet drive mechanism for propelling and controlling a watercraft on a body of water, including a pump having an inlet opening communicating with said body of water and a nozzle extending in a downwardly inclined direction, said pump being supported in a support housing which is pivotal about a substantially vertical axis, and sucking water into said inlet opening and then ejecting it through said nozzle in said downwardly inclined direction, said inlet opening and nozzle being located above the undersurface of said watercraft, said pump being a centrifugal pump having an impeller which rotates in a spiral housing, the improvement comprising wherein the axis of rotation of said impeller of said pump is inclined with respect to said pivot axis of said support housing and lies in a vertical plane arranged at an angle with respect to said direction of said nozzle, whereby the effective length and height of said nozzle are larger than if said axis of rotation of said impeller of said pump were to lie in a vertical plane parallel to said direction of said nozzle.

engageable with means on said tilt lock means for moving said tilt lock means from its released position to its locked position



upon movement of said tilt stop means to its operative position when said drive unit is in its tilted position.

4,419,084

# POWER ASSISTED STEERING FOR MARINE PROPULSION DEVICE

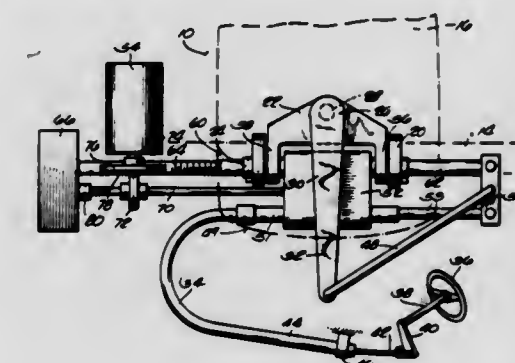
Gaylord M. Borst, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 26, 1979, Ser. No. 106,542

Int. Cl.<sup>3</sup> B63H 25/02

U.S. Cl. 440-58

14 Claims



4,419,083

# TILT LEVER RETURNING MECHANISM FOR OUTBOARD ENGINE

Michihiro Taguchi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of Japan

Filed Jan. 28, 1982, Ser. No. 343,467

Claims priority, application Japan, Jan. 31, 1981, 56-13480

Int. Cl.<sup>3</sup> B63H 21/26, 5/12

U.S. Cl. 440-56

7 Claims

1. In an outboard drive unit having a first member adapted to be affixed to the hull of a boat, a drive unit supported for pivotal, tilting movement by said first member about a generally horizontally extending axis, tilt stop means movable between a released position and an operative position for retaining said drive unit in a tilted up position, tilt lock means movable between a released position and a locked position for releasably restraining said drive unit in a tilted down position, the improvement comprising means on said tilt stop means

10. An outboard motor for a boat having a hull, said outboard motor comprising a support adapted to be fixed relative to the hull, propulsion means including a rotatably mounted propeller, means connecting said propulsion means to said support for pivotal steering movement about a steering axis, an electric motor which is continuously driven during operation of said outboard motor and which includes a rotatable output shaft, a member connected to said propulsion means and movable to effect steering movement of said propulsion means, and means including a push pull cable for selectively mechanically drivingly connecting and disconnecting said output shaft to said member in such manner as to selectively displace said member in opposite directions in response to selective driving connection between said output shaft and said member so as thereby to effect power assisted steering movement of said propulsion means.



4,419,085

**AMPHIBIOUS VEHICLE**

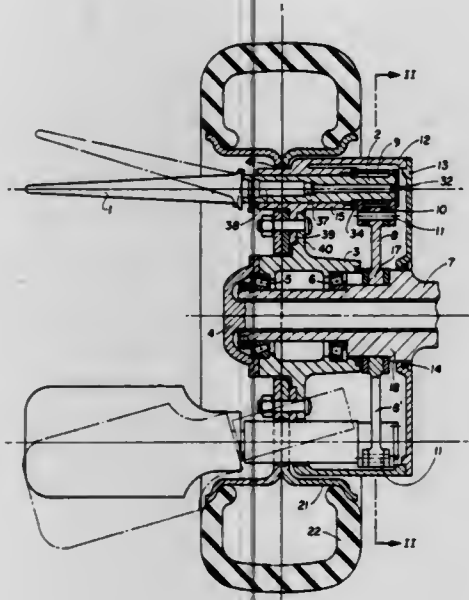
Rudolf Laucks, Heidenheim, and Karl Blickle, Herbrechtigen-Bolheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany  
Filed Oct. 29, 1981, Ser. No. 316,505

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041483

Int. Cl.<sup>3</sup> B63H 1/08

U.S. Cl. 440—93

6 Claims



1. In an amphibious vehicle having driven wheels connected to respective driving shafts for movement along dry surfaces and driving means for movement in a fluid, wherein at least one of said driven wheels has a rim connected to a hub and is provided with a plurality of propeller blades on supporting means attached to said at least one driven wheel and means for adjusting the position of said propeller blades relative to said at least one driven wheel, said propeller blades generating propulsion upon rotation of said at least one driven wheel in accordance with the principle of cycloidal propellers and supported by said supporting means such that said propeller blades substantially protrude axially outwardly, the improvement comprising:

said propeller blades having respective control portions and respective attachment portions thereon,

a plurality of blade-receiving means, each said blade receiving means comprising a cup-shaped blade support means connected to said hub for receiving therein said control portion and the outer end of said attachment portion of a respective one of said propeller blades,

said cup-shaped blade support means being concentrically connected to one of said at least one driven wheel and said driving shaft therefor on the side of said at least one driven wheel located towards the center axis of said vehicle, said propeller blades being receivable in respective said cup-shaped blade support means from the side of said at least one driven wheel opposite the center axis of said vehicle,

a hollow wheel axle connected to said at least one driven wheel and receiving said driving shaft therein, an eccentric on said hollow wheel axle and being of sine kinematics having a substantially rigidly defined, unchangeable eccentricity,

a control ring rotatably mounted around said eccentric, and a plurality of control arms connected between and to said control ring and respective said propeller blades for the operation thereof.

4,419,086

**TRUNNION SEAL AND CROSS VENTING SYSTEM FOR A CARDAN-TYPE UNIVERSAL JOINT**

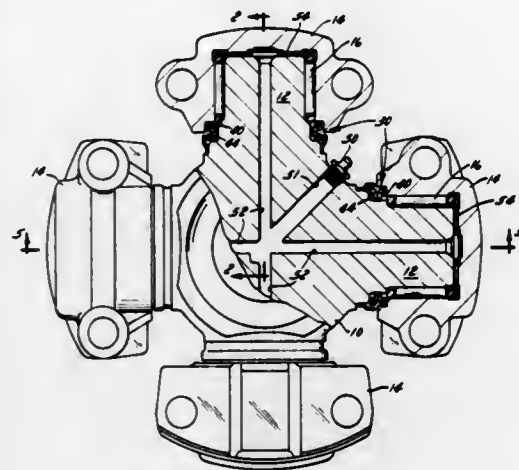
William T. Condon, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Sep. 11, 1981, Ser. No. 301,301

Int. Cl.<sup>3</sup> F16D 3/26, 3/40

U.S. Cl. 464—14

4 Claims



1. A sealing and venting assembly for a trunnion and bearing for a universal joint, said assembly comprising a cross having a plurality of trunnion pins extending therefrom, a cylindrical bushing rotatably mounted on and over the outer end of each of said trunnion pins, an anti-friction roller bearing assembly located between each of said trunnion pins and its associated cylindrical bushing for rotatably journalling said bushing on its trunnion pin, a mechanical, face type trunnion seal located between said trunnion pin and said cylindrical bushing, said trunnion seal comprising a pair of stamped L-shaped steel rings having adjacent ground and lapped surfaces which abut together to form a mechanical face seal having a face sealing area therebetween; said rings having a net internal area on which internal pressure acts on said rings; the ratio of said net internal area to said face sealing area being at least 0.60 to render said face seal self-sealing; said face type trunnion seal also including a pair of elastomeric o-rings bearing against said cylindrical bushing, said rings and said trunnion pin.

4,419,087

**SPLAYED ROLL FOLDER FOR ADHESIVE APPLICATION**

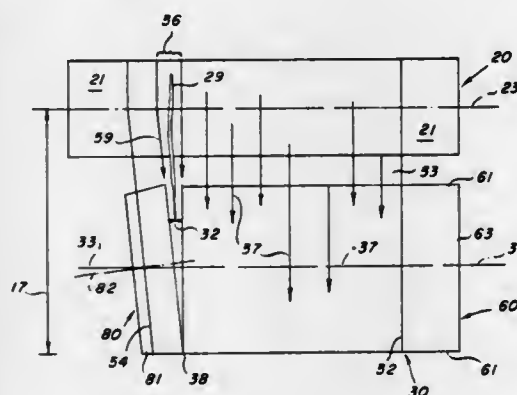
F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,523

Int. Cl.<sup>3</sup> B65H 45/22

U.S. Cl. 493—439

28 Claims



1. An apparatus for folding a strip in a continuously advancing sheet of indeterminate length to form a pleat in said sheet comprising:

a tensioning means for subjecting a reach of said sheet to

tension along a line of departure that is transversely disposed to said sheet;

a composite roll of a predetermined diameter having a composite peripheral surface which receives said reach along a line of arrival thereon, said sheet thereafter traveling over said composite peripheral surface through a peripheral distance;

said composite roll comprising at least a first component roll which has a first peripheral surface and a first axis transverse to the direction of said sheet and at least a second component roll mounted adjacent one end of said first component roll which has a second peripheral surface and a second axis of rotation approximately coaxial but inclined toward the first axis of rotation of said first component roll at a pleat angle, the first and second peripheral surfaces of said first and second component rolls defining said composite peripheral surface of said composite roll, said first and second component rolls having circular sides on respective axial ends of the rolls which oppose one another throughout their extents and which converge due to the inclined axis of rotation of said second component roll relative to the axis of said first component roll to form a circularly converging gap extending about at least a portion of the composite peripheral surface of said composite roll, said gap converging to a pinch zone along which said opposing sides are in revolving contact, the opposing circular sides of said first and second component rolls serving to fold said strip to form a pleat in said sheet as said sheet passes over said composite roll.

4,419,088

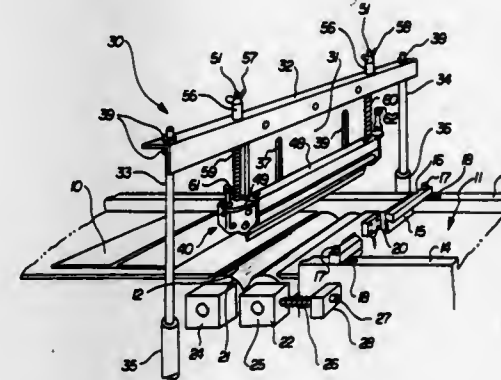
**GATE FOLDING APPARATUS**

David G. Nemec, 13621 Silver Rd., Garfield Hts., Ohio 44125  
Filed Jun. 19, 1981, Ser. No. 275,285

Int. Cl.<sup>3</sup> B65H 45/18

U.S. Cl. 493—444

6 Claims



1. In apparatus for making a gate fold in a sheet having two inwardly extending prefolded flaps forming two folded end edges, said apparatus including a folding table defining a central opening, means for transporting said sheet across said table, means for stopping said sheet at a predetermined position on said table with a central portion of said sheet spanning said opening, and a pair of fold rolls below said opening adapted to pass said sheet therebetween to form said gate fold, the improvement which comprises:

a gate assembly located above said opening and movable between a retracted position and a downwardly extended position, said assembly including

a blade adapted to drive a portion of said sheet between said rollers when said assembly is in its extended position, said blade having a lower end, and

a tuck roll assembly including a pair of tuck rolls extending parallel to said fold rolls, one tuck roll being located on each side of said blade and a pair of bearing blocks spaced at opposite ends of said assembly, said tuck rolls being journaled at each end in a respective bearing block,

means for supporting and guiding the rolls of said tuck roll assembly for vertical movement relative to said blade

between a normal position adjacent and above the lower end of said blade and a retracted position spaced above the normal position, and

means urging said tuck roll assembly toward said normal position, each of said tuck rolls being adapted to cooperate with a respective fold roll to movably guide a portion of said sheet passing therebetween,

whereby when said prefolded sheet reaches a predetermined position on said table said gate assembly is lowered and the lower end of said blade engages a central zone across said sheet and drives it downwardly, said tuck rolls engaging said sheet adjacent each respective fold roll to grip respective portions of said sheet to control said sheet as the lower end of said blade drives said central zone between said fold rolls to form a gate fold in said sheet.

4,419,089

**BLOOD CELL SEPARATOR**

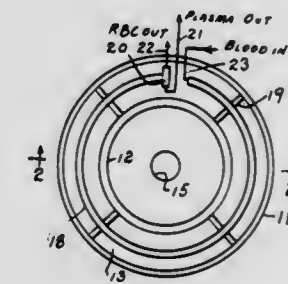
Theodor Kolobow, Rockville, and Yoichiro Ito, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 19, 1977, Ser. No. 817,016

Int. Cl.<sup>3</sup> B04B 7/12

U.S. Cl. 494—45

9 Claims



1. A flow-through centrifuge apparatus comprising a bowl member mounted on a vertical axis; means for rotating said bowl member about said axis; a tubular rotor chamber annularly disposed substantially concentrically in said bowl member, said tubular chamber having a first end, a second end and a radial extent; first outlet conduit means communicatively coupled to said tubular rotor chamber at a first given radial distance from said axis for removing a heavy fraction during flow-through procedure; second outlet conduit means communicatively coupled to said tubular rotor chamber at a second given radial distance from said axis closer to said axis than said first radial distance for removing a light fraction during flow-through procedure; and inlet conduit means communicatively connected to said tubular rotor chamber for admitting material to be separated into said tubular chamber, at a third given radial distance from said axis intermediate said first radial distance and said second radial distance; whereby during flow-through procedure, the heavier phase of the material supplied via the inlet conduit means travels along the tubular rotor chamber, toward said first end and the lighter phase of the material travels along the tubular rotor chamber toward said second end, the heavier and lighter phases forming an interface within the tubular rotor chamber.

4,419,090

**FIELD REPLACEABLE SCREW CONVEYOR INSERTS**

Edmund C. Chulada, Londonderry, and David A. Nelson, Wilton, both of N.H., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 31, 1981, Ser. No. 289,042

Int. Cl.<sup>3</sup> B04B 3/04

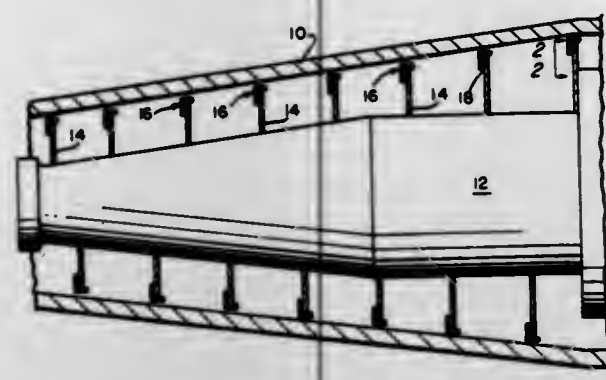
U.S. Cl. 494—53

2 Claims

1. An apparatus for separating a solid-liquid mixture comprising: a housing; a metal screw conveyor adapted to rotate



relative to the housing on a common longitudinal axis; said conveyor having helically-formed flights about its axis; and a plurality of replaceable inserts secured on the entire circumference of the flanks of said flights, all of said inserts of a pitch



length having been formed from the same annular member, said annular member being substantially equal to the curvature of the periphery of the screw conveyor, each insert having metal secured to said flights and an integral wear-resistant material adapted to function as the working surface.

4,419,091

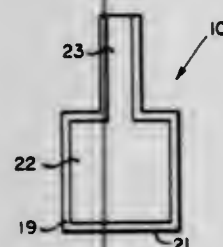
#### METALIZED MEDICAL TREATMENT ELECTRODE WITH INSULATED EDGE

Robert S. Behl, Fairport, and Franklin H. Ellis, Rochester, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.  
Filed Feb. 12, 1981, Ser. No. 233,899

Int. Cl.<sup>3</sup> A61N 1/30

U.S. Cl. 604—20

2 Claims



1. A flexible porous electrode for ion therapy comprising a substrate of polymer fibers, each of such fibers coated with a thin layer of conductive material to form a conductive mass, said substrate characterized by:

- a peripheral border in which said fibers are fused into a liquid-impervious and non-conductive mat, whereby conductive solution and conductive fibers are generally contained within said border, and ion concentration and current flow are thereby confined to the area within the periphery defined by said border, and
- said substrate including a tab portion through which said conductive fibers are adapted for electrical connection to a conductor.

4,419,092

#### IONTOPHORETIC ELECTRODE STRUCTURE

Stephen C. Jacobsen, Salt Lake City; Richard D. Luntz, Murray, and Barry K. Hanover, Salt Lake City, all of Utah, assignors to Motion Control, Inc., Salt Lake City, Utah  
Filed Nov. 6, 1981, Ser. No. 319,074

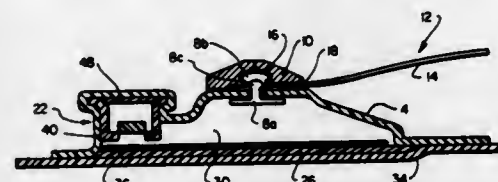
Int. Cl.<sup>3</sup> A61N 1/30

U.S. Cl. 604—20

12 Claims

1. A bioelectrode for use in the iontophoretic delivery of ions into the skin or tissue of a person comprising an enclosure having a bottom wall formed of a membrane through which ions may migrate when subjected to an electric field and an upper wall joined to the bottom wall

to define an interior compartment for holding an ion-containing solution, an electrode mounted to the enclosure to communicate electrically with the interior compartment of the enclosure through the upper wall, and receptacle means disposed in the enclosure for receiving solution into the enclosure, said receptacle means having a top and a bottom and being attached to said upper wall so that the bottom of the receptacle means is elevated above and out of contact with the bottom wall, said receptacle means including a conduit open at a first end, defining said top, which is directed away from the bottom wall,



one or more openings located in the conduit to allow solution which is introduced into the conduit to flow therefrom,

- a blocking element disposed at a second end defining said bottom of the conduit to prevent a needle inserted into the conduit through the first end from passing through the second end, and
- a plug means disposed in the first end to prevent solution from escaping from the interior of the enclosure, said plug means being made of a resilient material through which a needle may be inserted and which, when the needle is retracted, closes about the opening made by the needle.

4,419,093

#### METHOD OF RECEIVING AND DISPOSING OF FLUIDS FROM THE BODY

David W. Deaton, Abilene, Tex., assignor to American Hospital Supply Corporation, Evanston, Ill.

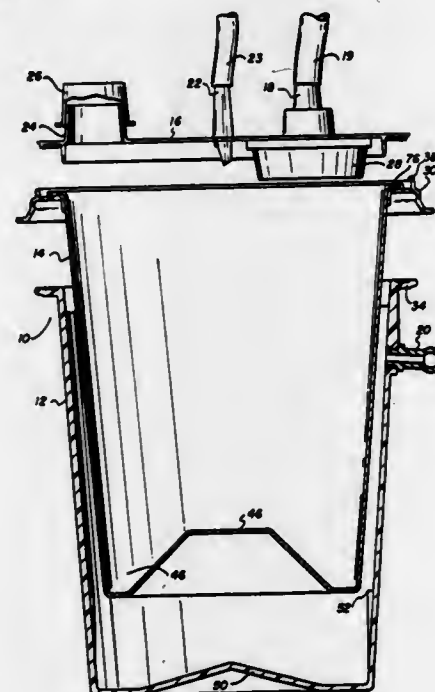
Division of Ser. No. 113,620, Jan. 21, 1980, Pat. No. 4,321,922.

This application Sep. 14, 1981, Ser. No. 301,525

Int. Cl.<sup>3</sup> A61M 31/00, 1/00

U.S. Cl. 604—49

9 Claims



1. A method of receiving fluids and disposing fluids from the body of a patient comprising:

- placing a disposable semi-rigid, burst resistive container having an open mouth inside a rigid outer canister;
- supporting said container from said canister such that a

space is formed between the wall surfaces of said container and said canister; fixedly attaching a cover over said open mouth of said canister to form an integral unit; retaining said cover in place by coacting with said container; applying vacuum to the interior of said container; drawing fluid from the patient into said container; and removing said semi-rigid container and said cover as an integral unit to maintain a seal and avoid contamination when all fluid is received for disposal thereof.

4,419,095

#### CANNULA WITH RADIOPAQUE TIP

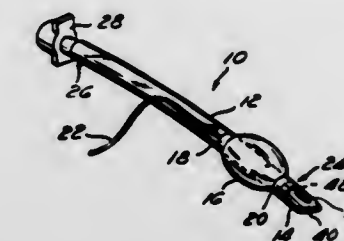
Perry A. Nebergall, Laguna Hills, and Robert C. French, El Toro, both of Calif., assignors to Shiley, Inc., Irvine, Calif.

Filed May 14, 1980, Ser. No. 149,568

Int. Cl.<sup>3</sup> A61M 25/00

U.S. Cl. 604—96

4 Claims



4,419,094

#### SUPRAPUBIC CATHETER SYSTEM

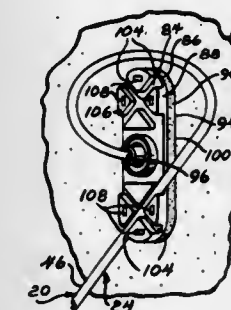
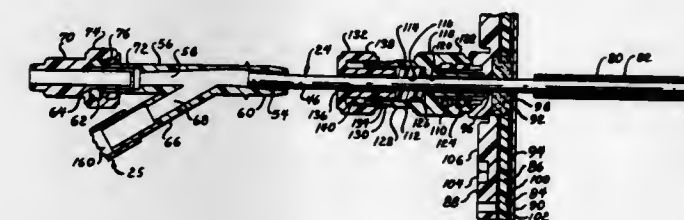
Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 8, 1981, Ser. No. 271,292

Int. Cl.<sup>3</sup> A61M 11/00

U.S. Cl. 604—93

6 Claims



1. A suprapubic catheter system, comprising: a puncture member comprising an elongated needle; and a catheter assembly comprising an elongated catheter having a distal end for placement in a patient, a proximal end, and a lumen to receive the needle, a stabilizer comprising a plate extending on opposed sides of the catheter, with said plate having an opening to slidably receive the plate on the catheter, and means for selectively locking the stabilizer at a desired position on the catheter, said locking means comprising, an elastic plug having a bore to slidably receive the catheter, a body member having a cavity to receive the plug and a bore to slidably receive the catheter, with a distal end of the body member being secured to a proximal side of the stabilizer plate, a compression member having a bore to slidably receive the catheter and a nipple for contacting the plug, and means for adjustably securing the compression member to a proximal end of the body member, such that the compression member may be moved from a first proximal position with the bore of the plug sufficiently large for sliding the plug along the catheter, and a second distal position with the nipple bearing upon the plug to decrease the size of the plug bore in order for the plug to frictionally engage the outer surface of the catheter.

1. A cannula for insertion into a body cavity, duct, vessel, and the like, of a patient, said cannula being formed by joining at least two distinct elements, comprising:

- a parent cannula member having distal and proximal ends; a radiopaque tip fused to said distal end of said cannula member to form a unitary cannula with said cannula member for substantially preventing detachment of said radiopaque tip within said cavity, duct, vessel, and the like, of said patient, said radiopaque tip having a reduced diameter in one location in order to form an annular shoulder on said tip, said radiopaque tip having a durometer Shore hardness factor of approximately 10 less than said parent cannula member; and
- an inflatable cuff mounted on and surrounding said parent cannula member, said cuff being attached to said cannula member by means of sleeves, at least one of said sleeves abutting said annular shoulder on said radiopaque tip in order to provide a smooth exterior surface on said cannula to prevent injury to said patient.

4,419,096

#### ELASTOMERIC BLADDER ASSEMBLY

Harold M. Leeper, Mountain View; Nikki Baumrind, and John R. Peery, both of Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Feb. 22, 1982, Ser. No. 350,585

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—132

9 Claims



1. A positive expulsion bladder assembly comprising, in combination, an elastomeric bladder having a central lumen with a predetermined, unexpanded, internal diameter and lumen filling core means within said bladder, said core means being provided with a bulbous portion having a diameter greater than said predetermined internal diameter.

4,419,097

#### ATTACHMENT FOR CATHETER TUBE

Floyd C. Rowland, Tulsa, Okla., assignor to Rexar Industries, Inc., Tulsa, Okla.

Filed Jul. 31, 1981, Ser. No. 288,993

Int. Cl.<sup>3</sup> A61M 25/02

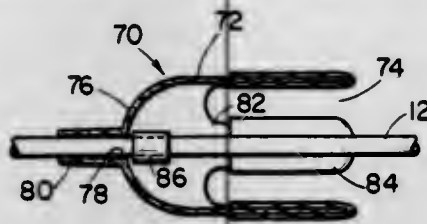
U.S. Cl. 604—174

10 Claims

2. An independent attachment for a catheter tube and comprising relatively rigid housing means having one open end and one closed end, said closed end being provided with aperture



means for receiving the catheter tube therethrough, said housing means being movable longitudinally along the outer periphery of the catheter tube for receiving a male member through the open end thereof, means for securing the housing means directly to the male member for extended time periods



for isolating movement of the catheter tube from the male member for comfort of the male member, and including sleeve means disposed within the housing means in the proximity of the aperture means for receiving the catheter tube therethrough for movement therewith for precluding accidental withdrawal of the catheter tube from the housing means.

4,419,098

## NEEDLE SHIELD

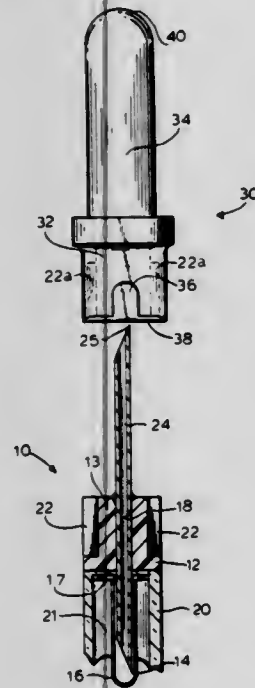
Michael C. Bennett, Summit, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Nov. 12, 1981, Ser. No. 320,361

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—263

4 Claims



1. A needle shield for a needle holding assembly, characterized by

- (a) a longitudinally extending housing defining an elongated chamber therein;
- (b) said housing having a closed end and an open end;
- (c) at least one radial slot in said housing extending from said open end to a point spaced from said open end; and
- (d) said radial slot providing communication between said elongated chamber and outside said shield throughout the length of said slot.

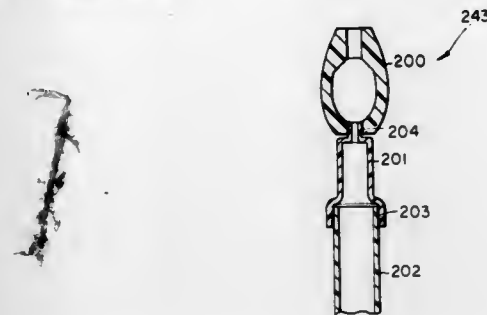
#### 4,419,099 ENEMA APPARATA IMPROVEMENTS RELATING TO DOUBLE CONTRAST STUDIES

Roscoe E. Miller, 7400 W. 88th St., Indianapolis, Ind. 46278  
Continuation-in-part of Ser. No. 131,965, Apr. 4, 1980, Pat. No. 4,333,460, which is a continuation-in-part of Ser. No. 39,502, May 16, 1979, abandoned. This application Feb. 11, 1982, Ser. No. 347,900

Int. Cl.<sup>3</sup> A61M 3/00

U.S. Cl. 604—275

8 Claims



1. An enema administering apparatus for use with a contrast medium tube of a first size, said apparatus being insertable into the rectum for delivery of a contrast medium to internal portions of a patient's anatomy and comprising:

- an enlarged, hollow, enema tip including a contrast medium passageway extending therethrough and a first contrast medium opening disposed in flow communication with said contrast medium passageway, said first contrast medium opening having a second size substantially different size from said first size of said tube; and

interchangeable connecting adapter means having a first end designed and arranged to be manually and securely assembled to and manually disassembled from said first contrast medium opening and a second, opposite end designed and arranged to be manually and securely assembled to and manually disassembled from said contrast medium tube, said first end having a third size corresponding to said second size of said contrast medium opening of said tip and said second opposite end having a fourth size corresponding to said first size of said tube, said third size being substantially different in size from said fourth size, said interchangeable connecting adapter means including an adapter contrast medium passageway which is arranged in flow communication between said first end and said second opposite end.

4,419,100

#### OSTOMY APPLIANCE AND FACEPLATE ATTACHMENT THEREFOR

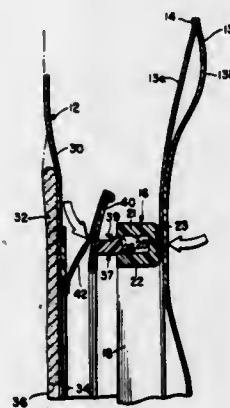
Brian S. Alexander, Evanston, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Mar. 16, 1982, Ser. No. 358,689

Int. Cl.<sup>3</sup> A61F 5/44

U.S. Cl. 604—339

17 Claims



1. An ostomy appliance comprising a flexible collection

pouch and a flexible, apertured faceplate adapted to be adhesively secured to a peristomal surface, and a pair of first and second semi-rigid coupling rings detachably connectable to each other, said first coupling ring being secured to said pouch and communicating with the interior thereof, and said second coupling ring being mounted upon said faceplate adjacent the aperture thereof, wherein the improvement comprises

said second ring being mounted upon said faceplate by flexible annular plastic web means having a pair of concentric edge portions, one of said edge portions being connected

to said second ring and the other of said edge portions being connected to said faceplate about the aperture thereof, said flexible web means allowing limited movement of said second ring in generally axial directions normal to said faceplate to permit insertion of the fingers between said second ring and said faceplate and thereby facilitate attachment and detachment of said rings without causing wearer discomfort and to allow conformity of said flexible faceplate to a wearer's body without objectionable resistance from said semi-rigid rings.

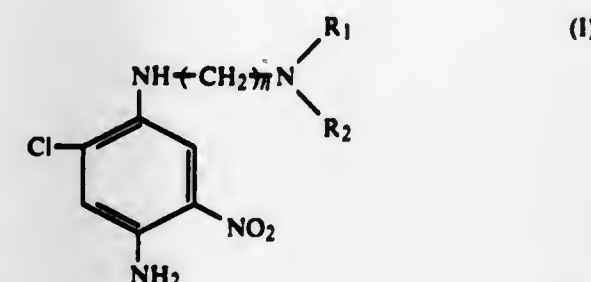


## CHEMICAL

### 4,419,101 CHLORINE-SUBSTITUTED NITRO-PARA-PHENYLENEDIAMINES, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN DYEING KERATIN FIBRES

Andree Bugaut, Boulogne-Billancourt, and Jean Cotteret, Franceville, both of France, assignors to L'Oreal, Paris, France  
Filed May 24, 1982, Ser. No. 381,636  
Claims priority, application France, May 25, 1981, 81 10374  
Int. Cl.<sup>3</sup> A61K 7/13; C07C 87/60

U.S. Cl. 8-415 20 Claims  
1. A nitro-para-phenylenediamine derivative which corresponds to the formula (I):



in which R<sub>1</sub> and R<sub>2</sub>, which are identical or different, denote hydrogen, a lower alkyl group or a monohydroxylated or polyhydroxylated alkyl group and n is an integer from 2 to 4 inclusive, or a cosmetically acceptable salt thereof.

6. A composition suitable for dyeing keratin fibres which comprises a diluent or carrier and at least one derivative as defined in claim 1 in an amount effective for dyeing hair.

16. Process for dyeing keratin fibres, which comprises applying thereto a composition as defined in claim 6, in an amount effective to dye hair, leaving it on the fibres for 5 to 70 minutes and then rinsing, optionally washing and rinsing again, the fibres and then drying them.

### 4,419,102 PROCESS FOR LEVEL DYEING OF TEXTILES BY HEAT TRANSFER

Emery J. Gorondy, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.  
Filed Nov. 30, 1979, Ser. No. 98,977  
Int. Cl.<sup>3</sup> D06P 5/00

U.S. Cl. 8-471 30 Claims  
1. A process comprising dyeing polymeric film at a temperature between about 120° C. and less than the softening point of the film with a disperse dye dissolved in an organic solvent for the dye having a boiling point above the dyeing temperature, and thereafter contacting said dyed film with a polymeric textile material in the presence of sufficient heat to cause said dye to sublime or vaporize and transfer some of said dye from said film to said textile material, whereby level dyeing of said textile material is effected; both said film and textile material having affinity for said dye, softening points which are higher, and glass transition temperatures which are lower, than the temperature needed to effect sublimation or vaporization and transfer of said dye from said film to said textile material.

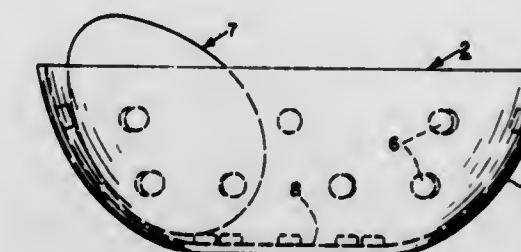
### 4,419,103 METHOD AND APPARATUS FOR COLORING EASTER EGGS

Thelma E. Balkan, 17 Jefferson St., Pinchurst, Mass. 01866  
Filed Sep. 7, 1978, Ser. No. 940,392  
Int. Cl.<sup>3</sup> B05C 11/08; D06P 5/20

U.S. Cl. 8-506 3 Claims  
1. Apparatus for coloring Easter eggs with a liquid dye comprising  
a generally dish-shaped container having  
a bottom and an outwardly sloping side wall, the inner exposed surface being formed predominately of material non-absorbent to liquid dye and having on said bottom and on said side wall a plurality of inwardly-extending

projections each having an exposed substantially planar tip surface of resilient material capable of absorbing liquid, the inner ends of said projections being separated by a substantial distance from the inner ends of adjacent projections.

3. The method of coloring Easter eggs comprising the steps of  
providing a container having a bottom and an outwardly sloping side wall, the inner surfaces thereof being predom-

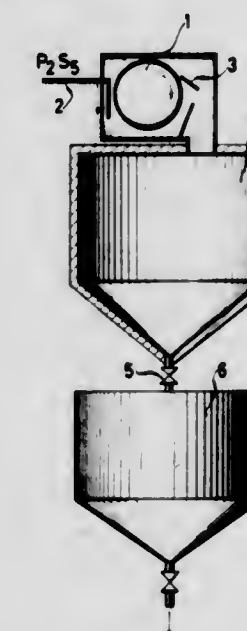


inately non-absorbent to liquid dye, said bottom and said side wall each having a plurality of spaced inwardly-extending projections thereon, the diameter of said dish being substantially greater than the diameter of the Easter egg to be colored,

exposing an Easter egg to liquid dye, and redistributing increments of said dye by swirling said egg, while wet with the liquid dye, around the inside of said container in successive momentary contact with said projections on said side wall and on said bottom.

4,419,104  
PREPARING P<sub>2</sub>S<sub>5</sub> OF LOW REACTIVITY  
Hermann Niermann, Erfstadt; Günter Reichert, Bornhelm-Merten; Hans Ebert, Erfstadt, and Friedrich Neumann, Holzwickede, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany  
Continuation of Ser. No. 71,307, Aug. 30, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,817  
Int. Cl.<sup>3</sup> C01B 25/14

U.S. Cl. 23-293 R 2 Claims



1. In the process of preparing solid phosphorus pentasulfide of low reactivity from liquid phosphorus pentasulfide, the improvement comprising solidifying the liquid on a cooling cylinder to abruptly cool it to a temperature of 150°-220° C., immediately scraping the solidified material from the cooling cylinder and depositing the scrapings in a container having thermally insulated walls, without the application of external heat permitting the deposited scrapings to dissipate their heat content through those insulated walls at a rate that lowers their



temperature not more than 30° C. per hour for between one and four hours to control the reactivity of the final product, and then more rapidly further cooling the thus-cooled scrapings to below 65° C.

**4,419,105**  
**MALEIC ANHYDRIDE-AMINE REACTION PRODUCT CORROSION INHIBITOR FOR ALCOHOLS**  
Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

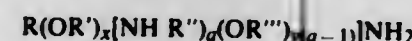
Filed Mar. 18, 1982, Ser. No. 359,454

Int. Cl.<sup>3</sup> C10L 1/02, 1/18, 1/22

U.S. Cl. 44—53

42 Claims

1. A composition comprising
  - (i) a water-soluble alcohol; and
  - (ii) an effective corrosion-inhibiting amount of the reaction product of a maleic acid anhydride and an amine having the formula



wherein

R is a C<sub>1</sub>-C<sub>20</sub> alkyl, alkaryl, aralkyl, aryl, cycloalkyl, or alkenyl hydrocarbon group;

R', R'' and R''' are each a C<sub>2</sub>-C<sub>5</sub> alkylene hydrocarbon group;

a is an integer 0-1

x is 1-20; and y is 1-20.

**4,419,106**  
**HYDROCARBON OILS WITH IMPROVED POUR POINTS**  
Richard F. Miller, Humble, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 22, 1982, Ser. No. 350,921

Int. Cl.<sup>3</sup> C10L 1/18

U.S. Cl. 44—62

10 Claims

1. An oil composition comprising a hydrocarbon oil and a pour depressing amount of a copolymer of about 10 to 90 parts by weight of alkyl acrylate units containing about 8 to 30 alkyl carbon atoms and about 90 to 10 parts by weight of alpha-monoolefin units having about 12 to 40 carbon atoms per 100 parts by weight of copolymer, said copolymer having a weight average molecular weight of about 1,000 to 100,000.

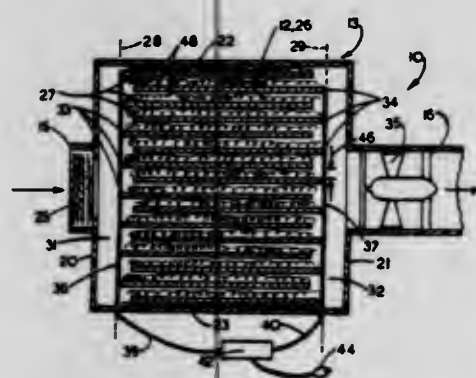
**4,419,107**  
**MERCURY FILTERING APPARATUS AND METHOD**  
Richard H. Roydhouse, 4697 W. 3rd Ave., Vancouver, B.C., Canada V6R 1N5

Continuation-in-part of Ser. No. 205,467, Nov. 10, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,797

Int. Cl.<sup>3</sup> B03C 3/00

U.S. Cl. 55—5

19 Claims



1. A method of collecting mercury from gas containing mercury, the method being characterized by:

- (a) exposing the gas to an absorber means having a collecting surface of a material that readily amalgamates with mer-

cury and is selected from a group including copper, silver, gold, platinum and zinc, the surface having a reactive tarnish produced by exposure of the collecting surface to available iodine.

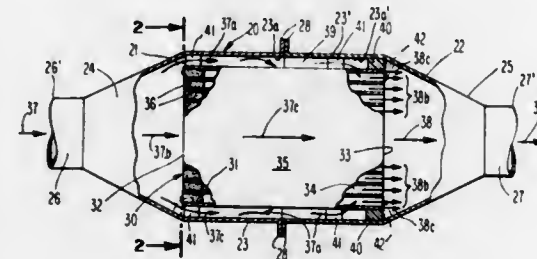
**4,419,108**  
**FILTER APPARATUS AND METHOD OF FILTERING**  
Rodney I. Frost, Corning, and Max R. Montierth, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,126

Int. Cl.<sup>3</sup> B01D 39/20

U.S. Cl. 55—97

13 Claims



1. An apparatus for filtering solid particulates from a fluid comprising:

- a filter of honeycomb structure comprising:

- a matrix of interconnected thin porous walls defining an inlet end face and an outlet end face and a multiplicity of cells extending longitudinally between the two end faces, and

- a porous outer wall extending between the two end faces and around the matrix of thin walls and having an exterior surface forming an outer longitudinal surface of the filter,

- an inlet group of the cells each being open at the inlet end face and closed at the outlet end face,

- an outlet group of the cells each being closed at the inlet end face and open at the outlet end face, and

- the thin walls and the outer wall each containing interconnected open porosity of volume and size sufficient to enable the fluid to flow completely across the narrow dimensions of the walls and the outer wall and to restrain at least a significant portion of the particulates from flowing completely across the thin walls or the outer wall;

- conduit means having an inner surface encircling the outer wall of the filter for transporting fluid containing the particulates to the filter and filtered away from the filter, the inner surface being spaced from the outer wall to form an annular gap therebetween;

- sealing means in the gap between the conduit means inner surface and the filter outer wall encircling the filter at a position remote from said outlet end face and forming a particulate barrier for preventing the particulates from bypassing the filter through the gap between the conduit means inner surface and the filter outer wall, the barrier being sufficiently narrow at the filter to allow the fluid to pass outwardly through and along a substantial portion of the exterior surface of the outer wall to the perimeter of outlet end face.

**4,419,109**  
**MEANS FOR DEGASSING PAPER PULP STOCK**  
Jouni Matula, Savonlinna, Finland, assignor to Eneo-Gutzelt OY, Helsinki, Finland

Filed May 25, 1982, Ser. No. 381,786

Claims priority, application Finland, Jun. 5, 1981, 811751

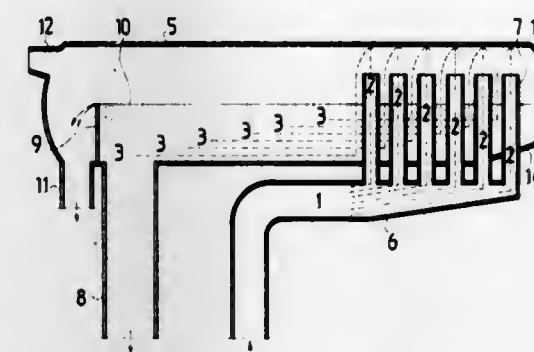
Int. Cl.<sup>3</sup> B01D 19/00

U.S. Cl. 55—192

5 Claims

1. Improvement in a means for degassing paper pulp stock, comprising an elongated horizontal cylindrical tank having a first end and a second end, a distribution pipe parallel to the

tank, a plurality of consecutive jet tubes for feeding pulp stock extend from said distribution pipe into the tank closer to the first end of the tank, an exit tube located close to the second end of the tank towards which the pulp stock flows on the bottom of the tank, means for maintaining the pulp stock level constant in the tank, an additional exit tube to return the excess pulp that has entered the tank back into circulation, and means for producing sub-atmospheric pressure in the tank, wherein



the improvement comprises that the flow in said tank is in the direction from the first end toward the second end and the flow in the distribution pipe is directed opposite to the flow within the tank, said jet tubes are spaced apart in the first end-second end direction, the flow cross section areas of said tank diminishes towards the first end in the tank where the jet tubes are located, the diminishing flow cross section extending at least over the region of one said jet tube, and being formed in that the tank is at least partially conically shaped.

**4,419,110**  
**GAS FILTER CONTAINER**  
William K. Ansite, Glendale; J. A. Van Haastert, Temple City, and James D. Cleary, Monrovia, all of Calif., assignors to Figgie International Inc., Willoughby, Ohio

Filed Aug. 20, 1981, Ser. No. 294,486

Int. Cl.<sup>3</sup> B01D 46/00, 27/08

U.S. Cl. 55—356

9 Claims



1. A gas filter container having assembled therein a gas filter canister of the type having a canister gas inlet and a canister gas outlet, the container and canister being capable of filtering toxic gases from an incoming gas mixture to render it breathable upon exiting therefrom; said container comprising:

- (a) a housing having a generally cylindrical sidewall-defining portion and a first end wall portion, said first end wall portion formed from an elastic, substantially gas impermeable material; said housing being provided with container inlet means capable of permitting the gas to be filtered to enter said container;

- (b) a second end wall portion having an annular wall extending therefrom and engaging said sidewall-defining portion when said second end wall portion is secured to said housing to define therewith a substantially gas tight cylin-

drical enclosure, said second end wall portion being provided with container outlet means capable of permitting gas to exit from said container and securing means for releasably securing the gas filter canister in substantially gas-tight relationship to said second end wall portion, said second end wall portion providing communication between the canister gas outlet of said gas filter canister and said container outlet means; and

(c) means for releasably securing said second end wall portion to said housing in substantially gas-tight relationship therewith in such a manner that said generally cylindrical sidewall-defining portion, said first end wall portion, and said second end wall portion define said substantially gas-tight enclosure for said gas filter canister and provide a continuous gas flow path from the container inlet means to the container outlet means wherein all gas passing through said container also passes through the gas filter canister.

**4,419,111**  
**DEVICE FOR ABSORBING MOISTURE IN A CLOSED SPACE**

Jean A. Dumas, Rueil Malmaison, and Hildebert Naudin, Saint-Cloud, both of France, assignors to Societe Anonyme Rubson S.A.F., Rueil-Malmaison, France

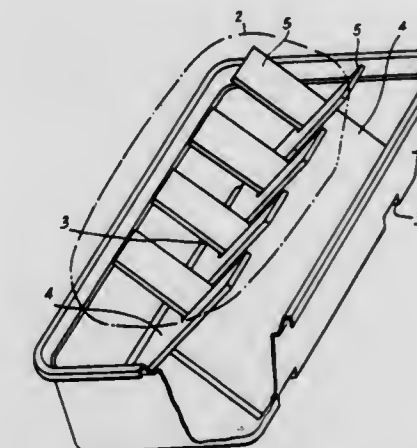
Filed Aug. 11, 1981, Ser. No. 292,135

Claims priority, application France, Sep. 30, 1980, 8020910

Int. Cl.<sup>3</sup> B01D 39/00

U.S. Cl. 55—388

3 Claims



1. A device for removing moisture in a closed space comprising:

- a perforated sachet of oblong shape containing hydrophilic sorbent in solid form which liquefies upon absorption of moisture;

- an upwardly open tank adapted to receive the liquefied hydrophilic sorbent

- and a support for said perforated sachet supporting said sachet above said tank, said support being in the form of an easel disposed in said tank and having upwardly and outwardly opposed extending teeth, said teeth supporting the perforated oblong sachet between said teeth at a level above the upper edge of the tank.

**4,419,112**  
**AIR CLEANER**  
Yoshio Kawamura, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Aug. 20, 1982, Ser. No. 409,891

Claims priority, application Japan, Aug. 26, 1981, 56-126893[U]

Int. Cl.<sup>3</sup> B01D 46/00

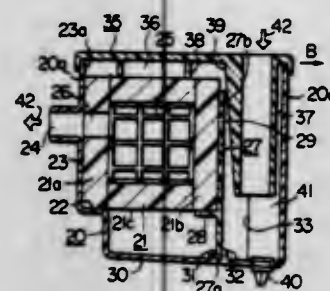
U.S. Cl. 55—480

1 Claim

1. An air cleaner comprising:  
an air cleaner body having an inlet and an outlet;



a fixed wall formed by said air cleaner body and having said outlet formed therein;  
 a holder plate mounted in said air cleaner body;  
 an air cleaner element removably held between said fixed wall and said holder plate between said inlet and said outlet;  
 an element inserting opening formed in said air cleaner body; and  
 a lid for covering said element inserting opening to close same; wherein the improvement resides in that:



said holder plate is removably mounted in said air cleaner body in a manner to be tiltable from a position in which it cooperates with the fixed wall to hold the air cleaner element therebetween to a position in which it releases the air cleaner element from holding engagement therewith, and that

said lid for said element inserting opening is formed with a pressing portion disposed to press said holder plate against said air cleaner element to hold the air cleaner element between it and the fixed wall when said element inserting opening is closed by said lid.

4,419,113

### DIESEL EXHAUST PARTICULATE TRAP WITH AXIALLY STACKED FILTERS

Richard H. Smith, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 8, 1982, Ser. No. 396,357

Int. Cl.<sup>3</sup> B01D 46/02

U.S. Cl. 55—484

3 Claims



1. A particulate trap for use in removing particulates from the exhaust gas discharged from a diesel engine, said trap including an elongated tubular housing having an exhaust inlet at one end connectable to an engine and an exhaust outlet at its other end, a plurality of axial flow filter means supported in said housing to define therewith a central axial extending inlet passage in flow communication at one end with said exhaust

inlet and closed by one of said filter means at the opposite end adjacent to said outlet, said filter means being stacked and positioned in said housing whereby the outer peripheral surfaces of said filter means defines with said housing an annular outlet passage in flow communication at one end with said exhaust outlet and whereby to define an alternating series of first radial passages in flow communication with said inlet passage and second radial passages in flow communication with said outlet passage between adjacent pairs of said filter means so that exhaust gas entering said housing via said exhaust inlet will flow into said inlet passage and then via one of said first radial passages into and axially through an associate said filter means, whereby particulates are removed, the exhaust gas then flowing via an associate said second radial passage to the said outlet passage for discharge out through the exhaust outlet.

4,419,114

### SYSTEM AND METHOD FOR CONVERTING WELLHEAD GAS TO LIQUEFIED PETROLEUM GASES (LPG)

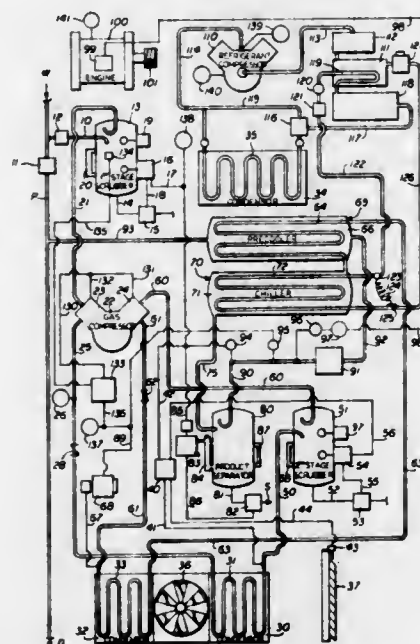
Ronald L. May, Humble, and Nicholas J. Snow, Jr., Houston, both of Tex., assignors to Sappucker, Inc., Houston, Tex.

Filed Apr. 19, 1982, Ser. No. 369,159

Int. Cl.<sup>3</sup> F25J 3/00, 5/00

U.S. Cl. 62—17

20 Claims



1. A system for converting natural wellhead gas to liquefied petroleum gases (LPG) containing propane and petroleum gases of lesser vapor pressure comprising components sized and designed to process wells producing less than 1000 MCFD, including: two-stage gas compressor connected to said wellhead for compressing natural gases received therefrom; refrigeration means downstream of said gas compressor for cooling the compressed gases therefrom; product separator means downstream of said refrigeration means for receiving cooled and compressed gases discharged from said refrigeration means and separating LPG therein from gases remaining in vapor form; and means to enable said compressor to essentially cycle or idle without any gases therein, responsive to means for predetermining pressures on the suction side of said compressor.

4,419,115

### FABRICATION OF SINTERED HIGH-SILICA GLASSES

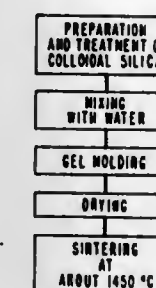
David W. Johnson, Jr., Pluckemin; John B. MacChesney, Lebanon, and Eliezer M. Rabinovich, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 31, 1981, Ser. No. 288,788

Int. Cl.<sup>3</sup> C03B 37/01, 19/06

U.S. Cl. 65—3.12

21 Claims



1. A method of fabricating a high-silica glass comprising:  
 (a) forming a substantially alkali-free first sol of particles in a liquid, the particles comprising silica;  
 (b) gelling the first sol to form a first gel;  
 (c) drying substantially the first gel, to form a dried first gel;  
 (d) forming particles from the dried first gel;  
 (e) forming a substantially alkali-free second sol of particles in a liquid, by dispersing the previously prepared, substantially alkali-free particles provided in step (d) in a liquid;  
 (f) gelling the second sol to form a second gel;  
 (g) drying substantially the second gel; and  
 (h) sintering the dried second gel to a glass at a temperature below the liquidus for the glass.

4,419,116

### PROCESS FOR PRODUCING OPTICAL FIBER PREFORM AND APPARATUS THEREFOR

Motohiro Nakahara, Mito; Naoki Yoshioka, Kanagawa; Hiroshi Yokota, Kanagawa; Tetsuo Miyajiri, Kanagawa, and Minoru Watanabe, Kanagawa, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Sumitomo Electric Industries Limited, both of Tokyo, Japan

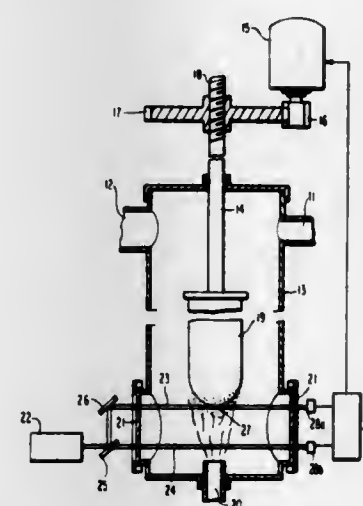
Filed Dec. 11, 1981, Ser. No. 329,958

Claims priority, application Japan, Dec. 12, 1980, 55-174726

Int. Cl.<sup>3</sup> C03B 19/00

U.S. Cl. 65—3.12

3 Claims



1. A process for producing an optical fiber preform by oxidizing a gaseous glass forming material with a flame from a burner and depositing the resulting soot in a rod form, wherein two signal beams, supplied by splitting a light beam, are projected in a direction normal to the direction in which the preform grows and are directed into the space between the burner and the deposition face of the preform, the two beams

being positioned so that one beam partially contacts the deposition face of the preform, while the other beam is directed to pass between the burner and the deposition face, the distance between the burner and the deposition face being controlled such that the ratio of the intensity of the two beams passing through the space between the burner and the deposition face is held constant.

4,419,117

### APPARATUS FOR PRODUCTION OF MINERAL WOOL FIBERS

Edgar Muschelkantz, Leverkusen, and Norbert Rink, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 251,808, Apr. 7, 1981, Pat. No. 4,337,074.

This application Mar. 15, 1982, Ser. No. 358,403

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016114

Int. Cl.<sup>3</sup> C03B 37/06

U.S. Cl. 65—16

4 Claims



1. In an apparatus for the production of mineral wool fibers according to the jet blast process, the apparatus including at least one opening in the base of a melting crucible for discharging at least one melt stream into a converging-diverging drawing nozzle, means for flowing a gaseous blasting medium into the nozzle substantially parallel to the melt stream so as to separate the melt stream into fibers, the blasting medium being drawn into the nozzle by suction due to a pressure drop produced between the nozzle inlet and outlet, and a diffuser connected downstream of the nozzle to reduce the gas flow rate, the improvement which comprises employing a drawing nozzle having

(a) a contour in its converging part extending within two concentric radii of about  $r_1=28\%$  and  $r_2=50\%$  of the narrowest cross-section of the nozzle;  
 (b) a diverging portion with an expansion angle of about  $1.8^\circ$  to  $2.2^\circ$ , and  
 (c) a region with a constant cross-section provided below the diverging portion, and  
 (d) a subsonic diffuser following the region of constant cross-section.

4,419,118

### QUARTZ GLASS AND A PROCESS FOR MAKING SAME

Oguma Reiji, Hatano, and Hirai Akihiro, Odawara, both of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 331,901

Claims priority, application Japan, Dec. 23, 1980, 55-181294

Int. Cl.<sup>3</sup> C03C 3/24

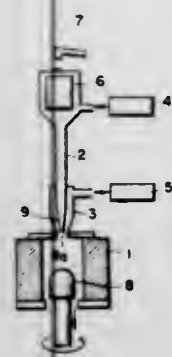
U.S. Cl. 65—18.2

19 Claims

1. A process for producing an infrared ray-absorbing and visible light-transmitting quartz glass comprising the steps of:



forming an admixture consisting essentially of silicon oxide or a precursor thereof, iron oxide or a precursor thereof and aluminum oxide or a precursor thereof in relative amounts providing a total iron content of 0.01 to 5% by



weight and a total aluminum content of 0.01 to 10% by weight in the final product; and melting said admixture in an oxygen-containing atmosphere in a furnace to produce said quartz glass having infrared ray-absorbing and visible light-transmitting properties.

4,419,119

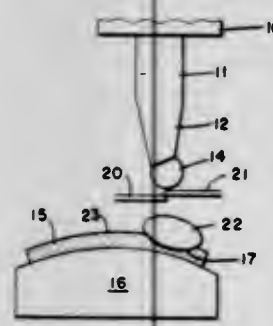
**METHOD OF FORMING MULTIFOCAL LENS BLANK**  
William W. Poundstone, 1503 Alderman Dr., Greensboro, N.C. 27408

Continuation of Ser. No. 900,259, Apr. 26, 1978, abandoned.  
This application Apr. 26, 1982, Ser. No. 371,794  
The portion of the term of this patent subsequent to Dec. 6, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> C03B 11/08, 23/22, 7/00

U.S. Cl. 65—39

4 Claims



1. A continuous method of forming multifocal lens blanks by flowing and fusing a minor element of molten glass into a pressed and unpolished countersink in the convex surface of a major lens blank to form a fused multifocal lens blank, comprising the steps of pressing a countersink of a preselected geometrical configuration into a major lens blank having the requisite refractive index while said major lens blank is maintained at an elevated temperature, and depositing a molten glass of the desired refractive index in the unpolished pressed countersink of said major lens blank while maintaining said major lens blank at an elevated temperature without reheating said blank to at least fill said countersink whereby the molten glass deposited in the unpolished pressed countersink of the major lens blank will be integrally fused together at least in the countersink preselected configuration.

4,419,120

**CONTROL OF PRICKLY SIDA, VELVETLEAF, AND SPURRED ANODA WITH FUNGAL PATHOGENS**  
Harrell L. Walker, Stoneville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 10, 1982, Ser. No. 356,864

Int. Cl.<sup>3</sup> A01N 63/00

U.S. Cl. 71—79

7 Claims

1. A method for controlling multiple plant weeds of prickly sida, velvetleaf, and spurred anoda, comprising infesting agri-

cultural fields with an effective amount of the fungus *Fusarium lateritium* to infect and produce typical lesions in and kill said multiple weeds.

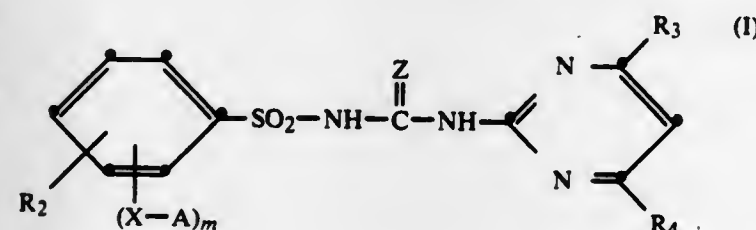
4,419,121

**N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS**  
Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Continuation-in-part of Ser. No. 417,716, Sep. 13, 1982, abandoned, which is a division of Ser. No. 282,847, Jul. 13, 1981.  
This application Jan. 17, 1983, Ser. No. 458,584  
Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81  
Int. Cl.<sup>3</sup> C07D 239/42; A01N 43/54

U.S. Cl. 71—92

26 Claims

1. A N-phenylsulfonyl-N'-pyrimidinylurea of the formula I



wherein

A is a C<sub>1</sub>-C<sub>6</sub>alkyl radical which is substituted by C<sub>1</sub>-C<sub>4</sub>alkoxy, C<sub>1</sub>-C<sub>4</sub>alkylthio, C<sub>1</sub>-C<sub>4</sub>alkylsulfonyl, or C<sub>1</sub>-C<sub>4</sub>alkylsulfonyl;  
X is oxygen, sulfur, a sulfinyl or sulfonyl bridge,  
Z is oxygen or sulfur,  
m is 1 or 2,  
R<sub>2</sub> is hydrogen, halogen, C<sub>1</sub>-C<sub>5</sub>alkyl, C<sub>2</sub>-C<sub>5</sub>alkenyl, C<sub>1</sub>-C<sub>4</sub>haloalkyl, or a radical -Y-R<sub>5</sub>, -COOR<sub>6</sub>, -NO<sub>2</sub> or -CO-NR<sub>7</sub>-R<sub>8</sub>,  
R<sub>3</sub> and R<sub>4</sub>, each independently of the other, are hydrogen, C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, C<sub>1</sub>-C<sub>4</sub>alkylthio, C<sub>1</sub>-C<sub>4</sub>haloalkyl, halogen or alkoxyalkyl of at most 4 carbon atoms,  
R<sub>5</sub> and R<sub>6</sub>, each independently of the other, are C<sub>1</sub>-C<sub>5</sub>alkyl, C<sub>2</sub>-C<sub>5</sub>alkenyl or C<sub>2</sub>-C<sub>6</sub>alkynyl,  
R<sub>7</sub> and R<sub>8</sub>, each independently of the other, are hydrogen, C<sub>1</sub>-C<sub>5</sub>alkyl, C<sub>2</sub>-C<sub>5</sub>alkenyl or C<sub>2</sub>-C<sub>6</sub>alkynyl, and  
Y is oxygen, sulfur, a sulfinyl or sulfonyl bridge, or a salt thereof.

4,419,122  
HERBICIDAL

**4-TRIFLUOROMETHYL-3'-OXYGEN-SUBSTITUTED-4'-SUBSTITUTED DIPHENYL ETHERS**  
Colin Swithenbank, Perkasi, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

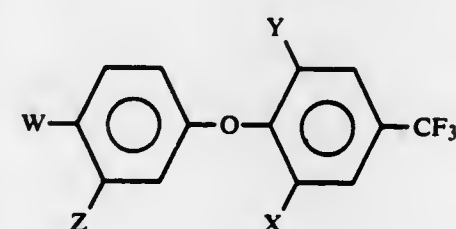
Filed Oct. 19, 1981, Ser. No. 312,476

Int. Cl.<sup>3</sup> C07C 101/00; E05B 65/08

U.S. Cl. 71—98

10 Claims

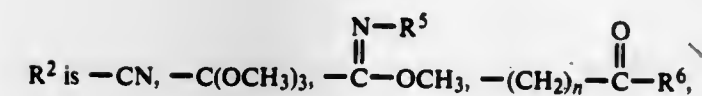
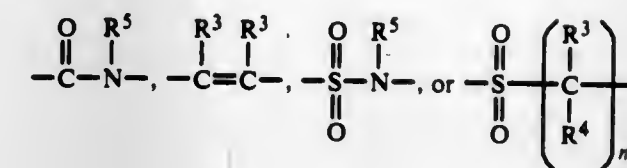
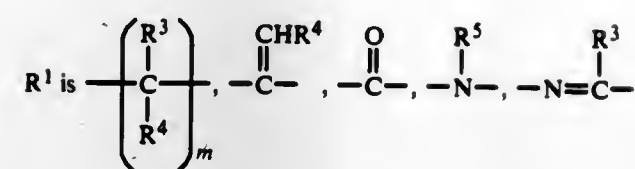
1. A compound of the formula



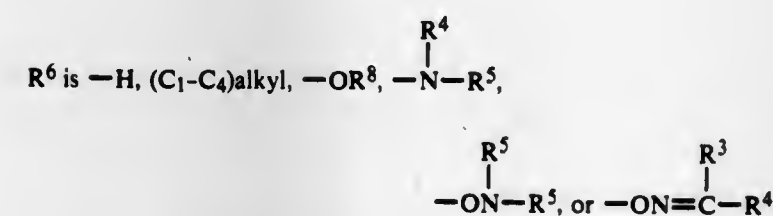
wherein

W is -NO<sub>2</sub>, -CN, -SO<sub>n</sub>CH<sub>3</sub> or a halogen atom,  
X is a hydrogen atom, a halogen atom, a trihalomethyl group, a (C<sub>1</sub>-C<sub>4</sub>)alkyl group, or a cyano group,  
Y is a hydrogen atom, a halogen atom, or a trihalomethyl group, and

Z is -O-R<sup>1</sup>-R<sup>2</sup> wherein

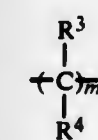


wherein  
W is -NO<sub>2</sub>, -CN, -SO<sub>n</sub>CH<sub>3</sub> (wherein n=0, 1, or 2) or a halogen atom,  
X is a hydrogen atom, a halogen atom, a trifluoromethyl group, a (C<sub>1</sub>-C<sub>4</sub>)alkyl group, or a cyano group,  
Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and  
Z is -R<sup>1</sup>-R<sup>2</sup>-R<sup>3</sup> wherein

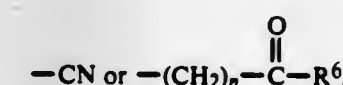


R<sup>7</sup> is (C<sub>1</sub>-C<sub>4</sub>)alkyl, carb(C<sub>1</sub>-C<sub>4</sub>)alkoxy, or -CF<sub>3</sub>;  
R<sup>8</sup> is H, (C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>2</sub>-C<sub>4</sub>)alkenyl, (C<sub>2</sub>-C<sub>4</sub>)alkynyl, (C<sub>2</sub>-C<sub>4</sub>)hydroxyalkyl, (C<sub>1</sub>-C<sub>4</sub>)alkoxy(C<sub>2</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkylthio(C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkylsulfonyl(C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkylsulfonyl(C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkylsulfonyl(C<sub>1</sub>-C<sub>4</sub>)alkyl, carboxy(C<sub>1</sub>-C<sub>4</sub>)alkyl, carb(C<sub>1</sub>-C<sub>4</sub>)alkoxy(C<sub>1</sub>-C<sub>4</sub>)alkyl, cyano(C<sub>1</sub>-C<sub>4</sub>)alkyl, or halo(C<sub>1</sub>-C<sub>4</sub>)alkyl;  
m is separately selected from the integers 1, 2, 3 and 4 for each individually selected radical; and  
n is separately selected from the integers 0, 1 and 2 for each individually selected radical;

including the agronomically-acceptable salts thereof, provided that no halogen atom shall be on a carbon atom which is α to an oxygen, nitrogen, or sulfur atom, and R<sup>2</sup> shall not be -SO<sub>2</sub>R<sup>7</sup> when R<sup>1</sup> is



and that R<sup>3</sup> and R<sup>4</sup> shall both be other than -H or (C<sub>1</sub>-C<sub>4</sub>)alkyl when R<sup>2</sup> is



6. A herbicidal composition comprising a herbicidally-effective amount of a compound according to claim 1 and an agronomically-acceptable carrier.

4,419,123

HERBICIDAL

**4-TRIFLUOROMETHYL-3'-CARBON-SUBSTITUTED-4'-SUBSTITUTED DIPHENYL ETHERS**

Colin Swithenbank, Perkasi, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

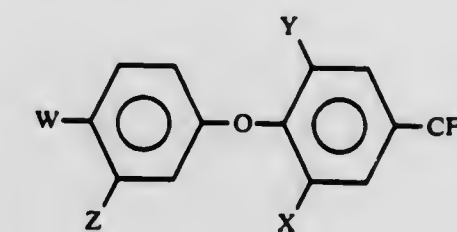
Filed Oct. 19, 1981, Ser. No. 312,454

Int. Cl.<sup>3</sup> C07C 101/00; E05B 65/08

U.S. Cl. 71—98

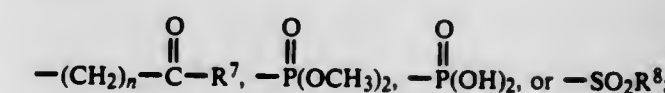
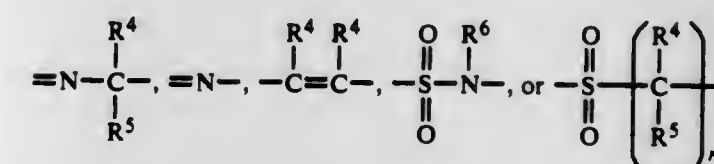
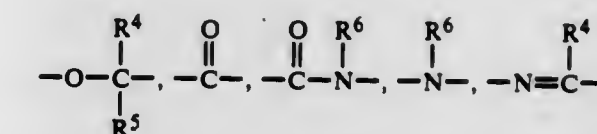
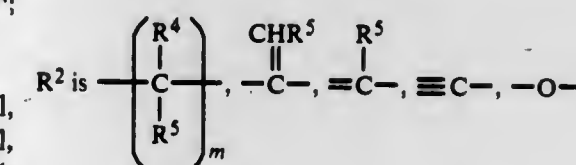
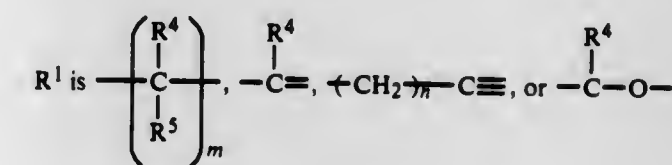
11 Claims

1. A compound of the formula



wherein

W is -NO<sub>2</sub>, -CN, -SO<sub>n</sub>CH<sub>3</sub> (wherein n=0, 1, or 2) or a halogen atom,  
X is a hydrogen atom, a halogen atom, a trifluoromethyl group, a (C<sub>1</sub>-C<sub>4</sub>)alkyl group, or a cyano group,  
Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and  
Z is -R<sup>1</sup>-R<sup>2</sup>-R<sup>3</sup> wherein

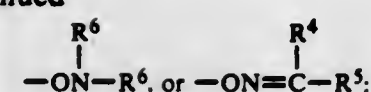


R<sup>4</sup> is -R<sup>9</sup>, -Cl, -F, -CF<sub>3</sub>, -CN, or -COR<sup>7</sup>;  
R<sup>5</sup> is -H, (C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkoxy, -CN, -COR<sup>7</sup>, -NH[(C<sub>1</sub>-C<sub>4</sub>)alkyl], -N[(C<sub>1</sub>-C<sub>4</sub>)alkyl]<sub>2</sub>, -S(O)<sub>n</sub>R<sup>8</sup>, or -CO<sub>2</sub>R<sup>9</sup>;  
R<sup>6</sup> is -R<sup>9</sup>, -CN, -SO<sub>2</sub>R<sup>8</sup>, or -CO<sub>2</sub>R<sup>9</sup>;

6. A herbicidal composition comprising a herbicidally-effective amount of a compound according to claim 1 and an agronomically-acceptable carrier.

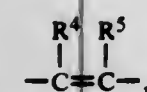


-continued

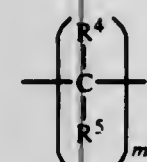


R<sup>8</sup> is (C<sub>1</sub>–C<sub>4</sub>)alkyl, carb(C<sub>1</sub>–C<sub>4</sub>)alkoxy, or —CF<sub>3</sub>;  
 R<sup>9</sup> is —H, (C<sub>1</sub>–C<sub>4</sub>)alkyl, (C<sub>2</sub>–C<sub>4</sub>)alkenyl, (C<sub>2</sub>–C<sub>4</sub>)alkynyl,  
 (C<sub>2</sub>–C<sub>4</sub>)hydroxyalkyl, (C<sub>1</sub>–C<sub>4</sub>)alkoxy(C<sub>2</sub>–C<sub>4</sub>)alkyl,  
 (C<sub>1</sub>–C<sub>4</sub>)alkylthio(C<sub>1</sub>–C<sub>4</sub>)alkyl, (C<sub>1</sub>–C<sub>4</sub>)alkylsulfonyl(C<sub>1</sub>–C<sub>4</sub>)alkyl,  
 (C<sub>1</sub>–C<sub>4</sub>)alkyl, (C<sub>1</sub>–C<sub>4</sub>)alkylsulfonyl(C<sub>1</sub>–C<sub>4</sub>)alkyl, carboxy(C<sub>1</sub>–C<sub>4</sub>)alkyl,  
 carb(C<sub>1</sub>–C<sub>4</sub>)alkoxy(C<sub>1</sub>–C<sub>4</sub>)alkyl, cyano(C<sub>1</sub>–C<sub>4</sub>)alkyl, or halo(C<sub>1</sub>–C<sub>4</sub>)alkyl;  
 m is separately selected from the integers 1, 2, 3 and 4 for each individually selected radical; and  
 n is separately selected from the integers 0, 1 and 2 for each individually selected radical;

including the agronomically-acceptable salts thereof, with the provisos that (a) no oxygen atom shall be bonded to another oxygen atom, (b) no sulfur atom shall be bonded to another sulfur atom, (c) no halogen atom shall be on a carbon atom which is α to an oxygen, nitrogen or sulfur atom, (d) R<sup>7</sup> shall not be —NR<sup>5</sup>R<sup>6</sup> when R<sup>2</sup> is —N—, (e) R<sup>4</sup> and R<sup>5</sup> shall not both be —H or —Cl when —R<sup>1</sup>—R<sup>2</sup> is



and (f) R<sup>1</sup> and R<sup>2</sup> shall not both be



6. A herbicidal composition comprising a herbicidally-effective amount of a compound according to claim 1 and an agronomically-acceptable carrier.

#### 4,419,124 HERBICIDAL

#### 4-TRIFLUOROMETHYL-3'-NITROGEN-SUBSTITUTED-4'-SUBSTITUTED DIPHENYL ETHERS

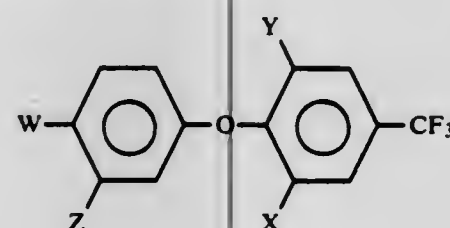
Colin Swithenbank, Perkasi, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 19, 1981, Ser. No. 312,453  
 Int. Cl.<sup>3</sup> C07C 101/00; E05B 65/08

U.S. Cl. 71—98

10 Claims

1. A compound of the formula



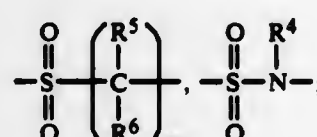
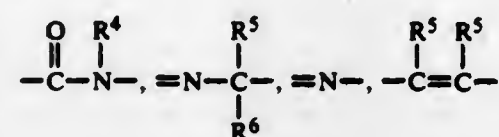
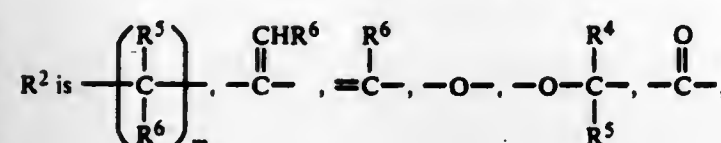
wherein

W is —NO<sub>2</sub>, —CN, —SO<sub>n</sub>CH<sub>3</sub> (wherein n=0, 1, or 2) or a halogen atom,

X is a hydrogen atom, a halogen atom, preferably a fluorine atom or a chlorine atom, a trihalomethyl group, preferably a trifluoromethyl group, a (C<sub>1</sub>–C<sub>4</sub>)alkyl group, preferably a methyl group, or a cyano group,

Y is a hydrogen atom, a halogen atom, preferably a fluorine atom or a chlorine atom, a trihalomethyl group, preferably a trifluoromethyl group, and

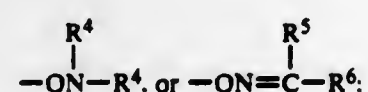
Z is —R<sup>1</sup>—R<sup>2</sup>—R<sup>3</sup> wherein



R<sup>4</sup> is —R<sup>9</sup>, —Cl, —F, —CF<sub>3</sub>, —CN, or —COR<sup>7</sup>;

R<sup>5</sup> is —H, (C<sub>1</sub>–C<sub>4</sub>)alkyl, (C<sub>1</sub>–C<sub>4</sub>)alkoxy, —CN, —COR<sup>7</sup>, —NH[(C<sub>1</sub>–C<sub>4</sub>)alkyl], —N[(C<sub>1</sub>–C<sub>4</sub>)alkyl]<sub>2</sub>, —S(O)<sub>n</sub>R<sup>8</sup>, or —CO<sub>2</sub>R<sup>9</sup>;

R<sup>6</sup> is —R<sup>9</sup>, —CN, —SO<sub>2</sub>R<sup>8</sup>, or —CO<sub>2</sub>R<sup>9</sup>;



R<sup>8</sup> is (C<sub>1</sub>–C<sub>4</sub>)alkyl, carb(C<sub>1</sub>–C<sub>4</sub>)alkoxy, or —CF<sub>3</sub>;

R<sup>9</sup> is —H, (C<sub>1</sub>–C<sub>4</sub>)alkyl, (C<sub>2</sub>–C<sub>4</sub>)alkenyl, (C<sub>2</sub>–C<sub>4</sub>)alkynyl, (C<sub>2</sub>–C<sub>4</sub>)hydroxyalkyl, (C<sub>1</sub>–C<sub>4</sub>)alkoxy(C<sub>2</sub>–C<sub>4</sub>)alkyl, (C<sub>1</sub>–C<sub>4</sub>)alkylthio(C<sub>1</sub>–C<sub>4</sub>)alkyl, (C<sub>1</sub>–C<sub>4</sub>)alkylsulfonyl(C<sub>1</sub>–C<sub>4</sub>)alkyl, carboxy(C<sub>1</sub>–C<sub>4</sub>)alkyl, carb(C<sub>1</sub>–C<sub>4</sub>)alkoxy(C<sub>1</sub>–C<sub>4</sub>)alkyl, cyano(C<sub>1</sub>–C<sub>4</sub>)alkyl, or halo(C<sub>1</sub>–C<sub>4</sub>)alkyl;

m is separately selected from the integers 1, 2, 3 and 4 for each individually selected radical; and  
 n is separately selected from the integers 0, 1 and 2 for each individually selected radical;

including the agronomically-acceptable salts thereof, with the provisos that no oxygen atom shall be bonded to another oxygen atom, no sulfur atom shall be bonded to another sulfur atom, no halogen atom shall be on a carbon atom which is α to an oxygen, nitrogen or sulfur atom, and the sum of m plus n is at least 2 when R<sup>3</sup> is



and R<sup>7</sup> is —OR<sup>9</sup> or —NR<sup>4</sup>R<sup>5</sup>.

6. A herbicidal composition comprising a herbicidally-effective amount of a compound according to claim 1 and an agronomically-acceptable carrier.

#### 4,419,125 METHOD FOR THE PREPARATION OF BRITTLE SUPERCONDUCTING MATERIAL IN ULTRAFINE PARTICLE FORM

Robert G. Charles, Hampton, and John R. Gavalier, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1982, Ser. No. 436,103

Int. Cl.<sup>3</sup> H01L 39/12

U.S. Cl. 75—0.5 B

13 Claims

1. A method of preparing submicron particles of superconducting powder, said method comprising:

- preparing a mixture of metal halides, the metal components of said halides being in essentially stoichiometric proportions for the desired superconducting compound;
- co-reducing said mixture of metal halides with an excess of liquid alkali metal to produce a metallic compound powder and an alkali metal halide;
- removing said alkali metal halide and the excess alkali metal from said powder;
- annealing said powder to render said powder superconducting at essentially the theoretical temperature of said compound whereby a superconducting powder is produced which is generally spherical and can be used to form a ductile superconductor wire.

#### 4,419,127 METALLOTHERMAL PROCESS FOR REDUCING METAL OXIDES

Aloyse Tanson, Luxembourg, Luxembourg, assignor to Continental Alloys A.A., Dommeldange, Luxembourg

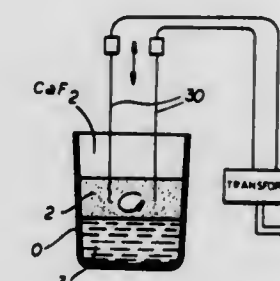
Filed May 11, 1982, Ser. No. 377,034

Claims priority, application Luxembourg, May 13, 1981, 83361

Int. Cl.<sup>3</sup> C22B 4/00

U.S. Cl. 75—10 R

9 Claims



1. A method of producing metal from a metal oxide which comprises the steps of:

- forming an ignitable autogenously reactive mixture containing said metal oxide and at least one metallic reducing agent for said metal oxide, igniting said mixture from the top with an ignition source to initiate a reaction within the mixture, and then permitting the reaction within said mixture to proceed autogenously to produce a molten metal phase surmounted by a slag phase;
- while said slag phase is retained and remains liquid but after burnout of the reaction in step (a), introducing at least one pair of electrodes into said slag phase and passing an alternating current through said slag phase between said electrodes to heat said slag phase and induce further reaction of residual metal oxide therein whereby metal from said metal oxide migrates to said metal phase; and
- adding a required amount of metallic reducing agent to said slag phase at an empirically determined rate during the heating in step (b).

#### 4,419,126 ALUMINUM PURIFICATION SYSTEM

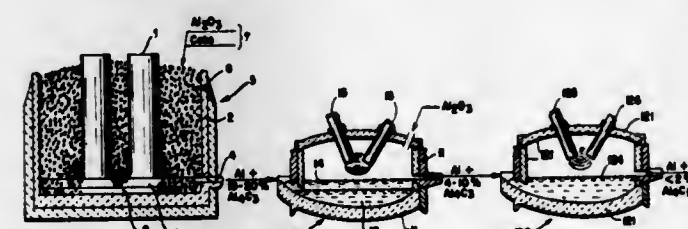
Robert M. Kibby, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 7,986, Jan. 31, 1979, Pat. No. 4,216,010, which is a continuation-in-part of Ser. No. 881,786, Feb. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 785,676, Apr. 7, 1977, abandoned. This application Jun. 20, 1980, Ser. No. 161,292

Int. Cl.<sup>3</sup> C22B 21/02

U.S. Cl. 75—10 R

10 Claims



1. A process for decreasing aluminum carbide contamination of aluminum produced by carbothermic processes, said process comprising:

- preparing said aluminum contaminated with about 10–20 weight percent aluminum carbide as a melt at an initial temperature sufficiently high to keep said melt in a fluid state;
- contacting said melt with a high-alumina containing molten slag in the absence of reactive carbon so as to cause the alumina-containing slag to react with the aluminum carbide in said melt until a partially purified aluminum containing 4–10% aluminum carbide is produced;
- continuing to heat said partially purified aluminum in the absence of both said carbon and said slag to produce a purified aluminum containing less than 4% aluminum carbide by weight; and
- recovering said purified aluminum.

#### 4,419,128 CONTINUOUS MELTING, REFINING AND CASTING PROCESS

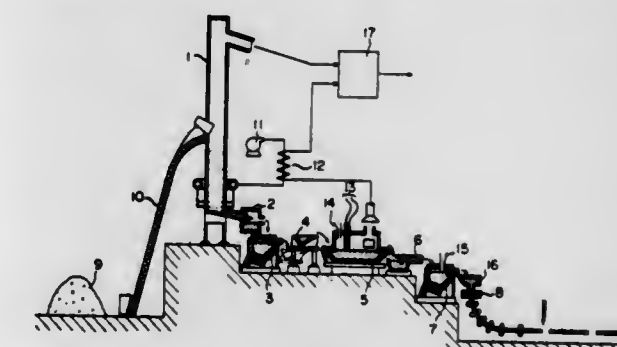
Ryulchi Nakagawa, Seki; Shiro Yoshimatsu, Tokyo; Akira Fukuzawa, Funabashi; Akira Sato, and Tsuyoshi Ozaki, both of Ohmiya, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 358,908

Int. Cl.<sup>3</sup> C21C 5/32

U.S. Cl. 75—46

19 Claims



1. In a continuous melting, refining and casting process for the production of steel from steel scrap, iron scrap and/or reduced iron by performing the following steps, substantially in series: a step of melting and carburizing steel scrap, iron scrap and/or reduced iron as a raw material in a combustion-type melting furnace, a refining step including oxidation by



gaseous oxygen, a refining and holding step, and a continuous casting step, the improvement which comprises using a cupola as the combustion type melting furnace for simultaneously melting and carburizing steel scrap, continuously charging the molten metal from the cupola to an intermediate holding step in a holding furnace, holding the molten metal in the holding furnace for a period of time sufficient to reduce variations in flow rate, temperature and chemical composition of the molten metal, continuously feeding the molten metal from the holding furnace to the refining step at a predetermined flow rate, and controlling the refining conditions in the refining step according to one or more of the characteristics of the molten metal in the intermediate holding step, whereby the variations in quality of the steel product can be controlled within narrow limits.

4,419,129

# HEAT RESISTANT CAST IRON-NICKEL-CHROMIUM ALLOY

Junichi Sugitani, Hirakata; Teruo Yoshimoto, Suita, and Makoto Takahashi, Hirakata, all of Japan, assignors to Kubota Ltd., Osaka, Japan

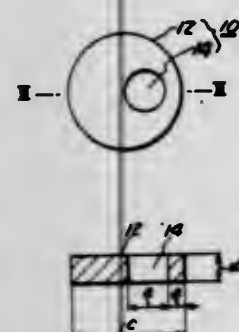
Filed Dec. 22, 1981, Ser. No. 333,472

Claims priority, application Japan, Jan. 12, 1981, 56-3602

Int. Cl.<sup>3</sup> C22C 30/00

U.S. Cl. 420—584

2 Claims



1. A heat resistant cast iron-nickel-chromium alloy consisting essentially of the following components in the following proportions in terms of % by weight:

C	0.3-0.6,
O < Si	2.0,
O < Mn	2.0,
Cr	20-30,
Ni	30-40,
Nb + Ta	0.3-1.5,
N	0.04-0.15,
B	0.0002-0.004,
Ti	0.04-0.50 and
Al	0.02-0.50,

the balance being substantially Fe.

4,419,130

# TITANIUM-DIBORIDE DISPERSION STRENGTHENED IRON MATERIALS

Edward R. Slaughter, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 75,047, Sep. 12, 1979, abandoned. This application Nov. 19, 1980, Ser. No. 208,375

Int. Cl.<sup>3</sup> C22C 38/56

U.S. Cl. 75—244

12 Claims

1. A high strength iron base material consisting of a ferrite matrix which contains from about 0.2 to about 10 weight

percent of XB<sub>2</sub> precipitate particles where X is selected from the group consisting of titanium, zirconium, and hafnium and



mixtures thereof, with the particles being present in a number density of at least 10<sup>10</sup> per mm<sup>3</sup>.

4,419,131

# FLUX FOR CONTINUOUS CASTING

Charles M. Loane, Jr., Bel Air, Md., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 14, 1981, Ser. No. 263,645

Int. Cl.<sup>3</sup> C22B 9/10

U.S. Cl. 75—257

6 Claims

1. A process for the production of granular flux comprising mixing a particulate glass frit and carbon black until the frit particles are coated with substantially all of the carbon black wherein substantially all of the particulate glass frit has a particle size within the range of 0.5 to 4 mm.

4,419,132

# PRINTING INK

John T. Moynihan, Phillipsburg, N.J., assignor to American Newspaper Publishers Association, Easton, Pa.

Filed Jan. 6, 1982, Ser. No. 337,220

Int. Cl.<sup>3</sup> C09D 11/06

U.S. Cl. 106—27

7 Claims

1. A printing ink consisting essentially of:

- Carbon black pigment 16.5%
- Gilsonite 25.1%, and
- Tall oil fatty acid 58.4%.

4,419,133

# BONDED AGGREGATE STRUCTURES AND PRODUCTION THEREOF

Calvin Shubow, Farmington, Mich., and Robert V. Skinner, Glen Ellyn, Ill., assignors to Quadco Component Systems, Inc., Livonia, Mich.

Filed Nov. 27, 1981, Ser. No. 325,393

Int. Cl.<sup>3</sup> C04B 9/04

U.S. Cl. 106—85

23 Claims

1. A bonded aggregate structure obtained by establishing a non-ammoniacal workable mixture of magnesium oxide, aluminum oxide, aggregate, and aqueous mono aluminum phosphate acidic solution, the weight ratio of aluminum oxide to acidic solution (expressed as 50% solution with P<sub>2</sub>O<sub>5</sub>:Al<sub>2</sub>O<sub>3</sub> of about 4) being from about 1:1 to about 1:3, the weight ratio of magnesium oxide to aluminum oxide being from about 1:1 to about 1:6, and the quantity of acidic solution relative to the total mixture being sufficient prior to setting to impart lubricity to the mixture; working the mixture into a predetermined form, and allowing the thus worked form to set into a rigid structure.

4,419,134

# ORGANIC PHOSPHORIC ESTER CONTAINING WATER-DISPERSIBLE ALUMINUM PASTE AS FOAMING AGENT IN LIGHT-WEIGHT FOAMED CONCRETE

Shizuo Ishijima, Mishima; Takeshi Kiritani, Yokohama, and Yukio Hayashi, Fujinomiya, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 152,294, May 22, 1980, Pat. No. 4,350,535.

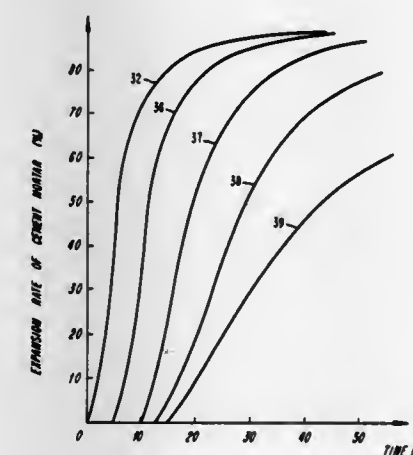
This application Jul. 1, 1982, Ser. No. 394,123

Claims priority, application Japan, May 28, 1979, 54-65007

Int. Cl.<sup>3</sup> C04B 1/00

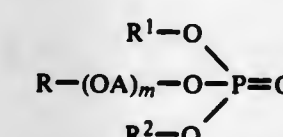
U.S. Cl. 106—87

9 Claims



1. In the production of light-weight foamed concrete comprising mixing a concrete-forming composition and a foaming agent, and allowing the foamed concrete to set, the improvement which comprises employing, as said foaming agent, a water-dispersible aluminum paste composition comprising:

- aluminum powder, and;
- from 0.1 to 20% by weight, based on the weight of the aluminum powder, of at least one organic phosphoric ester having a general formula:



where R represents an alkyl group having 6 to 24 carbon atoms, an alkenyl group having 6 to 24 carbon atoms or an aryl group containing at least one alkyl substituent having 6 to 24 carbon atoms or at least one alkenyl substituent having 6 to 24 carbon atoms, A represents an alkylene group having 2 to 4 carbon atoms, m represents an integer of from 0 to 20, and R<sup>1</sup> and R<sup>2</sup> independently represent hydrogen, an alkyl group having 1 to 24 carbon atoms, an alkenyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms or R—(OA)<sub>m</sub> (R, A and m are the same as set forth above).

4,419,135

# METHOD OF PREPARING CEMENTITIOUS COMPOSITIONS FOR TUNNEL BACKFILL

John H. Hoge, Cincinnati, Ohio, assignor to Molecrete Corporation, Cincinnati, Ohio

Filed Oct. 6, 1981, Ser. No. 309,019

Int. Cl.<sup>3</sup> C04B 7/35

U.S. Cl. 106—88

28 Claims

1. A method for preparing a highly flowable cohesive sealing grout for backfilling tunnels and similar underground structures comprising the steps of:

- charging a mixing means with 6 to 8 parts by weight of sand;
- adding to said sand 1½ to 3 parts by weight of water and

3 to 6 parts by weight of cement while maintaining the mixing agitation to form a grout;

- adding to said grout 0.01 to 0.05 parts by weight of a plasticizing agent selected from the class of water soluble metal salts consisting of the condensation products of an aldehyde and an aromatic sulfonic acid to form a plasticized grout;
- maintaining said plasticized grout in a state of agitation while adding concurrently 6 to 8 parts of sand and 0.02 to 0.04 parts by weight of a pituitous water soluble polyethylene oxide thickening compound having a molecular weight of about 2 million to about 7 million;
- agitating said plasticized grout for a period of time that will insure uniform dispersion of all ingredients; and
- discharging said grout into means for placing it promptly at the desired point of use.

4,419,136

# EXPANSIVE CEMENT

Edward K. Rice, 2077 Linda Flora Dr., Los Angeles, Calif. 90024

Filed Feb. 10, 1982, Ser. No. 347,560

Int. Cl.<sup>3</sup> C04B 7/35

U.S. Cl. 106—89

14 Claims

1. A method of forming an improved expansive cement comprising:

- separately grinding an expansive clinker containing a stable calcium aluminosulfate compound to a controlled particle size having a selected surface area greater than about 4600 sq. cm/gm; and
- blending said expansive clinker with a ground cement clinker and with gypsum to form said expansive cement.

4,419,137

# CORROSION INHIBITORS, METHOD OF PRODUCING AND PROTECTIVE COATINGS CONTAINING SAME

Richard A. Cayless, London, and David A. Pippard, Hampton Hill, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Jul. 28, 1981, Ser. No. 287,635

Claims priority, application United Kingdom, Aug. 9, 1980, 8026031

Int. Cl.<sup>3</sup> C09D 5/08

U.S. Cl. 106—14.39

15 Claims

1. A corrosion inhibitor comprising particles of an inorganic oxide selected from the group consisting of silica and alumina, having corrosion inhibiting metal cations chemically bound to the surface of the particles by ion exchange with protons from hydroxyl groups on said surface, whereby said cations bound to said particles can only be released by further ion exchange.

4,419,138

# ACCELERATOR ADDITIVE FOR CEMENTITIOUS COMPOSITIONS

Sandor Popovics, 283 Congress Ave., Lansdowne, Pa. 19050

Filed Sep. 18, 1981, Ser. No. 303,482

Int. Cl.<sup>3</sup> C04B 7/35

U.S. Cl. 106—90

15 Claims

1. A method for accelerating the hardening of a quantity of a settable cementitious material comprising: selecting a quantity of cementitious material; and mixing from about 0.5% to about 10% by weight formic acid with said cementitious material.



#### 4,419,139 PROCESS FOR PREPARING COATING BINDERS FROM VEGETABLE OIL MATERIAL

Jan W. Gooch, Gladstone, Md.; B. George Bufkin, Tipp City, Ohio, and Gary C. Wildman, Hattiesburg, Miss., assignors to University of Southern Mississippi, Hattiesburg, Miss.

Filed Mar. 24, 1982, Ser. No. 361,272  
Int. Cl.<sup>3</sup> C09D 3/28, 3/64, 3/72, 5/02

U.S. Cl. 106—252

15 Claims

1. A process of preparing a coating binder from a vegetable oil alkyl comprising introducing an alkyl of which about 60% of its fatty acid moieties are unsaturated and an oxygen permeable emulsifying agent into an aqueous medium, emulsifying said alkyl in said aqueous medium to encapsulate said alkyl in particles having an oxygen permeable outer layer of said emulsifying agent, subjecting said particles to shear force to adjust the average particle size to below about 1 micron in diameter, adjusting the pH of said emulsion to between about 2.5 and about 6.0, and contacting said emulsion with an oxygen-containing gas at pressures of between about 1 atmosphere and about 10 atmospheres to effect autoxidation of said alkyl sufficient to cross-link said alkyl until the swelling ratio of said emulsified particles is between about 10 and about 3, gelling or nearly gelling said particles.

10. A process of preparing a coating binder from a vegetable oil comprising introducing an oil, wherein above about 60% of the fatty acid moieties of said oil are unsaturated, and an oxygen permeable emulsifying agent into an aqueous medium, emulsifying said oil in said aqueous medium to encapsulate said oil in particles having an oxygen permeable outer layer of said emulsifying agent, subjecting said particles to shear force to adjust the average particle size to below about 1 micron in diameter, adjusting the pH of said emulsion to between about 2.5 and about 6.0, and contacting said emulsion with an oxygen-containing gas at pressures between about 1 atmosphere and about 10 atmospheres to effect autoxidation of said oil sufficient to cross-link said oil until the swelling ratio of said emulsified particles is between about 10 and about 3, gelling or nearly gelling said particles.

#### 4,419,140 ALKOXYLATED DIQUATERNARY AMMONIUM COMPOUNDS

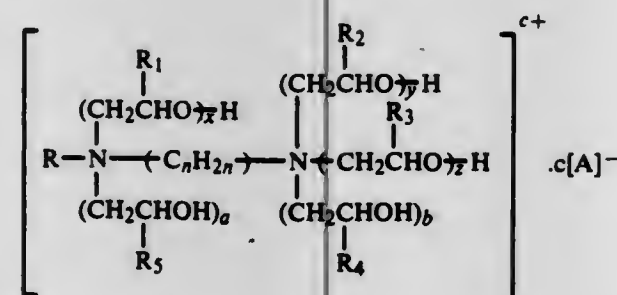
James M. Richmond, Naperville; Richard A. Reck, Hinsdale, and Gary A. Bernard, Bolingbrook, all of Ill., assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 162,570, Jun. 24, 1980, Pat. No. 4,313,895.  
This application May 8, 1981, Ser. No. 261,840  
Int. Cl.<sup>3</sup> C08L 95/00

U.S. Cl. 106—273 N

10 Claims

1. An asphalt emulsion comprising:
  - (a) a bituminous binder
  - (b) water
  - (c) an emulsifying amount of an emulsifying agent of the formula



wherein R is selected from a group of aliphatic radicals

containing from about 6 to about 22 carbon atoms; n is an integer of from 2 to 6; R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> are independently selected from the group consisting of hydrogen, methyl and ethyl; x, y and z are independently integers of from 1 to 50; a and b are independently 0 or 1, provided that the sum of a + b is greater than zero; and c is the sum of a + b; and A is a



radical wherein Z is lower alkyl, lower hydroxyalkyl or lower chloroalkyl.

#### 4,419,141 CLEANING LABYRINTHINE SYSTEM WITH FOAMED SOLVENT AND PULSED GAS

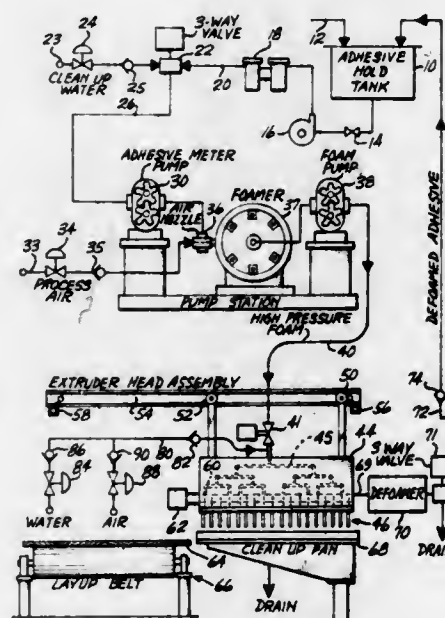
Arden L. Kunkel, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 5, 1982, Ser. No. 365,121

Int. Cl.<sup>3</sup> B08B 9/00

U.S. Cl. 134—22.12

10 Claims



1. A method of cleaning a viscous substance from a labyrinthine channel system which comprises:

- a. flushing the system with a liquid solvent for the substance, said solvent being a continuous phase containing discrete bubbles of a suspended gas in a ratio of at least one volume of gas for each three volumes of liquid, and
- b. injecting additional gas into the system in the form of regular discrete pulses during which pulse time the gaseous phase becomes the continuous phase.

#### 4,419,142 METHOD OF FORMING DIELECTRIC ISOLATION OF DEVICE REGIONS

Naohiro Matsukawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 20, 1981, Ser. No. 313,324

Claims priority, application Japan, Oct. 24, 1980, 55-148363; Oct. 31, 1980, 55-153250; Jul. 3, 1981, 56-104122

Int. Cl.<sup>3</sup> H01L 21/312; C03C 15/00; B01J 17/00

U.S. Cl. 148—1.5

13 Claims

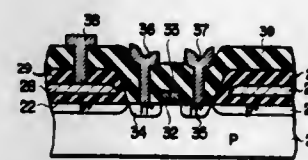
1. A method of manufacturing a semiconductor device which comprises the steps of:

- (a) depositing on a semiconductor substrate a layer of a material which is oxidized more quickly than said semiconductor substrate;
- (b) selectively oxidizing that portion of said more quickly oxidizable material layer which is located on the element

region of the semiconductor substrate to provide an oxidized layer;

(c) removing at least part of said oxidized layer deposited on the element region of the semiconductor substrate;

(d) wet oxidizing the retained layer of said more quickly oxidizable material to produce an element-isolating oxide



layer with a greater thickness than a remaining oxidized layer on the element region of the semiconductor substrate; and

(e) removing the remaining oxidized layer on the element region of the semiconductor substrate to expose said region.

#### 4,419,143 METHOD FOR MANUFACTURE OF ALUMINUM ALLOY CASTING

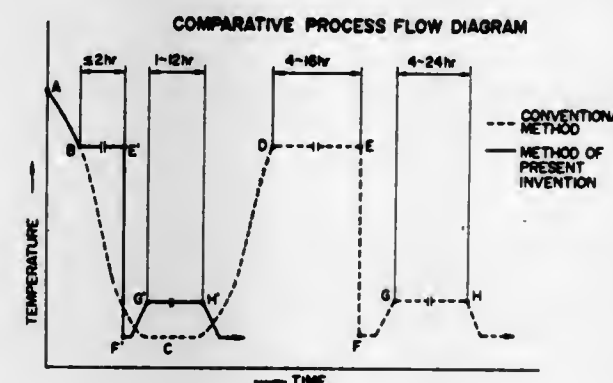
Tadao Ito, Fujii, and Akio Hashimoto, Numazu, both of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,882

Int. Cl.<sup>3</sup> C22F 1/04

U.S. Cl. 148—3

5 Claims



1. A method for the manufacture of a cast article of aluminum alloy, which comprises the steps of (a) pouring into a metal mold a molten Al-Si-Cu type or Al-Si-Cu-Mg type casting alloy containing antimony (Sb) in the range of 0.03-1.0% by weight; (b) after complete solidification of the alloy cast body in the mold but before it has cooled below about 450° C., placing said cast body in a heating furnace kept at temperatures in the range of from 480° to 530° C. and retaining it therein for a short period up to two hours; (c) then quenching said cast body; and (d) finally subjecting it to a treatment for artificial aging at temperatures in the range of about 140°-230° C. for not less than one hour.

#### 4,419,144 SPALL-RESISTANT STEEL TUBING OR OTHER STEEL ARTICLES SUBJECTED TO HIGH TEMPERATURE STEAM AND METHOD

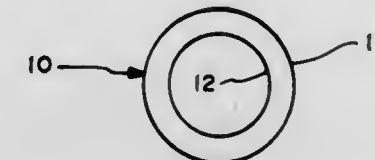
William R. Applett, Jr., Florham Park, and Irwin M. Rehn, Boonton, both of N.J., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 16, 1980, Ser. No. 159,682

Int. Cl.<sup>3</sup> C23F 7/26

U.S. Cl. 148—6.2

13 Claims



1. In a process in which a surface of a ferritic steel member is subjected to relatively high temperature air or steam for a period of time resulting in the formation of a duplex scale layer of steam-grown oxide at said surface, a method of reducing the possibility of scale spalling at said surface in response to thermal stress, said method comprising: pretreating said surface with particular substances including a non-corrosive chromate compound in a particular way to cause the formation of a chromite spinel barrier at the center of said duplex layer during formation of the latter, said barrier retarding the rate at which said duplex scale layer forms at said surface during said period, thereby reducing said possibility of scale spalling, said step of pretreating said surface including the steps of applying to said surface a solution selected from one or more non-corrosive compounds in the group consisting of potassium and sodium chromate and dichromate; confining said surface and applied solution to an environment including a predetermined gas; subjecting said solution applied surface in said environment to a predetermined pressure at a predetermined temperature for a predetermined period of time; and thereafter cooling said surface.

#### 4,419,145 PROCESS FOR PRODUCING Nb<sub>3</sub>Sn SUPERCONDUCTOR

Kyoji Tachikawa, Tokyo; Hisashi Sekine; Kikuo Itoh, both of Sakura, and Yasuo Iijima, Tsukuba, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,581

Int. Cl.<sup>3</sup> H01L 39/00

U.S. Cl. 148—11.5 F

8 Claims

1. In a process for producing a Nb<sub>3</sub>Sn superconductor which comprises drawing a composite composed of a core of niobium or a niobium alloy and at least one matrix of a copper-tin alloy and subjecting the drawn composite to reactive heat-treatment, thereby forming a layer of Nb<sub>3</sub>Sn between the core and the matrix; the improvement wherein the copper-tin alloy contains 1 to 15 atomic percent of tin, and 0.1 to 8 atomic percent in total of at least one element selected from the group consisting of 0.1 to 8 atomic percent of titanium, 0.1 to 5 atomic percent of zirconium and 0.1 to 5 atomic percent of hafnium.



4,419,146

**SOLDER FLUX COMPOSITIONS**

Daniel F. T. Roberts, Walden, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,409

Int. Cl.<sup>3</sup> B23K 35/36

U.S. Cl. 148—23

9 Claims



1. A flux composition comprising a dispersion of an amount of finely divided particles of a material selected from the group consisting of liquid and solid flux materials, said particles being dispersed, in a form selected from the group consisting of an emulsion and a suspension, in an amount of liquid carrier material in which all of said amount of said flux material is insoluble, wherein said dispersion consists essentially of a mixture of tartaric acid and sarcosine as said flux material and, as said liquid carrier material, a material selected from the group consisting of isopropyl alcohol and a mixture of water and isopropyl alcohol.

4,419,147

**PHOSPHATING PROCESS OF METAL SURFACE**

Ryoichi Murakami; Hideo Shimizu; Takashi Yoshii; Minoru Ishida, and Hiroto Yonekura, all of Neyagawa, Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 121,168, Feb. 13, 1980, Pat. No. 4,292,096.

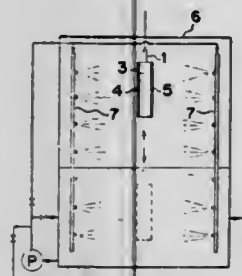
This application Apr. 6, 1981, Ser. No. 251,147

Claims priority, application Japan, Feb. 13, 1979, 54-15839

Int. Cl.<sup>3</sup> C23F 7/08

U.S. Cl. 148—31.5

1 Claim



1. A metal substrate having a fine phosphate film of 1.5 to 3 grams/m<sup>2</sup> on the surface thereof, said phosphate film having a cubic crystalline structure suitable for cationic electrocoating, said metal substrate formed by first dipping the metal surface into an acidic phosphating solution consisting essentially of a zinc compound in a concentration of 0.5 to 1.5 g/l as a zinc ion, a phosphate in a concentration of 5 to 30 g/l as a phosphate ion and a nitrite in a concentration of 0.01 to 0.2 g/l as a nitrite ion and a chlorate in a concentration of 0.05 to 2 g/l as a chlorate ion, at a temperature of 40° to 70° C. for not less than 15 seconds and then spraying the metal surface with said acidic phosphate for not less than 2 seconds.

4,419,148

**HIGH-REMANENCE FE-NI AND FE-NI-MN ALLOYS FOR MAGNETICALLY ACTUATED DEVICES**

Sungho Jin, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 142,634, Apr. 22, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,512

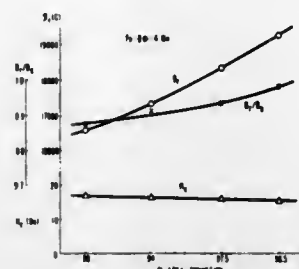
Int. Cl.<sup>3</sup> H01F 1/00

U.S. Cl. 148—120

8 Claims

1. Method for making a magnetic element consisting essentially of a body of a metallic alloy having a magnetic squareness ratio which is greater than 0.7 and having remanent magnetic induction which is greater than 7000 gauss, said method

being characterized by the steps of (1) plastically deforming a metallic body consisting essentially of an alloy comprising an amount of at least 98 weight percent, Fe, Ni, and Mn, Ni being in the range of 6–20 weight percent of said amount, and Mn being less than or equal to 8 weight percent of said amount, deforming being by uniaxial elongation by an amount corre-



sponding to an area reduction which is greater than or equal to 50 percent, (2) aging said body at a temperature corresponding to an essentially two-phase state of said alloy, (3) plastically deforming said body by uniaxial elongation by an amount corresponding to an area reduction which is greater than or equal to 80 percent, and (4) aging said body at a temperature corresponding to an essentially two-phase state of said alloy.

4,419,149

**METHOD FOR QUENCHING HEATED WORKPIECES**

Paul L. Day, Parma, Ohio, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

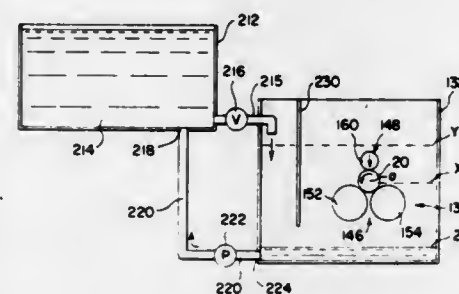
Division of Ser. No. 113,691, Jan. 21, 1980, Pat. No. 4,336,924.

This application Aug. 19, 1981, Ser. No. 234,201

Int. Cl.<sup>3</sup> C21D 9/00

U.S. Cl. 148—131

3 Claims



1. A method of quenching a heated elongated workpiece having a central axis and spaced ends, the method comprising the steps of: providing a quench tank, providing workpiece supporting and rotating means at a fixed position in said tank, locating a heated workpiece at said selected fixed position in said quench tank, rotating said workpiece at said fixed position about said central axis, preventing transverse deflection of said workpiece as said workpiece is rotating at said fixed position, rapidly flooding said quench tank with a quenching liquid to a level above said selected position while said workpiece rotates at said selected fixed position and about said central axis whereby said workpiece is quenched, and forcing said quenching liquid from said quench tank to a level below said selected position after said workpiece is quenched.

4,419,150

**METHOD OF FORMING LATERAL BIPOLAR TRANSISTORS**

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 220,399, Dec. 29, 1980. This application

Sep. 16, 1982, Ser. No. 418,862

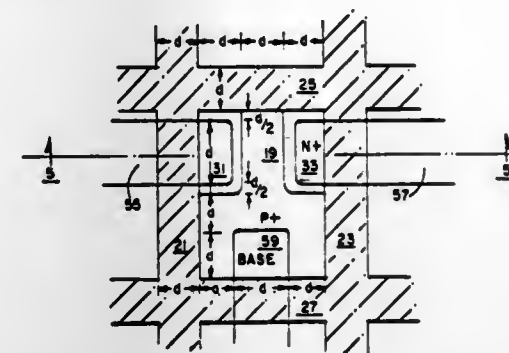
Int. Cl.<sup>3</sup> H01L 21/22, 21/265

U.S. Cl. 148—187

5 Claims

1. The method of making a NPN lateral transistor on an N doped substrate, comprising the steps of: forming a recess in the substrate bounding the region for the transistor; N+ doping spaced apart portions of said regions;

P doping the non-N+ doped portions of said region; filling said recess with field oxide; and,



establishing electrical connections to each of said N+ spaced apart portions and to the P doped non-N+ doped portions of said region.

4,419,151

**CRYSTAL AND GERMANIUM MODIFICATION AND PROCESS FOR ITS PREPARATION**

Andreas Grüttner; Reinhard Nesper, both of Stuttgart, and Hans-Georg von Schnering, Aidingen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,476

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3109229

Int. Cl.<sup>3</sup> C22B 41/00

U.S. Cl. 148—400

16 Claims

1. Crystalline modification of germanium, characterized by plates of metallic luster with an orthorhombic structure.

7. Method of manufacturing the germanium modification of claim 1 comprising melting together lithium and germanium in the ratio of 0.01:1 Li:Ge 1:1, cooling the melt, isolating a crystalline lithium-germanium compound of orthorhombic structure from the melt, and hydrolyzing the lithium-germanium compound with protic solvents and/or mild oxidizing agents.

4,419,152

**PROCESS FOR DIRECT HEAT TREATMENT OF TRACK LINKS FOR TRACTORS OR TRACKED VEHICLES**

Walter Grilli; Franco De Meo, and Ivan Franchini, all of Modena, Italy, assignors to Italtractor ITM S.p.A., Castel Vetro, Italy

Filed Jun. 15, 1982, Ser. No. 388,715

Claims priority, application Italy, Jul. 21, 1981, 48934 A/81

Int. Cl.<sup>3</sup> C21D 8/00

U.S. Cl. 148—12 F

9 Claims

1. Process for the manufacture of steel track links for tracked vehicles, comprising forging steel track links at an initial forging temperature of 1150°–1200° C. for 45–60 seconds with a finish forging temperature of 950°–1050° C., subjecting the links thus-produced to initial cooling at a rate of 2°–4° C./s to a temperature of 720°–830° C., maintaining the links at a temperature of 800°–850° C. for 2–3 minutes, again cooling the links at a rate of 10°–15° C./s to a second temperature of 180°–380° C., and maintaining the links at said second temperature for a period of 10–20 minutes, the steel having the following weight percent compositions:

C: 0.30–0.38  
Mn: 1.00–1.50  
Cr: up to 0.60  
Si: 0.15–0.35  
S+P: about 0.06  
balance essentially iron.

4,419,153

**PYROTECHNICAL DELAY CHARGE**

Tore Boberg, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed May 13, 1982, Ser. No. 377,888

Claims priority, application Sweden, May 21, 1981, 8103208

Int. Cl.<sup>3</sup> C06B 43/00

U.S. Cl. 149—22

20 Claims

1. A pyrotechnical delay charge for rates of burning between 2 and 30 mm/s which comprises at least 10% by weight tin dioxide (SnO<sub>2</sub>) as an oxidizer and slag former; 2 to 20% by weight of a fuel containing a member from the group of titanium and zirconium; and 40 to 70% by weight of bismuth trioxide.

4,419,154

**DELAY COMPOSITION FOR DETONATORS**

Alan L. Davitt, Brownsburg, and Kenneth A. Yuill, Alfred, both of Canada, assignors to CXA Ltd/CXA LTEE, North York, Canada

Filed May 18, 1981, Ser. No. 264,280

Claims priority, application Canada, Dec. 17, 1980, 366968

Int. Cl.<sup>3</sup> C06B 33/12

U.S. Cl. 149—40

5 Claims



1. A pyrotechnic delay composition adapted for non-electric and electric delay detonators comprising from 45% to 70% by weight of particulate barium sulphate and from 30% to 55% by weight of particulate silicon.

4,419,155

**METHOD FOR PREPARING TERNARY MIXTURES OF ETHYLENEDIAMINE DINITRATE, AMMONIUM NITRATE AND POTASSIUM NITRATE**

Kerry L. Wagaman; Chester F. Clark, both of Waldorf, Md.; Larry D. Henderson, San Jose, Calif., and W. Steven Jones, Indian Head, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1983, Ser. No. 491,462

Int. Cl.<sup>3</sup> D03D 23/00

U.S. Cl. 149—109.6

19 Claims

1. A method for synthesizing a ternary mixture of ethylenediamine dinitrate, ammonium nitrate, and potassium nitrate which comprises admixing, at a temperature from about 40° to about 130° C., approximately stoichiometric amounts of aqueous nitric acid, ammonia, ethylenediamine, and potassium hydroxide, to form said ternary nitrate mixture.



4,419,156

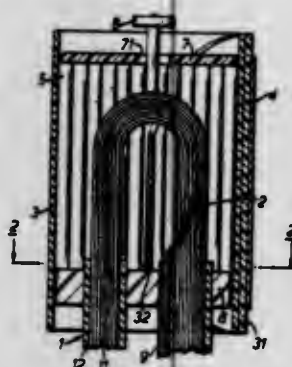
## METHOD OF ENCAPSULATION

Stephen H. Diaz, Los Altos Hills, and David A. Horsma, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 796,130, May 18, 1977. This application May 8, 1978, Ser. No. 903,961  
Int. Cl.<sup>3</sup> B60B 9/10

U.S. Cl. 156—49

11 Claims



1. A method of encapsulating a cable splice between at least two electrical cables, said cable splice comprising at least two joints between insulated electrical conductors, each joint comprising an insulating sleeve which overlies the joint and the insulation of the joined-together conductors, the method comprising the steps of

- (1) preparing an assembly by the steps of
  - (a) enveloping said cable splice within a closure member which forms an enclosure around the cable splice and which has at least one aperture of closed cross-section through which passes at least one of the cables forming that cable splice; and
  - (b) placing sealing material and a heater within said enclosure, the heater being wound around and through the sealing material and the joints between the insulated conductors;
- (2) supplying heat to said assembly, at least in part from said heater, to change the viscosity of said sealing material and maintaining the sealing material at an elevated temperature for a sufficient time that it forms a waterproof seal around substantially all the joints; and
- (3) cooling said assembly;

said sealing material (a) having, at a stage before completion of step (2), a viscosity such that it flows between and around and into sealing contact with substantially all of the joints of the cable splice within the enclosure, and (b) being substantially waterproof and having a substantially higher viscosity after step (3).

4,419,157

## PROCESS AND APPARATUS FOR MANUFACTURING TELECOMMUNICATION CABLES FILLED WITH EXPANSIBLE POWDER

Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Società per Azioni, Milan, Italy

Continuation of Ser. No. 149,467, May 13, 1980, abandoned.

This application Sep. 8, 1981, Ser. No. 300,263

Int. Cl.<sup>3</sup> H01B 13/06

U.S. Cl. 156—56

13 Claims

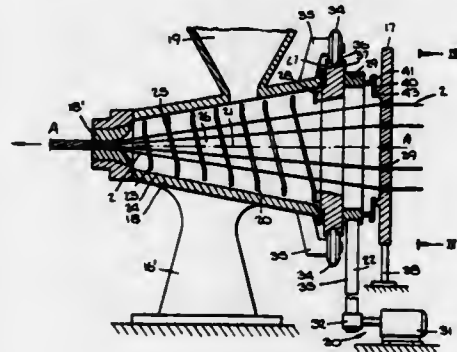
1. A process for manufacturing a multi-conductor, electric cable comprising a plurality of conductors bundled together, a covering over the bundled conductors, and a material expandable by the absorption of a liquid disposed between the conductors and between the conductors and the covering, said process comprising:

advancing a plurality of said conductors through a frusto-conical casing having guiding means forming a first wall at the larger diameter end and an inner frusto-conical wall, said casing having a conductor entrance in the first wall at the larger diameter end of said frusto-conical wall and a conductor exit at the smaller diameter end of said frusto-

conical wall, said conductors being advanced in the direction from said entrance to said exit, being fed into said entrance in spaced relation and being maintained in spaced relation until they are brought together in converging relation at said exit whereby the conductors effectively form an open frusto-conical cage within said casing having its larger end at said entrance and its smaller end at said exit;

at a point spaced from said exit in the direction of said entrance, supplying said material in powder form to the interior of said frusto-conical wall of said casing and to the interior of said frusto-conical cage while the conductors are advanced, and within said frusto-conical wall, mechanically causing said material in powder form to flow from said point along a helicoidal course within said frusto-conical wall and in said direction in which said conductors are advanced independently of the movement of the conductors, said conductors being exposed within said frusto-conical wall to said powder supplied therewithin and said helicoidal course also being directed so as to intersect the spaced conductors within said frusto-conical wall and so as to pass between the spaced conductors within said frusto-conical wall whereby said material is directed onto and between said conductors within said frusto-conical wall and enters and fills the frusto-conical cage formed by the spaced conductors and advances therewithin and toward said exit at which the material is forced toward the axis of said casing and further penetrates between the conductors; and

when the conductors with the powder thereon and therebetween leave said exit, applying a covering thereover.



4. Apparatus for manufacturing a multi-conductor, electric cable comprising a plurality of conductors bundled together with a material expandable by absorption of liquid disposed on and between the bundled conductors, said apparatus comprising:

a frusto-conical casing having a larger diameter entrance end, a smaller diameter, exit end and a frusto-conical inner wall, a conductor entrance opening at the larger diameter end of said wall and a conductor exit opening, smaller than the entrance opening, at the smaller diameter end of said wall;

means for advancing said conductors through the cavity defined by said wall in the direction from said entrance opening to said exit opening;

guiding means for guiding said conductors in spaced relation at the entrance end of the casing for maintaining the conductors in spaced relation until they are at the exit end of the casing and for bringing the conductors into close relation at the exit end of the casing, where said conductors effectively form a frusto-conical cage within the casing having its larger end at said entrance end and its smaller end at said exit end; and

means for supplying said expandable material in powder form to the interior of said casing at a point spaced from said exit end in the direction of said entrance end and onto and between the spaced conductors within said casing, said casing being free of obstructions between said last-mentioned means and said conductors within said casing

which would prevent said material in powder form from impinging upon said conductors within said casing and from passing therebetween into the cage formed within said casing by said conductors and said last-mentioned means including means within said frusto-conical inner wall of said casing for causing said expandable material in powder form to flow along a helicoidal course within said frusto-conical wall from in advance of said exit opening and toward said exit opening, said helicoidal course also intersecting said conductors and passing therebetween.

4,419,158

## PROCESS AND APPARATUS FOR THE PRODUCTION OF A PIPE OF FOAM MATERIAL WITH A CLOSURE

Gerhard Osterhagen, Eitorf, and Siegfried Feige, Siegburg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

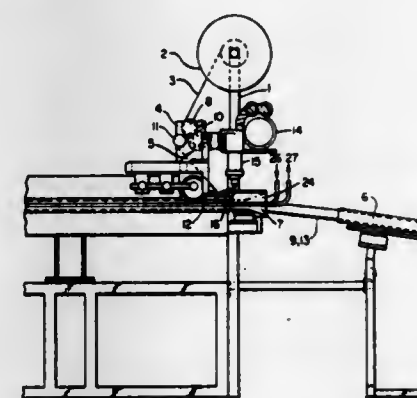
Filed Sep. 21, 1982, Ser. No. 420,879

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140388

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—66

10 Claims



1. A process for the continuous manufacture of a pipe that has a slot extending in the longitudinal direction of the pipe and a releasable closure means for closing the slot, and that is made from a sheet of a thermoplastic foam material, which comprises shaping the sheet in the heated thermoelastic and/or thermoplastic state at right angles to its longitudinal direction into form of a pipe, having a longitudinally extending open slot, and bonding strips of the closure means comprised of a thermoplastic synthetic resin, to the mutually facing longitudinal edges of the sheet that define the slot by welding, heat sealing, cementing, or the like bonding procedure; the closure means, prior to being bonded to the shaped, still heated foam pipe, being elongated by the effect of a tensile force to the same extent as the foam pipe shrinks during cooling after application of the closure means, so that the joined together closure means and the foam pipe shrink by the same extent.

4,419,159

## MANUFACTURE OF PLASTIC BAGS WITH INTERLOCKING PROFILE EXTRUSIONS

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 365,814, Apr. 5, 1982, Pat. No. 4,392,897. This application Oct. 12, 1982, Ser. No. 433,614

Int. Cl.<sup>3</sup> B29C 24/00; B65D 33/24

U.S. Cl. 156—66

6 Claims

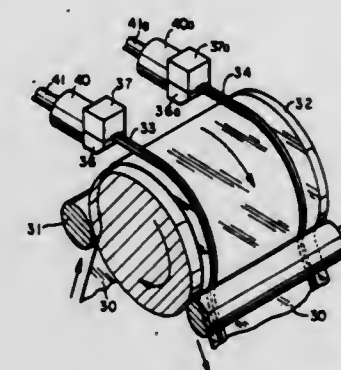
1. Apparatus for attaching locking profile extrusions to a plastic film comprising:

means for moving a web of said film;  
an extruding assembly positioned adjacent to said moving web comprising first and second means for extruding first and second locking plastic profiles and means for supplying molten thermoplastic to said extruding assembly;  
means for maintaining the temperature of said moving web sufficiently high so that said profiles adhere to said mov-

ing web upon contacting and thereafter cool to set said thermoplastic in said profiles; and  
means for maintaining said moving web under tension about a cylindrical roller including a first nip roller for biasing said moving web against said cylindrical roller prior to said moving web coming into contact with said profiles and a second nip roller for biasing said moving web against said cylindrical roller after said profiles come into contact with said moving web, so that contraction of said film upon release compensates for the contraction of said profiles as said profiles cool to prevent puckering of said moving web.

4. A method of attaching locking profile extrusions to a plastic film comprising:

moving a web of said film past an extruding assembly;



extruding from said extruding assembly first and second locking plastic profiles of molten thermoplastic onto said moving web;

maintaining the temperature of said moving web sufficiently high so that said profiles adhere to said moving web upon contacting and thereafter cool to set said thermoplastic in said profiles; and

maintaining said moving web under tension about a cylindrical roller with a first nip roller for biasing said moving web against said cylindrical roller prior to said moving web coming into contact with said profiles and with a second nip roller for biasing said moving web against said cylindrical roller after said profiles come into contact with said moving web, so that contraction of said film upon release compensates for the contraction of said profiles as said profiles cool to prevent puckering of said moving web.

4,419,160

## ULTRASONIC DYEING OF THERMOPLASTIC NON-WOVEN FABRIC

Kenneth Y. Wang, and Bobby L. McConnell, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 15, 1982, Ser. No. 339,734

Int. Cl.<sup>3</sup> B23K 27/08; B32B 31/20

U.S. Cl. 156—73.2

11 Claims

1. A process of producing and dyeing non-woven fabric of ultrasonically fusible fibers with an ultrasonic welding machine having horn means and opposed anvil means, the steps comprising:

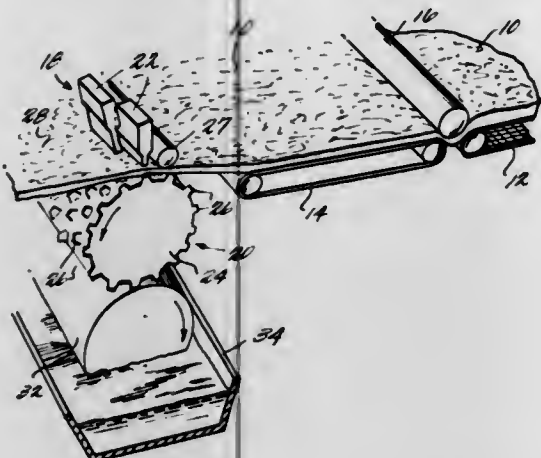
forming a web of random, loose, ultrasonically fusible fibers; distributing a fluent dye directly onto the web; and advancing the web with the dye thereon between the horn means and anvil means of the ultrasonic welding machine to utilize the ultrasonic energy thereof to simultaneously bond the fibers in the web at their contacting crossing points to form non-woven fabric and drive the dye into the bond points and fix the dye therein.

10. Apparatus for producing and dyeing non-woven fabric of ultrasonically fusible fibers comprising:

an ultrasonic welding machine having horn means and opposed anvil means, said anvil means comprising a roll having a pattern of anvil points;



means for advancing a web of random, loose ultrasonically fusible fibers between said horn means and said anvil means; and  
means for distributing a fluent dye directly onto the web so that at least those contacting crossing points of the fiber



fused and bonded by the ultrasonic energy of the machine are coated with the dye at the time of the application of the ultrasonic energy thereto and the dye is driven into and fixed in said bond points, said distributing means comprising the tops of said anvil points and a kiss roll for applying the dye to said tops.

4,419,161

#### METHOD OF PRODUCING COMPOSITE CERAMIC ARTICLES

Laurence N. Halley, Niagara Falls, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 218,982, Dec. 22, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,080  
Int. Cl.<sup>3</sup> B32B 31/00; C04B 39/12

U.S. Cl. 156—89

16 Claims

1. A method of joining separate silicon carbide components to form a composite article comprising the steps of:
  - (a) coating the face of at least one of the components to be joined with molybdenum boride having the formula  $\text{Mo}_2\text{B}_5$ ;
  - (b) pressing the surfaces to be joined together, and
  - (c) firing to produce a composite sintered article.

4,419,162

#### VINYL REPAIR COMPOSITION AND METHOD

Theodore E. Fischer, Birmingham, Ala., assignor to Polyplex Plastics, Inc., Rochester, N.Y.

Filed Sep. 8, 1981, Ser. No. 299,814

Int. Cl.<sup>3</sup> B29H 19/00; B32B 35/00

U.S. Cl. 156—94

6 Claims

1. A vinyl repair composition comprising a copolymer of vinyl chloride and vinyl acetate having a molecular weight of about 35,000; a solvent comprising tetrahydrofuran and dimethylformamide in an amount selected to provide a viscous flowable composition; and an amount of water selected to cause the composition, when dried, to release from adhesive tape.

6. The composition of claim 1 comprising the following ingredients in the indicated relative amounts:

Vinyl Chloride: 90 Parts  
Vinyl Acetate: 10 Parts  
Tetrahydrofuran: 250 Parts  
Dimethylformamide: 48 Parts  
Diocetylphthalate: 40 Parts  
Water: 3.3 Parts.

4,419,163

#### PIPELINE COATING METHOD

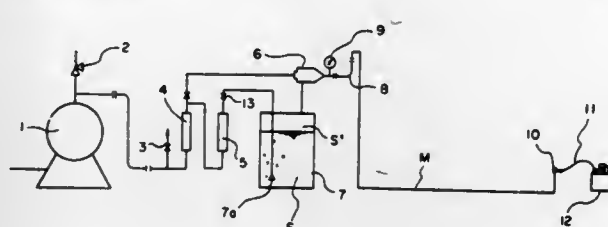
Mitsuo Yamamoto, Osaka; Takeo Namazugoshi, Shiga, and Hiroyoshi Seto, Takatsuki, all of Japan, assignors to Osaka Gas, Ltd., Osaka, Japan

Filed Sep. 30, 1981, Ser. No. 307,333

Int. Cl.<sup>3</sup> B05D 7/22; B32B 1/08

U.S. Cl. 156—94

6 Claims



1. A method for coating an inner surface of an elongated pipe comprising the steps of supplying a foamed sealant cylindrically along the inner surface of said pipe, directing a compressed air flow centrally of said foamed sealant to drive said sealant along the inner surface of said pipe wherein said sealant sticks to said inner surface over an entire length thereof while flowing in an annular condition along said inner surface of said pipe, and allowing said sealant to cure on the inner surface of said pipe with any excess foam forced from said pipe by said compressed air.

4,419,164

#### METHOD FOR MAKING A SELF-LUBRICATING LINER

Lawrence G. Martinelli, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

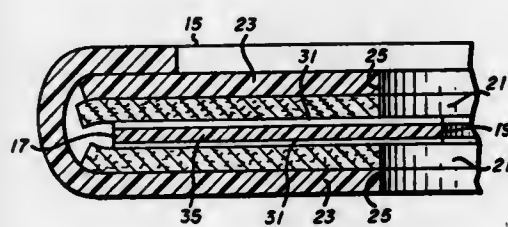
Division of Ser. No. 155,434, Jun. 2, 1980, Pat. No. 4,354,213.

This application Jul. 1, 1982, Ser. No. 394,406

Int. Cl.<sup>3</sup> B29D 7/02; G11B 5/016, 23/02, 5/72

U.S. Cl. 156—244.11

2 Claims



1. An improved method for manufacturing a lubricated liner for a floppy disk assembly of the type wherein the assembly includes a disk provided with a magnetic coating including a lubricant compounded therein, the improvement comprising the steps of:

- infusing a lubricant, identical to the lubricant compounded into the magnetic coating of the disk, into a precursor material;
- extruding fibers from the lubricant-infused precursor material; and
- binding the extruded fibers together to form a fibrous liner for abutting against the coating surface of the disk; wherein said lubricant infused into said precursor material is of a quantity sufficient to produce the result that, for the finished floppy disk assembly, migration of lubricant from said disk to said fibrous liner is substantially less than if said lubricant were not infused into said precursor material.

4,419,165

#### METHOD OF MAKING A ROTARY DRUM FILTER AND METHOD OF MAKING AN ANNULAR VALVE HOUSING FOR SUCH A DRUM FILTER

Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

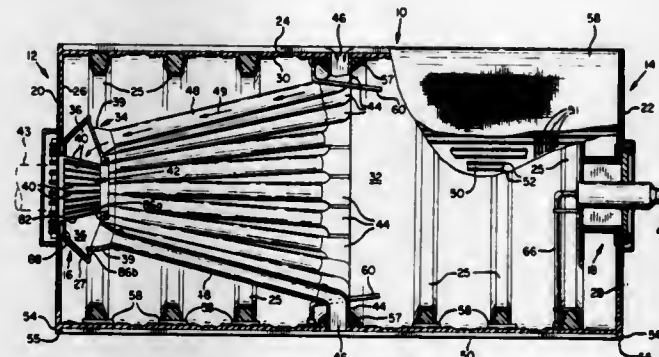
Division of Ser. No. 231,236, Feb. 4, 1981, Pat. No. 4,383,877.

This application Sep. 29, 1982, Ser. No. 426,919

Int. Cl.<sup>3</sup> B32B 31/12

U.S. Cl. 156—245

22 Claims



1. A method of making a rotary drum filter of the type having a valve housing, interior bucket sections for collecting filtrate from the surface of the drum filter, and internal drainage conduits which each deliver filtrate from an associated bucket to a filtrate inlet or chamber of the valve housing upon the application of a vacuum to the chamber in response to a valve member positioned within the valve housing, comprising:

- providing a cylindrical plastic filter drum shell with a drive head assembly at least partially of metal at a first or head end of the shell;
- mounting a plastic annular valve housing to the drive head; securing interior plastic bucket sections to the shell; mounting a tail assembly at least partially of metal to the second or tail end of the shell;
- connecting plastic drainage conduits to their associated buckets and filtrate inlets;
- providing bucket openings communicating between the exterior of the shell and buckets; and
- applying a layer of plastic to the metal surfaces of the head and tail assemblies which are within the drum.

4,419,166

#### METHOD OF ASSEMBLING A FILTER HOLDER

Roger R. Larson, Champaign, Ill., assignor to I-Temp Corporation, Decatur, Ill.

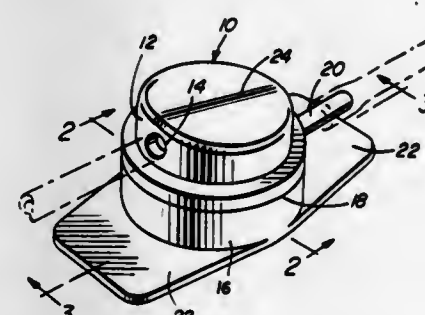
Division of Ser. No. 925,630, Jul. 6, 1978, Pat. No. 4,191,654.

This application Oct. 1, 1979, Ser. No. 80,945

Int. Cl.<sup>3</sup> B01D 25/04

U.S. Cl. 156—272.4

3 Claims



1. A method of assembling a membrane filter holder having a filter assembly and enclosing means, the filter assembly comprising a membrane constructed of flat plastic sheet material, said membrane having a flat upper surface and a flat lower surface, substantially all of said lower surface contacting a flat porous metal support plate, and the enclosing means compris-

ing an upper enclosure and a lower enclosure, said enclosures having opposed central recess portions and opposed sealing portions completely surrounding said central recessed portions, the upper enclosure having a shelf about the inside edge of said recessed portion and having an inlet aperture, said lower enclosure having an outlet aperture, said method comprising the steps of:

- (a) aligning said upper enclosure and said lower enclosure on opposite sides of said filter assembly with an edge strip of the upper flat surface of said membrane contacting said shelf and said opposed sealing portions contacting each other and the periphery of said support plate;
- (b) heating said metal support plate by induction heating, thereby heating said membrane to a temperature sufficient to melt said upper enclosure at said shelf; and
- (c) maintaining contact between said shelf and said edge strip until said edge strip is sealed continuously to said shelf, wherein said induction heating further raises the temperature of said metal support plate above the melting temperature of said opposed sealing portions, thereby causing said upper enclosure and said lower enclosure to form a fused seal at the contact point of said sealing portions adjacent said metal support plate.

4,419,167

#### HEAT SEALING APPARATUS AND METHOD

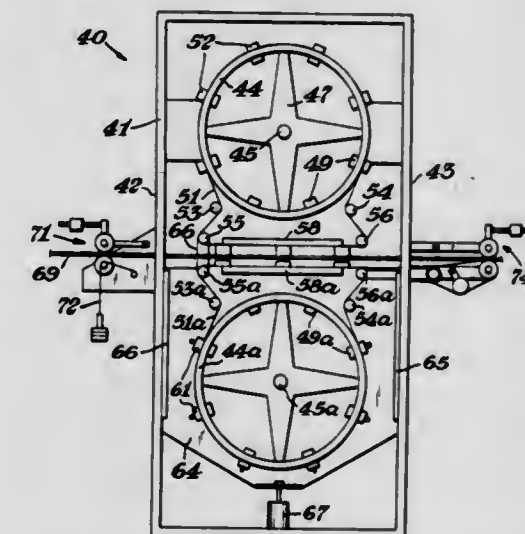
Robert A. Hay, II, Midland, and Oswald Bergman, Freeland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1982, Ser. No. 376,986

Int. Cl.<sup>3</sup> B30B 5/06, 15/34

U.S. Cl. 156—290

7 Claims



1. A heat sealing apparatus, the heat sealing apparatus comprising a frame, the frame supporting a first heating drum rotatably supported thereon and a second heating drum rotatably supported thereon; the first and second heating drums having generally parallel axes the first heating drum having associated therewith a first sealing chain, the first sealing chain comprising a plurality of flexibly connected, transversely extending profiled sealing members; the second heating drum having associated therewith and driven thereby a similar chain and a plurality of sealing elements; the first chain in a region generally adjacent the second drum having at least two rotatable chain support elements disposed in a plane generally parallel to the axes of the first and second heating drums, the plane being generally normal to a plane containing said axes; a second pair of rotatable chain support elements generally parallel to said first chain support elements supporting the second chain; said first and second pair of support elements positioned such that the heat sealing elements of the first and second chains disposed in the region between the first and second pair of chain supporting elements brings the sealing members of the first and second chains into a heat sealing



position; and means to synchronously rotate the first and second heating drums.

7. A method for the continuous heat sealing of synthetic resinous thermoplastic film comprising providing a first set of a plurality of heat sealing elements, providing a second set of a plurality of heat sealing elements, continuously moving the first and second sets of heat sealing elements to provide intermittent positioning of members of the first and second sets of heat sealing elements in heat sealing relationship to each other, while providing heat to the heat sealing elements by conduction at a location remote from the heat sealing elements when the heat sealing elements are disposed in heat sealing relationship.

4,419,168

# APPARATUS FOR HANDLING GASKET-FORMING MATERIAL

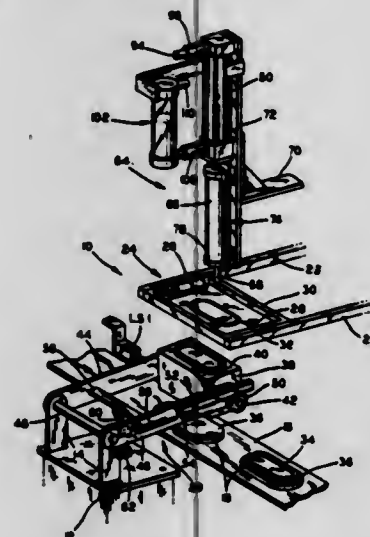
William A. Paul, 2338 Townley Rd., Toledo, Ohio 43614  
Division of Ser. No. 107,548, Dec. 27, 1979, Pat. No. 4,334,636.  
This application Oct. 13, 1981, Ser. No. 310,806

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—351

7 Claims



1. Apparatus for shaping gasket-forming material to a gasket configuration and applying the shaped material to a workpiece, said apparatus comprising shaping means for shaping the gasket-forming material to a desired gasket configuration, and transfer means for transferring the shaped material in operating cycles from said shaping means to a workpiece and returning to said shaping means, means for supplying the gasket-forming material to said shaping means comprising a cartridge of gasket-forming material, a cartridge holder having an opening to receive the cartridge, a plunger at an upper end of said cartridge holder and having a plunger rod extending outwardly therefrom, drive means for engaging said plunger rod to move said plunger toward a lower end of said cartridge holder, means for operating said drive means at predetermined intervals which are multiples of the operating cycles of said transfer means, and means for controlling the length of operation of said drive means at each interval.

4,419,169

# APPARATUS FOR RADIANT HEAT SEALING OF BALLOON ONTO CATHETER SHAFT

Lawrence F. Becker, Chicago, and Richard W. Cobean, Libertyville, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 195,328, Oct. 9, 1980, abandoned, which is a division of Ser. No. 956,590, Nov. 1, 1978, Pat. No. 4,251,305.  
This application Mar. 23, 1982, Ser. No. 360,947

Int. Cl.<sup>3</sup> H05B 1/00

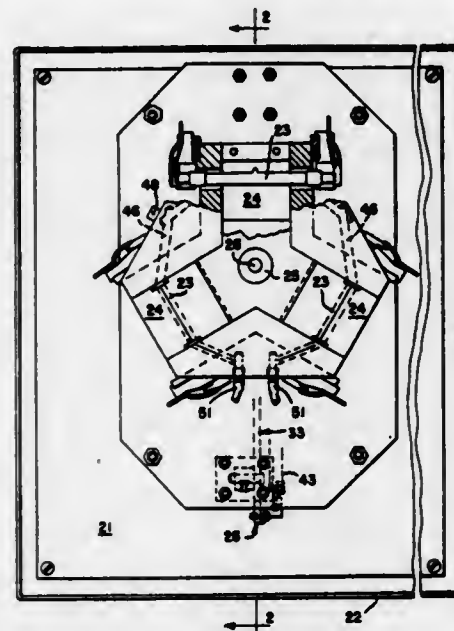
U.S. Cl. 156—359

3 Claims

1. An apparatus using radiant energy for sealing the annular

ends of a tubular member onto an elongated shaft of a medical device, comprising:

- an enclosure having a shaft receiving passageway with a cylindrical treatment site therein, said cylindrical treatment site having a band of radiant energy thereat for sealing the annular ends of the tubular member to the shaft;
- a plurality of lamps and reflectors for developing and focusing radiant energy into said band of radiant energy at said treatment site; and
- a shaft depth indexing means for aligning portions of an unfinished shaft of a medical device with said cylindrical treatment site, said shaft portions overlapping both a tubular member and a length of the elongated shaft, each of said portions including at least a part of a length of



shrink tubing overlying at least a part of both the shaft and the tubular member, said shaft depth indexing means including a top switch, a bottom switch, an upper stop means for aligning a first of said shaft portions at said cylindrical treatment site, a lower stop means for aligning a second of said shaft portions at said cylindrical treatment site, a biased linkage means for urging said tops which toward engagement with a head end of the elongated shaft, a timer activated by said top switch for transmitting power to said lamps for a predetermined length of time, a solenoid for withdrawing said upper stop and for permitting said elongated shaft to move to said lower stop and activate said bottom switch, a timer activated by said bottom switch for transmitting power to said lamps for a predetermined length of time.

4,419,170

# AUTOMATED LAY-UP MACHINE

Leiv H. Blad, Van Nuys, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed May 27, 1982, Ser. No. 382,497

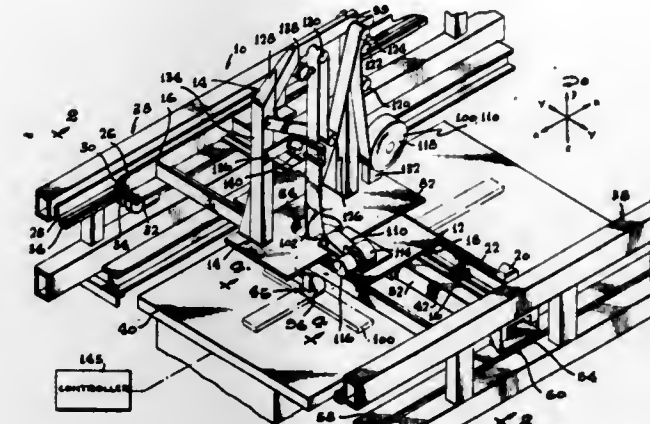
Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—361

12 Claims

1. A lay-up machine for laying up material comprising: supply means for supplying said material; upper carriage means adapted to carry said supply means and having a selected number of degrees of freedom of movement to allow positioning of said supply means; means for moving said upper carriage means; laying means adapted to receive said material from said supply means; lower carriage means adapted to carry said laying means and

having a selected number of degrees of freedom of movement to control the position of said laying means; means for moving said lower carriage means; and



means for slaving the motion of said upper carriage means to the motion of said lower carriage means.

4,419,171

# PORTABLE LABELING MACHINE

Werner Becker, Hirschhorn; Heinz Kistner, Neckarsteinach, and Kurt Schrotz, Beerfelden, all of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

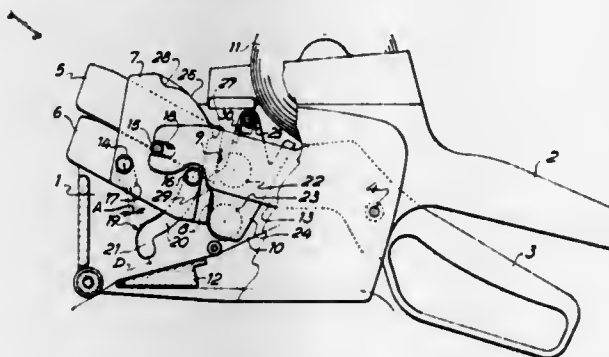
Filed Apr. 28, 1982, Ser. No. 372,650

Claims priority, application Switzerland, May 13, 1981, 3098/81

Int. Cl.<sup>3</sup> B65C 11/02

U.S. Cl. 156—384

10 Claims



1. A portable labeling machine having a housing (1) provided with a handle (2) with actuating trigger (3) and comprising at least two rocking printheads (5, 6) for printing at least two lines of characters of different colors on self-adhesive labels borne by a continuous support strip, a drive lever (13) connected to the trigger and to the printheads in order to move the latter, guide slides rigidly secured to the housing to guide the rocking of the printheads from a raised inking position to a lowered printing position, a print platen (12) rigidly connected to the housing, and at least two inking rollers (22, 23) of different colors disposed in the path of the lines of characters of the printheads in the raised position of the latter, characterized by the fact that the two printheads (5, 6) are mounted and fixed side by side in a common rocking housing (7) having, on at least one of its two side-walls, a pivot (14), a drive finger (15) and a guide finger (16), the three being spaced apart from each other in the order indicated; by the fact that the pivot is engaged in a first slot (17) which is linear and directed towards the print platen; by the fact that the drive finger is arranged continuously bearing against the drive lever; by the fact that the guide finger is engaged in a second slot (19) having an upper portion (20) in the form of a circular arc centered on the upper portion of the first slot, viewed with reference to the print platen, and a linear lower portion (21) which is also directed towards the print platen; by the fact that the two inking rollers (22, 23) are mounted side by side in a position

corresponding to that of the two lines of characters; and by the fact that at least that one of the two rollers which is located on the passage of said two lines of characters is mounted in a retractable movable support (24) which is actuated by a retraction mechanism (26, 29, 30) (15, 45, 46) controlled by the swiveling of the rocking housing (7).

4,419,172

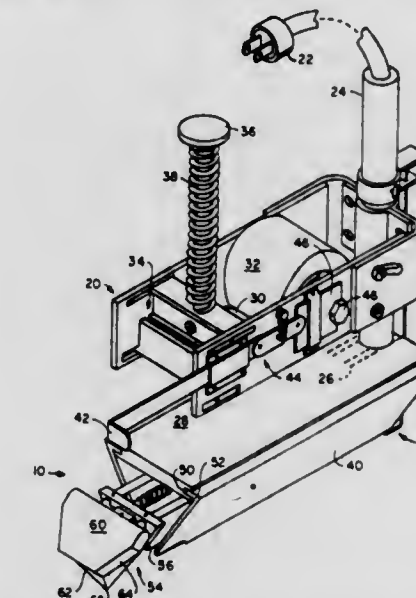
# ADAPTER FOR AUTOMATIC TAPE LAYING MACHINE

John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228  
Continuation-in-part of Ser. No. 307,365, Jan. 1, 1981, Pat. No. 4,373,987. This application Jul. 19, 1982, Ser. No. 399,958

Int. Cl.<sup>3</sup> B31F 1/00; B44C 7/00; B30B 5/02

U.S. Cl. 156—461

11 Claims



1. In a system for heating and laying tape in a "V" joint formed by intersecting wall panels upon manual advance of said system therealong, the system having a source of flat tape for running tape over a forward end and down and toward the rear end of a "V"-shaped soleplate adapter, the improvement comprising: means including a head for progressively changing the cross-sectional shape of tape from flat to "V"-shape at said forward end, means resiliently mounting and forwardly biasing said means for progressively changing, and means for holding said tape in alignment with said "V"-shaped soleplate adapter at said rear end in preparation for said tape laying.

4,419,173

# METHOD OF PRODUCING CORRUGATED CARDBOARDS AND APPARATUS

Toshimitau Akiyama, and Tadaashi Kasamatsu, both of Tokyo, Japan, assignors to K-Three Products Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 285,804

Claims priority, application Japan, Jul. 22, 1980, 55/100088

Int. Cl.<sup>3</sup> B31F 1/20

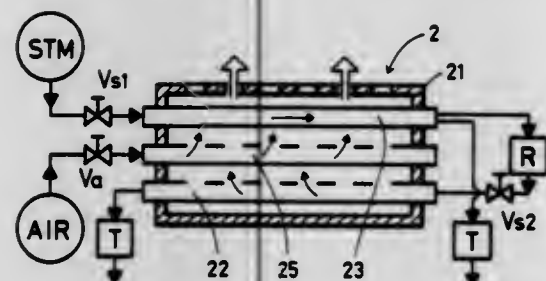
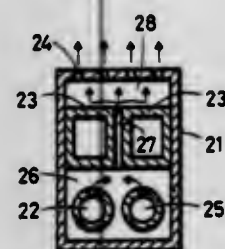
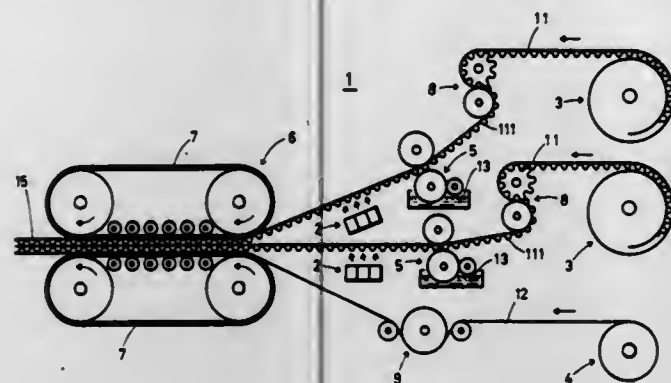
U.S. Cl. 156—470

6 Claims

1. In an apparatus for producing corrugated cardboards essentially comprising means for continuously feeding at least one half-lined corrugated paper and one liner, means for coating projecting portions of the corrugated paper with a water-suspension of raw starch, means for blowing steam on the coated raw starch suspension to cause gelation thereof, means for applying pressure to the half-lined corrugated paper sheet and the liner so as to adhere them to form a corrugated cardboard, and means for continuously receiving the thus formed corrugated cardboard, an improvement characterized in that the means for blowing steam comprises a pipe for feeding low pressure steam, a tubular body lying near the half-lined corrugated paper sheet across the moving direction of the sheet, the tubular body having multiple nozzles for blowing reheated steam at the upper surfaces of the sheet, a reheater of the feed



steam being located inside the tubular body and having pipes as passages for high pressure steam, the pipes dividing the tubular body into an upper header and a lower mixing chamber, the



pipe for the low pressure steam and a pipe for air to be mixed with the low pressure steam being positioned in the lower mixing chamber, and a pathway for the mixture connecting the lower mixing chamber and the upper header.

#### 4,419,174 APPARATUS FOR MANUFACTURING OSTOMY POUCHES

Ole R. Jensen, River Vale, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 286,495, Jul. 24, 1981, Pat. No. 4,388,135.

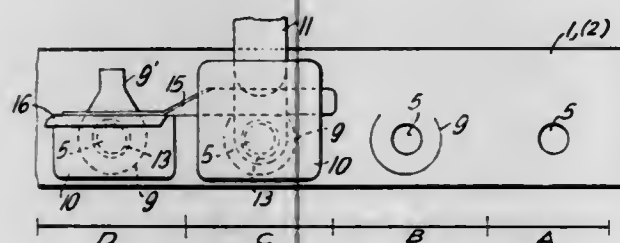
This application Feb. 28, 1983, Ser. No. 470,887

Claims priority, application Denmark, Aug. 1, 1980, 3328/80

Int. Cl.<sup>3</sup> B32B 31/18, 31/20

U.S. Cl. 156—513

2 Claims



1. An apparatus for manufacturing ostomy pouches having an adhesive label or faceplate that attaches the pouch to the body comprising

(a) means for advancing two superposed webs of weldable

plastics sheet material to a preliminary station wherein means are provided for producing an aperture only in the uppermost web;

(b) means for advancing said webs to a first station wherein means are provided to weld said two webs to form a partial pouch contour extending from the top edge of the pouch past the area of said aperture in said uppermost web;

(c) means for advancing said partially contour welded pouch to a second station wherein means are provided to sequentially insert a separator element into said partially contour welded pouch to function as a base for said uppermost pouch wall, to weld an adhesive label or faceplate to said supported uppermost pouch wall around said aperture, and to withdraw said separator element; and

(d) means for advancing said partially contour welded pouch to a third station wherein means are provided to complete the contour welding of said pouch walls and form a completed pouch of desired configuration.

#### 4,419,175

#### LAMINATING DEVICE FOR LETTERED TAPE

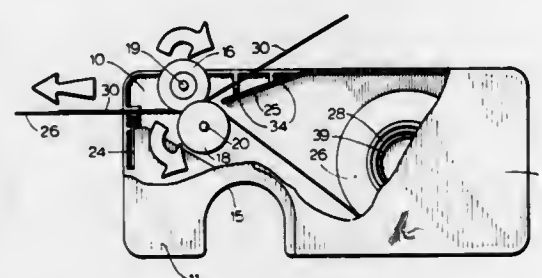
Franklin C. Bradshaw, Scottsdale, Ariz., and Thomas P. Connolly, Lino Lakes, Minn., assignors to Kroy Inc., St. Paul, Minn.

Filed Mar. 29, 1982, Ser. No. 363,015

Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156—554

17 Claims



1. A hand-held device for laminating a piece of adhesive coated laminating tape onto a section of lettered tape or the like of substantially the same width comprising:

a housing having a pair of side walls and top, bottom, front and rear edges;

a first generally cylindrical roller rotatably mounted between said pair of side walls about a first fixed axis generally perpendicular to said side walls, said first roller having a portion extending above the top edge of said housing to permit manual rotation thereof and having a first cylindrical surface parallel to said first fixed axis;

a second generally cylindrical roller rotatably mounted between said pair of side walls about a second fixed axis generally perpendicular to said side walls, said second roller being positioned adjacent said first roller to define a laminating station therebetween and having a second cylindrical surface parallel to said second fixed axis, one of said first and second rollers further having a tape alignment edge extending outwardly from each end of its corresponding cylindrical surface for guiding said laminating tape and said lettered tape in laminating association with said laminating station;

a supply of adhesive coated tape rotatably mounted between said pair of side walls about an axis generally perpendicular to said side walls and rearwardly of said first and second rollers, said supply of adhesive backed tape being disposed so that said adhesive coated tape is supplied to said laminating station between said first and second rollers with the adhesive side of said adhesive coated tape facing upwardly;

guide means for guiding a section of lettering tape from said top edge toward said laminating station; and

means positioned forward of said first and second rollers for severing said adhesive coated tape.

vacuum cup when said mold moves with said flexible sheet of interlayer material toward said bent glass sheet.

#### 4,419,176

#### APPARATUS COMPRISING ARRANGEMENT OF VACUUM CUPS TO ASSEMBLE ONE OR MORE BENT GLASS SHEETS WITH A SHEET OF FLEXIBLE INTERLAYER MATERIAL

James L. Valimont, and Joseph D. Kelly, both of Cheswick, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

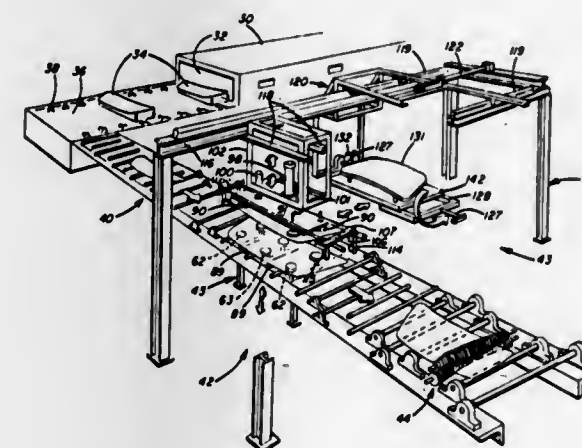
Division of Ser. No. 287,600, Jul. 28, 1981, Pat. No. 4,368,037.

This application Sep. 15, 1982, Ser. No. 418,323

Int. Cl.<sup>3</sup> B32B 17/00; B65H 29/24

U.S. Cl. 156—556

10 Claims



6. Apparatus for assembling a sandwich comprising a bent glass sheet having a convex major surface and a concave major surface and a flexible sheet of interlayer material assembled in engagement with said concave major surface, said apparatus comprising an assembly station, a vacuum mold having an apertured wall conforming to the shape of said bent glass sheet, a mold loading station for engaging said flexible sheet against said apertured wall, means for moving said mold between said mold loading station and a position of predetermined alignment with said bent glass sheet at said assembly station, means for moving said mold with said flexible sheet engaging said apertured wall into engagement with said concave major surface of said bent glass sheet, a first set of spaced vacuum cups adapted to engage the convex major surface of said bent glass sheet and constructed and arranged for movement transverse to said convex major surface of said bent glass sheet, said first set of vacuum cups being mounted along a curved surface conforming generally to the shape of said bent glass sheet, characterized by means biasing at least one vacuum cup in the central portion only of said first set of vacuum cups for limited movement transverse to said curved surface to bias said glass sheet in its central portion facing said biased

#### 4,419,177 PROCESS FOR ELECTROMAGNETICALLY CASTING OR REFORMING STRIP MATERIALS

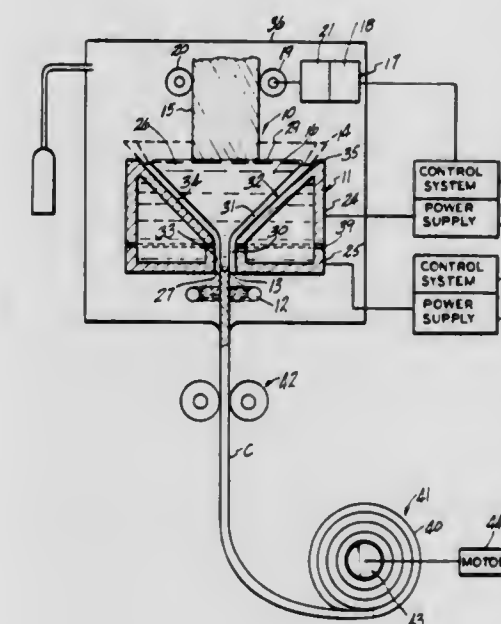
Michael J. Pryor, Woodbridge; Derek E. Tyler, Cheshire, and John C. Yarwood, Madison, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 29, 1980, Ser. No. 191,630

Int. Cl.<sup>3</sup> B22D 11/16, 27/02

U.S. Cl. 156—601

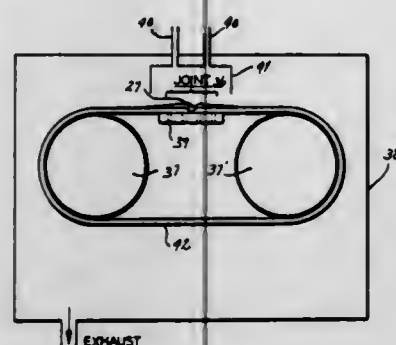
11 Claims



1. In a process for electromagnetically containing and forming molten material into a desired thin strip shape comprising the steps of providing at least two inductors for applying a magnetic field to said molten material wherein a first of said inductors electromagnetically contains a first portion of said molten material and a second of said inductors electromagnetically contains and forms a second portion of said molten material into said thin strip shape at a solidification zone, powering said inductors to provide said magnetic field, and electromagnetically containing and forming said molten material, the improvement comprising: controlling the heat input to said first portion and said second portion of said molten material and stirring said molten material in said first portion so that the molten material in said first portion is at a lower temperature than the molten material in said second portion at said solidification zone, said heat input controlling and stirring steps comprising the step of powering said first inductor with an alternating current having a first frequency and powering said second inductor with an alternating current having a second frequency substantially higher than said first frequency, whereby beneficial cooling of the molten material at said solidification zone is provided by the molten material of said first portion and the overall power consumption of said process is reduced.

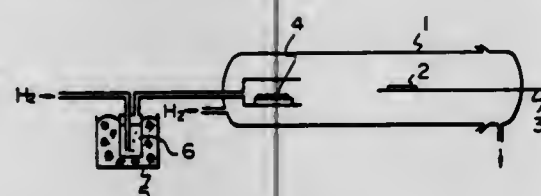


**4,419,178**  
**CONTINUOUS RIBBON EPITAXY**  
 Daniel L. Rode, 9 Prado, St. Louis, Mo. 63124  
 Filed Jun. 19, 1981, Ser. No. 275,321  
 Int. Cl.<sup>3</sup> C30B 29/00  
 U.S. Cl. 156—610



2. A process for forming an endless belt of monocrystalline composition comprising the steps of:
- slicing from a boule of said first monocrystalline composition a flat strip of uniform thickness;
  - beveling ends of said strip to provide beveled end surfaces each of preselected crystallographic orientation;
  - bending the opposite ends of said strip back upon each other in end-to-end juxtaposed relationship to define a bevel-edged notch between the ends of said strip, said bending being at a local radius not less than a local critical minimum radius; and
  - epitaxially growing material of said monocrystalline composition on said beveled end surfaces to fill said notch, thereby to provide said endless belt.

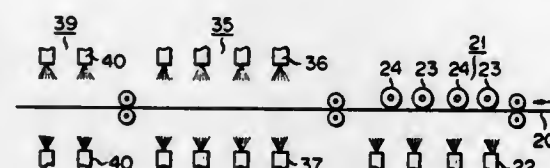
**4,419,179**  
**METHOD OF VAPOR PHASE GROWTH**  
 Masaharu Nogami, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan  
 Filed Mar. 20, 1981, Ser. No. 245,668  
 Claims priority, application Japan, Mar. 31, 1980, 55-41740  
 Int. Cl.<sup>3</sup> C30B 25/10  
 U.S. Cl. 156—613



1. A method of vapor phase epitaxial growth of gallium arsenide (GaAs) under kinetically limited growth conditions comprising the steps of: placing a substrate monocrystal in a uniform temperature region where a growth temperature  $T_D$  (K) is maintained at a level of approximately 650° to 700° C. and growing GaAs in said uniform temperature region while maintaining the molar fraction (MF) of arsenic in a feed gas within a range of  $2.6 \times 10^{11} \exp(-3.1 \times 10^4/T_D) > MF > 1.5 \times 10^{-17} \exp(-4.5 \times 10^4/T_D)$ .

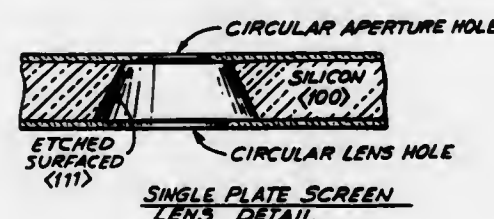
**4,419,180**  
 Patent Not Issued For This Number

**4,419,181**  
**METHOD FOR ETCHING METALLIC SHEET**  
 Hiroshi Tanaka, and Fusao Sakata, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan  
 Division of Ser. No. 248,795, Mar. 30, 1981, Pat. No. 4,357,196.  
 This application Aug. 19, 1982, Ser. No. 409,350  
 Claims priority, application Japan, Apr. 2, 1980, 55-41957  
 Int. Cl.<sup>3</sup> C23F 1/02  
 U.S. Cl. 156—640



1. A method for etching a metallic sheet comprising:
- a first step of forming an anticorrosive pattern defining apertures on one surface of the metallic sheet and an anticorrosive pattern defining smaller apertures than said apertures on the other surface of said sheet;
  - a second step of lightly etching said the other surface for removing an oxide film on the surface of the metal to expose the surface of the metal;
  - a third step of spraying an etching solution on said one surface for etching said one surface to a predetermined depth; and
  - a fourth step of simultaneously spraying an etching solution on both surfaces of said metallic sheet for forming apertures in said metallic sheet.

**4,419,182**  
**METHOD OF FABRICATING SCREEN LENS ARRAY PLATES**  
 Eugene R. Westerberg, assignor to Veeco Instruments Inc., Melville, N.Y.  
 Filed Feb. 27, 1981, Ser. No. 239,066  
 Int. Cl.<sup>3</sup> H01L 21/306; B44C 1/22; C03C 15/00, 25/06  
 U.S. Cl. 156—644



1. A method of fabricating screen lens array plates from round, silicon wafers of about 0.5 mm thickness comprising the steps of:
- polishing both sides of a silicon wafer;
  - oxidizing both sides of the silicon wafer to produce a high density, low porosity oxide coating having a thickness of about 2 microns;

- exposing by photolithographic techniques a predetermined pattern on both sides of the silicon wafer;
- indiffusing in conjunction with vapor transfer techniques a boron layer into both sides of the wafer to a depth of about 10 microns to a concentration greater than about  $7 \times 10^{19}$  atoms/cm<sup>3</sup>; and
- anisotropically etching the silicon wafer until said predetermined pattern has been formed through the thickness of the wafer.

**4,419,183**  
**ETCHANT**  
 Michael Gulla, Sherborn, and Marc Connelly, Roslindale, both of Mass., assignors to Shipley Company Inc., Newton, Mass.  
 Filed Jan. 18, 1983, Ser. No. 458,956  
 Int. Cl.<sup>3</sup> C23F 1/00; B44C 1/22  
 U.S. Cl. 156—666

- 20 Claims
12. A process for preparing a copper surface for metal deposition, said process comprising contact of the surface with an etchant comprising sulfuric acid in an amount of at least 0.5 moles per liter, hydrogen peroxide in an amount of at least 0.1 moles per liter and a solution soluble source of tungsten in an amount of at least 0.00005 moles per liter, said contact being for a time sufficient to form a matte surface over the copper.

**4,419,184**  
**METHOD FOR CONTROL OF CHEMICALS DURING GAS TREATMENT OF SUSPENSIONS**  
 Ake Backlund, Karlstad, Sweden, assignor to Kamy AB, Karlstad, Sweden  
 Filed Jul. 20, 1981, Ser. No. 284,815  
 Claims priority, application Sweden, Aug. 26, 1980, 8005959  
 Int. Cl.<sup>3</sup> D21C 7/12  
 U.S. Cl. 162—49

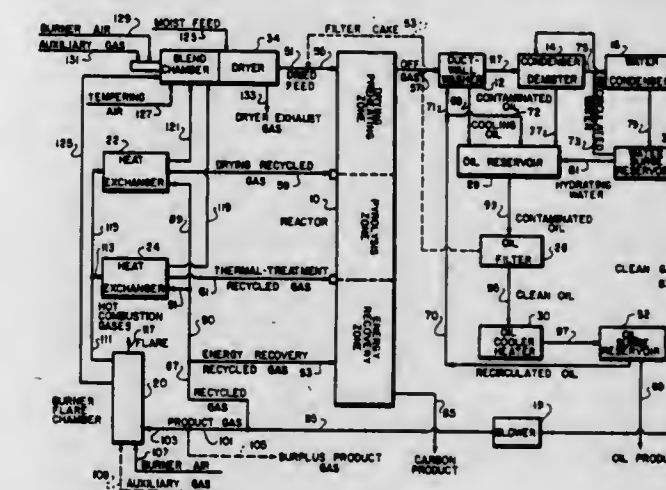
- 15 Claims
1. A method of treating a pulp suspension with a treatment gas comprising the steps of:
- adding a quantity of treatment gas to the pulp suspension in the form of finely distributed small bubbles the gas selected from the group consisting essentially of oxygen and oxygen containing gas;
  - after step (a), determining the density of the suspension containing the treatment gas at at least one moment;
  - simultaneously measuring the temperature and pressure of the suspension containing the treatment gas corresponding to the density determined during step (b);
  - calculating the residual gas content of the suspension at the at least one moment at which the density is determined, the calculation utilizing the information determined in steps (b) and (c);
  - calculating the gas consumption as the difference between the quantity of gas added in step (a) and the residual gas quantity calculated according to step (d);
  - controlling the quantity of gas added in step (a) based upon the consumption calculation in step (e) to obtain a desired resultant treatment of the suspension; and
- wherein steps (b) through (f) are practiced while maintaining the suspension at a substantially constant superatmospheric pressure.

**4,419,185**  
**PYROLYSIS SYSTEM WITH HOT GAS RECIRCULATION**  
 Mack D. Bowen, Smyrna, and Kenneth R. Purdy, Decatur, both of Ga., assignors to American Carbons, Inc., Atlanta, Ga.  
 Filed Jul. 16, 1981, Ser. No. 283,033  
 Int. Cl.<sup>3</sup> C10B 49/06, 53/02  
 U.S. Cl. 201—4

- 27 Claims
1. In a continuous process for producing a solid carbonaceous residue of predetermined volatile content, a pyrolytic oil, and a gaseous product, from an organic material that self-decomposes at elevated temperatures to a solid carbonaceous

residue and a gaseous mixture of condensable and noncondensable fractions, the steps comprising:

- establishing a vertically moving packed bed of said material, and maintaining said bed by substantially continuously introducing a feed of said material to the top portion thereof and removing said solid residue from the bottom portion thereof;
- determining a maximum temperature, in the range of about 800° to 1400° Fahrenheit, to which said material is to be heated in said bed, corresponding to the desired volatile content of said residue;
- establishing a temperature gradient through the depth of said bed, with said maximum temperature being maintained at an intermediate level, for pyrolysis of said material to said residue and gaseous mixture;
- withdrawing said gaseous mixture from said top portion of said bed as an offgas stream, including a noncondensable fraction and a condensable fraction comprised of organic vapors and water vapor, and treating said offgas stream to remove substantially all entrained solid particulate and condensable fractions therefrom, to provide a cleansed gas;
- recycling and upwardly drafting through said bed a first portion of said cleansed gas for energy recovery, said recovery gas being introduced into said bed at a lower level disposed below said intermediate level thereof, to define an energy recovery zone therebetween, and at a temperature substantially below said maximum temperature.



- ture, the volumetric flow rate of said recovery gas and the depth of said energy recovery zone being so maintained that said recovery gas is heated substantially to said maximum temperature at entry to said intermediate bed level, and is at least substantially in thermal equilibrium with said material thereat;
- recycling and upwardly drafting through said bed a second portion of said cleansed gas for thermal treatment of said material, said treatment gas being introduced into said bed substantially at said intermediate level and substantially at said maximum temperature; and
  - recycling and upwardly drafting through said bed a third portion of said cleansed gas for drying and preheating said feed, said drying/preheating gas being introduced at a level above said intermediate level and below the level of feed introduction to define therewith pyrolysis and drying/preheating zones, respectively, and being at a temperature that is substantially the same as that of the upward flowing gases and vapors exiting from said pyrolysis zone, the depth of said pyrolysis zone being so maintained as to ensure adequate pyrolysis of said material, the temperature and volumetric flow rate of said drying/preheating gas and the depth of said drying/preheating zone being so maintained as to adequately dry and preheat said feed material to said self-decomposition point, prior to entry into said pyrolysis zone in cooperation with said recovery gas and said treatment gas, and to therewith maintain said offgas stream at a temperature between the



temperatures at which said recovery and drying/preheating gases are introduced into said bed.

4,419,186

# PROCESS FOR MAKING STRONG METALLURGICAL COKE

Fritz O. Wienert, 394 Roosevelt Ave., Niagara Falls, N.Y. 14305  
Filed Dec. 11, 1981, Ser. No. 329,717  
Int. Cl.<sup>3</sup> C10B 47/10, 53/08

U.S. Cl. 201—6

14 Claims

1. A process for making strong metallurgical coke in a slot coke oven which comprises making a charge for said coke oven which shrinks during carbonization by mixing together, in a proportion which will result in the mix becoming transiently plastic during subsequent heating in a coke oven, particles of a fusible bituminous coal or a mixture of such coals of which about a major proportion by weight is of a size or sizes smaller than about 0.15 millimeter, and particles of a non-fusible material or mixture of such materials compatible with a blast furnace burden, of which at least a substantial proportion by weight is of a size smaller than about 0.15 mm., adding water to said mixture in such a proportion that subsequent compacting of such a mixture mixed with the water, at a pressure higher than about 500 kilograms per square centimeter, squeezes out at least 0.1% of water, by weight, based on the weight of the admixed water, mixing together the mixture of fusible bituminous coal particles and non-fusible material particles and the water, compressing such resulting mixture into a compacted product at a pressure higher than 500 kg./sq. cm. and heating the resulting compacted product and any fragments thereof which may be present, in a slot coke oven as at least a part of a charge thereto, so that the charge in such oven becomes transiently plastic and shrinks during such heating, and a strong metallurgical coke results.

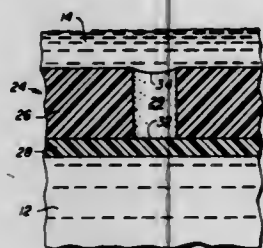
4,419,187

# APPARATUS AND METHOD FOR THERMAL MEMBRANE DISTILLATION

Dah Y. Cheng, Los Altos, and Steve J. Wiersma, Sunnyvale, both of Calif., assignors to International Power Technology, Inc., Sunnyvale, Calif.  
Continuation of Ser. No. 170,897, Jul. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 12,047, Feb. 14, 1979, Pat. No. 4,265,713. This application Mar. 4, 1982, Ser. No. 354,711  
Int. Cl.<sup>3</sup> B01D 3/02

U.S. Cl. 202—200

5 Claims



1. An improved thermal membrane distillation apparatus for distilling aqueous solutions comprising:

- a. a means for providing a body of distilland;
- b. a composite membrane having
  - (1) a microporous lyophobic layer;
    - (a) selected from the group consisting of polytetrafluoroethylene and polyvinylidene fluoride,
    - (b) wherein the average pore diameter is less than 0.4 micrometers; and
  - (2) wherein the improvement comprises means for preventing liquid intrusion into the pores of the lyophobic layer including a deposited layer of an essentially non-porous lyophilic coating on the lyophobic layer;
  - (a) the lyophilic coating being selected from the group

consisting of polyallylamine, polyacrylic acid and dehydrated polyvinyl alcohol,  
(b) wherein the lyophilic coating is positioned adjacent to the distilland; and

- c. a means sized for preventing said liquid intrusion by providing a sufficient temperature gradient across said microporous lyophobic layer so that the liquid distilland evaporates on the distilland of the pores of the lyophobic layer and condenses on the liquid distillate side of the pores of the lyophobic layer.

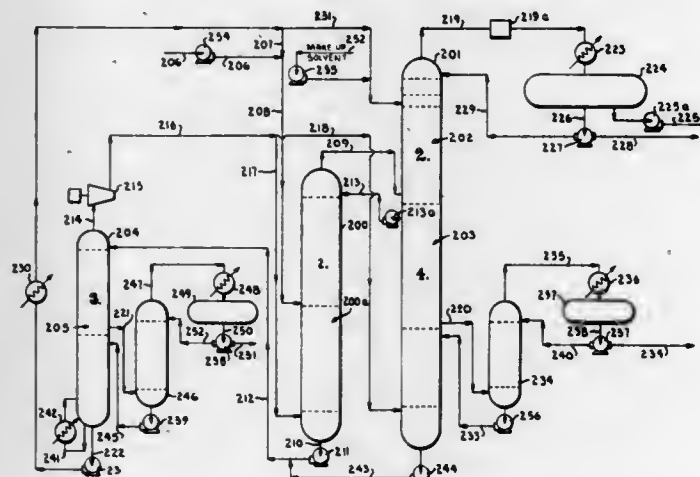
4,419,188

# THERMALLY COUPLED EXTRACTIVE DISTILLATION PROCESS

Thomas F. McCall, 5425 Windsor La., Fairway, Kans. 66205  
Continuation of Ser. No. 155,660, Jun. 2, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 350,592  
Int. Cl.<sup>3</sup> B01D 3/40

U.S. Cl. 203—24

25 Claims



1. In a plurality of distillation columns having positioned therewithin a plurality of distillation zones, the process of thermally coupled, extractive distillation comprising the steps of:

- (1) extractively distilling in a first distillation zone a first feed stream containing higher and lower boiling components in the presence of extractive solvent to separate a relatively high volatility overhead vapor stream and a relatively low volatility liquid bottoms stream,
- (2) supplying said overhead stream to the lower portion of a second distillation zone and said bottoms stream to the upper portion of a third distillation zone,
- (3) passing an overhead vapor stream, after dividing same, from said third distillation zone to a lower level of a fourth distillation zone and a lower level of the first distillation zone,
- (4) passing a second feed stream of predominantly extractive solvent to an upper part of the second distillation zone,
- (5) passing a liquid stream from the lower portion of the second distillation zone to an upper level of the first distillation zone and also to an upper level of the fourth distillation zone,
- (6) passing a liquid stream from the lower portion of the fourth distillation zone to an upper portion of the third distillation zone,
- (7) additionally carrying out extractive distillations in said second, third and fourth distillation zones also in the presence of said extractive solvent,
- (8) withdrawing an overhead highest volatility vapor stream from the top of the second distillation zone,
- (9) withdrawing an intermediate, next lower volatility stream, including some extractive solvent, from said fourth distillation zone intermediate the ends thereof,
- (10) withdrawing a lowest volatility liquid bottoms stream, predominantly comprising extractive solvent, from said third distillation zone,

- (11) passing at least a portion of the overhead withdrawal stream from the top of the second distillation zone, as well as a portion of the intermediate withdrawal stream from the fourth distillation zone out of the system,
- (12) condensing said second distillation zone overhead withdrawal vapor stream and recycling at least a portion thereof as reflux to an upper level of the second distillation zone
- (13) heating the lower part of the third distillation zone to aid in accomplishing the distillation of the said four distillation zones, and
- (14) recycling at least a portion of the third distillation zone bottoms withdrawal stream, after cooling thereof, to an upper level of the second distillation zone as the major portion of the second, predominantly extractive solvent feed stream thereto.

4,419,190

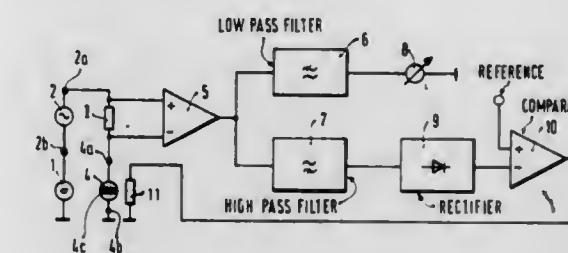
# METHOD AND APPARATUS TO MEASURE THE OPERATING TEMPERATURE OF SOLID ELECTROLYTE-TYPE GAS SENSORS

Hermann Dietz, Gerlingen; Ferdinand Grob, Besigheim; Klaus Muller, Tamm; Lothar Raff, Remseck; Franz Rieger, Aalen, and Hans-Martin Wiedenmann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Mar. 12, 1982, Ser. No. 357,803  
Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117790

U.S. Cl. 204—1 T

Int. Cl.<sup>3</sup> G01N 27/58

9 Claims



1. Method of measuring the operating temperature of a limit current-type solid electrolyte gas composition sensor (4) having two electrodes (4a, 4b), wherein the electrical characteristic of the sensor, representative of combustion of the gas, varies with change of at least a component thereof, and said change is evaluated;

comprising, in accordance with the invention, the steps of applying to the electrodes of the sensor (4) a direct voltage and, serially therewith, an alternating voltage of a frequency substantially in excess of the rate of variation of said electrical characteristic and of an amplitude which is substantially less than the range of direct voltage within which the current through the sensor is essentially independent of applied direct voltage and depends only on concentration of said gas;

and measuring the magnitude of alternating current flowing through the sensor to obtain a measure of the temperature thereof.

5. Apparatus to determine the operating temperature of a solid electrolyte limit current-type or polarographic-type gas composition sensor (4) having two electrodes (4a, 4b); said apparatus including a d-c current source (1) connected to the electrodes; means (6, 7) for evaluating an electrical characteristic of the sensor representative of the composition of the gas and varying with change of at least one component thereof, and comprising an alternating current voltage source (2) serially connected with the d-c current source and the electrodes of the sensor (4a, 4b);

current measuring means (3, 5) connected to the sensor and measuring current flow therethrough, the d-c current source (1), the a-c voltage source (2), the current measuring means (3) and the sensor (4) being connected in a closed series circuit, and the a-c voltage from said a-c source (2) being superimposed on, or modulating the d-c voltage; and frequency separating means (6, 7) connected to the output of said current flow measuring means and separating alternating current components and essentially direct current or slowly varying current components, and deriving, respectively, direct output signals representative of the at least one component in the composition of the gas, and alternating current components representative of temperature of the gas, the level of a-c voltage applied from the a-c source being of an amplitude which is substantially less than the range of direct voltage within which the current through the sensor is essentially independent of applied direct voltage.

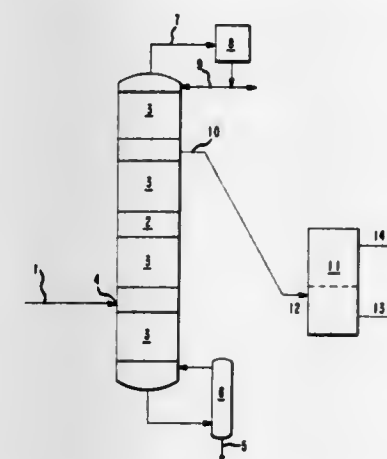
4,419,189

# DISTILLATION OF 1,4-BUTANEDIOL

Vincent P. Caracciolo, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.  
Filed Jan. 11, 1982, Ser. No. 338,475  
Int. Cl.<sup>3</sup> B01D 3/06, 3/26; C07C 29/80, 31/20

U.S. Cl. 203—77

2 Claims



1. A continuous two-stage process for refining 1,4-butanediol containing 1-20% by weight of water and 0.05-5% by weight of tars, the process comprising

- (a) in the first stage, passing the butanediol to a column at its midpoint or below, subjecting the 1,4-butanediol to vacuum distillation, and withdrawing partially refined liquid butanediol from the column at a point above its entry point,

and

- (b) in the second stage, subjecting the butanediol from the first stage to a single-stage flash evaporation under a vacuum greater than that in the column of the first stage, and withdrawing the refined butanediol, which contains less than 400 ppm of water and is substantially free of color-formers, from the evaporation stage as the unvaporized component.



4,419,191

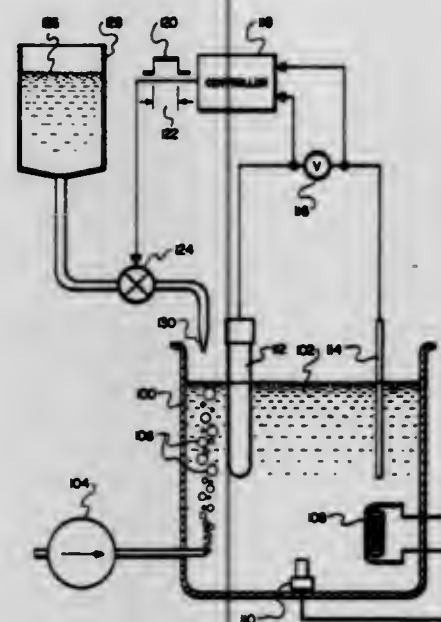
**ELECTROCHEMICAL MONITORING METHOD**

Kenneth E. Weber, Pacific Palisades, and Steven D. Hoffer, Sunnyvale, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Division of Ser. No. 346,168, Feb. 5, 1982. This application Aug. 20, 1982, Ser. No. 410,184  
Int. Cl.<sup>3</sup> G01N 27/46

U.S. Cl. 204—1 T

4 Claims



1. An electrochemical method for monitoring the concentration of hydrogen peroxide within an alkaline peroxide solution comprising the steps of:

- immersing a saturated calomel first electrode into said solution;
- immersing a pure metal magnesium second electrode into said solution; and
- measuring the electrochemical potential voltage generated between said first and second electrodes.

4,419,192

**METHOD FOR GALVANIC DEPOSITION OF COPPER**  
Wolfgang Dahms, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 17, 1981, Ser. No. 244,727

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3012168

Int. Cl.<sup>3</sup> C25D 3/38

U.S. Cl. 204—15

7 Claims

1. Method for galvanic deposition of smooth and ductile copper from acid copper baths, the metal content of which baths remains unchanged during the deposition, comprising the steps of providing an acid copper bath, inserting the object to be plated into said bath, connecting said object as a cathode, immersing into said bath a combination of soluble anode and inert anode composed of precious metal, precious metal alloys or their compounds, connecting said anodes to a source of electrical energy, using the anodes in which the ratio of the geometric surface of inert to soluble anode amounts to from 1:1 to 1:200, and providing the inert anode additionally with a potential.

5. Method according to claim 1 for building up the conductor paths of printed circuits.

4,419,193

**METHOD FOR MAKING HOLLOW PENDANTS**

Juei-Lung Chen, Kaohsiung, Taiwan

Filed Aug. 31, 1982, Ser. No. 413,500

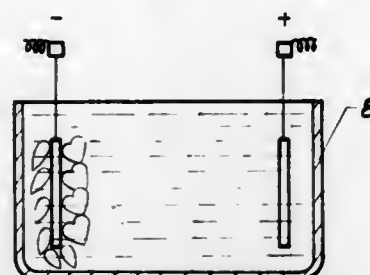
Int. Cl.<sup>3</sup> C25D 5/34, 7/00

U.S. Cl. 204—18.1

2 Claims

1. A method for making a hollow pendant of copper plate comprising cutting workpieces of the desired configuration for

the pendant from copper plate, press-forming said workpieces into half-pieces having the desired form for a half-piece of the pendant, clamping two of said half-pieces tightly together at their common surface to be joined, slowly rotating said



clamped half-pieces and simultaneously welding said surface together with silver alloy welding rod to join said half-pieces into a pendant, grinding said welded joint, polishing said pendant, and electroplating the surface of said pendant with the desired material to make the finished product.

4,419,194

**METHOD AND APPARATUS FOR CONTINUOUSLY CHROMIUM-PLATING**

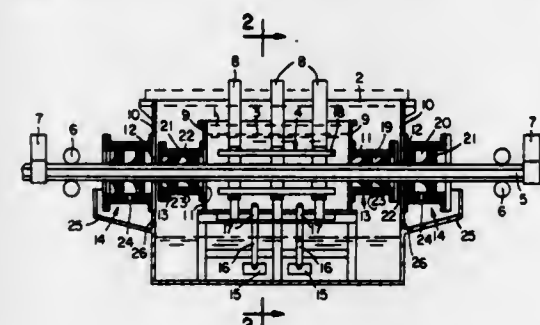
Sergio Angelini, Milan, Italy, assignor to Brevetti Elettrolitici Superfiniture S.R.L., Milan, Italy

Filed May 6, 1982, Ser. No. 375,786

Claims priority, application Italy, May 20, 1981, 21843 A/81  
Int. Cl.<sup>3</sup> C25D 7/00, 17/00

U.S. Cl. 204—25

10 Claims



1. A method for removing hydrogen in continuously chromium-plating of bars and the like, in which the bar is moved forward along a rectilinear path and through an anode immersed in a chromium-plating bath, and in which the level of the fluid in the chromium-plating bath is kept at a constant height by recycling the chromium-plating fluid of the aforesaid bath, the improvement comprising the steps of recycling the fluid of the chromium-plating bath feeding it directly into the space within the chromium-plating anode and directing a jet of chromium-plating fluid under pressure, towards surfaces of the aforesaid bar.

5. An apparatus for the continuously chromium-plating of bars and the like, for carrying out a method for removing hydrogen, the apparatus comprising a first inner tank containing a chromium-plating bath, placed within a second tank outside the first, the tanks having lateral walls with apertures for passage of the bars, said apertures being aligned with an anode having apertures immersed in the chromium-plating bath, and sealing means in correspondence with the apertures in the aforesaid walls, said sealing means comprising chambers for collecting the chromium-plating fluid passing through the seals themselves and means for conveying it into the outer tank and further comprising a cylindrical body for supporting at least two sets of flexible sealing elements axially spaced apart from one another and removably fixed to the wall of the tank, and spacing elements arranged within the aforesaid cylindrical body, the flexible sealing elements being held tight, by the action of an outer thrust flange, between the opposing edges of

two adjacent spacers, said spacers and said supporting body presenting on the bottom thereof outlet apertures for the chromium-plating fluid, and a system for recycling the chromium-plating fluid under pressure, from the outer tank to the inner tank, said recycling system comprising nozzles placed in correspondence with apertures in the anode, facing towards the inside of the anode itself and towards the bar to be chromium-plated.

4,419,195

**ELECTROLYTIC RECOVERY OF COBALT OXO CATALYSTS**

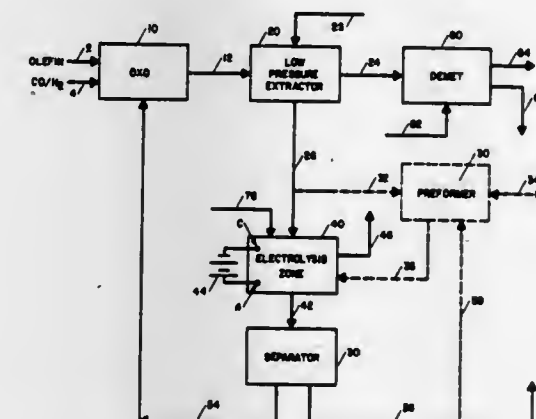
David A. Young, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 7, 1982, Ser. No. 337,593

Int. Cl.<sup>3</sup> C25B 3/02

U.S. Cl. 204—78

14 Claims



1. A process for forming dicobalt octacarbonyl in liquid medium, which comprises subjecting an aqueous solution containing a water-soluble tetracarbonylcobaltate salt in an electrolysis zone and in the presence of an organic solvent for dicobalt octacarbonyl to an externally applied voltage and electrical current at a magnitude and for a time sufficient to convert at least a portion of said tetracarbonylcobaltate salt to dicobalt octacarbonyl which is extracted into said organic solvent thereby forming an organic phase containing dissolved dicobalt octacarbonyl which can be recovered and is suitable for use as catalysts feed to an olefin hydroformylation reaction.

4,419,196

**PRODUCTION OF MOLDED PRODUCTS BASED UPON A TWO-COMPONENT HYDRAULIC MINERAL RESIN**

Philippe J. Beckerick, 44 rue J. Ferry, Follainville, France (78200); Patrice R. Hamelin, 6 rue Chambfort, Villeurbanne, France (69100), and Andre R. Fumez, Le Bourg d'en Haut, Bons en Chablais, France 74140

Filed Mar. 25, 1981, Ser. No. 247,328

Int. Cl.<sup>3</sup> B06B 3/00; C04B 9/02, 70/2

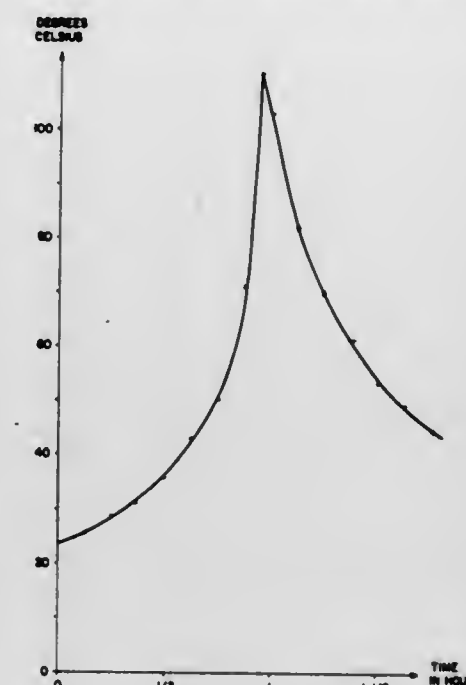
U.S. Cl. 204—157.1 R

7 Claims

1. Manufacturing process for molded products, whether or not expanded, based upon a two-component mineral resin mixture of magnesium oxide and magnesium chloride and water to form a pourable or moldable binder, said process comprising the steps of:

- preparing the hydraulic binder by making a mixture comprising 20 to 30% of magnesium chloride and 70 to 80% of magnesium oxide, to which ingredients there is added a quantity of water of between 10 and 35%; and
- subjecting the mixture to mechanical or electromagnetic vibrations, including waves of light or nuclear energy sufficient to trigger an abrupt exothermic reaction within

the core of the mixture, which causes the temperature of the mixture to spontaneously rise without continued addi-



tion of external heat during the entire setting period, whereby the mixture sets and hardens.

4,419,197

**PROCESS FOR CROSS-LINKING OF NON-POLAR POLYMERS IN HIGH FREQUENCY ELECTRIC ALTERNATING FIELDS**

Heinz Meyer, Hohenschäftlarn; Maximilian Dorn, Munich, and Hans Seidl, Grünwald, all of Fed. Rep. of Germany, assignors to Peroxide-Chemie GmbH, Hüllriegelskreuth Bei München, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,481

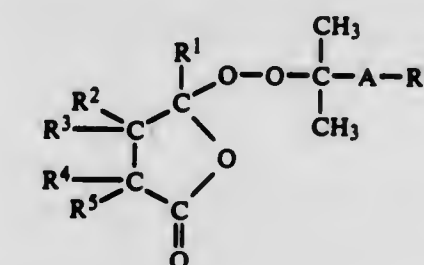
Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018321

Int. Cl.<sup>3</sup> C08F 8/00

U.S. Cl. 204—159.2

8 Claims

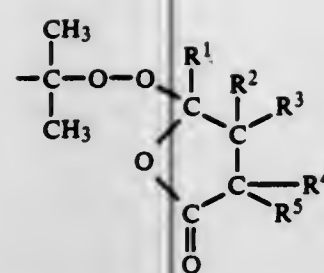
1. Process for cross-linking non-polar polymers in a high frequency electric alternating field which comprises contacting the non-polar polymer with a peroxide cross-linking agent and exposing the mixture to a microwave electric alternating field, wherein the cross-linking agent peroxide is of the formula



in which

- R<sup>1</sup> is a hydrogen atom, an alkyl radical containing up to 4 carbon atoms or a phenyl radical optionally substituted by halogen atoms or alkyl radicals containing up to 4 carbon atoms;
- R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup>, which can be the same or different, are hydrogen atoms or, together with the carbon atoms to which they are attached, represent o-phenylene radicals;
- A is a straight-chained or branched alkylene radical containing up to 5 carbon atoms or a straight-chained or branched alkylene radical containing up to 5 carbon atoms or a phenylene radical and;
- R<sup>6</sup> is a hydrogen atom or a radical of the general formula



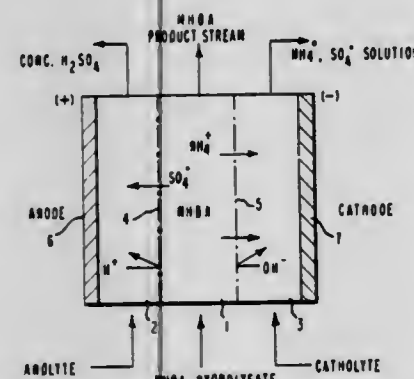


in which R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are identified as above.

**4,419,198**  
**PURIFICATION OF METHIOINE HYDROXY**  
**ANALOGUE HYDROLYZATE BY ELECTRODIALYSIS**  
 Ernest J. Breda, Beaumont, Tex., and Kenneth B. Keating,  
 Wilmington, Del., assignors to Monsanto Company, St. Louis,  
 Mo.

Filed Jun. 22, 1981, Ser. No. 275,670  
 Int. Cl.<sup>3</sup> B01D 13/02  
 U.S. Cl. 204—180 P

8 Claims



1. A process for separating anions and cations from a reaction mixture obtained by acid hydrolysis of MHBN to MHBA comprising:

- introducing the reaction mixture into an electrolytic cell, said cell having at least three compartments, an anode compartment containing anolyte and having an anode in contact with said anolyte, a cathode compartment containing catholyte and having a cathode in contact with said catholyte, separated by at least one process compartment into which said reaction mixture is introduced, an anion-exchange membrane separating said anode compartment from said process compartment, and a cation-exchange membrane separating said cathode compartment from said process compartment; said anolyte and said catholyte being selected from water or aqueous sulfuric acid containing up to about 10% sulfuric acid;
- applying a direct current of electricity through the cell such that up to about 450 Ampere-hours of electrical charge are passed per liter of reaction mixture, the current being driven by an applied voltage of about 2 to 20 volts per cell; and
- recovering the purified MHBA reaction mixture.

**4,419,199**  
**PROCESS FOR PHOSPHATIZING METALS**  
 Dieter Hauße, Frankfurt; Gerhard Müller, Hanau; Werner Rausch, Oberursel, and Gudrun Volting, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Occidental Chemical Corporation, Warren, Mich.

Filed Apr. 30, 1982, Ser. No. 373,475  
 Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118375

Int. Cl.<sup>3</sup> C23F 7/10, 7/12; C25D 13/06, 13/20  
 U.S. Cl. 204—181 R

6 Claims

1. A process for phosphatizing metal surfaces which comprises forming a phosphate coating on the metal surface by

contacting the metal surface with an aqueous acidic zinc phosphate solution containing an oxidizing agent, which zinc phosphate solution contains:

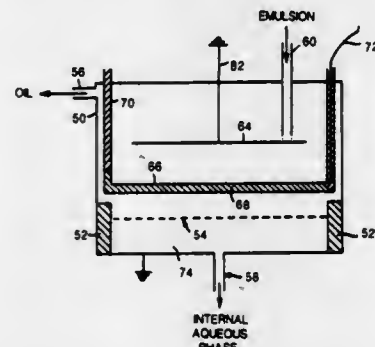
- from about 0.4 to 1.5 g/liter of Zn,
  - from 0 to 1.3 g/liter of Ni and
  - from 10 to 26 g/liter of P<sub>2</sub>O<sub>5</sub>,
- and in which the weight ratio of Zn to P<sub>2</sub>O<sub>5</sub> is from about 0.012 to 0.12:1 and the weight ratio of Ni to Zn is from about 0 to 1.5:1 and, thereafter, replenishing the said zinc phosphate solution with a replenishing solution in which the weight ratio of Zn:Ni:P<sub>2</sub>O<sub>5</sub> is from about 0.18 to 0.33:0 to 0.06:1.

6. The process as claimed in claim 1, 2, 5, 3, or 4 in which, following the formation of the phosphate coating on the metal surfaces treated, an electrophoretic coating is applied to said treated surfaces.

**4,419,200**  
**ELECTRICAL COALESCENCE OF LIQUID EMULSIONS**  
 Edward C. Hsu, Bridgewater; Norman N. Li, Edison, and Taras Hucal, Iselin, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 27, 1981, Ser. No. 286,874  
 Int. Cl.<sup>3</sup> B03C 5/00; C25B 11/00  
 U.S. Cl. 204—186

8 Claims



1. In a process for electrically coalescing a water-in-oil emulsion in an AC electrical field in a coalescing zone between at least two cooperating electrodes wherein a layer of solid dielectric medium is maintained in at least one portion of said inter-electrode field space adjacent to at least one electrode, the improvement which comprises a hydrophobic surface on at least a portion of said dielectric medium at the interface of said dielectric medium and said emulsion in said coalescing zone and wherein the dielectric constant of said dielectric medium is at least about 4.

**4,419,201**  
**APPARATUS AND METHOD FOR PLASMA-ASSISTED ETCHING OF WAFERS**  
 Hyman J. Levinstein, and Frederick Vratny, both of Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,531  
 Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 E

8 Claims

1. Apparatus for low-contamination plasma-assisted dry etching of an aluminum layer formed on a wafer, said apparatus comprising a reaction chamber, means for establishing within said chamber an etching plasma derived from a mixture of boron trichloride and chlorine gases, said chamber including surfaces exposed to said plasma, and a coating of aluminum oxide on at least the surfaces in the immediate vicinity of the wafer to be etched, wherein said coating comprises individual particles of crystalline-β aluminum oxide fused together on said surfaces in a plasma spraying process.

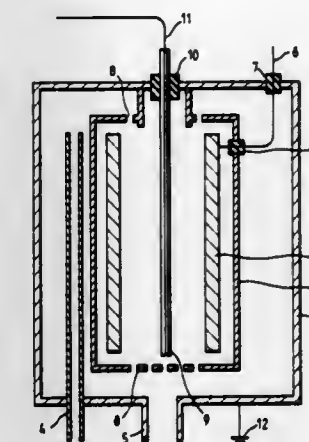
**4,419,202**  
**METAL COATINGS**  
 Ian P. Gibson, Snodland, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 17, 1981, Ser. No. 331,881  
 Claims priority, application United Kingdom, Dec. 22, 1980, 8041039

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 N

8 Claims



1. A method of coating the inner surface of a gun barrel with a wear resistant material, comprising the steps of:

- providing a coating material source within the gun barrel comprising a refractory metal or a refractory metal compound together with another metal, said refractory metal having a melting point in excess of 1535° C.;
- establishing a glow discharge in the region of the source, said source being connected as a sputtering cathode; and
- applying a negative bias potential to the gun barrel; whereby a smooth tenacious coating having a substantially non-columnar microstructure is formed on the inner surface of the gun barrel without excessive heating thereof.

**4,419,203**  
**APPARATUS AND METHOD FOR NEUTRALIZING ION BEAMS**  
 James M. E. Harper, Mordehai Heiblum, both of Yorktown Heights, N.Y., and Harold R. Kaufman, Fort Collins, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1982, Ser. No. 355,067  
 Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 R

8 Claims

1. An apparatus for generating a self-neutralized ion beam comprising:

- a plasma chamber for receiving a gas for producing ions, said chamber including anode and cathode elements, and an acceleration screen grid for supplying charged particles, said cathode and anode producing in response to a voltage potential energetic primary electrons and low energy background electrons for ionizing said gas;
- means for applying a voltage potential between said cathode and anode whereby said energetic primary electrons and low energy background electrons are produced; and
- means for maintaining said screen grid at a marginally positive voltage potential with respect to said cathode, and at a larger negative voltage with respect to said anode whereby said high energy electrons migrate to said grid along with ions produced by collisions of said electrons and gas, and exit said grid forming a neutralized ion beam.

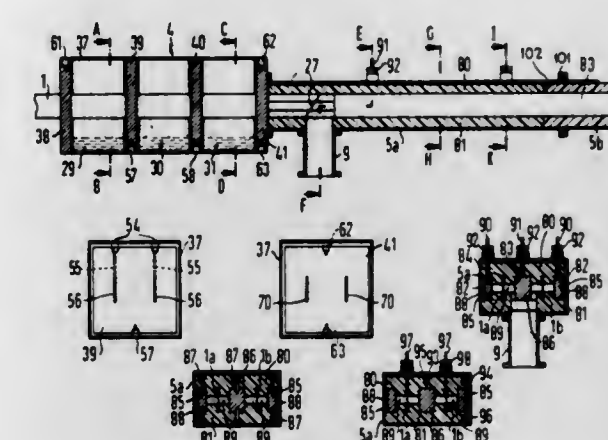
**4,419,204**  
**INSTALLATION FOR THE ELECTRO-DEPOSITION OF METALS, PARTICULARLY ALUMINUM**  
 Siegfried Birkle, Hoechststadt; Johann Gehring, Spardorf, and Klaus Stoeger, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 419,546  
 Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137908

Int. Cl.<sup>3</sup> C25D 17/00

U.S. Cl. 204—206

9 Claims



1. In an installation for electro-deposition of metals particularly for the deposition of aluminum from an aprotic, oxygen-free and water-free aluminum-organic electrolyte onto elongated goods, said installation comprising a tubular cell which is closed to the outside, receives the goods to be treated, has anodes extending therealong, and has means to cathodically contact the goods to be treated; conveying means for moving the goods continuously in an axial direction in the cell along the anodes; and pump means for circulating the electrolyte through the cell in a direction opposite the direction of motion of the goods, said cell having lock means consisting of a plurality of chambers for preventing the outflow of electrolyte from the tubular cell disposed at each end of the tubular cell, the improvements comprising said tubular cell comprising at least two interconnected rectangular metal tubes, each tube having a flange at each end for forming a connection, and interchangeable, nonconductive insert pieces being disposed in said tubular cell, said pieces being matched to the interior dimensions of the rectangular tubes and being shaped to provide at least two longitudinal channels for guiding the goods to be metallized and for positioning the anodes surrounding the goods to be metallized in the flow of electrolyte, and said conveying means and each of the chambers of the lock means being designed along with the two channels to enable simultaneous processing of at least two elongated goods.

**4,419,205**  
**APPARATUS FOR PREPARING MEAT FOOD PRODUCTS HAVING REDUCED SHRINKAGE**  
 Peter W. Rose, R.R. 3 Covered Bridge Rd., So. Barrington, Ill. 60010

Division of Ser. No. 165,850, Jul. 7, 1980, Pat. No. 4,276,313, which is a continuation-in-part of Ser. No. 139,795, Apr. 14, 1980, Pat. No. 4,264,632, which is a continuation-in-part of Ser. No. 129,727, Mar. 12, 1980, Pat. No. 4,264,631. This application Mar. 11, 1981, Ser. No. 242,477

Int. Cl.<sup>3</sup> C25B 15/08, 9/00

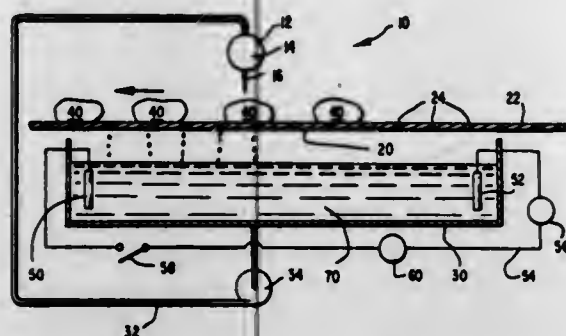
U.S. Cl. 204—228

4 Claims

1. In an apparatus for treating meat which includes meat support means, liquid injection means for injecting an aqueous meat treating solution into said meat movably positioned above said meat support means, and a reservoir for said meat treating solution positioned at a lower level than said meat injection means and communicating with said liquid injection means, the improvement which comprises a pair of spaced electrodes in



said reservoir capable of delivering a current concentration of at least about 0.001 amperes per liter of said solution in said reservoir, and

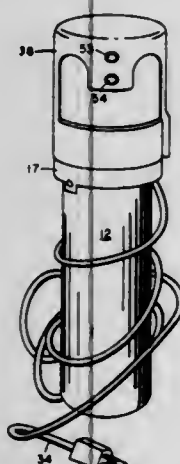


a direct current power source and an on-off switch operably associated with said spaced electrodes to pass current through said solution, said on-off switch being in an open position to stop the flow of current prior to the injection of said meat treating solution.

4,419,206

## ELECTRONIC WATER TREATING DEVICE

James R. Frame, 346 Sandan Rd., San Antonio, Tex. 78216  
Continuation of Ser. No. 129,611, Mar. 12, 1980, abandoned,  
which is a continuation of Ser. No. 267, Jan. 2, 1979, abandoned.  
This application Apr. 28, 1981, Ser. No. 258,505  
Int. Cl.<sup>3</sup> C25B 15/00, 9/00, 11/12; C02F 1/46  
U.S. Cl. 204—228 5 Claims



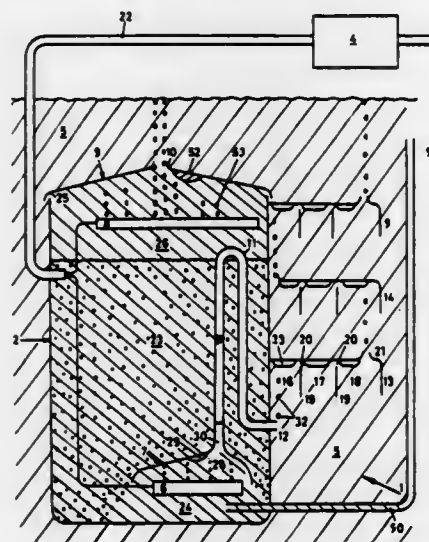
1. A water treating device comprising:  
a body portion having water inlet and outlet aperture means formed therein;  
an anode removably secured through electrical insulator means to said body portion;  
cannister cathode means removably secured to said body portion such that the interior of said cannister cathode is in fluid communication with said inlet and outlet apertures and said anode is centrally disposed in said cannister cathode;  
circuit means electrically connected to said anode and said cannister cathode for providing a flow of direct current through said anode and cannister cathode and through water flowing through said cannister cathode; and  
a standpipe in fluid communication with said water inlet aperture and projecting away from said body portion adjacent said anode, whereby water entering said cannister cathode is introduced at the base thereof.
2. A water treating device as in claim 1 wherein said circuit means comprises:  
first circuit means for providing a flow of direct current through said anode and said cannister cathode and through water flowing through said cannister cathode; and  
second circuit means for providing an indication that the resistance of said anode has increased beyond a predeter-

mined value due to an accumulation of material deposits thereon.

4,419,207

## ELECTROLYTIC HALOGEN GENERATORS

Jeffrey P. Bindon, 11 Edinburgh Crescent, Westville, 3630, Natal, South Africa  
Filed Jun. 7, 1982, Ser. No. 385,800  
Claims priority, application South Africa, Jun. 8, 1981, 81/3816  
The portion of the term of this patent subsequent to Feb. 14, 1999, has been disclaimed.  
Int. Cl.<sup>3</sup> C25B 9/00, 1/34, 15/08  
U.S. Cl. 204—237 6 Claims

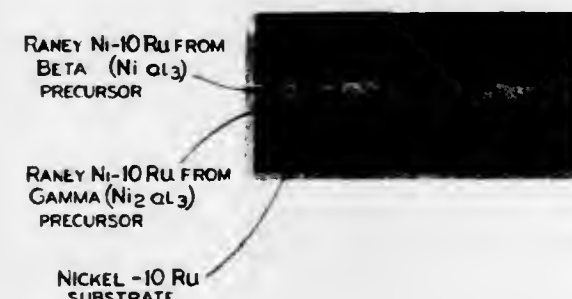


1. An electrolytic halogen generator comprising a cell which is submersible in a liquid and which includes a cathode adapted for location above a halide bed and an anode adapted for location therebelow, the cell being formed with a discharge aperture, at a high point, for the gaseous product formed at the cathode, is characterized in that inlet means is provided, which, in combination with the discharge of the cathode products through the discharge aperture, is adapted to promote a liquid flow in the electrolyte in a direction from the anode to the cathode.

4,419,208

## RANEY ALLOY COATED CATHODE FOR CHLOR-ALKALI CELLS

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.  
Filed Nov. 23, 1981, Ser. No. 324,188  
Int. Cl.<sup>3</sup> C25B 11/08; B01J 35/00  
U.S. Cl. 204—290 R 4 Claims



1. An improved low overvoltage electrode for use as a hydrogen evolution cathode in an electrolytic cell, the electrode having a Raney metal surface layer in electrical contact with a conductive metal core, characterized by the improvement in which said electrode is comprised of a porous Raney metal alloy surface layer integral with and derived from a monolithic nickel-ruthenium alloy conductive metal core,

wherein said Raney metal alloy surface layer is predominantly derived from an adherent (Ni-Ru)Al<sub>3</sub> Beta phase structured crystalline precursory alloy, and wherein the weight percentage of ruthenium in the nickel-ruthenium portion of said Raney metal alloy surface layer is between about 5 and about 15%.

4,419,209

## SOLID POLYMERIC ELECTROLYTE

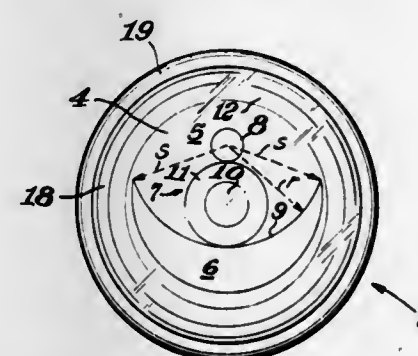
Peter R. Klinkowski, Norwalk, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.  
Filed Jul. 20, 1981, Ser. No. 285,196  
Int. Cl.<sup>3</sup> C25B 13/08; B01D 13/00  
U.S. Cl. 204—296 5 Claims

1. A solid polymeric electrolyte comprising a three-phase structure including a porous, woven or unwoven, substantially inert, fiber substrate, a film, impregnating said substrate, comprising fine particles of an ion exchange resin and a water insoluble matrix of an organic binder essentially permanently binding said particles to said fiber substrate and to each other, said binder having been precipitated onto said substrate from a mixture of binder, an organic solvent therefor and resin particles in suspension, by contact with a diluent characterized by a high degree of miscibility with said organic solvent and a relatively low degree of compatibility with said binder, forming an essentially continuous film of ion exchange resin and binder on said fiber substrate and in the interstices thereof capable of receiving a deposit thereon in the form of a cake of particulate solids, said solid polymeric electrolyte being essentially impervious to water.

4,419,210

## POLAROGRAPHIC ELECTRODE

Minchen Wang, Bayside, N.Y., assignor to Photovolt Corporation, Midland, Mich.  
Filed Aug. 9, 1982, Ser. No. 406,687  
Int. Cl.<sup>3</sup> G01N 27/54  
U.S. Cl. 204—403 10 Claims

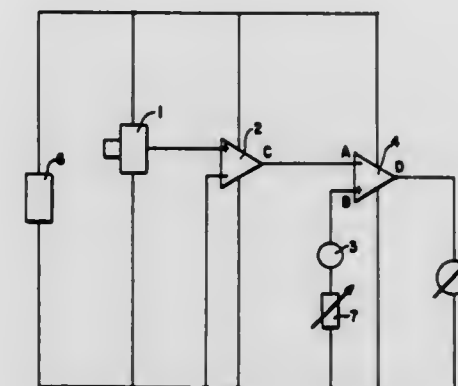


1. A membrane electrode comprising an analyte permeable membrane conformed to a smooth surface of a solidified filler matrix of an insulator material, which smooth surface is further comprised of the exposed surfaces of embedded electrodes which are flush with the adjacent surface of the filler matrix, the electrodes comprising an auxiliary electrode, working electrode, and reference electrode, the geometry of the auxiliary electrode defining a critical boundary which is an arc generated from a radius rotated about a point which is the center of the working electrode, the reference electrode being in the sector defined by the arc of the auxiliary electrode and the center of the working electrode.
10. The membrane electrode of claim 1 in which the membrane comprises immobilized glucose oxidase enzyme sandwiched between analyte permeable film membrane layers.

4,419,211

## GAS ANALYSIS SENSOR FOR MEASURING CONCENTRATION OF GAS CONSTITUENT

Lothar Brauer, Busseallee 14, 1000 Berlin 37, Fed. Rep. of Germany  
Filed Mar. 4, 1982, Ser. No. 354,905  
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3109224  
Int. Cl.<sup>3</sup> G01N 27/54  
U.S. Cl. 204—408 3 Claims



1. A gas analysis sensor for measuring gas concentration of a gas constituent and including an electronic instrument wherein a voltage is produced from the sensor which is proportional to the concentration of a gas constituent to be measured and said voltage is fed to an indicating device, the improvement comprising said electronic instrument further including:

a pressure-sensitive module adapted to be subjected to said gas concentration and to convert detected gas pressure into an electrical signal;  
an amplifier connected to amplify said electrical signal; and  
a differential amplifier having an invertible input connected to receive said amplified signal and a non-inverting input connected to receive said voltage and having its output connected to said indicating device for energization thereof, said differential amplifier means adapted to automatically adjust said voltage by an amount corresponding to variations in said voltage created by atmospheric pressure changes applied to said sensor and thereby provide said output with values compensated for changing atmospheric pressure such that said indicating device indicates true gas concentration unaffected by variations in atmospheric pressures.

4,419,212

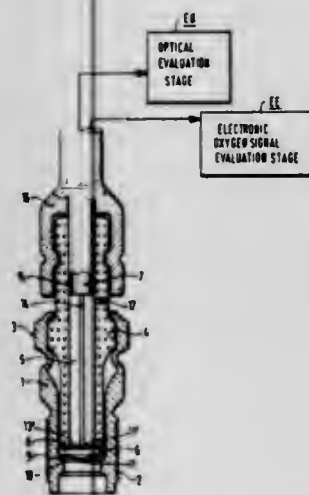
## COMBINATION GAS OXYGEN CONCENTRATION AND COMBUSTION LIGHT SENSOR

Hermann Dietz, Gerlingen; Gerhard Holfelder, Weissach-Flacht; Klaus Müller, Tamm, and Harald Reber, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Jan. 27, 1982, Ser. No. 343,194  
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104410  
Int. Cl.<sup>3</sup> G01N 27/46 10 Claims

1. Unitary oxygen concentration and combustion light sensor to determine  
(a) light emission phenomena upon combustion of a fuel-air mixture in a combustion chamber, especially the combustion chamber of an internal combustion (IC) engine; and  
(b) the concentration of oxygen in resulting combustion gases,  
having  
an elongated tubular housing (1) formed with attachment means (2, 3) to expose one end of the housing to the combustion chamber



comprising, in accordance with the invention, the combination of a solid electrolyte body of a light transmission ceramic material (6) positioned in the housing; electrodes (11, 11', 11c, 11'c, 12) applied to the solid electrolyte body; and connection means (9, 14, 15) connected to the electrodes for forming externally accessible terminals to apply signals derived from said electrode to an electronic oxygen signal evaluation stage (EE) to evaluate the oxygen content of the gases resulting from combustion of the fuel-air mixture in the combustion chamber;



with a light guide (7) positioned in optically coupled relation to the combustion chamber and secured in the tubular housing, to transmit light signals representative of combustion processes in the combustion chamber to an optical combustion process evaluation stage (EO) to optically evaluate the combustion process upon occurrence of combustion of said fuel-air mixture for conjoint and simultaneous sensing of changes in chemical composition of the atmosphere in the combustion chamber upon occurrence of combustion and the optical phenomena of said combustion.

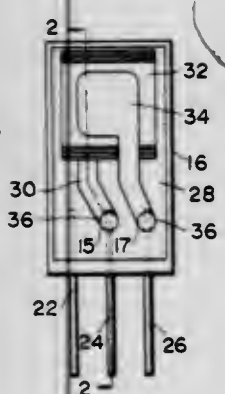
#### 4,419,213 OXYGEN SENSING ELEMENT FORMED AS LAMINATE OF THIN LAYERS ON SUBSTRATE PROVIDED WITH HEATER AND LEAD WIRES

Masaharu Oshima; Kenji Ikezawa, and Hiroyuki Aoki, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 12, 1982, Ser. No. 348,265  
Claims priority, application Japan, Feb. 19, 1981, 56-22242  
Int. Cl.<sup>3</sup> G01N 27/58

U.S. Cl. 204-425

7 Claims



1. An oxygen sensing element having a substrate comprising a ceramic material, an oxygen concentration cell in the form of a laminate of thin layers placed on a major surface of the substrate, said laminate including an oxygen ion conductive

solid electrolyte layer, a reference electrode layer adjacent the solid electrolyte layer and a measurement electrode layer adjacent the solid electrolyte layer, an electric heater embedded in the substrate and a plurality of lead wires having end portions inserted into the substrate and respectively connected to the heater and the reference and measurement electrode layers, wherein

the electrical connection of each of the lead wires connected to said concentration cell includes a conductor filled hole formed in the substrate so as to open at said surface of the substrate, and wherein

the inserted end portion of a first one of the lead wires, through which a current flows to the heater, is in close contact with a terminal portion of the heater substantially over the entire length of the inserted end portion and is completely shielded from environmental atmosphere by the substrate.

#### 4,419,214 PROCESS FOR THE RECOVERY OF SHALE OIL, HEAVY OIL, KEROGEN OR TAR FROM THEIR NATURAL SOURCES

Valer Balint; Andras Pinter, and György Mika, all of Budapest, Hungary, assignors to Országos Kőolaj és Gazipari Troszt and Budapesti Muszaki Egyetem, both of Budapest, Hungary  
Filed Oct. 22, 1981, Ser. No. 314,050

Claims priority, application Hungary, Dec. 23, 1980, 3091/80  
Int. Cl.<sup>3</sup> C10G 1/00; C10B 53/06, 57/00

U.S. Cl. 208-8 R

9 Claims

1. A method for the recovery of a hydrocarbon product from a natural source thereof which comprises the steps of:
  - (a) enclosing the mineral source in a pressure vessel;
  - (b) exposing the mineral source in said pressure vessel to microwave irradiation at a frequency selected from the group which consists of 915±50 MHz, 2375±50 MHz and 2450±50 MHz;
  - (c) simultaneously with the exposure of said mineral source in said pressure vessel to microwave irradiation, feeding an expelling medium selected from the group which consists of carbon tetrachloride, chloroform and chlorinated-fluorinated hydrocarbons through said pressure vessel to entrain the hydrocarbon product therefrom, said expelling medium having a dielectric constant of less than 5 at 3 GHz; and
  - (d) recovering said hydrocarbon product from said medium.

#### 4,419,215 METHOD OF PRE-HEATING PARTICLES OF A HYDROCARBON-BEARING SUBSTRATE AND AN APPARATUS THEREFOR

Heinz Voetter; Hubrecht C. A. Van Meurs; Richard C. Darton, all of The Hague, and Rajamani Krishna, Amsterdam, all of Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Apr. 19, 1982, Ser. No. 369,684

Claims priority, application United Kingdom, Apr. 22, 1981, 8112490

Int. Cl.<sup>3</sup> C10G 1/00; F28D 13/00

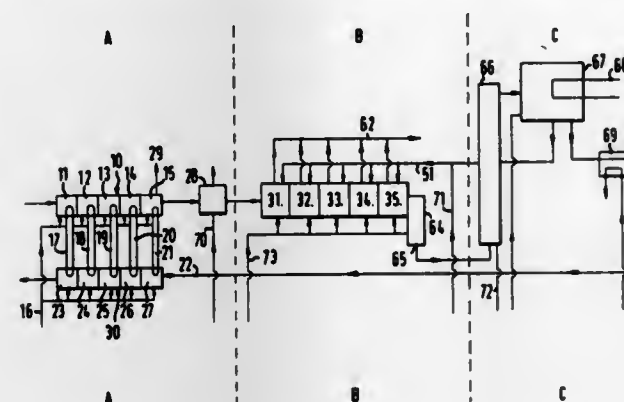
U.S. Cl. 208-11 R

14 Claims

1. A method of preheating particles of a hydrocarbon-bearing substrate by means of hot spent substrate, said particles having a diameter of 0.5 to 5 mm; comprising the steps of: providing a horizontal fluidized flow of hydrocarbon-bearing substrate and a horizontal fluidized flow of hot spent substrate, while maintaining the hot spent substrate in indirect, countercurrent flow with respect to the flow of the hydrocarbon-bearing substrate;

providing a series of heat transfer loops defining two or more heat transfer stages located between the flows of the hydrocarbon-bearing substrate and the hot spent substrate, each heat transfer loop containing a circulating heat transfer fluid,

and each loop being in heat transfer contact with each of said fluidized flows; choosing said heat transfer fluids such that part of the loops operate in the temperature range of from 65° to 100° C. and part in the temperature range of from 100° to 300° C. maintaining the horizontal flow of the hot spent substrate in substantially fluidized bed condition in two or more stages, said hot spent substrate being cooled in a staged manner;



maintaining the horizontal flow of the hydrocarbon-bearing substrate in a substantially fluidized bed condition in two or more stages; and indirectly heating the hydrocarbon-bearing substrate in a staged manner from ambient temperature to about 250° C. by means of heat transferred from the hot spent substrate by the heat transfer loops.

#### 4,419,216 PROCESS OF RECOVERING OIL FROM OIL-CONTAINING MATERIALS

Norbert Magadan, Hasselroth; Horst Seldel, and Hans J. Weiss, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

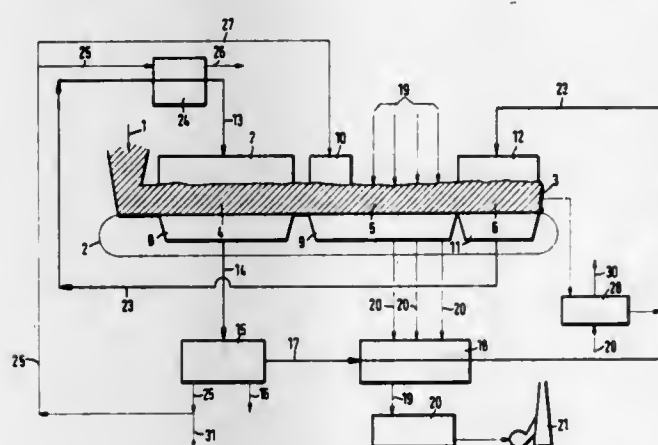
Filed Jun. 10, 1982, Ser. No. 387,074

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124277

Int. Cl.<sup>3</sup> C10G 1/02; C10B 53/06

U.S. Cl. 208-11 R

9 Claims



1. In a process of recovering oil from an oil-containing mineral consisting essentially of charging, said oil-containing mineral onto a travelling grate, passing a hot gas through the bed in a retorting zone to heat the bed to the retorting temperature, entraining the resulting vapors and gaseous retorting products by the retorting gases, separating oil from the retort gases in a separating stage, burning solid carbon in the resultant retorted bed in a succeeding combustion zone by means of an oxygen-containing gas passed therethrough, removing gases from oil in the separating zone and passing said gases through the bed in a succeeding cooling zone, and recycling the resultant heated gases to the retorting zone, the improvement wherein the retort gases are passed directly to said separating stage, the solid carbon in a top layer of said bed is ignited by

means of an ignition furnace at the beginning of the combustion zone, oxygen-containing gases are sucked through the bed thereafter to cause the burning zone to move through the bed from top toward bottom, partial stream of the gas which is leaving the separating stage is heated by an indirect heat exchange with the exhaust gases from the combustion zone and is passed through the bed in the cooling zone, and are reheated therein and is then recycled to the retorting zone, and a partial stream of the gas that is leaving the separating stage is discharged.

#### 4,419,217 PROCESS FOR IMPROVING THE YIELD OF SHALE OIL

Costand A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 17, 1983, Ser. No. 467,415  
Int. Cl.<sup>3</sup> C10G 1/00

U.S. Cl. 208-11 R

4 Claims

1. A method for increasing the yield of liquid oil from spent shales comprising (1) treating a spent shale with a mixture of from about a 10:1 to about a 1:10 ratio by volume of methanol to water at a temperature of between about 225° and 350° C. at a pressure of from about 900 to about 2750 psi for from about 10 minutes to about four hours, (2) removing the methanol-water mixture and (3) retorting the treated spent shale, resulting in the recovery of from about 10% to 40% more oil from the spent shale than was obtained in the original retorting process.

#### 4,419,218 CATALYTIC CONVERSION OF SHALE OIL

Philip J. Angevine, West Deptford; Günter H. Kühl, and Sadl Mizrahi, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 8, 1981, Ser. No. 281,450

Int. Cl.<sup>3</sup> C10G 47/16

U.S. Cl. 208-59

9 Claims

1. A process for selectively converting a previously hydro-treated shale oil to a fraction primarily in the 400°-650° F. boiling range, comprising contacting said shale oil with a ZSM-12 crystalline aluminosilicate zeolite having a silica-to-alumina ratio greater than about 12 said shale oil having been previously hydrotreated at a temperature of about 650°-850° F., a pressure of about 500 to 3000 psig, and hydrogen/oil ratio of about 1,000-10,000 SCF/B and an LHSV of about 0.2-2.95 and thereafter hydroprocessing under shale oil conversion conditions sufficient to convert from at least about 50 to about 95% of the unconverted treated shale oil present based on the weight of the oil to said 400°-650° F. fraction.

#### 4,419,219 ADSORPTION OF BASIC ASPHALTENES ON SOLID ACID CATALYSTS

Robert B. Long, Atlantic Highlands, and Fred A. Caruso, Elizabeth, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1981, Ser. No. 305,267

Int. Cl.<sup>3</sup> C10G 11/04, 25/00, 25/12

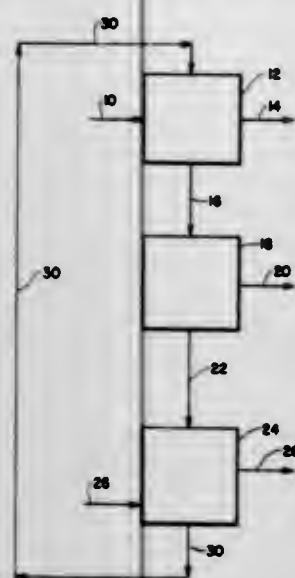
U.S. Cl. 208-96

10 Claims

1. A process for selectively removing basic asphaltenes from a basic asphaltene-containing hydrocarbon feed that contains less than about 1 wt. % water which comprises contacting said feed with a regenerated solid acid catalyst at a temperature below about 575° F. for a time sufficient to selectively absorb at least a portion of said basic asphaltenes onto said solid acid



to produce a hydrocarbon feed of reduced basic asphaltene content, wherein said solid acid catalyst has been calcined to



remove adsorbed water from the surface thereof prior to being contacted with said feed.

4,419,220

## CATALYTIC DEWAXING PROCESS

Rene B. LaPierre, Medford; Randall D. Partridge, Princeton; Nai Y. Chen, Titusville, all of N.J., and Steven S. Wong, Langhorne, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 18, 1982, Ser. No. 379,422

Int. Cl.<sup>3</sup> C10G 47/16

U.S. Cl. 208—111

10 Claims

1. A process for dewaxing a hydrocarbon feedstock containing straight chain paraffins, which comprises contacting the feedstock with a catalyst comprising zeolite beta having a silica:alumina ratio of at least 30:1 and a hydrogenation component under isomerization conditions.

4,419,221

## CRACKING WITH SHORT CONTACT TIME AND HIGH TEMPERATURES

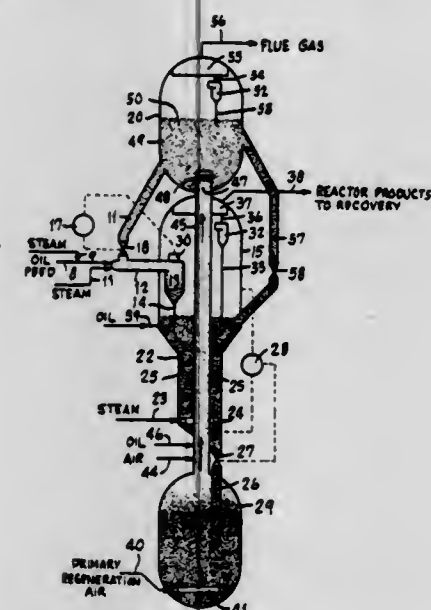
Leonce F. Castagnos, Jr., Nederland, and Roy E. Pratt, Neches, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,468

Int. Cl.<sup>3</sup> C10G 11/18; B01J 8/36

U.S. Cl. 208—113

6 Claims



4. In a fluidized catalytic hydrocarbon conversion process wherein hydrocarbon conversion is carried out in a transport type reaction zone in the presence of hot freshly regenerated catalyst, spent catalyst from said reaction zone is stripped of

volatile hydrocarbons in a catalyst stripping zone in admixture with hot freshly regenerated catalyst, and stripped catalyst is regenerated with an oxygen-containing gas in a catalyst regeneration zone, the improvement which comprises introducing only freshly regenerated cracking catalyst directly from the regeneration zone into a substantially horizontal transport reaction zone maintained at an elevated cracking temperature in the range of 1150° to 1350° F. in contact with hydrocarbon feedstock and passing said catalyst and hydrocarbon feedstock through said reaction zone with an average contact time in the range of 0.1 to 1 second, discharging reaction products and spent catalyst from said reaction zone into a separation zone, and effecting substantially complete separation of hydrocarbon conversion products from spent catalyst in said separation zone.

4,419,222

## HYDROCARBON CONVERSION PROCESSES USING IMPROVED TRANSITION METAL OXIDE CATALYSTS

Dane C. Grenoble, Baton Rouge, La.; Chang J. Kim, Somerset, and Lawrence L. Murrell, South Plainfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 203,141, Nov. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 927,828, Jul. 25, 1978, Pat. No. 4,233,139. This application Dec. 18, 1981, Ser. No. 332,162

Int. Cl.<sup>3</sup> C10G 11/04, 11/16

U.S. Cl. 208—120

17 Claims

1. A hydrocarbon conversion process comprising contacting a hydrocarbon feed, at elevated temperature and in a conversion zone, with a solid acid catalyst comprising at least one catalytic metal oxide selected from the group consisting of the oxides of (a) tungsten, niobium and mixtures thereof and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof supported on a silica-containing inorganic refractory metal oxide support, the silica content of which is less than 50 wt.% of the total support, said catalyst being steamed at a temperature at least 600° C. prior to use.

4,419,223

## CARBO-METALLIC OIL CONVERSION WITH WATER

George D. Myers, and Lloyd E. Busch, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 94,217, Nov. 14, 1979, Pat. No. 4,347,122, Continuation-in-part of Ser. No. 94,227, Nov. 14, 1979, Pat. No. 4,354,923, and a continuation-in-part of Ser. No. 319,570, Nov. 9, 1981, which is a division of Ser. No. 94,091, Nov. 14, 1979, Pat. No. 4,299,687. This application Apr. 30, 1982, Ser. No. 373,599

The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C10G 11/18

U.S. Cl. 208—120

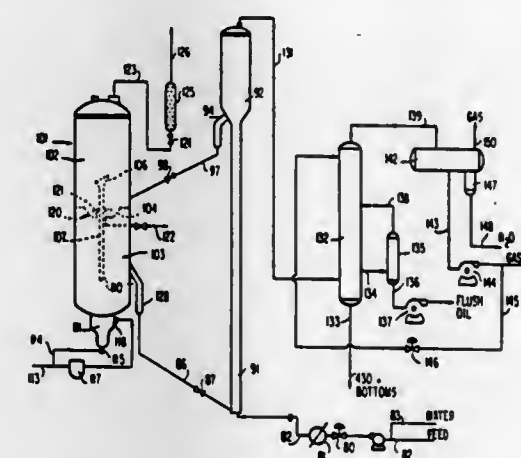
153 Claims

2. A process for economically converting carbo-metallic oils to lighter products, comprising:

- I. providing a converter feed which contains at least about 70% by volume of 650° F.+ material characterized by a carbon residue on pyrolysis of at least about 2 and by containing at least about 5.5 ppm by weight of Nickel Equivalents of heavy metal(s);
- II. bringing said converter feed together with cracking catalyst having an equilibrium microactivity test conversion activity level of at least about 60 volume percent and bearing an accumulation of at least about 3,000 ppm by weight of Nickel Equivalents of heavy metal(s), expressed as metal(s) on regenerated equilibrium catalyst, and with additional material in a weight ratio relative to feed of up to about 0.4 including H<sub>2</sub>O in a weight ratio relative to feed of at least about 0.04 to form a stream comprising a suspension of said catalyst in said feed and said additional material wherein the catalyst to feed weight ratio is at least about 6 and the ratio of the partial pressure of the

additional material relative to the partial pressure of the feed is in the range of about 0.8 to about 4, and causing the resultant stream to flow at a linear velocity of at least about 35 feet per second through a progressive flow type reactor having an elongated reaction chamber which is at least in part vertical or inclined for a vapor residence time in the range of about 0.5 to about 2.5 seconds at a reaction chamber outlet temperature of about 900 to about 1,300° F. and under a total pressure of about 15 to about 35 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 60% to about 90%, while producing at least about 6% coke by weight based on fresh feed and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight;

III. abruptly separating catalyst from product vapors at the downstream end of said elongated reaction chamber, discharging the catalyst thus separated into a catalyst



collection chamber, and preventing at least about 80% by volume of the total feed and product vapors which have passed through said elongated reaction chamber from having further contact with the thus separated catalyst in said catalyst collection chamber;

IV. stripping said separated catalyst;

V. regenerating said catalyst with oxygen-containing combustion-supporting gas under conditions of time, temperature and atmosphere sufficient to reduce the carbon on the catalyst to about 0.25% by weight or less, while forming combustion product gases which comprise CO and/or CO<sub>2</sub>, and maintaining the CO:CO<sub>2</sub> molar ratio of those combustion product gases formed from the burning of at least the major portion of the coke at a level of at least about 0.25 while such gases are in heat exchange contact with the catalyst; and

VI. recycling the regenerated catalyst to the reactor at a temperature of at least about 1,275° F. for contact with fresh feed.

4,419,224

## DESULFURIZATION OF HYDROCARBONS

J. Wayne Miller, and John W. Ward, both of Yorba Linda, Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation of Ser. No. 211,376, Nov. 28, 1980, Pat. No. 4,336,130. This application Jun. 21, 1982, Ser. No. 390,676

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C10G 29/04, 29/06

U.S. Cl. 208—244

14 Claims

1. A process comprising (a) contacting a hydrocarbon feedstock containing organo-sulfur compounds with a reduced catalytic absorbent comprising one or more nickel components and one or more platinum group metal promoters composited with a porous refractory oxide, said contacting being under substantially non-hydrogenative conditions including an elevated temperature such that a substantial proportion of said

organo-sulfur compounds is removed from said feedstock and said catalytic absorbent increases in sulfur content; and (b) recovering a hydrocarbon product stream containing less organo-sulfur compounds than are contained in said feedstock.

4,419,225

## DEMETALLIZATION OF HEAVY OILS

Simon G. Kukes, and Thomas Davis, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1983, Ser. No. 480,204

Int. Cl.<sup>3</sup> C10G 17/00, 45/00, 29/04, 29/00

U.S. Cl. 208—251 R

8 Claims

1. A method for treating metal containing hydrocarbon feed streams comprising contacting said hydrocarbon feed stream with an amount of elemental phosphorus of at least about 0.5 weight percent based on the weight of the hydrocarbon continuing feed stream at demetallizing temperatures and pressures sufficient to convert said metals to oil insoluble compounds.

4,419,226

## RECOVERY OF AROMATIC HYDROCARBONS AND A NON-AROMATIC RAFFINATE STREAM FROM A HYDROCARBON CHARGE STOCK

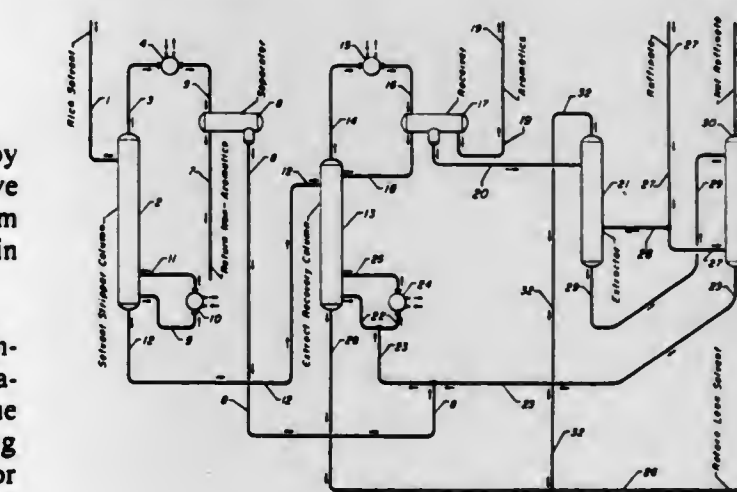
George F. Asselin, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 26, 1980, Ser. No. 163,446

Int. Cl.<sup>3</sup> C07C 7/08

U.S. Cl. 208—325

5 Claims



1. A process for the recovery of aromatic hydrocarbons and a raffinate stream substantially free of aromatics from a hydrocarbon charge containing both aromatic and non-aromatic hydrocarbons which comprises:

- (a) treating said hydrocarbon charge stock in an extraction zone in contact with an aromatics-selective solvent composition at conditions selected to provide a first aromatics-rich solvent stream containing non-aromatic hydrocarbons and a first raffinate stream comprising non-aromatic hydrocarbons and residual solvent;
- (b) treating said first aromatics-rich solvent stream in a first separation zone at conditions selected to separate substantially all of the non-aromatic hydrocarbons therefrom and to provide a second aromatics-rich solvent stream;
- (c) treating said second aromatics-rich solvent stream in a second separation zone in contact with stripping steam at conditions selected to provide an aromatics stream comprising aromatics and steam condensate and a lean solvent stream substantially free of aromatic hydrocarbons;
- (d) treating said aromatics stream of (c) in a third separation zone at conditions selected to provide a high purity aromatics stream and a first aqueous stream containing steam condensate and residual aromatics;
- (e) returning said lean solvent stream of (c) to said extraction zone of (a);
- (f) treating said first aqueous stream of (d) containing resid-



ual aromatics in a first contacting zone with a minor first portion of said raffinate stream removed from said extraction zone in (a) at conditions selected to provide a second aqueous stream containing less than 100 ppm aromatic hydrocarbons, and an aromatics containing second raffinate stream;

- (g) returning said aromatics-containing second raffinate stream of (f) to said extraction zone of (a);
- (h) treating said second aqueous stream of (f) with a major second portion of said first raffinate stream of (a) in a second contacting zone at conditions selected to provide a third raffinate stream substantially free of aromatic hydrocarbons and a solvent-containing aqueous stream; and
- (i) recovering said third raffinate stream substantially free of aromatics.

#### 4,419,227 RECOVERY OF SOLVENT FROM A HYDROCARBON EXTRACT

Philip B. Sherman, Orange, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 12, 1982, Ser. No. 377,294

Int. Cl.<sup>3</sup> C10G 21/20, 21/28

U.S. Cl. 208—326

8 Claims

1. In a process for solvent refining a lubricating oil feedstock wherein said lubricating oil feedstock is contacted under pressure with N-methyl-2-pyrrolidone as a selective solvent for aromatic constituents of said feedstock in an extraction zone under solvent refining conditions thereby forming a raffinate phase comprising raffinate and a part of said solvent and an extract phase comprising extract and a part of said solvent, said raffinate phase is separated from said extract phase, and said solvent is removed from said extract phase by vaporization serially in a first solvent vaporization zone at a pressure less than that of said extraction zone and in a plurality of zones at progressively higher pressure and wherein heat from an external source is supplied only to said last high pressure vaporization zone and heat for each preceding vaporization zone is supplied by heat exchange with vapors from each succeeding vaporization zone, and the extract and solvent mixture from the high pressure vaporization zone is subjected to flash vaporization in a subatmospheric pressure flash zone followed by stripping with a gaseous stripping medium, the improvement which comprises heating the extract solvent mixture from the subatmospheric flash zone in a heating zone in admixture with added normally gaseous inert gas to a temperature at least 5° C. higher than the temperature of said last high pressure vaporization zone, introducing the resulting heated mixture comprising inert gas, solvent and extract into a stripping zone, and removing additional solvent from said extract solvent mixture by stripping with an inert stripping gas at a low superatmospheric pressure.

#### 4,419,228 PROCESS FOR PRODUCING HIGH BRIGHTNESS CLAYS UTILIZING MAGNETIC BENEFICIATION AND CALCINING

Jerry A. Cook, Tennille, and Gary L. Cobb, Davisboro, both of Ga., assignors to Anglo-American Clays Corporation, Sandersville, Ga.

Continuation-in-part of Ser. No. 180,976, Aug. 25, 1980, Pat. No. 4,343,694. This application Aug. 6, 1982, Ser. No. 406,074. The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B03B 1/00

U.S. Cl. 209—9

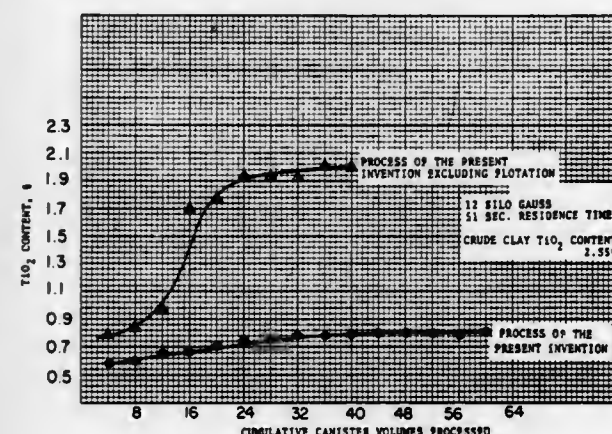
25 Claims

1. A method for producing a low-abrasion, high brightness calcined clay from a crude kaolin clay containing titaniferous and iron-containing discolorants, comprising the steps of: forming a dispersed aqueous slurry of said clay, containing a deflocculant, and a fatty acid collecting agent; and condi-

tioning said slurry to coat said discolorants with said collecting agent, to thereby render same hydrophobic; adding to said slurry a system of sub-micron sized magnetic ferrite seeding particles, the surfaces of which have been rendered hydrophobic;

mixing said seeded slurry to coalesce said hydrophobic surfaced discolorants with said hydrophobic-surfaced seeding particles;

subjecting said seeded slurry to a froth flotation to remove substantial quantities of said discolorants and seeding



particles coalesced therewith, and to remove excess seeding particles and coalesced seeding particles, and to remove excess of the fatty acid collecting agent;

subjecting the flotation-beneficiated clay slurry to a magnetic separation to remove further quantities of the discolorants and seeding particles associated therewith, and to remove seeding particles unassociated with said discolorants; and

calcining the product from said magnetic separation, at a temperature of at least 1500° F.

#### 4,419,229 DEVICE FOR CONTROLLING THE CATION SATURATION IN INTERCHANGING FILTERS

Roque Rubio Salas, Barcelona, Spain, assignor to Bayard J. R. International S.A., Barcelona, Spain

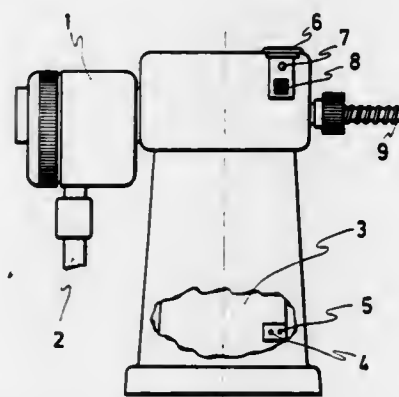
Filed Jan. 5, 1982, Ser. No. 337,272

Claims priority, application Spain, Nov. 10, 1981, 261.311[U]

Int. Cl.<sup>3</sup> C02B 1/40

U.S. Cl. 210—85

1 Claim



1. In a water treatment apparatus of the ion exchange type and including a bed of ion exchange resins, and means for determining the relative degree of saturation of said resins, the improvement wherein said determining means comprises means for detecting a predetermined reduction in the ion exchange capacity of said resins, said detecting means comprising:

a source of electric power;

a first electrode positioned within said resin bed and electrically connected to said power source for receiving therefrom a potential signal;

a second electrode positioned within said resin bed, without being electrically connected to said power source, for providing a potential signal representative of the ion exchange capacity of said resins;

tracking circuit means, connected to said first and second electrodes, for receiving said signals from said first and second electrodes and for generating a difference signal representative of the difference in potential therebetween;

comparator means, connected to said tracking circuit means and having a threshold value representative of a predetermined reduction in the ion exchange capacity of said resins, for receiving said difference signal from said tracking circuit means, for comparing said difference signal with said threshold value, and for generating an activating signal when said difference signal exceeds said threshold value; and

alarm means, connected to said comparator means, for receiving and being activated by said activating signal, thereby generating an alarm indicative of the occurrence of a predetermined reduction in the ion exchange capacity of said resins.

#### 4,419,230 APPARATUS FOR CONTAINING A LEAKAGE OF PCB COMPOUND

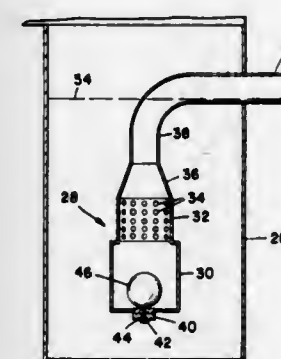
Tommy A. Horton, and Michael D. Augustyn, both of Bremerton, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 342,634

Int. Cl.<sup>3</sup> B03D 3/00

U.S. Cl. 210—114

10 Claims



1. Apparatus for confining a leakage of PCB from equipment to an enclosed volume and allowing water to be discharged when no PCB is present, which comprises:

(a) a containment receptacle having sufficient volume to hold the maximum PCB leakage, said equipment being disposed within said containment receptacle;

(b) a catch basin disposed lower than said receptacle and communicating with said receptacle for receiving liquid run-off from said receptacle, said catch basin having a discharge outlet; and

(c) a water/PCB separator float valve disposed in said catch basin, said valve comprising:

(1) a vertical, tubular valve body, said body having a flow-through section having apertures which communicate with the interior of the catch basin and a converging section of circular cross-section above said flow-through section, the smaller end of said converging section being coupled to the discharge outlet of said catch basin so that any material discharged from said catch basin through said discharge outlet must pass through the converging section of said valve body;

(2) a spherical float confined in said tubular valve body below said converging section, said spherical float having a specific gravity between that of PCB and water, said spherical float being adapted to seat in said converging section to seal said converging section, whereby said float will sink in water to allow water entering said valve body to flow through said converging section to said discharge outlet and whereby said

float will rise on PCB such that as the level of PCB increases in the catch basin, buoyant forces on the float will cause the float to be seated in the converging section to prevent PCB from flowing through said converging section to said discharge outlet, thereby confining the PCB to the catch basin and the containment receptacle.

#### 4,419,231 GROUND SURFACE DRAINAGE APPARATUS

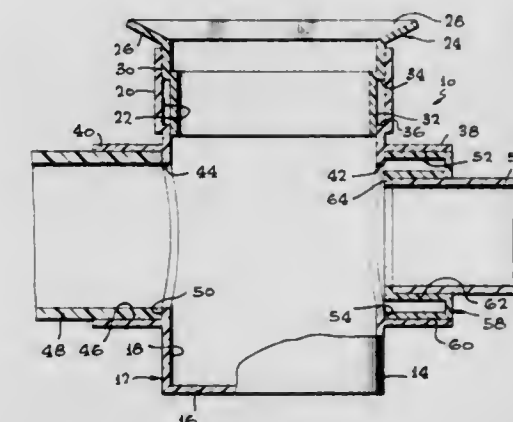
Edward L. Friedl, 6797 Little Ct., Coloma, Calif. 95613

Filed Jul. 23, 1981, Ser. No. 286,000

Int. Cl.<sup>3</sup> E03F 1/00

U.S. Cl. 210—164

4 Claims



1. A ground surface drainage apparatus comprising:

a catch basin, said catch basin having a substantially tubular cylindrical body arranged to be uprightly positioned below the ground surface to receive drainage water therein, said body having a closed bottom, an interior body diameter, and an open top edge, said top edge consisting of and being defined by a single horizontal upwardly directed annular body stop shoulder;

an upper sleeve integrally formed with said body at the top thereof, said upper sleeve being a cylindrical tube having an interior surface with an inner diameter larger than said interior body diameter to surround said body shoulder, said sleeve having a top edge consisting of a single horizontal upwardly directed annular sleeve shoulder;

a grate for positioning at the top of said sleeve and body so that ground surface water can pass through said grate downwardly into said catch basin, said grate having grate bars thereon to restrict flow of debris into said catch basin, said grate having a downwardly directed cylindrical neck of an outer diameter to slidably fit within said interior surface of said upper sleeve on said catch basin body, said grate also having a downwardly directed tube integrally formed with said neck, said downwardly directed tube being smaller than said neck to form a single horizontal downwardly directed annular stop shoulder therebetween at the bottom end of said neck, said tube having an outer diameter the same as said interior body diameter so as to slidably fit within said catch basin body, said stop shoulder on said bottom end of said neck and said stop shoulder on said catch basin body facing each other and spaced from each other to avoid contact, said sliding fit of said neck and tube with said sleeve and body, respectively, providing lateral positional security of said grate with respect to said body, said grate having outwardly extending flanges for resting upon said upper sleeve shoulder for vertical security, said stop shoulders being only for selectable insertion therebetween of an extension tube.



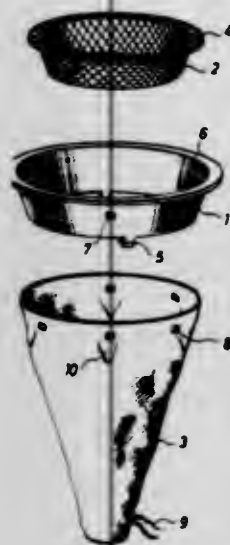
# 4,419,232 **FILTERING AND COLLECTING DEVICE FOR WATER DRAINS**

Oscar S. Arntyr, Wallingatan 37, S-111 24 Stockholm, and Thord I. Engström, S-950 18 Bensbyn, both of Sweden  
 Filed Nov. 9, 1981, Ser. No. 319,753

Claims priority, application Sweden, Oct. 1, 1981, 8105804  
 Int. Cl.<sup>3</sup> E03F 1/00

U.S. Cl. 210-164

6 Claims



1. A filter device for an outdoor water drain in a paved roadway gutter or the like, said drain having an outer protective grating 12 for preventing vehicles, pedestrians and large objects from falling therethrough, said filter device serving to separate and collect particulate impurities such as sand, twigs and leaves, and also oil and other liquid impurities passing through the grating, and comprising:

a continuous holder member (1) adapted to be mounted beneath the drain grating, said holder member having downwardly depending, fluid impervious sides, a relatively rigid and shallow coarse-filtering wire basket (2) removably disposed within said holder member and having downwardly depending sides, and a fine-filtering bag (3) made of a flexible and water-permeable cloth or fabric material removably disposed around the outside of said holder member and depending downwardly beyond the sides thereof and substantially below said wire basket, whereby said bag may be shifted laterally away from a vertical axis of the filter device below the holder member to accommodate for irregularities in the drain structure, said holder member including support means (5) extending inwardly from lower edges of its sides for supporting the wire basket, and said support means also serving as a handle by which the holder member and bag may be lifted together to facilitate emptying the bag.

# 4,419,233 **CHLORINATOR FOR A SWIMMING POOL**

Marvin E. Baker, 815 Ewing Ave., Nashville, Tenn. 37203  
 Filed Nov. 18, 1981, Ser. No. 322,465

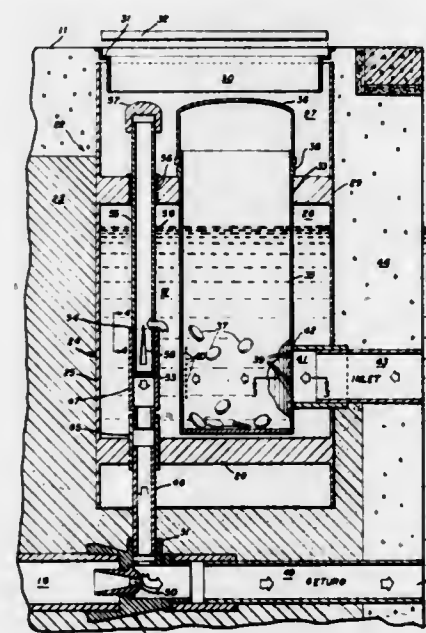
U.S. Cl. 210-169

Int. Cl.<sup>3</sup> E04H 3/20

5 Claims

1. A chlorinator system for a swimming pool comprising:  
 (a) a swimming pool having a surrounding deck level and having a normal water level within the swimming pool,  
 (b) a water re-circulating system including a pump, a drain line from the pool to the intake side of the pump, and a return line from the discharge side of the pump to the pool, the return line terminating in an inlet port through the wall of the swimming pool below said normal water level,  
 (c) a housing having an enclosing side wall, a bottom wall adjacent said swimming pool wall exteriorly of said swimming pool, said bottom wall being below the normal water level of the swimming pool,  
 (d) a transverse partition wall spanning said housing and

spaced between said bottom wall and said open top portion to define a closed liquid chamber within said housing below said partition wall and a control chamber above said partition wall within said housing, said partition wall having a container opening therethrough,  
 (e) a container for receiving soluble water-treatment agents, said container being received within said liquid chamber and projecting upwardly through said container opening into said control chamber, said container having an open upper end within said control chamber for receiving said water-treatment agents,  
 (f) water inlet apertures in one side of said container below said partition wall,  
 (g) water outlet apertures in the opposite side of said container from said inlet apertures,



(h) a water inlet line in direct fluid communication between said swimming pool and said water inlet apertures, said inlet line being below said normal water level,  
 (i) said water outlet apertures being in fluid communication with said liquid chamber,  
 (j) a standpipe member extending through, and projecting above, said bottom wall, and terminating at a predetermined height within said liquid chamber to provide a liquid outlet from said liquid chamber above said bottom wall and said inlet port to said swimming pool and below said normal water level,  
 (k) a Venturi orifice in said return line, and  
 (l) said standpipe member being in fluid communication with said return line downstream of said Venturi orifice, so that the liquid from said liquid chamber flows by aspiration into said return line when water from the pump is flowing through said return line.

# 4,419,234 **MULTIPLE CARTRIDGE FILTER ASSEMBLY WITH REMOVABLE FILTER CARTRIDGE ARRAY**

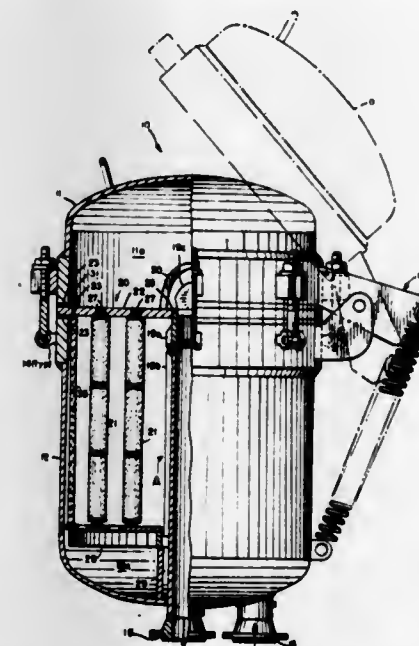
John D. Miller, Homer, and Clayton L. Reed, Tolly, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.  
 Continuation-in-part of Ser. No. 305,069, Sep. 24, 1981, abandoned. This application Aug. 6, 1982, Ser. No. 406,095  
 Int. Cl.<sup>3</sup> B01D 27/08

U.S. Cl. 210-232

10 Claims

1. A multiple cartridge filter assembly comprising:  
 (a) a housing having upper and lower portions securable face-to-face to form an enclosed sealed spaced having an inlet for pre-filtered fluid and an outlet for filtrate;  
 (b) a removable filter array comprising:  
 (1) a plurality of elongated filter cartridges each having a blind end and an adapter at the other end for axial engagement with a mating adapter;  
 (2) a separation plate securable substantially horizontally

within the housing in a working condition in which the separation plate defines upper and lower filter chambers, one chamber being for prefiltered fluid, the other chamber being for filtrate, the separation plate having a plurality of adapters to mate form below with the adapters of filter cartridges, the filter cartridge adapter creating a fluidtight seal with the separation plate adapter with the former axially engaged with the latter;  
 (3) a filter cartridge support platform; and  
 (4) means connecting the support platform to the separation plate in a substantially horizontal position beneath the blind ends of the filter cartridges, the connection between the separation plate and the support platform permitting the support platform to shift between a first



position in which it retains the filter cartridge adapters axially engaged with the separation plate adapters and a second position wherein the support platform is spaced from the separation plate by a greater distance than in the first position, the spacing between the separation plate and the support platform with the latter in the second position being sufficient to permit the insertion and removal of the filter cartridges, the support plate automatically assuming the second position unless restrained from beneath, and

(c) stop means within the housing for holding the support platform in substantially the first position when the removable filter array is within the housing with the separation plate in its working condition.

# 4,419,235 **GRAVITY FED WATER TREATMENT APPARATUS** Boris Sway, 7201 W. Aracoma Dr., Cincinnati, Ohio 45237 Continuation of Ser. No. 310,527, Oct. 13, 1981, abandoned. This application Jan. 28, 1983, Ser. No. 462,100 Int. Cl.<sup>3</sup> B01D 27/02

U.S. Cl. 210-282

8 Claims

1. An apparatus for removing chlorine, chlorinated hydrocarbons and other organic materials from drinking water, comprising:

(a) a first container having an open top for receiving water and a restricted opening in its bottom portion for discharging water, said container having slightly converging vertical walls for receiving a predetermined quantity of water and to serve as a temporary reservoir for the water, said restricted opening having threads about its periphery;  
 (b) a disposable cartridge containing at least one-half ounce of activated carbon particles ranging between 10 and 60 mesh in size, said disposable cartridge having a vertical length of at least two inches and a diametral dimension of approximately one inch and being threadably connected to and in open fluid communication with the restricted opening in the first container, said disposable cartridge

having a plurality of apertures in its bottom portion said first container and said disposable cartridge being dimensioned so as to discharge water through said plurality of apertures at a flow rate between approximately 0.0125 and 0.02 gallons per minute when said predetermined quantity of water is placed in said first container;  
 (c) a second container having a larger capacity than the first container, having a top opening sized to receive said



cartridge and having a first container-supporting top surface, said disposable cartridge being at least partially disposed within the second container to discharge water passing into the second container; and

(d) a plurality of ridges on the bottom of said first container, extending radially outward from said restricted opening across and contacting said top surface of the first container when the disposable cartridge is disposed within the second container.

# 4,419,236 **WATER DETECTING OR ABSORBING DEVICE FOR USE IN AND REMOVAL FROM A TANK WITH A LIMITED OPENING**

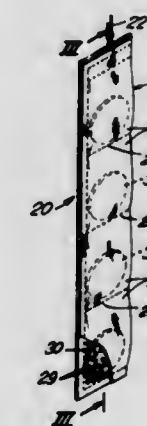
Charles J. Hsu, P.O. Box 460 Grand Central Station, New York, N.Y. 10017

Filed Mar. 11, 1982, Ser. No. 357,070

Int. Cl.<sup>3</sup> B01D 27/02

U.S. Cl. 210-282

16 Claims



1. A device for detecting the presence of or for absorbing water from the bottom of a closed tank or the like having a restricted opening through which the device is inserted into and removed from the tank comprising an envelope closed along the sides thereof and providing an interior space, said envelope formed of a porous cover material capable of transmitting liquid water into the interior space in said envelope, a



filler material located within the interior space within said envelope forming a loose pulverized dry filling, for affording maximum absorbency said filler material is liquid water absorbent but does not absorb liquids which do not contain water and said filler material has the characteristic of expanding to many times its dry volume when it absorbs liquid water, said filler material after it absorbs liquid water can be returned to the unexpanded dry state by drying only, the liquid water cannot be squeezed out of said filler material, at least one weighted member is located within the interior space along with said filler material so that said weighted member causes said device to sink to the bottom of the tank into which it is inserted, said weighted member comprises a generally flat disc-like member having a circumferentially extending edge surface having a maximum diametrical dimension determining the minimum diameter tank opening through which said device can be inserted and said envelope being dimensioned and filled with a selected amount of said pulverized filler material so that when said filler material absorbs liquid water and expands, the maximum dimension of the expanded said envelope generally perpendicular to the direction of removal through the tank opening is not greater than the maximum diametrical dimension of the circumferentially extending edge surface of said weighted member whereby said device after absorbing water can be removed out of the opening through which it was inserted into the tank.

4,419,237

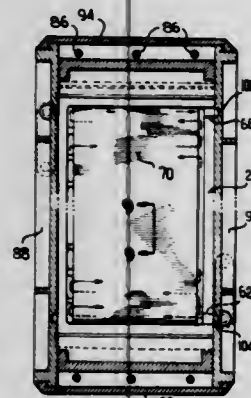
## PLEATED KIDNEY

William G. Esmond, 800 Country Club Rd., Havre de Grace, Md. 21078

Filed Aug. 9, 1977, Ser. No. 823,029

Int. Cl.<sup>3</sup> B01D 31/00

U.S. Cl. 210—321.2

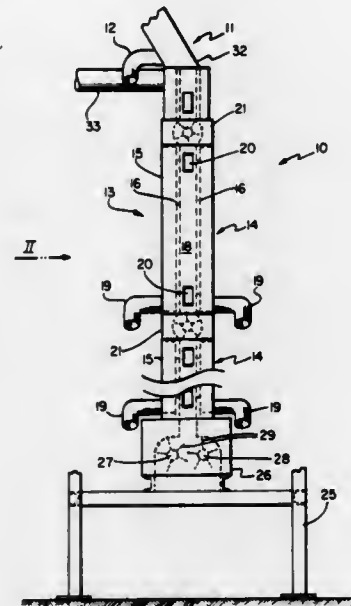


1. A dialyzer comprising a stack of first and second plates arranged in alternating relation, a membrane between adjacent plates, cooperating surfaces on said plates together with each membrane defining flow paths for different fluids on opposite sides of each membrane, and sealing means carried by said plates forming seals with said membranes, said seals being in the form of said plates being formed of a deformable soft plastic material and said plates having ribs thereon forcing said membranes into said plates, each plate being of a generally rectangular outline, said flow paths being generally transverse of said plates, and said ribs being disposed only transverse of said plates adjacent opposite ends thereof and spaced from said flow path.

4,419,238  
JUICE DRAINER  
Philip L. Shaw, Victoria, Australia, assignor to Lindeman (Holdings) Limited, New South Wales, Australia  
Continuation of Ser. No. 194,716, Oct. 7, 1980, abandoned, which is a continuation of Ser. No. 32,591, Apr. 23, 1979, abandoned. This application Jul. 2, 1982, Ser. No. 394,572  
Claims priority, application Australia, Apr. 24, 1978, PD4152  
Int. Cl.<sup>3</sup> B01D 35/02

U.S. Cl. 210—338

5 Claims



1. A juice extraction apparatus for extracting juice from crushed grapes continuously passing through the apparatus, said apparatus comprising a generally vertically extending housing, a vertically extending screen located within the housing and dividing the interior of said housing into a vertical first passage to receive the crushed grapes and through which the grapes pass unhindered under the influence of gravity and a second passage to receive juice filtered from the grapes via said screen, an inlet at the top of said housing in communication with said first chamber to enable crushed grapes to be delivered to said first chamber, a juice outlet in said housing communicating with said second chamber to drain filtered juice therefrom, lock means terminating the lower end of said first passage to regulate the flow of crushed grapes through said first passage and wherein said lock means includes a casing with curved side walls, a driven shaft, a plurality of radial vanes extending from said shaft and co-operating with said casing to inhibit the movement of crushed fruit past the vanes, and drive means to continuously turn said shaft to regulate the flow of crushed grapes through said second passage.

4,419,239

## APPARATUS FOR RECOVERING AND RECYCLING ANIMAL WASTE

Gerald P. Frankl, 187 McCook Lake, Jefferson, S. Dak. 57038  
Filed Apr. 14, 1982, Ser. No. 368,166

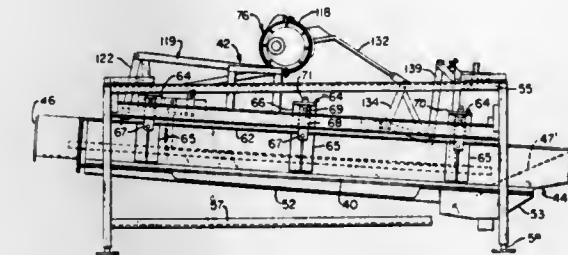
Int. Cl.<sup>3</sup> B01D 23/02

U.S. Cl. 210—413

13 Claims

1. Apparatus for separating a mixture of liquid and solid materials comprising:  
a lower receptacle;  
an elongated screen positioned over said receptacle, said screen having an opening size adapted to permit liquid and a preselected size of solid particles to pass by gravity therethrough;  
means for delivering said mixture of liquid and solid materials and depositing said mixture of materials at one end of said screen; and  
separator means operative to advance said mixture of materials along the length of said screen including a series of scraper blades and horizontally disposed pressure pad members extending at spaced intervals along the length of

said screen with each said scraper blade and pad member extending in a direction transversely of the length of said screen and pad having a broad surface portion in facing relation to said screen, and shuttle drive means operatively connected to said scraper blades and pad members to continuously and repeatedly advance and reverse said scraper blades and pad members in unison and in a linear



to-and-fro movement lengthwise of said screen to successively move downwardly into engagement with said mixture of materials on said screen for a limited distance substantially less than the length of said screen, then be raised and reversed in movement to their original positions whereby to incrementally advance said mixture of materials deposited onto said screen across the entire length of said screen.

4,419,240

## FLUID FILTERING DEVICE

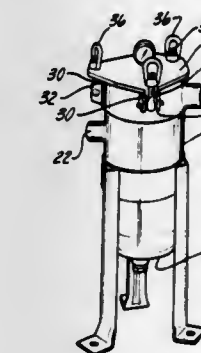
Borje O. Rosaen, 4031 Thoroaks, Ann Arbor, Mich. 48104

Filed Jul. 30, 1982, Ser. No. 403,343

Int. Cl.<sup>3</sup> B01D 29/10

U.S. Cl. 210—444

6 Claims



1. For use in conjunction with a high flow liquid fluid system, a liquid fluid filtering device comprising:  
a housing having an axially extending interior chamber and an open top;  
said housing having a fluid inlet and a fluid outlet open to said chamber, said fluid inlet adapted for connection to the high flow liquid fluid system,  
a seat secured to said housing within said chamber at a position spaced downwardly from said open top, said seat protruding into said chamber and forming an axially extending inner surface,  
a filter element removably insertable into said chamber through said open top and to a filtering position in which said filter element is positioned between said inlet and said outlet, said filter element comprising a flanged portion which abuts against a top of said seat when said filter element is in said filtering position and an outer surface which extends axially outwardly from said flanged portion,  
means for preventing severe tipping of said filter element and for maintaining a fluid seal between said filter element

and said housing despite slight tippage when said filter element is in said filtering position comprising:  
a seal carried at a midpoint on said axially extending inner surface of said seat, said seal engaging said filter element outer surface when said filter element is in said filtering position,  
a cover and means for detachably securing said cover to said housing so that said cover closes the open top of said housing,  
an elongated handle pivotally secured at one end to said filter element, said handle being dimensioned so that, when said filter element is in said filtering position and said cover is secured to said housing, the other end of said handle is positioned closely adjacent an intersection of said cover with said housing.

4,419,241

## TUBULAR FILTER ELEMENT FOR THE FILTRATION OF FLUIDS

Jürgen Hoffmann, Diemarden, Fed. Rep. of Germany, assignor to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

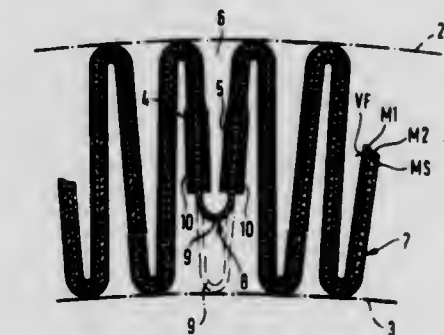
Filed Jul. 7, 1982, Ser. No. 396,113

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128546

Int. Cl.<sup>3</sup> B01D 27/06, 29/06

U.S. Cl. 210—493.5

12 Claims



1. In a pleated cylindrical filter for the filtration of fluids wherein the filter is constructed from a flat filter blank material, the material has a plurality of layers, the flat filter blank is pleated and the pleated filter material is bent to form an elongated cylinder with the folds of the pleats extending longitudinally with respect to the axis of the cylinder, the cylinder has an elongated junction zone consisting of the opposite edge portions of the blank which extend inwardly and radially, the improvement comprising an elongated connecting means in said junction zone, the connecting means having oppositely located elongated edge portions affixed between layers of said opposite edge portions of the blank, the connecting means forming an elongated, generally, longitudinal V-shaped fold, the apex of the fold extends inwardly and radially in the general direction of the flow of fluids through the filter, and the edge portions form legs of the fold extending outwardly and radially into the blank.

4,419,242

## COMPOSITE MEMBRANE FOR A MEMBRANE DISTILLATION SYSTEM

Dah Y. Cheng, Los Altos, and Steve J. Wiersma, Sunnyvale, both of Calif., assignors to International Power Technology, Inc., Sunnyvale, Calif.

Division of Ser. No. 118,192, Feb. 4, 1980, Pat. No. 4,316,772, which is a continuation-in-part of Ser. No. 12,047, Feb. 14, 1979, Pat. No. 4,265,713. This application Feb. 18, 1982, Ser. No. 350,078

Int. Cl.<sup>3</sup> B01D 3/02, 13/00

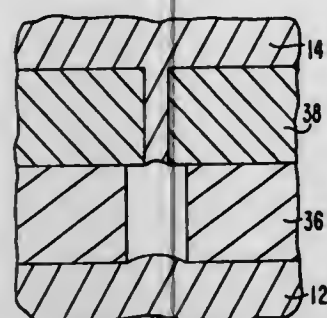
U.S. Cl. 210—500.2

12 Claims

1. A composite membrane comprising:  
a microporous hydrophobic layer through which water can pass in the form of a vapor;



a first hydrophilic layer on one surface of said microporous hydrophobic layer; said hydrophilic layer forming a barrier to prevent a salt bearing liquid from intruding with the pores of said hydrophobic layer;



a second hydrophilic layer on the opposite surface of said hydrophobic layer; and said materials forming said second hydrophilic and said hydrophobic layers, and the pore sizes of said hydrophobic layer, being selected to prevent water-logging of said hydrophobic layer when there is a heat gradient across said membrane.

4,419,243

## GROWTH OF BIOMASS

Bernard Atkinson, Copthorne; Geoffrey M. Black, Sale; Anthony Pinches, Offerton, and Paul J. S. Lewis, Abbotts Langley, all of England, assignors to The University of Manchester Institute of Science and Technology and Simon-Hartley Limited, both of Manchester, England

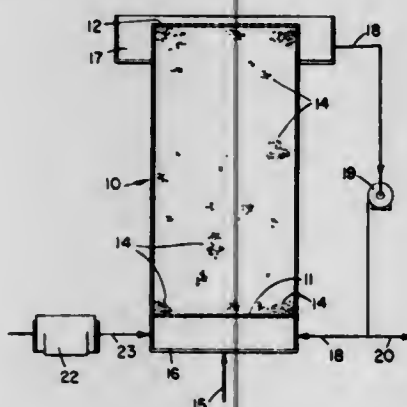
Continuation-in-part of Ser. No. 156,038, Jun. 3, 1980, abandoned, which is a division of Ser. No. 945,869, Sep. 26, 1978, abandoned. This application Feb. 11, 1982, Ser. No. 347,872

Claims priority, application United Kingdom, Oct. 20, 1977, 43613/77; Oct. 20, 1977, 43614/77; Oct. 20, 1977, 43615/77

Int. Cl.<sup>3</sup> C02F 3/10

U.S. Cl. 210—618

5 Claims



1. A process for promoting the growth of biomass from a supply of suitable nutrient material, comprising the steps of providing a vessel in which is contained a biomass support medium in the form of a plurality of movable bodies each having a substantially uniform rectangular structure defining an internal voidage consisting of a multiplicity of interconnected pores such as to provide throughout the voidage of each body a protective environment which will permit biomass growth therewithin and thus support and sustain active biomass as a substantially integral mass retained by said rectangular structure, the average pore size of said bodies lying in the range of 0.3 mm to 1 mm in diameter, said protective environment thereby allowing each body to fill with biomass over a period of time, there being an extensive area of access by way of a multiplicity of openings defined by said reticular structure at the external surface of each said body to the whole of the voidage therein, the overall shape and reticular structure of each body being sufficiently plain as to enable the bodies to move relative to each other with a rubbing or knocking action without interlocking or packing together as a solid unit; causing the nutrient

and any additional substances required for the process to flow through the vessel thus to contact and enter the bodies within the vessel; and causing relative movement of the bodies within the vessel during the growth process sufficiently for restricting accumulation of biomass outwardly from the outer surface of each said body and thus preventing overflow of biomass onto the external surface of each said body.

4,419,244

## METHOD AND ARRANGEMENT FOR AERATION OF LIQUIDS

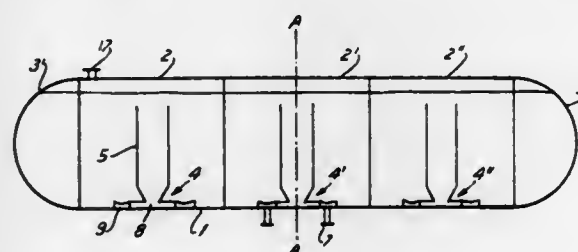
Hans Müller, Erlenbach, and Felix Müller, Staefa, both of Switzerland, assignors to Chemap AG, Männedorf, Switzerland

Continuation-in-part of Ser. No. 81,450, Oct. 3, 1979, abandoned. This application Dec. 10, 1981, Ser. No. 329,567 Claims priority, application Switzerland, Oct. 10, 1978, 10503/78

Int. Cl.<sup>3</sup> C02F 3/20; C12M 1/06, 1/08

U.S. Cl. 210—629

7 Claims



1. A method of aerating liquids for aerobic growing of microorganisms, in an elongated container extending in a substantially horizontal direction and containing a liquid, said container having a plurality of liquid-filled zones arranged adjacent to one another in direction of elongation of said container, the method comprising the steps of: providing a plurality of means each located in each of said zones for forming in each of said zones a longitudinally advancing stream of the liquid accommodated in said container, wherein each of said means for forming a longitudinal stream includes a stationary distributing element mounted on a container bottom and arranged to exit the liquid in the direction of elongation of said container, and a conduit provided for each distributing element for supplying air; providing a plurality of means each located in each of said zones for forming in each of said zones a circumferentially advancing stream of the liquid accommodated in said container, wherein each of said means for forming a circumferential stream of liquid includes a substantially upright conduit tube and an impeller communicating with the same and rotatable about a substantially upright axis so as to form said circumferential stream; and arranging said distributing element of each said means for forming said longitudinal stream to surround said impeller of each of said means for forming said circumferential stream so that said rotatable impeller rotates relative to said stationary distributing element, so as to cause superposition of said circumferential stream and said longitudinal stream in each of said zones and to form a composite closed spiral-shaped stream of liquid in said container travelling in the direction of elongation of said container through all said zones over substantially the entire length of said container.

4,419,245

## COPOLYMER PROCESS AND PRODUCT THEREFROM CONSISTING OF CROSSLINKED SEED BEAD SWOLLEN BY STYRENE MONOMER

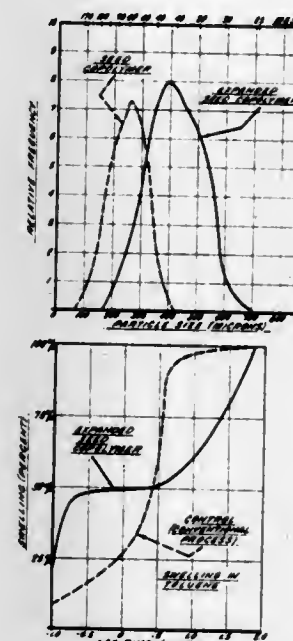
James H. Barrett, Feasterville; Thomas J. Howell, Langhorne, and George M. Leln, Jr., Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 30, 1982, Ser. No. 393,953

Int. Cl.<sup>3</sup> C08F 2/18; B01J 41/14, 39/20

U.S. Cl. 210—681

23 Claims



1. A seed process for manufacturing crosslinked ion exchange copolymer particles capable of withstanding swelling pressures without fracturing upon subsequent functionalization which comprises:

- (a) forming an agitated aqueous suspension of polymerized lightly crosslinked styrenic or ethylenic seed particles in the absence of an amount of polymeric protective colloids which would prevent imbibition of monomers into the seed particles;
- (b) feeding to said suspended seed particles under polymerization conditions from 2:20 parts by weight of the seed of a monomer or monomer mixture comprising (I) 0 to 98% by weight of said monomer or monomer mixture of at least one monoethylenically unsaturated styrenic or ethylenic monomer and (II) 2-100% by weight of said monomer or monomer mixture of at least one polyethylenically unsaturated styrenic or ethylenic crosslinking monomer, while balancing the suspension conditions, the feed rate, the agitation and the polymerization rate to avoid particle agglomeration and ultimately produce said ion exchange copolymer particles, until the seed particles have swollen to the desired size by imbibition of the monomer or monomer mixture;
- (c) continuing polymerization of the swollen seed particles until said ion exchange copolymer particles result; and
- (d) separating said ion exchange copolymer particles from the aqueous suspension medium.

4,419,246

## REMOVAL OF HEAVY METAL IONS

Madhusudan D. Jayawant, Hockessin, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,879

Int. Cl.<sup>3</sup> C02F 1/52, 1/72

U.S. Cl. 210—721

15 Claims

1. Method for removing from a aqueous waste or process stream heavy metal ions selected from iron, copper and nickel present in complexed water-soluble form comprising contacting with agitation said waste or process stream for a residence time of at least 0.1 hour at a pH adjusted to between about 10.2 and 12.5 with a magnesium ion donor compound, a peroxygen compound and either calcium hydroxide or calcium oxide so as

to form derivatives of said heavy metal ions which precipitate, and removing said precipitate from the waste or process stream, leaving a total content of iron, copper and nickel of less than 15 mg/l in the treated aqueous waste, said magnesium compound being present, basis magnesium, in a minimum ratio of 0.05:1 by weight the total weight of iron, copper and nickel, and said peroxygen compound being present, on the basis of active oxygen, at a weight ratio of 0.12:1 to 50:1 of the total weight or organic carbon in the waste stream.

4,419,247

## METHOD OF REMOVING SOLUBLE SULFIDE RESIDUE FROM SCRUBBER WATER WASTE

Alfred M. Tenny, 1335 Hickory Rd., Homewood, Ill. 60430

Filed May 8, 1981, Ser. No. 261,944

Int. Cl.<sup>3</sup> C02F 1/58

U.S. Cl. 210—726

2 Claims

1. The method of removing soluble sulfide residue from scrubber water waste and the like which comprises adding to said scrubber water waste an acidic copper waste in an amount whereby the copper ion added is sufficient to precipitate no more than 90 percent of the sulfide ion present, removing the precipitated copper sulfide, and thereafter adding a pickle acid waste containing ferrous ions in an amount sufficient to essentially completely react with all sulfide present and to precipitate as an iron-copper sulfide mixture.

4,419,248

## BIOFILM REMOVAL

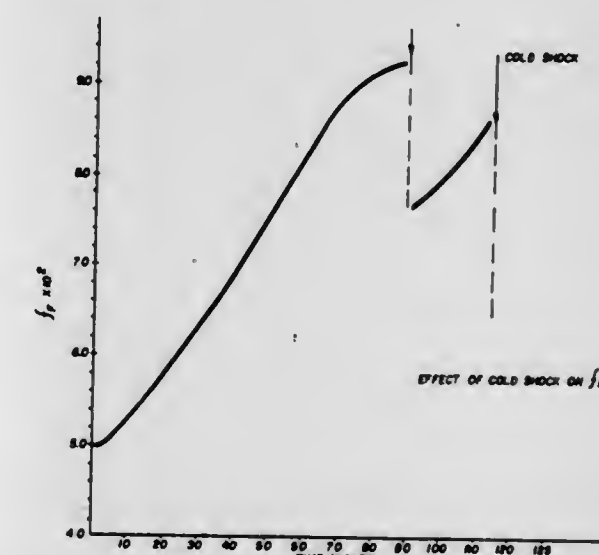
John W. F. Costerton, Calgary, Canada, assignor to Her Majesty the Queen in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources, Edmonton, Canada

Filed Apr. 5, 1982, Ser. No. 365,260

Int. Cl.<sup>3</sup> C02F 1/22

U.S. Cl. 210—764

10 Claims



1. A method for removing biofilm from a submerged fouled surface in an industrial aquatic conduit, said biofilm comprising bacteria associated with glycocalyx containing water, said biofilm being adherent to the surface, which comprises: cooling the biofilm to below the freezing point of water to thereby generate large sharp-edged ice crystals; thawing the frozen biofilm; and then removing at least part of the biofilm from the surface.

5. A method for removing biofilm on the surface of a heat exchanger normally exposed to water flow, said biofilm comprising bacteria associated with glycocalyx containing water and adhering to said surface, which comprises: slowly cooling the biofilm to below the freezing point of water to thereby generate large sharp-edged ice crystals; thawing the frozen biofilm;



and then removing at least part of the biofilm by liquid flow across the surface.

4,419,249

# METHOD AND APPARATUS FOR DEWATERING A SLURRY OF FINE PARTICLES

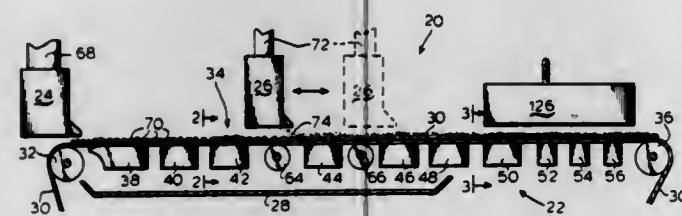
Joseph A. Bolton, Queensbury, and Louis L. Dufresne, Glen Falls, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,085

Int. Cl.<sup>3</sup> B01D 37/00

U.S. Cl. 210—783

18 Claims



1. An apparatus for dewatering a slurry of particles comprising: forming fabric; means for driving said forming fabric with said means being sized; primary headbox being sized for feeding a first slurry of particles at a predetermined rate onto the forming fabric; secondary headbox being sized for feeding a second slurry of particles at a predetermined rate onto the first slurry of particles deposited on the forming fabric; suction means being sized and positioned so as to provide a vacuum on forming fabric passing thereby; said forming fabric being of sufficient porosity and said suction means providing sufficient vacuum so as to allow dewatering of the first and second slurry of particles on the forming fabric by the suction means; and said means for driving said forming fabric drives at a rate sufficient to provide a mat of essentially only two discrete layers on the forming fabric.

10. A method for dewatering a slurry of particles comprising: providing headbox, secondary headbox, suction means, forming fabric of preselected porosity, and means for driving the forming fabric; feeding a first slurry of particles at a first rate from the primary headbox onto the forming fabric; feeding a second slurry of particles at a second rate from a secondary headbox onto the first slurry of particles; creating a sufficient vacuum on the first and second slurry of particles through the forming fabric by the suction means to cause dewatering of the first and second slurries thereon; driving said forming fabric at a fourth rate of speed by the driving means; and said first, second, third and fourth rates of speed being sufficient so as to provide a mat of essentially only two discrete layers.

4,419,250

# AGGLOMERATED BENTONITE PARTICLES FOR INCORPORATION IN HEAVY DUTY PARTICULATE LAUNDRY SOFTENING DETERGENT COMPOSITIONS.

Edwin Allen, Oupeye; Alan Dillarstone, Rocourt, and Joseph A. Reul, Heusy, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,712

Int. Cl.<sup>3</sup> C09K 3/18; C11D 3/14, 11/00; D06M 11/06

U.S. Cl. 252—8.6

5 Claims

1. Agglomerated bentonite particles, useful for incorporation in a particulate heavy duty detergent composition for use in automatic washing machines which comprise such agglomerated bentonite particles with which there is included a dispensing assisting proportion, at least 0.15%, of a salt of a lower alkyl silicic acid and/or polymerization product(s) thereof formed therefrom on storage.

4. A method of manufacturing agglomerated bentonite particles, useful for incorporation in a particulate heavy duty detergent composition which is dispensable from the charging compartment of an automatic washing machine by action of water being fed through such compartment, which comprises apply-

ing to surfaces of agglomerated bentonite particles a dispensing assisting proportion, at least 0.15%, of a salt of lower alkyl silicic acid.

4,419,251

# AQUEOUS LUBRICANT

Joosup Shim, Wenonah, and Derek A. Law, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 16, 1982, Ser. No. 419,107

Int. Cl.<sup>3</sup> C10M 1/24, 1/36, 1/48, 1/40

U.S. Cl. 252—32.7 E

15 Claims

1. A lubricant concentrate for forming oil-in-water emulsions upon dilution with water comprising a suitable mineral base oil having a viscosity ranging from about 60 SSU to about 6,000 SSU blended with:

- (1) about 20 to 65% by weight of an emulsifier/dispersant system comprising:
  - (a) an alkali or alkaline earth metal soap of rosin acids, and
  - (b) an alkylene oxide condensation product of a fatty amine or the reaction product thereof with a polyalkenylsuccinic acid or anhydride, and
- (2) about 10 to 20% by weight of an antiwear/antirust inhibitor system comprising:
  - (c) a zinc dialkyldithiophosphate, and
  - (d) a metal dialkyl-naphthalene sulfonate.

4,419,252

# AQUEOUS LUBRICANT

Joosup Shim, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 22, 1982, Ser. No. 436,157

Int. Cl.<sup>3</sup> C10M 1/24, 1/36, 1/40, 1/48

U.S. Cl. 252—32.7 E

15 Claims

1. A lubricant concentrate for forming oil-in-water emulsions upon dilution with water comprising a suitable mineral base oil having a viscosity ranging from about 60 SSU to about 6,000 SSU blended with:

- (1) about 20 to 65% by weight of an emulsifier/dispersant system comprising:
  - (a) an alkali or alkaline earth metal soap of rosin acids, and
  - (b) an alkylene oxide condensation product of a fatty amine or the reaction product thereof with a polyalkenylsuccinic acid or anhydride, and
- (2) about 10 to 20% by weight of an antiwear/antirust inhibitor system comprising:
  - (c) a zinc dialkyldithiophosphate, and
  - (d) a metal dialkyl-naphthalene sulfonate, and
- (3) about 0.001 to 3.0% by weight polyisobutylene.

4,419,253

# SYNTHETIC POST-PICKLE FLUID

Carl S. Kennedy, Dyer, and Theodore A. Hack, Munster, both of Ind., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 6, 1981, Ser. No. 318,974

Int. Cl.<sup>3</sup> C10M 3/18, 3/26

U.S. Cl. 252—34.7

11 Claims

1. A synthetic post-pickle fluid consisting essentially of an aqueous solution of from about 1 to about 6 percent of a dibasic carboxylic acid selected from the group consisting of azelaic acid, adipic acid, succinic acid, sebacic acid and mixtures thereof and from about 2 to about 10 percent of a base selected from the group consisting of potassium hydroxide, monoethanolamine, diethanolamine, and mixtures thereof.

4,419,254

# METHOD OF PROTECTING SILVER CONTACTS

Shuhei Kosaka, Ota, and Toshihiro Fujii, Ojima, both of Japan, assignors to Toshiba Silicones Limited, Waterford, N.Y.

Filed May 7, 1981, Ser. No. 261,417

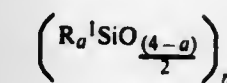
Claims priority, application Japan, May 9, 1980, 55-61504

Int. Cl.<sup>3</sup> C10M 1/38, 1/52

U.S. Cl. 252—37

17 Claims

1. A method of protecting silver contacts comprising applying to said silver contacts a grease comprising:  
(A) 100 parts by weight of a polyorganosiloxane represented by the general formula:



wherein R<sup>1</sup> is a monovalent group selected from the group consisting of methyl, ethyl, propyl, phenyl and halogenated phenyl groups, a is a number from 1.9 to 2.7, and n is a positive integer;

(B) 0.01 to 50 parts by weight of a thickener; and

(C) 0.01 to 3 parts by weight of an organomercaptan represented by the general formula:



wherein R<sup>2</sup> represents a saturated or unsaturated aliphatic hydrocarbon group having 18 to 22 carbon atoms.

4,419,255

# LUBRICATING OIL CONTAINING KETO AMIDE AS FRICTION REDUCING AGENT

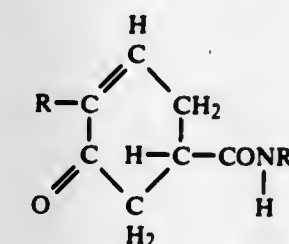
Benjamin J. Kaufman; Robert A. Sawicki, both of Wappingers Falls, and Stephen A. Levine, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,321

Int. Cl.<sup>3</sup> C10M 1/32

U.S. Cl. 252—51.5 A

34. A cyclic keto amide comprising:



wherein R is hydrogen or C<sub>1</sub>-C<sub>17</sub> alkyl, and



is an amine moiety.

4,419,256

# BUILDING INSULATION COMPOSITION

Richard E. Loomis, Texarkana, Ark., assignor to Delron Research and Development Corporation, South Bend, Ind.

Filed Nov. 12, 1981, Ser. No. 320,313

Int. Cl.<sup>3</sup> C04B 43/16; E04B 1/78

U.S. Cl. 252—62

14 Claims

1. A building insulation comprising thirty-five percent (35%) to fifty-three percent (53%) by weight of cellulose fiber, three percent (3%) to five percent (5%) by weight of an acid-containing fire retardant for reducing the flammability of said cellulose, seven percent (7%) to nine percent (9%) by weight

of expanded silicate glass for reducing the corrosive effect of said acid-containing fire retardant, and thirty-five percent (35%) to fifty-three percent (53%) by weight of mineral wool.

4,419,257

# MAGNETIC COATING COMPOSITION

Duncan W. Frew, Alamo; Zorro Stefanini, San Jose; Edward A. Schnee, Byron, and Leo di Ricco, San Jose, all of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Nov. 12, 1981, Ser. No. 320,454

Int. Cl.<sup>3</sup> H01F 1/02

U.S. Cl. 252—62.54

13 Claims

1. In a magnetic coating composition of the type having magnetic particles dispersed in a resin binder, the improvements comprising the use of a phosphate-ester dispersant and a solvent system including a dibasic ester wherein said solvent system has an initial Hansen three-dimensional solubility parameter range of approximately 10.5 to 11.0 and a Hansen three-dimensional solubility parameter range of approximately 9.3 to 10.0 after approximately 99% of the solvent has evaporated from the binder.

4,419,258

# DIALKYL GLYOXYLATE SURFACTANTS

Marvin M. Crutchfield, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

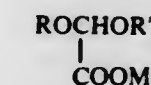
Filed Sep. 30, 1982, Ser. No. 430,551

Int. Cl.<sup>3</sup> C07C 59/10; C11D 1/04

U.S. Cl. 252—89.1

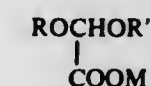
10 Claims

1. A compound of the formula:



wherein R and R' are independently a C<sub>6</sub>-C<sub>10</sub> aliphatic group or said aliphatic group containing an average in the range of about 1 to about 3 oxyethylene units and M is alkali metal, ammonium or alkanolammonium.

7. A detergent composition comprising a detergency builder and at least one compound of the formula:



wherein R and R' are independently a C<sub>6</sub>-C<sub>10</sub> aliphatic group or said aliphatic group containing an average in the range of about 1 to about 3 oxyethylene units and M is alkali metal, ammonium or alkanolammonium.

4,419,259

# DEGREASING AND DEOXIDIZING ALUMINUM FOIL

Donald J. Riley, Cliffside Park, N.J., and John W. Scott, Clinton, Tenn., assignors to Sprague Electric Company, North Adams, Mass.

Filed Oct. 22, 1981, Ser. No. 313,874

Int. Cl.<sup>3</sup> C11D 7/08; C23G 1/02

U.S. Cl. 252—142

8 Claims

1. A process for degreasing and deoxidizing raw aluminum foil before processing for electrolytic capacitors comprises contacting said foil with a solution consisting essentially of 1.0 to 7.0 M phosphoric acid, an agent corrosive to aluminum, and a nonionic surfactant at a temperature of 45° to 85° C. for a contacting time of 20 to 240 seconds without preferential etching of said foil.



**4,419,260**  
**METHOD FOR THE PRODUCTION OF A**  
**SUDS-STABILIZED SILICONE-CONTAINING**  
**DETERGENT**

Herbert Reuter, Hilden, Fed. Rep. of Germany; Herbert Saran, deceased, late of Dusseldorf, Fed. Rep. of Germany (by Karin Saran nee Müller, heiress), and Martin Witthaus, Dusseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,596  
 Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, 3128631

Int. Cl.<sup>3</sup> C11D 3/12, 9/36, 11/02, 17/00  
 U.S. Cl. 252—174.13 15 Claims

1. A method for the production of a suds-stabilized silicone-containing detergent by the spray-drying of an aqueous slurry mixture with a content of:

(A) customary tensides, builder salts and other detergent components which are stable under spray-drying conditions, and

(B) suds-stabilizing silicones which method comprises jointly passing an aqueous slurry mixture containing components (A) and a separately produced aqueous dispersion containing suds-stabilizing silicones (B), and a film-forming, high-molecular-weight polymer, which is soluble or swellable in water, in an amount sufficient for the formation of microcapsules, said suds-stabilizing silicones being present in said aqueous dispersion in a particle size of from 0.5  $\mu$ m to 40  $\mu$ m,

through a spray nozzle into an air-heated fall space and recovering said suds-stabilized silicone-containing detergent.

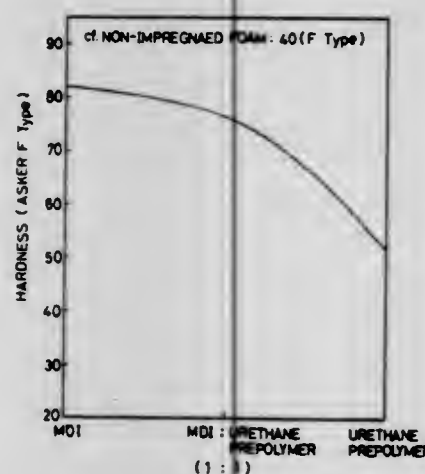
**4,419,261**  
**IMPREGNANT FOR MAKING SEMI-RIGID OR RIGID**  
**RESIN FOAMS**

Nobuhiro Takahashi, Tajimi, Japan, assignor to Wako Kemikaru Kabushiki Kaisha, Atsugi, Japan

Filed Sep. 23, 1980, Ser. No. 190,098

Int. Cl.<sup>3</sup> C09K 3/00

U.S. Cl. 252—182 21 Claims



1. An impregnant for converting a soft resin foam of open cells to a semi-rigid or rigid resin foam consisting essentially of an isocyanate selected from the group consisting of 4,4'-diphenylmethanediisocyanate, tolylenediisocyanate and a mixture thereof, and a polyurethane prepolymer obtained by reacting an isocyanate selected from the group consisting of tolylenediisocyanate, 4,4'-diphenylmethanediisocyanate and a mixture thereof with a polyol having a molecular weight of about 1500-4000 and 2-4 functional groups in such proportions that the content of NCO groups in the prepolymer is in the range of below 15%, and wherein the mixing ratio of the first-mentioned isocyanate to the prepolymer is in the range of 1:9 to 9:1 and an organic inert solvent mixed therewith, said solvent selected from the group consisting of aromatic hydrocarbons, aliphatic hydrocarbons, chlorinated hydrocarbons,

esters of hydrocarbons and ketones of hydrocarbons, said organic inert solvent being mixed in such a manner that the viscosity of the thus-diluted impregnant is below 500 cps.

**4,419,262**  
**PYRIDAZINES**

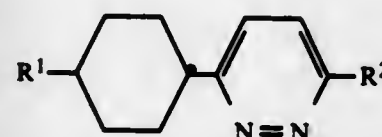
Martin Petrzilka, Kaiserangst, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 12, 1982, Ser. No. 396,998

Claims priority, application Switzerland, May 14, 1982, 3014/82

Int. Cl.<sup>3</sup> C09K 3/34; C02F 1/13; C07D 237/08, 237/02  
 U.S. Cl. 252—299.61 15 Claims

1. A compound of the formula



wherein R<sup>1</sup> is straight-chain alkyl of 1 to 12 carbon atoms, R<sup>2</sup> is 1-alkynyl and said 1-alkynyl group in R<sup>2</sup> is a straight-chain group of 2 to 10 carbon atoms.

**4,419,263**  
**LIQUID CRYSTALLINE CYCLOHEXYLCARBONITRILE**  
**DERIVATIVES**

Klaus Praefcke; Dietmar Schmidt, both of Berlin, and Rudolf Eidenschink, Dieburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

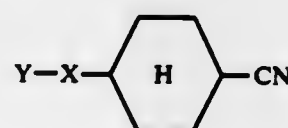
Filed Jan. 7, 1982, Ser. No. 337,805

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1981, 3100142

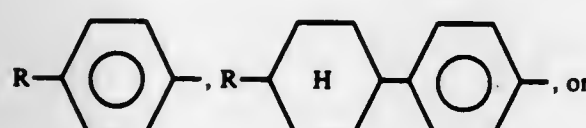
Int. Cl.<sup>3</sup> C09K 3/34; G02F 1/13; C07C 121/46, 121/66, 120/00, 120/04

U.S. Cl. 252—299.63 20 Claims

1. A cyclohexylcarbonitrile derivative of the formula

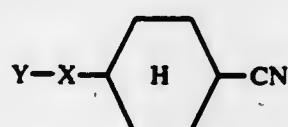


wherein Y is



X is —COO—, —O—CO—, —CH<sub>2</sub>O—, —OCH<sub>2</sub>— or —CH<sub>2</sub>C—H<sub>2</sub>—, and R is alkyl or alkoxy each of 1-12 carbon atoms; and all cyclohexyl rings are trans.

6. A cyclohexylcarbonitrile derivative of the formula



wherein Y is

**4,419,265**  
**ADDITION PRODUCTS FROM ETHYLENE**  
**OXIDE-PROPYLENE OXIDE BLOCK POLYMERS AND**  
**BIS-GLYCIDYL ETHERS, A PROCESS FOR THEIR**  
**PREPARATION AND THEIR USE**

Helmut Diery, Kelkheim, and Martin Hille, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

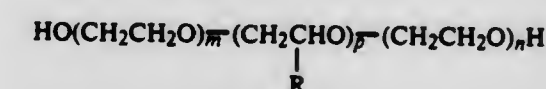
Filed Dec. 21, 1981, Ser. No. 332,971

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049455

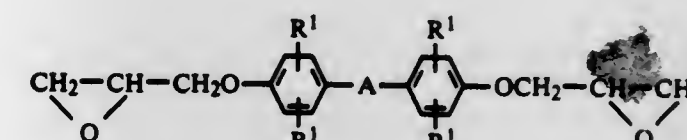
Int. Cl.<sup>3</sup> B01D 17/04; C08L 63/00

U.S. Cl. 252—331 4 Claims

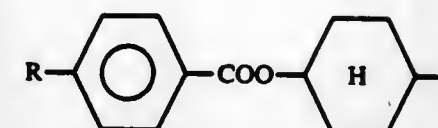
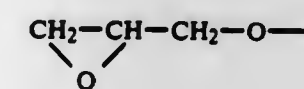
1. An addition product from the components consisting essentially of (a) an ethylene oxide-propylene oxide block polymer of the formula



wherein R denotes methyl or ethyl, n and m are numbers which are so chosen that the content of polyethylene oxide constitutes 5 to 80% of the molecular weight of the total molecule and p is a number larger than 10, and (b) a bis-glycidyl ether of the formula

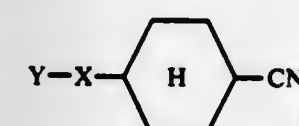


or

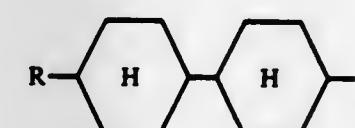


X is —CH<sub>2</sub>CH<sub>2</sub>—, and R is alkyl or alkoxy each of 1-12 carbon atoms; and all cyclohexyl rings are trans.

7. A cyclohexylcarbonitrile derivative of the formula



wherein Y is



X is —COO—, —O—CO— or —CH<sub>2</sub>CH<sub>2</sub>—, and R is alkyl or alkoxy each of 1-12 carbon atoms; and all cyclohexyl rings are trans.

**4,419,264**  
**FLUORINE-CONTAINING**  
**4,4'-BIS-(CYCLOHEXYL)-BIPHENYL DERIVATIVES,**  
**AND DIELECTRICS AND ELECTRO-OPTICAL DISPLAY**  
**ELEMENTS CONTAINING THEM**

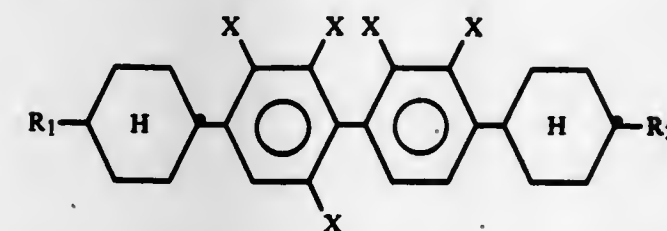
Rudolf Eidenschink, Dieburg; Michael Römer, Rodgau, and Ludwig Pohl, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,454

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117152

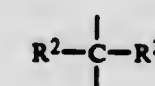
Int. Cl.<sup>3</sup> G02F 1/133; C09K 3/34; C07C 25/18, 43/184, 43/142  
 U.S. Cl. 252—299.63 10 Claims

1. A compound of the formula



wherein R<sub>1</sub> and R<sub>2</sub> are identical or different and each is alkyl or alkoxy each of up to 8 C atoms, and one or two of the substituents X are fluorine and the others are hydrogen.

wherein the R<sub>1</sub>'s can be identical or different and denote hydrogen, C<sub>1</sub>-C<sub>4</sub>-alkyl or halogen, A denotes a direct bond, a sulfonyl or cyclohexyl group or a group of the formula





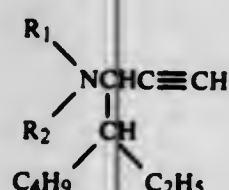
**4,419,266**  
**CORROSION INHIBITORS CONTAINING 3-DIALKYL-3-(1-ETHYLPENTYL)-PROP-1-YNE**  
 Eugene V. Hort, Wayne; Lowell R. Anderson, Morristown, and Dru W. Alwani, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,295  
 Int. Cl.<sup>3</sup> C23F 11/14

U.S. Cl. 252—392

18 Claims

1. An aqueous composition for inhibiting the corrosion of metals placed therein comprising:
  - (a) an effective amount of a corrosion-inhibiting compound having the formula:



- where  $R_1$  and  $R_2$  are independently alkyl  $C_1$ - $C_6$ , or phenyl; and
- (b) a non-oxidizing acid.
9. A corrosion inhibitor for aqueous solutions of mineral acids consisting essentially of the reaction product obtained by the catalytic ethynylation of a secondary amine  $R_1R_2NH$ , where  $R_1$  and  $R_2$  are independently alkyl  $C_1$ - $C_6$  or phenyl, and 2-ethylhexanal, with acetylene.

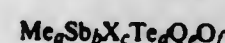
**4,419,267**  
**PROCESS FOR REGENERATING ANTIMONY CONTAINING OXIDE CATALYST COMPRISING AN AQUEOUS AMMONIA IMPREGNATION**  
 Yutaka Sasaki; Kunio Mori, both of Yokohama; Kiyoshi Moriya, Kanagawa, and Hiroshi Utsumi, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,271  
 Claims priority, application Japan, May 23, 1980, 55-67872  
 Int. Cl.<sup>3</sup> B01J 27/30, 23/92; C07C 120/14, 11/12

U.S. Cl. 502—26

7 Claims

1. A process for regenerating an antimony containing metal oxide catalyst which comprises
  - impregnating aqueous ammonia in an amount corresponding to the pore volume of the catalyst, into a metal oxide catalyst whose activity has been deteriorated, said catalyst containing as essential components (A) antimony, (B) at least one element selected from the group consisting of iron, cobalt, nickel, manganese, uranium, cerium, tin and copper, (C) at least one element selected from the group consisting of vanadium, molybdenum and tungsten and (D) tellurium, drying the catalyst, and
  - calcining the catalyst in a non-reducing atmosphere at a temperature in the range of about 550° C. to about 950° C.
2. The process according to claim 1, wherein the antimony containing metal oxide catalyst is a metal oxide catalyst containing, in addition to said components (A) to (D), (E) at least one element selected from the group consisting of magnesium, calcium, strontium, barium, lanthanum, titanium, zirconium, niobium, tantalum, chromium, rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum, silver, zinc, cadmium, boron, aluminum, sodium, potassium, rubidium, cesium, indium, thallium, silicon, germanium, lead, phosphorus, arsenic, bismuth, sulfur and selenium.
3. The process according to claim 2, wherein the antimony containing metal oxide catalyst is a metal oxide catalyst having the empirical formula



where Me represents at least one element selected from the group consisting of Fe, Co, Ni, Mn, U, Ce, Sn and Cu, X represents at least one element selected from the group consisting of V, Mo and W, and Q represents at least one element

selected from the group consisting of Mg, Ca, Sr, Ba, La, Ti, Zr, Nb, Ta, Cr, Re, Ru, Os, Rh, Ir, Pd, Pt, Ag, Zn, Cd, B, Al, Na, K, Rb, Cs, In, Tl, Si, Ge, Pb, P, As, Bi, S and Se; and a, b, c, d, e and f represent each atomic ratios, wherein, when a = 10, b = 5-60, c = 0.01-5, d = 0.02-10, e = 0-20 and f = the number of oxygen atoms corresponding to the oxide thereof.

**4,419,268**  
**PARTIALLY HYDROLYZED SILICATE TREATMENT OF CATALYST SUPPORT**  
 Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 20, 1981, Ser. No. 323,854  
 Int. Cl.<sup>3</sup> C08F 4/24, 4/02; B01J 31/02, 31/34  
 U.S. Cl. 502—158

14 Claims

1. A process for producing a catalyst comprising combining a silica organosol produced by the partial hydrolysis of a silicate ester to give an organosilicon compound having a plurality of silicon atoms per molecule with a support selected from a silica-containing material which is 80-100 weight percent silica or an aluminum phosphate to form a catalyst base, said base containing in addition a chromium compound.
2. A method according to claim 1 wherein said support is said silica-containing material.
4. A method according to claim 2 wherein said silica organosol is produced from a silicon tetrahydrocarbyloxyde of the formula  $Si(OR)_4$  where R is a hydrocarbyl radical containing from 1 to about 12 carbon atoms selected from alkyl, cycloalkyl, aryl, and combinations thereof, said R groups being alike or different.

**4,419,269**  
**TRANSITION METAL CONTAINING CATALYST**  
 Joseph G. Schell, Jr., Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 6, 1982, Ser. No. 447,385  
 Int. Cl.<sup>3</sup> C08F 4/64

3 Claims

1. A catalyst useful in the preparation of stereospecific polymer of one or more  $\alpha$ -olefins having at least three carbon atoms which is a titanium-containing catalyst prepared by
  - (A) reacting in the presence of an inert hydrocarbon diluent
    - (1) the reaction product of
      - (a) an organomagnesium compound;
      - (b) water, carbon dioxide or an organic oxygen-containing compound; and
      - (c) an electron donor or Lewis base; and
    - (2) a transition metal, Tm, halide;
  - (B) recovering and washing the resultant solid reaction product with an inert hydrocarbon;
  - (C) reacting the washed solid product from (B) with, in the order indicated,
    - (1) titanium tetrachloride and
    - (2) a reducing agent;
  - (D) stirring the mixture until the resultant brown  $\beta$ -crystalline form of titanium trichloride is transformed into the violet  $\alpha$ -crystalline form;
  - (E) recovering and washing the resultant solid catalyst with an inert hydrocarbon;

and wherein the components are employed in quantities so as to provide a sufficient quantity of component (A-1-b) to lower the amount of hydrocarbyl groups present in component (A-1-a) such that the resultant product will not substantially reduce  $TiCl_4$  at 25° C. Component (A-1-c) is employed in quantity which provides a final atomic ratio of electron donor:total combined transition metal in components (A-2) and (C1) of from about 0.05:1 to about 50:1; at least a sufficient amount of halogen from component (A-2) is employed to convert essentially all of the groups attached to a magnesium atom in component (A-1) to halide groups. The quantity of component (C-1) is that which is sufficient to provide a Ti from component (C-1):Mg atomic ratio of from about 0.01:1 to about 100:1; and

the quantity of component (C-2) is employed so as to only reduce a portion of the titanium tetrachloride so as to provide a final atomic ratio in the solid washed product of Ti:Mg of 0.02:1 to about 20:1.

**4,419,270**  
**OXIDATION CATALYST**  
 Michio Ueshima, Nishinomiya; Yoshiyuki Takahashi, Suita; Ritsuo Kitada, Takatsuki, and Isao Nagai, Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Jun. 19, 1981, Ser. No. 275,243  
 Claims priority, application Japan, Jun. 26, 1980, 55-85919; Apr. 16, 1981, 56-56238; Apr. 17, 1981, 56-56906; Apr. 22, 1981, 56-59782; Apr. 24, 1981, 56-61405

Int. Cl.<sup>3</sup> B01J 23/22, 23/28, 27/18

U.S. Cl. 502—209

2 Claims

1. A catalyst for the vapor-phase oxidation of an unsaturated hydrocarbon, alcohol, saturated aliphatic aldehyde or unsaturated aliphatic aldehyde having 4 carbon atoms, said catalyst comprising molybdovanadophosphoric acid and being formed by adding a nitrogen-containing heterocyclic compound selected from the group consisting of pyridine, piperidine and piperazine to an aqueous solution of molybdovanadophosphoric acid to form a precipitate, pelletizing, drying and calcining and has X-ray diffraction lines (Cu-K $\alpha$  radiation) at  $2\theta$  = about 26.2°, about 10.5°, about 21.3° and about 30.3° and a crystal structure approximating that of its salt, and said catalyst having the composition represented by the general formula



wherein the dissociable protons of the molybdovanadophosphoric acid are omitted, X represents at least one element selected from the group consisting of sodium, potassium, rubidium, cesium, thallium, beryllium, magnesium, calcium, strontium, and barium, Y represents at least one element selected from the group consisting of copper, silver, arsenic, antimony, tellurium, cobalt, bismuth and zirconium, and the subscripts a to f represent the atomic proportions of the respective elements, provided that when b is 12,
 

- a is 0.1-3.0,
- c is 0.1-6.0
- d is 0-10.0
- e is 0-5.0, and
- f is a value determined by the atomic valences and atomic proportions of the respective elements.

**4,419,271**  
**HYDROCARBON CONVERSION CATALYST**  
 John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 15, 1979, Ser. No. 84,761

Int. Cl.<sup>3</sup> B01J 29/08

U.S. Cl. 502—65

37 Claims

1. A composition of matter useful as a catalyst base for supporting active hydrogenation metal components or for catalyzing acid catalyzed hydrocarbon conversion reactions comprising in intimate heterogeneous mixture (1) a modified hydrogen crystalline aluminosilicate Y zeolite having activity for catalytically cracking hydrocarbons and having a unit cell size between 24.25 and 24.35 Å and a water absorption capacity, at 4.6 mm water vapor partial pressure and 25° C., less than 8% by weight of the zeolite and (2) a dispersion of silica-alumina in a gamma alumina matrix.

**4,419,272**  
**CATALYSTS FOR THE PRODUCTION OF 2-CYANOPYRAZINE**  
 Bergstein Wolfgang, Rodenbach; Heinz Friedrich, Hanau; Axel Kleemann, Hanau; Günther Prescher, Hanau, and Helmut Beschke, Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,404  
 Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107756

Int. Cl.<sup>3</sup> B01J 21/16, 23/16

U.S. Cl. 502—84

9 Claims

1. A composition suitable to catalyze the reaction of 2-methylpyrazine with ammonia and oxygen to form 2-cyanopyrazine consisting essentially of the elements antimony, vanadium and oxygen and additionally at least one of the elements iron, copper, titanium, cobalt, manganese, and nickel where the atomic ratio of antimony to vanadium is greater than 1 and which contains in addition to these compounds a lattice layer silicate and highly dispersed silica and which has a BET surface area of 5 to 50 m<sup>2</sup>/g, a macropore volume of 0.1 to 0.8 cm<sup>3</sup>/g, and an average pore radius of 1 to 8 × 10<sup>-7</sup> cm.

**4,419,273**  
**CLAY-BASED SULFUR SORBENT**  
 Donald S. Santilli, Pinole, Calif., and Donald W. Blakely, deceased, late of Oakland, Calif. (by Robert L. Jacobson, administrator), assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 4, 1981, Ser. No. 318,228  
 Int. Cl.<sup>3</sup> B01J 21/16, 23/72

U.S. Cl. 502—80

8 Claims

1. A sulfur sorbent comprising a support made from fibrous silicate clay with randomly dispersed fibers and at least enough copper-containing compound to provide a sorbent of at least 25 weight percent copper measured as the reduced metal.
4. The sulfur sorbent of claim 1 wherein said sulfur sorbent contains from 1 to 50 weight percent alumina.

**4,419,274**  
**NONMETALLIC CATALYST COMPOSITIONS FOR OXIDATION OF AMMONIA AND PROCESS FOR MAKING THE CATALYST**

Yoon K. Sin, Seoul, and Daiuk Kim, Young Il-Koon, both of Rep. of Korea, assignors to Pohang Iron & Steel Co., Ltd., Pohang City, Rep. of Korea

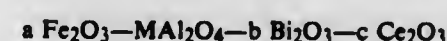
Filed Dec. 15, 1981, Ser. No. 331,216  
 Claims priority, application Rep. of Korea, Dec. 16, 1980, 4781

Int. Cl.<sup>3</sup> B01J 21/04, 23/10, 23/78, 23/84

U.S. Cl. 502—304

18 Claims

1. A nonmetallic catalyst composition of the formula



wherein  
 $MA_2O_4$  is a spinel carrier,  
 M is magnesium, manganese, calcium, strontium or barium,  
 a is from 10 to 40 weight percent,  
 b is from 3.5 to 6 weight percent, and  
 c is from 0.5 to 2 weight percent,  
 all percentages being based on the spinel.



4,419,275

## METHOD OF HYDROREFINING CATALYST MANUFACTURE

Shin-ichi Yoshida; Takemitsu Yano, and Hidehiro Higashi, all of Kitakyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 421,764

Claims priority, application Japan, Jun. 29, 1982, 57-112311  
Int. Cl.<sup>3</sup> B01J 21/04, 23/85

U.S. Cl. 502—322

5 Claims

1. A method of manufacturing a hydrorefining catalyst of an alumina carrier material and hydrogenating metal components deposited thereon which comprises controlling a water of hydration of pseudo-boehmite contained in an amorphous alumina hydrate slurry in the range of 1.20–1.50 mols per mol of  $Al_2O_3$ ; forming an alumina hydrate obtained from this slurry into alumina particles of desired shape and dimensions and drying; then calcinating the alumina particles in an atmosphere containing steam to thereby prepare a porous alumina carrier material; and depositing hydrogenating metal components on this porous alumina carrier material.

4,419,276

## SILVER CATALYST FOR THE MANUFACTURE OF ETHYLENE OXIDE AND A PROCESS FOR PREPARING THE CATALYST

Madan M. Bhasin, Charleston, and Glenn H. Warner, St. Albans, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1981, Ser. No. 307,242

Int. Cl.<sup>3</sup> B01J 23/04, 23/66

U.S. Cl. 502—347

14 Claims

1. A process for preparing a supported silver catalyst for the production of ethylene oxide by the vapor phase oxidation of ethylene with an oxygen-containing gas comprising:

- impregnating a porous catalyst support with a solution comprising a solvent or a solubilizing agent, and silver salt in an amount sufficient to deposit the desired amount of silver on said support;
- treating the impregnated support to convert at least a fraction of the silver salt to silver metal and effect deposition of silver on the surface of said support;
- impregnating the support treated in step (b) with a compound of at least one metal cation promoter in an amount sufficient to deposit the desired amount of promoter on said support dissolved in an organic solvent in which water is soluble at ambient temperature in an amount no greater than about 50 wt. % based on the weight of water-solvent solution; and
- treating the impregnated support produced in step (c) to effect deposition of said promoter on the surface of said support.

4,419,277

## TREATED POLYACETYLENE

Robert M. Myers, Holland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 23, 1981, Ser. No. 246,535

Int. Cl.<sup>3</sup> H01B 1/02

U.S. Cl. 252—500

27 Claims

1. A process for reducing doped polyacetylene crosslinking and embrittlement comprising treating said polyacetylene with a material selected from the class consisting of:

- hindered phenols having at least one alkyl or alkoxy group of from about 4 to about 12 carbon atoms, said alkyl or alkoxy group being in a position ortho and/or para to the hydroxy group on the benzene ring;
- alkyl ethers of hydroquinone, wherein said alkyl group has from 1 to about 12 carbon atoms; and
- dialkyl thiodipropionates wherein each of said alkyl groups has from 1 to about 18 carbon atoms and each alkyl group may be the same or different; and mixtures thereof.

4,419,278

## PHOTOACTIVE SEMICONDUCTOR MATERIAL USING TRUE SOLID/SOLID SOLUTION MIXED METAL OXIDE

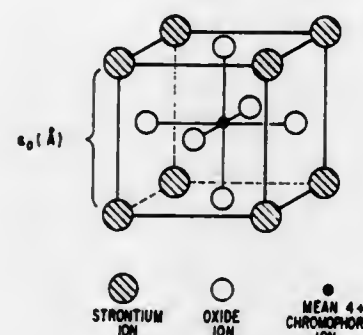
Arnold Z. Gordon, Lyndhurst, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed May 4, 1981, Ser. No. 259,941

Int. Cl.<sup>3</sup> H01B 1/06

U.S. Cl. 252—501.1

30 Claims

SrTi<sub>1-x</sub>BxO<sub>3</sub> UNIT CELL

1. A photoactive true solid/solid solution semiconductor mixed metal material having a band gap of about 1.4 eV containing metal components all of which are derived from precursor substances selected from the group consisting of elemental metals, non-oxide metal compounds, and mixtures thereof; said mixed metal oxide material corresponding to the formula  $A_rM_yO_z$ ; where said formula represents the stoichiometry of the basic repeating unit lattice cell; where M is the combination of component (a) metal and component (b) metal; A when present is at least one different metal which does not substantially alter the optical absorption accruing from M in the above formula; O represents oxygen, said formula being further characterized in the r, y, z, va and vm are defined by the relationship  $va(r) + vm(y) = 2z$ , wherein r equals a value of from 0 to 2, inclusive, y is from 1 to 2, inclusive, z is from 1 to 7, inclusive, va equals the positive valence of A, vm equals the positive mean valence of M and the valence of oxygen is -2; and wherein all said metal components of said formula are selected from the group consisting of boron, aluminum, tin, lead, the transition metals of families 1b through 7b, inclusive, and 8 of the periodic table of elements, and the lanthanide series; wherein M in the above formula comprises:

- 50 to 99.9 mole percent, based on the total metals mole fraction, of one or more component (a) metals; and
- 0.1 to 50 mole percent, based on the total metals mole fraction, of one or more component (b) metals;

with the proviso that said component (b) metals are different than said component (a) metals, and with the further proviso that said component (a) metals, when in comparable oxide form, have a larger band gap than said component (b) metals, when said component (b) metals are in their comparable oxide form.

4,419,279

## CONDUCTIVE PASTE, ELECTROCONDUCTIVE BODY AND FABRICATION OF SAME

John C. Abrams, Tappan, N.Y., assignor to Potters Industries, Inc., Hasbrouck Heights, N.J.

Filed Sep. 15, 1980, Ser. No. 187,428

Int. Cl.<sup>3</sup> H01B 1/02

U.S. Cl. 252—514

16 Claims

1. A conductive paste suitable for forming an electroconductive body, which comprises inorganic non-metallic particles coated with silver, said silver-coated inorganic non-metallic particles being of a size, on average, of from 1 to 100 microns in maximum dimension, and silver particles, in a polymeric organic binder formable into a matrix having embedded therein said silver-coated inorganic non-metallic particles and silver particles, the total amount of silver in said paste consti-

tuting at least 10% by weight of the paste and the amount of silver in said silver particles constituting at least 5% by weight of the paste.

4,419,280

## 1-ETHOXY-1-ETHANOL ACETATE AND USES THEREOF FOR AUGMENTING OR ENHANCING AROMA OR TASTE OF CONSUMABLE MATERIALS

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 176,111, Aug. 7, 1980, Pat. No. 4,296,131.

This application Jul. 6, 1981, Ser. No. 280,277

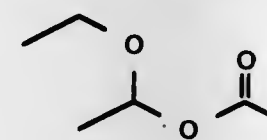
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 7/46

U.S. Cl. 252—522 R

2 Claims

1. A process for augmenting or enhancing the aroma of a perfume composition or cologne comprising adding to a perfume composition; or cologne base, an organoleptic property-modifying, augmenting or enhancing quantity of 1-ethoxy-1-ethanol acetate having the structure:



4,419,281

## N,N-DIETHYLHEPTANAMIDE FRAGRANCES

Claude Breant, Villeurbanne, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Sep. 15, 1981, Ser. No. 302,672

Claims priority, application France, Sep. 26, 1980, 80 20985

Int. Cl.<sup>3</sup> A61K 7/46; C11B 9/00

U.S. Cl. 252—522 R

15 Claims

1. In a perfumed composition containing an admixture of perfume ingredients, the improvement which comprises, as an odorant therefor, an effective fragrance imparting amount of N,N-diethylheptanamide.

4,419,282

## N,N-DIMETHYLOCTANAMIDE FRAGRANCES

Claude Breant, Villeurbanne, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Sep. 15, 1981, Ser. No. 302,673

Claims priority, application France, Sep. 26, 1980, 80 20984

Int. Cl.<sup>3</sup> A61K 7/46; C11B 9/00

U.S. Cl. 252—522 R

16 Claims

1. In a perfumed composition, the improvement which comprises, as an odorant therefor, an effective fragrance imparting amount of N,N-dimethyloctanamide.

4,419,283

## LIQUID COMPOSITIONS FOR DISPLAY DEVICES

Ronald A. Schneider, 555 Pierce St., #303, Albany, Calif. 94706

Continuation-in-part of Ser. No. 105,967, Dec. 21, 1979,

abandoned, and Ser. No. 105,966, Dec. 21, 1979, abandoned.

This application Jul. 20, 1981, Ser. No. 284,622

Int. Cl.<sup>3</sup> G09F 19/00

U.S. Cl. 252—600

28 Claims

1. In a display device which depends on the movement of a plurality of mutually immiscible liquids, the combination thereof with a composition comprising at least four mutually immiscible liquids, three of which are composed primarily of organic substances the molecules of which contain at least 3 hydrogen atoms and do not attain fluorine, and the fourth of which comprises water.

4,419,284

## PREPARATION OF HALOMETHYL ESTERS (AND RELATED ESTERS) OF PENICILLANIC ACID 1,1-DIOXIDE

Thomas C. Crawford, Gales Ferry, and Vytautas J. Jasys, New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

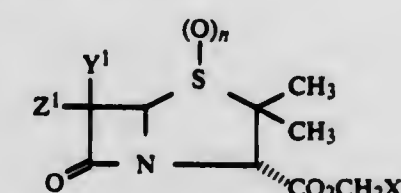
Filed Mar. 23, 1981, Ser. No. 246,453

Int. Cl.<sup>3</sup> C07D 499/00; A61K 31/425

U.S. Cl. 260—245.2 R

8 Claims

1. A compound of the formula



wherein X is Cl, Br, I or  $OSO_2R^1$  where  $R^1$  is alkyl having from one to six carbon atoms or  $C_6H_4R^2$  where  $R^2$  is H, Cl, Br, I,  $NO_2$  or alkyl or alkoxy having from one to three carbon atoms; n is zero, 1 or 2;  $Y^1$  is H and  $Z^1$  is  $C\equiv N$ — or  $SCN$ —, or  $Y^1$  is  $SeC_6H_4R^2$  and  $Z^1$  is Cl or Br,  $R^2$  is H, Cl, Br, I,  $NO_2$  or alkyl or alkoxy having from one to three carbon atoms.

4,419,285

## AZIDO FLUORODINITRO AMINES

Milton B. Frankel, Tarzana, and Edward F. Witucki, Van Nuys, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 19, 1982, Ser. No. 350,494

Int. Cl.<sup>3</sup> C07C 117/00

U.S. Cl. 260—349

2 Claims

1. The compound, azidomethyl bis(fluorodinitroethyl) amine.

4,419,286

## AZIDO ESTERS

Edward F. Witucki, Van Nuys, and Joseph E. Flanagan, Woodland Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 21, 1982, Ser. No. 370,235

Int. Cl.<sup>3</sup> C07C 117/00

U.S. Cl. 260—349

1 Claim

1. The compound, 6-azidoheptyl-6-azidoheptanoate.

4,419,287

## STEREOCONTROLLED SYNTHESIS OF STEROIDAL SIDE CHAINS

William G. Dauben, and Todd E. Brookhart, both of Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 216,959, Dec. 16, 1980, abandoned.

This application May 24, 1982, Ser. No. 381,171

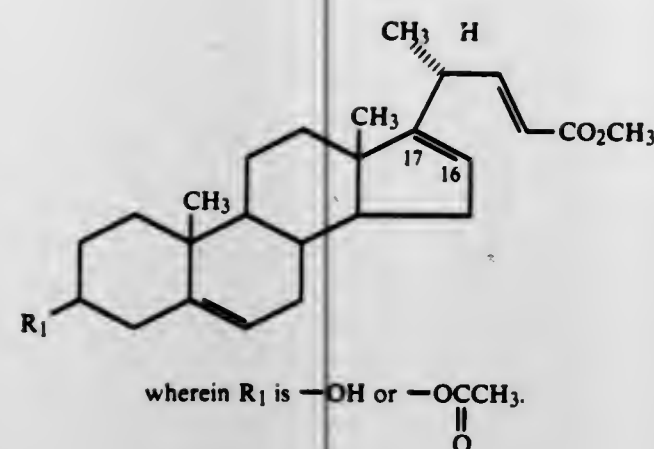
Int. Cl.<sup>3</sup> C07J 9/00

U.S. Cl. 260—397.1

8 Claims

1. A compound having the structure





4,419,288

## ELASTIN HYDROLYZATE

Gheorghe Cioca, Coatesville, Pa., assignor to Seton Company, Newark, N.J.

Continuation-in-part of Ser. No. 296,985, Aug. 27, 1981, Pat. No. 4,363,760. This application Aug. 23, 1982, Ser. No. 409,316  
Int. Cl.<sup>3</sup> A23J 1/10; C07G 7/06; C08L 89/04, 89/06

U.S. Cl. 260—123.7 3 Claims

1. A soluble elastin partial hydrolyzate comprised of polypeptides having from 3 to 4 desmosine and isodesmosine residues/1,000 residues.

4,419,289

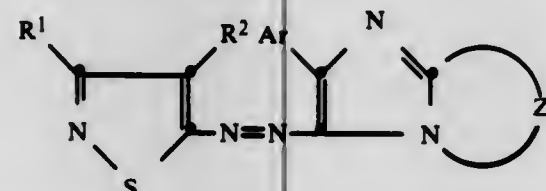
ISOTHIAZOLE TYPE AZO DYES CONTAINING  
IMIDAZO TYPE COUPLERS

Jean C. Fleischer; Gary T. Clark, and Max A. Weaver, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 128,209, Mar. 7, 1980, Pat. No. 4,354,970.  
This application Mar. 11, 1982, Ser. No. 356,991

Int. Cl.<sup>3</sup> C09B 29/039, 29/36, 29/46, 29/48  
U.S. Cl. 260—158 4 Claims

1. A compound having the formula



wherein R<sup>1</sup> and R<sup>2</sup> are each selected from cyano, bromo, hydrogen, chloro, formyl, lower alkoxy, carbonyl, lower alkyl, lower alkylsulfonyl, thiocarbonyl, carbamoyl, lower alkylcarbamoyl, and lower alkanoyl; Z represents the atoms necessary to complete a five or six membered ring which is unsubstituted or substituted with nitrogen, oxygen, sulfur or a combination thereof; and Ar is a benzene ring which is unsubstituted or substituted with up to three of lower alkyl, lower alkoxy, halogen, hydroxy, lower alkylamino, nitro or cyano.

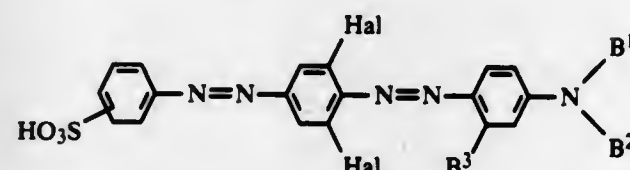
4,419,290  
DIAZO DYES HAVING A COUPLER COMPONENT  
ATTACHED TO A  
SULFAPHENYL-AZO-PHENYL-AZO-RADICAL

Johannes Dehnert, Ludwigshafen, and Hermann Loeffler, Speyer, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany  
Continuation of Ser. No. 896,383, Apr. 14, 1978. This application Jun. 16, 1980, Ser. No. 159,474

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718620

Int. Cl.<sup>3</sup> C09B 31/043, 31/062, 31/068, 31/14  
U.S. Cl. 260—186 2 Claims

1. A disazo dye having the formula:



wherein

Hal is chlorine or bromine;

B<sup>1</sup> is hydrogen, C<sub>1</sub> or C<sub>4</sub> alkyl, C<sub>2</sub> or C<sub>3</sub> hydroxyalkyl, allyl, C<sub>2</sub> and C<sub>3</sub> alkyl substituted by C<sub>1</sub> to C<sub>4</sub> alkoxy or C<sub>1</sub> or C<sub>4</sub> alkanoyloxy, β-cyanoethyl, β-chloroethyl or β-hydroxy-γ-chloropropyl;

B<sup>2</sup> is the same as B<sup>1</sup> or is cyclohexyl, benzyl, sulfobenzyl, phenylethyl, sulfophenylethyl, phenyl or sulfophenyl; and B<sup>3</sup> is hydrogen, chloro, methyl or C<sub>1</sub> to C<sub>4</sub> alkanoylamino.

4,419,291

PROCESS FOR THE DIRECTED  
INTERESTERIFICATION OF A TRIGLYCERIDE OIL OR  
OIL MIXTURE AND TRIGLYCERIDE OILS OR OIL  
MIXTURE THUS INTERESTERIFIED

Rene De Lathauwer, Herent; Martin Van Opstal, and Albert J. Dijkstra, both of Izegem, all of Belgium, assignors to Safinco, Belgium

Continuation of Ser. No. 74,474, Sep. 11, 1979, Pat. No. 4,284,578. This application Apr. 29, 1981, Ser. No. 258,794  
Claims priority, application Belgium, Sep. 14, 1978, 870481

The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> C11C 3/02 10 Claims

U.S. Cl. 260—410.7 10 Claims

1. Process for the directed interesterification of a triglyceride oil or oil mixture which comprises:

(a) adding a low temperature-active interesterification catalyst to the triglyceride oil or oil mixture;

(b) activating the interesterification catalyst at the temperature at which the catalyst is added to the triglyceride oil or oil mixture;

(c) cooling the triglyceride oil or oil mixture containing activated interesterification catalyst to a preselected upper cycle temperature, said temperature being above the reference cloud point temperature of the triglyceride oil or oil mixture;

(d) carrying out a first temperature and time regulated cycle, taking 20 minutes or less wherein, in sequence:

(i) the temperature of the triglyceride oil or oil mixture is rapidly reduced from the upper cycle temperature to the reference cloud point temperature or a preselected lower cycle temperature, said lower cycle temperature being below the reference cloud point temperature; and, (ii) if the temperature of the triglyceride oil or oil mixture is below the reference cloud point temperature, the temperature of the triglyceride mixture is increased to the reference cloud point temperature;

(e) carrying out at least three successive temperature and time regulated cycles with each such cycle taking 120 minutes or less wherein, in sequence:

- (i) the temperature of the triglyceride oil or oil mixture is increased from the reference cloud point temperature to the upper cycle temperature;
- (ii) the temperature of the triglyceride oil or oil mixture is rapidly reduced from the upper cycle temperature to the lower cycle temperature; and
- (iii) the temperature of the triglyceride oil or oil mixture is increased from the lower cycle temperature to the reference cloud point temperature.

wherein n is an integer from 1 to 10 and R represents a divalent hydrocarbon group having tertiary terminal carbon atoms.

5. A method for producing diisocyanate oligomers having carbodiimide linkages which comprises polymerizing a tertiary aliphatic diisocyanate in the presence of a volatile catalyst and at a temperature effective to produce such oligomers and carbondioxide while monitoring the amount of monomer, and separating the oligomers from catalyst and unreacted monomer at a predetermined minimum level of unreacted monomer.

4,419,292

PROCESS FOR PRODUCING POLYCONDENSATES OF  
ω-OXYPENTADECANOIC ACID

Tohr Yamanaka, Kamakura, and Takashi Imai, Hiratsuka, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1982, Ser. No. 339,230

Claims priority, application Japan, Jan. 13, 1981, 56-2629  
Int. Cl.<sup>3</sup> C11C 3/02 10 Claims

U.S. Cl. 260—410.9 R 10 Claims

1. A process for producing polycondensates of ω-oxypentadecanoic acid comprising hydrogenolysis of 2-tetrahydrofuran-undecanoic acid or an ester thereof using a mixed catalyst composed of a catalyst for hydrogenation comprising one or more metals of Group VIII of the Periodic Table, copper-chromium, or copper-zinc, and a solid acid catalyst, by heating under pressure with hydrogen.

4,419,293

## ALIPHATIC SOLVENT COMPATIBLE ISOCYANATES

George A. Hudson, deceased, late of Venetia, Pa. (by Richard L. White, administrator), and Helmut F. Reiff, Leverkusen, Fed. Rep. of Germany, assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

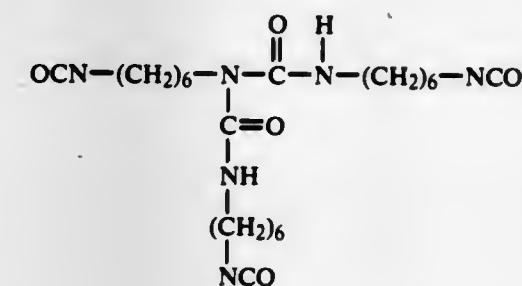
Filed Jul. 10, 1981, Ser. No. 282,206

Int. Cl.<sup>3</sup> C07C 127/24 5 Claims

U.S. Cl. 260—453 AB 5 Claims

1. A modified polyisocyanate having improved compatibility with aliphatic hydrocarbon solvents comprising the reaction product of

(a) an aliphatic biuret isocyanate having the formula



and

(b) about 0.05 to 0.5 mols per equivalent of isocyanate of an aliphatic monohydroxy alcohol having between 14 and 30 carbon atoms.

4,419,294

CARBODIIMIDE OLIGOMERS OF TERTIARY  
ALIPHATIC ISOCYANATES

Allan M. Feldman, Norwalk, and Peter S. Forgione, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 8, 1982, Ser. No. 355,820

Int. Cl.<sup>3</sup> C07C 119/055 9 Claims

U.S. Cl. 260—453 A 9 Claims

1. A stable, liquid diisocyanate consisting essentially of a mixture of oligomers of the formula



in which

X is a chlorine, bromine or iodine atom, with trimethylsilyl

4,419,295

CONTINUOUS PROCESS FOR THE PRODUCTION OF  
ORGANIC ISOCYANATES

Hans-Joachim Hennig, Leverkusen, Jürgen Lahrs, Cologne, and Dietrich Liebsch, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 379,822

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121036

Int. Cl.<sup>3</sup> C07C 118/02 9 Claims

U.S. Cl. 260—453 PH 9 Claims

1. A continuous process for the production of an isocyanate comprising:

(a) continuously combining a solution of a primary amine in an inert organic solvent with an excess of phosgene dissolved in an inert organic solvent in a mixing chamber at elevated temperature and pressure in a manner such that a less than stoichiometric quantity of amine is sprayed into the phosgene solution by means of at least one smooth jet nozzle having an internal diameter of from 0.01 to 30 mm and that a pressure differential of at least 0.5 bar is maintained; and

(b) continuously separating the components of the solution leaving the mixing chamber.

4,419,296

## PREPARATION OF TERTIARY ALKYL CYANIDES

Manfred T. Reetz, and Ioannis Chatzilosifidis, both of Marburg, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

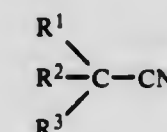
Filed Mar. 2, 1982, Ser. No. 353,986

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3115976

Int. Cl.<sup>3</sup> C07C 120/04 12 Claims

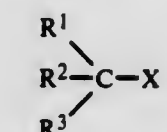
U.S. Cl. 260—464 12 Claims

1. A process for the preparation of a tertiary alkyl cyanide of the formula



in which

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> each independently is an alkyl group or, together with the tertiary carbon atom to which they are bonded, form a polycycloalkyl group, or R<sup>1</sup> and R<sup>2</sup>, together with the tertiary carbon atoms to which they are bonded, form a cycloalkyl group or a bicyclic group, comprising reacting a tertiary alkyl halide of the formula



in which



cyanide of the formula  $(CH_3)_3SiCN$  in the presence of a Lewis acid selected from the group consisting of  $SnCl_4$ ,  $TiCl_4$  and  $BiCl_3$ .

4,419,297

**PREPARATION OF NITRILES FROM FORMAMIDES**  
Dieter Arlt, Cologne, and Gerhard Klein, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 20, 1982, Ser. No. 340,902

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105452

Int. Cl.<sup>3</sup> C07C 120/00, 120/10

U.S. Cl. 260—465.2 8 Claims

1. A process for the production of a nitrile of the formula



in which R is an aliphatic hydrocarbon radical having up to 17 carbon atoms, any carbon atoms or a multiple which may be present, not being bonded directly to the nitrile group or is an araliphatic or aromatic hydrocarbon radical in each case having up to 12 carbon atoms, comprising reacting an N-substituted formamide of the formula



with at least the stoichiometric quantity of an acylating agent in gas phase at a temperature from about 250° C. to 500° C. in the absence of a catalyst, the acylating agent being selected from the group consisting of acetic anhydride, ketene and the anhydride of the acid corresponding to the desired nitrile.

4,419,298

**ETHANOLAMINE SALTS OF DI-PERFLUOROALKYL GROUP CONTAINING ACIDS**

Robert A. Falk, New City; Istvan Borsodi, Yonkers, both of N.Y., and Dieter Reinehr, Kandern, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

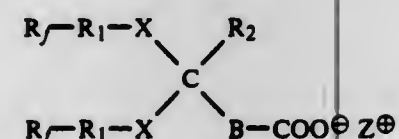
Filed Aug. 12, 1981, Ser. No. 292,326

Int. Cl.<sup>3</sup> C07C 53/18

U.S. Cl. 260—501.16

4 Claims

1. A compound of the formula



wherein

$R_f$  is perfluoroalkyl of 6 to 14 carbon atoms;  
 $R_1$  is straight or branched chain alkylene of 2 to 8 carbon atoms;  
 $X$  is  $-S-$  or  $-SO_2-$ ;  
 $R_2$  is hydrogen or alkyl of 1 to 4 carbon atoms;  
 $B$  is a covalent bond or alkylene of 1 to 6 carbon atoms; and  
 $Z$  is the cation of mono-, di-, or tri-ethanolamine.

4,419,299

**PHOSPHONOPOLYESTER OLIGOMERS**

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Co., Midland, Mich.

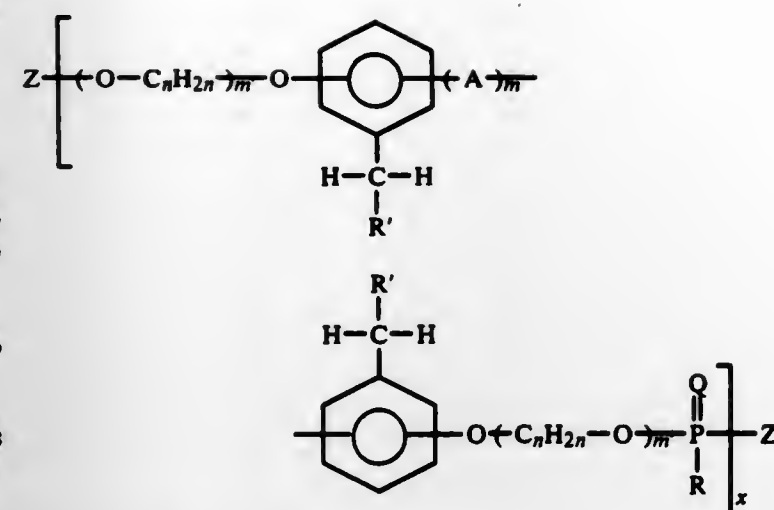
Filed Dec. 14, 1981, Ser. No. 330,106

Int. Cl.<sup>3</sup> C07F 9/09

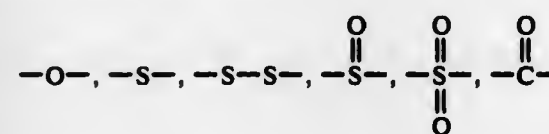
U.S. Cl. 260—929

3 Claims

1. An oligomer having recurring units represented by the following general formula



wherein each A is independently



or a divalent hydrocarbon group having from 1 to about 8 carbon atoms; each Q is independently oxygen or sulfur; each R is independently a hydrocarbon group having from about 1 to about 10 carbon atoms; each R' is independently a  $-CH=CH_2$  group or a  $-CXH-CXH_2$  group, wherein X is chlorine or bromine; each Z is independently a moiety such that the terminal groups are hydroxyl or phosphonate groups or combination thereof; each m is independently zero or one; each m' independently has a value from 1 to about 5; each n independently has a value of 2, 3 or 4; and x has an average value of from 1 to about 10.

4,419,300

**NON-CORROSIVE, NON-STAINING EVAPORATIVE COOLER**

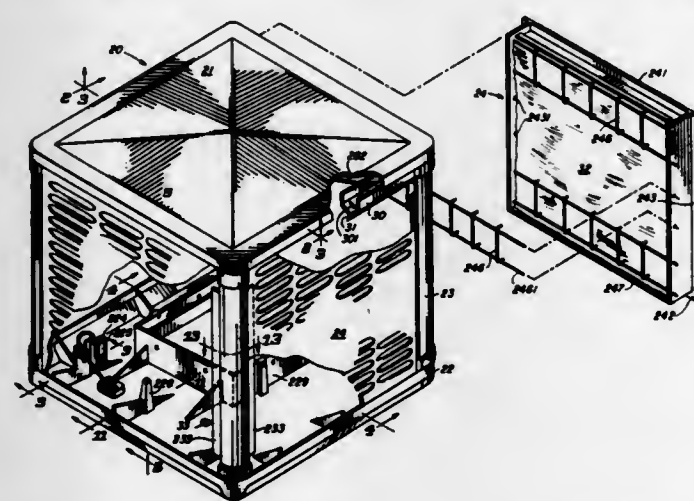
David VanNess; Joseph Hines, both of Scottsdale, and William E. Wells, Phoenix, all of Ariz., assignors to General Texas Corporation, Roanoke, Tex.

Continuation of Ser. No. 126,870, Mar. 3, 1980, Pat. No. 4,309,365. This application Dec. 30, 1981, Ser. No. 336,012

Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 261—106

5 Claims



5. A non-louvered ventilator panel for an evaporative cooler comprising:  
a frame having two substantially parallel vertical sides;  
means for removably mounting a cooler pad having a surface on the panel; and  
a plurality of stand-off means positioned between the vertical sides of the panel and a surface of a pad mounted

thereon, said stand-off means adapted to contact the surface of a pad substantially horizontally from one side of the panel to the other for positioning a pad for maximum air flow therethrough and for directing water flowing down the surface of a cooler pad into the pad.

4,419,301

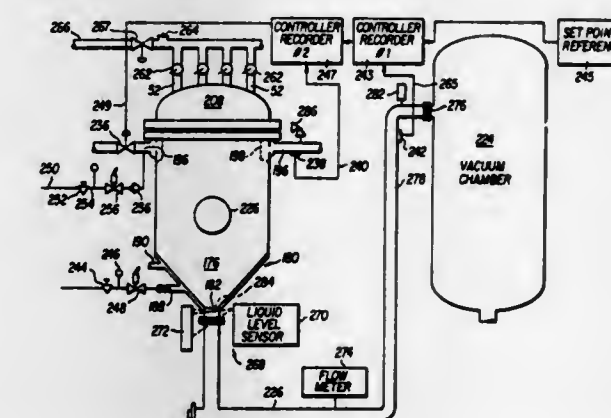
**METHOD AND APPARATUS FOR TREATING FLUENT MATERIALS**

John E. Nagra, Potomac, and Walter Woods, Silver Spring, both of Md., assignors to Dasi Industries, Inc., Washington, D.C. Continuation of Ser. No. 83,362, Oct. 10, 1979, Pat. No. 4,310,476, which is a continuation-in-part of Ser. No. 29,391, Apr. 12, 1979, abandoned, which is a continuation of Ser. No. 806,849, Jun. 15, 1977, abandoned. This application Jun. 29, 1981, Ser. No. 277,606

Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 261—118

10 Claims



1. A method for maintaining a stable fluid level in a pressurized fluid processing system including a vessel, independent of large changes in system dynamics, comprising the steps of:  
establishing a desired flow rate into said system, permitting said desired flow rate to vary independently of a predetermined fluid level at the bottom of the said vessel, pressurizing and heating said system to a desired level; collecting said fluid with said predetermined fluid level at the bottom of said vessel, setting constant parameters for a continuous flow outlet means for said system whereby said predetermined fluid level is maintained in said system; and maintaining said setting regardless of said variations in said flow rate into said system.

2. An apparatus for treating fluent material with a heated gas having an initial flow velocity comprising:  
a pressure vessel,  
dispensing means mounted within said vessel for forming at least one isolated, continuous film of said fluent material, baffle means mounted within said pressure vessel for reducing said initial flow velocity of said heated gas and for distributing said gas within said vessel to achieve rapid heating of said isolated, continuous film of said fluent material while subjecting said film to minimum of physical perturbation,  
fluid outlet means coupled to said vessel for withdrawing treated fluent material therefrom;  
holding tube means coupled to said fluid outlet means for maintaining said fluent material at a selected temperature for a selected time interval; and  
fluid collecting means within said pressure vessel for intercepting said isolated, continuous film and for supplying said treated fluent material to said outlet means with a minimum of physical agitation; wherein said dispensing means comprises:  
a structure forming a chamber for receiving a quantity of said fluent material, said structure having a discharge aperture formed therein; and  
distribution means positioned within said structure for dis-

tributing substantially equal quantities of said fluent material to each segment of said discharge aperture; and wherein the cross-sectional areas of said outlet means and holding tube means are fixed so as to provide balanced force control means for maintaining a stable liquid level in said pressure vessel independent of changes in system dynamics.

4,419,302

**STEAM GENERATOR**

Atsushi Nishino, Neyagawa; Tadashi Suzuki, Katano, and Kazunori Sonetaka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan PCT No. PCT/JP80/00223, § 371 Date May 28, 1981, § 102(e) Date May 28, 1981, PCT Pub. No. WO81/00903, PCT Pub. Date Apr. 2, 1981

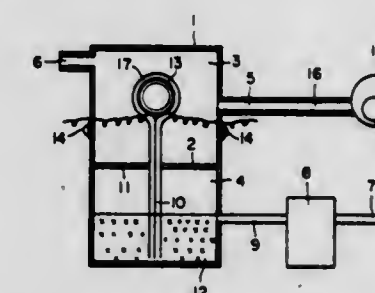
PCT Filed Sep. 26, 1980, Ser. No. 269,021

Claims priority, application Japan, Sep. 29, 1979, 54-125578; Sep. 29, 1979, 54-125579; Sep. 5, 1980, 55-123809; Sep. 11, 1980, 55-127450

Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 261—142

16 Claims



1. A steam generator comprising a container having an upper vaporization chamber and a lower liquid storage chamber, means for partitioning the upper and lower chambers from each other, said vaporization chamber having a gas charge inlet port enabling a gas to be charged into said vaporization chamber and a discharge port for discharging steam generated within said vaporization chamber; a suck-up member disposed to extend into the upper and lower chambers within said container so that one end portion of said suck-up member is immersed in a liquid contained in said lower storage chamber while the other end portion extends into the upper chamber; and heating unit means provided at said other end portion of the suck-up member for heating and vaporizing the liquid absorbed by the suck-up member at the one end portion when it reaches the other end portion of said suck-up member, said heating unit means being in the form of a wire or band and a metal oxide or metallic double oxide layer formed on said wire or band to thereby increase the surface area of the heating unit means in contact with the liquid and improve thermal transmission to vaporize the liquid, said vaporized liquid being entrained by a gas passed through said gas charge port for discharge through said discharge port.

4,419,303

**METHOD FOR PRODUCING LARGE DIAMETER HIGH PURITY SODIUM AMALGAM PARTICLES**

Scott Anderson, 1116 W. Church, Champaign, Ill. 61820 Continuation-in-part of Ser. No. 118,667, Feb. 5, 1980, which is a continuation-in-part of Ser. No. 70,839, Aug. 29, 1979, Pat. No. 4,238,173, which is a division of Ser. No. 654,416, Feb. 2, 1976, Pat. No. 4,216,178. This application Nov. 17, 1980, Ser. No. 207,628

Int. Cl.<sup>3</sup> B01J 2/04

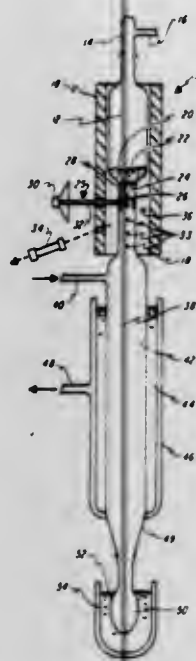
U.S. Cl. 264—9

27 Claims

1. A method for producing free-flowing, discrete sodium-amalgam particles of controlled particle size and low sodium oxide content in the range from about 500 microns to about 1300 microns in diameter comprising:



heating a mixture of sodium and mercury in a vessel to form an amalgam melt of determinable unoxidized sodium content;  
separating a portion of said melt from the vessel at a point other than at an upper surface of said melt to thereby



control the height of said separated portion above a vibrating discharge conduit and thus the initial velocity of the melt through said vibrating discharge conduit; and passing the separated portion of said melt through a vibrating discharge conduit into an inert, quenching atmosphere to form particles of said amalgam.

#### 4,419,304 METHOD FOR FORMING SEALS WITH HEAT SHRINKABLE MATERIALS

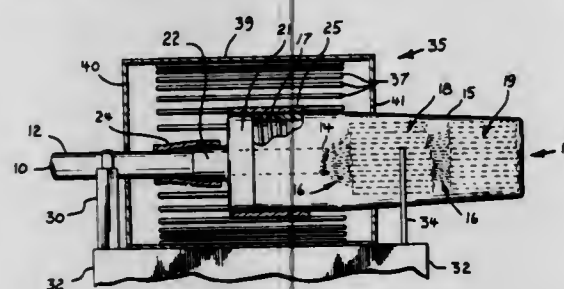
William H. Ficke, Gwinnett, and Robert N. McIntyre, DeKalb, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 15, 1980, Ser. No. 169,058

Int. Cl.<sup>3</sup> B29C 27/02; B29D 9/00

U.S. Cl. 264—25

10 Claims



1. A method of hermetically sealing a sleeve about a plastic substrate which comprises the steps of:

- (a) mounting a heat-shrinkable plastic sleeve having a transmittance of between 50% and 95% to electromagnetic radiation within a selected infrared wavelength band about the plastic substrate; and
- (b) applying electromagnetic radiation within said selected wavelength band to the sleeve for a period of time sufficient to cause the sleeve to shrink upon the substrate and for the interfacing surfaces of the substrate and sleeve to fuse.

#### 4,419,305 METHOD AND APPARATUS FOR WINDSHIELD REPAIR

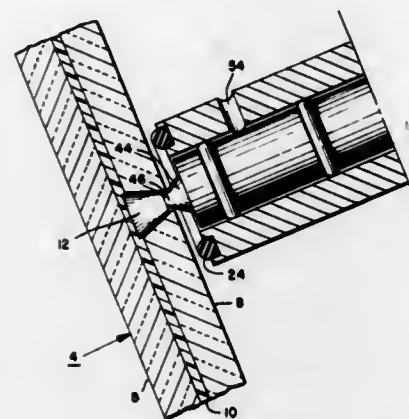
William B. Matles, Philadelphia, Pa., assignor to Glass Medic, Inc., Line Lexington, Pa.

Filed Dec. 10, 1981, Ser. No. 329,345

Int. Cl.<sup>3</sup> B29C 27/00, 1/00; B29G 3/00

U.S. Cl. 264—36

3 Claims



1. A method of repairing a conical crack in shatterproof glass comprising the steps of establishing an enclosed volume bounded in part by an area on the glass surrounding the crack and in part by a piston and cylinder assembly, an end of the cylinder being provided with a seal against the face of the glass, introducing a repair liquid into said volume and forcing said repair liquid under pressure into said crack by moving the piston of said piston and cylinder assembly toward said crack, characterized by the step of relieving the pressure on said repair liquid by forcing a pointed projection on an end of the piston against the apex of a separated cone of glass in the crack and breaking the seal between the end of the cylinder and the glass by applying to the cylinder a force which is a reaction to the force of the pointed projection against the cone of glass.

#### 4,419,306 AUTOMATIC CONTROL OF THE LENGTH OF ARTICLE ROW TO BE INJECTION-MOLDED

Kiyomitsu Ishihara, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

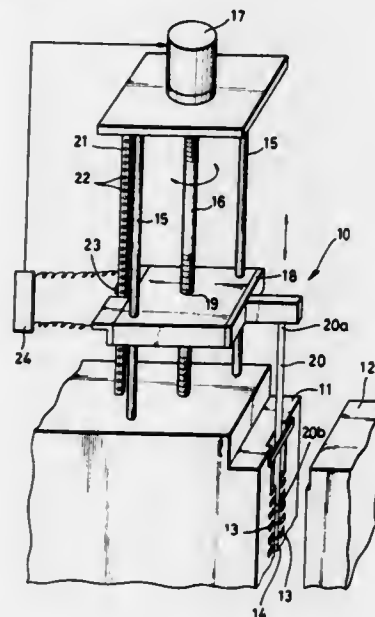
Filed Apr. 27, 1982, Ser. No. 372,281

Claims priority, application Japan, Apr. 27, 1981, 56-62532

Int. Cl.<sup>3</sup> B29F 1/05

U.S. Cl. 264—40.5

4 Claims



1. A method of automatically controlling the length of a row of articles to be injection-molded on a multi-cavity mold hav-

ing an elongate runner and a plurality of successive cavities spaced equidistantly along the runner, comprising the steps of:

- (a) electrically detecting an initial position of a control rod inserted in the runner;
- (b) registering both the direction and the extent to which the control rod is to be moved for longitudinal adjustment with respect to the runner, depending on said initial position of the control rod and a preselected length of the article row to be molded;
- (c) using a motor moving the control rod longitudinally of the runner in said registered direction;
- (d) electrically detecting the movement of the control rod to said registered extent; and
- (e) in response to the last-mentioned detecting, terminating the movement of the control rod.

2. An apparatus for automatically controlling the length of a row of articles to be injection-molded on a multi-cavity mold having an elongate runner and a plurality of successive cavities spaced equidistantly along the runner, comprising:

- (a) a slide;
- (b) means for moving said slide toward and away from the mold;
- (c) a control rod projecting from said slide for extending into the runner and, in response to the movement of said slide, movable longitudinally of the runner for allowing heated molding material to be filled in only a selected number of the successive cavities that corresponds to a preselected length of a row of articles to be molded;
- (d) means for detecting an initial position of said slide and thus said control rod in the runner and also for detecting the extent to which said slide and thus said control rod is moved; and
- (e) a control unit, connected to both said moving means and said detecting means, for registering both the direction and the extent to which said control rod is to be moved for longitudinal adjustment with respect to the runner, depending on both said detected initial position of said control rod and said preselected length of the article row to be molded, said control unit being adapted to produce a start signal for energizing said moving means to move said slide and thus said control rod in said registered direction, and a termination signal, when said slide and thus said control rod has been moved to said registered extent, for de-energizing said moving means to terminate the movement of said slide and thus said control rod.

#### 4,419,307 METHOD FOR MANUFACTURING HEAT-INSULATING MEMBER AND DEVICE THEREFOR

Koujiro Kohara, and Susumu Miyano, both of Takatsuki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

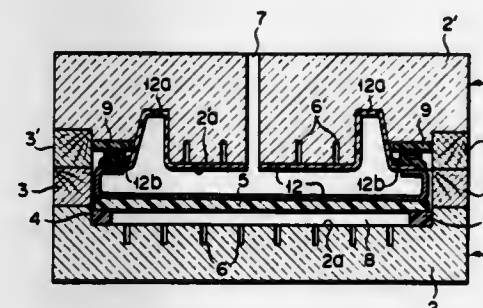
Filed Mar. 29, 1982, Ser. No. 363,385

Claims priority, application Japan, Apr. 1, 1981, 56-48919

Int. Cl.<sup>3</sup> B29D 27/04

U.S. Cl. 264—46.5

9 Claims



1. A method for manufacturing a heat-insulating member including a shell filled with a foamed heat-insulating material, which comprises the steps of:

- providing first and second jigs, each including a jig body substantially formed of a heat-insulating material and

having its inside contour substantially complementary to the outside shape of said shell, and a reinforcing frame arranged at the periphery of said jig body for reinforcing said jig body;

laying said shell which has not yet been filled with the heat-insulating material and is hollow, on the jig body of said first jig;

putting said second jig on said shell, thereby preventing said shell from being deformed when a foamable liquid composition is foamed within said shell in the step to follow;

injecting the foamable liquid composition into said shell to foam said composition therein; and,

removing a resultant heat-insulating member from said first and second jigs.

#### 4,419,308 PROCESS FOR PRODUCING POROUS, FILM-LIKE OR FIBROUS STRUCTURE OF AROMATIC POLYESTER

Shunichi Matsumura, and Hiroo Inata, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 28, 1983, Ser. No. 479,724

Claims priority, application Japan, Apr. 13, 1980, 55-60294

Int. Cl.<sup>3</sup> B29D 27/04

U.S. Cl. 264—49

23 Claims

1. A process for producing a porous, film-like or fibrous structure of an aromatic polyester, which comprises

- (1) forming a substantially non-oriented film-like or fibrous structure by melt-molding an aromatic polyester blend composed of

(A) an aromatic polyester containing an aromatic dicarboxylic acid as a main acid component and an aliphatic diol and/or an alicyclic diol as a main glycol component, and

(B) at least one low-molecular-weight compound selected from the group consisting of imide compounds and isocyanurate compounds being compatible, but substantially non-reactive, with the aromatic polyester and having a molecular weight of not more than 1,000, the low-molecular-weight compound being present in an amount of 10 to 300 parts by weight per 100 parts by weight of the aromatic polyester, and

- (2) extracting at least a major part of the low-molecular-weight compound from the resulting substantially non-oriented film-like or fibrous structure with an organic solvent which can dissolve the low-molecular-weight compound but under the extracting conditions does not substantially dissolve the aromatic polyester.

#### 4,419,309 POLYSTYRENE FOAM EXTRUSION INTO A FOAM ASSISTING ATMOSPHERE

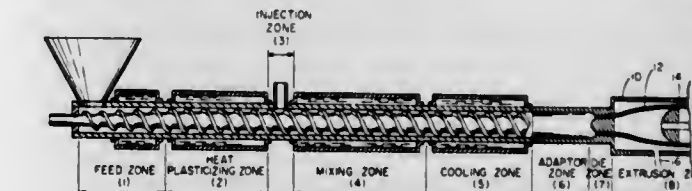
Charles M. Krutchen, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,455

Int. Cl.<sup>3</sup> B29D 27/00

U.S. Cl. 264—53

19 Claims



1. A process for preparing a thermoplastic resin thermoformable foam in sheet form comprising:

- (a) melting a thermoplastic resin;
- (b) introducing thereto, under pressure, a foaming agent in liquid form, said agent being a member selected from the group consisting of a low molecular weight aliphatic hydrocarbon, a low molecular weight halocarbon and mixtures thereof; and



(c) extruding the combination in sheet form directly into a lower pressure atmosphere of a member selected from the group consisting of carbon dioxide, water vapor and mixtures thereof to cause foaming of said resin so as to expose both surfaces of said sheet to said lower pressure atmosphere.

4,419,310

SRTIO<sub>3</sub> BARRIER LAYER CAPACITOR

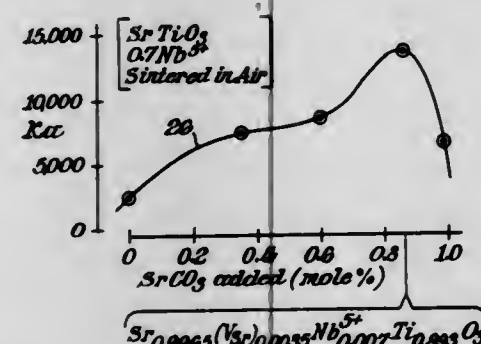
Ian Burn, and Stephen M. Neirman, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 6, 1981, Ser. No. 261,065

Int. Cl.<sup>3</sup> C04B 33/32

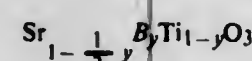
U.S. Cl. 264—59

11 Claims

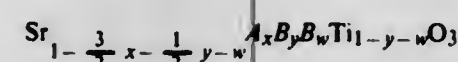


1. A method for making an intergranular barrier layer type capacitor without heating in a reduced atmosphere comprising:

(a) preparing a ceramic start mixture consisting essentially of strontium, titanium and strontium-titanate donor compounds, said donors being selected from large cations A, small cations B and combinations thereof, said start mixture being adjusted to form during sintering a ceramic compound selected from



and combinations thereof, to wit



wherein x, y and w are the atomic proportions, respectively, of said donor cations having a charge of +3, +5 and +6, so that both charge balance and large/small cation balance may be established by strontium vacancies,  $(V_{\text{Sr}})_{\frac{1}{2}x+\frac{1}{2}y+w}$  therein, and wherein  $x+y+w$  is from 0.003 to 0.017;

- (b) forming a body of said mixture;  
(c) sintering said body in air to maturity to form in said body semiconductive grains and interstitial dielectric barrier layers;  
(d) diffusing oxidizing agents containing bismuth into said body to increase the insulation resistance of said interstitial barrier layers; and  
(e) forming two spaced electrodes in contact with said body.

4,419,311

## PRODUCTION OF HIGH-STRENGTH CERAMIC BODIES OF ALUMINA AND UNSTABILIZED ZIRCONIA WITH CONTROLLED MICROFISSURES

Nils Claussen, Brandenburger Str. 13, Warnbronn, Fed. Rep. of Germany (7251), and Jörg Steeb, Reessweg 21, Stuttgart, Fed. Rep. of Germany (7000)

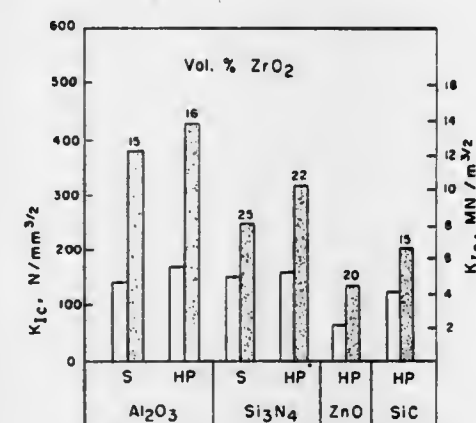
Division of Ser. No. 167,898, Jul. 14, 1980, Pat. No. 4,298,385, which is a continuation of Ser. No. 4,120, Jan. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 738,409, Nov. 3, 1976, abandoned. This application Jul. 6, 1981, Ser. No. 280,408

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549652

Int. Cl.<sup>3</sup> C04B 35/00, 35/10, 35/48, 35/71

U.S. Cl. 264—60

3 Claims



1. A method of preparing a ceramic body of high toughness by mixing an aluminum oxide matrix forming ceramic material and a ceramic embedment material, shaping and firing, comprising

mixing 4% to 25% of the volume of the body, of unstabilized zirconium dioxide and/or hafnium dioxide in the form of 0.3 to 1.25  $\mu\text{m}$  particles as the embedment material, with the aluminum oxide matrix forming ceramic material in the form of particles of less than 5  $\mu\text{m}$ , in a ball mill, including an inert mixing and grinding container and inert balls and with the use of an inert mixing liquid, or in an attrition mill, and

thereafter sintering by pressing the mixture to form a body and sintering or sintering by hot pressing the mixture in a mold, at a temperature of 1400° to 1500° C., whereby tensile stresses for the formation of controlled microfissures are generated in the ceramic body.

4,419,312

## METHOD FOR MAKING GRANULAR HYDROTHERMALLY HARDENED MATERIAL

Hendrik Loggers, Amerongen, and Gijsbert Versteeg, Nunspeet, both of Netherlands, assignors to Aarding Weerstandsals B.V., Nunspeet, Netherlands

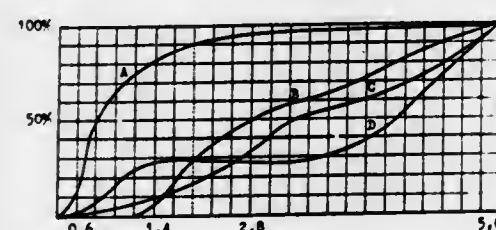
Filed Jan. 2, 1979, Ser. No. 564

Claims priority, application Netherlands, Dec. 30, 1977, 7714619

Int. Cl.<sup>3</sup> B28B 1/00; B29C 25/00

U.S. Cl. 264—82

11 Claims



1. A method for producing hydrothermally hardened products by granulating a water hardenable mixture of calcareous

and silicious materials and water and heating said granulated material under steam pressure in an autoclave, the improvement comprising the following steps:

- (1) In a first stage, heating to a steam pressure in the autoclave of at most 0.9 atmospheres, being 1.9 atmospheres absolute pressure;
- (2) subsequently decreasing the steam pressure in the autoclave so that the product in the first stage is subjected in a second stage at a steam pressure in the autoclave being less than 1.9 atmospheres absolute pressure, but more than 1.1 atmospheres absolute pressure; and (3) subsequently increasing the steam pressure in the autoclave so that the products from the second stage are subjected in a third stage at a steam pressure in the autoclave of at least 2 atmospheres absolute pressure wherein the first, second and third stages follow subsequently and after each other without absence of any steam pressure.

4,419,313

## SELF CRIMPING YARN AND PROCESS

James E. Bromley; John R. Dees; Harold M. Familant; Wayne T. Mowe, all of Pensacola, Fla., and Darwyn E. Walker, Wilbraham, Mass., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 55,859, Jul. 9, 1970, abandoned, which is a continuation of Ser. No. 825,495, Aug. 17, 1977, abandoned. This application Jul. 9, 1980, Ser. No. 167,164

Int. Cl.<sup>3</sup> D01D 3/00, 5/22

U.S. Cl. 264—167

11 Claims



1. A process for producing a self-crimping yarn, said yarn comprising a plurality of variable denier filaments, each of said filaments produced by the steps comprising:

- a. generating two individual streams of molten polyester of fiber-forming molecular weight, said individual streams travelling at different velocities;
- b. converging said individual streams side-by-side to form a combined stream;
- c. quenching said combined stream to form a combined filament; and
- d. withdrawing said combined filament from said combined stream at a rate of speed in excess of 3000 meters per minute and selected such that an individual filament quenched from one of said individual streams would have a shrinkage at least ten percentage points higher than that of an individual filament quenched from the other of said individual streams.

4,419,314

## METHOD OF COATING CORE SAMPLES

Darrell Bush, Colleyville, Tex., assignor to Core Laboratories, Inc., Dallas, Tex.

Filed May 26, 1981, Ser. No. 266,990

Int. Cl.<sup>3</sup> B29C 1/02

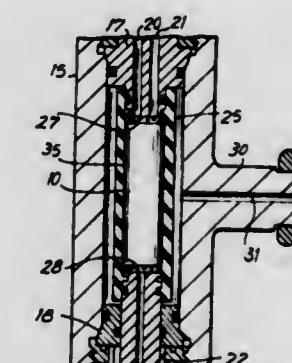
U.S. Cl. 264—130

7 Claims

1. A method of preparing a geological core sample containing pore spaces and representative of an underground formation from which the sample is taken to prepare the core sample for testing in testing apparatus in which pressures are applied to the core sample to simulate approximate overburden pres-

sure to which the sample material was subjected in its underground formation, the method comprising:

- applying a petroleum based release material to the exterior surface of the core sample;
- partially filling a mold with a plastic mixture of hardenable epoxy resin and hardener therefor;
- inserting one end of said core sample into the partially filled mold, the space between said sample and the interior of said mold lying within the range of from about 0.010 cm. to about 0.050 cm, to form a plastic coating on said sample substantially free of voids and having a thickness within said range so that the plastic coating on the thus coated



sample is sufficiently thick and stiff to prevent intrusion into the pores of the core sample during testing of the core sample under confining pressure yet is sufficiently thin to transmit the confining pressure to the sample;

applying a sufficient pressure to the opposite end of the core sample to slowly urge said sample into said mold until the plastic mixture therein covers the entire surface of said sample;

curing the plastic material for a period of time sufficient to form a stiff coating on the core sample;

removing the thus-coated core sample from said mold; and cutting off the ends of the core sample to remove the coating from said ends.

4,419,315

## EXTRUDED FIN-TYPE WEATHERSTRIP

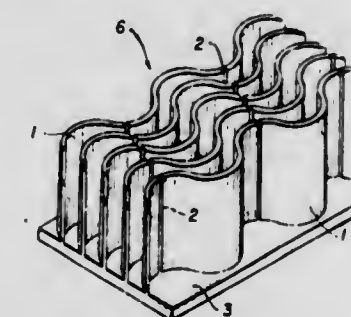
Gerald Kessler, 302 McClurg Rd. at Southern Blvd., Box 389, Youngstown, Ohio 44501

Division of Ser. No. 333,912, Dec. 23, 1981. This application Aug. 20, 1982, Ser. No. 409,900

Int. Cl.<sup>3</sup> D04H 11/00

U.S. Cl. 264—145

13 Claims



1. A method of extrusion forming of a resilient, all plastic, thin, wavy fin-type weatherstrip having an elongated longitudinal substrate from which integrally projects vertically therefrom a plurality of thin, flexible, deformable, wavy S-configured fin members extending in the direction of extrusion, said fin members being spaced generally parallel to one another, said process comprising:

providing an unbalanced extrusion die having a substrate forming orifice of a first thickness and a plurality of fin forming orifices of a second thickness extending from one side of the substrate forming orifice, wherein the first



thickness is substantially greater than the second thickness, and  
extruding plastic through said unbalanced extrusion die so that the rate of the plastic flow through the fin forming die orifices is substantially greater than the rate of flow of the plastic through the substrate forming die orifice.

2. A method of extrusion forming of a resilient, all plastic, thin, wavy fin-type weatherstrip having an elongated longitudinal substrate from which integrally projects vertically therefrom a plurality of thin, flexible, deformable, wavy S-configured fin members extending in the direction of extrusion, said fin members being spaced generally parallel to one another, said process comprising:

providing an extrusion die formed in sections including a fin orifice section having a plurality of fin forming orifices of a second thickness, and a substrate orifice section connected thereto having a substrate forming orifice of a first thickness, wherein said first thickness is substantially greater than said second thickness, and  
extruding plastic through said extrusion die while oscillating one said orifice section relative to the other said orifice section.

4,419,316

# PROCESS OF MAKING FILMS, FIBERS OR OTHER SHAPED ARTICLES CONSISTING OF, OR CONTAINING, POLYHYDROXY POLYMERS

Richard G. Schweiger, San Jose, Calif.

Continuation of Ser. No. 945,252, Sep. 25, 1978, abandoned, which is a continuation of Ser. No. 794,145, May 5, 1977, abandoned, which is a division of Ser. No. 669,483, Mar. 23, 1976, Pat. No. 4,035,569, which is a continuation of Ser. No. 487,196, Jul. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 298,580, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 40,442, May 25, 1970, Pat. No. 3,702,943. This application Oct. 29, 1980, Ser. No. 201,806

Int. Cl.<sup>3</sup> D01F 11/02, 11/04; C08L 1/16, 5/00

U.S. Cl. 264—184

54 Claims

1. A process of preparing films, fibers or other shaped articles comprising cellulose, which process comprises forming a cellulose nitrite ester by reacting dinitrogen tetroxide or nitrosyl chloride with activated cellulose that contains about 4 to 12 percent by weight of water which is homogeneously distributed within the cellulose, said reaction being conducted in a reaction medium containing a solubilizing agent for the cellulose nitrite ester and a proton acceptor which is a highly polar aprotic solvent or a weak tertiary amine base at a temperature of below about 50° C., bringing the reaction mixture containing the nitrite ester into the desired shape while maintaining the temperature below about 50° C., and regenerating and separating said cellulose polymer from said reaction mixture by contact with a protic solvent in the presence of an acid catalyst to form films, fibers or other shaped articles of essentially unmodified cellulose.

2. A process of preparing films, fibers or other shaped articles comprising cellulose, which process comprises forming a cellulose nitrite ester by reacting dinitrogen tetroxide or nitrosyl chloride with activated cellulose in which cellulose containing in excess of about 4 percent by weight of water uniformly distributed within the cellulose is treated with a highly polar aprotic solvent or a weak tertiary amine base to reduce the water content of the cellulose to below about 4 percent, said reaction being conducted at a temperature below about 50° C. in a reaction medium containing a solubilizing agent for the resulting cellulose nitrite ester and a proton acceptor which is a highly polar aprotic solvent or a weak tertiary amine base, bringing the reaction mixture containing the nitrite ester into the desired shape while maintaining the temperature below about 50° C., and regenerating and separating said cellulose polymer from said reaction mixture by contact with a protic solvent in the presence of an acid catalyst to form films, fibers or other shaped articles of essentially unmodified cellulose.

43. A solution of the nitrite ester of starch or a starch frac-

tion and an organic-solvent-soluble polymer substantially lacking hydroxyl groups in an anhydrous medium containing a highly polar aprotic solvent or a weak tertiary amine base or both.

47. A solution of the nitrite ester of polyvinyl alcohol and an organic-solvent-soluble polymer substantially lacking hydroxyl groups in an anhydrous medium containing a highly polar aprotic solvent or a weak tertiary amine base or both.

4,419,317

# PROCESS FOR THE PREPARATION OF FIBERS OF POLY-P-PHENYLENE-TEREPHTHALAMIDE

Takashi Fujiwara, Miyazaki; Shuji Kajita, Takatsuki; Tetsuo Matsushita, Miyazaki, and Seichi Manabe, Ibaraki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 129,403, Mar. 11, 1980, Pat. No. 4,374,977.

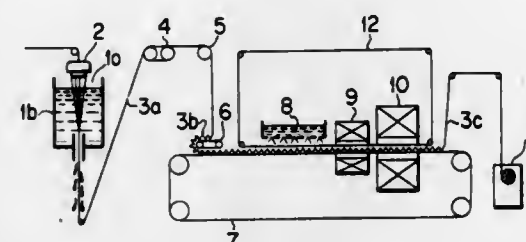
This application May 21, 1982, Ser. No. 380,781

Claims priority, application Japan, Mar. 13, 1979, 54-29116

Int. Cl.<sup>3</sup> D01D 5/12

U.S. Cl. 264—184

9 Claims



1. A process for the preparation of fibers consisting essentially of poly-p-phenylene-terephthalamide, which comprises extruding an anisotropic dope of a polymer consisting essentially of poly-p-phenylene-terephthalamide in concentrated sulfuric acid having a concentration of at least 98% by weight, in a non-coagulating layer, passing the extrudate through a coagulating layer, depositing the resulting coagulated fibers on a net conveyor, and in the absence of substantial tension sequentially washing the fibers to remove sulfuric acid, holding the fibers in saturated steam maintained at at least 100° C., and drying the fibers at a temperature in the range of from 120° C. to 450° C. for a time satisfying the condition:

$$250 \leq (\text{temperature, } ^\circ\text{C.}) \times (\text{time, seconds})^{0.08} \leq 600.$$

4,419,318

# PROCESS FOR FORMING PROJECTILES FOR SMOOTH BORE SHOOTING GUNS

Vincenzo Turco, and Antonio Pompili, both of Colleferro, Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

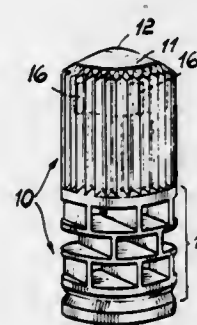
Filed Oct. 20, 1980, Ser. No. 199,039

Claims priority, application Italy, Oct. 26, 1979, 26831 A/79

Int. Cl.<sup>3</sup> B29C 6/00; B29D 3/00

U.S. Cl. 264—274

4 Claims



1. A process for forming a projectile for use in a smooth bore gun and of the type including a combined metal bullet and a wad-flight control element formed of a plastic material, said process comprising:

forming a metal bullet having a front end of ogival configuration, a rear end, and at least one cylindrical intermediate section having extending therefrom fins;

positioning said bullet in a die and centering said bullet therein by contacting the ogive of said front end and said fins with respective first and second inner surfaces of said die, while maintaining a generally annular space around said cylindrical section, between said cylindrical section and said second inner surface of said die;

positioning adjacent said rear end of said bullet within said die a plurality of die inserts of a configuration to define therebetween a reticulated space in communication with said annular space and a cup-shaped space in communication with said reticulated space and facing away therefrom; and

injecting plastic material into and filling said cup-shaped space, said reticulated space and said annular space, thereby fixedly forming on said metal bullet a plastic wad-flight control element including a container portion fixed to and surrounding said bullet and formed from plastic injected into said annular space, a reticulated portion integral with and extending rearwardly from said container portion and formed from plastic injected into said reticulated space, and a sealing cup portion integral with and extending rearwardly from said reticulated portion and formed from plastic injected into said cup-shaped space.

4,419,319

# PREFORM STRUCTURE

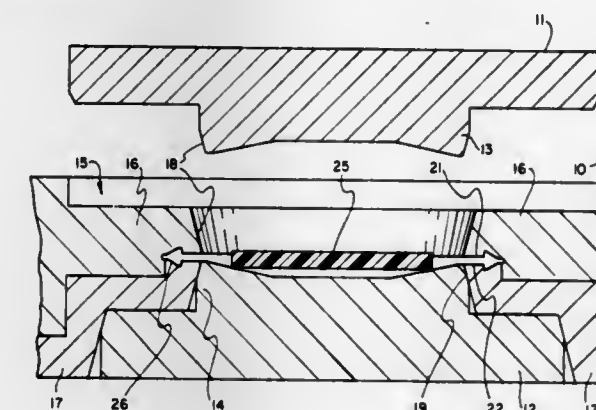
Virgil C. Reynolds, Jr., Yorktown, Ind., and Daryl D. Cerny, Greenville, Ohio, assignors to Ball Corporation, Muncie, Ind.

Filed Aug. 10, 1981, Ser. No. 291,540

Int. Cl.<sup>3</sup> B29C 17/03, 3/00

U.S. Cl. 264—292

6 Claims



1. A process of obtaining a predetermined volume of thermoplastic material having a multilayered structure for a container with a rim portion formed from a preform comprising the steps of providing a thermoplastic blank of material comprising layers of different polymers for said container, bringing said blank to a temperature in a range from just below the softening temperature to about the melting temperature of the material, forging said material in a forging mold provided with a container forming portion, including said rim portion and a retaining portion defined by a circumferential cavity communicating with said container forming portion and allowing said material to flow outwardly from said container forming portion into said circumferential cavity, the layers of said multilayered structure being forced beyond the rim forming portion into the retaining portion to collect residual thermoplastic material therein whereby a predetermined and specific volume is defined in said container forming portion, including said rim portion, all the layers being advanced beyond the rim forming portion of the preform into the circumferential cavity, and removing the forged preform from said forging mold.

1037 O.G.—11

4,419,320

# NOVEL PROCESS FOR DEEP STRETCH FORMING OF POLYESTERS

William G. Perkins, Cuyahoga Falls, and Clem B. Shriver, Clinton, both of Ohio, assignors to The Goodyear Tire &amp; Rubber Company, Akron, Ohio

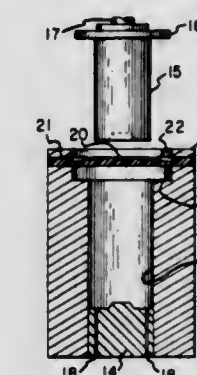
Division of Ser. No. 199,139, Oct. 22, 1980, Pat. No. 4,358,492.

This application Aug. 20, 1982, Ser. No. 409,770

Int. Cl.<sup>3</sup> B29C 17/03

U.S. Cl. 264—296

9 Claims



1. A deep stretch forming process for preparing biaxially oriented, heat set, hermetically sealable, hollow containers with cylindrical sidewall and bottom sections measuring approximately the same thickness, from high molecular weight polyester, said process comprising the steps of

(A) injection molding a contoured preform of high molecular weight polyester, said contoured preform consisting of a thick peripheral clamping section and immediately interiorly thereof a tapered central section which radially increases in thickness from about one-fourth the thickness of the peripheral clamping section at a point immediately adjacent to said clamping section to about the same thickness as that of the peripheral clamping section at about the center axis of said contoured preform;

(B) heating the contoured preform at a temperature ranging from about 10° C. below to about 30° C. above the glass transition temperature of the polyester comprising said contoured preform and clamping said preform exteriorly to and above a hollow die comprising a chamber or cavity having an annular flange forming recess in the upper portion thereof;

(C) forcing the tapered central section of the contoured preform through the entrance aperture of and into the chamber or cavity of said hollow die by means of a forming plunger having a flange forming annular ring affixed to the upper portion thereof, said plunger being heated to a temperature ranging from about 10° C. below to about 30° C. above the glass transition temperature of the polyester comprising the contoured preform;

(D) increasing the temperature of the forming plunger to a temperature sufficient to induce rapid crystallization of the polyester in the hollow container formed from the contoured preform to anneal or heat set the polyester in the formed container; and

(E) cooling the formed container in the hollow die to a temperature below the glass transition temperature of the polyester in the hollow container prior to finally removing the container from the hollow die.

4,419,321

# METHOD OF FORMING AN INTEGRATED TRUSS STRUCTURE

James S. Hardigg, Conway, Mass. 01341

Continuation of Ser. No. 105,864, Dec. 20, 1979, abandoned.

This application Jan. 22, 1982, Ser. No. 341,866

Int. Cl.<sup>3</sup> B29F 1/08

U.S. Cl. 264—328.12

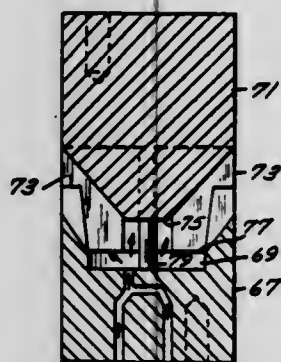
3 Claims

1. The method of forming an integrated truss structure with



a mold having a first fixed mold member including a plurality of spaced raised flat portions, a plurality of spaced recessed flat portions, and a plurality of open grooves connecting said raised and recessed portions, said open grooves sloping from said raised flat portions to said recessed flat portions, and a second movable mold member, including a plurality of spaced raised flat portions, a plurality of spaced recessed flat portions, and a plurality of open grooves connecting said raised flat portions and said recessed flat portions, said open grooves sloping away from said raised flat portions to said recessed flat portions, the method comprising the steps of:

moving said second mold member into registration with said first mold member, wherein said raised flat portions of said first member are aligned with said recessed flat portions of



said second member and vice versa, the position of said raised and recessed flat portions of said first and second mold members defining a plurality of junction chambers and the position of said open grooves of said first and second mold members defining a plurality of strut beam chambers;

injecting a moldable material into and throughout said strut beam chambers and said junction chambers formed by said registration of said first and second mold members to form a unitary molded truss structure;

cooling said moldable material until said material is solidified; and

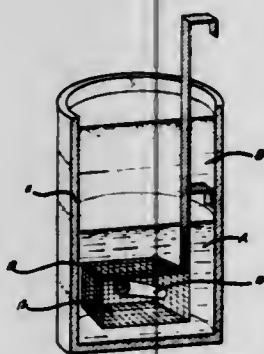
separating said second mold member from said first mold member to permit removal of said molded integrated truss structure.

#### 4,419,322 METHOD FOR DILATING PLASTICS USING VOLATILE SWELLING AGENTS

Dudley A. Clemence, and Pankaj K. Das, both of Willimantic, Conn., assignors to Akzona Incorporated, Asheville, N.C.  
Filed Sep. 27, 1982, Ser. No. 424,116  
Int. Cl.<sup>3</sup> B29C 25/00

U.S. Cl. 264—343

7 Claims



1. A method for dilating a cold shrink plastic article which comprises the steps of:

immersing said article into the lower phase of a bath having distinct upper and lower phases with said upper and lower phases being substantially immiscible, said lower phase being a volatile swelling agent for said cold shrink plastic article and having a specific gravity greater than that of

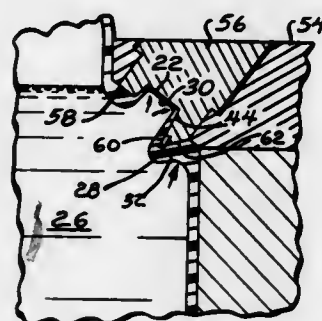
said upper phase; said upper phase acting as a blanket to substantially prevent vaporization of said lower phase; allowing said article to remain in said lower phase of said bath until it has dilated; and, removing said article from said bath for use.

#### 4,419,323 METHOD FOR MANUFACTURING A PLASTIC CONTAINER WITH NON-CORING PENETRABLE WALL PORTION

David A. Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.  
Continuation of Ser. No. 119,716, Feb. 8, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 311,094  
Int. Cl.<sup>3</sup> B29C 17/07

U.S. Cl. 264—523

6 Claims



1. A method for manufacturing a plastic container having a penetrable wall portion, which is thin relative to the thickness of the container walls, from a tubular plastic parison about a fill tube, the steps comprising:

- providing a mold cavity having a bottom wall surface, a side wall extending upwardly from the bottom wall surface, a projecting step above the bottom wall surface and projecting from the side wall and a recess adjacent to and above at least a portion of the projecting step;
- inserting the fill tube with the plastic parison thereabout into the mold cavity;
- expanding the parison to conform to the inside surface of the mold cavity by the application of pressure from the fill tube, below the projecting step in the mold cavity;
- blocking the flow of plastic from the expanding parison at the projecting step as the parison expands from the bottom wall surface along the side wall of the mold cavity; and
- thereby arranging the portion of the plastic parison spanning the recess so that the portion diminishes in thickness as it moves into the recess toward the end thereof, the mold cavity recess end corresponding to the thin penetrable wall portion of the container.

#### 4,419,324 METHOD FOR CONTINUOUS FRICTION ACTUATED EXTRUSION

John B. Childs, and Owen P. McKenna, both of London, England, assignors to BICC Public Limited Company, London, England

Filed Oct. 30, 1981, Ser. No. 316,681  
Claims priority, application United Kingdom, Nov. 17, 1980, 8036834

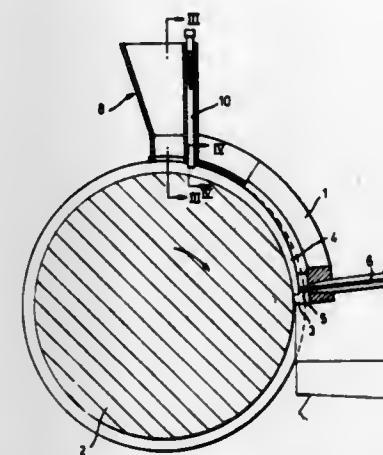
Int. Cl.<sup>3</sup> B22F 1/00

U.S. Cl. 419—67

3 Claims

1. A method of continuous friction-actuated extrusion comprising the steps of feeding extrudible metal in particulate form into a first end of a passageway formed between first and second members with said second member having greater surface area for engaging said extrudible metal than the first member, said passageway having an obstruction at a second end remote from said first end and having at least one die orifice associated with the obstructed end, and continuously

moving the passageway defining surface of said second member relative to the passageway defining surface of the first member in the direction towards the die orifice from said first end to said second end such that frictional drag of the passageway defining surface of the second member draws said extrudible metal through the passageway and generates in said extrudible metal a pressure that is effective to extrude said extrudible metal through the die orifice to form a body of uniform cross-



section and indefinite length, wherein said extrudible material is fed into said passageway at a low rate such that the rate at which said body emerges from said die orifice is consequent upon and substantially equal to the rate of feeding, said passageway being of uniform cross-sectional area and said extrudible metal being fed thereto by a storage hopper feeding to said passageway through an adjustable constriction having a cross-sectional area smaller than the cross-sectional area of said passageway.

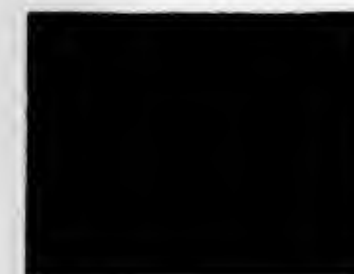
#### 4,419,325 DENTAL ALLOYS FOR PORCELAIN-FUSED-TO-METAL RESTORATIONS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Filed Jul. 21, 1982, Ser. No. 400,481  
Int. Cl.<sup>3</sup> C22C 5/04, 30/02

U.S. Cl. 420—464

12 Claims



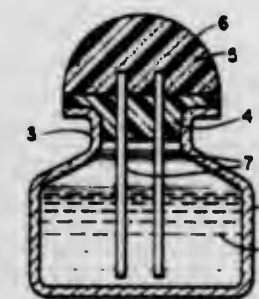
1. A grain-refined palladium based dental alloy for porcelain-fused-to-metal restorations consisting by weight of essentially about 35–85% palladium, 0–12% copper, 5–15% gallium, 0–50% gold, 0–5% aluminum, 0–13% cobalt and 0.1–0.5% ruthenium or rhenium, the total of the constituents being 100%.

#### 4,419,326 VAPOR DISPERSING PROCESS

Thomas F. Santini, New York, N.Y., assignor to De Laire, Inc., New York, N.Y.  
Division of Ser. No. 259,068, Apr. 30, 1981, which is a continuation-in-part of Ser. No. 246,089, Mar. 23, 1981, abandoned. This application Sep. 21, 1982, Ser. No. 420,848  
Int. Cl.<sup>3</sup> A61L 9/04, 9/12

U.S. Cl. 422—4

5 Claims



1. A process for vaporizing a volatile air treating liquid having a volatile component and a non-volatile component, comprising supplying said air treating liquid to a porous element having an open cell surface, predetermining the rate at which said non-volatile component will occlude said open cell surface, and impregnating said open cell surface, prior to contact by said air treating liquid, with a volatile occluding agent whose rate of vaporization from said open cell surface bears a desired relationship to said predetermined occluding rate of said non-volatile component, whereby the evaporation rate of said volatile component occurs at a desired rate over an extended period of time.

#### 4,419,327 METHOD OF SCAVENGING DISSOLVED OXYGEN IN STEAM GENERATING EQUIPMENT USING AMMONIA OR AMINE NEUTRALIZED ERYTHORBIC ACID

John A. Kelly, Woodridge, and Cynthia A. Soderquist, Bollingbrook, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 22, 1981, Ser. No. 333,379  
Int. Cl.<sup>3</sup> C23F 11/10

U.S. Cl. 422—17

8 Claims

1. A method of removing dissolved oxygen from boiler feedwater and passivating boiler metal surfaces comprising adding to said boiler feedwater an oxygen scavenging amount of an ammonium or amine neutralized erythorbate at a pH of at least about 5.0.

#### 4,419,328 CONTROLLED FLUIDIZED BED REACTOR FOR TESTING CATALYSTS

Dennis E. Walsh, Richboro, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,546  
Int. Cl.<sup>3</sup> G01N 31/12; B01J 8/18

U.S. Cl. 422—62

9 Claims

1. Apparatus for investigating the performance of a catalyst used in a continuous catalytic cracking process for the conversion of a stream of hydrocarbon feed stock wherein said stream is contacted with an active catalyst in a reactor maintained under catalytic cracking conditions to provide reaction products which are removed from said reactor, the catalyst in said reactor becoming contaminated by the deposition of coke thereon, said apparatus comprising:

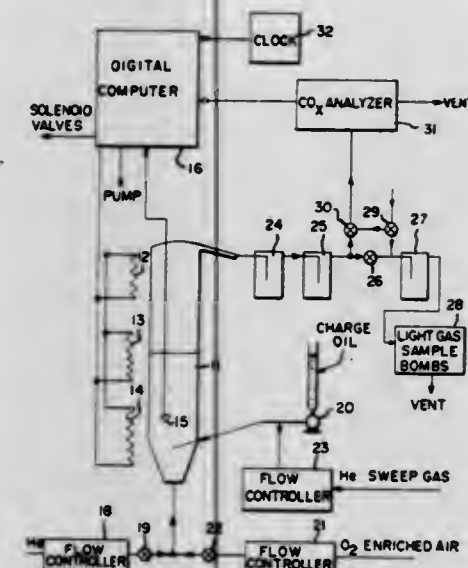
a single fluidized bed laboratory scale reactor charged with the catalyst to be investigated;

means for supplying hydrocarbon feed stock to said reactor;

means for supplying air to said reactor for regeneration of said catalyst;



means for controlling said means for supplying in successive and repeated cyclic catalyst cracking intervals and cyclic catalyst regeneration intervals;  
means for monitoring the reaction product yields from said reactor and the coke deposited on said catalyst whereby the performance of said catalyst in a larger continuously operated catalytic cracking process is assessed in said laboratory scale reactor operated cyclically; and



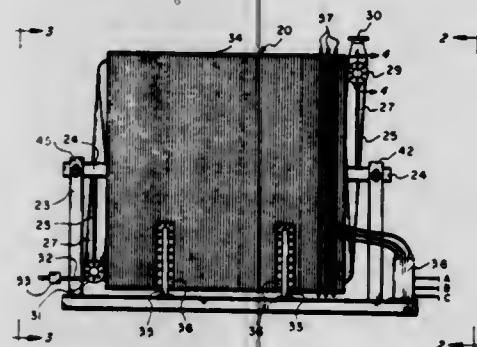
means for monitoring the concentration of CO and CO<sub>2</sub> in said reactors during said regeneration intervals by control of a computer;  
means for periodically recording the monitored values of CO and CO<sub>2</sub>; and  
means for increasing the frequency of said monitoring and recording as the concentration of CO and CO<sub>2</sub> increases in said reactor.

4,419,329

# DEVICE FOR PRODUCING HYDROGEN AND OXYGEN GASES

Charles H. Heller, 17 Beth Dr., Moorestown, N.J. 08057  
Continuation of Ser. No. 167,339, Jul. 9, 1980, abandoned. This application Apr. 15, 1982, Ser. No. 368,571  
Int. Cl.<sup>3</sup> B01J 7/00, 19/08, 19/12  
U.S. Cl. 422—111

13 Claims



1. An apparatus to disassociate combustion product compound into its component fuel part and oxygen gases comprising:
  - (a) a source of combustion product compound,
  - (b) a tube to carry the compound,
  - (c) acceleration means to cause the compound to accumulate a high level of velocity kinetic energy, comprising an ionization means to continuously add excess electrons to the compound,
  - (d) a porous plug of catalytic metal in the tube in the path of the compound allowing the high velocity compound to pass through the porous plug, and wherein the ionization means comprises the tube constructed of a layer of semi-conductor N-function material on the outside, a P-function material

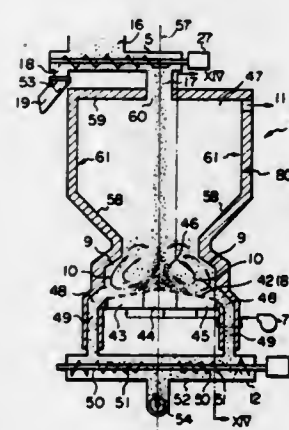
layer next inside, and a non-magnetic layer on the inside in contact with the compound flow.

4,419,330

# THERMAL REACTOR OF FLUIDIZING BED TYPE

Hideo Ishihara, Yokohama; Takahiro Ohshita, Kanagawa, and Harumitsu Saito, Yokohama, all of Japan, assignors to Ebara Corporation, Tokyo, Japan  
Filed Nov. 9, 1981, Ser. No. 319,875  
Claims priority, application Japan, Jan. 27, 1981, 56-10520; Jan. 29, 1981, 56-10841  
Int. Cl.<sup>3</sup> F27B 15/16; B01J 8/30  
U.S. Cl. 422—143

15 Claims



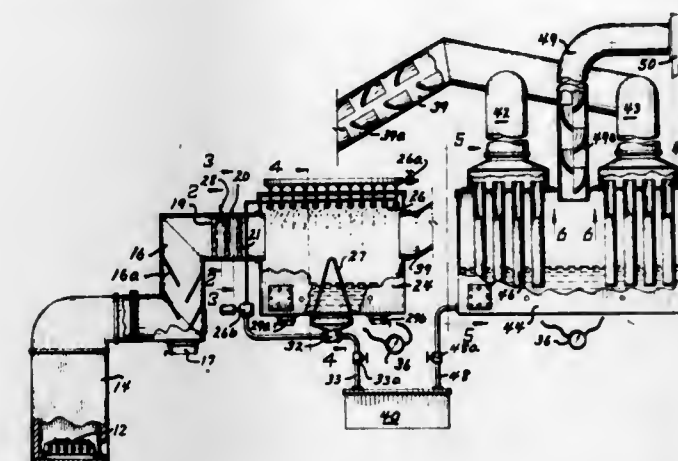
1. A thermal reactor of the fluidized bed type, comprising:
  - a vertical furnace housing having a generally rectangular horizontal cross-section;
  - a diffusion means disposed in the lower portion of the inside of said housing and extending from one side wall to the opposite side wall of said housing, said diffusion means having a plurality of gas discharging means spaced across the width of the inside of said housing for discharging fluidizing gas upwardly into said housing, a pressurized fluidizing gas source, and gas distributing means coupled between said gas source and said gas discharging means for supplying a greater mass flow of fluidizing gas to the gas discharging means adjacent the opposite side walls than that at the center portion of the width of the inside of said housing for producing a central fluidized bed of fluidized medium above said center portion and side fluidized beds of fluidized medium on opposite sides of said center fluidized bed adjacent said walls, said side fluidized beds whirling adjacent said side walls and moving upwardly and said central fluidized bed generally tending to descend between said two upwardly moving side fluidized beds, the top of said diffusion means being a single inverted V-shape cross-section member having the opposite lower ends adjacent said side walls;
  - a material charging means operatively associated with said housing for charging material to be processed into said housing onto the top portion of said central fluidized bed;
  - two deflecting means, one on each of the opposite side walls of said housing and extending inwardly toward each other with a gap between the inner ends thereof above the top of said central fluidized bed, the lower surfaces of said deflecting means being upwardly and inwardly inclined into said housing for deflecting the upward flow of said side fluidized beds toward the portion of said housing above said central fluidized bed, the space from the top of said diffusion means up to said two deflecting means and between the opposite side walls being clear of any obstructions to flow in the direction between said opposite side walls whereby said central fluidized bed and said side fluidized beds can contact each other freely; and
  - discharge means in the bottom part of said furnace housing for discharging incombustible residue from said furnace housing.

# 4,419,331 SULPHUR DIOXIDE CONVERTER AND POLLUTION ARRESTER SYSTEM

Victor H. Montalvo, Owensboro, Ky., assignor to Michael F. Walters, Owensboro, Ky., a part interest  
Filed Apr. 12, 1982, Ser. No. 367,419  
Int. Cl.<sup>3</sup> B01D 50/00

U.S. Cl. 422—170

9 Claims



1. A sulphur dioxide converter and pollution arresting system comprising a source of smoke containing sulphur dioxide, ductwork directing the movement of said smoke into a first treating chamber, said ductwork including a turbulence creating zone, means introducing a catalyst into said ductwork, said first treating chamber having a series of outlets therein passing atomized liquid directly downwardly by gravity through the path of movement of said smoke, a deflector disposed within said first treating zone serving solid and liquid separating purposes, a second treating chamber communicating with said first treating chamber, said second treating chamber positioning a series of depending conduits for passage of said smoke and including a volume of liquid at the bottom thereof into which said series of conduits extend and into which said smoke is introduced, an outlet duct directly communicating with said second treating chamber at the top thereof and above the level of said liquid and arranged to permit liquid entrained in smoke passing from said second treating chamber to return by gravity flow into said second treating chamber, and a flue communicating with said outlet duct achieving the vacuum flow of said smoke through said system, said sulphur dioxide in said smoke combining with said catalyst and said liquid in said first and said second treating chamber to produce sulphuric acid.

4,419,332

# EPITAXIAL REACTOR

Hubert von der Ropp, Nordheim, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany  
Filed Oct. 21, 1980, Ser. No. 200,548  
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1979, 2943634

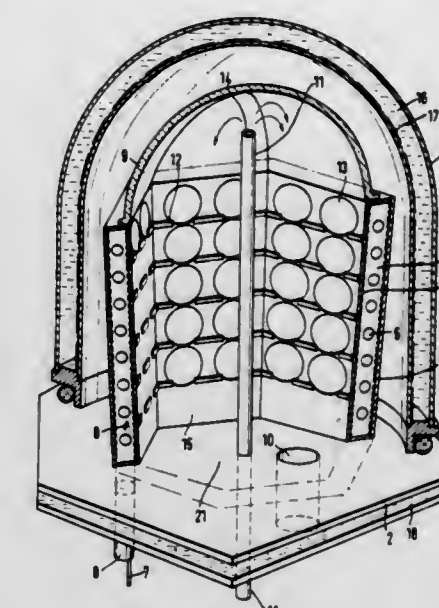
Int. Cl.<sup>3</sup> C30B 25/10

U.S. Cl. 422—245

10 Claims

1. In an epitaxial reactor with a modified heat pipe system for the epitaxial deposition of semiconductor layers on semiconductor substrate discs, comprising an enclosed and evacuable container, a heating tube disposed in the container and enclosing a reaction chamber, a seal covering one end of the heating tube to enclose the reaction chamber, a transport line passing into the container and the reaction chamber and having an outlet end in the vicinity of the seal for introducing reaction gas into the reaction chamber, means defining an outlet extending from the reaction chamber and through the container for the exhaust of reaction gas from the reaction chamber, with the surface of the heating tube which faces the reaction chamber being provided for accommodating the discs, the improvement wherein said heating tube comprises two concentric walls spaced apart to delimit a sealed inner chamber, and said reactor

further comprises a heat source and a temperature control system located in said inner chamber and operative for automatically providing a selected, uniform temperature in said reaction chamber based on the saturation temperature of the vapor pressure existing in said inner chamber.



4,419,333

# PROCESS FOR REMOVAL OF NITROGEN OXIDES

Josef Reus, Maintal; Hans Wewer, Schoneck, and Hofmann Jürgen, Bad Orb., all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany  
Continuation of Ser. No. 237,950, Feb. 25, 1981, abandoned.  
This application Jul. 16, 1982, Ser. No. 398,929  
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3008012

Int. Cl.<sup>3</sup> C01B 21/00

U.S. Cl. 423—235

7 Claims

1. A process for the removal of nitrogen monoxide from a gas mixture by scrubbing the nitrogen monoxide containing gas mixture with a nitric acid solution in the column portion of an absorption apparatus consisting essentially of a column and a sump, said process comprising passing the nitric acid solution from the column portion to the sump and introducing gaseous oxygen as an oxidizing agent into the nitric acid present as a 15-50 weight % solution in said sump, there being a sufficiently large volume of said nitric acid solution containing said oxygen present in the sump that there is produced the oxidation of the nitrogen monoxide in the solution and wherein the thus purified gas mixture still contains residual nitrogen monoxide and nitrogen dioxide and oxidizing the residual nitrogen monoxide and nitrogen dioxide with hydrogen peroxide to convert the residual nitrogen monoxide and nitrogen dioxide to nitric acid.

4,419,334

# PROCESS FOR COOLING AND SEPARATING CHLORIDES AND FLUORIDES FROM GAS MIXTURES

Robert Karger, Dortmund, Fed. Rep. of Germany, assignor to Vereinigte Elektrizitätswerke Westfalen Aktiengesellschaft, Dortmund, Fed. Rep. of Germany  
Filed Nov. 6, 1981, Ser. No. 318,920  
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1980, 3043329

Int. Cl.<sup>3</sup> B01D 53/34

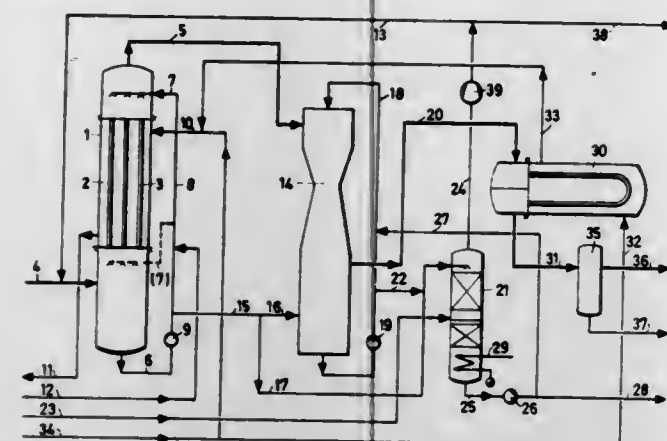
U.S. Cl. 423—240

18 Claims

1. A method for cooling and selective separation of chlorides and fluorides from hot mixtures of gases generated by gasifying solid or liquid fuels or by extracting gas from solid fuels comprising cooling the gas mixture in the presence of a circulating liquid of ammonia and water in a cooler to a temperature at or below the adiabatic saturation temperature to condense the



steam contained in said gas and forming, by sublimation of the reacted mass between the heat source and the gates to a gaseous  $\text{NH}_3$ ,  $\text{HCl}$  or  $\text{HF}$ , solid ammonium chloride and am-



monium fluoride, and wherein a part of said solids is dissolved in the condensed steam or, respectively, in the circulation liquid, and discharging the dissolved material from the cooler.

4,419,335

### PROCESS FOR PRODUCING RHOMBOHEDRAL SYSTEM BORON NITRIDE

Toshihiko Ishii, and Tadao Sato, both of Sakura, Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Mar. 10, 1982, Ser. No. 356,784

Claims priority, application Japan, Oct. 26, 1981, 56-171249  
Int. Cl.<sup>3</sup> C01B 21/06

U.S. Cl. 423—290

10 Claims

1. A process for producing high-purity rhombohedral system boron nitride, having good crystallinity, which comprises heating a boron material selected from the group consisting of boron oxide, boric acid and an oxygen-containing boron compound capable of forming boron oxide when heated, at a temperature of from 1200° to 2100° C., thereby vaporizing the boron oxide and reacting the vaporized boron oxide with hydrogen cyanide or cyanogen gas.

4,419,336

### SILICON CARBIDE PRODUCTION AND FURNACE

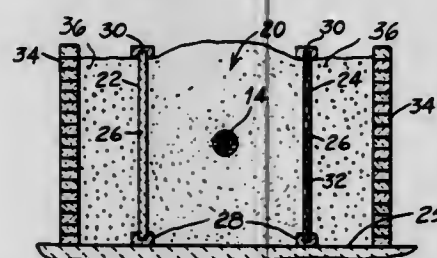
Areekattuthazhayil K. Kuriakose, Gloucester, Canada, assignor to Norton Company, Worcester, Mass.

Filed Mar. 29, 1982, Ser. No. 362,701

Int. Cl.<sup>3</sup> C01B 31/36

U.S. Cl. 423—345

1 Claim



1. A method of making a larger percentage of coarsely crystalline silicon carbide in an Acheson furnace comprising packing the silica and coke ingredients forming a reaction mix around a centrally disposed resistive element heat source while confining the mix between gates that hold the mix in an insulated zone surrounding said source, supplying current to said source for raising the temperature within the mass to about 1800° C. for reacting all of the ingredients in the mix between the heat source and the gates to form finely crystalline silicon carbide, and then increasing the crystal size of the silicon carbide in the reacted mass by increasing the temperature of

### PROCESS AND APPARATUS FOR REACTING SULPHUR-CONTAINING MATERIAL WITH OXIDIZING GAS

Richard F. Jagodzinski, and Richard K. Kerr, both of Calgary, Canada, assignors to Hudson's Bay Oil and Gas Company Limited and Alberta Energy Company Ltd., both of Alberta, Canada

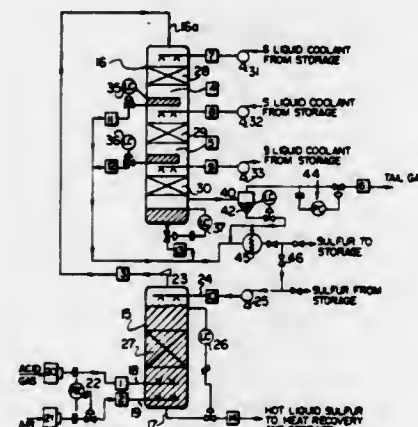
Filed Jun. 19, 1981, Ser. No. 275,201

Claims priority, application Canada, Oct. 21, 1980, 362841

Int. Cl.<sup>3</sup> C01B 17/04; B01D 53/34

U.S. Cl. 423—574 R

19 Claims



1. A process for reacting hydrogen sulfide with oxygen comprising:

continuously introducing a gas containing at least 1% hydrogen sulfide and an oxidizing gas containing free oxygen into a reactor which contains a bed of solid catalyst through which the said gases pass and which causes the hydrogen sulfide to react with oxygen to produce sulfur dioxide;  
maintaining all the catalyst continuously saturated with liquid sulfur during the reaction by continual injection and removal of liquid sulfur; and,  
maintaining and controlling within the reactor a temperature between about 275° and 550° C. and a pressure of at least 5 atmosphere absolute during the reaction.

4,419,338

### LIQUID-LIQUID EXTRACTION

Achille De Schepper, Lichtaart, and Antoine Van Peteghem, Olen, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Division of Ser. No. 231,367, Feb. 3, 1981, abandoned, which is a division of Ser. No. 912,989, Jun. 6, 1978, Pat. No. 4,277,445.

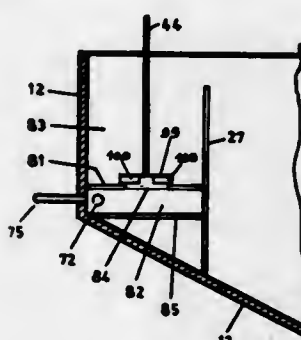
This application Dec. 29, 1981, Ser. No. 335,551

Claims priority, application Luxembourg, Jun. 7, 1977, 77498

Int. Cl.<sup>3</sup> B01D 11/04

U.S. Cl. 423—658.5

2 Claims



1. A multi-stage liquid-liquid extraction process for carrying

out extractions involving light and heavy phases accompanied by a solid phase settling comprising the steps of

- establishing a connected series of mixer-settler zones, each of said mixer-settler zones consisting of a mixing zone which empties into a settling zone,
- separately introducing into each mixing zone two liquid phases of different densities and separately removing from each settling zone two liquid phases of different densities,
- introducing a heavy liquid to be submitted to an extraction operation into the mixing zone of the first in the series of mixer-settler zones and withdrawing a heavy liquid that has been submitted to an extraction operation from the settling zones of the last in the series of said mixer-settler zones,
- introducing a light liquid phase which acts as extractant into the mixing zone of the last in the series of mixer-settler zones and withdrawing said light liquid phase from the settling zone of the first in the series of mixer-settler zones,
- withdrawing a heavier liquid fraction from each settling zone and passing it to the mixing zone of the next in the series of mixer-settler zones and finally removing it from the settling zone of the last of said mixer-settler zones,
- withdrawing a lighter liquid fraction from each settling zone and passing it to the mixing zone of the next previous mixer-settler zone in the series of mixer-settler zones,
- causing the mixed liquid phases exiting from each mixing zone to (a) first flow in one direction with an increase in the depth of the flowing body of liquid, which facilitates the settling of solids from the liquid phases, and (b) thereafter flow the liquid phases along a separate path in a direction which is generally opposite to said first direction and in such a manner that the depth of the liquid body decreases,
- withdrawing a light liquid fraction and a heavy liquid fraction adjacent the area where each settling zone reaches its minimum depth, and
- withdrawing solids adjacent the area where each settling zone reaches its maximum depth.

4,419,339

### FORMULATION AND METHOD OF MAKING CATIONIC LIPOPHILIC COMPLEXES

Rudi D. Neirineckx, East Windsor, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 5, 1981, Ser. No. 290,268

Int. Cl.<sup>3</sup> A61K 43/00, 49/00; C07F 15/02, 1/08

U.S. Cl. 424—1.1

20 Claims

1. A method for the preparation of a technetium-99m complex having the formula



which comprises adding technetium-99m to a complex having the formula



and heating the mixture in the presence of a source of anion  $X^{\ominus}$ , wherein each L is the same or different lipophilic ligand, each X is the same or different monovalent anionic ligand, and M is a non-toxic trivalent metal ion other than technetium.

4,419,340

### CONTROLLED RELEASE OF ANTICANCER AGENTS FROM BIODEGRADABLE POLYMERS

Seymour Yolles, Newark, Del., assignor to University of Delaware, Newark, Del.

Continuation of Ser. No. 859,766, Dec. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 504,588, Sep. 9, 1974, abandoned, which is a continuation of Ser. No. 102,431, Dec. 29, 1970, Pat. No. 3,887,669, which is a continuation-in-part of Ser. No. 809,946, Mar. 24, 1969, abandoned. This application Nov. 20, 1980, Ser. No. 208,506

The portion of the term of this patent subsequent to Jun. 3, 1992, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 9/26, 31/74, 47/00

U.S. Cl. 424—19

3 Claims

1. An implant drug dispensing device article for prolonged administration upon implantation of an anticancer agent which comprises, a solid shaped article formed from a combination of (a) a biodegradable polymer selected from poly(lactic acid) or polyglycolic acid, and, substantially uniformly and intimately dispersed throughout portions of the article, (b) cis-dichlorodiammine-platinum (II), and (c) doxorubicin or cyclophosphamide each being present in administrable dosage being much larger than those normally toxic, to lower than are normally infused by injection, and having an average particle size of from 150 to 425 microns.

4,419,341

### DRUG FOR TREATMENT OF DENTAL CARIES

Anatoly G. Kolesnik, Moscow; Galina I. Kadnikova, Riga; Lilia V. Morozova, Moscow, and Lidia M. Boginskaya, Moskovskaya, all of U.S.S.R., assignors to Rzhasky Meditsinsky Institut, Moscow, U.S.S.R.

Filed Mar. 4, 1983, Ser. No. 472,085

Int. Cl.<sup>3</sup> A61K 7/18, 33/16, 35/32

U.S. Cl. 424—52

3 Claims

1. A drug for treatment of dental caries, comprising an active principle, namely, a mixture of sodium monofluorophosphate and an anticaries composition obtained by treating osseous tissue with a diluted mineral acid till a complete dissolution of the mineral components and water-soluble proteins contained in the osseous tissue, separating the solution, diluting it with water, adding as a stabilizer, citric acid or its salt, to the solution, and neutralizing and evaporating the solution, which anticaries composition has the following percentage-by-weight composition:

calcium	2-6
sodium	19-23
potassium	0.04-0.18
mineral acid anions	6-10.6
orthophosphoric acid anions	1.5-5.0
water-soluble proteins	1.0-5.0
magnesium	0.05-0.2
trace elements, including fluorine, manganese, tin, zinc, and iron	0.01-0.02
complex citrate compounds in terms of citric acid anions	the balance;

and a chewable and swallowable water and saliva-soluble pharmaceutical diluent, the ratio between said active principle and said pharmaceutical diluent being 1:23.5-24.5.



4,419,342

## DENTIFRICE PREPARATION

Harry Hayes, Warrington, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 356,674, Mar. 10, 1982, abandoned. This application Jan. 17, 1983, Ser. No. 458,244, Int. Cl.<sup>3</sup> A61K 7/16, 7/22

U.S. Cl. 424-54

5 Claims

1. An opaque dentifrice comprising a liquid vehicle which contains at least about 35% by weight of water, up to about 10% by weight of gelling agent, about 10-50% by weight of a polishing material at least a major portion of which is a siliceous polishing material having an empirical SiO<sub>2</sub> content of at least 70%, a particle size in the range from 1 to 35 microns, substantially amorphous X-ray structure and a refractive index of about 1.40-1.47 and as an additional polishing agent an amount of about 5-20% by weight of the dentifrice of a dentally acceptable polishing agent selected from the group consisting of calcined alumina, alpha-alumina trihydrate, dicalcium phosphate dihydrate, anhydrous dicalcium phosphate, insoluble sodium metaphosphate, calcium carbonate and mixtures thereof, said amount of said additional polishing agent not exceeding the amount of said siliceous polishing agent, about 0.1-5% by weight of a surface active agent containing sodium alkyl sulphate wherein the alkyl group contains 10-18 carbon atoms, with about 40-70% of the alkyl groups being C<sub>12</sub> and about 0.1-15% by weight of a water soluble, orally acceptable salt of an alkylene diamine tetramethylene phosphonic acid, wherein the alkylene group contains 1-10 carbon atoms, said dentifrice being smooth and without substantial soft lump rheological deformation.

4,419,343

## COMPOSITION USABLE NOTABLY AS A COSMETIC PRODUCT ALLOWING A TANNING OF THE SKIN COMPRISING THE USE OF AMINOACIDS

Marc Pauly, Chateau Salins, France, assignor to Laboratoires Serobiologiques S.A., France

Continuation of Ser. No. 84,019, Oct. 12, 1979, abandoned. This application Aug. 19, 1981, Ser. No. 294,402

Claims priority, application France, Oct. 19, 1978, 78 29797 Int. Cl.<sup>3</sup> C07C 143/00; A61K 7/42; C07D 233/64; C07C 83/00 U.S. Cl. 424-59

19 Claims

1. A composition for topical application to the epidermis to effect photo-pigmentation or photo-protection of skin upon exposure to the sun or ultra-violet rays, said composition comprising a skin photo-pigmentation or photo-protection effective amount of a salt of tyrosine with a basic aminoacid, distributed in a vehicle for topical application.

4,419,344

## QUATERNARY, COPOLYMERIC, HIGH MOLECULAR WEIGHT AMMONIUM SALTS BASED ON ACRYLIC COMPOUNDS, THEIR PREPARATION, AND THEIR USE IN COSMETICS

Dieter Strasilla, Weil am Rhein, Fed. Rep. of Germany; Hubert Meindl, Riehen, Switzerland; Laszlo Moldovanyi, Basel, Switzerland, and Charles Fearnley, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 27, 1981, Ser. No. 286,920

Claims priority, application Switzerland, Aug. 1, 1980, 5876/80

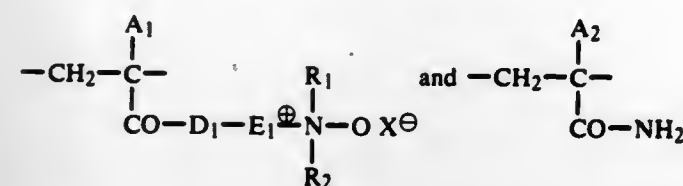
Int. Cl.<sup>3</sup> A61K 7/08; C08F 28/02

U.S. Cl. 424-70

14 Claims

12. A method of hair treatment to give ease of wet and dry combing which comprises the step of applying a cosmetic which contains at least one copolymeric, quaternary ammonium salt which is soluble or forms a microemulsion in an aqueous surfactant system, which has a molecular weight distribution of 10<sup>4</sup> to 10<sup>5</sup>, the molecular weight of at least 5 percent by weight of the copolymer being 10<sup>7</sup> and 10<sup>9</sup>, and

comprises, in any order, recurring structural elements of the formulae



in which A<sub>1</sub> and A<sub>2</sub> are each hydrogen or methyl, D<sub>1</sub> is oxygen or -NH-, E<sub>1</sub> is alkylene having 1 to 4 carbon atoms unsubstituted or substituted by hydroxyl, R<sub>1</sub> and R<sub>2</sub> are each methyl or ethyl, Q is alkyl or hydroxyalkyl having 1 to 4 carbon atoms or benzyl and X<sup>-</sup> is the radical of at least one anionic sulfate ether surfactant, which may be zwitterionic.

4,419,345

## SLEEP-INDUCING PHARMACEUTICAL COMPOSITION AND METHOD

Richard J. Wyatt, Bethesda, Md., assignor to Kinetic Systems, Inc., Arlington, Va.

Filed Jul. 20, 1981, Ser. No. 284,684

Int. Cl.<sup>3</sup> A61K 31/195, 33/06, 33/14

U.S. Cl. 424-153

8 Claims

5. A method for inducing sleep in warm blooded animals, comprising administering thereto a sleep-inducing effective amount of a combination of tryptophan, or a non-toxic salt thereof and a calcium cation wherein the weight ratio of the tryptophan or a non-toxic salt thereof to the cation is about 0.02:1 to 1.0:1.

4,419,346

## METHOD AND COMPOSITION TO INHIBIT THE GROWTH OF STREPTOCOCCUS MUTANS BY THE USE OF SACCHARIN/FLUORIDE COMBINATION

John J. Stroz, Monroe, Conn., and Andrew M. Slee, Averill Park, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Aug. 13, 1982, Ser. No. 407,987

Int. Cl.<sup>3</sup> A61K 7/18, 9/68, 33/16

U.S. Cl. 424-151

5 Claims

1. In the method of inhibiting the growth of *Streptococcus mutans* by contacting *Streptococcus mutans* with a saccharin compound selected from the group consisting of sodium saccharin, ammonium saccharin, calcium saccharin, or the free acid form of saccharin in an amount sufficient to inhibit growth of *Streptococcus mutans*, the improvement comprising contacting *Streptococcus mutans* with said saccharin in synergistic combination with a fluoride material in an amount which inhibits or prevents growth of *Streptococcus mutans*.

4,419,347

## NONAPEPTIDE AND DECAPEPTIDE ANALOGS OF LHRH, USEFUL AS LHRH ANTAGONISTS

John J. Nestor, San Jose; Gordon H. Jones, and Brian H. Vickery, both of Cupertino, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

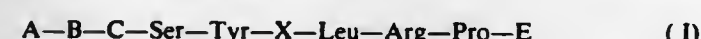
Continuation of Ser. No. 194,180, Oct. 6, 1980, Pat. No. 4,341,767. This application Apr. 8, 1982, Ser. No. 366,635 The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424-177

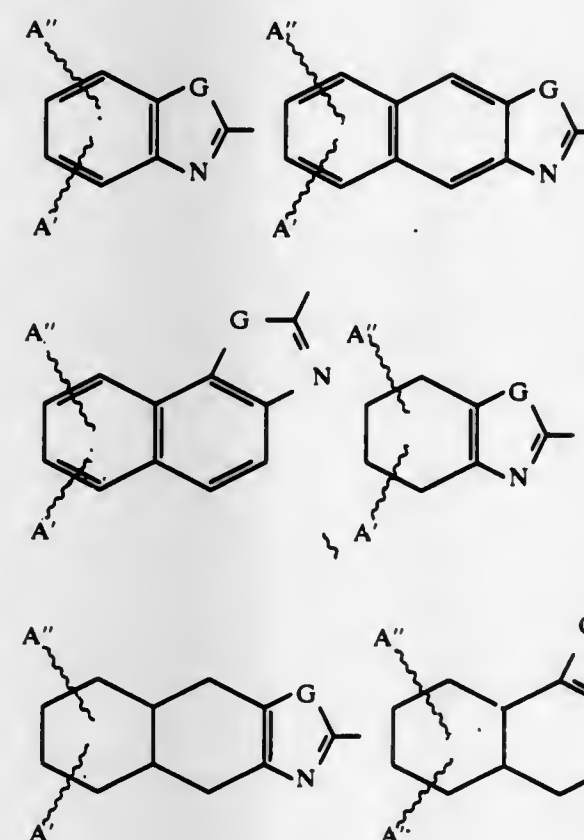
28 Claims

1. A compound of the formula



and the pharmaceutically acceptable salts thereof, wherein: X is a D-alanyl residue wherein one hydrogen on C-3 is replaced by:

- (a) a carbocyclic aryl-containing radical selected from the group consisting of phenyl substituted with three or more straight chain lower alkyl groups, naphthyl, anthryl, fluorenyl, phenanthryl, biphenyl and benzhydryl; or
- (b) a saturated carbocyclic radical selected from the group consisting of cyclohexyl substituted with three or more straight chain lower alkyl groups, perhydronaphthyl, perhydrobiphenyl, perhydro-2, 2-diphenylmethyl, and adamantyl; or
- (c) a heterocyclic aryl containing radical selected from the group consisting of radicals represented by the following structural formulas:



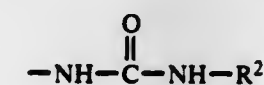
wherein A' and A'' are independently selected from the group consisting of hydrogen, lower alkyl, chlorine, and bromine, and G is selected from the group consisting of oxygen, nitrogen, and sulfur;

A is an aminoacyl residue selected from the group consisting of L-pyroglyutamyl, D-pyroglyutamyl, N-acyl-L-prolyl, N-acyl-D-prolyl, N-acyl-D-tryptophanyl, N-acyl-D-phenylalanyl, N-acyl-D-p-halophenylalanyl, and N-acyl-X, wherein X is as defined previously;

B is a D-p-halophenylalanyl residue;

C is an amino acyl residue selected from the group consisting of L-tryptophanyl, D-tryptophanyl, D-phenylalanyl and X wherein X is as defined above;

E is glycineamide or -NH-R<sup>1</sup>, wherein R<sup>1</sup> is lower alkyl, cycloalkyl, fluoro lower alkyl or



wherein R<sup>2</sup> is hydrogen or lower alkyl.

4,419,348

## ANTHRACYCLINE GLYCOSIDE COMPOSITIONS, THEIR USE AND PREPARATION

Aquilur Rahman, Rockville, and Philip S. Schein, Bethesda, both of Md., assignors to Georgetown University, Washington, D.C.

Filed Apr. 27, 1981, Ser. No. 258,016

Int. Cl.<sup>3</sup> A61K 31/70; C07H 17/08

U.S. Cl. 424-180

15 Claims

1. A cardiolipin complexed anthracycline glycoside com-

pound encapsulated in liposomes formed from phosphatidyl choline, cholesterol and stearyl amine wherein said anthracycline glycoside is selected from the group consisting of doxorubicin, daunorubicin and pharmaceutically acceptable derivatives or salts thereof.

4,419,349

## INTERFERON INDUCER, A PROCESS FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Yasuhiko Kojima, Yokohama; Seishi Konno, Tokyo; Sadao Tamamura, Tokyo; Yoshimoto Sano, Tokyo; Nobuyuki Shibukawa, Tokyo, and Takashi Hashimoto, Chofu, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 97,609, Nov. 27, 1979, abandoned. This application May 22, 1981, Ser. No. 266,038 Claims priority, application Japan, Nov. 28, 1978, 53-146976; Sep. 6, 1979, 54-114623

Int. Cl.<sup>3</sup> A61K 35/78

U.S. Cl. 424-195

13 Claims

1. A process for producing a water soluble interferon inducer having a high molecular weight from a plant tissue, comprising extracting said interferon inducer with water from the tissue of a plant selected from the plants of the genus *Perilla* containing said interferon inducer at a temperature from ambient to the boiling point of the extraction mixture for a period of up to 5 days to extract said interferon inducer present in said tissue, forming a supernatant from the extracted solution, fractionating the supernatant to yield fractions containing the major portion of said interferon inducer in the supernatant and recovering said interferon therefrom.

4,419,350

## CARBOFURAN COMPOSITIONS FOR PROBLEM SOILS

Peter E. Letchworth, Cupertino, and Thomas B. Williamson, Santa Clara, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 5, 1981, Ser. No. 318,295

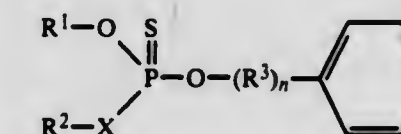
Int. Cl.<sup>3</sup> A01N 43/08, 57/00

U.S. Cl. 424-225

10 Claims

1. An insecticidal composition based on the insecticide 2,3-dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate for use in soil which has been previously treated with said insecticide and to which second or subsequent applications of said insecticide have produced a declining level of insecticidal activity, consisting essentially of

- (a) an insecticidally effective amount of said insecticide, and
- (b) an amount of an organophosphorus compound sufficient to restore at least a portion of the insecticidal activity of said insecticide, said organophosphorus compound having the formula



in which

R<sup>1</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl,

R<sup>2</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl,

R<sup>3</sup> is C<sub>1</sub>-C<sub>4</sub> alkylene,

X is oxygen or sulfur, and

n is zero or one;

the weight ratio of insecticide to organophosphorus compound being about 1:1.



4,419,351

## PLATINUM-DIOXOPYRIMIDINE COMPLEXES

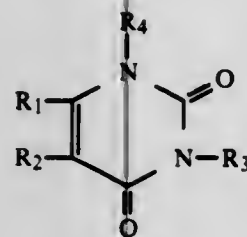
Barnett Rosenberg, Holt; Loretta Van Camp, East Lansing; Robert G. Fischer, Lansing, all of Mich.; Samir Kansy, Eugene, Oreg.; Henry J. Peresie, Lafayette, Ind., and James P. Davidson, Lansing, Mich., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 803,269, Jun. 3, 1977, abandoned, which is a continuation of Ser. No. 508,854, Sep. 24, 1974, abandoned. This application Dec. 18, 1978, Ser. No. 970,524 Int. Cl.<sup>3</sup> A61K 31/505

U.S. Cl. 424-245

8 Claims

1. The blue or green platinum-[2,4-dioxypyrimidine] complex or the mixture thereof prepared by reacting a 2,4-dioxypyrimidine having the formula:



wherein

R<sub>1</sub> and R<sub>2</sub> may be the same or different and are selected from the group consisting of H, lower alkyl, di-lower alkyl amino, di-halo lower alkyl amino, halogen, hydroxy, hydroxy lower alkyl, carbonyl, lower alkoxy,

R<sub>3</sub> and R<sub>4</sub> may be the same or different and are selected from the group consisting of H, lower alkyl ribosyl, deoxyribosyl, ribosyl, triacetyl-, tribenzoyl- or 2',3' loweralkylidene ribosyl, ribosyl phosphates and deoxyribosyl phosphates or

a 5,6-2H derivative thereof

with cis-diaquodiammineplatinum(II) wherein the molar ratio of 2,4-dioxypyrimidine to cis-diaquodiammineplatinum(II) is from about 2:1 to about 1:1 at a temperature of from about 0° to about 55° C., a pH of from about 3 to about 8 and for a time sufficient to form said complex or mixture.

4,419,352

## PYRANOQUINOLINONES AND ANALOGS THEREOF

David Cox; Hugh Cairns, both of Loughborough; Nigel Chadwick, West Bridford, and John L. Suschitzky, Loughborough, all of England, assignors to Fisons Limited, London, England Continuation of Ser. No. 82,994, Oct. 9, 1979, abandoned. This application Feb. 20, 1981, Ser. No. 236,329

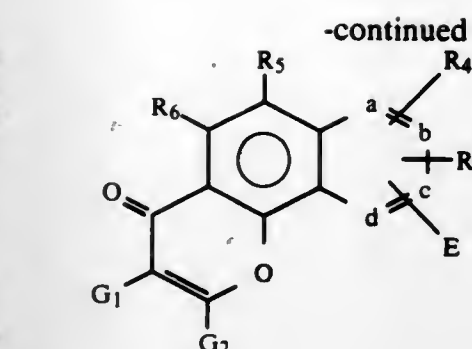
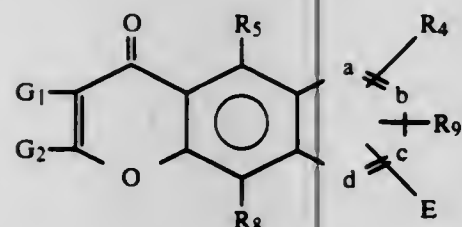
Claims priority, application United Kingdom, Oct. 31, 1978, 42679/78; Jun. 14, 1979, 7920760

Int. Cl.<sup>3</sup> C07D 491/04, 413/14; A61K 31/535, 31/47

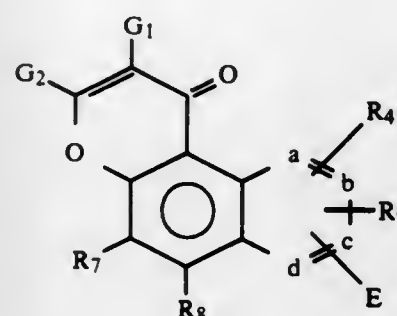
U.S. Cl. 424-248.4

31 Claims

1. A compound selected from the group having the formulas



II



III

wherein

one of the atoms a and d is nitrogen and the other is carbon, and b and c are carbon,

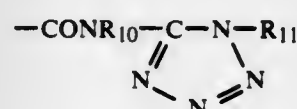
R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub>, which may be the same or different, each represent hydrogen, alkyl, halogen, alkenyl, -NO<sub>2</sub>, -NR<sub>1</sub>R<sub>2</sub>, -OR<sub>3</sub>, -S(O)<sub>n</sub>R<sub>3</sub>; or alkyl substituted by hydroxy, amino, alkoxy or carbonyl oxygen,

n is 0, 1 or 2,

R<sub>1</sub> and R<sub>2</sub>, which may be the same or different, each represent hydrogen, alkyl, -CONHR<sub>3</sub>, phenyl or phenyl substituted by alkyl or halogen, or R<sub>1</sub> and R<sub>2</sub> together with the nitrogen atom to which they are attached form a morpholine, piperidine or pyrrolidine ring,

R<sub>3</sub> represents hydrogen, alkyl, alkenyl or phenyl,

one of G<sub>1</sub> and G<sub>2</sub> is hydrogen and the other is a group E, each E, which may be the same or different, is -COOH, a 5-tetrazolyl group, or a group having the formula



R<sub>10</sub> and R<sub>11</sub> are the same or different and are hydrogen, alkyl, alkenyl, phenylalkyl, alkanoyl, or alkoxy carbonyl, and R<sub>10</sub> is hydrogen when R<sub>11</sub> is hydrogen,

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub>, R<sub>10</sub> and R<sub>11</sub>, when they contain carbon, each containing up to 8 carbon atoms, provided that when (i) either a or d is a carbon atom, (ii) E is in a position ortho to the N atom and is -COOH, a 5-tetrazolyl group or an unsubstituted (N-tetrazol-5-yl)carboxamido group, (iii) R<sub>9</sub> is hydrogen, (iv) G<sub>1</sub> is hydrogen and G<sub>2</sub> is a group E, and (v) R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> are selected from hydrogen, hydroxy, alkyl, halogen, alkenyl, alkoxy or -NR<sub>1</sub>R<sub>2</sub>, then R<sub>4</sub> is not an -OH group para to the N atom,

and pharmaceutically acceptable salts, and when E is -COOH, pharmaceutically acceptable lower alkyl esters, 2-(diethylamino)esters and lower alkanoyl-lower alkyl esters, and pharmaceutically acceptable unsubstituted or mono- or di-phenyl or C<sub>1</sub> to C<sub>6</sub> alkyl amides, thereof.

25. A pharmaceutical composition for treatment of a condition involving an antigen-antibody reaction or excess mucous secretion comprising a therapeutically effective amount of a compound according to claim 1, as active ingredient, in combination with a pharmaceutically acceptable inert adjuvant, diluent or carrier.

4,419,353

## ISOXAZOLYL INDOLAMINES

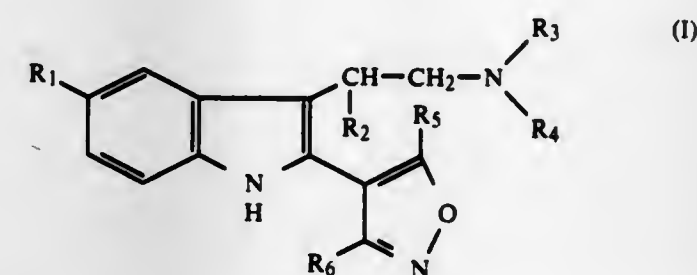
Leonard J. Brand, Randolph, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., East Hanover, N.J. Division of Ser. No. 245,188, Mar. 18, 1981, Pat. No. 4,336,379, which is a continuation-in-part of Ser. No. 196,785, Oct. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 138,872, Apr. 10, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,185

Int. Cl.<sup>3</sup> A61K 31/40, 31/42

U.S. Cl. 424-248.4

19 Claims

1. A pharmaceutical composition useful in treating diabetes as a hypoglycemic agent comprising a compound of the formula:



(I)

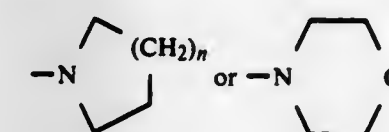
wherein

R<sub>1</sub> represents hydrogen, fluoro, chloro, lower alkyl having 1 to 4 carbon atoms, or lower alkoxy having 1 to 4 carbon atoms, and

R<sub>2</sub> represents hydroxy, and

R<sub>3</sub> and R<sub>4</sub> each independently represent lower alkyl having 1 to 4 carbon atoms, or

R<sub>3</sub> and R<sub>4</sub> together with N represent



wherein

n is 1, 2 or 3, and

R<sub>5</sub> and R<sub>6</sub> each independently represent hydrogen or lower alkyl having 1 to 4 carbon atoms,

or pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutical carrier or diluent, said compound being present in an amount sufficient to provide a daily dose of 50 to 2000 milligrams of compounds.

4,419,354

## 9,10-BIS(AMINOALKOXY)ANTHRACENES

Ralph G. Child, Pearl River, and Stanley A. Lang, Jr., Blauvelt, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

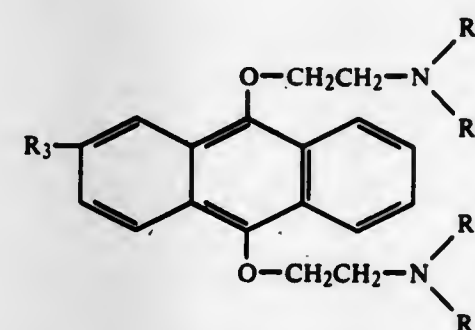
Filed Jun. 3, 1982, Ser. No. 384,461

Int. Cl.<sup>3</sup> A61K 31/13, 31/535; C07C 93/10; C07D 265/30

U.S. Cl. 424-248.56

34 Claims

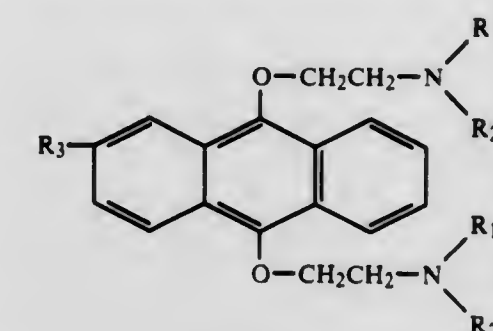
1. A compound selected from the group consisting of those of the formula:



wherein R<sub>1</sub> and R<sub>2</sub> are the same or different and are hydrogen, alkyl having up to 3 carbon atoms or β-hydroxyethyl and R<sub>3</sub>

and R<sub>2</sub> taken together with the associated N(itrogen) is morpholino, N-methyl piperazino, piperidino, 2-methyl piperidino, 3-methyl piperidino, 4-methyl piperidino, 4-piperidinol, 3,5-dimethyl piperidino, 3-piperidinemethanol, 3-piperidinecarboxylic acid ethyl ester or pyrrolidino; R<sub>3</sub> is hydrogen, methyl or chloro; and the pharmacologically acceptable acid-addition salts thereof.

33. A method of modulating the immune response in a mammal which comprises administering orally to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R<sub>1</sub> and R<sub>2</sub> are the same or different and are hydrogen, alkyl having up to 3 carbon atoms or β-hydroxyethyl and R<sub>1</sub> and R<sub>2</sub> taken together with the associated N(itrogen) is morpholino, N-methyl piperazino, piperidino, 2-methyl piperidino, 3-methyl piperidino, 4-methyl piperidino, 4-piperidinol, 3,5-dimethyl piperidino, 3-piperidinemethanol, 3-piperidinecarboxylic acid ethyl ester or pyrrolidino; R<sub>3</sub> is hydrogen, methyl or chloro; and the pharmacologically acceptable acid-addition salts thereof.

4,419,355

## CONDENSED AS-TRIAZINE DERIVATIVES AND METHOD OF USING THE SAME

Ibolya Kosoczky; Eva Toncsev, nee Ravasz; Pal Benko; Laszlo Pallos; Lujza Petocz; Sandor Batori; György Hajos; Andras Messmer, and Katalin Grasser, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Jul. 16, 1981, Ser. No. 283,971

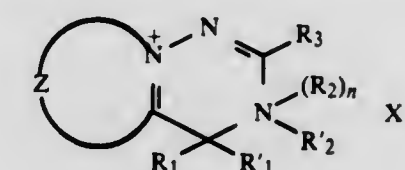
Claims priority, application Hungary, Jul. 18, 1980, 179880

Int. Cl.<sup>3</sup> C07D 253/08; A61K 31/53

U.S. Cl. 424-249

10 Claims

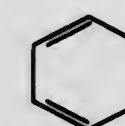
1. A pharmaceutically acceptable salt of the formula (I)



(I)

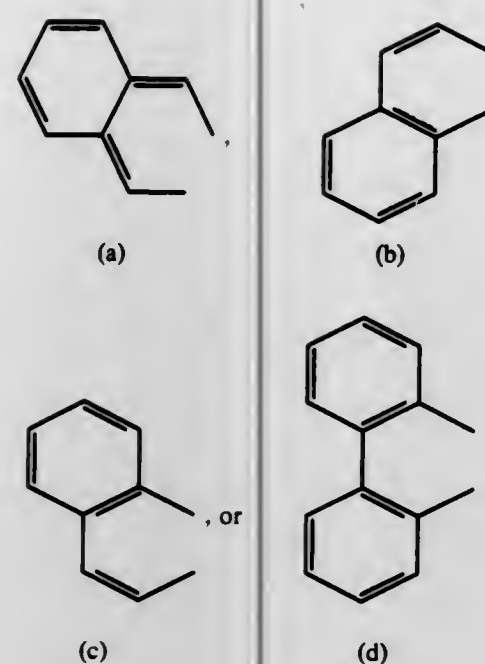
wherein

Z is a buta-1,3-dienyl group of the formula



or a group of the formula





$R_1$  is phenyl, halophenyl, or oxo;  
 $R_2$  is hydrogen or  $C_1$  to  $C_4$  alkyl;  
 $R_3$  is hydrogen or  $C_1$  to  $C_4$  alkyl;  
 $X^-$  is a halide, perchlorate, p-toluene-sulfonate or methanesulfonate ion; and  
 in the case where  $R_1$  is oxo,  $R_1'$  and  $R_2'$  represent nothing and  $n$  is 1; and  
 in the case where  $R_1$  is other than oxo,  $R_1'$  and  $R_2'$  form an additional bond between the carbon and nitrogen atoms, and  $n$  is 0.

10. A method of treating depression in an animal subject which comprises the step of orally administering to said animal subject an anti-depressant effective amount of the salt defined in claim 1.

4,419,356

### 2,3,6,7-TETRAHYDROTHIAZOLO[3,2-a]PYRIMIDINE DERIVATIVES HAVING ANTI-RHEUMATIC PROPERTIES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Francois Debarre, Antony; Jean-Louis Fabre, Paris; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France  
 Filed Jul. 22, 1981, Ser. No. 285,845

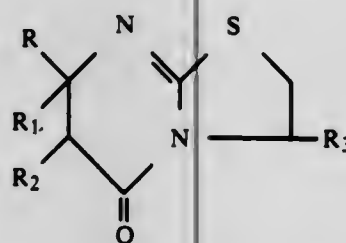
Claims priority, application France, Jul. 24, 1980, 80 16319; May 15, 1981, 81 09724

Int. Cl.<sup>3</sup> A61K 31/505

U.S. Cl. 424-251

11 Claims

1. A 2,3,6,7-tetrahydrothiazolo[3,2-a]-pyrimidine compound of the formula:



wherein R represents phenyl, alkyl of 1 through 4 carbon atoms, alkenyl of 2 through 4 carbon atoms or cycloalkyl of 3 through 6 carbon atoms and  $R_1$  represents hydrogen, or R and  $R_1$  each represent phenyl or unsubstituted alkyl of 1 through 4 carbon atoms, or R and  $R_1$  together represent an alkylene radical of 4 or 5 carbon atoms, and  $R_2$  and  $R_3$  each represent hydrogen or an unsubstituted alkyl radical of 1 through 4 carbon atoms, or R and  $R_1$  each represent hydrogen and one of  $R_2$  and  $R_3$  represents hydrogen and the other represents unsub-

stituted alkyl of 1 through 4 carbon atoms, or  $R_2$  and  $R_3$  both represent unsubstituted alkyl of 1 through 4 carbon atoms.

4,419,357

### 3-(1H-TETRAZOL-5-YL)-4(3H)-QUINAZOLINONES

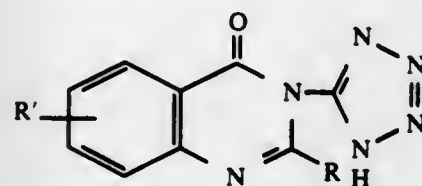
Norton P. Peet, and Shyam Sunder, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.  
 Filed Jan. 18, 1982, Ser. No. 340,577

Int. Cl.<sup>3</sup> A61K 31/41, 31/505; C07D 403/04

U.S. Cl. 424-251

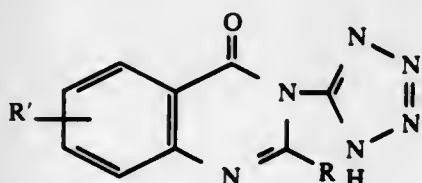
11 Claims

1. A compound of the formula:



wherein R is hydrogen,  $C_{1-4}$  lower alkyl or phenyl;  $R'$  is hydrogen, methyl, methoxy, halogen or the divalent group 6,7-methylenedioxy; and the pharmaceutically acceptable salts thereof.

8. A method for inhibiting the result of antibody-antigen reactions in mammals which comprises administration to a mammal susceptible to allergic reaction of an effective amount of a compound of the formula:



wherein R is hydrogen,  $C_{1-4}$  lower alkyl or phenyl;  $R'$  is hydrogen, methyl, methoxy, halogen or the divalent group 6,7-methylenedioxy; and the pharmaceutically acceptable salts thereof.

4,419,358

### ISETHIONIC ACID SALT OF 9-CYCLOHEXYL-2-PROPOXY-9H-PURINE-6-AMINE AND COMPOSITIONS CONTAINING AN EFFECTIVE BRONCHODILATING CONCENTRATION OF IT

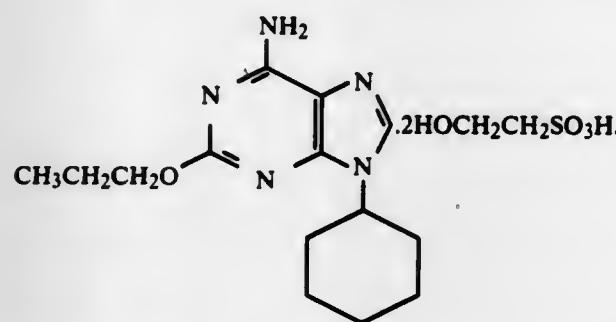
John D. Catt, and Davis L. Temple, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.  
 Filed Nov. 12, 1981, Ser. No. 320,357

Int. Cl.<sup>3</sup> A61K 31/52; C07D 473/18

U.S. Cl. 424-253

4 Claims

1. The di-2-hydroxyethanesulfonate salt of 9-cyclohexyl-2-propoxy-9H-purine-6-amine (I)



2. The salt of claim 1 in dilute solution suitable for bronchial application comprising a liquid pharmaceutical carrier containing an effective bronchodilating concentration of said salt.

4,419,359

### NITRO-SUBSTITUTED POLYCYCLIC DERIVATIVES USEFUL IN THE TREATMENT OF PSORIASIS

Tibor Keve; Gyorgy Fekete; Csaba Lörincz, all of Budapest; Janos Galambos, Erd; Bela Zsados, Budapest; Maria Zajner Balazs, Budapest; Lilla Forgach, Budapest; Egon Karpati, Budapest; Arpad Kiraly, Budapest; Gyongyver Kiraly nee Soos, Budapest; Laszlo Szporny, Budapest, and Bela Rosdy, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary  
 Filed Feb. 4, 1982, Ser. No. 345,631

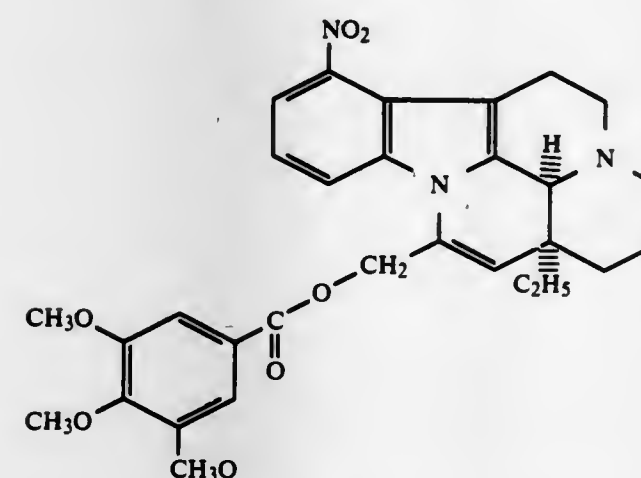
Claims priority, application Hungary, Feb. 11, 1981, 323/81

Int. Cl.<sup>3</sup> A61K 31/435; C07D 461/00

U.S. Cl. 424-256

10 Claims

1. (-)-9-nitro-apovincaminol-3',4',5'-trimethoxy-benzoate of the Formula Ia



or a pharmaceutically acceptable acid addition salt thereof.

6. A method for the treatment and prophylaxis of psoriasis which comprises the step of treating the affected skin surface with a pharmaceutically effective amount of the (-)-9-nitro-apovincaminol-3',4',5'-trimethoxy-benzoate or a pharmaceutically acceptable salt thereof, as defined in claim 1.

4,419,360

### ARTHROPOD REPELLENTS

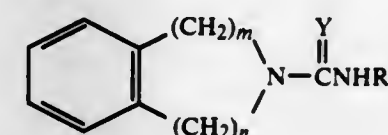
Joel R. Smolanoff, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.  
 Filed Oct. 31, 1979, Ser. No. 90,156

Int. Cl.<sup>3</sup> C07D 215/16; A61K 31/47, 31/55, 31/40

U.S. Cl. 424-258

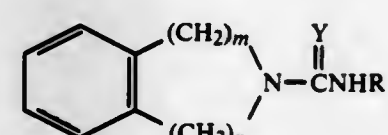
7 Claims

1. A method for repelling arthropods which comprises applying an effective amount of a compound of the formula:



wherein  $R^1$  is hydrogen, lower alkyl of from 1 to 9 carbon atoms, lower alkenyl of from about 2 to 5 carbon atoms, or lower alkoxy lower alkyl wherein the alkyl or alkoxy have from 1 to 6 carbon atoms; Y is O or S; m is an integer of 1 to 3 and n is an integer of 0 to 1.

6. A compound of the formula:



wherein  $R^1$  is lower alkenyl of from 2 to 5 carbon atoms or lower alkoxy carbonyl lower alkyl wherein the alkyl or alkoxy

have from 1 to 6 carbon atoms; Y is O or S; m is an integer of 1 to 3 and n is an integer of 0 to 1.

4,419,361

### COMBATING FUNGI WITH 1-PHENOXY

-1-IMIDAZOL-1-yl-4-FLUORO-BUTANE DERIVATIVES  
 Wolfgang Krämer, Wuppertal; Karl H. Büchel, Wuppertal; Jörg Stetter, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Hans Scheinplüg, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
 Continuation of Ser. No. 142,536, Apr. 21, 1980, abandoned.

This application Nov. 16, 1981, Ser. No. 321,642

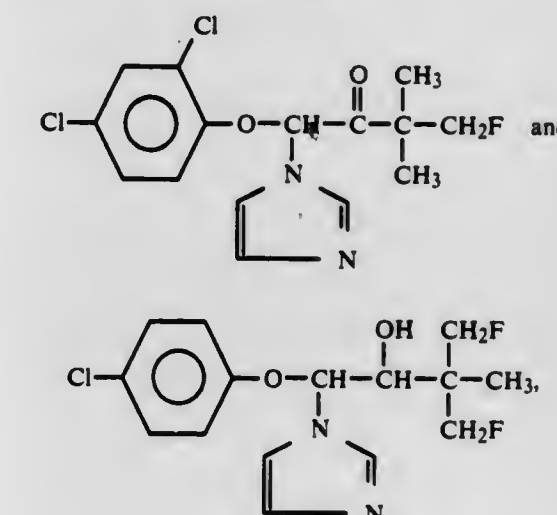
Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918893

Int. Cl.<sup>3</sup> A01N 43/50; C07D 233/60

U.S. Cl. 424-273 R

6 Claims

1. A 1-phenoxy-1-imidazol-1-yl-4-fluoro-butane derivative selected from the group consisting of



or an acid adduct thereof.

5. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound or adduct according to claim 1.

4,419,362

### IMIDAZALYLALKYLTHIOIMIDAZOLES

Roger Crossley, and Kay H. Dickinson, both of Reading, England, assignors to John Wyeth and Brother Limited, Maidenhead, England

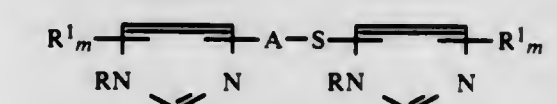
Division of Ser. No. 217,925, Dec. 18, 1980, Pat. No. 4,343,805, which is a continuation of Ser. No. 98,421, Nov. 29, 1979, abandoned. This application Feb. 24, 1982, Ser. No. 351,836  
 Claims priority, application United Kingdom, Dec. 16, 1978, 48813/78

Int. Cl.<sup>3</sup> A61K 31/415; C07D 403/12

U.S. Cl. 424-273 R

7 Claims

1. A compound of the formula



wherein R is hydrogen or lower alkyl;  $R^1$  is hydrogen, lower alkyl, hydroxyl lower alkyl, loweralkoxy lower alkyl, loweralkoxy, halogen, formyl, phenyl, phenylalkyl of 7 to 12 carbon atoms, or  $CH(OR^4)_2$  where  $R^4$  is lower alkyl or two  $R^4$  radicals are joined to form a lower alkylene chain; A is a saturated alkylene of 1 to 6 carbon atoms which may be substituted by lower alkyl of 1 to 6 carbon atoms or  $-CH=CHCH_2$ ; S is sulfur; or a pharmaceutically acceptable acid addition salt thereof; with the proviso that:

(1) at least one substituent R is lower alkyl, and







lytic activity calculated as the product of specific activity and milligrams of protein is in the range of 1 to 38 optical absorbency units, and for a time in the range 5 to 90 minutes prior to the cooking step whereby curd formation on the surface of the cooked fish is reduced.

4,419,371

**PACKAGED TOPPING FOR SALADS AND THE LIKE**  
Darrel R. Suderman, Middleburg Heights, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,507

Int. Cl.<sup>3</sup> A23L 1/176, 1/226, 1/22

U.S. Cl. 426—94

9 Claims

1. An improved, packaged, non-frozen topping capable of storage at ambient temperature, and immediate use after storage, comprising

a plurality of edible deep-fat fried, batter-coated fibrous vegetable pieces, said vegetable pieces being of the type which cook to a non-mealy crisp cellular structure when deep fat fried; and blended therewith an effective amount of edible, crisp, cellular, farinaceous pieces effectively interspersed with the vegetable pieces for rendering the topping resistant to clumping; said topping being readily pourable from the container therefor.

4,419,372

**SIMULATED RAWHIDE PRODUCT**

C. Lawrence Greene, Boulder Creek, Calif.; David C. Creech, Farmers Branch, and Donald W. Kelley, Garland, both of Tex., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Mar. 19, 1982, Ser. No. 360,077

Int. Cl.<sup>3</sup> A23J 3/00

U.S. Cl. 426—104

19 Claims

10. A process for preparing a simulated rawhide product comprising the steps of

(a) admixing ingredients including protein which comprises from 30 to 60 weight percent ground, defatted protein-containing oil seed, from 10 to 50 weight percent water, from 5 to 30 weight percent polyol plasticizer, and from 0.1 to 4 weight percent lecithin; (b) heating the admixture obtained at an elevated pressure and temperature above 100° C. which is sufficient to convert it to a flowable mass and extruding the flowable mass while reducing its surface temperature below 100° C. before it is exposed to atmospheric pressure; and (c) impacting the extruded mass with a stream of solid particles while maintaining it at a temperature within the range of from 25° to 90° C. until an opaque, rawhide-like surface appearance is obtained, the particles having a hardness greater than the hardness of the extruded mass surface and the stream of particles having an impact angle of from 35 to 90 degrees with the extruded mass surface.

4,419,373

**METHOD OF HEATING CONTENTS IN A SELF VENTING CONTAINER**

Walter J. Oppermann, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 29, 1982, Ser. No. 363,072

Int. Cl.<sup>3</sup> B65D 81/34

U.S. Cl. 426—234

9 Claims

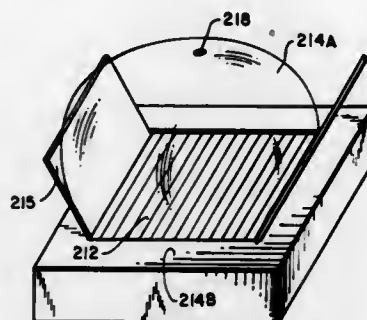
1. A method of heating a package of material wherein the material is contained within a closed and sealed packaging structure, the material being capable of generating moisture vapor from a substance contained therein when the temperature of said material is raised, the method comprising the steps of:

(a) enclosing said material in a sealed packaging structure wherein at least a portion of said packaging structure comprises an extensible plastic film, at least a portion of

said film having a route devoid of barriers between said film and said material;

(b) configuring said package so that at least a portion of said film is devoid of barriers to displacement of said film away from said material; and

(c) applying thermal energy to said material, causing sub-



stantial vaporization of said substance, such that said plastic film is displaced by said vapor away from said material,

and such that, said film being at least 80% ionomer, after said film is displaced from said material, a vent hole appears at an unselected location in said film for venting said vapor without substantial rupture of said film as a whole.

4,419,374

**METHOD OF BAKING BREAD**

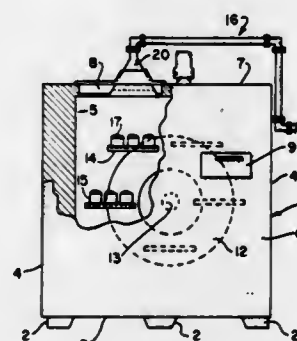
David C. T. Pei, Ontario, Canada, assignor to Bettendorf Stanford Inc., Salem, Ill.

Filed Sep. 2, 1982, Ser. No. 414,401

Int. Cl.<sup>3</sup> A21D 8/06

U.S. Cl. 426—243

5 Claims



1. In the process of baking proofed loaves of bread in an oven wherein a substantially uniform hot air heat in the range of 300° to 500° F. is applied to said loaves constantly throughout the baking process and the loaves are subjected to microwave energy through a portion of said process, the improvement comprising, relative to a standard one pound loaf, first heating said loaves with said hot air alone for a period of about 1 to 1.5 minutes; second, exposing said loaves to microwave power in the amount of about 0.5 to 1.7 KW per loaf for a period of about 1.0 to 1.5 minutes, and third, exposing said loaves to said hot air substantially alone for a total heating period in said oven of about 8 minutes.

4,419,375

**PROCESS FOR FORMING A POTATO PATTY**

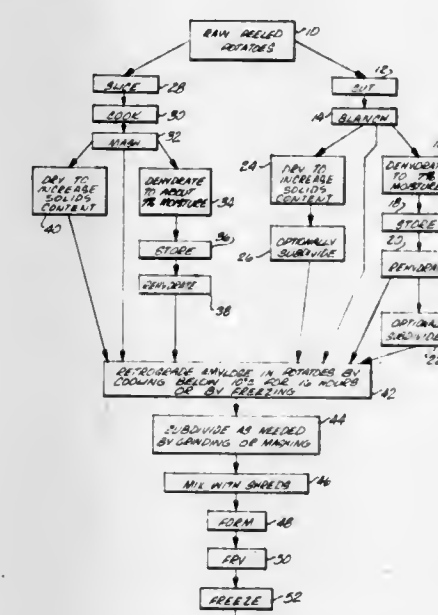
Miles J. Willard, P.O. Box 2774, Idaho Falls, Id. 83401, and William J. Englar, Moses Lake, Wash., assignors to Miles J. Willard, Idaho Falls, Id.

Continuation of Ser. No. 130,600, Mar. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 84,447, Oct. 12, 1979, abandoned, which is a continuation of Ser. No. 962,899, Nov. 22, 1978, abandoned, which is a continuation of Ser. No. 871,150, Jan. 20, 1978, abandoned. This application Jan. 15, 1982, Ser. No. 339,328

Int. Cl.<sup>3</sup> A23L 1/216

U.S. Cl. 426—272

30 Claims





and an emulsifier having an HLB more than about 10 selected from the group consisting of polyglycerol esters of fatty acids, ethoxylated fatty acid esters and sugar esters, said emulsifier being present in the amount of about 0.14-0.7% by weight based on the entire weight of the alcohol/fat/water emulsion, effective to achieve emulsion stability, thus preventing phase separation.

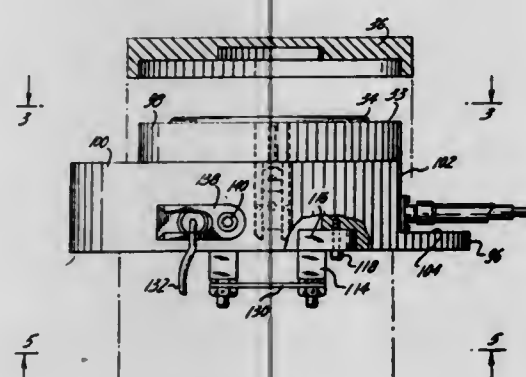
4,419,379

## CRYSTAL PLATING METHOD

Alan Kaplan, West Caldwell, N.J., assignor to Emkay Manufacturing Company, East Hanover, N.J.  
Continuation of Ser. No. 193,195, Oct. 6, 1980, abandoned, which is a division of Ser. No. 34,780, Apr. 30, 1979, Pat. No. 4,236,487. This application Apr. 19, 1982, Ser. No. 369,401  
Int. Cl.<sup>3</sup> B05D 3/14

U.S. Cl. 427-10

12 Claims



1. A method of plating a crystal to adjust the frequency of oscillations of the crystal to a desired frequency comprising the steps of:

- placing the crystal in a holder with the surface of the crystal exposed;
- electrically connecting the crystal to the holder;
- masking the surface of the crystal to expose selected portions of the crystal for plating;
- placing the holder with the masked electrically connected crystal within a chamber in a base;
- electrically connecting the holder to an energizing and frequency circuit connected to the base;
- thereafter evacuating the chamber;
- energizing the base to cause said crystal to oscillate;
- depositing a plating material from a source within the chamber separate from said holder onto the exposed portions of the crystal while monitoring the frequency of oscillation of said crystal.

4,419,380

## METHOD FOR ION-AIDED COATING ON ELECTRICALLY INSULATING SUBSTRATES

Helmut Bollinger, Bernd Bücken, Dietmar Schulze, and Rüdiger Wilberg, all of Dresden, German Democratic Rep., assignors to VEB Hochvakuum Dresden, Dresden, German Democratic Rep.

Filed Nov. 3, 1981, Ser. No. 317,817

Claims priority, application German Democratic Rep., Dec. 4, 1980, 225718

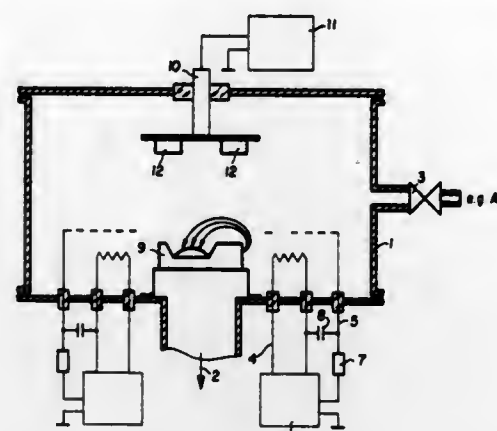
Int. Cl.<sup>3</sup> B05D 1/00

U.S. Cl. 427-38

1 Claim

1. Method for ion-aided coating of electrically insulating substrates characterized in that the plasma source, consisting of thermionic cathode (4) and anode (5), is operated with the

anode voltage continuously alternating between an ignition voltage  $U_Z$  and an extinction voltage  $U_L$  at a frequency of



between several kHz and several hundred kHz, the thermionic cathode thereby continuously emitting electrons.

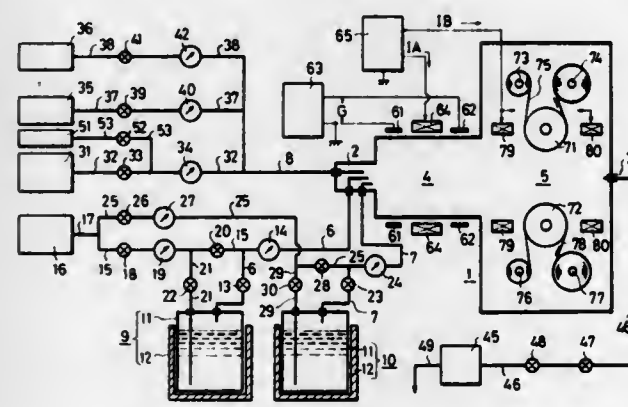
4,419,381

## METHOD OF MAKING MAGNETIC MATERIAL LAYER

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan  
Filed Jan. 12, 1982, Ser. No. 338,870  
Int. Cl.<sup>3</sup> H01F 10/02

U.S. Cl. 427-39

11 Claims



1. A magnetic material layer manufacturing method comprising the steps of:

- disposing a base member in a reaction chamber between its gas inlet and gas outlet;
- introducing a gas mixture of a raw material compound gas of halogenide or carbonyl of a first magnetic material selected from a group consisting of Fe, Ni and Co and a carrier gas of hydrogen into the reaction chamber from the gas inlet while exhausting gas from the reaction chamber through the gas outlet; and
- applying plasma generating electrical energy to the gas mixture to produce in the reaction chamber a stream of plasma of the gas mixture, whereby a stream of active reaction products containing active particles of the first magnetic material is passed over the base member to deposit thereon amorphous or semi-amorphous particles of the first magnetic material, forming a magnetic material layer consisting principally of the amorphous or semi-amorphous particles of the first magnetic material.

4,419,382

## PLASMA POLYMERIZED COLOR COATINGS

Francis A. Sliemers, Columbus, and Vincent D. McGinniss, Delaware, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 14, 1981, Ser. No. 330,098

Int. Cl.<sup>3</sup> B05D 3/06

U.S. Cl. 427-40

4 Claims

1. A process for producing an adherent, colored-polymer coating on a substrate comprising:
  - (A) coating a substrate with a layer of a plasma-reactive precursor and an additive comprising a dye, pigment or a material capable of reacting under plasma conditions to form a dye or pigment;
  - (B) introducing the coated substrate into plasma polymerization apparatus having a low-pressure environment comprising a plasma-forming inert gas;
  - (C) producing a glow discharge for a time sufficient to form a plasma from the inert gas and to initiate free radical formation, polymerization and crosslinking throughout the thickness of the plasma reactive precursor layer forming a partially cured coating on the substrate, and thereafter
  - (D) heat treating the partially cured coating at a temperature and for a time sufficient to complete the cure reaction and increase the adherence of the coating to the substrate.

4,419,383

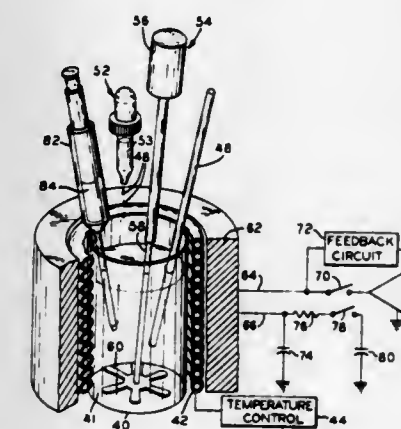
## METHOD FOR INDIVIDUALLY ENCAPSULATING MAGNETIC PARTICLES

Lawrence L. Lee, Fort Wayne, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Division of Ser. No. 287,023, Jul. 27, 1981, which is a continuation-in-part of Ser. No. 106,793, Dec. 26, 1979, Pat. No. 4,283,438. This application Apr. 11, 1983, Ser. No. 483,668  
Int. Cl.<sup>3</sup> B05D 3/14

U.S. Cl. 427-47

15 Claims



1. A method for dispersing a preselected average number of magnetized particles, the particles being enclosed in a discrete amount of internal phase, comprising the following steps:
  - immersing the particles in a liquid internal phase;
  - suspending internal phase drops containing the immersed particles in a liquid continuous phase;
  - mechanically agitating the continuous phase to provide initial dispersing of said particles and forming smaller drops with a reduced number of particles in each drop;
  - applying a varying magnetic field to said suspension for further dispersing of said particles into smaller drops with a reduced number of particles in each drop, the frequency of said field variations being selected according to the desired number of particles in individual drops;
  - microencapsulating individual ones of said drops to form capsules containing drops in which said particles are rotatable.

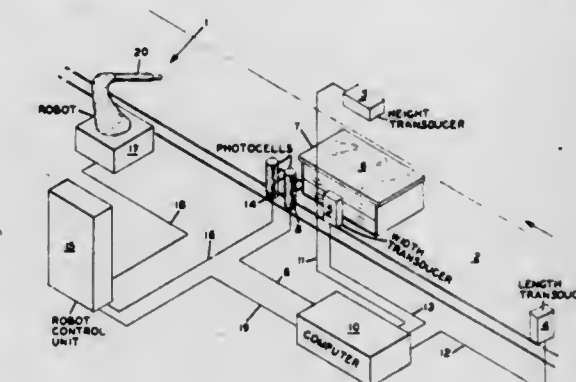
4,419,384

## APPARATUS AND PROCESS FOR ULTRASONICALLY IDENTIFYING AND COATING ARTICLES HAVING DIFFERING CHARACTERISTICS

John F. Kane, and Kerry L. Weinhold, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.  
Filed Sep. 27, 1981, Ser. No. 423,664  
Int. Cl.<sup>3</sup> B05D 3/12

U.S. Cl. 427-57

2 Claims



1. A process utilizing ultrasonic identifying and control means, for coating articles having differing dimensional characteristics comprising:

- (a) providing a means for moving a series of said articles past a predetermined point to work station;
- (b) detecting the presence of each article when it reaches said predetermined point;
- (c) generating ultrasonic waves from at least two transducers and impinging the waves on each article at said predetermined point to obtain reflected wave patterns from each article thereby to identify its dimensional characteristics;
- (d) electronically comparing and matching the reflected wave patterns with similar numerically code-identified wave patterns in a data base to select a predetermined control sequence program for operating a numerically controlled pre-programmed means for coating each of said articles in accordance with its dimensional characteristics; and
- (e) electronically transmitting the identifying code numbers to the coating means to cause coating to be appropriately applied to each article when it arrives at the work station.

4,419,385

## LOW TEMPERATURE PROCESS FOR DEPOSITING AN OXIDE DIELECTRIC LAYER ON A CONDUCTIVE SURFACE AND MULTILAYER STRUCTURES FORMED THEREBY

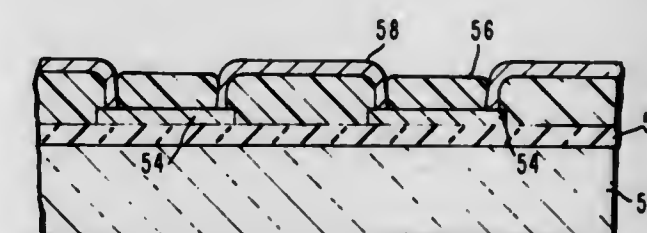
John W. Peters, Malibu, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 24, 1981, Ser. No. 305,009

Int. Cl.<sup>3</sup> B05D 5/12; C23C 11/00; B32B 9/04

U.S. Cl. 427-99

9 Claims



1. A process for forming an effective insulating layer of an oxide of a chosen element on the surface of a substrate of a chosen conductive material comprising the step of exposing said surface to a chosen vapor phase reactant containing said chosen element in the presence of neutral atomic oxygen at a



temperature sufficiently low to minimize deformation of said surface of said substrate to thereby produce a reaction between said atomic oxygen and said reactant to form said oxide which deposits as a layer on said surface of said substrate, whereby said layer of said oxide exhibits relatively low pinhole density, relatively good surface morphology, and relatively good step coverage to thereby provide said effective insulating layer.

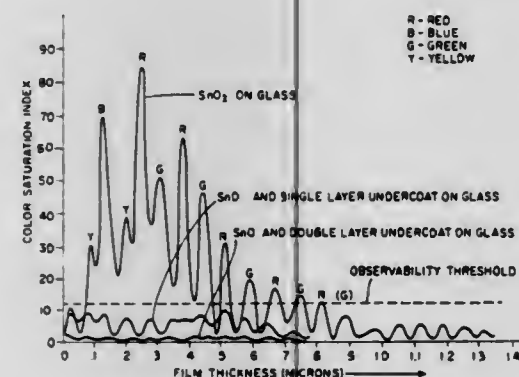
4,419,386

## NON-IRIDESCENT GLASS STRUCTURES

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138  
Division of Ser. No. 302,216, Sep. 14, 1981, Pat. No. 4,377,613.  
This application Aug. 30, 1982, Ser. No. 412,599  
Int. Cl.<sup>3</sup> C03C 17/23

U.S. Cl. 427-109

12 Claims



1. A process for making a non-iridescent, transparent, structure of the type comprising

- (A) a transparent substrate,
  - (B) an infra-red reflective coating thereon and
  - (C) an iridescence-suppressing interlayer between said substrate and infra-red-reflective coating, said process comprising the steps of forming, between said infra-red-reflective coating and said transparent substrate, an interlayer formed of two coatings
- (1) a coating nearer to said substrate a first interlayer component of relatively high refractive index material;
  - (2) a coating over said relatively high refractive index material, a second interlayer component of relatively low refractive index material, and
  - (3) terminating each interlayer component at such a thickness that the combined interlayer components form said iridescence-suppressing means and the total optical thickness of said interlayer components is about 1/6th of a 500 nanometer design wavelength.

4,419,387

## BORIC ACID HAVING IMPROVED HANDLING PROPERTIES

George W. Campbell, Hesperia, and Jerome T. Muench, Lancaster, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Feb. 2, 1982, Ser. No. 345,267

Int. Cl.<sup>3</sup> B05D 7/00

U.S. Cl. 427-215

12 Claims

1. The method of decreasing the lubricity of particulate boric acid which comprises contacting said particulate boric acid with an effective amount of gaseous ammonia at a temperature of about 0° to about 50° C., thereby providing boric acid particles of reduced lubricity having about 5 to 5000 ppm. ammonia chemically bonded to the surface thereof.

4,419,388

## WATERPROOFING METHOD FOR INK JET RECORDS

Masatoshi Sugiyama; Ichiro Nakanishi, and Yoshiaki Suzuki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Oct. 19, 1981, Ser. No. 312,459  
Claims priority, application Japan, Oct. 17, 1980, 55-145341  
Int. Cl.<sup>3</sup> B05D 5/00; B32B 3/00, 27/14; G01D 15/34  
U.S. Cl. 427-288 18 Claims

1. A waterproofing method for an ink jet record in a method of recording images on a recording sheet by an ink jet recording method using aqueous ink, comprising applying on at least the imaged portion of the recording sheet after forming images thereon, a compound represented by the formula



wherein  $M^I$  represents a mono-valent metal atom or an ammonium group,  $M^{III}$  represents a tri-valent metal atom, and X represents a sulfur atom or a selenium atom.

4,419,389

## METHOD FOR MAKING CARBON/METAL COMPOSITE PRETREATING THE CARBON WITH TETRAISOPROPYLITANATE

Tadashi Donomoto; Atsuo Tanaka; Masahiro Okada, all of Toyota; Atsushi Kitamura, Otsu, and Tetsuyuki Kyono, Kyoto, all of Japan, assignors to Toray Industries, Aichi and Toyota Jidosha Kabushiki Kaisha, Tokyo, both of Japan

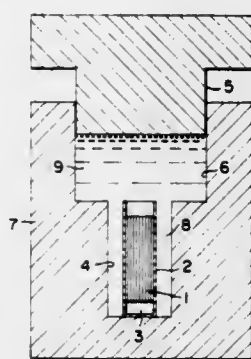
Filed Aug. 30, 1982, Ser. No. 413,126

Claims priority, application Japan, Sep. 3, 1981, 56-138854

Int. Cl.<sup>3</sup> B05D 3/00; B32B 5/14, 7/00

U.S. Cl. 427-294

11 Claims



1. A method for manufacturing a composite material which includes carbon material in a matrix metal, comprising the step of combining said carbon material with said matrix metal, characterized in that before said step of combining said carbon material with said matrix metal, first a step is performed of applying tetraisopropyltitanate to said carbon material so as to wet it, and next a step is performed of drying said carbon material wetted with said tetraisopropyltitanate.

10. A method for manufacturing a composite material according to claim 1, said carbon material being in the form of carbon fibers, wherein, in said step of applying tetraisopropyltitanate to said carbon material so as to wet it, said tetraisopropyltitanate is infiltrated into the carbon material by vacuum suction.

4,419,390

## METHOD FOR RENDERING NON-PLATABLE SEMICONDUCTOR SUBSTRATES PLATABLE

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540  
Division of Ser. No. 931,513, Aug. 7, 1978, Pat. No. 4,228,201, which is a continuation-in-part of Ser. No. 803,777, Jun. 6, 1977, Pat. No. 4,181,760. This application Sep. 29, 1980, Ser. No. 192,412  
Int. Cl.<sup>3</sup> C23C 3/02

U.S. Cl. 427-304

9 Claims

1. A process for rendering a non-platable substrate platable by conventional electroless plating, said process resulting in the deposition of metallic sites, said sites being catalytic to said conventional electroless plating, said substrate selected from the group consisting of silicon, germanium, and III-V compounds, comprising the step of immersing said non-platable substrate into a promoter composition wherein said promoter composition is a single composition which comprises a suitable reducing agent and primary metal ions selected from the group consisting of nickel, cobalt, and iron wherein said reducing agent is capable of chemically reacting with said non-platable substrate and said primary metal ions and further wherein the concentration of said reducing agent relative to said primary metal ions is so adjusted as to permit the initial chemical interaction of the reducing agent with the non-platable substrate and then the heterogeneous reduction of some of the primary metal ions present in the promoter composition, and further wherein said promoter composition also comprises other metal ions selected from the group consisting of tin, cadmium, zinc, thallium, and lead and mixtures thereof, said other metal ions being present in a lower concentration relative to said reducing agent and in a sufficient concentration to inhibit the growth of said metallic sites and further wherein said process is prior to conventional electroless plating.

4,419,391

## METHOD OF IMPARTING IMPROVED TOUCH TO A FABRIC

Masaki Tanaka, Annaka, and Koichi Yamaguchi, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 361,036

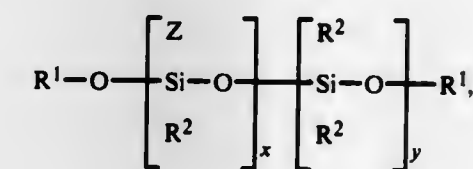
Claims priority, application Japan, Mar. 31, 1981, 56-47547

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427-387

4 Claims

1. A method for finishing a fabric to impart improved touch thereto which comprises soaking the fabric with a liquid composition containing an amino-containing organopolysiloxane represented by the general formula



in which  $R^1$  is an alkyl group,  $R^2$  is a monovalent hydrocarbon group having from 1 to 20 carbon atoms or a halogen-substituted group thereof, at least 50% by number of the groups denoted by  $R^2$  being methyl groups, Z is an amino-substituted monovalent hydrocarbon group represented by the formula



$R^3$  being a divalent hydrocarbon group having from 1 to 5 carbon atoms,  $R^4$  being a hydrogen atom, a monovalent hydrocarbon group having from 1 to 20 carbon atoms or a halogen-substituted group thereof and a being a number of 0, 1, 2 or 3, and x and y are each a positive integer, x+y being sufficiently large to give a viscosity in the range from 50 to 100,000 centistokes at 25° C. to the organopolysiloxane, and then heating the thus soaked fabric.

4,419,392

## PROCESS FOR PRODUCING COMPACT LACQUER LAYERS FOR RECORD CARRIERS

Dietrich J. Bahr, Herrenberg, and Marian Briska, Böblingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Jun. 4, 1982, Ser. No. 385,152

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 81106496[U]

Int. Cl.<sup>3</sup> B05D 1/36, 7/00; G01D 15/24

U.S. Cl. 427-404

5 Claims

1. A process for producing a record carrier comprising a substrate, an intermediate layer and a metallic or metalliferous overcoat layer, said process comprising the steps of coating the substrate with an intermediate layer which is a cellulose acetate-based lacquer admixed with a filler which is a high-molecular weight polysaccharide having side chains and containing lignin, and having a particle size distribution of less than 10  $\mu$ m and a molecular weight of about 10<sup>6</sup>, and then coating said intermediate layer with a metallic or metalliferous layer.

4,419,393

## METHOD AND APPARATUS FOR USE IN APPLYING A BAND OF LIQUID ADHESIVE

Raymond Hanson, Rearsby, England, assignor to USM Corporation, Farmington, Conn.

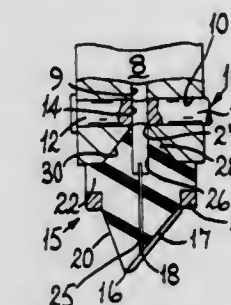
Filed May 14, 1982, Ser. No. 378,101

Claims priority, application United Kingdom, May 26, 1981, 8115976

Int. Cl.<sup>3</sup> B05D 1/26

U.S. Cl. 427-430.1

14 Claims



1. A method of applying a band of liquid adhesive to a surface of a workpiece using an applicator head comprising: providing a tapering applicator portion which is resiliently flexible and is provided with an adhesive-guiding surface which extends to a narrow terminal spreading surface of the applicator portion, the adhesive-guiding surface being partially cylindrical about an axis which extends transversely of the spreading surface, and an elongated orifice opening through the adhesive-guiding surface, and an extending generally parallel to the spreading surface; supplying liquid adhesive to the orifice so that the adhesive flows through the orifice and down the adhesive-guiding surface to the spreading portion; bringing the surface of the workpiece into contact with the spreading surface so that a pool of adhesive forms on the surface against the spreading portion; causing the applicator portion to flex so that a portion of the adhesive-guiding surface extends along the surface of the workpiece; and bringing about relative movement between the applicator portion and the surface so that the pool of adhesive is spread on the surface by the applicator portion.



4,419,394

**CATALYST AND METHOD OF MAKING THE SAME**  
John M. Crone, Jr., Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,861  
Int. Cl.<sup>3</sup> B05D 1/18, 7/24

U.S. Cl. 427—434.5

6 Claims

1. A method of coating an article comprising the steps of forming a coating solution by adding a sufficient quantity of an alumina gel to an alkali aluminate solution to effect a coating of an adherent alumina trihydrate film on a substrate upon the contacting of the substrate with said coating solution, said alumina gel comprising an amorphous precipitate formed by the reaction of aluminum sulfate and aqueous ammonium hydroxide at a pH of between about 6 and 8, said alumina gel not completely dissolving into said solution and not crystallizing out of said solution prior to forming said adherent alumina trihydrate film; and contacting a substrate with said coating solution for a period of time sufficient to form an adherent alumina trihydrate film on said substrate.

2. A method of coating an article comprising the steps of contacting a substrate with an alkali aluminate solution which does not substantially cost said substrate with an alumina trihydrate film; and adding a sufficient quantity of an alumina gel to the alkali aluminate solution to cause an adherent alumina trihydrate film to form on said substrate, said alumina gel comprising an amorphous precipitate formed by the reaction of aluminum sulfate and aqueous ammonium hydroxide at a pH of between about 6 and 8, and said alumina gel not completely dissolving into said solution and not crystallizing out of said solution prior to forming said adherent alumina trihydrate film.

4,419,395

PERFUMED PENDANT

Terutaka Sugimoto, 2-20-1 Nakazato, Kita-Ku, Tokyo, Japan  
Filed Aug. 18, 1982, Ser. No. 409,101

Int. Cl.<sup>3</sup> A44C 25/00; A61L 9/04

U.S. Cl. 428—28

13 Claims



1. A perfumed pendant suitable for use by infants comprising a front vinyl sheet having a design printed thereon, a back vinyl sheet having a design mating with said design on the front vinyl sheet printed thereon and welded at the outer peripheral edge thereof to the outer peripheral edge of said front vinyl sheet, a foam resilient padding interposed between said front and back vinyl sheets and a capsulated perfume layer laminated to the outer surface of said front vinyl sheet at a selected area of the sheet outer surface, said front and back sheets bulging outwardly.

4,419,396

THREE-DIMENSIONAL PERFUMED SEAL

Terutaka Sugimoto, 2-20-1 Nakazato, Kita-ku, Tokyo, Japan  
Filed Aug. 18, 1982, Ser. No. 409,102

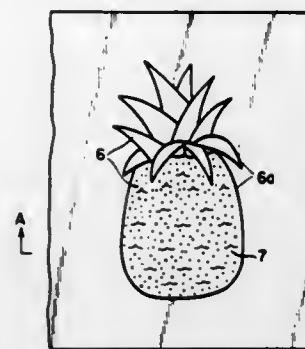
Int. Cl.<sup>3</sup> A61L 9/04; G09F 3/00

U.S. Cl. 428—40

13 Claims

1. A three-dimensional perfumed seal, suitable for use by infants, comprising a vinyl base sheet, an adhesive layer applied to one surface of said base sheet, a release paper applied to the surface of said adhesive layer opposite from said base sheet, a foam synthetic resin padding material disposed on the surface of said base sheet opposite from said adhesive layer, a

covering vinyl sheet sandwiching, said foam padding material between said covering sheet and said base sheet and said covering vinyl sheet bulging outwardly from said base sheet over the entire length thereof and having a design printed thereon and



4,419,397

SCABROUS SURFACE LIGHT DIRECTOR

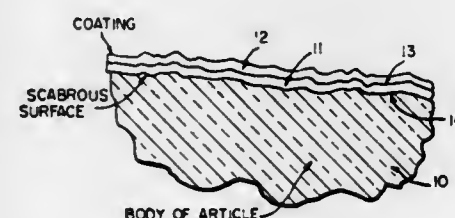
Clarence E. Neat, and Mark A. Neat, both of 6 Sundown Dr., Rolling Hills Estates, Calif. 90274

Filed Apr. 14, 1982, Ser. No. 368,048

Int. Cl.<sup>3</sup> B32B 3/26, 15/08

U.S. Cl. 428—141

11 Claims



1. A scabrous surface light director comprising: a substrate possessing a scabrous surface; and a reflective coating adhered to the surface of said substrate, said reflective coating comprising a laminated reflective film whose surface conforms to the texture of the substrate and comprises a thin layer of aluminum sandwiched between transparent films.

4,419,398

**LAMINATED STOP OF CURVED SHAPE, PARTICULARLY FOR THE ROTORS OF HELICOPTERS**  
Rene L. Coffy, Sausset-les-Pins, and Jean J. E. Azeau, Gardanne, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Dec. 17, 1981, Ser. No. 331,787

Claims priority, application France, Dec. 26, 1980, 80 27593

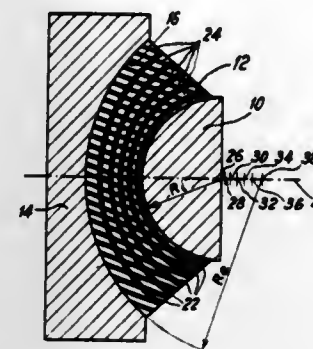
Int. Cl.<sup>3</sup> B32B 1/00

U.S. Cl. 428—174

6 Claims

1. A laminated stop of curved shape having an axis of symmetry and comprising an inner fitting having a convex surface; an outer fitting having a concave surface; and, between the inner and outer fittings, layers of flexible material and layers of rigid material alternating therewith; wherein, in each axial plane, the mean radii of curvature of the successive layers of

flexible material increase more rapidly than the sum of the thicknesses measured from the inner fitting, so that each layer



of flexible material has a thickness which increases in the direction away from the axis.

4,419,399

TRANSPARENT CONDUCTIVE FILM

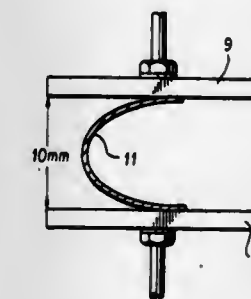
Rinjiro Ichikawa, and Chiyoji Hitomi, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jul. 6, 1981, Ser. No. 280,492

Int. Cl.<sup>3</sup> B32B 7/02, 27/38

U.S. Cl. 428—215

9 Claims



1. A transparent conductive film comprising a polymeric supporting substrate in the form of a film or sheet having a transparent conductive layer formed on one surface of said substrate wherein said substrate is optically isotropic, has a thickness of 5 to 1000 microns, a retardation value of not more than 30 millimicrons, a heat distortion temperature of not lower than 80° C., an average visible light transmittance of not less than 75%, a water vapor permeability of not higher than 30 g/24 hr-m², an Izod impact strength of not less than 1.5 kg-cm/cm and the degree of swelling on a surface having the transparent layer thereon of not more than 0.5% in a solvent.

4,419,400

PULTRUDED REINFORCED PHENOLIC RESIN PRODUCTS

Raymond R. Hindersinn, Lewiston, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,097

Int. Cl.<sup>3</sup> B29G 2/00, 7/00; B32B 5/16, 27/42

U.S. Cl. 428—245

11 Claims

1. In a pultruded, filament-reinforced product having a substantially uniform cross-section throughout its length and comprising (a) a filament component comprising a plurality of filaments and (b) a cured normally liquid resin interspersed around said filaments; the improvement wherein the liquid resin is a liquid phenolic resin having a viscosity in the range of about 500 to about 4,000 centipoises at 23° C., and a maximum volatile content of about 12 weight percent of volatile material having a boiling point of less than 120° C.

4,419,401

**FIRE RETARDANT CONCENTRATES AND METHODS**  
Glenn A. Pearson, 3709 S. George Mason Dr., Falls Church, Va. 22041

Filed Aug. 3, 1982, Ser. No. 404,915

Int. Cl.<sup>3</sup> B32B 7/00; C08L 61/02

U.S. Cl. 428—262

15 Claims

1. A concentrate comprising the reaction product of (a) about 35-65 parts by weight of ammonium phosphate, (b) about 10-30 parts by weight of ammonium sulfate, (c) about 40-60 parts by weight of an alkanolamine, (d) about 40-60 parts by weight of phosphoric acid, and (e) about 20-40 parts by weight of an aldehyde, said concentrate being contained in about 100-140 parts of water and forming flexible, hard non-burning coatings on substrates.

4,419,402

**FLAME RETARDANT POLYORGANOPOLYSILOXANE RESIN COMPOSITIONS**

Beth I. Gutek, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 349,214, Feb. 16, 1982, Pat. No. 4,404,305.

This application Apr. 11, 1983, Ser. No. 483,998

Int. Cl.<sup>3</sup> B32B 27/12

U.S. Cl. 428—266

13 Claims

1. In an article of manufacture comprising a translucent fibrous substrate and a translucent coating on said substrate, said coating consisting essentially of a polyorganosiloxane resin and an effective amount of a flame retardant for said resin, the improvement comprising the presence in said resin of a flame retardant consisting essentially of from 1 to 10 parts by weight per 100 parts of said resin of an organic compound containing at least one halogen atom, selected from the group consisting of bromine and chlorine and from 5 to 150 parts by weight per 100 parts of said resin of glass particles having an average particle size of from 5 to 100 microns; the weight ratio of said organic compound to the glass particles being from 0.05 to 0.4.

4,419,403

WATER DISPERSIBLE PREMOISTENED WIPER

Eugenio Varona, Wilmington, Del., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Dec. 7, 1981, Ser. No. 328,305

Int. Cl.<sup>3</sup> A61F 13/16; D04H 1/58; B32B 27/00

U.S. Cl. 428—288

6 Claims

1. A water dispersible premoistened wiper comprising a nonwoven cellulosic fibrous web containing greater than 1% by weight of an alkali salt of a sulfated cellulose ester resin binder distributed in said fibrous web, said resin binder having a degree of saturation of about 2.5 to 3.0 sulfate groups per anhydroglucose unit, and said web being impregnated with an aqueous solution of potassium ions in an amount effective to gel said sulfated cellulose ester resin binder.

4,419,404

**MAGNETIC RECORDING MEDIA AND PROCESS OF PRODUCING THEM**

Yoshihiro Arai, and Akira Nahara, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanawaga, Japan

Filed Feb. 16, 1982, Ser. No. 348,883

Claims priority, application Japan, Feb. 16, 1981, 56-21652

Int. Cl.<sup>3</sup> G11B 5/72

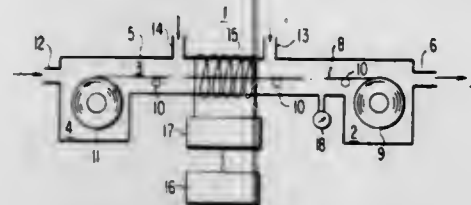
U.S. Cl. 428—336

5 Claims

1. A magnetic recording medium, comprising: a non-magnetic, flexible support; a thin ferromagnetic metal layer formed on a surface of said support; an overcoat layer formed on a surface of said ferromagnetic



metal layer, said overcoat layer comprising a fluorine-containing organic material, wherein the fluorine content of



said overcoat layer continuously and gradually increases in a direction away from said ferromagnetic metal layer.

4,419,405

**ULTRAVIOLET LIGHT ABSORBING AGENTS AND COMPOSITIONS AND ARTICLES CONTAINING SAME**  
Bruce A. Ashby, and Siegfried H. Schroeter, both of Schenectady, N.Y., assignors to General Electric Company, Waterford, N.Y.

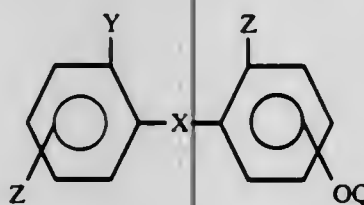
Division of Ser. No. 225,429, Jan. 15, 1981, Pat. No. 4,374,674, which is a division of Ser. No. 154,622, May 30, 1980, Pat. No. 4,278,804. This application Sep. 23, 1982, Ser. No. 421,798  
Int. Cl.<sup>3</sup> B32B 27/18, 27/30; C09K 3/00

U.S. Cl. 428-412

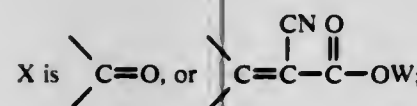
12 Claims

1. An article comprising:

- (A) a substrate,
- (B) a primer layer on said substrate, and
- (C) a hard, protective coating over said primer layer and said substrate, said coating comprising an aqueous composition which comprises, before curing,
  - (a) a dispersion of a colloidal silica in a solution of the partial condensate of a silanol having the formula  $\text{RSi}(\text{OH})_3$ , where R is selected from the group consisting of alkyl having 1 to 3 carbon atoms and aryl, at least 70 weight percent of which is  $\text{CH}_3\text{Si}(\text{OH})_3$ , in a mixture of an aliphatic alcohol and water, said dispersion containing from 10 to 50 percent by weight of solids, said solids consisting essentially of 10 to 70 percent by weight of the colloidal silica and 30 to 90 percent by weight of the partial condensate, and
  - (b) an effective amount of an ultraviolet light absorbing agent comprising a compound having the formula



wherein:



Y is H or OH;

Z is H, OH, OQ or OW, where at least one Z is OH if Y is H;

Q is  $-\text{CH}_2(\text{CH}_2)_n\text{Si}(\text{R}_2)_x(\text{OR}_1)_y$ ; and

W is  $-\text{C}_m\text{H}_{2m+1}$ ;

where  $x=0, 1$  or  $2$ ,  $y=1, 2$  or  $3$ ,  $x+y=3$ , and  $\text{R}_1=\text{alkyl}$  or  $\text{alkanoyl}$  having 1 to 6 carbon atoms,  $\text{R}_2=\text{alkyl}$  having from 1 to 6 carbon atoms,  $n=0, 1$ , or  $2$  and  $m$  is 1 to 18.

4,419,406

**MAGNETIC RECORDING MEDIUM AND PRODUCTION THEREOF**

Yukihiko Isobe; Kazushi Tanaka; Masaharu Nishimatsu; Osamu Shinoura, and Yuichi Kubota, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

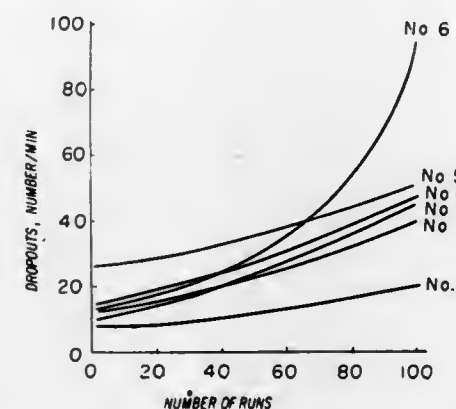
Filed Mar. 29, 1982, Ser. No. 362,655

Claims priority, application Japan, Apr. 13, 1981, 56-54362

Int. Cl.<sup>3</sup> B32B 27/00

U.S. Cl. 428-422

7 Claims



1. A magnetic recording tape having a magnetic layer on one surface of a substrate and an anti-static backing layer on the opposite surface of said substrate, said magnetic recording tape produced by a process comprising:

- (1) applying a magnetic layer on one surface of a substrate,
- (2) thereafter applying an anti-static layer, containing filler dispersed in a radiation-sensitive curable resin binder, to the opposite surface of said substrate,
- (3) irradiating said radiation-sensitive curable resin binder with active energy radiation to cure said resin binder, and
- (4) rolling said tape.

4,419,407

**ELASTOMERIC COATING COMPOSITIONS**

Robert M. Piccirilli, Pittsburgh; Wen-Hsuan Chang, Gibsonia; Samuel Porter, Jr., Natrona Heights; James B. O'Dwyer, Gibsonia, all of Pa., and Kyu-Wang Lee, Danville, Calif., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 29, 1982, Ser. No. 343,785

Int. Cl.<sup>3</sup> B32B 27/40

U.S. Cl. 428-423.1

16 Claims

1. A thermosetting, elastomeric coating composition sprayable at resin solids content of at least 40 percent by weight and being flexible such that when the coating composition is deposited on an elastomeric substrate and cured, the coated substrate can be bent around a  $\frac{1}{4}$ -inch mandrel with the coating facing outwardly and the coating exhibits no breaks or cracks when tested at 70-75° F., comprising as the film-forming constituents:

- (A) a hard polyester polyol having at least 20 percent by weight cyclic moieties and the percentage of cyclic moieties being not greater than that required to achieve said flexibility, having a hydroxyl value of at least 80 and the hydroxyl value being not greater than that required to achieve said flexibility, a molecular weight of 300 or greater but not greater than that required for formulating said coating composition with a sprayability of at least 40 percent by weight, and said polyester polyol having a Sward Hardness value of at least 15,
- (B) a polyurethane polyol having a molecular weight of 2,000 or greater but not greater than that required for formulating said coating composition with a sprayability of at least 40 percent by weight, and said polyurethane polyol having a Sward Hardness value of less than 10, and
- (C) a curing agent capable of reacting with the active hydrogens in (A) and (B) to form a crosslinked coating selected from the class consisting of aminoplast and polyisocyanates; the difference in Sward Hardness values between

(A) and (B) being greater than 10; the ratio of (A)+(B):(C) being within the range of 5 to 0.5:1; the weight ratio of (A)+(C):(B) being within the range of 100 to 1:1.

4,419,408

**COMPOSITE STRUCTURES**

Seymour Schmukler, Palatine; John Machonis, Jr., Schaumburg, and Mitsuzo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 327,278, Dec. 4, 1981. This application Dec. 23, 1982, Ser. No. 452,873

Int. Cl.<sup>3</sup> B32B 27/32, 27/28

U.S. Cl. 428-424.4

47 Claims

1. A composite structure of components comprising:

- (a) a substrate, and adhered thereto
- (b) an adhesive blend consisting essentially of:
  - (i) about 0.1-40 parts by weight in said blend of a graft copolymer of about 70-99.999 wt. % of a polyethylene backbone grafted with about 30-0.001 wt. % of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or carboxylic acid anhydride for a total of 100% and
  - (ii) about 99.9-60 parts by weight of a blending resin mixture of about 25-90 wt. % of a high density polyethylene and about 75-10 wt. % of a polypropylene for a total of 100%.

4,419,409

**BICOLORED POLYHEDRAL BODY OF ALUMINUM**

Machiro Kishida, Sayama; Tsuneji Takasugi, Hanno, and Kenji Irie, Yokohamashi, all of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

Division of Ser. No. 234,176, Feb. 13, 1981, Pat. No. 4,375,391.

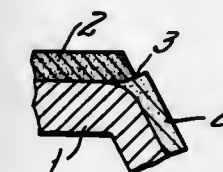
This application Sep. 16, 1982, Ser. No. 418,995

Claims priority, application Japan, Feb. 27, 1980, 55-23522

Int. Cl.<sup>3</sup> B32B 1/10, 15/20

U.S. Cl. 428-469

2 Claims



1. A bicolored polyhedral body made of aluminum having at least a first face and a second face with an anodically oxidized layer on the surface of the aluminum body, said first and second faces being demarcated by a ridgeline and colored in different colors wherein the peripheral margin of the anodically oxidized layer on the second face extends and intrudes interstitially between the anodically oxidized layer on the first face and the surface of the aluminum body.

4,419,410

**HIGHLY STEREOREGULAR FILMS OF IMPROVED SURFACE CHARACTERISTICS AND METHOD OF FORMING SAME**

Milton L. Welner, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,830

Int. Cl.<sup>3</sup> B32B 27/08

U.S. Cl. 428-516

25 Claims

10. An oriented multi-layer polypropylene film structure having a surface-modifying agent selected from the group consisting of a slip agent, antistatic agent, antifog agent, antiblock agent, and any mixtures thereof bloomed on the surface thereof comprising a coextruded combination of:

- (a) a base layer comprising polypropylene of comparatively high stereoregularity, the precursor resin of which con-

tains said surface-modifying agent at least substantially uniformly dispersed therein; and  
(b) a skin layer comprising polypropylene of comparatively low stereoregularity on at least one surface of (a); said combination having been oriented; the surface of (b) having bloomed thereon said surface-modifying agent in an effective quantity greater than that of said surface-modifying agent-containing precursor resin alone in extruded film form.

4,419,411

**MULTI-LAYER POLYPROPYLENE FILM STRUCTURE AND METHOD OF FORMING SAME**

Hee Chung P. Park, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,483

Int. Cl.<sup>3</sup> B32B 27/08

U.S. Cl. 428-516

13 Claims

1. An oriented multi-layer polypropylene film structure having surface-modifying agents comprising finely divided silica, silicone oil and an amide of a water-insoluble monocarboxylic acid having from about 8 to about 24 carbon atoms on a surface thereof, said structure comprising coextruded layers of:

- (a) a base layer comprising polypropylene of comparatively high stereoregularity, the precursor resin of which contains an amide of a water-insoluble monocarboxylic acid having from about 8 to about 24 carbon atoms, and mixtures of said amides; and
- (b) a skin layer comprising a polyolefin of comparatively low stereoregularity on at least one surface of (a), said skin layer containing a combination of finely divided silica and a silicone oil; the surface of (b) having bloomed thereon at least some of the amide of (a).

4,419,412

**PLASTIC BLANK STRUCTURE**

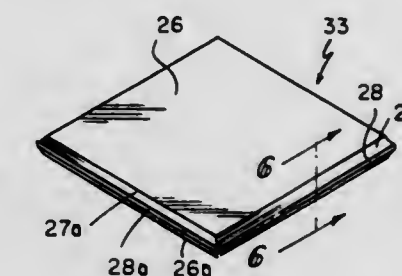
Robert M. Gross, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 216,747, Dec. 16, 1980. This application May 3, 1982, Ser. No. 373,925

Int. Cl.<sup>3</sup> B32B 9/04

U.S. Cl. 428-542.8

6 Claims



1. A plastic polygonal blank capable of being made into a container by high-melt, high-pressure methods comprising a first and a second surface, said surfaces being substantially parallel to one another, at least one transitional surface extending outwardly between said first and second surfaces at an angle between about 20° to about 85° and presenting a smooth surface commensurate to that of said first and second surface, and an peripheral vertical wall providing an outer surface for said blank, said peripheral vertical wall connecting said at least one transitional surface and being roughened as compared to the other surfaces of said blank.



4,419,413

**POWDER MOLDING METHOD AND POWDER COMPRESSION MOLDED COMPOSITE ARTICLE HAVING A REST-CURVE LIKE BOUNDARY**

Tadashi Ebihara, Hatogaya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

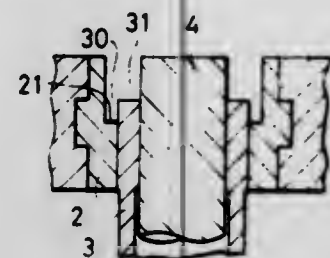
Filed Feb. 23, 1982, Ser. No. 351,563

Claims priority, application Japan, Feb. 26, 1981, 56-26116

Int. Cl.<sup>3</sup> B22F 7/02, 3/16; B32B 7/02, 31/20

U.S. Cl. 428—548

38 Claims



1. A powder compression molding method for producing a multi-layer powder compression molded article having a plurality of different material layers disposed in a compression direction by utilizing relative movements of an upper punch, a lower punch, a die, and first and second feed shoes, the method comprising the steps of:

forming a first space between the die and the lower punch, the die having a step formed therein; introducing a first powder into the first space; lowering the lower punch relative to the die to form a second space above a top surface of the first powder; introducing a second powder into the second space; and compressing the first and second powders to form the multi-layer powder compression molded article.

33. A powder compression molded article comprising a first and a second layer, the first and second layers comprising different materials, a boundary between the different material layers having a rest-curve like shape formed by relative movement between a punch and a die after said first layer in powder form is deposited on an upper surface of said punch and said die but prior to said second layer in powder form being deposited on said first powder layer.

34. The article claimed in claim 33, wherein said powder compression molded article comprises a metallurgical article.

4,419,414

**CYLINDER FOR USE WITH OTHER COMPONENTS IN PROCESSING MATERIAL**

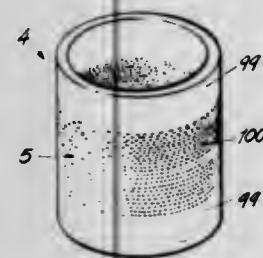
Robert R. Fischer, Michigan City, and Joe R. Urschel, Valparaiso, both of Ind., assignors to Urschel Laboratories, Incorporated, Valparaiso, Ind.

Filed Jul. 24, 1981, Ser. No. 286,373

Int. Cl.<sup>3</sup> B02C 19/00

U.S. Cl. 428—575

15 Claims



3. A tubular cylinder for receiving a food product to be extruded, said cylinder having a solid cylindrical metal wall of substantially uniform thickness extending throughout at least a major portion of its length provided with a multitude of substantially radial undrilled outwardly diverging passages extending therethrough through which the product received in said cylinder can be extruded outwardly through said passages

and said cylinder being constructed for receiving means for forcing the product outwardly through said passages.

4,419,415

**MAGNETIC HEAD COMPRISING TWO SPOT WELDED METAL PLATES**

Adrianus C. H. J. Liefkens, and Gerardus J. A. M. Notenboom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

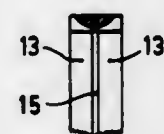
Filed Jan. 18, 1982, Ser. No. 339,931

Claims priority, application Netherlands, May 2, 1981, 8100545

Int. Cl.<sup>3</sup> G11B 5/16

U.S. Cl. 428—594

12 Claims



1. A magnetic head, comprising:

at least one core part having magnetic properties and including two stacked parallel plates each having a minor face, the plates being formed of a material consisting essentially of Al-Fe-Si,

readily adhering ductile metal layers each having an essentially equal thickness in a range between 5 and 500  $\mu$ m provided on respective minor faces of the plates, the layers being arranged substantially adjacent one another so that the plates are mutually securable by welding the layers, and

a weld located in the layers, the weld extending a maximum depth into the layers in a direction generally toward the minor faces, the maximum depth being less than the thickness of each layer so that the weld mutually secures the plates without affecting their magnetic properties.

4,419,416

**OVERLAY COATINGS FOR SUPERALLOYS**

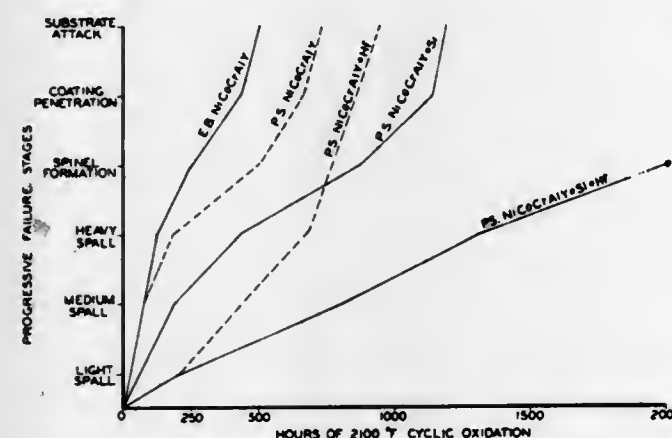
Dinesh K. Gupta, Vernon, and David S. Duvall, Cobalt, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 5, 1981, Ser. No. 289,952

Int. Cl.<sup>3</sup> B32B 15/00

U.S. Cl. 428—656

6 Claims



1. A gas turbine engine component which comprises a substrate selected from the group consisting of Ni and Co base superalloys having thereon a protective coating consisting essentially of 5-40% Cr, 8-35% Al, 0.1-2.0% Y, 1-7.0% Si and 0.1-2.0% Hf balance selected from the group consisting of Ni, Co and mixtures thereof.

4,419,417

**MAGNETIC DOMAIN DEVICE HAVING A WIDE OPERATIONAL TEMPERATURE RANGE**

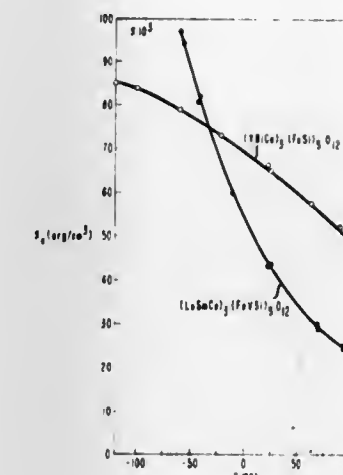
Roy C. Le Craw, Westfield; Lars C. Luther, Basking Ridge, and Terence J. Nelson, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1981, Ser. No. 319,609

Int. Cl.<sup>3</sup> G11C 11/14

U.S. Cl. 428—692

7 Claims



1. Device comprising a supported layer of a magnetic garnet material having uniaxial magnetic anisotropy in a direction which is essentially perpendicular to said layer, said layer being capable of sustaining a magnetic domain whose magnetization is essentially antiparallel to the magnetization of a portion of said layer surrounding said domain, said domain having a diameter which is less than 3 micrometers, and said domain having mobility which is greater than 2000 centimeters per second per oersted, said device being characterized in that the composition of said garnet material is essentially as denoted by the formula  $(Y_{3-p-q-r-s}Bi_pCa_qRM_rRN_s)(Fe_{5-r-u-v-w}AlHd_tGa_uSi_vGe_w)O_{12}$  where RM denotes one or both of the magnetic rare earth elements Eu and Sm, where RN denotes one or several of the small-ionic-radius rare earth elements Lu, Tm, and Yb, where p is in the range of 0.2-1.5, q is in the range of 0.2-0.9, r is in the range of 0.0-0.3, s is in the range of 0.0-0.6, t is in the range of 0.0-1.0, u is in the range of 0.0-1.0, v is in the range of 0.2-0.9, w is in the range of 0.0-0.9, and where v+w is essentially equal to q whereby said device has an operational temperature range which comprises the range of -150 to 150 degrees C.

4,419,418

**INDIVIDUAL RECHARGEABLE ELECTRIC CELL**

Reinhard Knodler, Friedrich Harbach, and Ludwig Weiler, all of Heidelberg, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,550

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114348

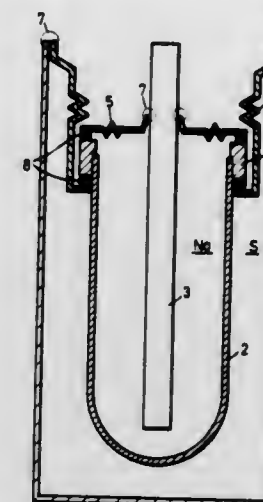
Int. Cl.<sup>3</sup> H01M 4/36, 2/38, 2/02, 2/08

U.S. Cl. 429—104

1 Claim

1. Individual rechargeable electric cell with liquid sodium as the negative electrochemical material and liquid sulfur absorbed in graphite as the positive electrochemical material which comprises a metallic tubular housing, a tubular container of a sodium ion-conducting solid electrolyte open at one end disposed in the housing with space between the inner housing surface and the outer container surface for one said electrochemical material and the container interior for the other said electrochemical material, a current collector extending into said container interior, a first flexible flange connecting the current collector to the container, a second flexible flange connecting the housing to the container, an  $\alpha$ - $Al_2O_3$  ring fused-on to the open end of the electrolyte, said

ring connected to said two flanges via thermocompression seals, the first flange connected to the current collector by a weld, the second flange connected to the housing by a weld, said first flange containing bellows or flexible sleeves to allow lateral movement of the solid electrolyte relative to the current collector, and said second flange containing bellows or flexible sleeves to allow vertical movement of the electrolyte relative to the housing.



4,419,419

**RECHARGEABLE ELECTRIC STORAGE BATTERY**

Reinhold Knödler, Heidelberg, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

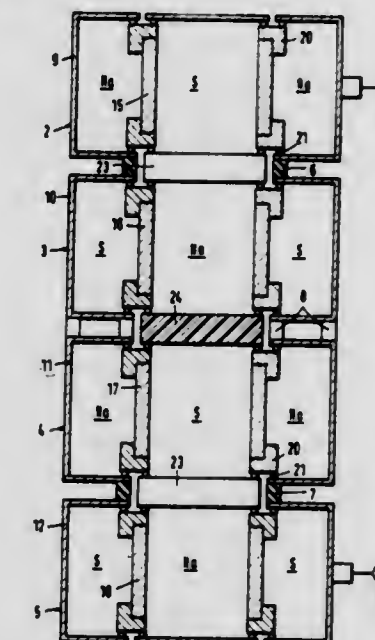
Filed Apr. 23, 1982, Ser. No. 371,120

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118194

Int. Cl.<sup>3</sup> H01M 4/36, 2/02, 4/48, 6/18

U.S. Cl. 429—104

6 Claims



1. Rechargeable electric storage battery comprising (a) a plurality of individual cells, each cell having liquid sodium as the negative and liquid sulfur, absorbed in graphite, as the positive electrochemical material, as well as a sodium ion-conducting solid electrolyte and a metallic housing, (b) the individual cells being series-connected and the individual cells being connected to each other, each cell having a tubular electrolyte arranged coaxially in a tubular housing, to which the electrolyte at both its ends is connected; (c) two adjacent series-connected individual cells having a dissimilar arrangement of the sodium and the sulfur mate-



rials with one of said two cells having the sulfur between the housing and the electrolyte and the sodium in the interior of the electrolyte, and the other of said two cells having the sulfur and sodium materials in the reverse order;

(d) the electrolytes of some of the two adjacent series-connected individual cells being separated from each other by an electrically conducting plate while the housing of said two cells are connected by an alpha-Al<sub>2</sub>O<sub>3</sub> ring, and the electrolytes of other two adjacent series-connected individual cells being separated from each other by an electrically non-conducting plate while the housing of said two cells are connected by an Al ring, and these two forms of connections alternating in the series-connection of the cells.

4,419,420

## BATTERY CONTAINER AND LID

Morio Ishizaki, Kobe, Japan, assignor to Ishizaki Press Kogyo Co., Ltd., Itami, Japan

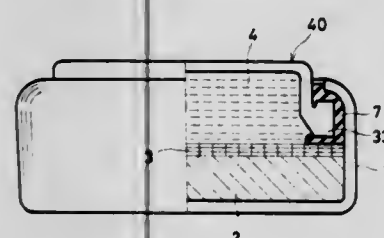
Filed Apr. 6, 1981, Ser. No. 251,539

Claims priority, application Japan, Mar. 8, 1980, 55-29529

Int. Cl.<sup>3</sup> H01M 2/08

U.S. Cl. 429—185

2 Claims



1. A battery container comprising a battery container main body and a lid, said lid having a peripheral portion U letter shaped in section to form an inner and outer peripheral side for engagement with said main body through a packing when an opening edge of said main body is curled inward, wherein the lower end of said peripheral portion U letter shaped in section is formed with a plastic deformed outer surface which is formed by the press of die means, said plastic deformed outer surface comprises a horizontal surface facing downward, and an oblique surface extending from the inner peripheral edge of said horizontal surface and facing downward and inward, and a vertical surface extending from the outer peripheral edge of said horizontal surface and facing outward, said oblique surface is formed with material of the lid biased toward the outer peripheral side at the inner peripheral portion of the lower end of said peripheral portion U letter shaped in section, and the material biased from the inner peripheral side to the outer peripheral side of said peripheral portion U letter shaped in section being at the corner defined by said horizontal surface and said vertical surface, whereby the thickness of the outer peripheral side of said peripheral portion U letter shaped in section is larger than that of the inner peripheral side of said peripheral portion U letter shaped in section, and work hardening is caused due to said biasing of the material at said outer peripheral side including said corner.

4,419,421

## ION CONDUCTOR MATERIAL

Winfried Wichelhaus, Ingelheim am Rhein; Werner Weppner, Stuttgart, and Peter Hartwig, Weinheim, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften E.V., Göttingen, Fed. Rep. of Germany

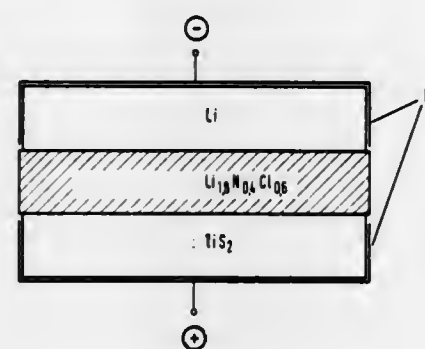
Continuation of Ser. No. 110,584, Jan. 9, 1980. This application Oct. 22, 1981, Ser. No. 313,870

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901303

Int. Cl.<sup>3</sup> H01M 6/18

U.S. Cl. 429—191

5 Claims



1. Solid ion conductor consisting of a compound selected from

Li<sub>1.8</sub>N<sub>0.4</sub>Cl<sub>0.6</sub>

Li<sub>1.6</sub>N<sub>0.3</sub>Cl<sub>0.7</sub>

Li<sub>6</sub>NBr<sub>3</sub>.

4,419,422

## SULFIDE-CONTAINING CATHODE FOR NONAQUEOUS CELLS

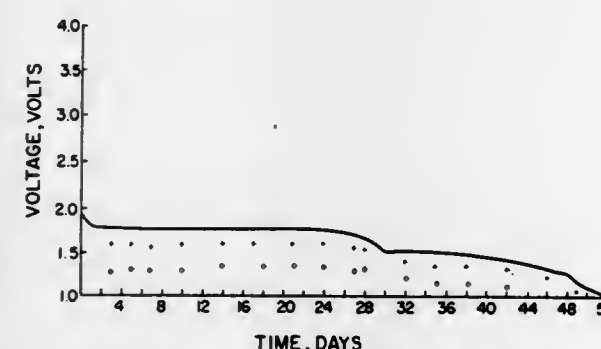
Violeta Z. Leger, North Olmsted, and William P. Evans, Rocky River, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 22, 1982, Ser. No. 360,850

Int. Cl.<sup>3</sup> H01M 6/14, 4/58, 4/34, 4/36

U.S. Cl. 429—194

6 Claims



1. A nonaqueous cell comprising an active anode, an organic electrolyte solution and a solid cathode material comprising a sulfide-containing cathode having the formula:



where

M is one or more mono- or divalent metals selected from the group consisting of Co, Ni, Fe, Sn, Pb, Mn, Zn, Cd, Hg, Cu and Ag;

M' is at least one material selected from the group consisting of trivalent arsenic (As), antimony (Sb), and bismuth (Bi) with the proviso that when MM' is a binary metal combination then when M' is Sb, M cannot be Pb or Sn and when M' is Bi, M cannot be Fe, Sn or Pb;

S is sulfur (as sulfide); and

a, b and c are each integers with each being equal to or greater than 1 with the proviso that when M is monovalent,  $c = (a + 3b)/2$  and when M is divalent,  $c = (2a + 3b)/2$ .

4,419,423

NONAQUEOUS CELLS EMPLOYING HEAT-TREATED MNO<sub>2</sub> CATHODES AND A PC-DME-LICF<sub>3</sub>SO<sub>3</sub> ELECTROLYTE

Violeta Z. Leger, North Olmsted, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 163,497, Jun. 27, 1980, abandoned.

This application Jun. 2, 1982, Ser. No. 384,222

Int. Cl.<sup>3</sup> H01M 6/14

U.S. Cl. 429—197

9 Claims

1. A nonaqueous cell comprising a metal anode selected from the group consisting of lithium, potassium, sodium, calcium, magnesium, aluminum and alloys thereof, a cathode of heat-treated manganese dioxide a conductive agent and a binder, wherein the heat-treated manganese dioxide has a water content of less than 1 weight percent based on the weight of the manganese dioxide and a liquid organic electrolyte comprising lithium trifluoromethane sulfonate dissolved in propylene carbonate and a dimethoxyethane.

4,419,424

## ELECTRODES FOR ELECTROCHEMICAL CELLS CURRENT GENERATING CELLS AND RECHARGEABLE ACCUMULATORS

John D. Julian, Flötzersteig 203, Vienna A-1140, Austria

Filed Jul. 14, 1981, Ser. No. 286,571

Int. Cl.<sup>3</sup> H01M 4/62

U.S. Cl. 429—217

10 Claims

1. An electrode for electrochemical cells, current generating cells and rechargeable accumulators, comprising a current collector and a sintered mixture of a metallic powder and ethylene or polyethylene vinylacetate containing an essentially insoluble ferri- or ferrocyanide compound as active electrode material, the mixture being porous and permeable to electrolyte.

4,419,425

## METHOD FOR MANUFACTURING COLOR FILTER

Kazufumi Ogawa, Hirakata, and Isamu Kitahiro, Yawata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

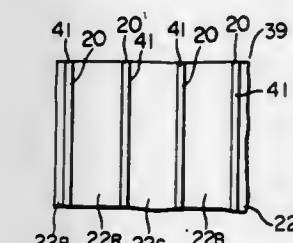
Filed May 20, 1982, Ser. No. 380,344

Claims priority, application Japan, May 20, 1981, 56-77199

Int. Cl.<sup>3</sup> G03C 5/00

U.S. Cl. 430—7

4 Claims



1. A method for manufacturing a color filter comprising:  
(a) forming a stripe -or lattice- shaped light-shield film on one major surface of a transparent glass substrate;  
(b) forming a photosensitive resin film to be dyed on said one major surface of said glass substrate on which said light-shield film is formed;  
(c) exposing said resin film by radiating light from the other major surface of said glass substrate, using said light-shield film as a mask, and developing said resin film, thereby re-

moving a nonexposed portion of said resin film on said light shield film; and

(d) forming a photoresist film over said light-shield film and said resin film;

(e) exposing said photoresist film through a mask having a predetermined pattern thereon;

(f) developing said exposed photoresist film to selectively form an opening therein which corresponds to a portion of said resin film be dyed, a residual portion of said photoresist film being provided as an antidy mask;

(g) dying the portion of the resin film which is uncovered in the opening of the photoresist film; and

(h) removing said photoresist film.

4,419,426

## METHOD FOR THE VISUAL INSPECTION OF THE REPRODUCTION QUALITY OF DRAWING ELEMENTS AND ELEMENTS FOR THE EXECUTION OF THE METHOD

Christof Kehl, St. Gallen, Switzerland, assignor to Dr.-Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

PCT No. PCT/DE80/00103, § 371 Date Mar. 5, 1982, § 102(e)

Date Mar. 5, 1982, PCT Pub. No. WO82/00368, PCT Pub.

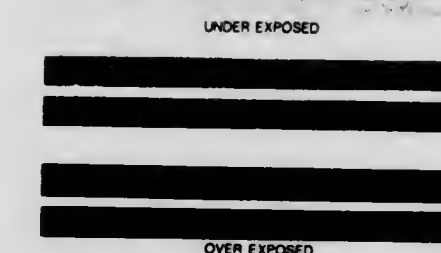
Date Feb. 4, 1982

PCT Filed Jul. 15, 1980, Ser. No. 355,736

Int. Cl.<sup>3</sup> G03C 5/04

U.S. Cl. 430—30

6 Claims



1. A method for the visual inspection of the reproduction quality of drawing elements which are exposed by means of a cathode ray tube on light-sensitive photo material, characterized in that at least three different surface elements which are normal elements, positive elements and negative elements are exposed and such elements differ in their reaction to different processing conditions such that when under-exposed, the negative elements become weaker and when over-exposed the positive elements become stronger and with normal exposure all three elements appear the same, characterized in that said three surface elements are combined with one another such that a control field occurs which has figurative or verbal forms of expression with different processing conditions, characterized in that raster points which have the shape and form of a traditional raster point are employed as said normal elements, characterized in that raster elements which include latent intensification forms are employed as said positive elements, characterized in that raster elements which include latent weak points are employed as said negative elements, and wherein said normal element consists of a contiguous black surface.



4,419,427

**ELECTROPHOTOGRAPHIC MEDIUM WITH PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID N,N'-BIS-(2',6'-DICHLOROPHENYL)-DIIMIDE**

Fritz Graser, Ludwigshafen; Gerhard Hoffmann, Otterstadt; Reinhold J. Leyrer, Ludwigshafen, and Peter Neumann, Wiesloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,600

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110955

Int. Cl.<sup>3</sup> G03G 5/06, 5/14

U.S. Cl. 430—58

2 Claims

1. An electrophotographic recording medium which consists essentially of an electrically conductive base, a first layer containing charge carrier-producing dyes, and a second layer which is substantially transparent to actinic light and is composed of an insulating organic material containing at least one compound which is charge carrier-transporting when exposed to light, wherein perylene-3,4,9,10-tetracarboxylic acid N,N'-bis-(2',6'-dichlorophenyl)-diimide is employed as the charge carrier-producing dye.

4,419,428

**ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MEDIA HAVING A DIS-AZO COMPOUND**

Kazuharu Katagiri, Shozo Ishikawa; Katsunori Watanabe; Shigetoshi Ohta, and Makoto Kitahara, all of Tokyo, Japan, assignors to Canon Inc., Tokyo, Japan

Filed May 18, 1981, Ser. No. 264,799

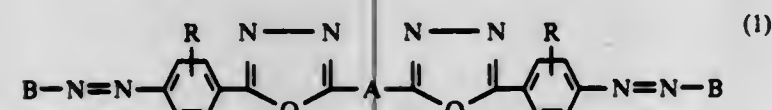
Claims priority, application Japan, Jun. 2, 1980, 55-72752

Int. Cl.<sup>3</sup> G03G 5/06, 5/14

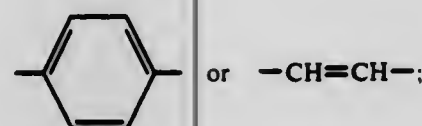
U.S. Cl. 430—77

14 Claims

1. An electrophotographic light-sensitive medium having a light-sensitive layer, comprising: fine particles of a dis-azo compound represented by Formula (I)



wherein A represents one of a single bond,



B represents an aromatic coupler having therein a phenolic hydroxy group; and R is selected from the group consisting essentially of hydrogen, a halogen and a lower alkyl having 1 to 4 carbon atoms.

4,419,429

**SENSITIZED ELECTROPHOTOGRAPHIC PHOTOSENSITIVE COMPOSITION**

Toru Nakazawa, Sennan, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 8, 1982, Ser. No. 346,774

Claims priority, application Japan, Feb. 9, 1981, 56-16823

Int. Cl.<sup>3</sup> G03G 5/06, 5/09

U.S. Cl. 430—83

3 Claims

1. A photosensitive composition for electrophotography which consists essentially of (A) a phthalocyanine photoconductor, (B) 4-nitrophthalic anhydride as a sensitizer, and (C) an electrically insulating, electrophotographically inactive resin binder having a volume resistivity of at least  $1 \times 10^{14} \Omega\text{-cm}$ , the sensitizer (B) being present in an amount of 1 to 200 parts by weight per 100 parts by weight of the photoconductor (A), and

the photoconductor (A) and the binder (C) being present at a weight ratio of from 1/20 to 1/1.

4,419,430

**DRY TRANSFER OF ELECTROPHOTOGRAPHIC IMAGES**

Sidney Cooper, Roslyn Harbor, and Ezekiel J. Jacob, Brooklyn, both of N.Y., assignors to Ani-live Film Service, Inc., New York, N.Y.

Division of Ser. No. 799,476, May 23, 1977, Pat. No. 4,216,283.

This application May 21, 1980, Ser. No. 152,031

Int. Cl.<sup>3</sup> G03C 9/08

U.S. Cl. 430—109

3 Claims

1. An electrophotographic adhesive toner composition comprising an intumescent electroscopic powder mixture, comprising a thermoadhesive agent, a pigment and a dry intumescent agent, said thermoadhesive agent comprising microspheres carrying or containing adhesive characterized by comprising an encapsulating shell and an inner core, said core comprising a tacky balsamic solid or a tacky liquid and said encapsulating shell comprising a thermoplastic, thermoadhesive material, said toner composition used in an electrophotographic process, which process comprises formation of an electrostatic image by electrophotographic means upon a carrier sheet, corresponding to information to be recorded, formation of a pattern of said toner composition on said carrier sheet corresponding to said electrostatic image, thereby forming a toner-image, said carrier sheet being adhesive towards said toner-image.

4,419,431

**ONE- OR TWO-COMPONENT DIAZO-TYPE MATERIAL WITH DIPHENYL DIAMINE AS LIGHT FADE INHIBITOR**

Regina Lischewski, Wolfen; Jörg Marx, Dessau; Reinhard Walter, Wolfen, and Peter Möckel, Lützschena, all of German Democratic Rep., assignors to VEB Filmfabrik Wolfen, Wolfen, German Democratic Rep.

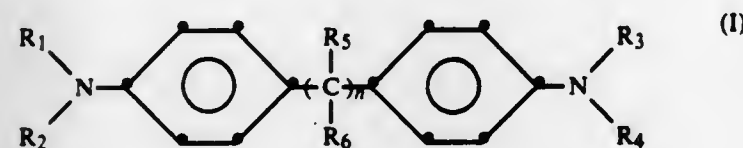
Filed Nov. 30, 1981, Ser. No. 326,099

Int. Cl.<sup>3</sup> G03C 1/60

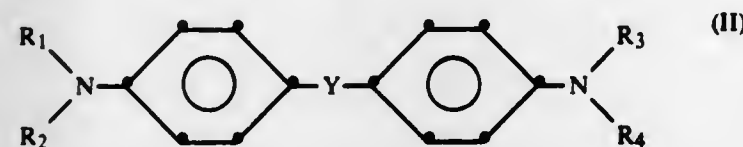
U.S. Cl. 430—179

15 Claims

1. A one- or two-component diazo-type composition with a fading inhibitor, comprising a light-sensitive diazonium compound, and a compound of the general formula



or



having a light absorption maximum less than about 380 nm, wherein

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> being the same or different, represent hydrogen, alkyl with 1 to 5 carbon atoms, R<sub>1</sub> and R<sub>2</sub> and/or R<sub>3</sub> and R<sub>4</sub> represent the alkyl groups necessary for completion of a 5- or 6-membered heterocyclic ring, with or without another hetero atom of N, O or S;

R<sub>5</sub>, R<sub>6</sub> being the same or different, represent hydrogen, aryl, alkyl with 1 to 4 carbon atoms;

Y represents —S—, —SO—, —SO<sub>2</sub>—; and

n is 0, 1, 2, 3;

as the inhibitor in an amount sufficient to increase light stability of azo image dyestuff formed by light imaging and development of said composition.

4,419,432

**DIAZOTYPE COMPOSITION STABILIZATION**

Noreen J. Pillitteri, Spring Valley, N.Y., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Sep. 22, 1982, Ser. No. 421,688

Int. Cl.<sup>3</sup> G03C 1/60

U.S. Cl. 430—179

5 Claims

1. Diazotype material comprising a light-sensitive diazonium compound, an azo coupler compound, and a stabilizing amount of a compound selected from the group consisting of caprolactam, caprylactam, and azacyloctanone.

4,419,433

**PHOTOGRAPHIC MATERIAL**

Massashi Kubota, and Tsuru Noda, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,298

Claims priority, application Japan, Dec. 3, 1981, 56-195038

Int. Cl.<sup>3</sup> G03C 1/06; D21D 3/00

U.S. Cl. 430—206

24 Claims

1. A photographic material containing at least one kind of silver halogenide developer in at least one stratum of photograph-constructing layer provided on a support prepared by coating a base paper material with a film-formable resin, wherein said base paper material for support is a paper treated with at least one member selected from the group consisting of aminomethanesulfonic acid and its salts.

19. A photographic material according to claim 1, wherein at least one stratum of said photograph-constructing layer is silver halogenide photographic emulsion layer.

22. A photographic material according to claim 1, wherein said photographic material is a photographic material for diffusion transfer process and the photograph-constructing layer of its silver halogenide photographic material and the photograph-constructing layer of its image-receiving material both contain a silver halogenide developer.

4,419,434

**IMAGE TRANSFER FILM UNIT WITH MODIFIED SURFACE LAYER CONTAINING CAPILLARIES**

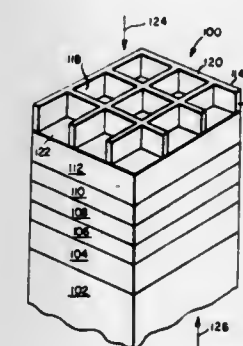
Michel F. Molaire, Rochester, and John V. Williams, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,320

Int. Cl.<sup>3</sup> G03C 1/76, 1/48, 1/40, 5/54

U.S. Cl. 430—207

10 Claims



1. In an image transfer film unit comprised of a support and, located on said support, an imaging portion comprised of radiation-sensitive imaging means capable of providing mobile image forming material as a function of exposure and means for receiving said mobile image forming material from said imaging means to form a viewable transferred image, the improvement comprising a capillary surface layer overlying said imaging portion and forming an array of open-ended capillaries for supplying processing liquid uniformly to said imaging portion, the capillaries subtending

within the image viewing area of said image transfer film unit more than half the area of said capillary surface layer.

4,419,435

**PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING 6-HETEROCYCLYLAZO-3-PYRIDINOL NONDIFFUSIBLE CYAN DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF**

James A. Reczek, Rochester, and James K. Elwood, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

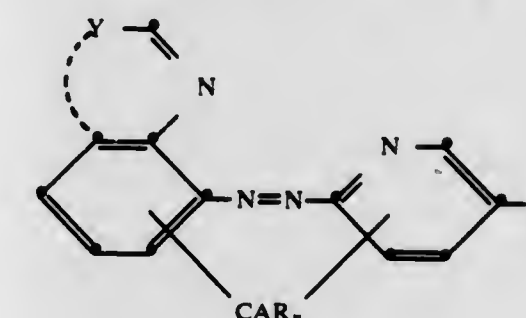
Continuation-in-part of Ser. No. 380,844, May 21, 1982, abandoned. This application Jan. 17, 1983, Ser. No. 458,501

Int. Cl.<sup>3</sup> G03C 1/40, 5/54, 1/10, 7/00

U.S. Cl. 430—223

44 Claims

24. In a photographic assemblage comprising: (i) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; and (ii) a dye image-receiving layer; the improvement wherein said dye image-providing material is a nondiffusible compound capable of releasing at least one diffusible cyan dye moiety comprising a 6-heterocyclylazo-3-pyridinol, said compound having the formula:



wherein:

- Y represents the atoms necessary to complete a 5- or 6-membered aromatic heterocyclic fused ring;
- CAR represents a ballasted carrier moiety capable of releasing said diffusible cyan dye moiety as a function of development of said silver halide emulsion layer under alkaline conditions;
- R represents a hydroxy group, a salt thereof, or a hydrolyzable precursor thereof, or CAR which is linked to said dye moiety through an oxygen atom thereon; and
- d is 0, 1 or 2, with the proviso that when n is 0, then R is CAR which is linked to said dye moiety through an oxygen atom thereon.

4,419,436

**PHOTOSENSITIVE PLATE**

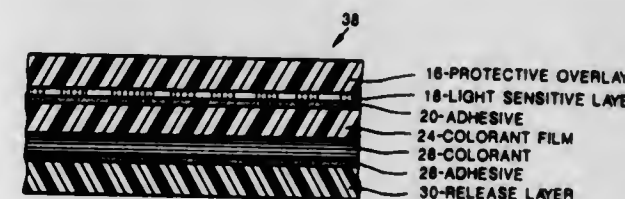
Leonard S. Kranser, 1718 Elevado Ave., Arcadia, Calif. 91106

Filed Jan. 22, 1982, Ser. No. 341,871

Int. Cl.<sup>3</sup> G03C 5/04, 5/54

U.S. Cl. 430—260

29 Claims



1. A kit for preparing a mountable image plate comprising: (a) a light sensitive film comprising: (i) a light transmitting polymeric base, (ii) an optically clear, polymeric protective overlay, and (iii) a light sensitive layer between the base and the overlay; and



(b) a mounting element for the light sensitive film after the film has been developed and the polymeric base has been removed, the mounting element comprising:

- (i) an optically transmissive top protective liner,
  - (ii) a clear first adhesive layer on the underside of the top protective layer,
  - (iii) a color layer comprising a clear colorant film on the underside of the first adhesive layer and colorant on the underside of the colorant film,
  - (iv) a pressure-sensitive second adhesive layer on the underside of the colored layer; and
  - (v) a moisture resistant release layer on the underside of the pressure-sensitive adhesive layer,
- wherein the top protective layer can be removed from the first adhesive layer and the release layer can be removed from the second adhesive layer.

**4,419,437**  
**IMAGE-FORMING COMPOSITIONS AND ELEMENTS**  
**CONTAINING IONIC POLYESTER DISPERSING**  
**AGENTS**

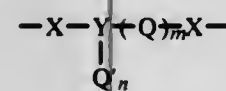
John M. Noonan; Raymond W. Ryan, and James F. Houle, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 11, 1981, Ser. No. 233,526  
 Int. Cl.<sup>3</sup> G03C 1/68

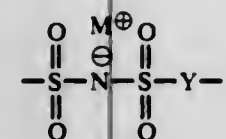
U.S. Cl. 430—270

14 Claims

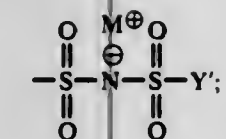
1. An image-forming composition comprising:  
 a radiation sensitive polymeric composition,  
 a particulate pigment, and  
 a substantially amorphous polyester comprising (1) dicarboxylic acid recurring units of which from about 2 to about 25 mole percent, based on total moles of said dicarboxylic acid recurring units, are ionic dicarboxylic acid recurring units of the formula



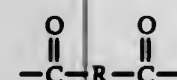
wherein each of m and n is 0 or 1 and the sum of m and n is 1; each X is carbonyl; Q has the formula:



Q' has the formula:



Y is a divalent aromatic radical; Y' is a monovalent aromatic radical or alkyl; and M is a monovalent cation; and the remainder of said dicarboxylic acid recurring units are nonionic and have the formula

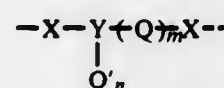


wherein R is alkylene, cycloalkylene or arylene; and (2) diol recurring units derived from diols of the formula HO—R<sup>1</sup>—OH wherein R<sup>1</sup> is a divalent aliphatic, alicyclic or aromatic radical having from 2 to 12 carbon atoms and containing an ether linkage,

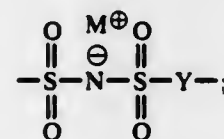
said polyester being present in said image-forming composition in an amount effective to uniformly disperse said pigment in said image-forming composition.

13. In a process for preparing an image-forming composition comprising a radiation sensitive polymeric composition, an organic solvent, a particulate pigment and a dispersing agent, said process comprising

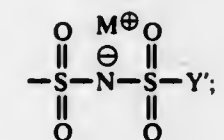
- (1) dispersing said pigment in said solvent by means of said dispersing agent to form a pigment dispersion, and
  - (2) combining said radiation sensitive polymeric composition with said pigment dispersion,
- the improvement wherein said dispersing agent is a substantially amorphous polyester and is added to said image-forming composition in an amount effective to uniformly disperse said pigment in said image-forming composition; said polyester comprising (1) dicarboxylic acid recurring units of which from about 2 to about 25 mole percent, based on total moles of said dicarboxylic acid recurring units, are ionic dicarboxylic acid recurring units of the formula:



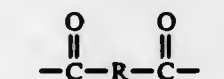
wherein each of m and n is 0 or 1 and the sum of m and n is 1; each X is carbonyl; Q has the formula:



Q' has the formula:



Y is a divalent aromatic radical; Y' is a monovalent aromatic radical or alkyl; and M is a monovalent cation; and the remainder of said dicarboxylic acid recurring units are nonionic and have the formula



wherein R is alkylene, cycloalkylene or arylene; and (2) diol recurring units derived from diols of the formula HO—R<sup>1</sup>—OH wherein R<sup>1</sup> is a divalent aliphatic, alicyclic or aromatic radical having from 2 to 12 carbon atoms and containing an ether linkage.

**4,419,438**  
**IMAGE FORMING MATERIAL AND METHOD**  
 Kuniomi Etoh, Shiga; Toshikiyo Tanaka, Toyonaka; Yoshio Katoh, Otsu; Takeo Sugiura, Tokorozawa; Yoshiyasu Itoh, Yono, and Takeo Kohira, Chiba, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan  
 Filed Mar. 9, 1982, Ser. No. 356,410  
 Claims priority, application Japan, Mar. 10, 1981, 56-35008  
 Int. Cl.<sup>3</sup> G03F 7/02; G03C 1/76, 5/00

U.S. Cl. 430—275

12 Claims

1. An image reproducing material comprising a supporting sheet bearing a metal or metallic compound layer having a thickness of 100 to 1000 Å and a photosensitive resin layer, which is characterized in that said photosensitive resin layer contains (1) ethylenically unsaturated compound which is polymerizable by the action of free radical and chain propaga-

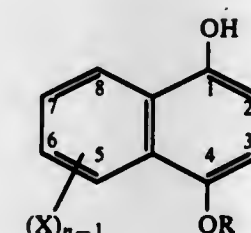
tion, (2) a compound showing photochromism by radical mechanism, (3) free radical producing agent and (4) actinic light absorber.

**4,419,439**  
**PROCESS FOR FORMING PHOTOGRAPHIC IMAGES**  
 Shigeru Kuwazima; Eiichi Kato, and Minoru Yamada, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
 Filed Nov. 16, 1981, Ser. No. 322,053  
 Claims priority, application Japan, Nov. 14, 1980, 55-160325  
 Int. Cl.<sup>3</sup> G03C 7/00

U.S. Cl. 430—375

24 Claims

1. A process for forming a photographic image comprising imagewise exposing a silver halide photographic light-sensitive material to light and development processing the exposed silver halide photographic light-sensitive material with an alkaline processing solution having a pH of 10 to 13 and in the presence of an auxiliary developing agent, wherein the silver halide photographic light-sensitive material contains, as a developing agent, an alkoxynaphthol compound, which is represented by formula (I)



wherein R represents an alkyl group having from 6 to 22 carbon atoms, a substituted alkyl group having from 6 to 22 carbon atoms, an aryl group having from 6 to 22 carbon atoms, a substituted aryl group having from 6 to 22 carbon atoms, an alkenyl group having from 6 to 22 carbon atoms, a substituted alkenyl group having from 6 to 22 carbon atoms or an aralkyl group having from 7 to 22 carbon atoms; X represents an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 6 carbon atoms, or a halogen atom; and n represents an integer from 1 to 3, said alkoxynaphthol compound being oxidized by the silver in said exposed silver halide photographic light sensitive material during development processing with the resulting oxidized alkoxynaphthol compound reacting together to form a dye.

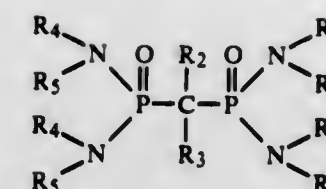
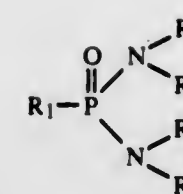
**4,419,440**  
**PROCESS FOR THE INTRODUCTION OF**  
**HYDROPHOBIC PHOTOGRAPHIC ADDITIVES**  
 Lothar Kuhnert, Berlin; Burkhard Costisella, Neuenhagen; Christoph Roth, Halle-Neustadt; Walter Kroha, Wolfen; Wolfgang Baumbach, and Renate Hoppe, both of Berlin, all of German Democratic Rep., assignors to VEB Filmfabrik Wolfen, Wolfen, German Democratic Rep.  
 Filed Nov. 9, 1981, Ser. No. 319,857  
 Claims priority, application German Democratic Rep., Nov. 26, 1980, 225482

Int. Cl.<sup>3</sup> G03C 1/40

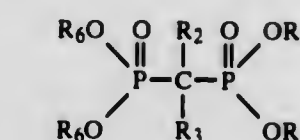
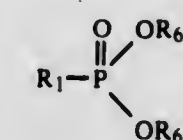
U.S. Cl. 430—377

17 Claims

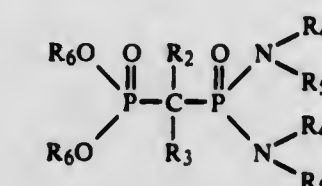
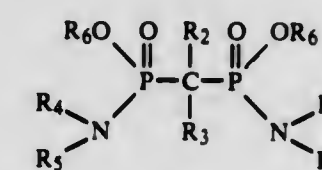
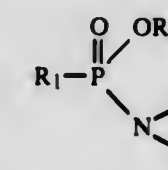
1. Process for the introduction of an hydrophobic photographic additive into a hydrophilic colloidal layer, wherein these additives are dissolved in an organic solvent that is not completely miscible with water and are subsequently dispersed in an aqueous medium, characterized in that at least one phosphonic acid diamide or methane bisphosphonic acid diamide of the general formulae



and/or phosphonic acid esters or methane bisphosphonic acid esters of the general formulae



and/or mixed phosphonic acid esters amides or methane bisphosphonic acid esters of the general formulae



wherein R<sub>1</sub> represents aryl, methyl-substituted aryl, halogen-substituted aryl, alkyl with 1 to 14 carbon atoms or substituted alkyl; R<sub>2</sub> and R<sub>3</sub> represent hydrogen, alkyl, aryl, —N(R<sub>4</sub>)<sub>2</sub>, —S—R<sub>4</sub>, —OR<sub>4</sub>, or R<sub>2</sub> may represent hydrogen and R<sub>3</sub> represents alkyl, aryl, —N(R<sub>4</sub>)<sub>2</sub>, —S—R<sub>4</sub>, OR<sub>4</sub>, and R<sub>4</sub> and R<sub>5</sub> represents alkyl with 1 to 14 carbon atoms and R<sub>6</sub> alkyl with 1 to 14 carbon atoms, aryl, methyl-substituted aryl or halogen-substituted aryl, is used as a high-boiling solvent.

**4,419,441**  
**DISPERSION PROCESS**  
 Fritz Nittel, Leverkusen, and Helmut Mäder, Odenthal, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany  
 Continuation of Ser. No. 278,603, Jun. 29, 1981, abandoned.  
 This application Apr. 11, 1983, Ser. No. 482,280  
 Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024881

Int. Cl.<sup>3</sup> G03C 1/40

U.S. Cl. 430—377

9 Claims

1. A dispersion process of preparing a stable dispersion of a



hydrophobic substance in an aqueous medium using an oil former, comprising a plurality of dispersion steps

which comprises dispersing in a main dispersion step the total quantity of said hydrophobic substance together with from 0 to about 80% of the total amount of oil former in the aqueous medium and additionally in at least one additional dispersion step which precedes or follows said main dispersion step,

dispersing from about 20 to 100% of the total amount of oil former, in the absence of dispersing of said hydrophobic substance, in said aqueous medium, so as to provide from said combined main and additional dispersion steps said stable dispersion of said hydrophobic substance in said aqueous medium.

9. Process as claimed in claim 1 in which the hydrophobic substance is a color coupler.

4,419,442

**PHOTOSENSITIVE SILVER HALIDE EMULSION**  
Martin L. Falxa, Waltham, and Richard S. Himmelwright, Melrose, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 4, 1982, Ser. No. 439,077  
Int. Cl.<sup>3</sup> G03C 1/02

U.S. Cl. 430—567

34 Claims

1. Photosensitive silver halide grains comprising a shell of silver halide substantially surrounding a water-soluble, non-silver containing grain.

18. A method for forming photosensitive silver halide grains which comprises the steps of: (a) dispersing water-soluble, non-silver containing grains with a rock salt habit in an organic solvent in which said non-silver grains are insoluble; and, (b) adding a non-aqueous solution of a silver salt to said dispersion wherein silver halide is insoluble in said organic solvent.

4,419,443

**SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL**

Hiroyuki Mifune; Yoshiharu Fuseya, both of Kanagawa, and Shinpei Ikenoue, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1981, Ser. No. 320,045

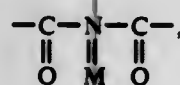
Claims priority, application Japan, Nov. 11, 1980, 55/158518; May 14, 1981, 56/72654

Int. Cl.<sup>3</sup> G03C 1/28

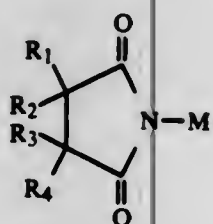
U.S. Cl. 430—600

23 Claims

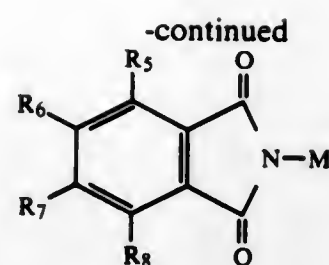
1. A silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer wherein the silver halide emulsion layer has been chemically-ripened in the presence of at least one compound containing a unit represented by the formula



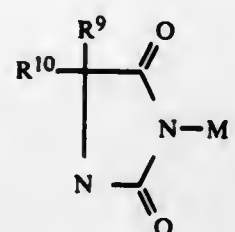
wherein M represents a hydrogen atom, an alkali metal atom, or NH<sub>4</sub>, and further, wherein said compound is represented by formula (I), (II), (III) or (IV)



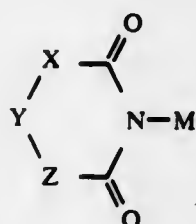
(I) R<sup>9</sup>, R<sup>10</sup>, R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup>, R<sup>17</sup>, R<sup>19</sup>, R<sup>20</sup>, and R<sup>21</sup> each represent a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, an alkoxy group, a halogen atom, a sulfo group, or a carboxy group; R<sup>14</sup> and R<sup>15</sup> may be connected to each other to form a condensed ring; and R<sup>11</sup>, R<sup>16</sup>, and R<sup>19</sup> each represent a hydrogen atom or a substituted or unsubstituted alkyl group and wherein the silver halide emulsion is sensitized with a sulfur sensitizer or noble metal sensitizer.



(II)

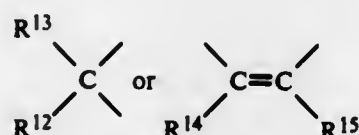


(III)

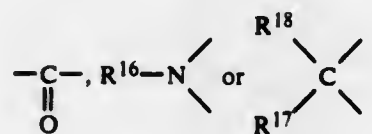


(IV)

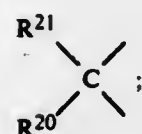
wherein M is defined as above; and R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> each represent a hydrogen atom, a halogen atom, a nitro group, a sulfo group, a carboxy group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or an alkoxy group; W represents —O—, —S— or R<sup>11</sup>—N<; X represents



together with Y; Y represents —O—, —S—,



Z represents —O—, —S—, R<sup>19</sup>—N< or



4,419,444

**NOVEL SUPPORTS CARRYING SIDE CHAINS, PROCESSES FOR OBTAINING THESE SUPPORTS, PROCESS FOR ATTACHING ORGANIC COMPOUNDS HAVING CARBOHYDRATE RESIDUES ONE SAID SUPPORTS, PRODUCTS AND REAGENTS RESULTING FROM SAID CHEMICAL FIXATION**

Gerard A. Quash, Sainte Foy Les Lyon, France, assignor to Institut National de la Sante et de la Recherche Medicale-INSERM, Paris, France

Continuation of Ser. No. 934,003, Aug. 16, 1978, which is a division of Ser. No. 740,840, Nov. 11, 1976. This application Sep. 30, 1980, Ser. No. 192,479

Claims priority, application France, Nov. 13, 1975, 75 34627; Mar. 26, 1976, 76 08966; Aug. 27, 1976, 76 25898  
Int. Cl.<sup>3</sup> G01N 33/50; C12N 11/00, 11/06, 11/08, 11/10, 11/12, 11/14

U.S. Cl. 435—7

36 Claims

1. A process for agglutinating a biologically active analyte to an immunochemical reagent comprising

forming on an insoluble support base a side chain having from three to ten carbon atoms and at least one reactive —NH<sub>2</sub> group, by reacting a compound selected from the group consisting of diamines, polyamines, amino-acids, aliphatic hydrazines bearing an acid group, and aromatic hydrazines bearing an acid group with an insoluble support base bearing at least one carboxyl group or at least one amino group in the presence of a condensation agent to covalently bind said compound to said support base to form a side chain on said insoluble support base;

oxidizing into a CHO group at least one —CH<sub>2</sub>OH group of an organic compound having a carbohydrate residue; attaching the organic compound to said support by reacting said —CHO group with at least one reactive —NH<sub>2</sub> on said side chain to chemically attach the organic compound on said support; and combining said analyte and said support under conditions suitable for agglutination.

4,419,445

**METHOD FOR DETERMINING THE ACTIVITY OF CHOLINESTERASES**

Yasushi Kasahara, Tama; Yoshihiro Ashihara, Fuchu; Masami Sugiyama, Hachioji, and Takahiro Harada, Ube, all of Japan, assignors to Fujizaki Pharmaceutical Co., Ltd., Tokyo, Japan  
Filed Mar. 22, 1982, Ser. No. 360,723

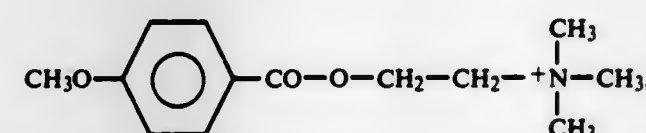
Claims priority, application Japan, Apr. 8, 1981, 56-51708  
Int. Cl.<sup>3</sup> C12Q 1/46, 1/26

U.S. Cl. 435—20

3 Claims

1. A method for determining the activity of cholinesterase, comprising the steps of:

mixing a liquid containing cholinesterase with a solution containing p-methoxybenzoate demethylmonooxygenase, reduced nicotinamide adenine dinucleotide (NADH) and p-methoxybenzoyl choline cation having the formula:



under conditions effective to transform said p-methoxybenzoyl choline first to the corresponding p-methoxybenzoic acid and then to p-hydroxybenzoic acid and to convert said NADH to NAD<sup>+</sup>, and measuring the decrease in absorbance of light caused by NADH, which decrease is caused by conversion of NADH to NAD<sup>+</sup>.

4,419,446

**RECOMBINANT DNA PROCESS UTILIZING A PAPILLOMA VIRUS DNA AS A VECTOR**

Peter M. Howley; Nava Sarver, both of Bethesda, and Ming-Fan Law, Germantown, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Dec. 31, 1980, Ser. No. 221,565

Int. Cl.<sup>3</sup> C12P 21/00, 19/34; C12N 15/00, 1/00

U.S. Cl. 435—68

6 Claims

1. A process for producing a recombinant DNA suitable for introduction and replication in eukaryotic cells comprising the steps of:

(a) cleaving bovine papilloma virus (BPV) type 1 or type 2 to produce a first linearized DNA segment selected from the group consisting of BPV-1 DNA cleaved at Bam HI; BPV-1 DNA cleaved at Hind III; BPV-2 DNA cleaved at Hind III; and the 69% subgenomic fragment; BPV<sub>697</sub> DNA, cleaved from BPV-1 DNA at Bam HI and Hind III,

(b) combining said first linear DNA segment with a second linear DNA segment containing a foreign gene and having termini ligatable to the termini of the first segment under joining conditions to join said first and second segments to provide a functional recombinant DNA.

3. A Eukaryotic cloning vector consisting essentially of the subgenomic fragment BP V<sub>697</sub> consisting of the 69 percent transforming region of bovine papilloma virus type 1 (BPV-1) cleaved from BPV-1 DNA at Bam HI and Hind III.

4,419,447

**FERMENTATION PROCESS FOR PRODUCING DEMYCINOSYLYTOSIN**

Richard H. Baltz; Gene M. Wild, both of Indianapolis, Ind., and Eugene T. Seno, Norwich, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 6, 1981, Ser. No. 260,961

Int. Cl.<sup>3</sup> C12P 19/62; C12R 1/54

U.S. Cl. 435—76

6 Claims

1. The method of producing 23-demycinosylytylosin and 20-dihydro-23-demycinosylytylosin which comprises cultivating bacteria having the identifying taxonomic characteristics of *Streptomyces fradiae* NRRL 12170 and capable of producing 23-demycinosylytylosin in recoverable amounts in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced.

4,419,448

**CONTINUOUS FERMENTATION IN SERIES OF MAIN VESSELS WITH AUXILIARY VESSEL PROVIDED**

Rolf H. Kretz, Singen, Fed. Rep. of Germany, assignor to Process Engineering Company SA, Männedorf, Switzerland  
Filed Jul. 20, 1981, Ser. No. 285,135

Claims priority, application Switzerland, Aug. 21, 1980, 6303/80

Int. Cl.<sup>3</sup> C12P 7/06; C12M 1/00

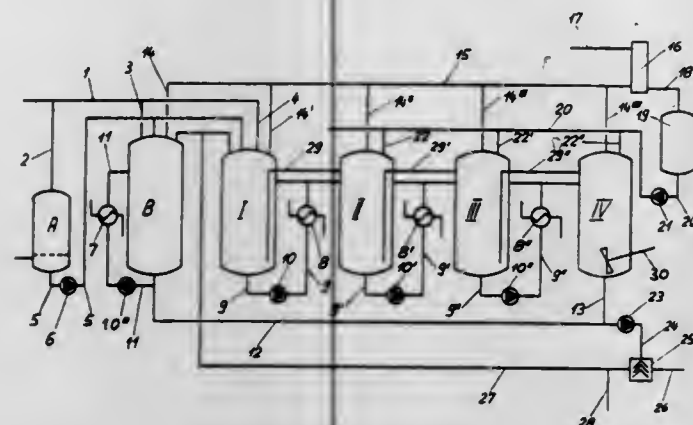
U.S. Cl. 435—161

10 Claims

1. A method of producing alcohol by fermentation of a continuously supplied mash containing yeast and yeast nutrients, comprising the steps of successively transferring the mash through a series of separate fermentation vessels for fermentation therein during normal operation; diverting the further supply of mash at intervals and for a predetermined period of time into an intermittently operating auxiliary fermentation vessel for fermentation therein as the mash already present in



the series of fermentation vessels continues to be successively transferred through such series during modified operation; and restriction endonuclease cleavage map as shown in the drawing.



continuing the fermentation of the diverted mash in the auxiliary fermentation vessel until completion.

4,419,449

# PROCESS FOR THE PRODUCTION OF A SUBSTANCE HAVING BACTERIOSTATIC ACTIVITY

Francois Maillard, and David Shepherd, both of Morges, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 86,277, Oct. 19, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,421

Claims priority, application Switzerland, Nov. 1, 1978, 11230/78

Int. Cl.<sup>3</sup> C12P 1/04; C12Q 1/24; C12N 1/20, 1/02  
U.S. Cl. 435—170

5 Claims

1. A process for the production of a substance having bacteriostatic activity, which comprises isolating one or more strains of Beggiatoa micro-organisms selected from the group consisting of the strains NCIB 114 18 to NCIB 114 25 from baregine, culturing the micro-organisms with agitation under aerobic conditions over a period of from 5 to 36 hours at a temperature of from 20° to 50° C. and at a pH-value of from 6 to 8 in an aqueous nutrient medium and collecting the biomass and/or the culture medium.

4,419,450

# PLASMID CLONING VECTOR FOR BACILLUS SUBTILIS

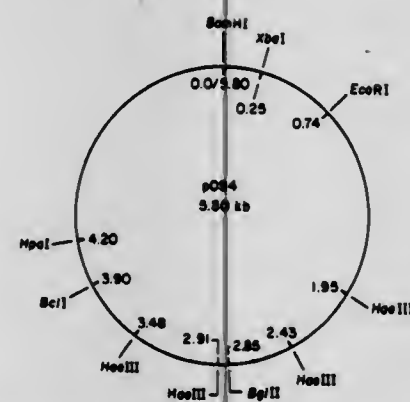
Donald H. Dean, Worthington, and Margaret M. Dooley, Columbus, both of Ohio, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Apr. 21, 1982, Ser. No. 370,431

Int. Cl.<sup>3</sup> C12N 1/20, 1/00, 15/00

U.S. Cl. 435—253

2 Claims



1. Essentially pure plasmid, pOS4, having erythromycin resistance and kanamycin resistance coding genes characterized by a molecular weight of approximately 5.8 kb and a

4,419,451

# OXYGEN SCAVENGING SYSTEM FOR ANAEROBOSIS

Richard L. Garner, and Luther Winans, Jr., both of Abilene, Tex., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed May 21, 1981, Ser. No. 265,875

Int. Cl.<sup>3</sup> C12M 1/22; C09K 3/00; C01B 3/08, 15/16  
U.S. Cl. 435—298

24 Claims

1. A system for producing an atmosphere for use in culturing anaerobic microorganisms, characterized by

- a sealable container;
- a material in said container which when contacted by water generates a gas capable of reacting with oxygen to provide an atmosphere for culturing anaerobic microorganisms;
- said material being a metal-metal salt couple wherein said metal is selected from the group consisting of magnesium, beryllium, barium, strontium, and calcium and wherein said metal salt is selected from the group consisting of copper, platinum, palladium, tin, iron, nickel and cobalt; and
- catalytic means in said container for catalyzing reaction between oxygen and gas generated in said container.

4,419,452

# METHOD OF DETECTING FLUORESCENT MATERIALS AND APPARATUS FOR THEIR DETECTION

Kazuhiro Imai; Zenzo Tamura, both of Tokyo, and Shin-ichiro Kobayashi, Imiya, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

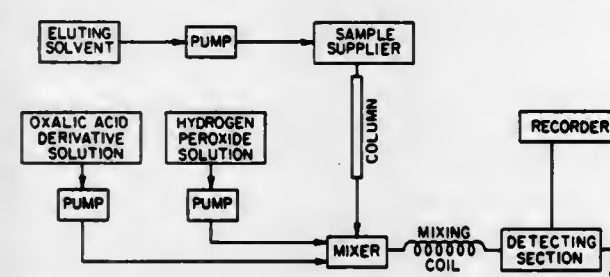
Continuation of Ser. No. 80,294, Oct. 1, 1979, abandoned. This application Aug. 12, 1981, Ser. No. 292,287

Claims priority, application Japan, Apr. 3, 1979, 54-39922

Int. Cl.<sup>3</sup> G01N 31/08, 21/76

U.S. Cl. 436—89

6 Claims



1. A method for detecting amounts of a dansylamino acid in the range of  $10^{-14}$  to  $8 \times 10^{-13}$  moles in a mixture, which comprises:

- separating dansylamino acid by liquid column chromatography to form a column eluate containing the separated dansylamino acid;
- continuously passing the column eluate to a first mixing zone;
- continuously mixing a solution of an oxalic acid derivative and a solution of hydrogen peroxide, each solution provided at a controlled rate, with the column eluate in the first mixing zone to form a first mixture;
- continuously passing the first mixture through a coiled mixing zone to form a second mixture; and
- continuously passing the second mixture through a chemiluminescence flow cell detector to detect the chemiluminescence resulting from the reaction of the mixture of solutions.

4,419,453

# IMMUNOLOGICAL AGGLUTINATION ASSAYS WITH DYED OR COLORED LATEX AND KITS

Linneaus C. Dorman, Midland, Mich., and Leigh B. Bangs, Carmel, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 306,067, Sep. 28, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,528  
Int. Cl.<sup>3</sup> G01N 33/54, 33/76

U.S. Cl. 436—534

31 Claims

1. In a method for detecting the presence of an immunochemical in a biological sample using an indirect latex agglutination test which comprises

- admixing an immunological counterpart of said immunochemical with said biological sample to form a reaction mixture;
- allowing said reaction mixture to incubate for at least about one minute;
- adding latex polymer particles, having said immunochemical bound thereto, to said reaction mixture; and then
- determining if agglutination occurs by the aggregation of polymer particles;

the improvement which comprises:

- employing dyed latex polymer particles having said immunochemical bound thereto;
- carrying out said method in the presence of a water-soluble, non-latex polymer particle adsorbing dye that is contrasting in color to the dyed latex polymer particles; and
- determining if agglutination occurs by observing a color change in the reaction mixture which is characterized by the appearance of the true color of the dyed latex polymer particles, intensified by clumping or precipitation of the dyed latex polymer particles, and the appearance of the remainder of reaction mixture being that of the water-soluble, non-latex polymer particle adsorbing dye.

4,419,454

# RAPID-FIRE REFRACTORIES

William G. Long, Lynchburg, and Helen H. Moeller, Concord, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 14, 1981, Ser. No. 329,903

Int. Cl.<sup>3</sup> C04B 35/80

U.S. Cl. 501—95

12 Claims

1. The method of removing moisture from a water containing calcium aluminate-bonded refractory mass without explosive spalling comprising the steps of: (a) mixing water, organic fibers and at least one inorganic material to create a refractory mixture, (b) casting, stamping or gunning the mixture, (c) thereafter curing the mixture and (d) firing the mixture under rapid-fire conditions.

4,419,455

# PACKING MATERIALS

Hiroshi Shikano, 3-24-6 Hiyoshidai, and Tsutomu Harada, 1612-4 Ohaza Kumate, both of Yahata Nishi-ku, Kitakyushu-Shi, Fukuoka-Ken, Japan

Filed Jan. 22, 1982, Ser. No. 341,756

Claims priority, application Japan, Jan. 27, 1981, 56/9580

Int. Cl.<sup>3</sup> C04B 35/80

U.S. Cl. 501—95

12 Claims

1. A high erosion resisting-airtight packing material which consists essentially of:

- a blend consisting of 0.5–20 parts by weight of a low melting point metal based on 100 parts by weight of said blend, 3–10 parts by weight of fiber and the balance of at least one refractory powder, and
- a binder in an amount varying depending upon the amount of said low melting point metal.

4,419,456

# METHOD FOR THE DISPOSAL OF SHOT COKE

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,567

Int. Cl.<sup>3</sup> C01B 3/02; C07C 1/04; C01B 3/06

U.S. Cl. 518—703

9 Claims

1. A method for the disposal and utilization of shot coke in the form of hard-to-grind spherical particles of approximately 4 mm in diameter and having a Hardgrove grindability index of about 20 determined by the Hardgrove machine method ASTM D409-71 comprising:

- contacting a first fluidized bed consisting essentially of said shot coke at elevated temperatures with oxygen and sufficient steam so as to produce a gaseous fuel product comprising a major amount of carbon monoxide and hydrogen, and
- introducing said gaseous fuel product and oxygen into a second fluidized bed consisting essentially of shot coke, said oxygen being supplied in sufficient amount to combust the hydrogen to form water and to react with said hydrogen and carbon monoxide to yield heat to maintain the second bed of shot coke sufficiently hot to allow the regeneration of carbon monoxide and hydrogen by reaction of the shot coke in said second bed and the water formed in the second bed of shot coke.

4,419,457

# PRODUCTION OF POLYURETHANE FOAMS

Mototsugu Tokunaga, Kyoto, Japan, assignor to Dai-ichi Kogyo Sanyaku Co., Ltd., Kyoto, Japan

Filed Sep. 30, 1982, Ser. No. 429,902

Claims priority, application Japan, Oct. 6, 1981, 56-159827

Int. Cl.<sup>3</sup> C08G 18/14

U.S. Cl. 521—65

7 Claims

1. Method of producing an open-cell polyurethane foam comprising heating a mixture of an aqueous emulsion of a polyurethane-forming composition and a fluorocarbon compound of 1 to 3 carbon atoms having a boiling point of 5° to 100° C.

4,419,458

# FIRE RETARDANT FINE PARTICULATE EXPANDABLE STYRENE POLYMERS

Josef K. Rigler, Recklinghausen; Ekkehard Wienhöfer, Marl; Horst Leithäuser, Marl, and Karl Trukenbrod, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Division of Ser. No. 380,071, May 20, 1982. This application Apr. 19, 1983, Ser. No. 486,430

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122341

Int. Cl.<sup>3</sup> C08J 9/20, 9/22

U.S. Cl. 521—56

4 Claims

1. In a particulate molding composition for the production of foamed articles consisting essentially of a mixture of an expanding agent, a fire-retardant organic halogen compound and a polymerized styrene monomer or styrene monomer in admixture with comonomers, the improvement comprising said composition containing about 0.0001 to 0.1 percent by weight based on said monomers and comonomers of an epoxidation product of an aliphatic hydrocarbon having an epoxidated aliphatic chain containing from 6 to 18 carbon atoms, said epoxidation product being soluble in said monomers.



4,419,459

**PROCESS OF PRODUCING TRANSPARENT FOAMED PLASTICS MATERIALS**

Bernd Melchior, Remscheid, Fed. Rep. of Germany, assignor to August Hohnholz KG, Hamburg, Fed. Rep. of Germany  
PCT No. PCT/DE81/00012, § 371 Date Jul. 30, 1981, § 102(e) Date Jul. 30, 1981, PCT Pub. No. WO81/02018, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 14, 1981, Ser. No. 287,744

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 3001205

Int. Cl.<sup>3</sup> C08J 9/22

U.S. Cl. 521—59

10 Claims

1. A process of producing transparent foamed plastics, comprising mixing (i) a polymerizable composition consisting essentially of methyl methacrylate and a polymerization catalyst and which does not contain a blowing agent, and (ii) at least one component selected from the group consisting of (a) solid beads comprising a mixture of at least one transparent polymethylmethacrylate and blowing agent, and (b) solid beads comprising at least one transparent polymethylmethacrylate with blowing agent containing microcapsules enclosed therein, heating and expanding said beads and polymerizing said polymerizable composition.

4,419,460

**PHENOLIC FOAMS**

Stanley S. Ho, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 219,165, Dec. 22, 1980,

abandoned. This application Jul. 6, 1981, Ser. No. 280,197

Int. Cl.<sup>3</sup> C08J 9/14

U.S. Cl. 521—123

4 Claims

1. A foam composition having a density of 0.032 to 0.064 grams/cubic centimeter and a closed cell content of at least 50% comprising a resole with a formaldehyde to phenol mole ratio of from 1.2 to 2.5:1 and from 2 to 15% by weight, based on the resole weight, of finely divided hydrated alumina.

4,419,461

**CATALYST FOR MAKING POLYURETHANES**

Francis W. Arbir, Itasca; Daniel S. Raden, Hawthorn Woods; Kenneth W. Narducy, Bloomingdale, and Francois M. Casati, Highland Park, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 252,634, Apr. 9, 1981. This application Oct. 21, 1982, Ser. No. 435,842

Int. Cl.<sup>3</sup> C08G 18/14

U.S. Cl. 521—126

6 Claims

1. The process of preparing a polyurethane foam from a polyisocyanate and a polyol using methylene chloride as a blowing agent, consisting essentially in carrying out the reaction in the presence of a catalytically effective amount of a partially blocked DMAPA, said partial blocking being caused by the inclusion of a branched octanoic acid present in the equivalent % of 10–50% of said DMAPA.

4,419,462

**FOAMED THERMOPLASTIC RESIN COMPRISING POLY (P-METHYLENEBENZOATE)**

Edward E. Paschke, Wheaton, and James L. Throne, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 445,435, Nov. 30, 1982. This application Apr. 18, 1983, Ser. No. 485,877

Int. Cl.<sup>3</sup> B29H 7/29; C08J 9/10, 9/14

U.S. Cl. 521—134

7 Claims

1. A thermoplastic foamed resin product having a foaming level of from about 10% to about 50% characterized by high shear sensitivity, slow rate of crystallization and inherently high impact resistance which comprises a polymer composi-

tion of poly(p-methylenebenzoate) having an I.V. greater than 0.4 dl/g.

4,419,463

**PREPARATION OF CROSS-LINKED HYDROGEL COPOLYMERS FOR CONTACT LENSES**

Ivor B. Atkinson, 32 Mount Rd., Chessington, Surrey, and Barry C. Holdstock, 67, Northway, Morden, Surrey, both of England

Division of Ser. No. 98,479, Nov. 29, 1979, Pat. No. 4,361,657.

This application Mar. 16, 1982, Ser. No. 358,552

Claims priority, application United Kingdom, Nov. 30, 1978, 46681/78

Int. Cl.<sup>3</sup> G02C 7/04

U.S. Cl. 523—106

2 Claims

1. A method of producing a soft contact lens having a water content of at least about 30% by weight based on the weight of the hydrated lens which comprises:

- preparing a monomer mixture containing a major proportion of a hydroxyalkyl acrylate or methacrylate, up to 12% by weight of an unsaturated carboxylic acid, a minor proportion of a cross-linking monomer, from about 4 to about 30% by weight of styrene or a substituted styrene and a polymerisation initiator,
- removing oxygen from mixture,
- filling the mixture into a suitably-shaped mould and effecting polymerisation in the absence of oxygen and,
- converting free carboxylic acid groups in the resulting copolymer to salt form.

4,419,464

**ERASABLE INK FOR BALL POINT PENS**

Raymond S. Williams, Boulder City, Nev., and Paul C. Fisher, 711 Yucca St., Boulder City, Nev. 89005, assignors to Paul C. Fisher, Boulder City, Nev.

Continuation of Ser. No. 320,443, Nov. 12, 1981, Pat. No.

4,367,966. This application Jul. 29, 1982, Ser. No. 402,830

Int. Cl.<sup>3</sup> C09D 11/18; C08K 5/05, 5/06

U.S. Cl. 523—161

9 Claims

1. An erasable writing ink suitable for use in a ball point pen comprising at least 10% by weight of an elastomer selected from the group consisting of polyvinyl acetate, a copolymer of ethylene and vinyl acetate, and mixtures thereof, from about 10% to about 40% by weight of trichloroethylene, and an effective amount of a colorant.

4,419,465

**POLYMERIZATION PROCESS**

Alan J. Backhouse, South Ascot; Charles Bromley, Bourne End, and Morice W. Thompson, Maldenhead, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 212,753, Dec. 4, 1980, Pat. No. 4,336,177.

This application Dec. 2, 1981, Ser. No. 326,619

Claims priority, application United Kingdom, Dec. 6, 1979, 7942092

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08L 33/02

U.S. Cl. 523—201

11 Claims

1. A coating composition comprising a blend of:

- composite polymer microparticles having a diameter of from 0.1 to 10 microns, each of which comprises a core of crosslinked polymer surrounded by and grafted to a layer of non-crosslinked polymer, the microparticles being produced as a dispersion in a non-aqueous liquid medium as hereinbelow defined by a process comprising the steps of (i) polymerising one or more ethylenically unsaturated monomers, including at least one crosslinking monomer, from which the crosslinked core polymer of the microparticles is to be derived, in an aqueous medium comprising (a) at least 30% by weight of water and (b) not more than

70% by weight of a second constituent which is miscible with water, the nature and proportion of which are such that the mixture as a whole is capable of dissolving the monomer or monomers being polymerised to the extent of at least 3% by weight but is a non-solvent for the polymer formed, the polymerisation being carried out in the absence of ionic species and at a temperature at least 10° C. higher than the glass transition temperature of the core polymer, in the presence in the aqueous medium as steric stabiliser of a block or graft copolymer which contains in the molecule a polymeric component which is solvatable by the aqueous medium and another polymeric component which is not solvatable by the aqueous medium and is capable of becoming associated with the polymer particles formed, the concentration of free monomer in the polymerisation mixture being maintained throughout this process step at a level such that at no time does the free monomer form a separate phase and the total amount of monomer polymerised being such that the resulting dispersion contains at least 20% by weight of microparticles, (2) polymerising, in the dispersion obtained from step (1) and again in the absence of ionic species, one or more further ethylenically unsaturated monomers, not including any crosslinking monomer, from which the non-crosslinked polymer of the outer layer is to be derived, optionally in the presence of additional block or graft copolymer stabiliser, the concentration of such further monomer in the free state in the polymerisation mixture being maintained at a level such that at no time does that free monomer form a separate phase, and (3) transferring the polymer microparticles from the resulting dispersion into a non-aqueous liquid medium which is a solvent for the non-crosslinkable polymer under such conditions that the particles become stably dispersed therein, with (B) a main film-forming constituent which is compatible with the non-crosslinked polymer component of the microparticles.

4,419,466

**METHOD FOR CONTINUOUS PRODUCTION OF INVERT EMULSION POLYMERS**

Thomas R. Hopkins, Chesterland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jun. 25, 1981, Ser. No. 277,300

Int. Cl.<sup>3</sup> C08J 3/10

U.S. Cl. 523—324

18 Claims

1. A method for preparing an invert emulsion polymer which comprises the steps of:

- continuously circulating, in a loop reactor, under polymerization conditions, a system comprising (A) a non-polar liquid which is inert to addition polymerization, and (B) an aqueous solution of one or more polymerizable monomers;
- continuously adding components A and B to said system under conditions and in proportions to produce said invert emulsion polymer; and
- continuously withdrawing a portion of said circulating system comprising said invert emulsion polymer.

4,419,467

**PROCESS FOR THE PREPARATION OF CATIONIC RESINS, AQUEOUS, DISPERSIONS, THEREOF, AND ELECTRODEPOSITION USING THE AQUEOUS DISPERSIONS**

Marco Wismer, Gibsonia, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 14, 1981, Ser. No. 301,712

Int. Cl.<sup>3</sup> C08L 63/02

U.S. Cl. 523—414

14 Claims

1. In a process for preparing a resin which contains cationic base groups comprising reacting a polyepoxide resin with a

cationic base group former and dispersing the resulting cationic resin in aqueous medium, the improvement comprising: contacting a polyepoxide with a polyether polyol and heating the two together to form the polyepoxide resin, said polyether polyol formed from reacting:

- a cyclic polyol with
  - ethylene oxide or a mixture of ethylene oxide and an alkylene oxide having 3 to 8 carbon atoms in the alkylene chain;
- the equivalent ratio of (B) to (A) being within the range of 3 to 20:1.

4,419,468

**ELECTRODEPOSITABLE COMPOSITIONS**

Joseph P. Lucas, Wexford, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 269,132, Jun. 1, 1981, abandoned. This application Dec. 2, 1982, Ser. No. 446,127

Int. Cl.<sup>3</sup> C08L 63/02

U.S. Cl. 523—426

5 Claims

1. A cationic electrodepositable coating composition comprising:

- an aqueous cationic paint dispersion, and further consisting essentially of:
- an organic polycarboxylic acid or a salt thereof, said acid or salt being present in an amount sufficient to reduce discoloration of a coating due to metallic ions in the paint.

4,419,469

**THERMOPLASTIC ELASTOMER BLENDS WITH BITUMEN**

Georg G. A. Böhm; Lee E. Vescellus, and Gary R. Hamed, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 1,623, Jan. 8, 1979, Pat. No. 4,250,273, which is a continuation-in-part of Ser. No. 879,308, Jan. 21, 1978, abandoned, which is a division of Ser. No. 806,036, Jun. 13, 1977, abandoned. This application Apr. 16, 1980, Ser. No. 140,905

Int. Cl.<sup>3</sup> C08L 95/00

U.S. Cl. 524—68

5 Claims

1. A thermoplastic elastomer composition comprising, a blend of

- from about 30 to about 45 parts by weight of a crystalline 1-olefin polymer, said 1-olefin polymer selected from the class consisting of a homopolymer of polyethylene, polypropylene, and a copolymer made from monomers of ethylene and propylene, said homopolymer or said copolymer having a melting point of at least 90° C.;
- from about 65 to about 25 parts by weight of a random styrene-butadiene rubber;
- from about 10 to about 40 parts by weight of a bitumen, wherein said bitumen is an asphalt, a tar, or a tar derivative, said asphalt selected from the group consisting of a petroleum asphalt, a native asphalt, and combinations thereof, said petroleum asphalt selected from the group consisting of straight-reduced asphalts, thermal asphalts, and air-blown asphalts, said native asphalts selected from the group consisting of an asphalt with a mineral content below 5 percent, an asphalt with a mineral content above 5 percent, and combinations thereof, said tar selected from the group consisting of a coal tar reduced to float grade, a coal-tar pitch, and combinations thereof, said tar derivative being a residual from pyrogenous distillates, and
- said blend forming a thermoplastic elastomer, said thermoplastic elastomer capable of being repeatedly reprocessed.



4,419,470

# WOOD DERIVED, THERMOPLASTIC ESTER MIXTURES AS A SUBSTITUTE FOR PETROLEUM-DERIVED COMPONENTS IN COMPOUNDED RUBBER STOCKS

James A. Davis, Uniontown, and Robert C. Koch, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

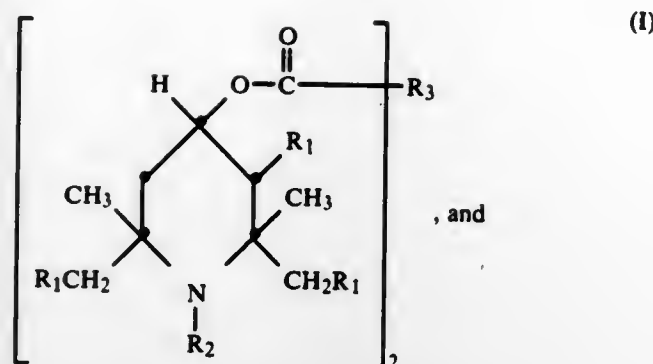
Continuation-in-part of Ser. No. 193,198, Oct. 2, 1980, Pat. No. 4,324,710. This application Mar. 19, 1982, Ser. No. 359,739. The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08L 93/04; C09F 1/00

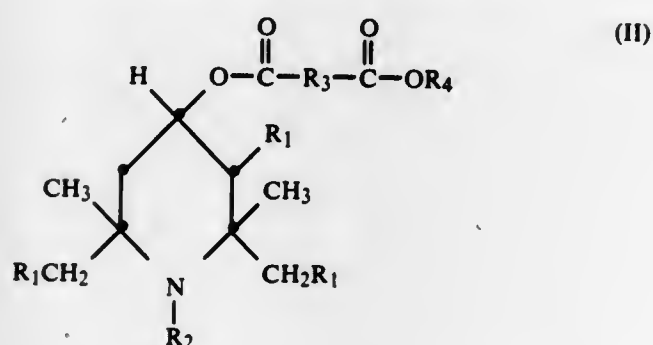
U.S. Cl. 524—76

11 Claims

1. An improved rubber stock containing conventional rubber components, wherein the improvement comprises replacing at least a portion of a petroleum derived product in the stock with a thermoplastic resin, said resin comprising carboxylic acid ester groups and derived from wood and both said petroleum-derived product and said resin not being elastomeric and being a minor portion of the stock.



(b) 10–30% by weight of an ester of formula II



in which R<sub>1</sub> is hydrogen or methyl, R<sub>2</sub> is hydrogen, C<sub>1</sub>-12 alkyl, C<sub>3</sub>-8 alkenyl, C<sub>7</sub>-11 aralkyl, cyanomethyl or C<sub>2</sub>-4 acyl, R<sub>3</sub> is C<sub>1</sub>-18 alkylene, C<sub>2</sub>-C<sub>18</sub> oxaalkylene, C<sub>2</sub>-18 thiaalkylene, C<sub>2</sub>-18 azaalkylene or C<sub>2</sub>-8 alkenylene and R<sub>4</sub> is C<sub>1</sub>-4 alkyl.

8. Plastics material which has been stabilised against photochemical degradation and which contains, as stabiliser, 0.1 to 5% by weight of a composition according to claim 1.

4,419,471

# CORE-SHELL POLYMERS

Suzanne Nelsen, Bergenfield, N.J.; Yehuda Ozari, Louisville, Ky.; Dru Alwani, Wayne, N.J., and Edward Wotier, Chattanooga, Tenn., assignors to GAF Corporation, New York, N.Y. Continuation of Ser. No. 299,464, Sep. 4, 1981, abandoned, which is a continuation of Ser. No. 115,649, Jan. 28, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,593. The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C08K 5/34, 5/13

U.S. Cl. 524—100

6 Claims

1. A core-shell polymer composition comprising:  
(a) discrete cores of styrene-butadiene copolymer having antioxidant intimately mixed therein in amounts effective to improve the stability of the copolymer to oxidation; and  
(b) shells of a copolymer formed from:  
(1) at least one monomer selected from the group consisting of alkyl methacrylates and alkyl acrylates; and  
(2) an ultraviolet light stabilizer containing a copolymerizable vinyl group or a copolymerizable group which is a reactive precursor of an alkyl group;  
said shells completely surrounding said cores.

4,419,472

# PIPERIDINE COMPOSITIONS FOR LIGHT STABILIZATION

Godwin Berner, Rheinfelden; Manfred Rembold, Basel, and Jean Rody, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 16, 1981, Ser. No. 322,041

Claims priority, application Switzerland, Nov. 17, 1980, 8520/80

Int. Cl.<sup>3</sup> C08K 5/34; C07D 401/12, 401/06

U.S. Cl. 524—102

9 Claims

1. A composition, which is a mixture of esters of the formulae I and II, which comprises  
(a) 90–70% by weight of an ester of formula I

# POLYOLEFIN PLASTIC COMPOSITIONS HAVING IMPROVED TRANSPARENCY

Robert L. Mahaffey, Jr., Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 275,561, Jun. 22, 1981, abandoned. This application May 20, 1982, Ser. No. 380,370

Int. Cl.<sup>3</sup> C08K 5/34

U.S. Cl. 524—104

7 Claims

1. A polyolefin plastic composition having improved transparency, which comprises:  
(a) a major portion of a linear, low density polyethylene polymer;  
(b) a di-acetal of sorbitol and an aromatic aldehyde in an amount sufficient to improve transparency characteristics;  
(c) a di-acetal decomposition inhibitor selected from metal sequestrants and acid neutralizers in an amount sufficient to inhibit decomposition of said di-acetal; and  
(d) said linear, low density polyethylene polymer further containing high acid catalyst residue in an amount sufficient to cause decomposition of said di-acetal.

4,419,474

# FLAME-REPELLENT POLYSILOXANE MOLDING COMPOSITIONS

Jürgen Ackermann, Bergisch-Gladbach; Hans-Heinrich Moretto, Cologne; Wilfried Kniege, Bergisch-Gladbach, and Werner Rauer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 313,112

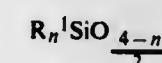
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041588

Int. Cl.<sup>3</sup> C08L 83/06

U.S. Cl. 524—195

4 Claims

1. In a polysiloxane molding composition which can be cured to give flame-repellent products, comprising  
(a) a diorganopolysiloxane of the formula



in which

n is 1.9 to 2.05, and

R<sup>1</sup> is an alkyl, alkenyl and/or aryl radical with 1–8 C-atoms,

(b) a finely divided silicic acid,

(c) finely divided TiO<sub>2</sub> with a surface area, measured by the BET method, greater than 20 m<sup>2</sup>/g and a particle size less than 0.5 μm,

(d) platinum and/or one of its sulphur-free compounds, and

(e) a curing agent,

the improvement which comprises about 0.05 to 10% by weight of (a) to (e) of a nitrogen compound selected from the group consisting of a cyanoguanidine and an arylguanidine or a salt thereof.

4,419,475

# HEAT RESISTANT ETHYLENE-PROPYLENE RUBBER WITH IMPROVED TENSILE PROPERTIES AND INSULATED CONDUCTOR PRODUCT THEREOF

Joseph E. Vostovich, Bridgeport, Conn., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 208,725, Nov. 20, 1980, Pat. No. 4,303,574, which is a continuation of Ser. No. 50,036, Jun. 19, 1979, abandoned. This application Aug. 3, 1981, Ser. No. 289,611

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C08K 5/54

U.S. Cl. 524—264

6 Claims

1. A curable ethylene-propylene rubber composition having improved tensile and related physical properties, resistance to heat and apt electrical and physical properties, consisting essentially of the combination in approximate parts by weight of:

Ethylene-propylene rubber	100
Chlorosulfonated polyethylene	3–10
Zinc Oxide	15–30
Talc	50–125
Vinyl silane	0.5–3
Carbon black	10–32
Antimony oxide	3–10
Amine antioxidant	1–4
Imidazole antioxidant	0.2–4
Peroxide curing agent	2–8
Curing coagent	2–5

4,419,476

# TERNARY ADHESIVE SYSTEMS

James E. Coughlin, Philadelphia, Pa.; Eugene G. Sommerfeld, Mt. Laurel, N.J., and Clifford H. Strolle, Springfield, Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 310,069, Oct. 9, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 404,981

Int. Cl.<sup>3</sup> C08G 18/10

U.S. Cl. 524—284

39 Claims

1. A ternary adhesive system consisting essentially of:  
A. at least one hydroxyl-terminated polymeric polyol having a molecular weight M<sub>n</sub> of about 1,000–5,000 and soluble in methyl ethyl ketone or ethyl acetate to the extent of at least 65% by weight;  
B. an isocyanate-capped polyol-urethane formed from at least one polyol having a molecular weight M<sub>n</sub> of about 500–4,000 which has been extended and capped with a diisocyanate in the —NCO/—OH ratio of 2/1–1.3/1 and is capable of forming a block copolymer with and thereby extending polyol A; and  
C. a polyisocyanate crosslinking agent C supplying 6–50% by weight in a mixture of B plus C.

4,419,477

# POWDER PHENOLIC RESIN COMPOSITION FOR DRY PROCESS RESIN-BONDED FELT

Yukio Saeki, and Naomitsu Inoue, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,199

Claims priority, application Japan, Oct. 5, 1981, 56-157464

Int. Cl.<sup>3</sup> C08L 61/10

U.S. Cl. 524—290

7 Claims

1. A powdered phenolic resin composition for resin-bonded felt produced by the dry process comprising a phenol-aldehyde resin, an aromatic carboxylic acid having a formula R—Ar—COOH present in the range of about 0.3 to 5% of the phenol-aldehyde resin and the composition having a bulk density of about 0.29–0.36 g/cm<sup>3</sup>, wherein

R is selected from hydrogen, hydroxy or alkoxy groups,

Ar is selected from phenyl, phenylalkenyl or phenylalkyl groups.

4,419,478

# THERMOPLASTIC MOLDING MATERIALS

Franz Brandstetter, Neustadt; Adolf Echte, Ludwigshafen; Herbert Naarmann, Wattenheim, and Edmund Priebe, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 5, 1982, Ser. No. 365,519

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1981, 3114915

Int. Cl.<sup>3</sup> C08K 5/10

U.S. Cl. 524—318

5 Claims

1. A thermoplastic molding material based on impact resistant styrene polymer prepared by the polymerization of monostyrene in the presence of polybutadiene rubber and polyphenylene ether wherein the molding material contains 0.1 to 5 percent by weight, based on the weight of the mixture of the styrene polymer and the polyphenylene ether, of an ester of an aliphatic monocarboxylic acid having 8 to 30 carbon atoms and an aliphatic or aromatic hydroxy compound having 1 to 6 hydroxyl groups and homogeneously mixing said molding material.



4,419,479

# **REINFORCED CARBOXY NITRILE POLYMER COMPOSITIONS CONTAINING PARTICULATE NICKEL** Virgil E. Springer, Corsicana, Tex., assignor to Regal International, Inc., Corsicana, Tex.

Filed Jan. 14, 1983, Ser. No. 458,029

Int. Cl.<sup>3</sup> C08K 3/08, 5/33; C08G 79/00; C08F 220/46

U.S. Cl. 524—413 22 Claims  
1. A reinforced polymer carboxylated nitrile composition comprising a minor effective amount of a particulate nickel metal reinforcing agent.

4,419,480

# **SOFT, FATIGUE RESISTANT ELASTOMER ARTICLES** Ronald J. Tabar, Amherst, Mass., and Paul C. Killgoar, Jr., Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 192,782, Oct. 1, 1980, abandoned. This application Aug. 19, 1982, Ser. No. 409,486

Int. Cl.<sup>3</sup> C08K 3/04

U.S. Cl. 524—525 15 Claims  
1. A soft, fatigue resistant vulcanizate adapted for transmitting a load between moving mechanical parts comprising (a) 100 parts by weight crosslinked elastomer, (b) about 10–75 parts by weight of substantially internally uncrosslinked, substantially linear polymer that (i) is made from monomers consisting essentially of isobutylene, (ii) is a strain crystallizable elastic solid at 20° C. and (iii) has a viscosity average molecular weight (Flory) above about 1.3 million, (c) about 5–200 parts by weight particulate comprising carbon black reinforcing particulate, said elastomer being crosslinked with (d) curative in an amount sufficient to crosslink said elastomer, wherein said polymer of (b) is dispersed throughout said elastomer of (a) in a discrete microscopic phase.

4,419,481

# **SMALL PARTICLE SIZE LATEX USEFUL AS A PRESSURE SENSITIVE ADHESIVE**

James E. Schwartz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 251,008, Apr. 3, 1981. This application Nov. 1, 1982, Ser. No. 438,183

Int. Cl.<sup>3</sup> C08L 47/00

U.S. Cl. 524—551 15 Claims  
1. A pressure-sensitive adhesive formulation comprising a blend of  
(a) an aqueous synthetic polymer latex comprising disperse polymer particles having a number average diameter of less than about 120 nm, as measured by hydrodynamic chromatography calibrated by electron microscopy, and which individually comprise:  
(i) a soft monomer, a homopolymer of which would have a glass transition temperature of less than about 25° C., in an amount to impart stickiness to the latex,  
(ii) a hard monomer, a homopolymer of which would have a glass transition temperature of greater than about 25° C., in an amount to impart strength to the latex; and  
(b) a tackifying amount of a tackifying resin.

4,419,482

# **PRODUCTS CONTAINING POLYMER CHAINS, THE PREPARATION AND USE THEREOF**

Philippe J. Teyssie, Neuville-en-Condroz; Robert J. Jerome, Tilff-Esneux, and Guy J. Brpze, Grace-Hollogne, all of Belgium, assignors to Unibra Societe Anonyme, Brussels, Belgium

Filed Feb. 2, 1982, Ser. No. 345,102

Claims priority, application Luxembourg, Feb. 2, 1981, 83106

Int. Cl.<sup>3</sup> C08K 5/01

U.S. Cl. 524—560 26 Claims  
1. A process for preparing products containing polymer chains, in which a linear  $\alpha,\omega$ -diacid prepolymer or polymer selected from the group consisting of polydienes, polyolefins,

polyvinyl polymers, polyacrylic polymers, polyalkylene oxides and polysiloxanes having, only at each chain end, at least one free acid group selected from the group consisting of carboxylic, sulfonic and phosphonic groups is reacted with an alkoxide of a metal (M) having a valence of more than 2, the amount of alkoxide being such that said alkoxide functional groups are in excess of more than 1 with respect to the stoichiometric quantity of the acid functional groups carried by said linear polymer or prepolymer, the reaction mixture being stirred in the presence of humidity until a product is obtained, in which the hydrogen atoms of the acid groups of said linear prepolymer or polymer are substituted by an atom of the metal which is itself linked to another atom of this metal by M-O-M linkages.

4,419,483

# **PROCESS FOR PREPARING WATER-IN-OIL EMULSIONS**

Michael J. Yanutola, Rock Hill, S.C., assignor to Sun Chemical Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,033

Int. Cl.<sup>3</sup> C08K 3/38

U.S. Cl. 524—701 10 Claims  
1. In a process for making water-in-oil emulsions of polymers or copolymers of at least one water-soluble ethylenically unsaturated monomer by the steps of (1) forming a water-in-oil emulsion of said monomer or comonomers or aqueous solution thereof in an inert hydrophobic liquid organic dispersion medium containing an emulsifying agent and (2) heating said emulsion under free radical-forming conditions to polymerize said monomer or comonomers in a disperse phase, the improvement which consists of including sodium borate in the aqueous phase of said water-in-oil emulsion.

4,419,484

# **ORGANOPOLYSILOXANE MOLDING COMPOSITIONS** Hans Sattlegger, Odenthal; Karl Schnurrbusch, and Theo Achtenberg, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 341,929

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104645

Int. Cl.<sup>3</sup> C08K 5/54

U.S. Cl. 524—731 4 Claims  
1. In a one component organopolysiloxane molding composition, which in the presence of water or steam crosslinks to give elastomers, comprising  
(A) an  $\alpha,\omega$ -dihydroxyorganopolysiloxane of a viscosity of about 500 to 2,000,000 cP (20° C.)  
(B) a crosslinking agent,  
(C) a filler, pigment and/or conventional auxiliary, and  
(D) optionally a hardening catalyst,  
(E) the improvement which comprises about 0.1 to 15% by weight of the total composition of hexamethyldisiloxane whereby the composition is capable of prolonged storage in the absence of moisture without loss of properties.

4,419,485

# **SHAPED ARTICLES AND PROCESS FOR THE PRODUCTION THEREOF**

Willem F. H. Borman; Morton Kramer, and Eugene P. Reilly, all of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 144,536, Apr. 28, 1980, abandoned, which is a continuation of Ser. No. 610,094, Sep. 2, 1975, abandoned, which is a continuation of Ser. No. 382,512, Jul. 25, 1973, abandoned. This application Jan. 12, 1981, Ser. No. 223,943

Int. Cl.<sup>3</sup> C08G 63/76; C08F 283/00; C08L 67/00

U.S. Cl. 525—437 13 Claims  
1. A hollow shaped article blow molded from a composition comprising a branched, high molecular weight poly(1,4-butylene terephthalate) resin including from 0.05 to 3 mole %, based on the terephthalate units, of a branching component which contains at least three ester-forming groups.

4,419,486

# **SULPHONATED POLYARYLETHETERKETONES**

John B. Rose, Letchworth, England, assignor to Imperial Chemical Industries PLC, London, England

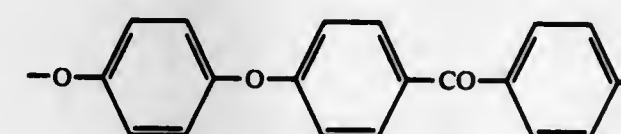
Filed May 26, 1981, Ser. No. 267,288

Claims priority, application United Kingdom, Jun. 10, 1980, 8018915

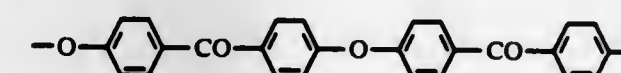
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C08G 65/40, 65/48

U.S. Cl. 525—534 9 Claims  
1. A polyaryletherketone copolymer which is a hydrophilic sulphonated copolymer derived by controllably sulphonating a copolymer with concentrated sulfuric acid (98% w/w) at  $\geq 50^\circ\text{C}$ , said copolymer having repeat units of formula



together with repeat units of formula



at least 70% of the units A being sulphonated after sulphonation and substantially all the units B remaining non-sulphonated after sulphonation, the control being effected by varying the proportion of the repeat units B in the copolymer of repeat units A and B.

4,419,487

# **TOUGHENED POLYESTER RESINS**

Eugene H. Rowe, Moab, Utah, assignor to The B. F. Goodrich Company, Akron, Ohio

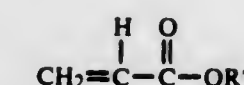
Continuation-in-part of Ser. No. 156,849, Jun. 5, 1980,

abandoned. This application Apr. 22, 1982, Ser. No. 370,769

Int. Cl.<sup>3</sup> C08L 67/06

U.S. Cl. 525—38 10 Claims  
1. Composition of matter comprising a reaction product of an unsaturated polyester resin and a carboxyl-terminated reactive liquid polymer wherein said polyester resin is selected from polyesters of polyhydric alcohols and carboxylic acids or their anhydrides, amount of said liquid polymer being sufficient to improve toughness in terms of crack and/or impact resistance of said composition without significantly deteriorating other mechanical properties, said liquid polymer having a backbone comprising one or more polymerized vinylidene monomers selected from (a) monoolefins containing 2 to 14 carbon atoms, (b) dienes containing 4 to 10 carbon atoms, (c)

vinyl and allyl esters, (d) vinyl and allyl ethers, and (e) acrylates of the formula



where R' is hydrogen, alkyl radical of 1 to 18 carbon atoms or an alkoxyalkyl, alkylthioalkyl, or cyanoalkyl radical containing 2 to 12 carbon atoms; the polybutadiene in said liquid polymer containing polybutadiene in the backbone being substantially 1,4-polybutadiene.

4,419,488

# **PROCESS FOR CONTINUOUS PRODUCTION OF HIGH IMPACT POLYSTYRENE**

Chihiro Fukumoto, Kodaira; Tokinobu Furukawa, and Chikao Oda, both of Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,303

Claims priority, application Japan, Apr. 15, 1981, 56-55568

Int. Cl.<sup>3</sup> C08F 279/00, 279/02

U.S. Cl. 525—53 7 Claims  
1. A process for continuously producing a high impact polystyrene which comprises:  
a step of feeding rubber and styrene monomer continuously to a multistage horizontal rubber dissolving tank to dissolve the rubber completely with stirring by increasing the temperature of each stage along the direction of the liquid flow therethrough to provide a rubber solution,  
a step of feeding the rubber solution to a first multistage horizontal type polymerizer operating at a temperature of from 100° to 200° C. to effect phase inversion of the rubber and preliminary polymerization of styrene, thereby providing a conversion of 25 to 40% by weight at the outlet of said first polymerizer,  
a step of feeding the resulting preliminary polymerized solution to one or more horizontal type polymerizers successively to undergo bulk polymerization at a temperature of from 100° to 230° C. while removing the heat generated therein by spraying styrene monomer over the exposed surface of the polymerization solution and evaporating the monomer to attain a conversion of about 70 to 85% by weight at the polymerization solution outlet of a final polymerizer, and  
a step of feeding the polymerization solution to a monomer separator to remove the remaining monomer.

4,419,489

# **EASILY EMULSIFIABLE ACRYLAMIDE AND RUBBER MODIFIED ASPHALTS**

Anthony V. Grossi, Newark; Leon A. Hagelee, Minerva Park; Louis T. Hahn, and Alfred Marzocchi, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 329,902, Dec. 11, 1981, Pat. No. 4,394,481. This application Dec. 27, 1982, Ser. No. 453,029

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> C08F 216/06

U.S. Cl. 525—54.5 14 Claims  
1. As a composition of matter, the product produced by reacting an acrylamide, asphalt having a viscosity of less than about 120,000 cps (at 140° F.), a vinyl aromatic monomer and a rubbery polymer.



4,419,490

**POLYMERIC HYDROGENATION CATALYSTS, THE PRODUCTION THEREOF AND THEIR USE TO PROMOTE HYDROGENATION**

Ernst Bayer, and Wilhelm Schumann, both of Tubingen, Fed. Rep. of Germany, assignors to Heyl & Co. Chemisch-Pharmazeutische Fabrik, Fed. Rep. of Germany  
Continuation of Ser. No. 62,740, Aug. 1, 1979, abandoned. This application Jun. 12, 1981, Ser. No. 273,068

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1978, 2835943; May 10, 1979, 2918942

Int. Cl.<sup>3</sup> C08F 8/42

U.S. Cl. 525—61

18 Claims

1. As a polymeric hydrogenation catalyst soluble in at least one solvent selected from the group consisting of water, methanol, propanol, N-methylpyrrolidone and mixtures thereof, a synthetic or semi-synthetic polymer having as a metal binding functional group a sulfonic acid, carbonyl, carboxyl, amino, imino, hydroxyl, cyano or acid amide group and being directly bound by covalent or secondary valent bonds by said metal binding functional group to a metal or salt of said metal, the metal being of the eighth subgroup of the periodic system, said polymer being selected from the group consisting of polyvinyl alcohol, polyacrylonitrile, polyacrylic acid, polyvinyl pyrrolidone, carboxymethyl cellulose, polyethylene glycols, polypropylene glycols, polyurethanes, polyvinyl amines, polyethylene imines, polyamides, polypeptides and polymeric polyhydroxy compounds, and mixtures of said polymers.

4,419,491

**THERMOPLASTIC RESIN COMPOSITION EXCELLENT IN COLOR DEVELOPMENT**

Hajime Sakano, Osaka; Fumio Nakai, Shiga, and Yukio Tomari, Osaka, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan

Filed Feb. 23, 1982, Ser. No. 351,553

Claims priority, application Japan, Feb. 23, 1981, 56-26000; Mar. 4, 1981, 56-31715; Mar. 12, 1981, 56-35870; Mar. 27, 1981, 56-46078

Int. Cl.<sup>3</sup> C08L 51/04, 69/00, 33/12, 25/12

U.S. Cl. 525—67

10 Claims

1. A thermoplastic resin composition which comprises (A) a graft polymer comprising an ethylene-propylene elastomeric polymer and units of at least two kinds of monomers chosen from aromatic vinyl compounds, vinyl cyanide compounds and other copolymerizable monomers grafted thereon and, (A') a copolymer consisting of copolymerized monomer units comprising at least one aromatic vinyl compound and at least one vinyl cyanide compound and other copolymerizable monomers in a weight proportion of 55:45 to 85:15 and having an intrinsic viscosity of 0.40 to 1.10 (determined in dimethylformamide at 30° C.), the weight proportion of the graft polymer (A) and the copolymer (A') being from 5:95 to 80:20, with (B) a methyl methacrylate polymer consisting of copolymerized monomer units comprising at least about 50% by weight methyl methacrylate units, the proportion of the combined weight of the graft polymer (A) and the copolymer (A') and the weight of the methyl methacrylate polymer (B) being from 5:95 to 95:5.

4,419,492

**PROCESS FOR PREPARING ABS POLYMERIC POLYBLENDS**

Robert H. M. Simon, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 6, 1981, Ser. No. 290,645

Int. Cl.<sup>3</sup> C08L 51/00, 53/00

U.S. Cl. 525—71

25 Claims

1. A process for producing ABS polymeric polyblends having dispersed alkadiene rubber particles grafted with monovinylidene aromatic and alkenenitrile monomers, said rubber

particles having a bimodal rubber particle size distribution and being dispersed in a matrix copolymer of said monomers, the sequential steps: consisting essentially of:

- grafting by aqueous emulsion graft polymerization an alkadiene rubber with a monovinylidene aromatic monomer and an alkenenitrile monomer to produce first graft rubber particles in an aqueous latex having a particle size of about 0.01 to 0.8 microns,
- mixing with said latex, having 30 to 400 parts per hundred parts of latex rubber solids by weight, at least one additional monoethylenically unsaturated monomer selected from the group consisting of monovinylidene aromatic monomers and alkenenitrile monomers,
- extracting said first grafted rubber particles from said aqueous latex into the additional monomer forming a dispersion of said particles in the additional monomer, and leaving a separate free water phase,
- separating said free water phase from said additional monomer containing the first grafted rubber particles and adjusting said additional monomer with at least one monoethylenically unsaturated monomer such that the weight ratio of monoethylenically unsaturated aromatic to alkenyl nitrile monomer is about 80:20 to 20:80,
- subjecting said first grafted rubber particles dispersed in said adjusted additional monomer having said weight ratio to mass polymerization conditions to produce a composition comprising said grafted rubber particles dispersed in a first matrix copolymer of said adjusted additional monomers as a first melt,
- mixing said first melt with a second melt prepared by mass polymerization forming a second matrix copolymer of monovinylidene aromatic and alkenyl nitrile monomers having second grafted rubber particles dispersed therein, said second particles having a rubber particle size of about 1.0 to 10 microns being grafted with alkenyl nitrile and monovinylidene aromatic monomers forming a third melt having said first and second grafted rubber particles dispersed in said first and second matrix copolymers,
- devolatilizing said third melt so as to remove unreacted monomers providing said ABS polyblend comprising said first and second matrix copolymers having said first and second grafted rubber particles dispersed therein such that said rubber particles have a bimodal particle size distribution.

4,419,493

**SULFUR-VULCANIZABLE BLENDS OF ETHYLENE-VINYL ACETATE COPOLYMER ELASTOMERS AND POLYACRYLATE ELASTOMERS**

Eugene Y. C. Chang, Bridgewater, and Rudolf A. Behrens, Somerset, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 21, 1982, Ser. No. 435,827

Int. Cl.<sup>3</sup> C08L 13/00, 51/04, 31/04, 33/08

U.S. Cl. 525—76

20 Claims

- A sulfur-vulcanizable elastomer composition comprising: (A) from about 35 to 65 percent, by weight, of a graft elastomer comprising about 18 to 80 percent, by weight, of a copolymer of ethylene and vinyl acetate having grafted thereon about 82 to 20 percent, by weight, of a mixture of a major proportion of ethyl acrylate and a minor proportion of an ethylenically unsaturated comonomer containing a cure-site for sulfur vulcanization, said copolymer of ethylene and vinyl acetate comprising, before grafting, about 50 to 92 percent, by weight, of ethylene and about 8 to 50 percent, by weight, vinyl acetate, and (B) from about 65 to 35 percent, by weight, of a sulfur vulcanizable polyacrylate elastomer comprising (1) a C<sub>1</sub>-C<sub>8</sub> alkyl acrylate, a mixture of C<sub>1</sub>-C<sub>8</sub> alkyl acrylates, or a mixture of one or more C<sub>1</sub>-C<sub>8</sub> alkyl acrylates and up to about 20%, by weight, based on the total weight of acrylate, of an acrylate or methacrylate, and (2) vinyl chloroacetate.

4,419,494

**HEAT RESISTANT HOT MELT ADHESIVES**

Paul P. Puletti, Glen Gardner, and Catherine E. Stubler Salerno, Stirling, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Mar. 16, 1982, Ser. No. 358,758

Int. Cl.<sup>3</sup> C08L 93/00, 93/04; C08J 25/00

U.S. Cl. 525—95

11 Claims

1. A hot-melt adhesive composition with improved heat resistance comprising 10-55% of a block copolymer having the general configuration A-B-A wherein A is a non-elastomeric polymer block derived from the moieties of a monovinyl aromatic hydrocarbon monomer, and B is an elastomeric polymer block derived from the moieties of a conjugated diene monomer or a hydrogenated derivative thereof; 20-70% of a tackifying resin; 0-25% plasticizing oil; 0-50% wax diluent; and 0-3% antioxidant; wherein the improvement comprises the present of 1-20% of a polymeric fatty acid polyamide.

4,419,495

**EPOXY RESIN POWDER COATINGS HAVING LOW GLOSS**

Rhetta Q. Davis, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 303,792, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 166,230, Jul. 7, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,728

Int. Cl.<sup>3</sup> C08L 63/00

U.S. Cl. 525—109

12 Claims

1. In a powder coating containing a solid curable epoxy resin containing more than one vicinal epoxy group and a curing agent thereof selected from the group consisting of (1) substituted guanidines, (2) derivatives of biguanides, (3) aliphatic amines, (4) aromatic amines, (5) compounds having an average of more than one phenolic hydroxyl group per molecule and which are free of (a) sulfone groups and (b) fused rings, (6) polycarboxylic acids, (7) halogenated anhydrides, (8) non-halogenated anhydrides, and (9) mixtures thereof; the improvement which comprises employing as at least a part of said curing agent, a polymer prepared only from ethylene and acrylic acid as monomers, said polymer having a melt index of from about 30 to about 40,825 in a sufficient quantity so as to lower the 60° gloss of the coating when cured.

4,419,496

**PARTICLE AGGLOMERATION IN RUBBER LATICES**

David E. Henton, and Teresa M. O'Brien, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1982, Ser. No. 350,849

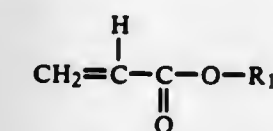
Int. Cl.<sup>3</sup> C08F 279/02

U.S. Cl. 525—301

25 Claims

1. An agglomerating agent (AgAg) suitable for agglomerating the particles of a latex of an elastomeric material which AgAg is a dispersion of particles having core material and shell material, said AgAg comprising:

- as shell material substantially grafted to the core material, from about 5 to about 50 weight percent, based on the total weight of the AgAg of a polymerized mixture of: (i) from about 80 to about 99.5 weight percent based on the total weight of component (a) of ester monomer of the formula:



wherein R<sub>1</sub> is a lower alkyl radical containing up to about 4 carbon atoms; and

- from about 0.5 to about 20 weight percent based on weight component (a) of an ethylenically unsaturated

mono- or difunctional carboxylic acid having from about 3 to about 8 carbons;

- as core material, from about 50 to about 95 weight percent, based on the total weight of the AgAg, of an elastomeric material, such core material having polymerized therein essentially no ester monomer which is polymerized in the shell material.

4,419,497

**PROCESS FOR PRODUCING NOVEL HYDROGENATED RESIN FROM FIVE-MEMBER CYCLIC COMPOUNDS HAVING A CONJUGATED DOUBLE BOND AND/OR DIELS-ALDER ADDITION PRODUCTS THEREOF**

Shozo Tsuchiya, Tokyo; Akio Oshima, and Hideo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed May 17, 1982, Ser. No. 378,680

Claims priority, application Japan, Aug. 22, 1979, 54-106109; Aug. 23, 1979, 54-106606; Nov. 14, 1979, 54-146442; Jun. 6, 1980, 55-75453; Jun. 6, 1980, 55-75454

Int. Cl.<sup>3</sup> C08F 8/04

U.S. Cl. 525—338

15 Claims

- A process for producing a novel hydrogenated resin which comprises the steps of: (i) copolymerizing a five-member cyclic compound (component A) selected from the group consisting of cyclopentadiene, dicyclopentadiene, and mixtures thereof, with a comonomer (component B) of cyclopentadiene and 1,3-butadiene selected from the group consisting of tetrahydroindene, vinylnorbornene, and mixtures thereof, by heating a mixture of 20 to 90 parts by weight of said component A and 80 to 10 parts by weight of said component B at a temperature of from 220° to 350° C. to obtain a resin; and (ii) hydrogenating said resin to hydrogenate substantially all the carbon-carbon double bonds in the resin.

4,419,498

**PROCESS FOR PRODUCING QUATERNARY AMMONIUM AMINO POLYAMIDE CONTAINING HALOHYDRIN FUNCTIONALITY**

Ralph A. Bankert, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

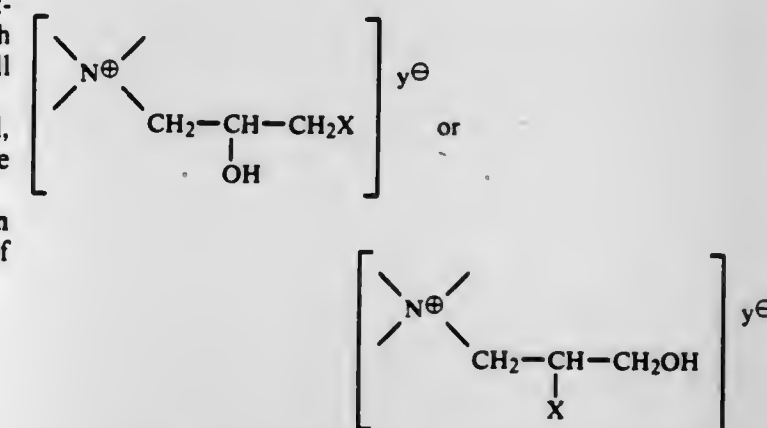
Division of Ser. No. 155,026, May 30, 1980, Pat. No. 4,354,006. This application Aug. 12, 1982, Ser. No. 407,533

Int. Cl.<sup>3</sup> C08G 69/48

U.S. Cl. 525—426

5 Claims

1. A process for producing a polymeric quaternary ammonium compound containing halohydrin functionality and having in its molecular structure at least one quaternary nitrogen group of the formula



where X and y are halogen, which process comprises reacting an aminopolyamide derived from a polyamine containing at least three amine groups, at least one of which is a tertiary amine group and a saturated aliphatic dicarboxylic acid said aminopolyamide containing at least one tertiary amine group,



with at least one mole of allyl halide per mole of tertiary amine present in the aminopolyamide to quaternize the tertiary amine groups and form allyl substituted quaternary ammonium halide groups, and then reacting the resulting allyl substituted product with hypohalous acid until substantially all of the allyl substituents are converted to the corresponding halohydrin moieties.

4,419,499

**COMPOSITIONS OF URETHANE RUBBER AND NYLON**  
Aubert Y. Coran; Raman Patel, and Debra Williams, all of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.  
Filed Mar. 25, 1982, Ser. No. 361,703  
Int. Cl.<sup>3</sup> C08L 77/00

U.S. Cl. 525—424

20 Claims

1. A composition comprising a blend of about 10–75 parts by weight of nylon, and, correspondingly, about 90–25 parts by weight of cured millable urethane rubber in which the curing agent consists essentially of an organic peroxide.

4,419,500

**PROCESS FOR PRODUCING QUATERNARY AMMONIUM POLYAMINO UREYLENE CONTAINING HALOXYDRIN FUNCTIONALITY**

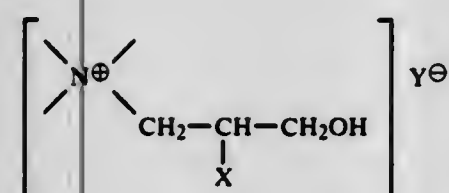
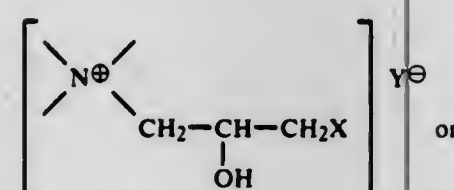
Ralph A. Bankert, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 155,026, May 30, 1980, Pat. No. 4,354,006.  
This application Jul. 29, 1982, Ser. No. 403,204  
Int. Cl.<sup>3</sup> C08G 71/02

U.S. Cl. 525—540

6 Claims

1. A process for producing a quaternary ammonium compound containing halohydrin functionality and having in its molecular structure at least one quaternary nitrogen group of the formula



where X and Y are halogen, which process comprises reacting a polyaminoureyline containing at least one tertiary amine group and derived by reacting urea with a polyamine containing at least three amine groups, at least one of which is a tertiary amine group, with at least one mole of allyl halide per mole of tertiary amine present in the polyaminoureyline to quaternize the tertiary amine groups and form allyl substituted quaternary ammonium halide groups, and then reacting the resulting allyl substituted product with hypohalous acid until substantially all of the allyl substituents are converted to the corresponding halohydrin moieties.

4,419,501

**OLEFIN POLYMERIZATION CATALYST COMPONENTS AND POLYMERIZATION PROCESS**  
Brian L. Goodall, and Jacob C. Van Der Sar, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 207,848, Nov. 18, 1980, Pat. No. 4,343,721.

This application Feb. 4, 1982, Ser. No. 345,900

Claims priority, application United Kingdom, Nov. 20, 1979, 7940131

Int. Cl.<sup>3</sup> C08F 4/02, 10/00

U.S. Cl. 526—122

19 Claims

1. Process for the polymerization of alpha-monoolefins which comprises contacting the monomer or monomers to be polymerized with a catalyst composition comprising

- (a) an organoaluminum compound, and
- (b) a titanium-containing catalyst component prepared by contacting a solid composition consisting essentially of magnesium dihalide, an electron donor and a tetravalent titanium halide, this composition being substantially free from aluminum compounds, with a dilute suspension or solution, in a substantially anhydrous liquid medium, of from 1 to 50 mol %, basis titanium, of a halide of B, Al, Ga, In, Tl, Sn or Sb, these elements being present in their highest valency state or a halide of tetravalent Te, and removing from the resulting solid substantially all metal halide originating from the liquid medium; and recovering the resulting olefin polymer.

4,419,502

**POLYMERIZATION PROCESS FOR CARBOXYL CONTAINING POLYMERS**

Eugene J. Sehm, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 29, 1982, Ser. No. 427,323

Int. Cl.<sup>3</sup> C08F 2/08

U.S. Cl. 526—209

10 Claims

1. A method comprising polymerizing olefinically unsaturated carboxylic acids containing at least one activated carbon-to-carbon olefinic double bond and at least one carboxyl group in a polymerization media consisting essentially of methylene chloride in the presence of a free radical forming catalyst and a surface active agent having an HLB value greater than 12 selected from the group consisting of sorbitan polyoxyethylene(n)monoesters and polyoxy ethylene(n)alkyl ethers wherein n is a number from 18 to 28 and the acid radical of the ester and the alkyl group of the ether containing from 8 to 22 carbon atoms.

4,419,503

**CATALYTIC PROCESS FOR THE PRODUCTION OF PETROLEUM RESINS**

Francisco M. Benitez, and Michael F. English, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 24, 1982, Ser. No. 381,205

Int. Cl.<sup>3</sup> C08F 4/14

U.S. Cl. 526—237

7 Claims

1. A process for the polymerization of olefin and diolefin hydrocarbons into a petroleum resin comprising the step of contacting a feedstream of olefinic and diolefinic hydrocarbons of 5 to 12 carbon atoms having less than about 100 ppm water with an anhydrous hydrogen halide in a weight ratio of hydrogen halide to feedstream of 1:250 to 1:2000 and under substantially anhydrous conditions with a catalyst comprising a Friedel-Crafts metal halide selected from the group consisting of AlCl<sub>3</sub>, AlBr<sub>3</sub> and BF<sub>3</sub>, said hydrogen halide present in a molar ratio with said metal halide of from 0.5 to 2 and thereby causing the C<sub>5</sub>-C<sub>10</sub> olefinic and diolefinic hydrocarbons to form a petroleum resin.

4,419,504

**METHOD OF ACCELERATING CURE RATES FOR ACETYLENE-TERMINATED RESINS AND CURABLE COMPOSITIONS EMPLOYED THEREIN**  
Harry T. Hanson, Millburn, N.J., assignor to Celanese Corporation, New York, N.Y.

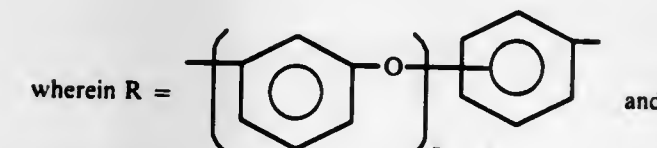
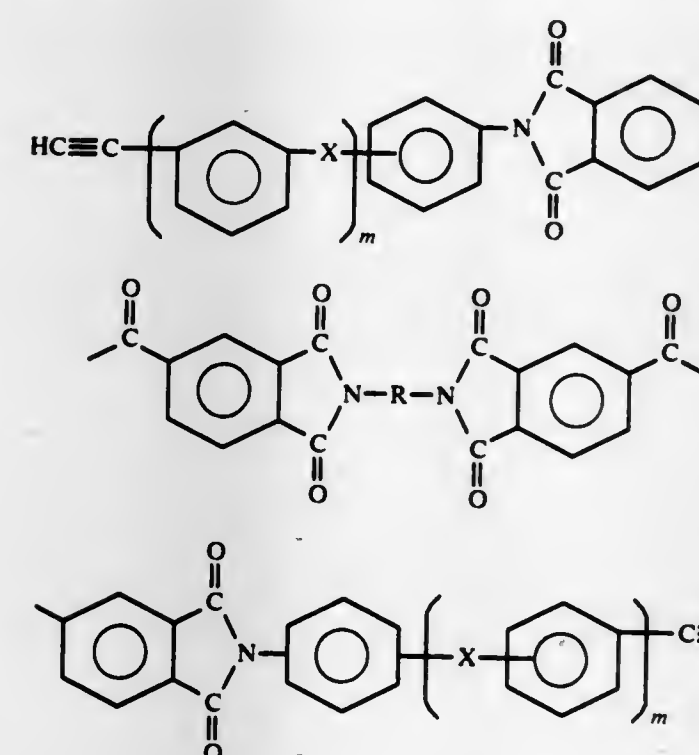
Filed Apr. 7, 1982, Ser. No. 366,445

Int. Cl.<sup>3</sup> C08F 238/00

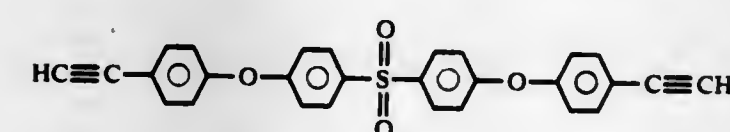
U.S. Cl. 526—262

8 Claims

1. A method for accelerating the cure rate of a resin selected from the group consisting of ethynylated polyimide oligomers having the structure:



wherein n=0 to 5, m=0 to 5, and X is O, S, CH<sub>2</sub>, CO or SO<sub>2</sub>; and ethynyl-terminated aromatic sulfones having the structure:



wherein at least some of the aromatic rings in said sulfones may optionally include substitution of at least some of the hydrogen atoms present thereon by a substituent selected from the group consisting of an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, a halogen and mixtures thereof, said method comprising thermally curing said resin in combination with an amount of a diethynylbiphenyl effective to accelerate the cure of said resin having the following structure:



wherein at least some of the aromatic rings in said diethynylbiphenyl may optionally include substitution of at least some of the hydrogen atoms present thereon by a substituent selected from the group consisting of an alkyl group of 1 to 4 carbon

atoms, an alkoxy group of 1 to 4 carbon atoms and mixtures thereof.

4,419,505

**CONTACT LENS COMPOSITION, ARTICLE AND METHOD OF MANUFACTURE**

Donald J. Ratkowski, Mesa, and Ping-Chang Lue, Scottsdale, both of Ariz., assignors to Paragon Optical, Inc., Mesa, Ariz.

Filed Jul. 14, 1982, Ser. No. 398,423

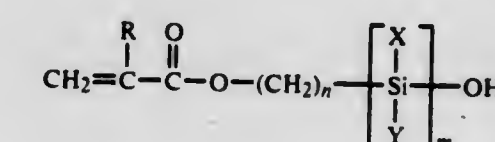
Int. Cl.<sup>3</sup> C08F 30/08

U.S. Cl. 526—279

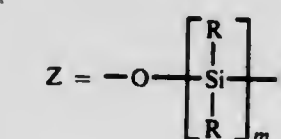
4 Claims

1. A copolymer composition, specially adapted for use in fabricating a contact lens, comprising a copolymer of copolymerized comonomers including:

- (a) about 1–95 parts by weight of a hydroxy ester silane of the structure:



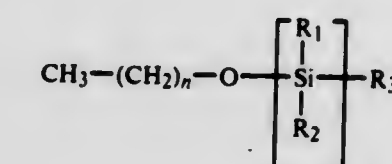
where

R=CH<sub>3</sub>—, H—X, Y=C<sub>1</sub>–C<sub>6</sub> Alkyl, phenyl, Z

n=1–3

m=1–5 and

- (b) an alkyl-alkoxy silane of the structure



where

R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub>=C<sub>1</sub>–C<sub>6</sub> Alkyl

n=an integer from 1–3,

said alkyl-alkoxy silane being present in an amount of 0 parts by weight to just below stoichiometric with respect to said hydroxy ester silane; and

- (c) about 99–5 parts by weight of a C<sub>1</sub>–C<sub>20</sub> alkanol ester of acrylic or methacrylic acid.

4,419,506

**RADIATION SENSITIVE POLYMER MATERIALS**

Kazuo Nate, Machida; Toshio Kobayashi, Tokyo, and Tokio Isogai, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,511

Claims priority, application Japan, Mar. 27, 1981, 56-44032

Int. Cl.<sup>3</sup> C08F 116/36, 212/00, 216/36

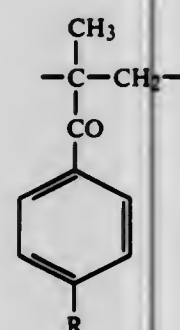
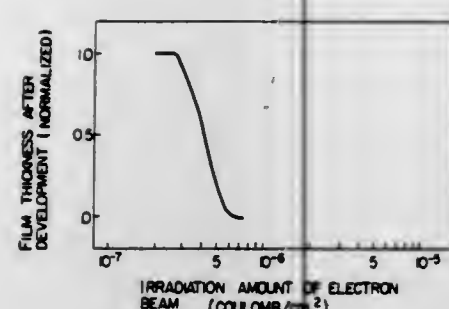
U.S. Cl. 526—316

17 Claims

1. A radiation sensitive polymer material for producing a positive type resist having improved radiation sensitivity which consists essentially of

- (a) 10 to 100% by mole of one or more repeating units of the formula:





wherein R is a hydrogen atom, a lower alkyl group, a lower alkoxy group, a halogen atom, or a dialkylamino group, and

(b) 90 to 0% by mole of an addition polymerizable repeating unit derived from a compound having a  $\text{CH}_2=\text{C}<$  group in the molecule.

4,419,507

## COPOLYESTER ADHESIVES

Bobby J. Sublett, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 342,612, Jan. 25, 1982. This application Oct. 27, 1982, Ser. No. 437,060

Int. Cl.<sup>3</sup> C08G 63/16; B32B 27/00

U.S. Cl. 528—302

15 Claims

1. A linear copolyester derived from 100 mole % of a dibasic acid component comprising about 40–100 mole % terephthalic acid and 100 mole % of a glycol component comprising about 40–100 mole % 1,4-butanediol, wherein about 20–120 mole %, based on a total of 200 mole % polymer, is derived from about (a) 0–60 mole % of a second acid selected from the group consisting of aliphatic dicarboxylic acids having 3–12 carbon atoms, (b) 0–60 mole % of diethylene glycol, or (c) 20–120 mole % of a combination of said second acid and diethylene glycol,

said copolyester characterized by having a melting point of about 40°–190° C., a glass transition temperature of about –20° C. to about 40° C., a heat of fusion of not less than 1.0 calorie per gram, and a crystallization half time of less than 10 minutes at maximum crystallization temperature.

4,419,508

## 20-DIHYDRO-20-DEOXY-23-DEMYCINOSYLTYLOSIN AND PROCESS FOR ITS PRODUCTION

Richard H. Baltz; Herbert A. Kirst; Gene M. Wild, all of Indianapolis, Ind., and Eugene T. Seno, Norwich, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 205,539, Nov. 10, 1980, Pat. No. 4,304,856.

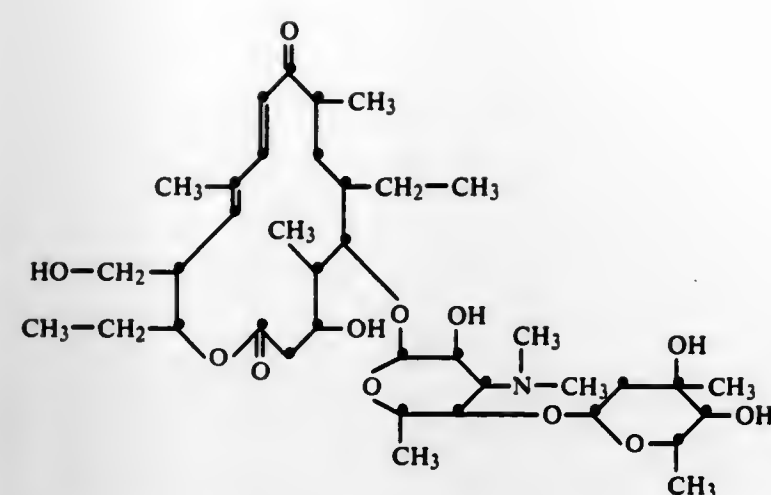
This application Sep. 28, 1981, Ser. No. 305,930

Int. Cl.<sup>3</sup> C07H 17/08; C12P 19/62

U.S. Cl. 536—7.1

33 Claims

1. A compound selected from the group consisting of (1) 20-dihydro-20-deoxy-23-demycinostylosin which has the structure:



and (2) the acid addition salts of 20-dihydro-20-deoxy-23-demycinostylosin.

4,419,509

## PROCESS FOR DE-CYANOETHYLATING BLOCKED NUCLEOTIDES

Hansen M. Hsiung, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 24, 1981, Ser. No. 295,421

Int. Cl.<sup>3</sup> C07H 15/12, 17/00

U.S. Cl. 536—27

8 Claims

1. A process for selectively removing a  $\beta$ -cyanoethyl blocking group from the phosphate moiety of a nucleotide or polynucleotide, which comprises treating said nucleotide or polynucleotide with a primary amine having from 3 to 5 carbon atoms.

4,419,510

## METHOD FOR CONTROLLING CELLULOSE ETHERIFICATION REACTION

Timothy Thomson, and Ferman Peters, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 30, 1982, Ser. No. 403,898

Int. Cl.<sup>3</sup> C08B 11/00, 11/02

U.S. Cl. 536—84

4 Claims

1. A method for controlling the reaction for making cellulose ether compounds from cellulose and an etherifying agent comprising the steps of:

- combining cellulose with an alkylene oxide and alkyl halide in a reactor wherein an etherification reaction is initiated which includes a vapor phase,
- periodically measuring the quantity of at least one of the reactants or products in the vapor phase of the reactor and therewith determining the rate of the etherification reaction taking place, and
- regulating the reaction temperature continuously while the reaction is taking place by using the rate of reaction determined in step (b) to determine the amount of heating or cooling needed for the reactor.

4,419,511

## PROCESS FOR THE PREPARATION OF TRIMETHINE DYESTUFFS

Roderich Raue, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Del.X

Filed Jan. 28, 1982, Ser. No. 344,262

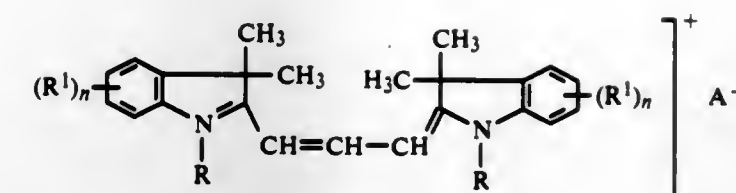
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105778

Int. Cl.<sup>3</sup> C09B 23/06

U.S. Cl. 542—471

5 Claims

1. A process for the preparation of trimethine dyestuffs of the formula



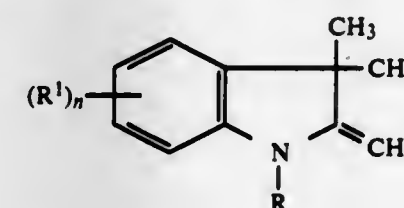
wherein

R represents a C<sub>1</sub>- to C<sub>4</sub>-alkyl radical,

R<sup>1</sup> represents hydrogen, C<sub>1</sub>- to C<sub>4</sub>-alkyl, benzyl, cyclohexyl, C<sub>1</sub>- to C<sub>4</sub>-alkoxy, benzyloxy, phenoxy, halogen, trifluoromethyl, acetylaminio, carboxylic acid C<sub>1</sub>- to C<sub>4</sub>-alkyl esters, carbonamide which may be substituted by C<sub>1</sub>- to C<sub>4</sub>-alkyl and/or phenyl, C<sub>1</sub>- to C<sub>4</sub>-alkylsulfonyl, phenylsulfonyl, cyano, nitro, benzoxazol-2-yl, benzimidazol-2-yl, benzthiazol-2-yl or sulphonamide which may be monosubstituted or disubstituted by C<sub>1</sub>- to C<sub>4</sub>-alkyl, or two radicals R<sup>1</sup> represent a fused benzene ring,

n denotes 1 to 4 and

A<sup>-</sup> denotes an anionic radical, and wherein the aliphatic and aromatic radicals can carry further nonionic radicals, characterized in that first an alkali metal salt of formic acid is reacted with a mixture of acetic acid and acetic anhydride and thereafter the product is reacted with indoline compounds of the formula



in which R, R<sup>1</sup> and n have the abovementioned meaning.

4,419,512

## N-SUBSTITUTED

POLYALKYLPIPERIDINE-4-SPIROOXAZOLONES  
Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,647

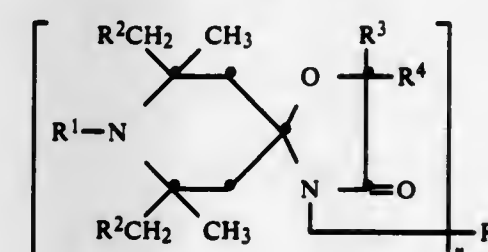
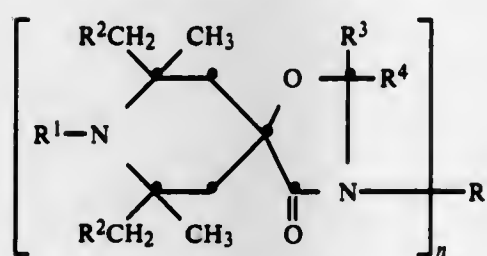
Claims priority, application Switzerland, Oct. 15, 1981, 6600/81

Int. Cl.<sup>3</sup> C07D 498/10, 498/20

U.S. Cl. 544—70

3 Claims

1. A compound of the formula Ia or Ib



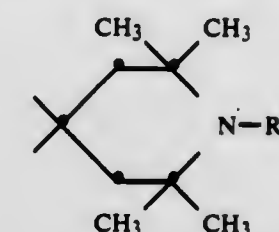
wherein

n is 1 or 2;

R<sup>1</sup> is C<sub>2</sub>-C<sub>30</sub>alkanoyl, C<sub>3</sub>-C<sub>20</sub>alkenyl, —CH<sub>2</sub>CN,

—CO—N(R<sup>6</sup>)(R<sup>7</sup>), C<sub>7</sub>-C<sub>11</sub>aroyl, C<sub>8</sub>-C<sub>14</sub>arylalkanoyl or C<sub>8</sub>-C<sub>20</sub>alkylaroyl;

R<sup>2</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub>alkyl; each of R<sup>3</sup> and R<sup>4</sup> independently of the other is hydrogen, C<sub>1</sub>-C<sub>30</sub>alkyl, unsubstituted or chlorine- or alkyl-substituted C<sub>6</sub>-C<sub>10</sub>aryl, unsubstituted or alkyl-substituted C<sub>7</sub>-C<sub>11</sub>aralkyl, or R<sup>3</sup> and R<sup>4</sup>, together with the carbon atom to which they are attached, form a cycloalkane or alkylcycloalkane ring containing 5 to 18 carbon atoms, or a group of the formula



R<sup>5</sup>, when n is 1, is C<sub>1</sub>-C<sub>30</sub>alkyl, C<sub>3</sub>-C<sub>20</sub>alkenyl, unsubstituted or alkyl-substituted C<sub>7</sub>-C<sub>11</sub>aralkyl, or is C<sub>5</sub>-C<sub>12</sub>cycloalkyl, C<sub>2</sub>-C<sub>18</sub>alkanoyl, C<sub>3</sub>-C<sub>18</sub>alkenoyl, C<sub>7</sub>-C<sub>11</sub>aroyl, C<sub>8</sub>-C<sub>14</sub>arylalkanoyl or C<sub>8</sub>-C<sub>20</sub>alkylaroyl, or

R<sup>5</sup>, when n is 2, is C<sub>2</sub>-C<sub>30</sub>alkylene, C<sub>2</sub>-C<sub>30</sub>alkenylene or C<sub>8</sub>-C<sub>18</sub>arylenedialkylene;

R<sup>6</sup> is hydrogen, C<sub>1</sub>-C<sub>18</sub>alkyl, C<sub>5</sub>-C<sub>8</sub>cycloalkyl, C<sub>7</sub>-C<sub>15</sub>aralkyl or C<sub>6</sub>-C<sub>10</sub>aryl;

R<sup>7</sup> is C<sub>1</sub>-C<sub>18</sub>alkyl, C<sub>5</sub>-C<sub>8</sub>cycloalkyl, C<sub>7</sub>-C<sub>15</sub>aralkyl or C<sub>6</sub>-C<sub>10</sub>aryl; or

R<sup>6</sup> and R<sup>7</sup>, together with the nitrogen atom, form a pyrrolidine, piperidine, morpholine or piperazine ring; and

R<sup>8</sup> is hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>3</sub>-C<sub>5</sub>alkenyl, C<sub>3</sub>-C<sub>5</sub>alkynyl, unsubstituted or alkyl-substituted C<sub>7</sub>-C<sub>11</sub>aralkyl, C<sub>2</sub>-C<sub>8</sub>alkanoyl, C<sub>3</sub>-C<sub>18</sub>alkenoyl, —CH<sub>2</sub>CN or —CO—N(R<sup>6</sup>)(R<sup>7</sup>).

4,419,513

## ISOCYANATO-ISOCYANURATES, AND PROCESS FOR THE PRODUCTION THEREOF

Peter Breidenbach, Cologne; Manfred Bock, Leverkusen; Josef Pedain, Cologne, and Gerhard Mennicken, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1981, Ser. No. 296,677

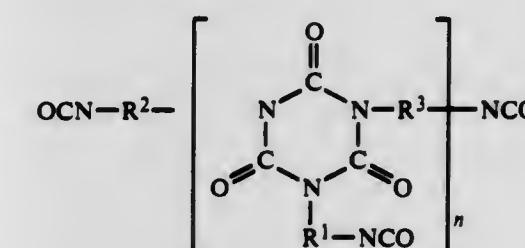
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033860

Int. Cl.<sup>3</sup> C07D 251/34

U.S. Cl. 544—222

13 Claims

1. Compounds or mixtures of compounds corresponding to the following general formula:



wherein

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup>, which may be the same or different, represent a hexamethylene radical or a radical obtainable by removing the isocyanate groups from 1-isocyanato-3,3,5-trimethyl-5-isocyanatomethyl-cyclohexane, such that (on statistical average) at least about 20% and at the most about 80% of the radicals R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> represent a hexamethylene radical; and

n represents an integer, or based on statistical average, a fractional number of from about 1 to 7.



4,419,514

**METHOD FOR CONVERTING CARBOXYLIC ACID GROUPS TO TRICHLOROMETHYL GROUPS**

Lennon H. McKendry, Midland, Mich.; Michael J. Ricks, Martinez, and Richard B. Rogers, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 180,064, Aug. 21, 1980, abandoned. This application May 18, 1981, Ser. No. 264,491

Int. Cl.<sup>3</sup> C07D 239/02, 211/72, 211/84, 213/26

U.S. Cl. 544—334

13 Claims

1. A method for converting a carboxylic acid group on the ring of an aryl or nitrogen heteroaromatic compound to a trichloromethyl group which comprises contacting said aryl or nitrogen heteroaromatic compound with a phenylphosphonic dichloride and phosphorus pentachloride in a ratio of from about 0.01:1 to about 10:1 for a time and at a temperature sufficient to carry out the conversion of the carboxylic acid group to a trichloromethyl group.

4,419,515

**TWO STAGE PROCESS FOR PREPARING 2,6-PYRIDINEDICARBOXYLIC ACID**

Giovanni Ghelli, Savona; Enrico Bruschi, and Gino Agnese, both of Genoa, all of Italy, assignors to Luigi Stoppani S.p.A., Milan, Italy

Continuation of Ser. No. 167,222, Jul. 9, 1980, abandoned, which is a continuation of Ser. No. 965,037, Nov. 30, 1978, Pat. No. 4,237,301. This application Jul. 13, 1981, Ser. No. 283,082

Claims priority, application Italy, Dec. 1, 1977, 30273 A/77

Int. Cl.<sup>3</sup> C07F 11/00; C07D 213/55

U.S. Cl. 546—5

7 Claims

1. An intermediate molar addition compound prepared by oxidation of 2,6-dimethyl-pyridine, the process comprising the step of reacting at a temperature of from about 70°–115° C. and at atmospheric pressure in a homogeneous phase an acid solution of 2,6-dimethyl-pyridine with a solution of a soluble salt of hexavalent chromium having a concentration based on CrO<sub>3</sub> to provide from about a 10–100% stoichiometric excess to form said addition compound in insoluble form, and recovering said addition compound.

4,419,516

**ANTIVIRAL IMIDAZO- AND TRIAZOLO-PYRIDINES**

Peter H. L. Wei, Springfield, and Stanley C. Bell, Penn Valley, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

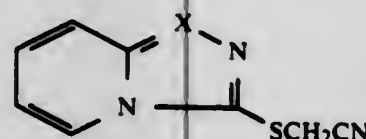
Filed Jun. 16, 1982, Ser. No. 388,805

Int. Cl.<sup>3</sup> C07D 471/04

U.S. Cl. 546—119

3 Claims

1. A compound having the formula



wherein X is CH or N.

4,419,517

**4A-ARYL-TRANS-DECAHYDROISOQUINOLINES**

David R. Brittelli, Nottingham, Pa., and William C. Ripka, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

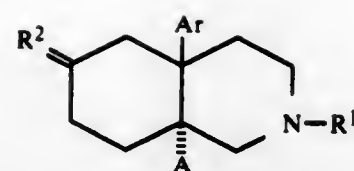
Continuation-in-part of Ser. No. 365,843, Jun. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 273,806, Jul. 20, 1972, abandoned. This application Apr. 8, 1975, Ser. No. 566,089

Int. Cl.<sup>3</sup> C07D 217/14

U.S. Cl. 546—144

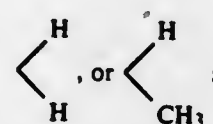
22 Claims

1. A compound of the formula



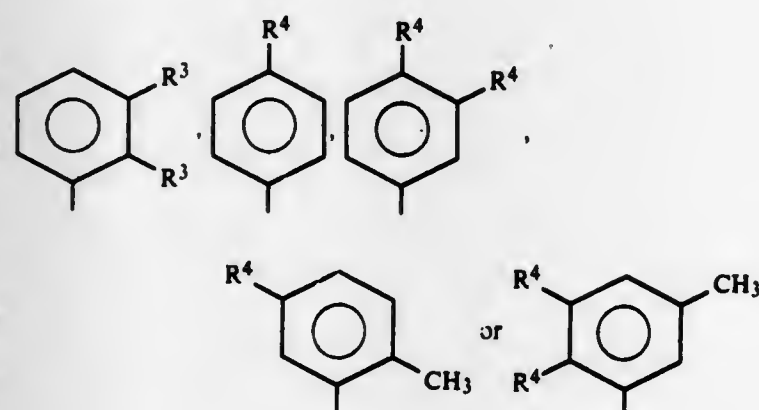
wherein

R<sup>1</sup> is C<sub>1</sub>–C<sub>6</sub> alkyl or cycloalkylmethyl of the formula —CH<sub>2</sub>OH<(CH<sub>2</sub>)<sub>n</sub> in which n is an integer in the range 2–5; R<sup>2</sup> is



A is hydrogen or hydroxyl;

Ar is



in which

R<sup>3</sup> is hydrogen, hydroxyl, methoxyl or acetoxyl; R<sup>4</sup> is hydroxyl, methoxyl or acetoxyl; and jointly, two of R<sup>3</sup> or of R<sup>4</sup> situated on adjacent carbons may be combined to form a divalent methylenedioxy (—OCH<sub>2</sub>O—) group; provided that when R<sup>1</sup>=methyl, R<sup>3</sup> may not both be hydrogen.

4,419,518

**1,4-DIHYDROPYRIDINE DERIVATIVES**

Masato Kamibayashi, Hasuda; Shinji Tsuchiya, Washimiya, and Kozo Hiratsuka, Tsurugashima, all of Japan, assignors to Tokyo Tanabe Co. L.T.D., Japan

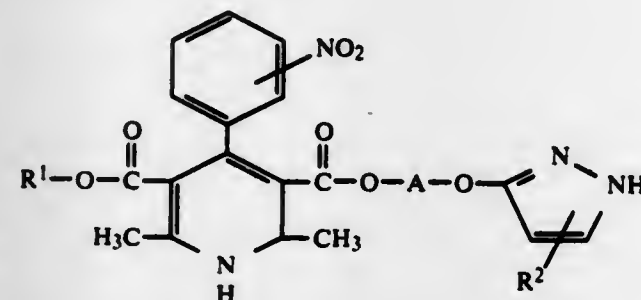
Filed Jul. 26, 1982, Ser. No. 402,124

Int. Cl.<sup>3</sup> C07D 401/12

U.S. Cl. 546—279

11 Claims

1. A 1,4-dihydropyridine derivative of the following general formula [I]:



wherein R<sup>1</sup> represents an alkyl group having from 1 to 4 carbon atoms or an alkoxyalkyl group having from 3 to 6 carbon atoms, R<sup>2</sup> represents an alkyl group having from 1 to 8 carbon atoms, and A represents a hexamethylene group which may optionally be substituted by one or two alkyl groups having from 1 to 3 carbon atoms.

4,419,519

**CONTINUOUS PREPARATION OF PHTHALIMIDE**

Gerhard Kilpper, Battenberg, and Johannes Grimmer, Ludwigs-hafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 119,958, Feb. 8, 1980. This application Jun. 29, 1981, Ser. No. 278,697

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911245

Int. Cl.<sup>3</sup> C07D 209/48

U.S. Cl. 548—480

11 Claims

1. A concurrent, two stage process for the continuous preparation of phthalimide wherein phthalic anhydride and ammonia are reacted in stoichiometric ratios, which comprises:

(a) turbulently mixing phthalic anhydride and ammonia, in the ratios of 1.0 to 1.1 moles of ammonia per mole of phthalic anhydride, in turbulent mixing apparatus, wherein the degree of mixing is at least equivalent to that achieved by continuously passing both molten phthalic anhydride at a flow velocity of from 0.005 to 15 meters per second and ammonia at a flow velocity of from 0.1 to 50 meters per second into ejector mixers, the temperature in said mixing apparatus being from 135° to 300° C., the pressure within said mixing apparatus being from 1 to 50 bar, the ratio of ammonia to phthalic anhydride being 1 to 1.1 mole of ammonia per mole of phthalic anhydride, said phthalic anhydride and ammonia being both thoroughly mixed in said apparatus and reacted to the extent that from about 50 to 80% by weight of the phthalic anhydride is reacted within the mixing apparatus; and thereafter

(b) passing the reaction mixture from the mixing apparatus into and through a reaction tube at a flow velocity of from 0.01 to 100 meters per second, the temperature within said reaction tube being from 235° to 300° C. and the pressure within said reaction tube being from 1 to 50 bar, the reaction between the phthalic anhydride and the ammonia being completed within the reaction tube in a residence time of 0.1 to 600 seconds.

4,419,520

**HYDROXYALKYL- AND ALKOXYALKYL-TRIAZOLIDINE-3,5-DIONE COMPOUNDS AND THEIR PROCESSES FOR THEIR PREPARATION**

Ludwig Rottmaier, Odenthal, and Rulolf Merten, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,369

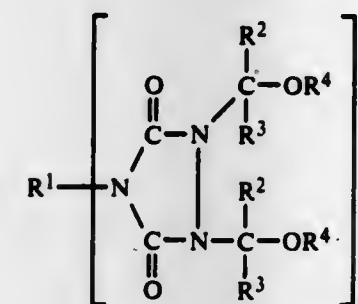
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027596

Int. Cl.<sup>3</sup> C07D 249/12

U.S. Cl. 548—264

20 Claims

1. A compound of the formula

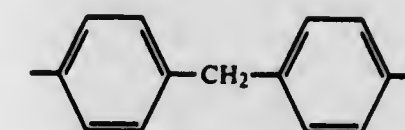
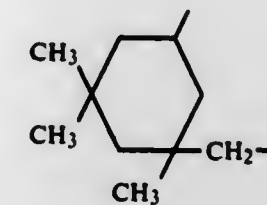
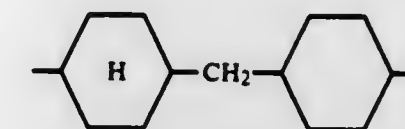


wherein

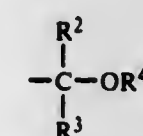
m is an integer of from 1 to 5;

R<sup>1</sup> is an aliphatic group having 1 to 20 carbon atoms; a mono- or poly-cycloaliphatic group having from 5 to 21 carbon atoms; an araliphatic group having 7 to 17 carbon atoms; an aromatic group having 6 to 20 carbon atoms;

one of the aforesaid groups substituted by halogen, C<sub>1</sub>–C<sub>10</sub>-alkoxy or C<sub>1</sub>–C<sub>10</sub>-alkoxycarbonyl;



or, in the case where m is 1, R<sup>1</sup> can also be



R<sup>2</sup> and R<sup>3</sup>, independently of each other, are each hydrogen or an aliphatic group having 1 to 10 carbon atoms, and R<sup>4</sup> is hydrogen, an aliphatic group having 1 to 20 carbon atoms or a mono- or polycycloaliphatic group having 5 to 10 carbon atoms or an araliphatic group having 7 to 17 carbon atoms.

4,419,521

**6-HALO-4-CHROMANAMINES USEFUL AS INTERMEDIATES TO MAKE CHIRAL HYDANTOINS**

Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

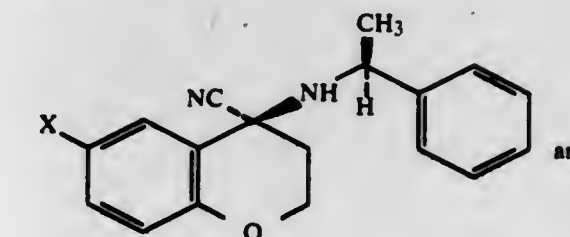
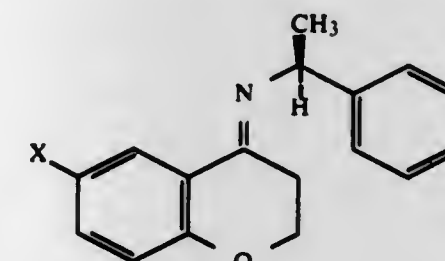
Division of Ser. No. 320,051, Nov. 12, 1981, Pat. No. 4,348,576, which is a continuation-in-part of Ser. No. 226,434, Jan. 19, 1981, abandoned, which is a division of Ser. No. 135,137, Mar. 28, 1980, Pat. No. 4,286,098. This application Jun. 17, 1982, Ser. No. 389,253

Int. Cl.<sup>3</sup> C07D 311/02

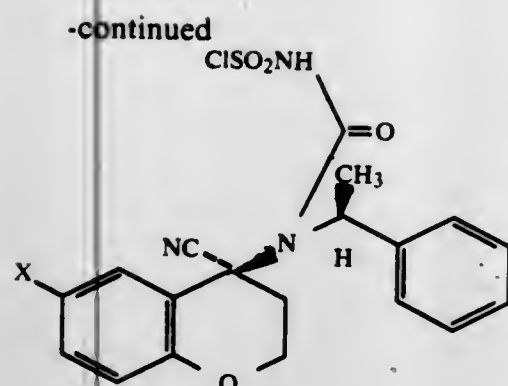
U.S. Cl. 549—404

10 Claims

1. A compound selected from the formula







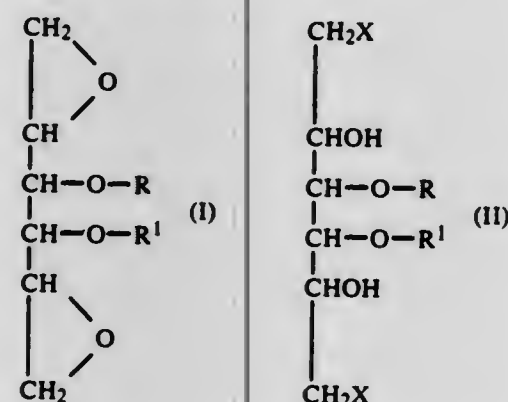
wherein X is chloro or fluoro.

**4,419,522**  
**HEXITOLS CONTAINING FREE CARBOXY GROUPS AND A PROCESS FOR THE PREPARATION THEREOF**  
 Ilona Elekcs; Laszlo Inattoris; Kalman Medzihradzky; Laszlo Ötvös; Hedvig Medzihradzky-Schweiger; Katalin De Gleria; Janos Sugar; Somfai Relle; Sandor Eckhardt; Ivan Hidy, and Sandor Kerpel-Fronius, all of Budapest, Hungary, assignors to Chinoi Gyogyszer Vegyeszeti Termek Gyara Rt., Budapest, Hungary

Filed Oct. 26, 1981, Ser. No. 315,182  
 Claims priority, application Hungary, Nov. 4, 1980, 2649/80  
 Int. Cl.<sup>3</sup> C07D 303/16; C07C 69/657, 69/653, 69/65, 69/635, 69/63; A61K 31/335

U.S. Cl. 549—557

1. A hexitol of the formula (I) or (II),



wherein

the hexitol skeleton is dulcitol, mannitol or iditol, X represents halogen, R is a saturated or unsaturated C<sub>4-10</sub> alkylcarbonyl group which also contains a free carboxy group, and R<sup>1</sup> is hydrogen, a saturated or unsaturated C<sub>4-10</sub> alkylcarbonyl group which also contains a free carboxy group, a saturated or unsaturated C<sub>2-10</sub> alkylcarbonyl group, a saturated or unsaturated C<sub>4-10</sub> alkylcarbonyl group which also contains an alkoxycarbonyl group, or a saturated or unsaturated C<sub>8-10</sub> aralkylcarbonyl group, or a pharmaceutically acceptable salt thereof.

**4,419,523**  
**N-(BENZENESULFONYL) CARBAMATES-HERBICIDAL ANTIDOTES**

Ferenc M. Pallos, Walnut Creek, and Edmund J. Gaughan, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 108,889, Dec. 31, 1979, Pat. No. 4,293,701, which is a division of Ser. No. 721,721, Sep. 13, 1976, Pat. No. 4,230,874, which is a continuation-in-part of Ser. No. 619,114, Oct. 2, 1975, abandoned. This application May 11, 1981, Ser. No. 262,576

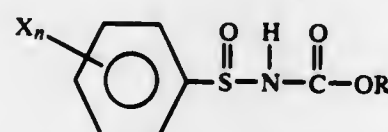
The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.<sup>3</sup> C07C 147/14

U.S. Cl. 560—12

1. Compounds according to the formula

5 Claims



in which X is hydrogen, bromo, chloro, methoxy, trifluoromethyl, and methyl; n is an integer from 1 to 3 inclusive, provided that when X is bromo, trifluoromethyl, or methoxy, n is 1; and R is selected from haloalkyl having 2 to 6 carbon atoms, inclusive, wherein halo is chloro or fluoro from 1 to 6, inclusive, and dialkylamino having a total of 2 to 8 carbon atoms, inclusive, provided that when X is trifluoromethyl and n is 1, then R can be alkyl having 1 to 4 carbon atoms, inclusive.

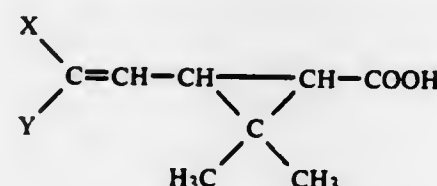
**4,419,524**  
**PROCESS FOR THE PREPARATION OF DIHALOVINYLCYCLOPROPANECARBOXYLIC ACIDS**  
 Ferenc Lindwurm; Jozsef Muskovits; Sandor Zoltan; Rezso Koltai; Rudolf Soos; Tivadar Puskas; Eva Somfai, and György Hidasi, all of Budapest, Hungary, assignors to Chinoi Gyogyszer Es Vegyeszeti Termek Gyara Rt, Budapest, Hungary

Filed Feb. 19, 1982, Ser. No. 350,424  
 Claims priority, application Hungary, Feb. 20, 1981, 411  
 Int. Cl.<sup>3</sup> C07C 69/743

U.S. Cl. 562—506

1. A process for the preparation of a carboxylic acid of the formula (I) having a given ratio of cis to trans isomers thereof

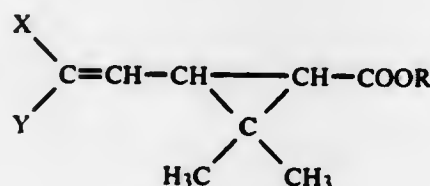
10 Claims



wherein

X and Y independently stand for halogen, which comprises the steps of:

(a) hydrolyzing a corresponding ester of the formula (II) having the same given ratio of cis to trans isomers thereof



wherein

R is alkyl having 1 to 6 carbon atoms, with a 2 to 50% by weight aqueous solution of an alkali metalhydroxide,

said alkali metal hydroxide present in an equivalent amount of 100% to 150% relative to the amount of the ester of the formula (II) present, in the presence of an alkali-resistant compound selected from the group consisting of sodium dodecyl benzenesulfonate, triacrylmethyl ammonium chloride, cetyl trimethyl ammonium bromide, and polyoxyethylene sorbitane monooleate, the concentration of said compound amounting to 0.01 to 5% of the reaction mixture;

- adding an aliphatic hydrocarbon having 5 to 10 carbon atoms to the reaction mixture containing the hydrolysis product of step (a);
- adjusting the pH of the reaction mixture to an acidic pH by addition of an acid thereto; and
- separating the free carboxylic acid of the formula (I) from the aliphatic hydrocarbon containing 5 to 10 carbon atoms.

**4,419,525**  
**RECOVERY AND REJUVENATION OF WACKER-TYPE CATALYSTS**

Tod K. Shioyama, and Jim J. Straw, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1982, Ser. No. 357,101

Int. Cl.<sup>3</sup> C07C 45/27, 45/34; B01J 31/40, 23/96

U.S. Cl. 568—401

5 Claims

1. A process for the recovery and rejuvenation for reuse of a catalyst useful for the oxidation of olefins to ketones which catalyst contains a palladium component, a heteropolyacid component, and a surfactant component following its use to catalyze the oxidation of an olefin to a ketone in a reaction zone to produce a reaction mixture which contains an organic phase and an aqueous phase, which process includes the essential steps of:

- removing the organic phase from the reaction mixture to leave the aqueous phase,
  - removing water from the aqueous phase until substantially dry catalyst solids remain,
  - adding water to the product of step (2) to yield a solution, and
  - recycling the solution of step (3) to the reaction zone.
2. The process of claim 1 which includes the step of (5) adjusting the pH of the solution from step (4) to a pH of about 0.5 to 3.0 before it is recycled to the reaction zone.
3. The process of any one of claims 1 or 2 wherein the catalyst also contains one or more boric acid components.

**4,419,526**  
**CATALYST AND REVERSE DISPROPORTIONATION PROCESS**

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 29, 1982, Ser. No. 403,254

Int. Cl.<sup>3</sup> C07C 5/09, 15/40

U.S. Cl. 585—435

13 Claims

1. A process for the reverse disproportionation of stilbene and ethylene which comprises contacting stilbene and ethylene at reverse disproportionation conditions with an activated catalyst containing catalytically-effective amounts of antimony, tungsten, and an alkali or alkaline earth component or compounds thereof supported on a carrier material to produce styrene.

**4,419,527**  
**CATALYST AND REVERSE DISPROPORTIONATION PROCESS**

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 29, 1982, Ser. No. 403,258

Int. Cl.<sup>3</sup> C07C 5/09, 15/40

U.S. Cl. 585—435

13 Claims

1. A process for the reverse disproportionation of stilbene and ethylene which comprises contacting stilbene and ethylene

at reverse disproportionation conditions with an activated catalyst containing catalytically-effective amounts of lead, tungsten, and an alkali or alkaline earth component or compounds thereof supported on a carrier material, to produce styrene.

**4,419,528**  
**REGIOSELECTIVE PREPARATION OF  $\alpha$ - OR  $\beta$ -NAPHTHOL**

George A. Olah, Beverly Hills, Calif., assignor to PCUK - Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Oct. 5, 1979, Ser. No. 82,182

Int. Cl.<sup>3</sup> C07C 37/60

U.S. Cl. 568—741

8 Claims

1. A process for the regioselective hydroxylation of naphthalene with hydrogen peroxide giving either  $\alpha$ - or  $\beta$ -naphthol in high isomeric purity between about 92 and 98+ % depending on the acid system employed to carry out the reaction which comprises reacting naphthalene with a molar excess of hydrogen peroxide in an acid system having an H<sub>0</sub> acidity function of -11 or less to produce  $\alpha$ -naphthol with an isomeric purity between about 92 and 98+ % or in a superacidic system having an H<sub>0</sub> acidity function in excess of -11 to produce  $\beta$ -naphthol with an isomeric purity between about 92 and 98+ %.

**4,419,529**  
**PROCESS FOR THE PREPARATION OF A 2-ALKYLPHENOL**

Arthur Steinmetz, Seelze, Fed. Rep. of Germany, assignor to Riedel-de Haen Aktiengesellschaft, Seelze, Fed. Rep. of Germany

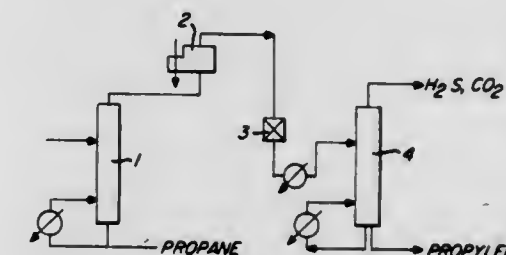
Filed Mar. 3, 1982, Ser. No. 354,308

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108265

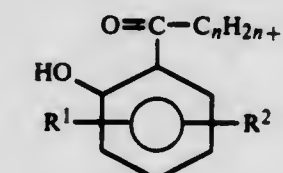
Int. Cl.<sup>3</sup> C07C 37/00, 39/06

U.S. Cl. 568—772

15 Claims



1. A process for the preparation of a 2-alkylphenol by reduction of a 2-acylphenol in the presence of a metallic catalyst, which comprises hydrogenating 2-acylphenol of the formula



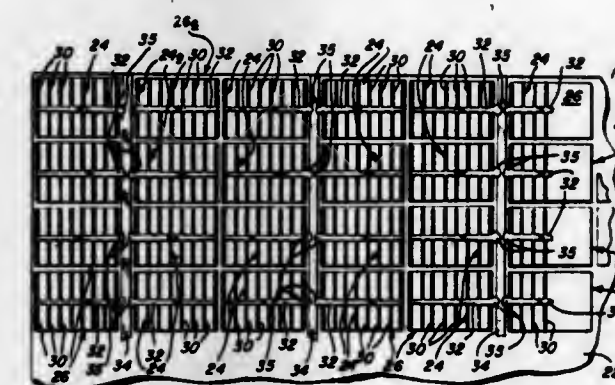
in which n represents an integer from 2 to 17 and R<sup>1</sup> and R<sup>2</sup> are identical or different and each denote a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxy group having 1 to 16 carbon atoms, an acyl or acyloxy group each having 2 to 10 carbon atoms, a dialkylamino group having a total of 2 to 14 carbon atoms or a hydrocarbon radical having 1 to 16 carbon atoms, at a temperature of 80° to 200° C. and in the presence of gaseous hydrogen under a pressure of 10 to 100 bars and in the presence of a catalytically effective amount of a base metal selected from the group consisting of copper, nickel and cobalt.



## ELECTRICAL

**4,419,530**  
**SOLAR CELL AND METHOD FOR PRODUCING SAME**  
 Prem Nath, Troy, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.  
 Filed Feb. 11, 1982, Ser. No. 347,779  
 Int. Cl.<sup>3</sup> H01L 31/06, 25/02, 31/18  
 U.S. Cl. 136—251

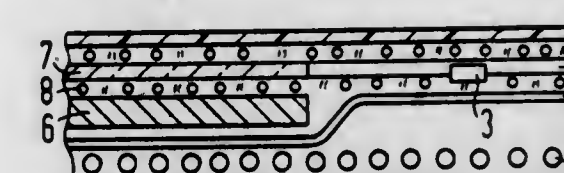
24 Claims



**4,419,531**  
**PHOTO-VOLTAIC SOLAR MODULE**  
 Josef Lang, Regensburg; Reinhard Hollaus, Obertraubling; Ulrike Reeh, Munich; Hans Denk, Gauting, and Reiner Harbrich, Helmstetten, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,144  
 Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129167; Oct. 23, 1981, 3142129  
 Int. Cl.<sup>3</sup> H01L 31/02  
 U.S. Cl. 136—251

18 Claims



1. A solar module having at least one solar cell embedded in synthetic resin and resting on a flexible supporting element, further comprising a sheet-like rigid element reinforcing the solar cell.

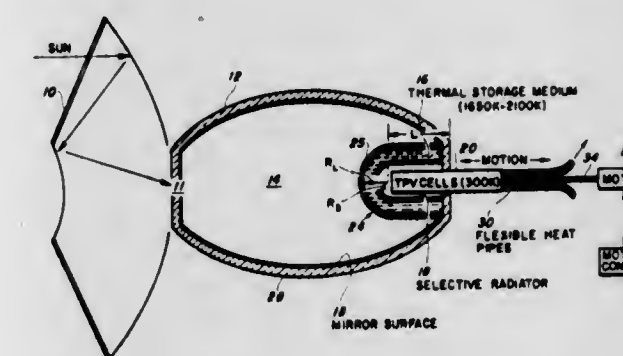
1. A method of fabricating improved photovoltaic devices, each photovoltaic device including: (a) a common electrically conductive substrate layer; (b) a semiconductor body deposited upon the substrate layer; and (c) a transparent, electrically conductive layer deposited atop the semiconductor body; the method including the steps of:

- dividing the semiconductor body into a plurality of portions, each portion being substantially electrically isolated from other portions;
- testing the electrical output of each isolated portion of the semiconductor body;
- connecting only those electrically operative isolated portions to an electrically conductive strip; the conductive strip providing an electrical contact associated with the semiconductor body; and
- providing an electrical contact on the substrate layer; whereby the overall efficiency of the photovoltaic device is improved by electrically connecting only those electrically operative portions of the semiconductor body.

14. An improved solar cell including: (a) a common electrically conductive substrate layer; (b) a semiconductor body deposited upon the substrate layer; and (c) a transparent electrically conductive layer deposited atop the semiconductor body; the solar cell comprising, in combination: a plurality of substantially electrically isolated small area portions into which the semiconductor body is divided, at least one small area portion being electrically inoperative; at least one electrically conductive strip; only electrically operative portions of the semiconductor body electrically connected to the at least one conductive strip, the at least one conductive strip providing an electrical contact associated with the semiconductor body; an electrical contact on the substrate layer; and an upper, electrically-insulating, light-admitting, protective layer and a lower electrically-insulating layer, the solar cells encapsulated between the upper and lower layers, so that only electrically operative portions of the semiconductor body are electrically connected, thereby improving the overall efficiency of the solar cell.

**4,419,532**  
**THERMOPHOTOVOLTAIC POWER SOURCE**  
 James G. Severns, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
 Filed Jul. 30, 1982, Ser. No. 403,838  
 Int. Cl.<sup>3</sup> H01L 31/04  
 U.S. Cl. 136—253

15 Claims



1. A thermophotovoltaic power source comprising: a light energy concentrator for collecting light energy and concentrating it in a small area, a thermal storage vessel including a thermal storage material; a containment vessel for holding said thermal storage material therein, said containment vessel being disposed within a portion of said thermal vessel, a light aperture for introducing light energy from said concentrator into said thermal vessel so that it impinges on said containment vessel; a hot selective band radiating layer disposed on a portion of the surface of said containment vessel for radiating in a small predetermined wavelength band when heated by said thermal storage material; and an array of photovoltaic cells positioned so that it may be disposed adjacent said selective radiating layer, said cells having a maximum spectral response approximating the predetermined wavelength band of said selective radiating layer; and means for moving said photovoltaic array into and out of adjacency with said selective radiating layer.



4,419,533

# PHOTOVOLTAIC DEVICE HAVING INCIDENT RADIATION DIRECTING MEANS FOR TOTAL INTERNAL REFLECTION

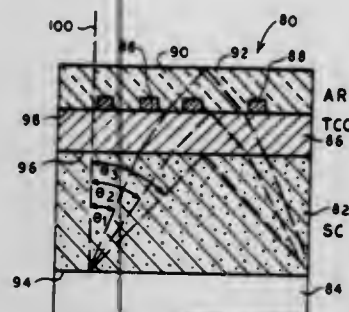
Wolodymyr Czubytyj, Hamtramck; Rajendra Singh, Clawson; Joachim Doehler, Union Lake; David D. Allred, Troy, and Jaime M. Reyes, Birmingham, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 3, 1982, Ser. No. 354,285

Int. Cl.<sup>3</sup> H01L 31/06

U.S. Cl. 136—259

19 Claims



1. In a photovoltaic device formed from semiconductor material including at least one active region upon which incident radiation can impinge to produce charge carriers, the improvement comprising a random bulk reflector for directing at least a portion of said incident radiation through said at least one active region at an angle sufficient to cause said directed radiation to be substantially confined within said photovoltaic device.

4,419,534

# END CAP FOR COMMUNICATION CABLES

Liam D. Dwyer, Corinth, Miss., assignor to American Sawmill Machinery Company, Corinth, Miss.

Filed Nov. 30, 1982, Ser. No. 445,662

Int. Cl.<sup>3</sup> H02G 1/08, 15.23

U.S. Cl. 174—10

9 Claims



1. An end cap for communication cables having multiple conductors comprising a cylindrical sleeve open at one end and dimensioned to receive an end of the cable, the sleeve being circumferentially crimpable to constrict the cable and form a gas tight seal therewith, a closure at the other end of the sleeve, a spigot extending axially within the sleeve from the closure and provided with at least one portion intermediate its length which is of enlarged cross section relative to the axially adjacent portions, and means in the end closure for introducing pressurized gas into the sleeve, wherein at least one continuous passageway for gas, extending substantially the length of the spigot and protected from obstruction by conductors of the cable, is formed in at least one longitudinally extending channel defined in the surface of the spigot.

4,419,535

# MULTI-CABLE CONDUIT FOR FLOORS AND WALLS

Robert J. O'Hara, 2809 Covert Rd., Glenview, Ill. 60025

Filed Jul. 31, 1981, Ser. No. 288,767

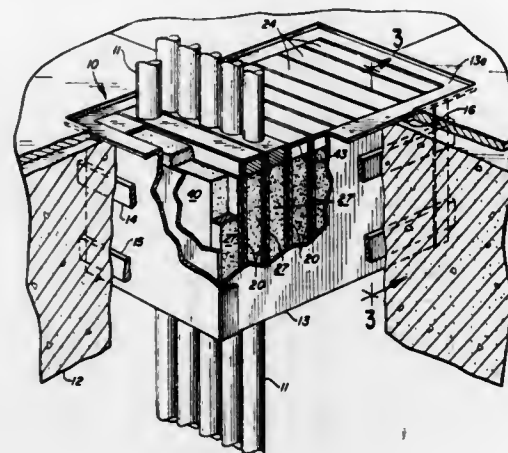
Int. Cl.<sup>3</sup> H02G 3/22

U.S. Cl. 174—48

27 Claims

1. A multi-cable conduit comprising a housing having openings at opposite ends thereof, a plurality of partitions dividing the interior of said housing into a plurality of compartments extending between said openings and communicating therewith, each of said

compartments being sized to receive a multiplicity of cables extending through the compartment and the open ends of the housing, said compartments also being elongated in a direction transverse to the axes of said cables, means for supporting said partitions within said housing, a lining of intumescent material on the walls of each of said compartments for expanding into and sealing each of said compartments in response to a fire,



a non-flammable insert for filling any of said compartments, or portions thereof, that are not filled with cables, and sealing means forming a seal between the walls of each compartment and any cables therein, said sealing means being located at at least one of the open ends of each compartment, to limit the transmission of smoke through said compartments prior to expansion of said intumescent material.

4,419,536

# MEANS FOR AFFIXING AN ELECTRONIC COMPONENT ON A SUPPORTING MEDIUM

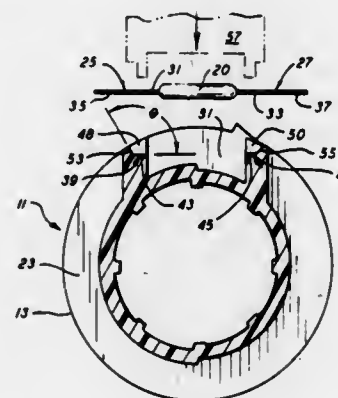
Richard F. Doyle, Corfu; Thomas E. Gausman, Batavia, and Edward T. Myers, Tonawanda, all of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Continuation of Ser. No. 87,356, Oct. 23, 1979, abandoned. This application Mar. 30, 1982, Ser. No. 363,368

Int. Cl.<sup>3</sup> H01F 27/40

U.S. Cl. 174—52 R

5 Claims



1. A supporting medium for receiving an electronic component having a body portion and a pair of substantially opposed leads extending outward from the body portion in a substantially axial manner, each of said leads having a proximal portion and a distal portion relative to the body portion, said supporting medium comprising a bobbin of non-conductive material having a generally circular disc-like configuration, and having a peripheral portion for receiving an electronic component, slot means formed in the peripheral portion of the bobbin, said slot means including a pair of sidewalls disposed generally co-planar with the bobbin, each sidewall having

4,419,538

# UNDER-CARPET COAXIAL CABLE

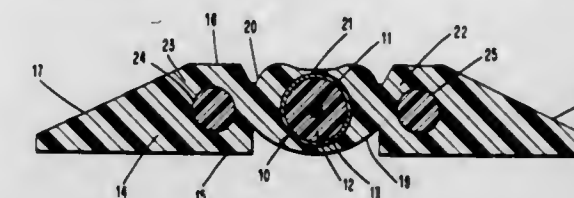
George A. Hansell, III, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 13, 1981, Ser. No. 321,104

Int. Cl.<sup>3</sup> H01B 7/08

U.S. Cl. 174—117 F

9 Claims



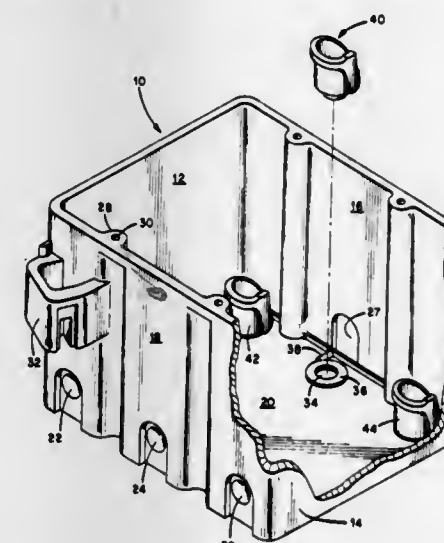
4,419,537  
ELECTRICAL WIRING BOX ARRANGEMENTS  
Oral F. Leep, Vienna; Vernon D. Dellinger, Parkersburg, both of W. Va., and Claude J. Bauer, Belpre, Ohio, assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 17, 1982, Ser. No. 359,346

Int. Cl.<sup>3</sup> H02G 3/08

U.S. Cl. 174—65 R

11 Claims



1. An electrical wiring box arrangement including a wiring box and cable clamp device;

said wiring box comprising:

a wall structure defining front-to-rear walls and a rear wall therebetween which in combination define a chamber having a forward facing opening;

said wall structure including a first wall provided with a frangible knockout region for providing a knockout opening adapted to receive a non-metallic sheathed cable, and a second wall forming an angle with said first wall, said second wall provided with attachment receiving means for rotatably mounting said cable clamp device to said second wall adjacent to said knockout region in said first wall;

said cable clamp device comprising:

a generally cylindrical member having a base portion provided with attachment means for coaxing with said attachment receiving means of said wiring box wall structure to rotatably mount said cable clamp member to said box wall structure;

a cable engaging surface; and

means for urging, generally in a direction along the axis of said cylindrical member, said cable engaging surface against an electrical cable inserted through said knockout opening in said wiring box wall structure; whereby a non-metallic sheathed electrical cable passing through said knockout opening of said wiring box having said cable clamp device attached thereto passes between the edge of the wall structure defining said knockout opening and the cable engaging surface of said clamp member, and upon rotation of said clamp member is urged against said edge, securing said cable.

1. A thin, flat electrical cable of the type having opposing generally flattened surfaces, the cable comprising:

(a) at least one elongated signal conductor;

(b) at least two elongated stress-bearing members longitudinally disposed parallel to, spaced apart from, and on opposite sides of, said signal conductor, said two members for bearing stresses resulting from a compressive load applied against the cable opposing surfaces; and

(c) a unitary, electrically insulative, pliable jacket means for fixing the transverse relationship of said signal conductor and said stress-bearing members, said means also for affording independent longitudinal movement to said stress-bearing members relative to said jacket means, said jacket means separately enclosing said signal conductor and said stress-bearing members.

4,419,539

# APPARATUS FOR PREVENTING NOISE GENERATION IN AN ELECTRICAL DIGITIZER DUE TO GENERATION OF OPTICAL SIGNALS

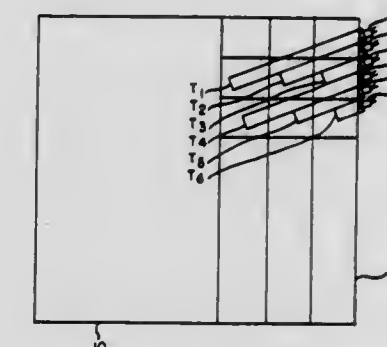
David M. Arrigoni, Los Gatos, Calif., assignor to Arrigoni Computer Graphics, Los Gatos, Calif.

Filed Oct. 24, 1980, Ser. No. 200,310

Int. Cl.<sup>3</sup> G08C 21/00; G02B 5/14

U.S. Cl. 178—18

12 Claims



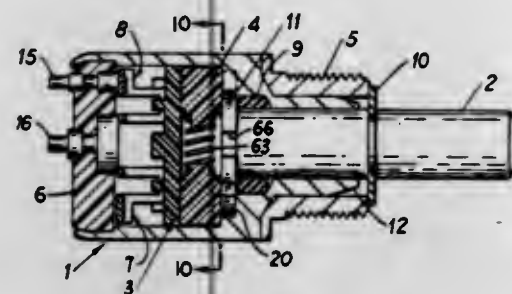
1. In a digitizer having a menu section for selection of desired functions by a switch stylus/cursor at various locations in said section, an optical transmission means comprising a solid light pipe capable of transmitting light having a first end and a second end, including means situate outside said digitizer for emitting an optical signal into said first end; said light pipe including said second end extending within the menu section of said digitizer; means for reflecting said optical signal at said second end; and an emission region located on an exterior surface of said light pipe, wherein said optical signal reflected from said means for reflecting is transmitted through said emission region from the interior of said light pipe to illuminate a particular location on said menu section.







actuator means for enabling rotation of said rotor from outside the housing, said rotor including a first end in opposed facing relation with said stationary contacts and containing two ledge portions, each of said two ledge portions being recessed between walls of a generally H shaped projection, each of said ledge portions including an elongate generally rectangular key wall extension and a gutter adjacent the ends of each said key wall extension,



the other end of the rotor containing a generally round neck member projection having two diametrically disposed keyway slots therein, and said bridging contact including two spring arms which meet at a vertex in the form of a convex boss which includes a contact tab portion, said arms extending outwardly and downwardly from the convex boss, said bridging contact having a keyway opening therein dimensioned to receive said key wall extension of the rotor.

#### 4,419,547 IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE

Iwao Imai, and Masazumi Sone, both of Yokosuka, Japan, assignors to Nissan Motor Company, Ltd., Yokohama and Hitachi, Ltd., Tokyo, both of, Japan

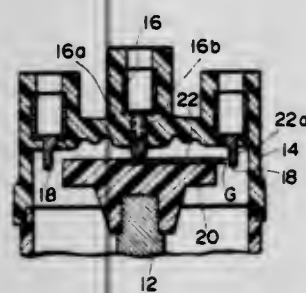
Filed Feb. 8, 1982, Ser. No. 346,744

Claims priority, application Japan, Feb. 25, 1981, 56-25408; Jul. 27, 1981, 56-116384; Aug. 3, 1981, 56-120711

Int. Cl.<sup>3</sup> H01H 19/00

U.S. Cl. 200—19 R

14 Claims



1. In an ignition distributor for an internal combustion engine comprising:  
a distributor cap;  
an ignition distributor rotor rotatable about its axis within said distributor cap;  
said distributor cap having a center electrode extending along the rotor axis of rotation and a plurality of cap electrodes circumferentially disposed about the rotor axis of rotation;  
said ignition distributor rotor comprising a rotor main body of an electrically insulating material rotatable about the rotor axis of rotation and a rotor electrode supported by said rotor main body;  
said rotor electrode having a discharge face which, when said ignition distributor rotor is rotated with said rotor main body, traces a circular path inwardly from the circumferentially disposed distributor cap electrodes by a predetermined distributor gap, said rotor electrode having a surface area in contact with said center electrode;  
the improvement wherein either said rotor electrode or each

of said cap electrodes is made of semiconductive alumina ceramics comprising a resistance element of alumina and a semiconductive element of titania.

#### 4,419,548 TIMING DEVICE AND METHOD

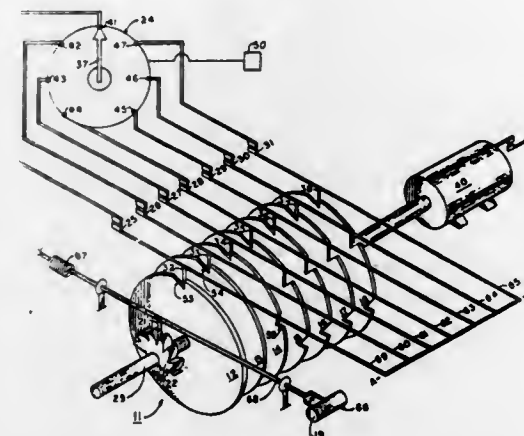
Paul D. Hales, 226 Woodbine St., High Point, N.C. 27264

Filed Sep. 7, 1982, Ser. No. 415,132

Int. Cl.<sup>3</sup> H01H 43/00

U.S. Cl. 200—38 R

6 Claims



1. A timing device for supplying electric current to an appliance or the like during a selected cycle comprising: cam driving means, said cam driving means including solenoid means, a rod member, said rod member being affixed at one end to said solenoid means, resilient means, said resilient means being joined to the other end of said rod member, cam means, said cam means including a cam wheel means having a notched outer surface, said cam driving means for only initially rotating said cam means, contact support means, said contact support means having contact means, selector means, said selector means communicating with said contact means and motor means, said motor means joined to said cam means for continuing the rotation of said cam means after initial rotation during the remainder of the selected cycle.

#### 4,419,549 OPERATING MECHANISM FOR AN ELECTRIC SWITCH

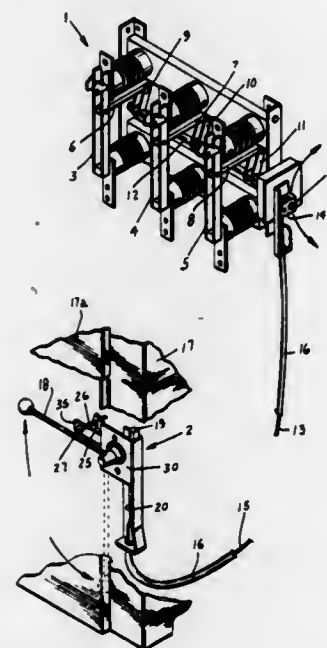
Anthony Osborne, Duluth, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed May 7, 1982, Ser. No. 375,728

Int. Cl.<sup>3</sup> H01H 9/20

U.S. Cl. 200—50 A

10 Claims



1. An operating mechanism for an electric switch disposed in

a housing having an access door, said operating mechanism comprising a movable element interconnected with the switch for imparting operating movement thereto, motivating means including a rotatable pinion and an associated reciprocable rack for imparting operating movement to said movable element, and interlocking means including a locking element secured to said pinion and a yieldably mounted locking bar having a part engageable with said locking element and having another part engageable with said door, said locking bar being arranged to engage said locking element so as to prevent switch closing movement of said motivating means so long as said access door is open.

#### 4,419,550 ROTARY SWITCH APPARATUS HAVING A MULTIPLE ARM CONTACT SPRING SUPPORT

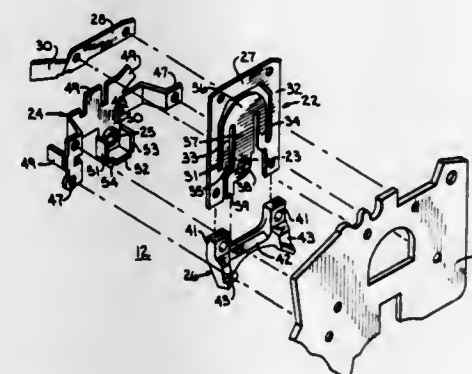
Gerald J. Monette, Wausau, Wis., assignor to Marathon Electric Manufacturing Corp., Wausau, Wis.

Filed Jun. 4, 1981, Ser. No. 270,596

Int. Cl.<sup>3</sup> H01H 35/10

U.S. Cl. 200—80 R

13 Claims



1. A switch apparatus for a dynamoelectric machine having a speed responsive actuator moving from a first position to a second position in response at a preselected speed, comprising:  
a support base;  
a flat multiple arm spring unit having a plurality of laterally spaced spring arms including a pair of deflection spring arms attached to the support base and projecting from the attachment and a pair of connecting arms secured to the outer ends of the deflection arms and extending backwardly therefrom between said deflection arms and at least one contact arm secured to the inner end of both said connecting arms and extending backwardly therefrom to an outer end;  
a first contact secured to the outer end of said contact arm;  
a second contact mounted in opposed aligned relation to said first contact; and  
coupling means secured to said deflection arms for moving said arms and thereby moving said connecting arms and contact arm to move the first contact relative to the second contact.

#### 4,419,551 VACUUM CIRCUIT INTERRUPTER AND METHOD OF PRODUCING THE SAME

Masaru Kato, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 910,905, May 26, 1978, abandoned.

This application Oct. 1, 1980, Ser. No. 192,842

Claims priority, application Japan, May 27, 1977, 52-62356; May 27, 1977, 52-62359

Int. Cl.<sup>3</sup> H01H 33/66

U.S. Cl. 200—144 B

3 Claims

1. A vacuum circuit interrupter comprising a pair of electrode contacts engageable and disengageable from each other, each of said electrode contacts consisting of an aggregate structure formed by sintering copper particles and chromium particles together in the solid phase, whereby said chromium

particles are uniformly dispersed amongst said copper particles:

said chromium particles having a mean particle size of not more than 100  $\mu\text{m}$ ;  
said copper particles having a mean particle size of not less than 5  $\mu\text{m}$ ;



said electrode contacts having a density of not less than 90% relative to the theoretical density thereof and said copper being present at 80 to 20 wt. % and said chromium being present at 20 to 80 wt. %.

#### 4,419,552 CIRCUIT BREAKER

Eiichi Haginomori, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

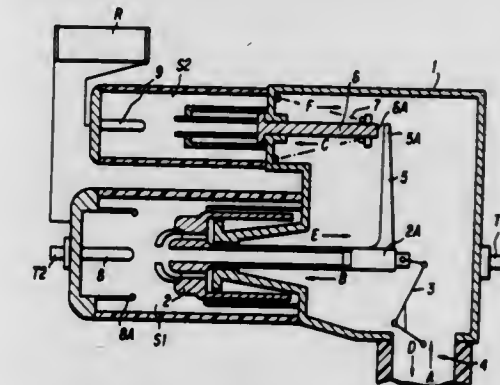
Filed Jan. 22, 1981, Ser. No. 227,252

Claims priority, application Japan, Apr. 25, 1980, 55-55023

Int. Cl.<sup>3</sup> H01H 33/16

U.S. Cl. 200—144 AP

8 Claims



1. A circuit breaker comprising:  
a main contact having a moving part and a fixed part;  
a series circuit coupled in parallel with said main contact, said series circuit including a resistor coupled in series with a resistor contact, said resistor contact having a moving part and a fixed part;  
means for moving said moving part of said main contact to switch said main contact;  
means for closing said resistor contact and for moving said moving part of said resistor contact together with said moving part of said main contact in a closing direction; and  
means for opening said resistor contact and for moving said moving part of said resistor contact independently of said moving part of said main contact in an opening direction; wherein the moving speed of said moving part of said resistor contact in the opening direction due to said opening means is slower than the moving speed of said moving part of said main contact due to said moving means and wherein the initiation of said moving part of said resistor contact in the opening direction occurs simultaneously with the initiation of said moving part of said main contact in the opening direction.



4,419,553

## VACUUM TYPE CIRCUIT BREAKER

Masayuki Ohshita, Amagasaki; Toshiaki Horiuchi, Settsu; Takashi Yamanaka, Itami, and Yoshihiro Usui, Kawanishi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

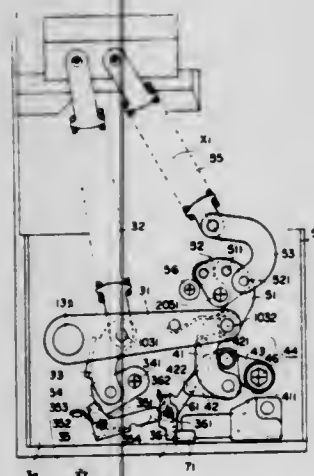
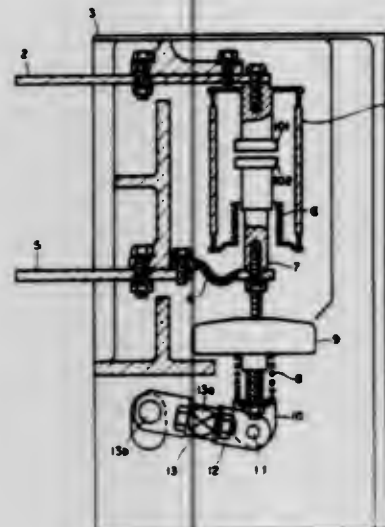
Filed Dec. 31, 1981, Ser. No. 336,433

Claims priority, application Japan, Jan. 19, 1981, 56-6799; Jan. 19, 1981, 56-6800

Int. Cl.<sup>3</sup> H01H 33/00

U.S. Cl. 200—144 B

4 Claims



1. A vacuum type circuit breaker comprising an energy storage link mechanism having an energy storage crank pivotally supported on a shaft, a closing spring having a line of action, the spring connected at one end thereof to said energy storage link mechanism, an operating lever connected at one end thereof to a movable electrode of a vacuum switch tube and at another end thereof to said energy storage link mechanism, and a pivotal connection between a trip latch mechanism and a connector disposed between the ends of said operating lever, wherein when said vacuum switch tube is in its open state and when said operating lever has been latched by said trip latch mechanism, said energy storage link mechanism applies energy stored in said closing spring to said another end of said operating lever as a link force in a direction which turns said operating lever around an axis of the connection to said trip latch mechanism to open the vacuum switch tube, said link force being set by said energy storage link mechanism such that it is less than a force applied to said operating lever so that the latter is turned around the axis of the connection to said trip latch mechanism by a self-closing force applied to the movable electrode of the vacuum switch tube by a difference between internal pressure of the vacuum switch tube and atmospheric pressure, and wherein the self-closing force of said vacuum switch tube overcomes said link force so as to turn said operating lever around the axis of said connection in a direction which closes the vacuum switch tube, while turning the energy

storage crank, whereby the line of action of said closing spring passes across the connection between said energy storage link mechanism and the closing spring and across a dead point defined by said shaft, whereby said link force applied to said another end of said operating lever by said energy storage link mechanism is reversed to turn said operating lever around the axis of the connection to said trip latch mechanism, so that the electrodes of said vacuum switch tube are quickly closed under the action of the stored energy of said closing spring and the self-closing force of said vacuum switch tube.

4,419,554

## ELECTRIC SWITCHES FOR RECEIVING UNITARY INTERNAL CONTACT/WIRE TERMINAL ELEMENTS

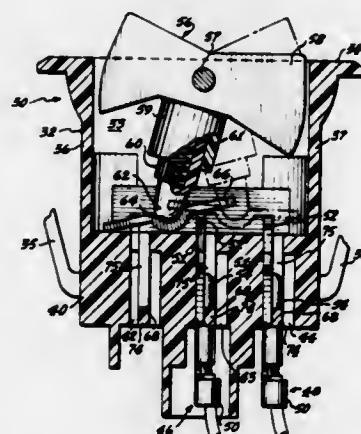
Thomas F. Osika, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Nov. 16, 1981, Ser. No. 321,735

Int. Cl.<sup>3</sup> H01H 1/00

U.S. Cl. 200—284

6 Claims



1. An electric switch for receiving at least one user inserted wire terminal which couples said electric switch into an electric circuit and provides a switch contact within said electric switch comprising:

- a switch casing having a cavity and at least one passageway which extends from the periphery of said switch casing and opens into said cavity;
- a wire terminal one end of which defines a switch contact portion, said wire terminal slidably insertable into said passageway of said switch casing to a position which places said switch contact portion thereof within said cavity of said switch casing;
- cooperative elements of a lockable interconnection within said passageway of said switch casing and on said wire terminal for lockably retaining said wire terminal within said passageway of said switch casing when said wire terminal is slidably inserted therein;
- said wire terminal having a planar body portion with a resiliently deflectable latching lug extending from one of the side edges thereof;
- a latching ledge integral with said switch casing and having a latching surface, said latching ledge extending into said passageway of said switch casing, said latching ledge exerting a deflecting force on said latching lug of said wire terminal during slidable insertion thereof into said passageway and removing that deflecting force when said wire terminal is fully inserted therein to allow said latching lug of said wire terminal to resiliently move into latching engagement with the latching surface of said latching ledge; and
- switch actuating means having a movable operating means disposed within said cavity of said switch casing and movable into and out of electrically conductive contact with said switch contact portion of said wire terminal when said wire terminal is inserted into said passageway of said switch casing and maintained therein.

4,419,555

## ILLUMINATED PUSH-BUTTON SWITCH ASSEMBLY

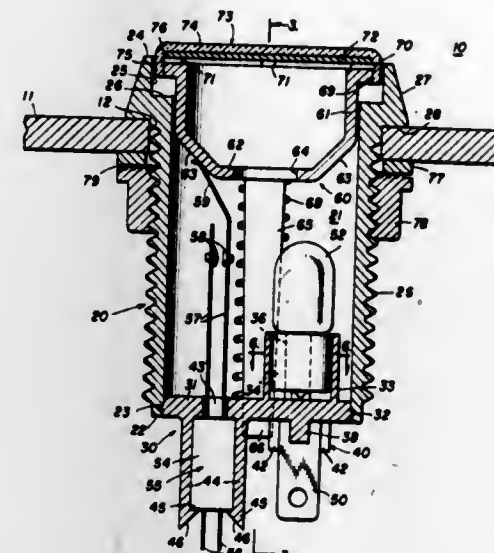
Syng N. Kim, Hoffman Estates, Ill., assignor to Wilco Corporation, Niles, Ill.

Filed Jun. 1, 1982, Ser. No. 383,811

Int. Cl.<sup>3</sup> H01H 3/12, 9/02

U.S. Cl. 200—314

10 Claims



1. An illuminated push-button switch assembly comprising: a hollow cylindrical housing, a base member closing said housing at one end thereof and having a first aperture and a pair of spaced apertures therethrough, electric switch means carried by said base member outside said housing and having switch contacts extending through said first aperture into said housing, an actuator disposed for reciprocating movement within said housing longitudinally thereof between a normal rest position and an actuating position, said actuator having a light-transmitting portion closing said housing at the other end thereof, said actuator having a cam surface disposed within said housing for engagement with and closure of said switch contacts in response to movement of said actuator from the rest position to the actuating position thereof, said actuator including a pair of resilient legs extending longitudinally of said housing and provided with cam means at the distal end thereof, said cam means being engageable with the outer edges of said a pair of spaced apart second apertures for cammed deflection to permit insertion thereof through said pair of spaced apart second apertures, said pair of resilient legs having retaining means adjacent to the distal end thereof, said pair of resilient legs resiliently returning to their original position after insertion through said pair of spaced apart second apertures for bringing said retaining means into position for engagement with the outer surface of said base member when said actuator is disposed in its normal rest position, lamp receptacle means formed integrally with said base member and projecting therefrom into said housing externally of said actuator, electric lamp means carried by said base member in said receptacle means, and bias means resiliently urging said actuator to the normal rest position thereof.

4,419,556

## EXTENSION CONTROL DEVICE AND TUBING MEMBER FOR CONTROLLING SWITCH ACTUATION

Patrick H. Hare, 2027 Que St., NW., Washington, D.C. 20009

Filed Jan. 29, 1982, Ser. No. 344,036

Int. Cl.<sup>3</sup> H01H 3/20

U.S. Cl. 200—331

11 Claims

1. An extension control device for use with a wall-mounted toggle switch assembly having a switch with a protruding lever comprising:

- an elongated member having a proximal end portion and a distal end portion graspable by a user of the extension control device; and
- a tubing member connected to a portion of said elongated

member in the vicinity of the proximal end thereof, said tubing member having:

1. a distal end portion connected to the elongated member,
2. a proximal end portion defining means for engaging a switch lever and having two spaced apart pronged portions protruding from a hollow tubular portion, the switch lever being insertable between the pronged portions into the hollow tubular portion so that the hollow tubular portion releasably grips the switch lever, one of said pronged portions being insertable into said hollow tubular portion prior to insertion of the switch lever to thereby reduce the interior cavity of said hollow tubular portion so that the hollow tubular



portion releasably grips the switch lever in a secure manner, and

3. a notched portion defining a hinge intermediate said tubing member distal end portion and said tubing member proximal end portion so that an upper portion of said tubing member above said notched portion is angularly movable with respect to a lower portion, the lower portion extending substantially vertically when the tubing member is engaged with a switch lever and the upper portion extending skewed to the lower portion whereby up and down movement of said elongated member moves said upper portion to thereby control movement of said switch lever.

4,419,557

## METHOD AND APPARATUS FOR WELDING METAL PARTS COATED WITH A THERMOPLASTIC

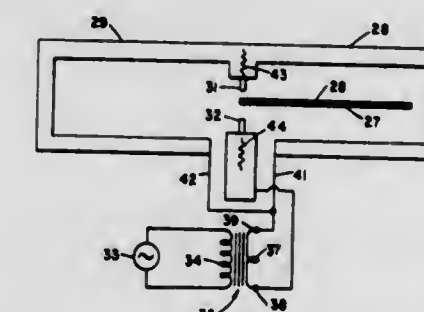
John S. Gellatly, LaGrange, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 4, 1982, Ser. No. 337,056

Int. Cl.<sup>3</sup> B23K 11/10

U.S. Cl. 219—86.25

13 Claims

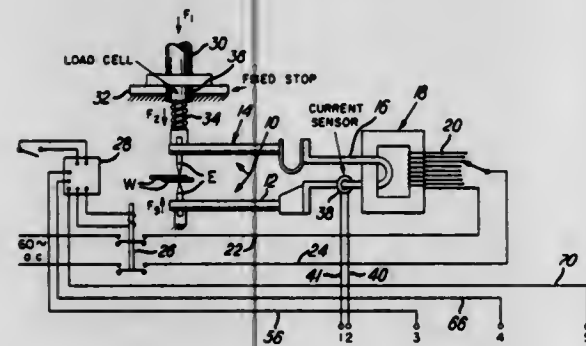


1. A method of welding together two paramagnetic metal parts, which includes: positioning the metal parts in a first of a pair of parallel connected conductive loop halves;



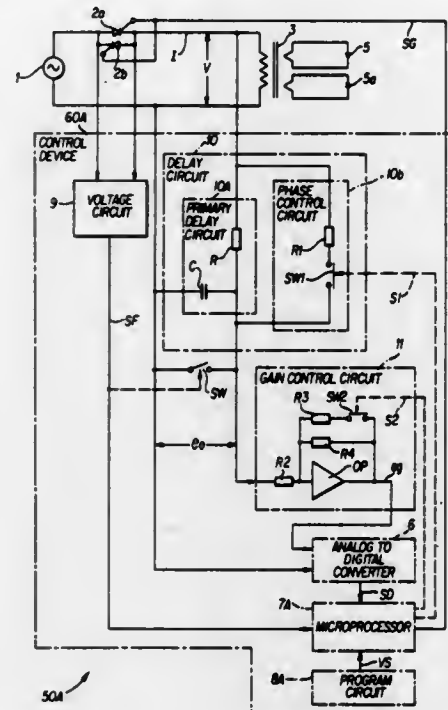
impairing relative movement between the metal parts and said first conductive loop half to incrementally reposition the metal parts in the second conductive loop half; cyclically moving first and second welding electrodes toward each other to cyclically engage the metal parts as the metal parts are incrementally repositioned in the second conductive loop; and applying current pulses to the first welding electrode and through the first and second conductive loops to the second welding electrode during each engagement of the welding electrodes with the metal parts, whereupon the amount of current flow in the first and second conductive loops is proportional to the relative positions of the metal parts within the first and second conductive loops.

**4,419,558**  
**APPARATUS AND METHOD FOR MONITORING AND CONTROLLING RESISTANCE SPOT WELDING**  
 Ariel Stiebel, Bloomfield Hills, Mich., assignor to Wagen of America, Inc., Warren, Mich.  
 Filed Nov. 23, 1981, Ser. No. 323,956  
 Int. Cl.<sup>3</sup> B23K 11/02  
 U.S. Cl. 219-109 13 Claims



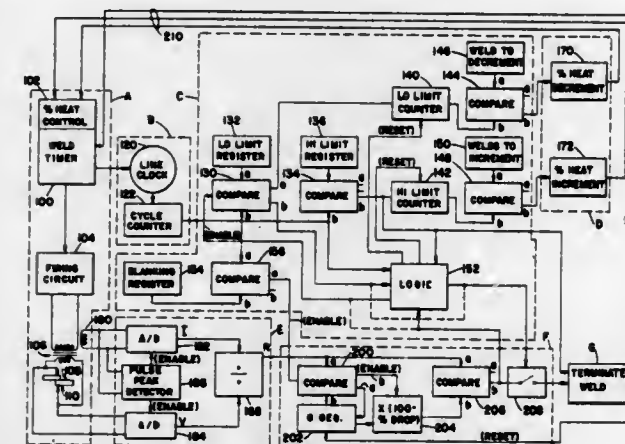
1. In resistance spot-welding apparatus that includes a pair of electrodes positioned to receive workpieces between them, means for moving one electrode toward the other to apply a squeezing force to the workpieces, means for causing an electrical current to flow from one electrode to the other through the workpieces to form a weld, and means for controlling the duration of the flow of current through the workpieces, the improvement wherein the means for moving one electrode to apply a squeezing force to the workpieces includes a member that is movable under a force in a direction to apply the squeezing force, means for applying a force to the member substantially greater than a desired squeezing force, stop means engageable by the member for limiting the movement of the member in said direction, and a mechanical spring interposed between the member and the movable electrode for applying to the movable electrode a force that varies as a function of the indentation of the electrodes into the workpieces when the current melts them, and further comprising transducer means for detecting the force exerted by the mechanical spring and generating a welding signal indicative thereof, and signal processing means responsive to the transducer means for producing a signal indicative of a change in the squeezing force on the workpieces.

**4,419,559**  
**RESISTIVE WELDER HAVING A CONTROLLED OUTPUT VOLTAGE UNAFFECTED BY SECONDARY CIRCUIT DISCONNECTION**  
 Takatomo Izume, Urawa, and Chihro Okado, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan  
 Filed Sep. 24, 1981, Ser. No. 305,223  
 Claims priority, application Japan, Oct. 7, 1980, 55-140303  
 Int. Cl.<sup>3</sup> B23K 11/24  
 U.S. Cl. 219-110 24 Claims



1. A resistance welder, comprising: said electronic contactor means further including means coupled to receive said gate control signal for controlling an output voltage thereof appearing across said primary winding of said transformer means such that said output voltage becomes equal to a predetermined value corresponding to said predetermined reference value.

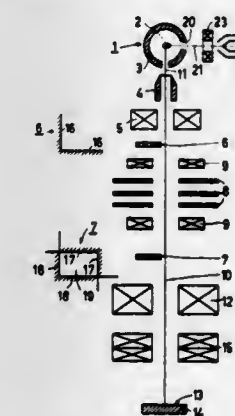
**4,419,560**  
**WELDING CONTROL WITH AUTOMATIC PERCENT HEAT ADJUSTMENT**  
 Thomas E. Zurek, Redford, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio  
 Filed Dec. 19, 1980, Ser. No. 218,319  
 Int. Cl.<sup>3</sup> B23K 11/24  
 U.S. Cl. 219-117.1 30 Claims



23. A method of controlling the percent heat in a resistance welding machine comprising: measuring the duration of each weld; comparing each measured duration with a high limit duration and with a low limit duration; and

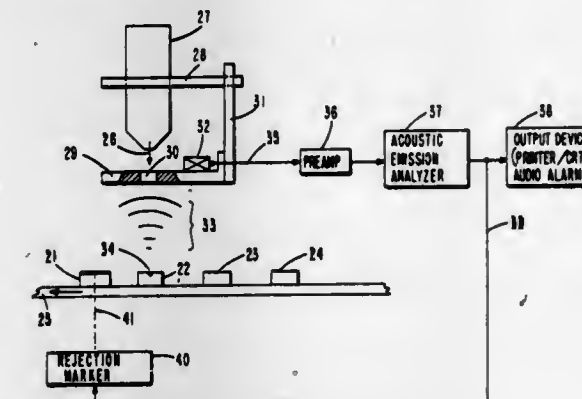
increasing the percent heat in response to the measured duration in at least a preselected number of welds matching or exceeding the high limit duration and decreasing the percent heat in response to the measured duration in at least a preselected number of welds failing to exceed the low limit duration.

**4,419,561**  
**METAL WIRE CATHODE FOR ELECTRON BEAM APPARATUS**  
 Heico J. Frima, Delft, and Jan B. Le Poole, Voorschoten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.  
 PCT No. PCT/NL80/00030, § 371 Date May 19, 1981, § 102(e)  
 Date Dec. 18, 1980, PCT Pub. No. WO81/00929, PCT Pub. Date Apr. 2, 1981  
 PCT Filed Sep. 18, 1980, Ser. No. 217,885  
 Claims priority, application Netherlands, Sep. 19, 1979, 7906958  
 Int. Cl.<sup>3</sup> B23K 15/00  
 U.S. Cl. 219-121 EB 5 Claims



1. An electron beam source comprising a longitudinally-displaceable cathode wire, an anode having an aperture disposed adjacent one side of the wire, and means for applying an energy beam to a portion of the wire to effect electron emission from said side through the aperture, said side having a flattened surface for minimizing the divergence of electrons emitted thereby.

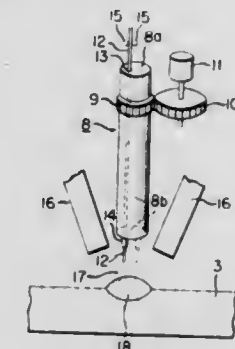
**4,419,562**  
**NONDESTRUCTIVE REAL-TIME METHOD FOR MONITORING THE QUALITY OF A WELD**  
 Min-Chung Jon, East Windsor Township, Mercer County, and Vito Palazzo, Hamilton Township, Mercer County, both of N.J., assignors to Western Electric Co., Inc., New York, N.Y.  
 Filed Jan. 19, 1982, Ser. No. 340,607  
 Int. Cl.<sup>3</sup> B23K 9/10  
 U.S. Cl. 219-130.01 4 Claims



1. Method for monitoring the quality of a weld on a workpiece comprising the steps of: positioning a high frequency wideband acoustic emission sensor in noncontact spaced relation with the workpiece and in

noncontact spaced relation with the weld site on said workpiece; detecting at said acoustic emission sensor airborne shock wave signals propagating away from the weld site and having a frequency above 100 KHz; and analyzing the detected high frequency acoustic emission signals thereby determining the quality of the weld.

**4,419,563**  
**ROTARY ARC-WELDING METHOD**  
 Hirokazu Nomura, and Yuji Sugitani, both of Tsu, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan  
 Filed Dec. 2, 1981, Ser. No. 326,511  
 Int. Cl.<sup>3</sup> B23K 9/28  
 U.S. Cl. 219-137 R 1 Claim



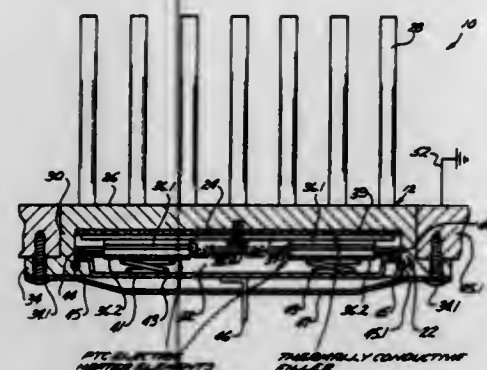
1. In a rotary arc-welding method which comprises: directing a nozzle substantially vertically toward a weld zone of at least one object of welding; feeding a consumable welding electrode through said nozzle eccentrically from the center axis of said nozzle toward said weld zone; feeding welding current to said consumable welding electrode to produce an arc between the tip of said consumable welding electrode and said weld zone to weld said at least one object of welding by means of heat from said arc; rotating said nozzle to cause a circular movement of said arc from the tip of said consumable welding electrode corresponding to the eccentricity thereof; and, feeding a shielding gas toward said weld zone to shield said arc and said weld zone from the open air; the improvement wherein: the diameter of said consumable welding electrode is limited within the range of from 0.8 to 1.2 mm; said welding current is limited within the range of from 400 to 800 amperes; and, the number of rotations of said nozzle is limited within the range of from 3,000 to 6,000 r.p.m.

**4,419,564**  
**SELF-REGULATING ELECTRIC HEATER FOR USE IN AN EARLY FUEL EVAPORATION SYSTEM**  
 Leo Marcoux, Rehoboth, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.  
 Filed Mar. 30, 1981, Ser. No. 248,773  
 Int. Cl.<sup>3</sup> H05B 3/02; F02M 31/12; H01C 7/02  
 U.S. Cl. 219-206 11 Claims

1. A heater device comprising a cast thermally conducting metal radiator body of substantial size having a first heat-receiving side and having a second, opposite side with a plurality of heat-distributing fin means upstanding therefrom for transferring heat to a zone to be heated, and self-regulating electrical resistance heater means of ceramic material of positive temperature coefficient of resistivity arranged for transferring heat to the heat-receiving side of the radiator body, characterized in that the heater means comprises a thin plate of substantial area of thermally conducting metal having first and second sides, at least one self-regulating electrical resistance heater disc of



a ceramic material of positive temperature coefficient of resistivity having one side thereof bonded in electrical and thermally conducting relation to a limited portion of the first side of the thin plate, means securing a limited portion of the thin plate in electri-



cally conductive relation to the radiator body with its second side in closely spaced, facing, heat-transfer relation to the heat-receiving side of the radiator body, and spring means for electrically engaging an opposite side of the at least one to connect the at least one disc in an electrical circuit for energizing the heater means.

4,419,565

**TWO-MODE STEAM BRUSH CURLER**

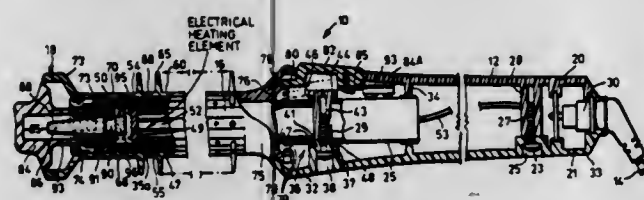
John McGaw, Markham, Canada, assignor to Appliance Design Probe Inc., Scarborough, Canada

Filed Aug. 10, 1979, Ser. No. 65,464

Int. Cl.<sup>3</sup> A45D 1/02; A46B 15/00, 7/10; H05B 3/02

U.S. Cl. 219-222

6 Claims



1. A hand-held steam curler for hair, comprising:
  - a handle,
  - a hollow, open-ended, perforated, metallic cylinder extending forwardly from said handle and fixed with respect thereto,
  - a hollow metallic cylindrical member fixedly mounted within said cylinder and having a closed end remote from said handle and an open end proximate to said handle, said member being spaced uniformly inwardly from the said cylinder adjacent the perforations of the latter, to define a first annular space therebetween,
  - a heating element within said cylindrical member for heating the side wall and end wall thereof,
  - a rotatable, perforated barrel of cylindrical form surrounding said cylinder and spaced uniformly outwardly therefrom to define a second annular space, communicating with said first annular space through said perforations in the cylinder, the barrel being restrained against axial movement and defining a mandrel for contacting the hair to be treated,
  - first means mounted on the end of the cylinder remote from the handle to maintain one end of the barrel uniformly spaced from the cylinder while permitting barrel rotation, said first means including selectively operable steam-producing means closing the end of said cylinder remote from said handle and capable of producing steam in said first annular space by bringing water into contact with the closed end of said cylindrical member,
  - second means proximate to said handle and fixed with respect thereto, for maintaining the other end of the barrel

uniformly spaced from the cylinder while the barrel rotates, and manual locking means on said handle and barrel for selectively cooperable locking and releasing of the barrel with respect to the handle and metallic cylinder.

4,419,566

**HOT AIR SOLDERING AND RESOLDERING SYSTEM**

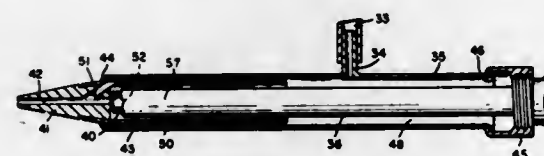
William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265

Filed May 18, 1981, Ser. No. 264,362

Int. Cl.<sup>3</sup> B23K 3/04

U.S. Cl. 219-230

9 Claims



1. In a temperature-controlled soldering instrument:
  - (a) a handle housing a temperature-control circuit;
  - (b) a tip assembly including a tip having an axial bore and a tip assembly sleeve extending from said tip and secured thereto;
  - (c) a heater element;
  - (d) a heater sleeve for housing said heater element and extending beyond said element, said tip assembly sleeve surrounding said heater sleeve;
  - (e) a retainer sleeve surrounding said tip assembly sleeve and said heater sleeve, said tip assembly sleeve being substantially shorter than said retainer sleeve to form a relatively large preheating chamber between said heater and retainer sleeves and a relatively much smaller heating chamber between said heater sleeve and said tip assembly sleeve and said tip assembly and retainer sleeve, said heating chamber being connected to the hollow bore of said tip, whereby cold air passed into said preheating chamber at a predetermined rate of flow is preheated in said preheating chamber and is further heated in said heating chamber when said heater element is heated to a predetermined temperature to deliver a jet of hot air from said hollow tip; and
  - (f) means for connecting said retainer sleeve to said handle.

4,419,567

**HEATING ELEMENT FOR ELECTRIC WATER HEATER**

Robert A. Murphy, Franklin, and George L. Fehrmann, Nashville, both of Tenn., assignors to Apcom, Inc., Franklin, Tenn.

Filed Mar. 2, 1981, Ser. No. 239,630

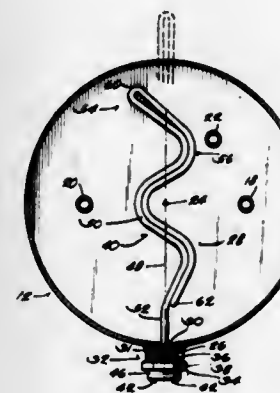
Int. Cl.<sup>3</sup> H05B 3/82; H01C 1/00; F24H 1/20

U.S. Cl. 219-336

2 Claims

1. A heating element for an electric heater including a generally cylindrical tank, a threaded, bored boss on the water tank for receiving a heating element, and one or more obstructions extending inside the tank generally parallel to the tank centerline, said heating element comprising
  - an outer connector assembly including a cylindrical portion adapted to be threaded into the tank boss; and
  - a sheathed electrical heating rod including a continuous member which has opposite ends secured to said connector assembly, extends generally perpendicularly to the tank centerline when installed, and is formed in a generally W-shaped pattern with respect to the centerline of said connector cylindrical portion to thereby provide said heating rod with an effective length greater than the inside diameter of the tank, to permit said heating rod to be inserted and withdrawn through the bore of the tank boss and to permit said heating element to be rotated about the centerline of said connector threaded portion, as said connector assembly is being threaded into or out of the tank boss, without any portion of said heating rod striking

any of the obstructions inside the tank, one portion of said member extending in a first generally horizontal plane and in said pattern between said connector and a location



remote from said connector and another portion of said member extending in a second generally horizontal plane vertically spaced from said first plane and in said pattern between said connector and said remote location.

4,419,568

**WET DRESSINGS HEATER**

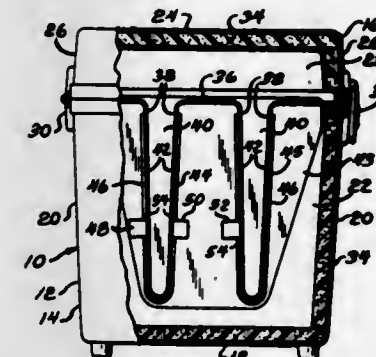
Ronald R. Van Overloop, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 12, 1982, Ser. No. 397,302

Int. Cl.<sup>3</sup> F27D 11/00

U.S. Cl. 219-441

21 Claims



1. A heater for wet dressing comprising:
  - a case having a base with sidewalls defining a cavity;
  - an insert within the cavity of said base and defining at least one narrow recess in said insert to receive wet dressings, said recess being capable of being heated;
  - an electrical heating element, electrically insulated with respect to said recess and located in close proximity to the insert recess within that portion of said cavity between the insert and the base, for heating the wet dressings;
  - electrical circuit means within said cavity interconnecting said heating element and a source of electric current; and
  - means for controlling the temperature of the heating element in the desired range of temperature of the wet dressings, said controlling means being a part of said electrical circuit means and comprising:
    - first means for controlling current to the heating element and for sensing the temperature associated with the heating element, said first means initially supplying current to the heating element until a first temperature is sensed substantially higher than the desired temperature range of

the wet dressings, said first means interrupting current to the heating element at said first sensed temperature, said first means again supplying current to the heating element at a second sensed temperature substantially below the range of desired temperature of the wet dressings, and said first means subsequently interrupting current to the heating element when said first temperature is sensed; and second means for controlling current to the heating element and for sensing the temperature associated with the heating element, said second means initially supplying current to the heating element until a third temperature is sensed higher than the desired temperature range of the wet dressings and lower than said first temperature, said second means interrupting current to the heating element at said third sensed temperature, said second means again supplying current to the heating element at a fourth sensed temperature below the range of desired temperature of the wet dressings and higher than said second temperature, and said second means subsequently interrupting current to the heating element when said third temperature is sensed.

4,419,569

**MODULAR HEATING CABLE ASSEMBLY**

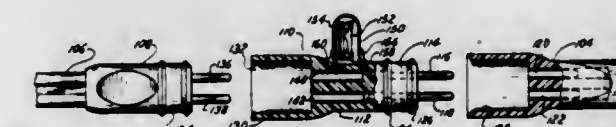
Jerrold L. Colten, Lakeville, Ind., assignor to Bristol Corporation, Elkhart, Ind.

Filed Mar. 26, 1979, Ser. No. 23,884

Int. Cl.<sup>3</sup> H05B 3/36

U.S. Cl. 219-528

3 Claims



1. A modular heating cable assembly comprising two electrical cold wires extending substantially the full length of the assembly and being divided into a cold lead module and a heating module, a connector at one end of said assembly connected to said wires for connecting said wires to a source of electrical current, a female connector at the other end of said assembly connected to said wires, a resistance heating means connected at one end to one of said cold wires and connected at the other end to the other of said cold wires, and a fuse means connected to one of said cold wires in said assembly anterior to said heating wire and being responsive to an excessive amount of current in said one cold wire for interrupting the current in the event of an overload of current in said cold wires, said fuse means being a separate, insertable and removable unit adapted to be disposed between said cold lead module and said heating module and having a waterproof housing with male and female ends for connection in a waterproof relation with female and male ends, respectively, on said modules.

4,419,570

**HEATING GLASS PANE**

Reinhard Kalbekopf, Onex, and Otto Baumberger, Carouge, both of Switzerland, assignors to Societa Italiana Vetro - SIV - S.p.A., San Salvo, Italy

Filed Feb. 25, 1981, Ser. No. 238,087

Claims priority, application Switzerland, Mar. 3, 1980, 1658/80

Int. Cl.<sup>3</sup> H05B 3/06

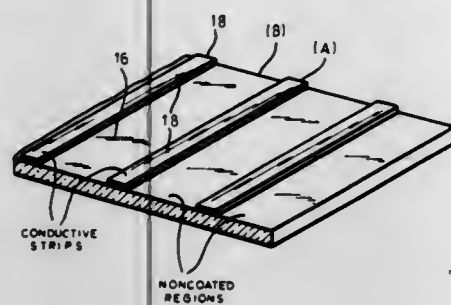
U.S. Cl. 219-522

1 Claim

1. A glass pane heatable by the Joule effect comprising:
  - (a) a transparent glass plate having a pair of broad surfaces on opposite sides thereof; and
  - (b) a plurality of mutually parallel, transparent, electrically conductive strips applied to one of said surfaces by vapor deposition coating of an SnO<sub>2</sub> layer thereon whereby said strips alternate with electrically nonconductive regions in which said glass plate is not coated, the strips defining a



total area A and said regions defining a total area B, both said areas being transparent under normal conditions, said strips being electrically connectable to a source of a heating current, the ratio A/B of said areas being between  $\frac{1}{2}$



and  $\frac{1}{2}$ , the transparency of said area A is not less than 70% of the transparency of said area B, said conductive strips having a resistivity of  $10^{-3}$  to  $10^{-4} \Omega \cdot \text{cm}$  and a thickness of 0.5 to 5.

#### 4,419,571 STEPPED-DOWN MECHANICAL COUNTING MECHANISM

Ulf Koch, Eberbach, Fed. Rep. of Germany, assignor to Esselte Pendeflex Corporation, Garden City, N.Y.

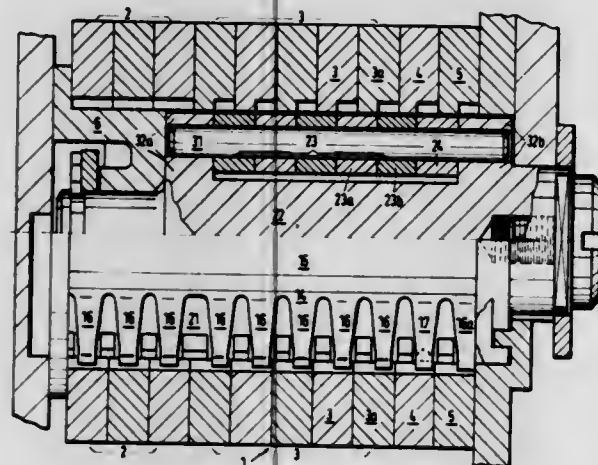
Filed Apr. 14, 1982, Ser. No. 368,206

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1981, 3116629

Int. Cl.<sup>3</sup> B41J 45/00; G07G 1/00

U.S. Cl. 235—1 C

16 Claims



1. In a mechanism for idling and advancing wheels of a stepping device having a locking shaft for supporting said wheels for rotation relative to said locking shaft and to each other to facilitate stepping, said wheels arranged in series upon said locking shaft such that a driven side surface of each of said wheels abuts and slideably engages a drive side surface of an adjacent wheel of said series, said device further having a ratchet shaft located interiorly of and rotating to and fro through a working angle relative to said locking shaft upon operation of the mechanism, said ratchet shaft supporting a series of advancing pawls for movement through said working angle upon operation of said device and for rotation relative to said ratchet shaft and to each other, each of said advancing pawls engageable with inner rims of a corresponding pair of said wheels for stepped advancing of at least one of said pair according to a switching mode, said device further comprising a control disc for controlling idling and advancing of at least one of said wheels according to said switching mode, the improvement comprising:

an adjustable link means, integral with said mechanism, for selective changing of said switching mode between different stepping modes of operation comprising different sequences of idling and advancing of said wheels; said control disc being an end wheel of said series; and

an idle stroke pawl engageable with said control disc according to said switching mode; wherein, during operation of said mechanism in said stepping modes, said control disc is advanced by said idle stroke pawl during idling of remaining wheels of said series, and is advanced by an advancing pawl during advancing of at least one of said remaining wheels.

4,419,572

#### CHECK DIGIT CALCULATOR

Mutsumi Takahashi, Kawasaki; Toshio Uwabe, Tokyo; Toshio Nagase, Yokohama; Shosuke Sato, and Hideshi Matsuzawa, both of Tokyo, all of Japan, assignors to Tokyo Keiki Company Ltd. and Totec Co. Ltd., both of Tokyo, Japan

Division of Ser. No. 955,236, Oct. 27, 1978, Pat. No. 4,272,674.

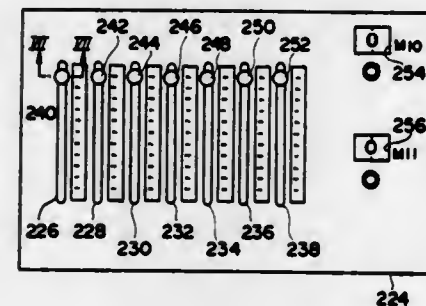
This application Oct. 10, 1980, Ser. No. 196,134

Claims priority, application Japan, Oct. 31, 1977, 52-130406

Int. Cl.<sup>3</sup> G06C 27/00; G01D 13/22

U.S. Cl. 235—69

3 Claims



1. A check digit calculator for directly indicating code number check digits according to modulus 10 and/or modulus 11, comprising:

code number setting means wherein a plurality of slits are formed in the surface of a calculator case, said slits being equal in number to code number digit groups, a code number digit group is indicated along each of said slits, said digit group corresponding to a predetermined modulus and elected according to the weight of each digit in the code number associated therewith and a code number setting knob is disposed slidably along each of said slits; check digit indicating means actuated in response to the setting of a desired code number by said code number setting means to indicate a corresponding check digit and comprising modulus 10 and/or modulus 11 check digit rotary indicators;

a plurality of moving pulleys each disposed along each of said slits so as to be slidable by the code number setting knob;

a plurality of idle pulleys provided to cooperate with corresponding moving pulleys;

a first driven pulley fixedly mounted to said modulus 10 check digit rotary indicator;

a second driven pulley fixedly mounted to said modulus 11 check digit rotary indicator;

connecting means for connecting said code number setting knobs with said plurality of moving pulleys; and

a wire fastened at one end thereof to the case of said calculator, extended around said moving pulleys and said idle pulleys to form loops, brought into contact with said first driven pulley, wound a plurality of times around said second driven pulley, and fastened at the other end thereof to said driven pulley.

#### 4,419,573 VARIABLE DATA PRODUCT BAR CODE SALES SYSTEM

Rudolf C. von Geldern, Alphen a/d Rijn, Netherlands, assignor to Maatschappij van Berkel's Patent N.V., Leidschendam, Netherlands

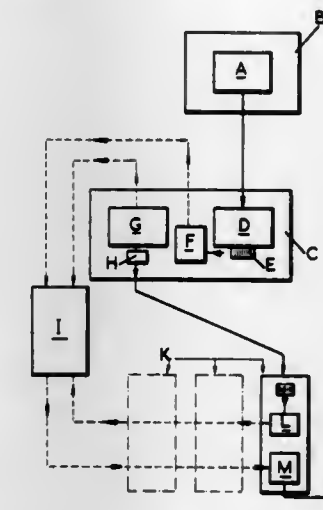
Filed Mar. 17, 1981, Ser. No. 244,339

Claims priority, application United Kingdom, Mar. 19, 1980, 8009275

Int. Cl.<sup>3</sup> G06K 15/00

U.S. Cl. 235—383

4 Claims



1. In a supermarket having a central computer and at least one check-out with a bar-code reader and a register each connected to the computer for retrieving computer-stored sales data corresponding to source-coded saleable-products bearing a bar-code label, the improvement which comprises providing a service counter for sales of 'fresh' products of variable weight and/or price, said service counter comprising a dispenser of bar-code labels each having a unique number pre-printed thereon in bar-code form, means for determining sales data for each said 'fresh' product, said means being connected to said computer, a reader for identifying the unique number of a said pre-printed bar-code label and connected to said computer to thereby address a computer memory location for storage of the fresh product sales data identified by said determining means, said fresh product sales data being retrieved from the computer memory location by subsequent operation of the check-out bar-code reader by the pre-printed bar-code label corresponding to said sales data and supplied to the check-out register.

4,419,574

#### FOCUS DETECTING DEVICE WITH VARYING PITCH CYLINDRICAL LENS ELEMENT

Takashi Kawabata, Kamakura; Nobuhiko Shinoda; Shinji Sakai, both of Tokyo, and Takao Kinoshita, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jul. 13, 1981, Ser. No. 282,605

Claims priority, application Japan, Jul. 18, 1980, 55-101517[U]

Int. Cl.<sup>3</sup> G01J 1/36

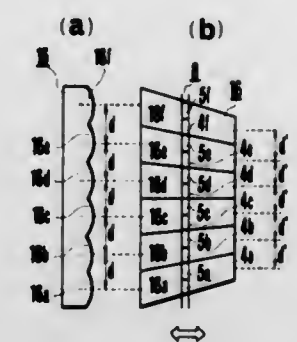
U.S. Cl. 250—204

3 Claims

1. In a focus detecting system for detecting the focusing condition of objective lens means to an object, comprising: a plurality of pairs of radiation sensitive elements arranged in a linear array; and

a plurality of lens elements arranged in a linear array corresponding to the linear array of said pairs of radiation sensitive elements, each lens element being arranged to cause one radiation sensitive element in each pair of radiation sensitive elements to receive radiation from a first portion of said objective lens means, and to cause the other radiation sensitive element to receive radiation from a second portion of the objective lens means, the improvement characterized in that said plurality of lens

elements assume the form of a plurality of cylindrical lens elements arranged in a linear array corresponding to the linear array of said pairs of radiation sensitive elements,



each of the pitches between the successive cylindrical lens elements varying along the longitudinal direction of said cylindrical lens element.

4,419,575

#### APPARATUS USEFUL FOR POSITIONING A LIGHT FILTER

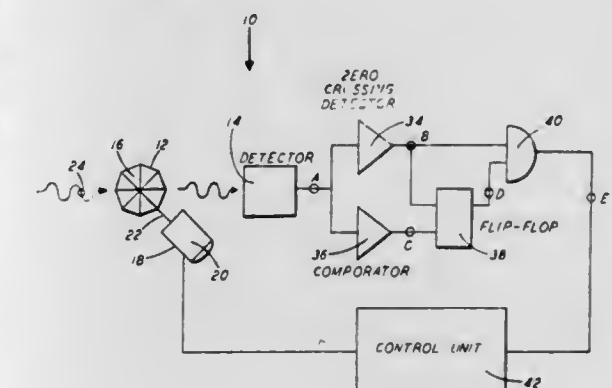
Edward J. Lakatos, Seymour, and Paul C. Talmadge, Ansonia, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 2, 1981, Ser. No. 269,305

Int. Cl.<sup>3</sup> G01J 3/00

U.S. Cl. 250—226

7 Claims

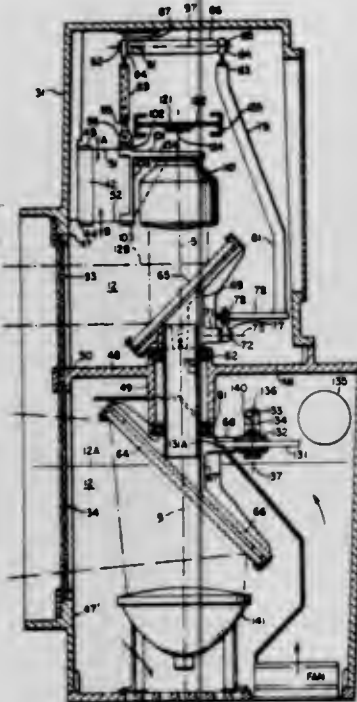


1. An apparatus useful for reproducibly initializing a multi-segment light filter, each discrete segment thereof having a different spectral pass band; said apparatus comprising: an optical/electrical transducer responsive to light passing through said filter; a reference light beam having a frequency lying in the pass band of only one of said segments, said filter being in the path of said light beam and in front of said transducer, whereby said transducer producing an electrical signal only when said one segment is positioned in said path of said light beam; means for moving said light filter in predetermined incremental steps through said path of said reference light beam; means, responsive to said electrical signal for substantially instantaneously stopping said movement whereat the leading edge of said one of said segments is positioned in said path of said reference light beam.



**4,419,576**  
**FOCUS COMPENSATION LINKAGE**  
 Warren H. Miller, Jr., Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.  
 Filed Sep. 17, 1981, Ser. No. 303,136  
 Int. Cl. H04N 1/04  
 U.S. Cl. 250-234

13 Claims



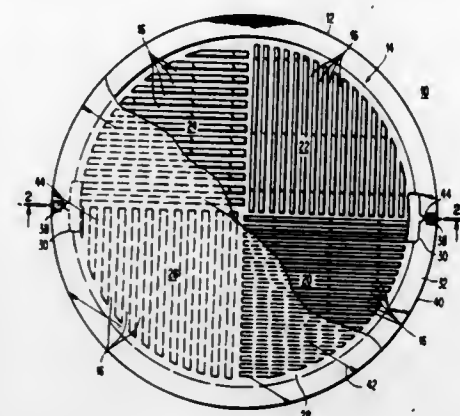
1. An optical scanning arrangement comprising: first means for rotating an image scanning optical device about an axis of rotation, said image scanning optical device directing an image-containing beam toward a photodetector device;
- second means, disposed between said image scanning optical device and said photodetector device, for focussing said beam onto said photodetector device; and
- third means, responsive to the rotation of said image scanning optical device by said first means, for adjusting the distance between said second means and said photodetector device so as to maintain said image-containing beam focussed on said photodetector device irrespective of the rotational position of said image scanning optical device about said axis, said third means including means for controllably adjusting the distance between said second means and said photodetector device, and a rotational displacement-to-linear displacement translating link mechanism having a first arm portion pivotally coupled to said controllably adjusting means, a second arm portion extending from said first arm portion, and means for pivotally coupling said second arm portion to said first means so that rotation of said image scanning optical device by said first means about said axis causes pivotal movement of said second arm portion therewith and displacement of said first arm portion so as to cause said controllably adjusting means to change the distance between said second means and said photodetector device.

**4,419,577**  
**TEST PATTERN DEVICE FOR RADIATION DETECTOR AND METHOD OF MANUFACTURE**  
 William R. Guth, Hoffman Estates, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.  
 Filed Feb. 17, 1981, Ser. No. 234,656  
 Int. Cl. G01D 18/00; G02B 5/00  
 U.S. Cl. 250-252.1

11 Claims

1. A test pattern device for a radiation detector of a type having a closed body member formed with internal chambers

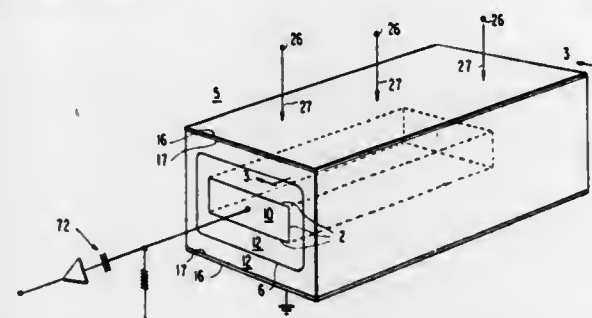
arranged in a test pattern configuration and a radiation opaque material located within the chambers, characterized in that the



internal chambers are communicating passages and the radiation opaque material is in liquid form.

**4,419,578**  
**SOLID STATE NEUTRON DETECTOR**  
 Kenneth A. Kress, Falls Church, Va., assignor to United States of America, Washington, D.C.  
 Filed Jun. 15, 1981, Ser. No. 281,255  
 Int. Cl. G01T 3/08  
 U.S. Cl. 250-390

17 Claims



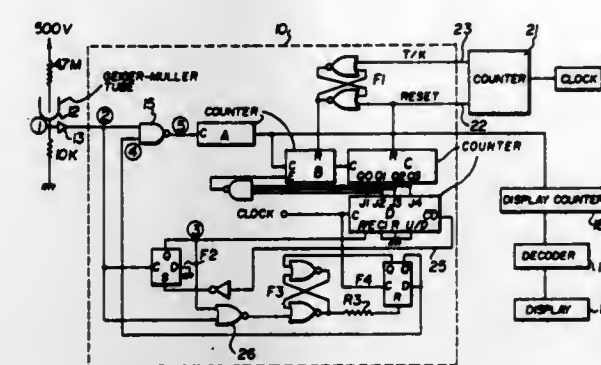
1. A neutron detector for detecting neutrons travelling in at least a first direction and comprising at least one neutron detecting assembly, said neutron detecting assembly comprising: a neutron-sensitive first material which produces energetic reaction particles when bombarded by neutrons; a semiconducting second material forming a rectifying junction with said first material and containing hydrogen, said second material producing energetic free protons when bombarded by neutrons, said second material also producing electron-hole pairs as a result of energy deposited therein by said reaction particles and free protons, said electron-hole pairs migrating in opposite directions relative to said junction to produce an electrical current across said junction; and means for measuring said electrical current flowing across said junction.

**4,419,579**  
**DEAD TIME COMPENSATION CIRCUIT**  
 Philip C. East, Nepean, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada  
 Filed Feb. 23, 1981, Ser. No. 237,254  
 Claims priority, application Canada, Mar. 6, 1980, 347112  
 Int. Cl. H01J 47/08  
 U.S. Cl. 250-374

6 Claims

1. A dead time compensation circuit for a radiation detector using a Geiger-Muller tube comprising a first counter for producing a count proportional to pulses produced by the Geiger-Muller tube during a predetermined time interval T, said first counter having an output for feeding a digital display counter, second counter means for storing a count proportional to pulses produced by the Geiger-Muller tube during a

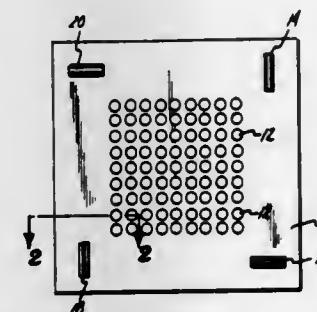
predetermined time interval T/K where K is a constant, means for decrementing to zero the count in said second counter means following expiration of said time interval T/K, and



means enabled while the count in said second counter is being decremented to produce an extra pulse following receipt of a pulse from the Geiger-Muller tube which extra pulse is added to the count in said first counter.

**4,419,580**  
**ELECTRON BEAM ARRAY ALIGNMENT MEANS**  
 David M. Walker, Westford, and John J. Carrona, Concord, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.  
 Filed Jun. 26, 1981, Ser. No. 277,554  
 Int. Cl. G21K 1/08, 5/00  
 U.S. Cl. 250-396 R

8 Claims



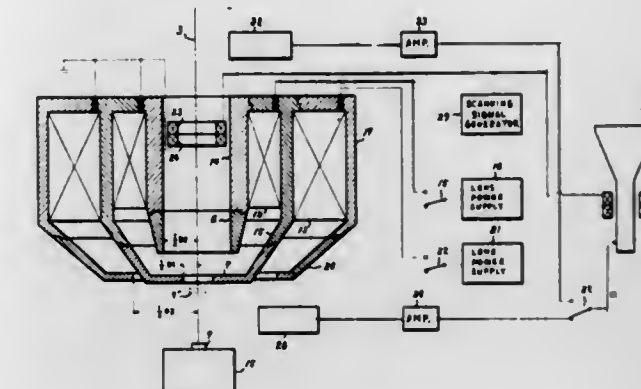
1. Mounting and alignment apparatus for an electron beam lens optics of a type having two or more parallel plates, comprising: four slots formed in each plate, each slot spaced from the others, each slot possessing a long linear portion, the linear portion of one slot parallel with that of the diagonally opposed slot and orthogonal with those of the laterally adjacent slots; the slots being arranged on the plate at the corners of an imaginary rectangle; the imaginary rectangles for each plate being of the same dimensions; at least four cylindrical rods having a diameter sufficient for the circumference thereof to contact the opposite sides of the linear portion of a slot simultaneously; said rods and plates arranged wherein said at least four rods are each in simultaneous contact with one slot on two opposed plates; and means for maintaining said plates and said rods in said arrangement.

**4,419,581**  
**MAGNETIC OBJECTIVE LENS FOR USE IN A SCANNING ELECTRON MICROSCOPE**  
 Selichi Nakagawa, Akishimashi, Japan, assignor to JEOL Ltd., Tokyo, Japan  
 Filed Jan. 11, 1982, Ser. No. 338,622  
 Int. Cl. H01J 37/14  
 U.S. Cl. 250-396 ML

3 Claims

1. A magnetic objective lens for use in a scanning electron microscope comprising:

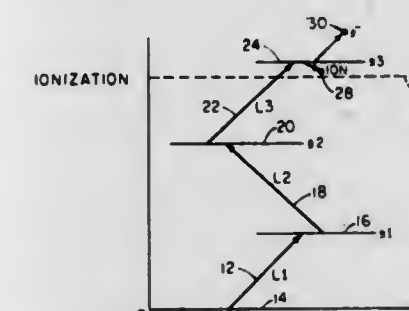
- (a) a lower magnetic pole piece having a bore diameter D1,
- (b) an upper magnetic pole piece having a bore diameter D2 which is larger than D1,
- (c) an outer magnetic pole piece having a bore diameter D3 which is larger than D1,



- (d) a first excitation coil for generating the magnetic field between said lower magnetic pole piece and said upper magnetic pole piece, and
- (e) a second excitation coil for generating the magnetic field between said lower magnetic pole piece and said outer magnetic pole piece.

**4,419,582**  
**USE OF AUTOIONIZATION TRANSITION ABSORPTION PEAKS IN ISOTOPICALLY SELECTIVE PHOTOEXCITATION**  
 George S. Janes, Lincoln, and Robert E. Schlier, Concord, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.  
 Continuation of Ser. No. 861,700, Dec. 19, 1977, abandoned.  
 This application Mar. 2, 1981, Ser. No. 239,521  
 Int. Cl. B01D 59/00  
 U.S. Cl. 250-424

39 Claims



1. A method for ionizing particles of a selected isotope in an environment of plural isotope types comprising the steps of: selectively exciting the particles of said selected isotope type in one or more energy steps to an excited state; applying ionizing radiation of a predetermined broad spectral width and frequency and tuned to an ionization transition of increased cross-section having an absorption line at a predetermined ionization absorption peak for the particles in said excited state which both excites the particles from the excited state to a bound state within a predetermined energy range above the ionization level and excites the particles with a predetermined frequency which is absorbed more strongly than absorption at immediately adjacent frequencies by at least an order of magnitude.



4,419,583

**POLARIZATION FLUOROIMMUNOASSAY WITH PULSED LIGHT SOURCE**

Hans G. Noeller, 1942 Deerpark Dr. #92, Fullerton, Calif. 92631

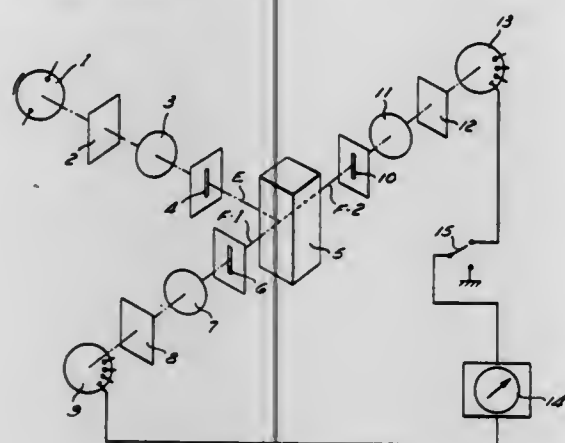
Filed May 26, 1981, Ser. No. 266,968

Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020730

Int. Cl.<sup>3</sup> G01N 21/64, 21/00, 21/01

U.S. Cl. 250—458.1

3 Claims



1. Apparatus for determining the extent of an immunoreaction by means of fluorescent tagged species, comprising the combination of:

- (a) an excitation light beam source for producing a pulse of high intensity light for exciting fluorescent radiation in such tagged species;
- (b) means for positioning a sample in the path of said excitation light beam;
- (c) means in the excitation light beam path for polarizing the excitation light beam directed toward the sample position;
- (d) means for measuring the intensity of a first fluorescent light beam emitted from the sample in one direction and at a first polarization orientation;
- (e) means for measuring the intensity of a second fluorescent light beam emitted from the sample in another direction at a second polarization orientation; and
- (f) means for comparing the output of the first measuring means and the second measuring means and reporting the difference between such outputs.

4,419,584

**TREATING WORKPIECE WITH BEAMS**

Victor M. Benveniste, Magnolia, Mass., assignor to Eaton Semiconductor Implantation Corporation, Beverly, Mass.

Filed Jul. 14, 1981, Ser. No. 283,507

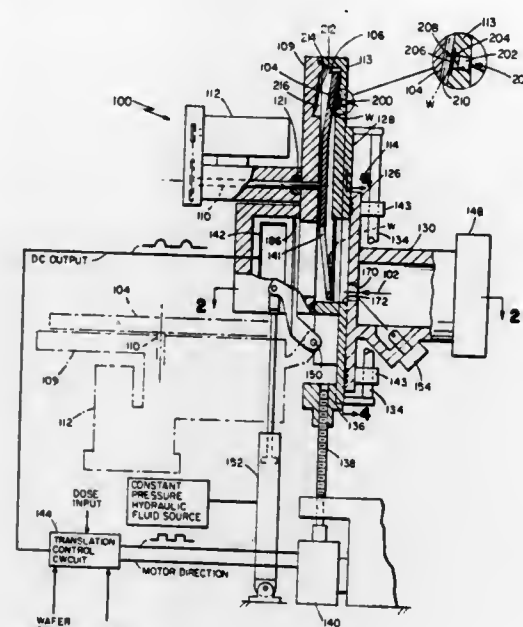
Int. Cl.<sup>3</sup> H01J 37/20

U.S. Cl. 250—492.2

17 Claims

1. In apparatus for treating workpieces by directing a beam at the workpieces, with resultant heating of said workpieces, said apparatus including a moving support element for repeatedly carrying a multiplicity of workpieces successively past said beam in a scanning direction, means for providing translation of said support element relative to said beam in a control direction generally orthogonal to said scanning direction, said means for providing translation including a structure that moves in said control direction with said support element but not in said scanning direction, the improvement comprising an infrared detector mounted on said structure in position to receive black body radiation individually from said multiplicity of workpieces and intervening portions of said support element as the workpieces pass said detector in their movements in said scanning direction, registry means to correlate the position of said moving support element passing said detector with the radiation being

sensed by said infrared detector to correlate black body radiation signals with respective workpieces, and means to correct black body radiation measurements of said workpieces for noise resulting from dark current variation,



whereby an indication of the temperatures of said individual workpieces can be obtained as said workpiece movements and beam treatment occur.

4,419,585

**VARIABLE ANGLE SLANT HOLE COLLIMATOR**

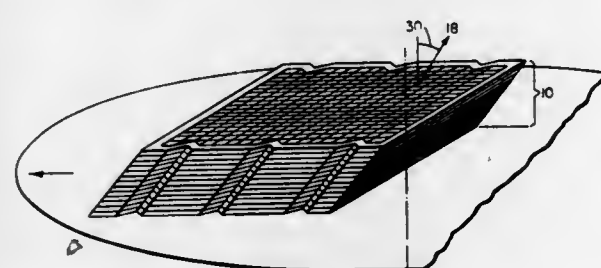
H. William Strauss, Newton Centre; Richard H. Moore, Concord, and Nathaniel M. Alpert, Swampscott, all of Mass., assignors to Massachusetts General Hospital, Boston, Mass.

Filed Feb. 26, 1981, Ser. No. 238,582

Int. Cl.<sup>3</sup> G02B 5/00; G21K 1/00; H01J 1/52

U.S. Cl. 250—505.1

16 Claims



1. A radiation collimator comprising:

- a plurality of sheets of a generally radiation absorbing material, said sheets being apertured in a predetermined two dimensional pattern over a substantial area of said sheets; and
- means for stacking said sheets with said apertures in alignment to provide a set of radiation channels through the stack of sheets with a predetermined orientation and to provide for angular variation in said predetermined orientation by skewing of said sheets within said stack; said set of radiation channels forming a collimated view through said sheets defined by said predetermined orientation;
- the pattern of apertures in each sheet being selected relative to the pattern of apertures in adjacent sheets of said stack to provide said predetermined orientation to the set of radiation channels with a characteristic within the range of characteristics from divergence to convergence.

4,419,586

**SOLID-STATE RELAY AND REGULATOR**

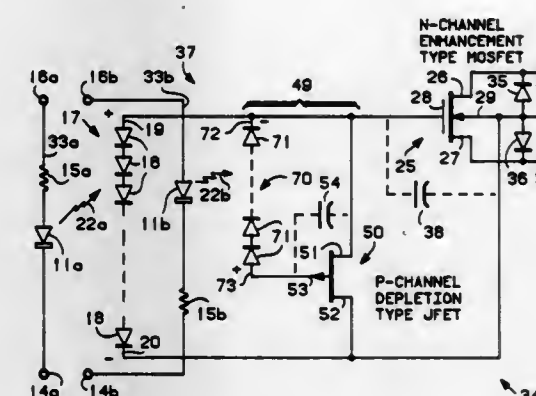
John P. Phipps, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1981, Ser. No. 296,756

Int. Cl.<sup>3</sup> G02B 27/00

U.S. Cl. 250—551

11 Claims



1. A photosensitive device exhibiting variable impedance between output terminals in response to light input, comprising:

- first photovoltaic means for producing a first voltage in response to a first light input from a first light source;
- second photovoltaic means for producing a second voltage in response to a second light input from a second light source different from said first light source;
- a first field effect transistor having a first control terminal and a first reference terminal, coupled to said first photovoltaic means and responsive to said first voltage, and further having a first variable impedance current-carrying pathway coupled between said output terminals, said variable impedance varying in response to said first voltage; and
- a second field effect transistor having a second control terminal and a second reference terminal coupled to said second photovoltaic means and responsive to said second voltage, and said second field effect transistor providing a second variable impedance current-carrying pathway coupled to said first control and reference terminals and wherein said second field effect transistor presents a high impedance in the presence of said second voltage and a low impedance in the absence of said second voltage.

4,419,587

**OUTPUT POWER MODULATED WIND RESPONSIVE APPARATUS**

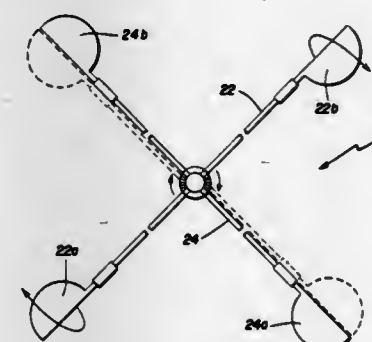
William M. Benton, Middleburg, Va., assignor to Vericard Corporation, Fort Lauderdale, Fla.

Filed Sep. 11, 1981, Ser. No. 301,176

Int. Cl.<sup>3</sup> F03B 1/02; F03D 3/02; B63H 13/00

U.S. Cl. 290—44

19 Claims



1. Apparatus for controlling the conversion of natural wind forces into useful energy comprising:  
a frame,

shaft means rotatably mounted on said frame;  
first cross arm means connected to said shaft means having first impeller means disposed thereon to cause rotation of said first cross arm means and said shaft means means in response to wind;  
second cross arm means connected to said shaft means and disposed at an angle to said first cross arm means and having second impeller means disposed thereon to cause rotation of said second cross arm means and said shaft means in response to wind;  
adjustment means for moving said second cross arm means about said first axis relative to said first cross arm means to change selectively the angular position of said second cross arm means and second impeller means relative to said first cross arm means and first impeller means, whereby the speed of rotation of said shaft means may be controlled for varying wind conditions.

4,419,588

**SECURITY ELECTRICAL POWER DISTRIBUTION SYSTEMS FOR LIGHT AIRCRAFT EQUIPPED FOR FLIGHT ON INSTRUMENTS**

Jean-Pierre Goiset, Saint-Maur-des-Fosses, France, assignor to Les Modeles Francais, Saint-Maur, France

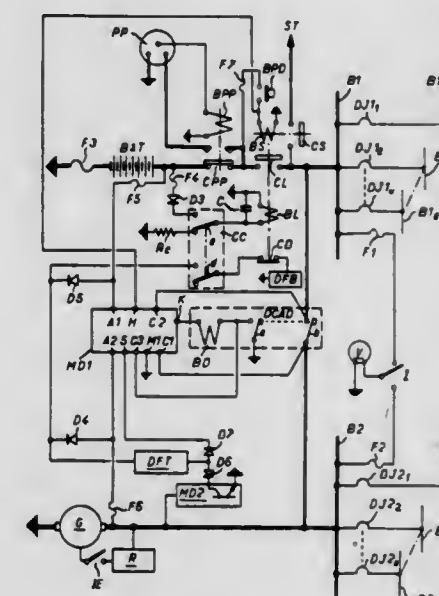
Filed Jan. 20, 1982, Ser. No. 340,860

Claims priority, application France, Jan. 20, 1981, 81 00940

Int. Cl.<sup>3</sup> H02J 9/06

U.S. Cl. 307—9

8 Claims



1. Security electrical power distribution system for light aircraft equipped for flight on instruments and having at least one navigation system comprising a main instrument and a standby instrument, said power distribution system comprising a battery, a generator, a battery bus and a generator bus connected to respective instruments of the or each navigation system, a remote-controlled circuit-breaker interconnecting said buses, and a fault detector with two control inputs connected to respective terminals of said circuit-breaker, one power feed input connected to said battery and another power feed input connected to said generator.

4,419,589

**MULTI-STAGE ELECTRICAL CONTROL SYSTEM**  
James W. Ross, 7418 E. Cholla La., Paradise Valley, Ariz. 85253

Filed Jun. 14, 1982, Ser. No. 387,830

Int. Cl.<sup>3</sup> H02J 3/00

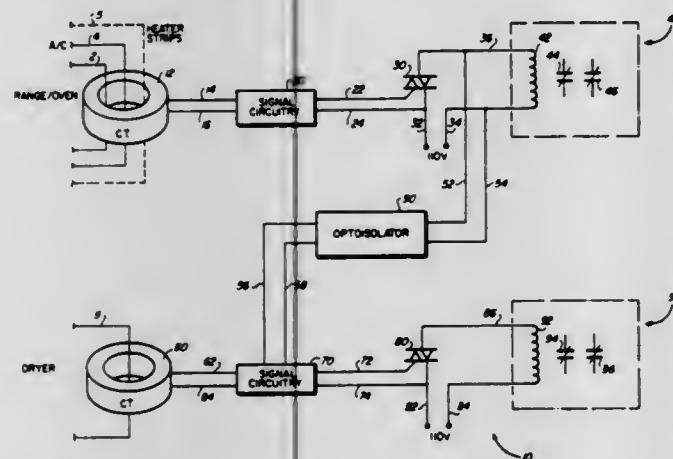
U.S. Cl. 307—39

6 Claims

1. Load control apparatus for controlling a plurality of electrical loads having different predetermined priorities, comprising, in combination:  
electrical load means, including



a first electrical load having a first priority, a second electrical load having a second priority, and a third electrical load having a third priority; sensing means for sensing the "on" status of the first and second electrical loads and for providing output signals in response thereto; and disconnect means for disconnecting the electrical loads in response to the output signals of the sensing means, including first disconnect means for disconnecting the second electrical load in response to the sensed "on" status of the first electrical load,



second disconnect means for disconnecting the third electrical load in response to the sensed "on" status of the first or second electrical loads, first signal circuitry means for providing an output signal to the first disconnect means in response to the sensed "on" status of the first electrical load, second signal circuitry means for providing an output signal to the second disconnect means in response to the sensed "on" status of the first or second electrical loads; and isolation means for isolating the first signal circuitry means and the first disconnect means from the second signal circuitry means and the second disconnect means.

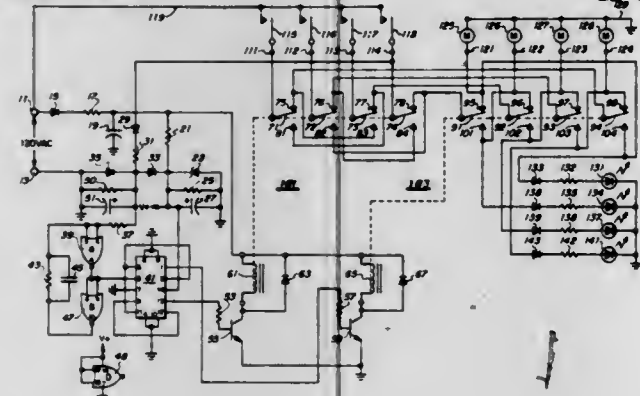
4,419,590

**SEQUENCER FOR PUMP MOTORS OR THE LIKE**  
Earl W. Voss, Colcord, Okla., assignor to Diversified Electronics, Inc., Evansville, Ind.

Filed Feb. 10, 1982, Ser. No. 347,182  
Int. Cl.<sup>3</sup> H02J 1/00

U.S. Cl. 307-41

12 Claims



10. Sequencer apparatus for equalizing service times of multiple electrical load devices controlled to turn on one by one in response to demand for service and having at least three electrical loads and a corresponding number of control signal sources, comprising,

a first electromechanical relay having three pairs of fixed double-throw contacts and three armature contacts,

a first driver circuit connected to drive said first electromechanical relay, a second electromechanical relay having three pairs of fixed double-throw contacts and three armature contacts, a second driver circuit connected to drive said second electromechanical relay, said first electromechanical relay having its normally closed double-throw contacts connected one by one to armature contacts of said second electromechanical relay, a first set of three control signal terminals, said second electromechanical relay having its normally closed double-throw contacts connected one by one to respective ones of said first set of control signal terminals and its normally open double-throw contacts connected one by one to different ones of said first set of control signal terminals, a second set of three control signal terminals connected one by one to the armature contacts of said first electromechanical relay, a solid-state binary counter with at least one input and two outputs, said two outputs being connected respectively to said first driver circuit and said second driver circuit, and a sequencing signal source connected to the input of said binary counter,

whereby load devices may be connected to one of said sets of control signal terminals and control signal sources may be connected to the other of said sets of control signal terminals causing the sequencing of operation of said load devices to change in response to said sequencing signal source.

4,419,591

**MULTITERMINAL DC POWER TRANSMISSION SYSTEM**

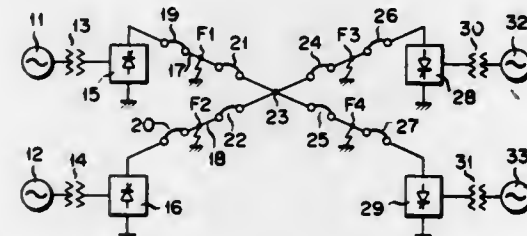
Shoichi Irokawa, Nagareyama; Koji Imal, Fuchu; Takeichi Sakurai, Tokyo, and Kiyoshi Goto, Musashino, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 3, 1981, Ser. No. 299,142

Claims priority, application Japan, Sep. 4, 1980, 55-121711  
Int. Cl.<sup>3</sup> H02J 3/36

U.S. Cl. 307-45

5 Claims



1. A multiterminal DC power transmission system having a plurality of forward converters and inverse converters, in which said forward and inverse converters are respectively provided with control units including constant voltage control means, different constant voltages are set in said converters by said constant voltage control means and the minimum value of those constant voltage set values of said forward converters is larger than the maximum value of those constant voltage set values of said inverse converters.

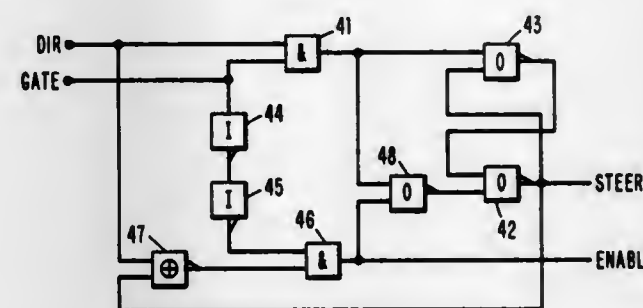
4,419,592

**BIDIRECTION DATA SWITCH SEQUENCING CIRCUIT**  
Kent S. Norgren, Longmont, and Stephen E. Stucka, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,374  
Int. Cl.<sup>3</sup> H03K 17/56, 5/13

U.S. Cl. 307-241

3 Claims



1. In a circuit having at least two port means for sending and receiving signals, said port means being coupled to one another by bidirectional gating means for providing, in response to an enabling signal, a signal path in one of two selectable directions, the direction of said signal path depending on a steering signal, and first and second signal source means for respectively producing a gating signal and a direction indicating signal, the improvement comprising:

asynchronous circuit means for producing said enabling signal and said steering signal in response to said first and second signal source means, said asynchronous circuit means including means for inhibiting said enabling signals until said steering signal is established.

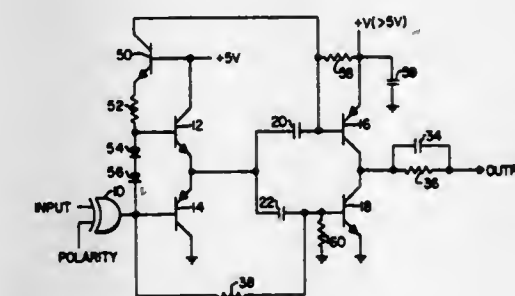
4,419,593

**ULTRA FAST DRIVER CIRCUIT**  
Neal R. Butler, Acton, and Alan R. Carson, Billerica, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1981, Ser. No. 278,775  
Int. Cl.<sup>3</sup> H03K 5/01, 17/60

U.S. Cl. 307-268

13 Claims



1. A circuit comprising:

A. input logic for receiving an input signal;  
B. output logic for providing an output signal in response to a drive current;  
C. logic means coupled to said input logic for providing said drive current in response to said input signal;  
D. means for coupling said drive current for receipt by said output logic;  
E. means for providing a high speed signal path and a low speed signal path, said high speed signal path including said means for coupling and said high speed signal path coupled between said logic means and said output logic, and said low speed signal path coupled between said input logic and said output logic, wherein said high and low speed signal paths are operative substantially independent of each other;  
F. wherein said logic means includes two transistors having

their respective emitters coupled together and to said output logic; and G. wherein said output logic includes two transistors having their respective collectors coupled together and also includes two capacitive elements, one end of each of said elements coupled together and to the junction of the emitters of said transistor included in said logic means, and the other end of said elements coupled to the bases respectively of the two transistors included in said output logic.

4,419,594

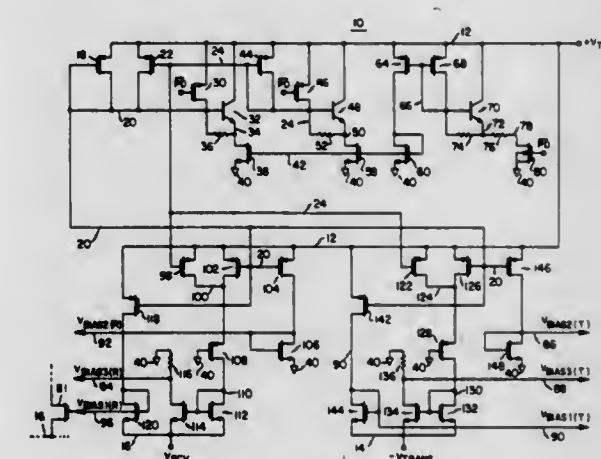
**TEMPERATURE COMPENSATED REFERENCE CIRCUIT**

Robert M. Gemmell, Carrollton, and David B. Hildebrand, Bedford, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Nov. 6, 1981, Ser. No. 319,045  
Int. Cl.<sup>3</sup> H02J 1/04

U.S. Cl. 307-297

13 Claims



1. A circuit for generating a reference current having a controlled temperature coefficient, comprising:  
a bipolar transistor having a collector for coupling to a power supply,  
a resistor connected between the base and emitter terminals of said bipolar transistor,  
means for generating a first current having a predetermined temperature coefficient, said means for generating connected to said bipolar transistor and said resistor such that said first current is essentially equal to the sum of the collector current of said bipolar transistor and the current through said resistor, and  
transistor means connected to the base terminal of said bipolar transistor and said resistor for passing said reference current through said transistor means.

4,419,595

**ANALOG OR GATE CIRCUIT**

Richard W. Reiner, Westlake Village, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 14, 1981, Ser. No. 311,378  
Int. Cl.<sup>3</sup> H03K 5/24

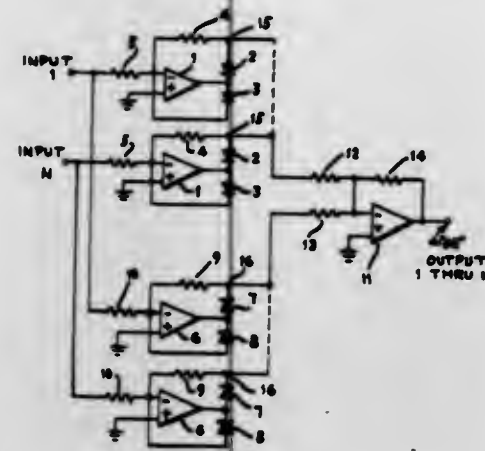
U.S. Cl. 307-355

4 Claims

1. An analog OR gate circuit for detecting the maximum instantaneous value of analog signals from multiple sources comprising:  
a multiplicity of gate circuit inputs, each receiving a discrete analog input signal,  
a gate circuit output,  
a positive half wave rectifier circuit connected to each said gate circuit input,  
a negative half wave rectifier circuit connected to each said gate circuit input, the outputs of said positive half wave rectifier circuits connected to provide an OR output, the



outputs of said negative half wave rectifier circuits connected to provide an OR output, and



summing means summing said OR outputs and providing an output to said gate circuit output.

4,419,596

## POWER ON CLEAR CIRCUIT

Hideo Kikuchi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

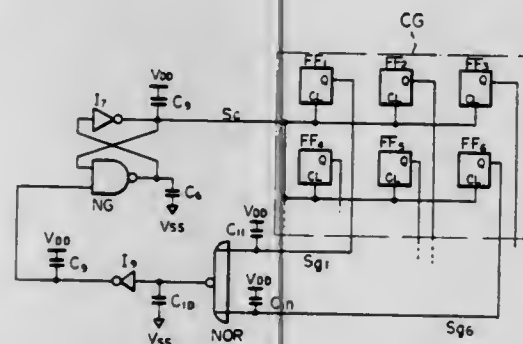
Filed May 5, 1980, Ser. No. 146,212

Claims priority, application Japan, May 9, 1979, 54-56774

Int. Cl.<sup>3</sup> H03K 5/163, 17/22, 17/284

U.S. Cl. 307—603

29 Claims



1. A power-on clear circuit comprising:  
a flip-flop which is placed in a set state so as to provide an output signal when a power supply is turned on;  
means for feeding the output signal to a circuit that is to be cleared when the power supply is turned on;  
detection means for detecting that said circuit is cleared by the output signal and for providing a detection signal;  
means for delaying the generation of said detection signal, said delaying means being connected to said detection means; and  
means for feeding said detection signal to said flip-flop to place it in a reset state.

4,419,597

## ALTERNATOR ASSEMBLY HAVING A RECTIFIER DEVICE IN THERMAL CONTACT WITH CASE AND COVER

Tsutomu Shiga, Aichi, and Takayasu Nimura, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 28, 1981, Ser. No. 258,293

Claims priority, application Japan, May 9, 1980, 55-63349[U]

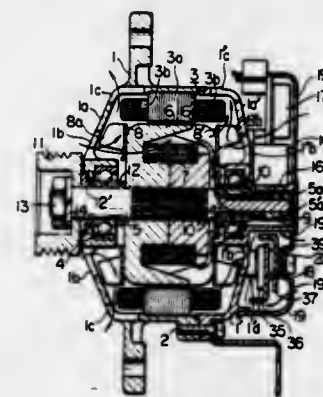
Int. Cl.<sup>3</sup> H02K 9/02

U.S. Cl. 310—68 D

5 Claims

1. In an alternator assembly the improvement comprising the combination of:  
an end frame;

a rear cover attached to said end frame at the outside thereof in a manner to define a space therebetween; and  
a rectifier device arranged in said space;  
said rectifier device including:  
a negative-side cooling fin;  
a first group of diodes having their positive electrodes in contact with and supported by said negative-side cooling fin;  
a positive-side cooling fin located more remote from said cover than said negative-side cooling fin so as to be upstream of the latter with respect to the cooling air flow thereover;  
a second group of diodes having their negative electrodes in contact with and supported by said positive-side cooling fin, said negative-side cooling fin having an area smaller than that of said positive-side cooling fin, whereby said positive-side cooling fin is contacted by a portion of the cooling air which has not first contacted and been warmed by said negative-side cooling fin;



a terminal board formed of an insulating material for supporting a plurality of terminals each connected to one of the negative electrodes of said first group of diodes and to one of the positive electrodes of said second group of diodes;  
metal members for securing together in a unitary structure said negative-side cooling fin, said positive-side cooling fin, and said terminal board that are placed one over another in superposed relation, said metal members being maintained in contact with said negative-side cooling fin but out of contact with said positive-side cooling fin; and  
a spacer formed of an insulating material for keeping said negative-side cooling fin and said positive-side cooling fin out of contact with each other;  
said rectifier device being arranged in the space defined by said rear cover and said end frame in such a manner that the metal members are in contact at one end thereof with said rear cover and at the other end thereof with said end frame.

4,419,598

## PIEZOELECTRICALLY CONTROLLED PIEZORESISTOR

Erich Spitz, and Francois Micheron, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 15, 1981, Ser. No. 331,130

Claims priority, application France, Dec. 15, 1980, 80 26543

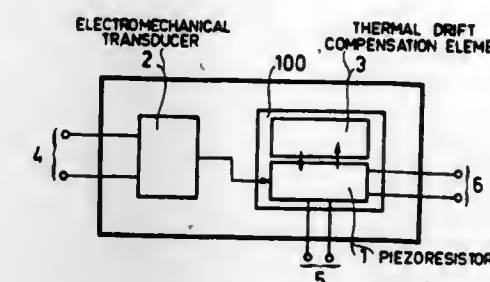
Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—311

13 Claims

1. An electrically controlled piezoresistor comprising at least one piezoresistive element made from a conductive particle-charged dielectric material and having one percolation point and a pair of input terminals, and at least one electromechanical transducer connected at its input terminals to an electrical control signal and acting on said piezoresistive ele-

ment via a transmitter element made from a dielectric material, means for compensating the thermal drift due to the piezoresis-



tive element cooperating to supply an output signal which is a function of the electrical control signal.

4,419,599

## PIEZOELECTRIC TRANSDUCER MADE FROM A POLYMER MATERIAL AND PROCESS FOR MANUFACTURING SAME

Francois Micheron, Paris, France, assignor to Thomson-CSF, Paris, France

Division of Ser. No. 179,220, Aug. 18, 1980, Pat. No. 4,345,359.

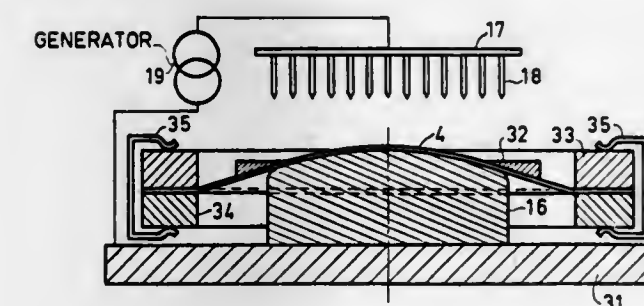
This application Apr. 21, 1982, Ser. No. 370,591

Claims priority, application France, Aug. 21, 1979, 79 21086

Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—311

4 Claims



1. In a piezoelectric transducer whose active element is formed by a polymer film forming a self-supporting structure provided with electrodes on both its faces, the part of the film between said electrodes contains at least one non-developable zone mechanically relaxed and caused to change from a non-polar to a polar phase by an electric field applied thereto; said electric field inducing in said polymer film a macromolecular chain transition between reversed and non-reversed neighboring chains.

4,419,600

## STRESS-COMPENSATED QUARTZ RESONATORS

Bikash K. Sinha, West Redding, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 204,400, Nov. 5, 1980, abandoned. This application May 27, 1981, Ser. No. 267,507

Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—361

23 Claims

1. A stress compensated thickness-shear resonator adapted to vibrate in at least one of its fast and slow thickness-shear modes of vibration at a frequency substantially determined by the thickness thereof, said resonator being of an orientation selected from the group consisting of the orientations (yxw)  $\phi/\theta$  defined by the loci of FIG. 10 and the orientations (yxw)  $\phi/\theta$  defined by the loci of FIG. 11, plus or minus  $4^\circ$  in  $\phi$  and  $\theta$ .

4,419,601

## SPARK PLUG FOR INTERNAL COMBUSTION ENGINE

Kyugo Hamai, Yokosuka; Yasuhiko Nakagawa, Kamakura; Meroji Nakai, Yokosuka, and Ryuzaburo Maruyama, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

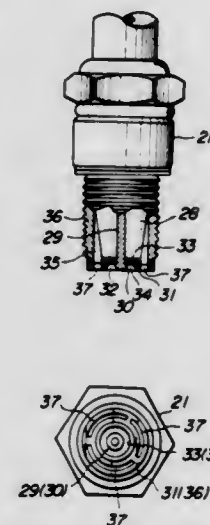
Filed Oct. 30, 1980, Ser. No. 202,157

Claims priority, application Japan, Nov. 5, 1979, 54-143073; Mar. 10, 1980, 55-30011

Int. Cl.<sup>3</sup> H01T 13/52, 13/32

U.S. Cl. 313—131 A

4 Claims



1. A spark plug for an internal combustion engine including positive and negative electrodes between which spark discharge occurs to produce self-induction electromagnetic force by means of which plasma gas is jetted into a combustion chamber of said internal combustion engine, comprising a resistive semiconductor body connecting said positive and negative electrodes to provide a creeping discharge, one of said electrodes being located at a center of the plug, and an insulator surrounding said one electrode, the other of said electrodes having a plurality of arcuate communicating apertures arranged in a circle and a cylindrical portion surrounding and spaced from said insulator to define a gas space about the insulator communicating with said combustion chamber through the apertures whereby the heat dissipation characteristics of said spark plug are a function of the volume of said gas space.

4,419,602

## ELECTRIC LAMP

Zenzou Mitamura, Yokohama; Takashi Oosawa, Tokyo, and Akihiro Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

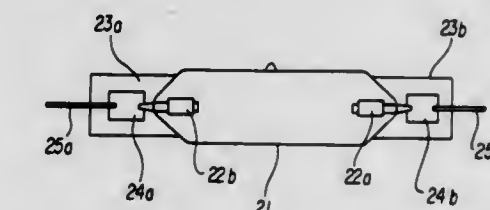
Filed Jan. 21, 1982, Ser. No. 341,570

Claims priority, application Japan, Jan. 23, 1981, 56-7885

Int. Cl.<sup>3</sup> A47B 88/00, 95/00

U.S. Cl. 313—332

4 Claims



3. A quartz glass envelope for an electric lamp including an improved molybdenum coupling member having increased resistance to mechanical failure at high temperatures comprising:

a pinch seal portion at either end of said glass envelope, a molybdenum coupling member enclosed within each said pinch seal portion, said coupling member having predetermined



mined quantities of potassium and silicon dioxide dispersed therein; and, an external conductor and a tungsten electrode welded to each said coupling member.

4,419,603

# BIALKALINE PHOTOCATHODE HAVING INCREASED SPECTRAL SENSITIVITY AND METHOD OF MANUFACTURING SAME

Jacques Nussli; Georges J. P. Marandas, and Antoine Farayre, all of Brive, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,434

Claims priority, application France, Jul. 30, 1980, 80 16820

Int. Cl.<sup>3</sup> H01J 1/14, 19/06

U.S. Cl. 313—346 R

4 Claims



1. A photocathode comprising a layer of potassium caesium antimonide  $\text{SbK}_2\text{Cs}$  deposited on a substrate characterized in that said substrate comprises a sub-layer of manganese oxide  $\text{MnO}$  in contact with said layer of potassium caesium antimonide and an inert outer layer substrate in contact with said layer of manganese oxide.

4,419,604

# LIGHT SENSITIVE SCREEN

Sachio Ishioka, Tokyo; Yoshinori Imamura, Hachioji; Yasuharu Shimomoto; Saburo Ataka, both of Hinodemachi; Yasuo Tanaka, Kokubunji, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

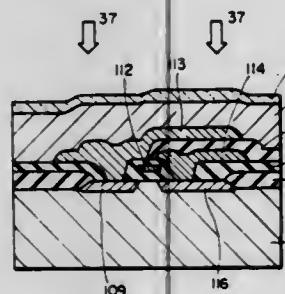
Filed Apr. 24, 1981, Ser. No. 257,611

Claims priority, application Japan, Apr. 25, 1980, 55-54155

Int. Cl.<sup>3</sup> H01J 29/45

U.S. Cl. 313—385

17 Claims



1. A light sensitive screen including at least a light-transmitting conductive film and at least one photoconductive layer, the light-transmitting conductive film being arranged with respect to the photoconductive layer at the side of intended incidence of light; said at least one photoconductive layer being formed of an amorphous silicon material which contains at least 5 atomic-% to 30 atomic-% of hydrogen, and which has an optical forbidden band gap in the range of 1.65 eV to 2.3 eV and an infrared absorption spectrum in which the peak component at the wave number  $2,100\text{ cm}^{-1}$  is not smaller than that of a wave number  $2,000\text{ cm}^{-1}$ .

4,419,605

# GAS DISCHARGE DISPLAY DEVICE

David Branston, Erlangen, Fed. Rep. of Germany; assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

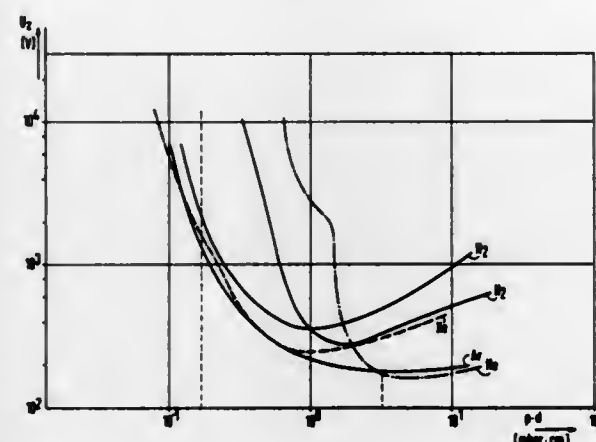
Filed Dec. 30, 1980, Ser. No. 221,257

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1980, 3002930

Int. Cl.<sup>3</sup> H01J 61/16

U.S. Cl. 313—485

1 Claim



1. In a gas discharge display device comprising a closed envelope containing a filling gas and having a gas discharge path which is separated, by a hole matrix with control electrodes, from an electron acceleration path which is terminated by a picture screen, the improvement comprising the filling gas being helium He, to which an amount of 0.1 to 10% by volume of at least one of the gases selected from the group consisting of argon Ar, krypton Kr, xenon Xe, nitrogen  $\text{N}_2$  and carbon dioxide  $\text{CO}_2$  is admixed, said filling gas being at an overall pressure of 0.5 to 5 mbar.

4,419,606

# MAGNETRON

Mamoru Tsuzurabara, and Seiji Kitakaze, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

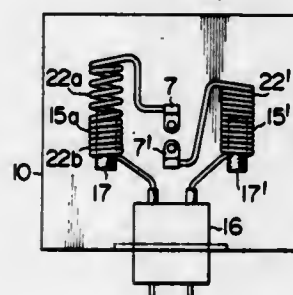
Filed Jun. 1, 1981, Ser. No. 268,905

Claims priority, application Japan, Jun. 2, 1980, 55-72768

Int. Cl.<sup>3</sup> H01J 25/50

U.S. Cl. 315—39.51

11 Claims



1. A magnetron comprising: an anode structure having a cylindrical anode electrode and vanes interiorly of the anode electrode; a cathode electrode disposed concentrically with the anode structure; cathode input terminals connected to the cathode electrode and extending from interior to exterior of the anode structure; and a shield case housing a filter circuit comprised of choke coils and a capacitor connected in series with the cathode input terminals, at least one of said choke coils having an air-core coil winding of at least two turns close to one of said cathode input terminals, the at least two turns of the air-core coil winding being wound at a predetermined spacing therebetween and a remainder of the at least one

choke coil being wound about a ferrite core with adjacent turns thereof being wound in intimate contact.

4,419,607

# DISCHARGE LAMP STARTER AND STARTING AND OPERATING CIRCUITRY

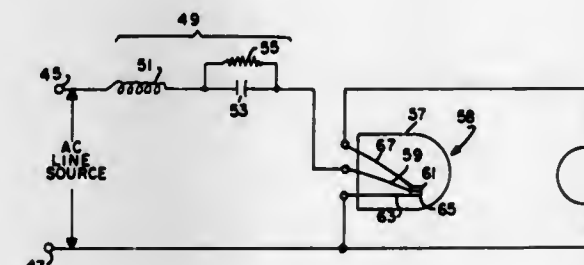
Nikolaos Barakitis, Haverhill, and Sheppard Cohen, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 19, 1982, Ser. No. 398,721

Int. Cl.<sup>3</sup> H05B 41/06

U.S. Cl. 315—73

12 Claims



1. Starting and operating circuitry for discharge lamps comprising: a pair of input terminals formed for connection to a source of AC line voltage; a ballast coupled to one of said pair of input terminals; a starter device having an electrical conductor and a first bimetal each having one end connected to one of a first and second electrical conductors respectively and the other end connected together at a first contact and a second bimetal having one end connected to a third electrical conductor and the other end at a second contact adjacent said first contact; means connecting said second and third electrical conductors to said ballast and to said other one of said pair of input terminals; and means connecting a discharge lamp to said first and third electrical conductors and said starter device whereby energization of said ballast causes current flow through and heating of said first and second bimetal to flex both bimetal and separate said first and second contacts and upon starting of said discharge lamp effect current flow through said first bimetal is an amount sufficient to maintain separation of said first and second contacts.

4,419,608

# HORIZONTAL DEFLECTION CIRCUIT

James E. Hicks, New Palestine, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,385

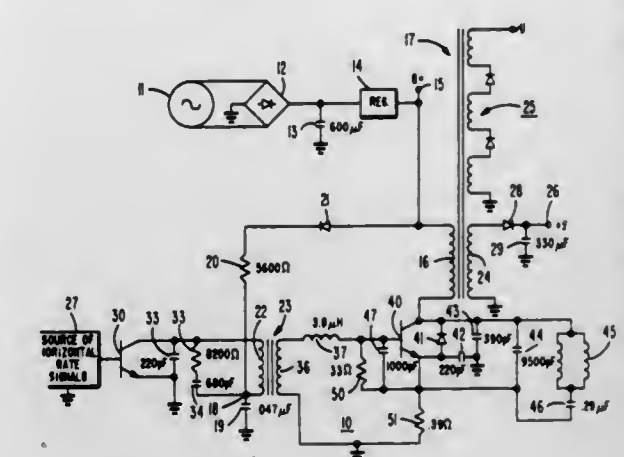
Int. Cl.<sup>3</sup> H01J 29/70, 29/76

U.S. Cl. 315—408

6 Claims

1. A television horizontal deflection circuit comprising: a transistor having base, emitter and collector electrodes; a source of horizontal rate drive signals coupled to said base electrode of said transistor and to a source of reference potential and providing base current to said transistor; a load circuit comprising variable impedance means providing load current to said collector electrode of said transistor; horizontal deflection coil means including distortion correcting impedance means coupled between said collector electrode and said emitter electrode of said transistor; and resistance means coupled to said emitter electrode of said transistor and to said source of reference potential, said resistance means coupled so as to be located in both the path of said load current and the path of said base current

of said transistor to enable the voltage developed by the load current across said resistance means to bias the base-



emitter junction of said transistor in accordance with said load current.

4,419,609

# DEVICE FOR THE ATTENUATION OF THE MOVEMENT OF REEL MOTORS IN TAPE RECORDERS DURING STANDSTILL OF THE TAPE DRIVE ROLLER

Franz J. Meyer, Emmering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 179,110, Aug. 18, 1980, abandoned.

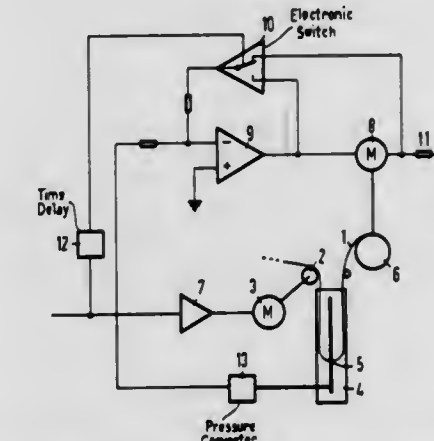
This application Sep. 1, 1982, Ser. No. 413,811

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936937

Int. Cl.<sup>3</sup> H02P 3/08

U.S. Cl. 318—7

5 Claims



1. In a tape transport system for tape recorders including a capstan drive means for driving the tape, tape tensioning motor means responsive to motor current to control tape tension, buffer chamber means for receiving a loop of the tape between the capstan drive means and tape tensioning motor means, wherein the improvement comprises: circuitry means for the attenuation of the movement of the tape tensioning motor means after cessation of tape drive and for prevention of a constant movement of the tape loop in the buffer chamber means, said circuitry means regulating said tape tensioning motor means during tape drive via control of the motor current which flows in said tape tensioning motor means, and after said cessation of tape drive via control of the voltage at said tape tensioning means so as to attenuate movement of the tape loop in the buffer chamber means.



# 4,419,610 REVERSIBLE REGENERATING ELECTRIC VEHICLE DRIVE

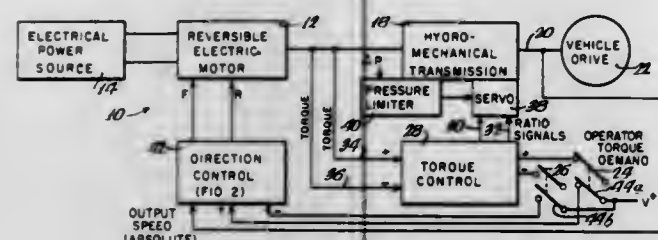
Frederic W. Pollman, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 15, 1982, Ser. No. 357,889

Int. Cl.<sup>3</sup> H07D 3/14

U.S. Cl. 318—12

8 Claims



1. A regenerative drive system for driving a load at varying speeds in a forward or reverse direction comprising: a variable ratio transmission having an input and an output shaft coupled so as to be capable of driving the load; a constant speed bi-directional electric motor having an output coupled to the input of the transmission; a source of power for energizing the motor; means for generating a torque demand signal representing a torque to be developed by the transmission to control the direction of the motor; means for generating in response to the torque demand signal generating means a motor direction command signal; and means for controlling the direction of operation of the motor in response to the motor direction command signal when the speed of the output shaft of the transmission is less than a predetermined value.

# 4,419,611 WIPER INTERMITTENT MOTION CONTROL DEVICE

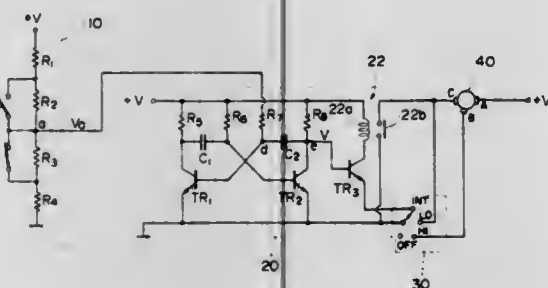
Teruo Kawasaki, Kouichi Kogawa, both of Yokohama, and Hiroyuki Nomura, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 11, 1980, Ser. No. 186,327

Int. Cl.<sup>3</sup> H02P 1/04

U.S. Cl. 318—443

12 Claims



1. A device for use in a road vehicle having a transmission to intermittently connect a wiper drive motor means to a power source for intermittent motion of a wiper blade, comprising: (a) first means for providing a control signal output with its magnitude increased to a first predetermined value when said vehicle starts running and to a second predetermined value higher than the first predetermined value when said transmission is in a top-gear position; (b) second means for providing a first signal for a predetermined period of time and a second signal for a period of time variable according to the magnitude of said control signal applied thereto; and (c) third means for connecting said wiper drive motor means to said power source in response to said first signal applied thereto from said second means and for disconnecting said wiper drive motor means from said power source in response to said second signal applied thereto from said second means.

response to said second signal applied thereto from said second means.

# 4,419,612 SINGLE WORKHEAD ELECTRO-MECHANICAL INTERNAL GRINDING MACHINE WITH GRINDING SPINDLE DIRECTLY ON CROSS SLIDE

Kazimierz J. Reda, Victor F. Dziewaltowski, both of Springfield, and Richard H. Gile, North Clarendon, all of Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

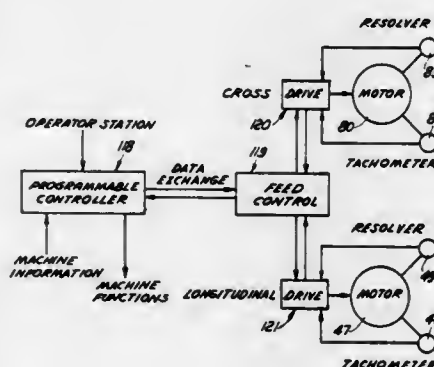
Continuation of Ser. No. 152,286, May 22, 1980, abandoned.

This application Jan. 18, 1982, Ser. No. 340,410

Int. Cl.<sup>3</sup> G05B 19/24

U.S. Cl. 318—571

2 Claims



1. A method for controlling the position and movement of a grinding wheel and spindle in a single workhead grinding machine with two slide means establishing the relative position between a rotating workpiece and the grinding wheel with the slide means being driven by first and second electric motor driven screw actuator means along first and second axes arranged perpendicular to one another and with one of the first and second axes being on the same axis as the axis of rotation of the grinding wheel spindle comprising:

- (a) programming a programmable computer with first and second sets of data to control the position and drive speed of a slide means to establish the relative position and relatively velocity of movement between a grinding wheel and a rotating workpiece;
- (b) interfacing an electronic feed control means with the programmable controller and an electric motor servo controller means;
- (c) controlling the speed and position of the slide means by speed sensing and closed loop control of a single servo loop for the speed and position of movement of each of first and second electric motor driven screw actuator means; and
- (d) controlling the first electric motor driven actuator means to control directional movement and speed of the slide means along the same axis as the axis of rotation of a grinding wheel spindle to adjust the relative position and relative velocity of movement of the grinding wheel and slide means at a grinding position and between a workpiece grinding position and a retract position;
- (e) said last mentioned controlling step including providing simultaneous coarse and fine resolution of movement of the slide solely by the closed loop control of said first electric motor driven actuator means by one of the single servo loops.

# 4,419,613 APPARATUS FOR INTERMITTENTLY DRIVING ENDLESS BELT IN AUTOMATIC SCREEN PRINTING MACHINE

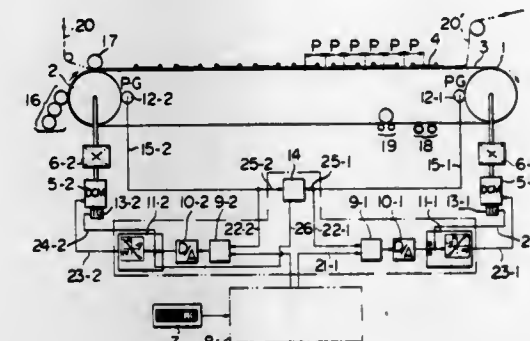
Shiro Ichinose, Kobe; Saneto Machida, Nishinomiya; Shotoku Murakami, and Teruo Furusawa, both of Iruma, all of Japan, assignors to Toshin Kogyo Co. Ltd., Hyogo, Japan

Filed Jan. 18, 1982, Ser. No. 340,035

Int. Cl.<sup>3</sup> G05D 23/275

U.S. Cl. 318—632

2 Claims



1. An apparatus for intermittently driving endless belt by two electric motors in an automatic screen printing machine, which comprises a pair of rollers, an endless belt supported on the rollers, a direct current electric motor for intermittently driving said rollers and a control mechanism for setting a repeat length of the endless belt while converting it to a pulse number, detecting the actual feed length of the endless belt as a pulse number and subtracting the detected pulse number from the set pulse number to stop the endless belt at the repeat length corresponding to the set pulse number, wherein each of the pulling and feed-out rollers supporting the endless belt is provided with a direct current electric motor capable of independently the roller, a pulse generator for detecting as a pulse number and actual feed length of the endless belt according to displacement of the roller and a digital servo mechanism for subtracting the detected pulse number from the set pulse number and reducing the speed of the direct current electric motor and stopping the same to stop the belt at the repeat length corresponding to the set pulse number, and a deviation comparing counter is arranged between the two pulse generators and at least one digital servo mechanism to compare the detected pulse number from the pulse generator on the pulling roller side with the detected pulse number from the pulse generator on the feed-out roller side and correct and control inputs to the electric motors according to the deviation, whereby any difference of the position is not produced between the two rollers at any moment during any mode of starting, running and speed reduction and therefore, no tension for driving is imposed on the endless belt.

# 4,419,614 APPARATUS FOR DRIVING OBJECTIVE LENS IN TRACKING DIRECTION

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Company Limited, Japan

Filed Feb. 26, 1982, Ser. No. 352,475

Claims priority, application Japan, Mar. 7, 1981, 56-33030

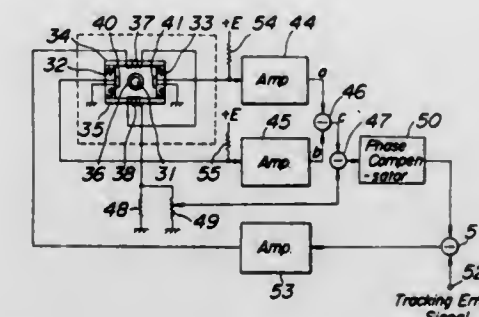
Int. Cl.<sup>3</sup> G05B 1/06

U.S. Cl. 318—653

8 Claims

1. In an apparatus for driving an objective lens in a tracking direction perpendicular to an optical axis of the objective lens and to a track direction comprising first and second magnet members arranged symmetrically with respect to a plane which includes the optical axis of objective lens and is at right angles to said tracking direction, first and second magnetic members arranged across the same poles of said first and second magnet members, a third magnetic member arranged within a space surrounded by said first and second magnet members and first and second magnetic members movably in the tracking direction together with the objective lens, and

first and second coils wound around said first and second magnetic members, respectively substantially at middle portions thereof, said third magnetic member and objective lens being moved in said tracking direction by supplying a tracking control signal to said first and second coils, the improvement comprising



- magneto-electro transducing means for detecting a magnetic flux leaked out of said third magnetic member to produce an electric signal representing a displacement of the third magnetic member and objective lens in the tracking direction; and means for feeding back said electric signal to said tracking control signal to suppress a resonant vibration of the third magnetic member and objective lens.

# 4,419,615 METHOD OF CONTROLLING PULSE WIDTH MODULATED INVERTER FOR USE IN INDUCTION MOTOR DRIVE

Nobuyoshi Muto; Keijiro Sakai, and Yasuo Matsuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

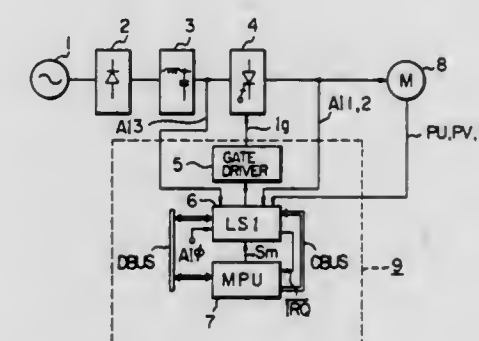
Filed Nov. 9, 1981, Ser. No. 319,268

Claims priority, application Japan, Nov. 10, 1980, 55-158669

Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318—811

3 Claims



1. A control method of a pulse width modulated inverter for driving an induction motor in a speed variable manner, utilizing a process for forming a pulse width modulating signal by a microcomputer comprising the steps of:

- (a) executing a command for reading a value of a rated frequency ( $f_1$ )max externally set;
- (b) calculating the number of running pulses for calculating the number N of pulses allotted to a half cycle of a modulating wave corresponding to the running frequency  $f_1$  from a zero frequency to said running frequency  $f_1$ ;
- (c) calculating a PWM timer fundamental unit time t for determining a fundamental unit time of a carrier wave;
- (d) calculating a crest value H wherein  $H = 1/(4t \times N \times f_1)$  of said carrier wave;
- (e) calculating a voltage  $V_1$  wherein  $V_1 = \beta f_1$  and  $\beta$  is a constant;
- (f) calculating an amplitude ratio  $K_H$  corresponding to said voltage  $V_1$ ;
- (g) calculating a modulating wave level D wherein  $D = K_H H$ ;
- (h) calculating data for determining the carrier waveform by



the use of said PWM timer fundamental unit time  $t$  and said crest value  $H$ ;

(i) calculating data for determining the modulating waveform by the use of said modulating wave level  $D$ ; and

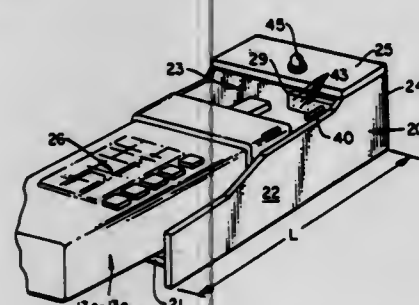
(j) forming said pulse width modulating signal by the use of said data for determining the carrier waveform and said data for determining the modulating waveform.

**4,419,616**  
**POWER-UP RACK AND METHOD OF USE IN ASSOCIATION WITH PORTABLE MICROCOMPUTERS WITHIN A REFINERY AND THE LIKE**  
 Lew E. Baskins, Torrance, and J. Patrick Ellis, Manhattan Beach, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 29, 1980, Ser. No. 220,627  
 Int. Cl.<sup>3</sup> H02J 7/00

U.S. Cl. 320—2

5 Claims



1. A power-up rack for a programmable microcomputer used to gather engineering data within a refinery or chemical complex for later automatic transmission to a central computer via a communication link, said microcomputer having a series of keys arranged in rows and columns over a top surface thereof and a first multi-pin receptacle for recharging purposes, mounted at a far end thereof comprising:

a H-shaped support means including twin up-right wall means, cross-member means connected to said wall means and end wall means forming a repository to accept and accommodate said microcomputer in a recharging electrical engagement, said repository being U-shaped throughout a substantial portion of its length, with the open side of the U facing outwardly wherein loading of said microcomputer into said rack from a loading position above said cross-member means is facilitated, said cross-member means sloping front-to-back as a function of its length, said end wall means having a second multi-pin receptacle mounted thereon and adapted to engage said first receptacle in a power-up, recharging relationship said support means including top wall means attached to said side wall means and end wall means, and a light indicator supported on said top wall means in electrical circuit with and activated by electrical engagement of said first and second receptacles, said top wall being of limited cross-wise dimension so as to extend only a slight amount into said open side of said U-shaped repository whereby when said microcomputer is loaded into said repository for recharging same, said series of keys of said microcomputer can be manipulated for testing purposes, without removal of said microcomputer from said repository.

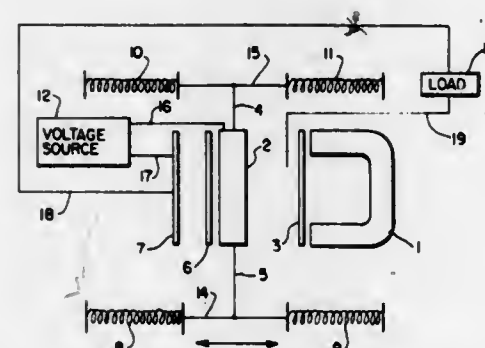
**4,419,617**  
**THERMALLY ELECTROGENERATIVE STORAGE CELL AND GENERATOR APPARATUS**  
 Ronald P. Reitz, P.O. Box 1543, Annapolis, Md. 21401  
 Continuation-in-part of Ser. No. 5,724, Jan. 23, 1979, abandoned. This application Jun. 11, 1979, Ser. No. 47,354  
 Int. Cl.<sup>3</sup> H02N 1/00

U.S. Cl. 322—2 R

7 Claims

1. Apparatus for generating electric energy from heat energy comprising:

- (a) a first electrode means,
- (b) a second electrode means spaced proximate said first electrode means such that a first dielectric region is established therebetween,
- (c) means for initially charging said first and second electrode means,
- (d) means for electrically disconnecting said first electrode means from said means for initially charging said first and second electrode means,
- (e) means for decreasing the capacitance between said first and second electrode means after said first electrode means has been electrically disconnected from said charging means,
- (f) means for electrically connecting said first and second electrode means in circuit with a load to be driven which is desired to be driven,



- (g) said means for decreasing the capacitance between said first and second electrode means further comprising means for magnetically forcing said first electrode to move with respect to said second electrode such that the distance between said first and second electrode means is increased,
- (h) said magnetic forcing means further comprising a magnetic field producing means, a ferromagnetic material positioned substantially within the magnetic field produced by said magnetic field producing means and a means whereby said ferromagnetic material may be caused to increase and decrease in temperature such that the magnetic permeability of said ferromagnetic material is made to vary in strength thereby causing the magnetic field in the space proximate said ferromagnetic material to be made to vary in strength.

**4,419,618**  
**ON-BOARD VEHICULAR NETWORK METHOD FOR EFFICIENT GENERATOR UTILIZATION**  
 Ralf Gretsch, Erlangen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
 Filed Oct. 22, 1981, Ser. No. 313,649  
 Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041201

Int. Cl.<sup>3</sup> H02P 9/04; H02J 7/14

U.S. Cl. 322—7

25 Claims

1. Method of increasing the operating efficiency and supplying current of on-board vehicular networks having an a-c generator (1) subject to widely varying operating speed and loads;

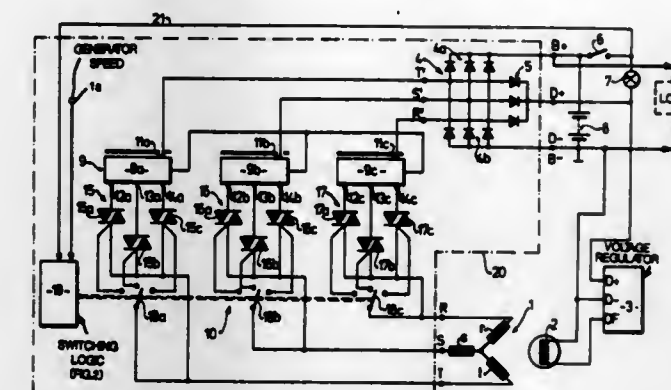
a battery (8), and loads (L) selectively connectable to the battery;

a rectifier network (4) rectifying the output from the a-c generator and connected to charge and supply the battery (8) and the loads (L) comprising the steps of

determining the speed of operation of the generator by analyzing the frequency of the output of the generator and obtaining a speed signal (1a) representative of the speed of operation of the generator;

matching the internal impedance of the generator to the

impedance of the battery and load, as the speed of the generator changes, under control of said speed signal, by connecting a transformer of variable transformation ratio between the generator and battery and load;



and changing the transformation ratio of the transformer in dependence on said speed signal.

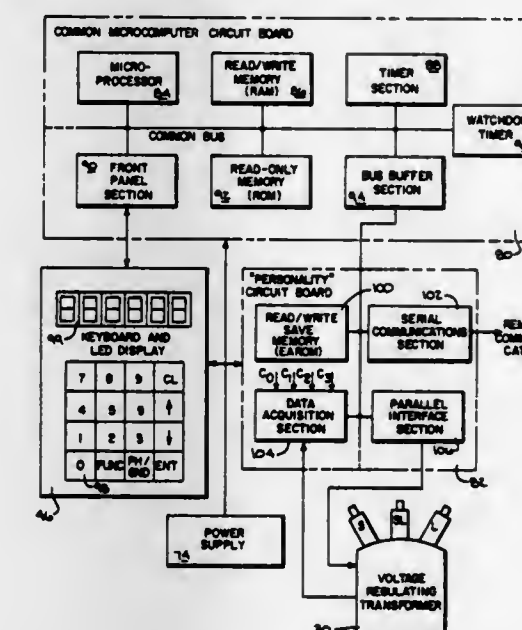
**4,419,619**  
**MICROPROCESSOR CONTROLLED VOLTAGE REGULATING TRANSFORMER**

James A. Jindrick, Racine; James R. Hurley, Brookfield; Clyde Gilker; Naresh K. Nohria, both of Milwaukee; James A. Baranowski, Oak Creek, and Thomas G. Dolnik, Kenosha, all of Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 18, 1981, Ser. No. 303,608  
 Int. Cl.<sup>3</sup> G05F 1/20, 1/30

U.S. Cl. 323—257

23 Claims



1. A voltage regulating transformer, comprising:
- a. a first winding defining a first plurality of turns and having an associated input terminal adapted to be connected to a source of A.C. voltage;
- b. a second winding, electromagnetically coupled to said first winding, defining a second plurality of turns and having an associated output terminal;
- c. changer means, operated in response to an analog control signal supplied thereto, for changing the ratio of turns through which current flows through said first winding and said second winding, whereby the voltage at said output terminal varies in response to said analog control signal when A.C. voltage is applied to said input terminal;
- d. voltage output signaling means, operatively connected to said output terminal, for producing a plurality of digital voltage signals representative of the instantaneous A.C. voltage at said output terminal;
- e. digital input means for producing a reference digital volt-

age signal representative of the RMS voltage to be maintained at said output terminal over the period of said A.C. voltage;

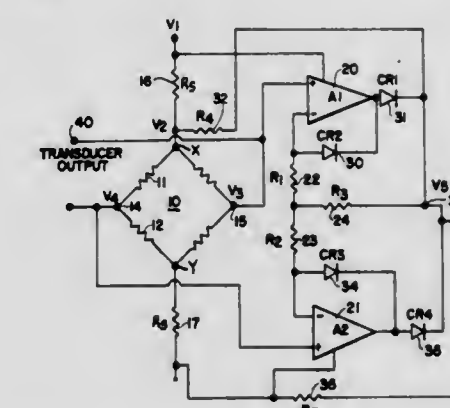
- f. digital computer means having a single microprocessor for Fast Fourier Transforming said plurality of digital voltage signals from the time domain into the frequency domain to obtain a measured digital voltage signal representative of the RMS voltage at said output terminal over the period of said A.C. voltage and for generating a digital control signal representative of the difference between said measured digital voltage signal and said reference digital voltage signal; and
- g. converter means for converting said digital control signals to an analog control signal to operate said changer means, whereby said changer means is operated in response to the RMS voltage at said output terminal over the period of the A.C. voltage applied to said input terminal.

**4,419,620**  
**LINEARIZING CIRCUITS FOR A SEMICONDUCTOR PRESSURE TRANSDUCER**  
 Anthony D. Kurtz, Englewood, and Donald Weinstein, Fair Lawn, both of N.J., assignors to Kulite Semiconductor Products, Ridgefield, N.J.

Filed Mar. 8, 1982, Ser. No. 356,084  
 Int. Cl.<sup>3</sup> G01L 9/06; G01R 17/10

U.S. Cl. 323—280

10 Claims



1. A linearizing circuit apparatus for a differential transducer of the type employing a conventional Wheatstone bridge array having first and second input terminals for applying a source of biasing potential therebetween and first and second output terminals for obtaining a transducer output voltage therebetween, with said transducer undesirably providing a non-linear output voltage for both a positive and a negative voltage difference between said output terminals, said linearizing circuit apparatus operative to linearize said output voltage for both said positive and negative voltage differences comprising:

- (a) first and second amplifiers each having a non-inverting and an inverting input terminal and an output terminal, with the non-inverting input terminal of said first amplifier coupled to said first output terminal of said bridge, and the non-inverting input terminal of said second amplifier coupled to said second output terminal of said bridge;
- (b) input means coupling said inverting input terminals of said first and second amplifiers together;
- (c) first threshold means coupled between the output terminal and the inverting input terminal of said first amplifier and second threshold means coupled between the output terminal and the inverting input terminal of said second amplifier;
- (d) feedback means coupling said output terminals to said input means, to cause said first amplifier to operate when said voltage at said first bridge output terminal exceeds the voltage at said second bridge output terminal with said second threshold means operative to bypass said second amplifier, and to cause said second amplifier to operate when said voltage at said second bridge output terminal exceeds the voltage at said first bridge output terminal



with said first threshold means operative to bypass said first amplifier and means for coupling the output terminals of said first and second amplifiers to one of said input terminals of said bridge array.

4,419,621

### MONITORING SYSTEM FOR THE CAPACITOR BATTERIES OF A THREE-PHASE FILTER CIRCUIT

Michael Becker, Uttenreuth; Alfons Fendt, Erlangen; Dusan Povh, Nuremberg; Klaus Renz, Fürth; Gerhard Schuch, Erlangen, and Hermann Waldmann, Weiher, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

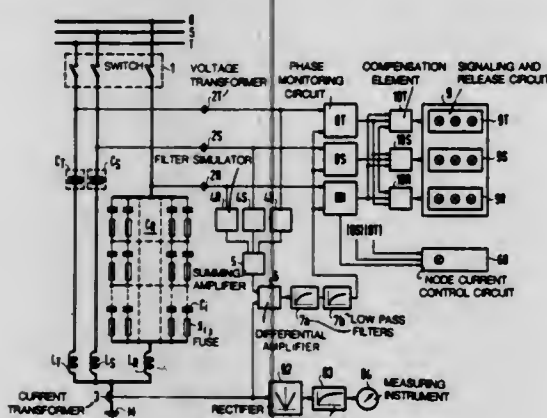
Filed May 20, 1981, Ser. No. 265,459

Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020110

Int. Cl.<sup>3</sup> G01R 31/02

U.S. Cl. 324—51

8 Claims



1. A monitoring system for the capacitor batteries of a three-phase filter circuit having three filter legs connected in a Y-circuit configuration, the Y-circuit node being connected to a reference potential, each capacitor battery being of the type having a plurality of parallel legs, each leg having a plurality of sectional capacitors connected in series with respective fuses, adjacent ones of the sectional capacitors being coupled to one another, the system further comprising means for determining variations in the magnitude and phase of a fundamental frequency component of a zero current flowing from the Y-circuit node of the three-phase filter circuit to the reference potential, said variations being evaluated to identify defective ones of the sectional capacitors in a capacitor battery.

4,419,622

### EM SENSOR FOR DETERMINING IMPEDANCE OF EM FIELD

Andrew A. Cuneo, Jr., Towson, Md., and James J. Loftus, Alex, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 19, 1981, Ser. No. 275,470

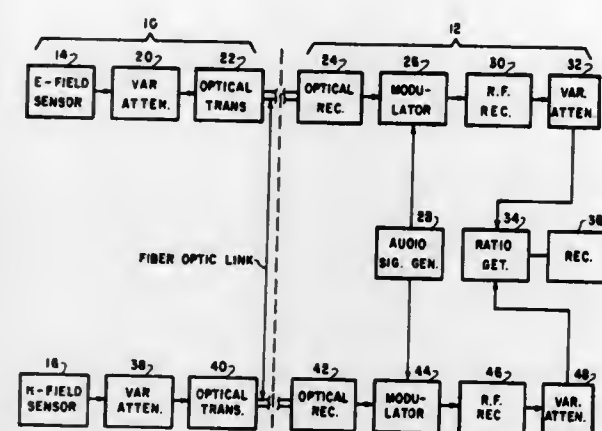
Int. Cl.<sup>3</sup> G01R 27/00

U.S. Cl. 324—57 R

18 Claims

1. A method of determining the impedance of the electric and magnetic fields in the near and far fields associated with a radiating antenna comprising the steps of:  
sensing said electric and magnetic field components of said antenna at a first location in said far field;  
sensing electric and magnetic field components of said antenna at multiple subsequent locations;  
transforming each of said electric and magnetic field components into an optical electric field signal and an optical magnetic field signal;  
transmitting each of said optical signals to optical signal receivers;  
transforming each of said optical signals into a radio frequency electric field signal and a radio frequency magnetic field signal;

modulating said radio frequency electric field and radio frequency magnetic field signals;  
determining a ratio between said modulated radio frequency electric and magnetic field signals;



recording said ratio as a function of said first and subsequent locations.

4,419,623

### REACTANCE METER

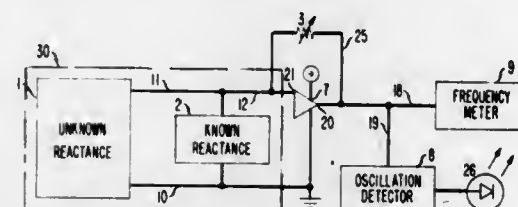
Raymond W. Ketchledge, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 7, 1981, Ser. No. 327,925

Int. Cl.<sup>3</sup> G01R 27/00

U.S. Cl. 324—57 Q

8 Claims



1. A circuit for determining the value of an unknown reactance comprising:  
known reactance means of one type;  
unknown reactance means of another type;  
means for connecting said known reactance means in circuit with said unknown reactance means for forming a tank circuit;  
amplifying means with an input and output;  
adjustable resistance means connected in positive feedback relationship between the output and input of said amplifying means, the adjustable resistance means for canceling the nonreactive component of the tank circuit in such a way to permit oscillation thereof; and  
means connected to the output of said amplifying means for measuring the frequency of oscillation of said tank circuit; the product of the reactor values of said known and unknown reactance means being inversely proportional to the square of said frequency of oscillation.

4,419,624

### APPARATUS FOR PHASE MEASUREMENT

Morton E. Brown, San Antonio, Tex., assignor to Southern Gas Association, Dallas, Tex.

Filed Mar. 23, 1981, Ser. No. 246,715

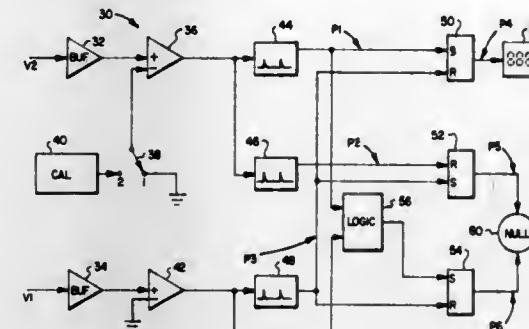
Int. Cl.<sup>3</sup> G01R 25/00

U.S. Cl. 324—83 D

5 Claims

1. An apparatus for calibrating a pulse width reading phase-meter, comprising:  
means for generating first and second consecutive pulses, wherein the pulses exist while a driving signal voltage is higher than a first calibrating voltage, and wherein both

the end of the first pulse and the beginning of the second pulse occur when a reference signal crosses a second calibrating voltage on a positive transition;  
means for adjusting the relative phase between the driving and reference signals;



means for determining when the first and second pulses have the same width; and  
means for generating a third pulse having a width proportional to the phase difference between the reference and driving signals.

4,419,625

### DETERMINING ASYNCHRONOUS MOTOR COUPLE

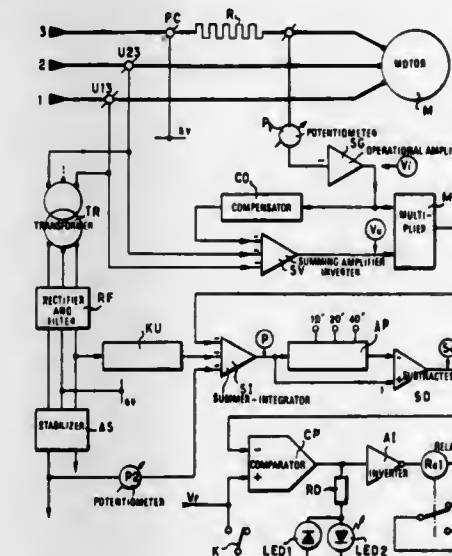
Emile Bejot, Carros, and Adriano Fillaggi, Antibes, both of France, assignors to La Telemecanique Electrique, France

Filed Dec. 5, 1980, Ser. No. 213,251

Int. Cl.<sup>3</sup> G01R 21/00, 31/00

U.S. Cl. 324—142

12 Claims



1. A device for the determination of the couple provided by an asynchronous motor, said device comprising:  
(i) means for determining the mean power absorbed from a polyphase current supply, said means including means for measuring the current in a phase, means for generating a single phase voltage from a combination of the voltages between the respective phases, means for deriving the product of the said current and single phase voltage, means for determining the mean value of the said product; and  
(ii) means for subtracting from said product, before said determination of the mean value thereof, a quantity which is a function of the said current, and which substantially represents the losses in the motor.

4,419,626

### BROAD BAND CONTACTOR ASSEMBLY FOR TESTING INTEGRATED CIRCUIT DEVICES

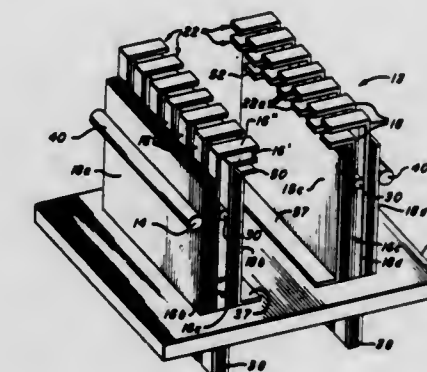
Nicholas J. Cedrone, Wellesley Hills, and Kenneth R. Lee, Lincoln, both of Mass., assignors to Daymarc Corporation, Waltham, Mass.

Filed Aug. 25, 1981, Ser. No. 296,234

Int. Cl.<sup>3</sup> G01R 1/06, 31/02

U.S. Cl. 324—158 P

12 Claims



1. In a contactor assembly for electronic devices with a plurality of connection pins arrayed in at least one row, said assembly having a base, and a plurality of contacts each secured at a first end to the base and extending from the base to a second end and adapted to conduct an electrical signal to an associated pin of the device, said contacts being structured to flex resiliently from a first position where said second ends are spaced from said pins to a second position where said second ends are in electrical connection with said pins, the improvement comprising conductive plate means secured in a closely spaced, generally parallel relationship with said at least one row of contacts, the dimensions of said plate means and said spacing producing a distributed capacitance such that the capacitive reactance induced by the presence of said plate means generally offsets the inductive reactance of said contacts and thereby present a generally characteristic impedance to said signal over a broad band.

4,419,627

### MEASURING THE MOISTURE CONTENT OF MATERIALS

Juergen F. Schmelzer, Bolton, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada

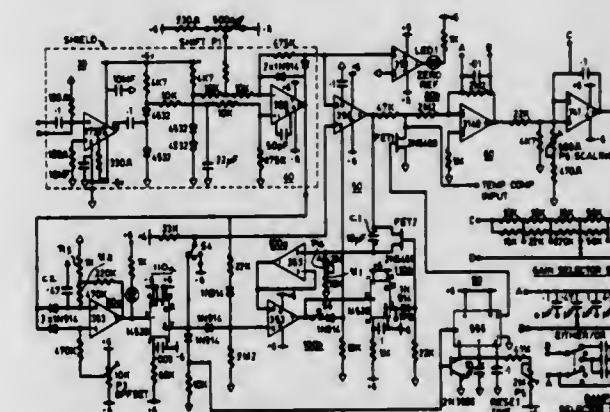
Filed Jan. 2, 1981, Ser. No. 222,139

Claims priority, application United Kingdom, Jan. 7, 1980, 8000422

Int. Cl.<sup>3</sup> H03K 5/00; G08B 21/00

U.S. Cl. 328—4

4 Claims



1. Apparatus for determining the moisture content of a material comprising means for deriving a D.C. signal having a magnitude that increases and decreases in direct proportion to increases and decreases respectively of the moisture content of



the material; comparator having first and second input terminals and an output terminal, said comparator providing an output signal at said output terminal thereof that changes from a first value to a second value different from said first value in response to said D.C. signal decreasing and that remains at said first value during application of said D.C. signal to said input terminals of said comparator and while said D.C. signal is level or increasing in magnitude; means for supplying said D.C. signal to said input terminals of said comparator; pulse producing means having an input terminal and an output terminal, said pulse producing means being responsive to said output signal of said comparator changing from said first value to said second value for producing an output pulse of predetermined pulse width at said output terminal of said pulse producing means; means for supplying said output signal of said comparator to said input terminal of said pulse producing means; a sample and hold network having first and second input terminals and an output terminal, said sample and hold network being adapted to derive at said output terminal thereof a moisture indicating output signal related to the signal applied to the first input terminal of said sample and hold network when said output pulse is applied to said second input terminal of said sample and hold network and to hold said output signal at said output terminal of said sample and hold network after said output pulse has terminated; means for supplying said output pulse to said second input terminal of said sample and hold network; means for supplying said D.C. signal to said first input terminal of said sample and hold network; timer means for producing an output signal after a predetermined time; means for resetting said timer means responsive to said output signal of said comparator changing from said first value to said second value; and means responsive to said output signal of said timer for inhibiting said sample and hold network from producing a moisture indicating output signal at least until another output pulse is produced by said pulse producing means.

4,419,628

## TRANSIENT-NOISE SIMULATORS

Yoshiro Sato, Tokyo, Japan, assignor to Tohoku Metal Industries, Ltd., Sendai, Japan

Filed Mar. 13, 1981, Ser. No. 243,643

Int. Cl.<sup>3</sup> H03K 3/86; H03H 5/00; G01R 27/00

U.S. Cl. 328-67

3 Claims



1. In a noise simulator for injecting simulated-noise pulse signals onto the AC power line of electrical equipment in a noise-simulating test, which includes pulse generator means operating as a charged delay line, and capacitor means for connecting the output of said pulse generator means to said AC power line, the improvement which comprises circuit means connected between the output of said pulse generator means and said capacitor means comprising first series resistor means connected between the output of said pulse generator means and said capacitor means and second parallel resistor means connected between the output of said pulse generator means and ground, the resistances of said first and second resistor means being determined so that the impedance at the input side of said reflection absorbing circuit means with a predetermined impedance load thereon is equal to the output impedance of said pulse generator means, while the impedance at the output side of said reflection absorbing circuit means with said generator means connected thereto is equal to said predetermined impedance, and grounded electrical conductor plate means movably dis-

posed commonly adjacent said first resistor means and said capacitor means for controlling stray capacitance.

4,419,629

## AUTOMATIC SYNCHRONOUS SWITCH FOR A PLURALITY OF ASYNCHRONOUS OSCILLATORS

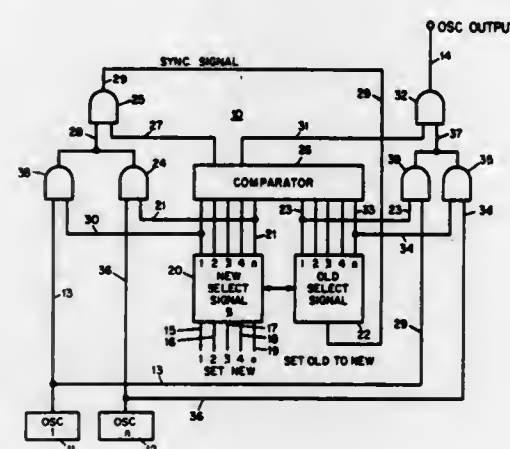
Steven M. O'Brien, Norristown, PA, assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,962

Int. Cl.<sup>3</sup> H03K 3/013

U.S. Cl. 328-72

10 Claims



1. A switching circuit for selecting one of a plurality of asynchronous oscillators comprising:  
a plurality of asynchronous oscillators adapted to be in an ON condition,  
switch selection means for generating a select signal indicative of one of said oscillators,  
means responsive to said select signal for generating a new oscillator selection output signal and an old oscillator selected output signal,  
comparator means coupled to means responsive to said select signal for determining if the new oscillator selection output signal is the same as the old oscillator selected output signal,  
said comparator means being provided with enabling and disabling output signals,  
first control selection means coupled to said asynchronous oscillators and said new oscillator selection output signal being enabled by said enabling output signals of said comparator means for generating a clock signal output in synchronism with said newly selected oscillator,  
second control selection means coupled to said asynchronous oscillators and said old oscillator selected output signal being disabled by said disabling output signal of said comparator means for discontinuing the output of said old oscillator,  
said clock signal output from said first control selection means being coupled to the means responsive to said select signal to change said old oscillator selected output signal to a delayed new oscillator selection output signal, and  
said second control selection means being coupled to said delayed new oscillator selection output signal for providing a newly selected oscillator signal.

4,419,630

## PHASE DEMODULATOR UTILIZING A FREQUENCY DIVIDER, SYNCHRONOUS FILTER, AND PHASE COMPARATOR

Paul H. Gilbert, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1981, Ser. No. 260,629

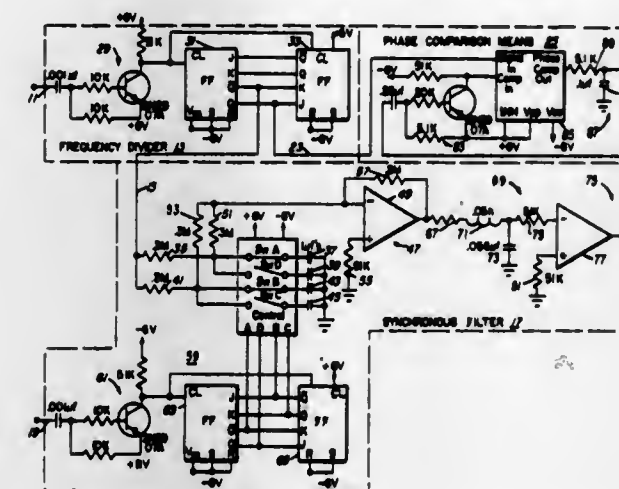
Int. Cl.<sup>3</sup> H03D 3/02; H03K 9/06

U.S. Cl. 329-50

13 Claims

1. A phase demodulator for recovering the modulating wave from a phase-modulated wave comprising:

a frequency divider for dividing the phase-modulated wave in frequency to produce a phase-modulated subharmonic wave having an unmodulated carrier component and side-band frequencies;  
a filter coupled to the output of said frequency divider for rejecting the side-band frequencies while passing the unmodulated carrier component of the phase-modulated subharmonic wave; and



phase comparison means coupled to receive the outputs of said frequency divider and said filter for comparing the phase of the unmodulated carrier component to the instantaneous phase of the phase modulated subharmonic wave whereby an output proportional to the amplitude of the modulating wave is provided.

4,419,631

## INTEGRATED CIRCUIT AMPLIFIER FUNCTIONING IN CLASS AB AND INCORPORATING CMOS (METAL OXIDE SEMICONDUCTOR) TECHNOLOGY

Jean P. Bertalis, Cristian Perrin, and Louis Tallaron, all of Paris, France, assignors to Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux (EFCIS), Grenoble, France

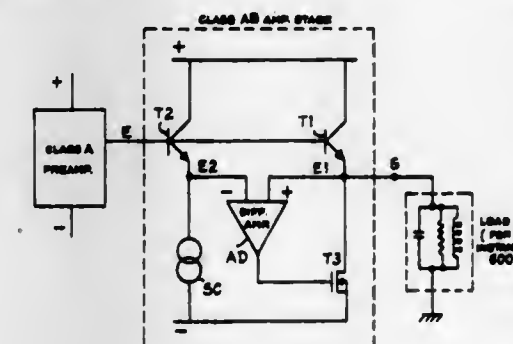
Filed Oct. 22, 1981, Ser. No. 314,025

Claims priority, application France, Oct. 23, 1980, 80 22662

Int. Cl.<sup>3</sup> H03F 3/45, 3/26

U.S. Cl. 330-255

5 Claims



1. An integrated amplifier incorporating MOS technology, and functioning in class B or AB, and characterized by the fact that its output stage comprises:

a first NPN bipolar transistor and an N-channel MOS transistor, connected in series, the junction between the emitter of the first transistor and the drain of the second forming the amplifier output;  
a second NPN bipolar transistor, the base of which, in the same way as the first such transistor, receives the signal for amplification, this second transistor being connected basically as a voltage follower;  
a differential amplifier, the two inputs of which are connected to the emitters of the two NPN transistors respectively, and the output of which is connected to the control

grid of the MOS transistor, to control its polarization, in a way that tends to subordinate the emitter voltage of the first transistor to that of the second.

4,419,632

## BIAS CIRCUIT FOR MICROWAVE FETS

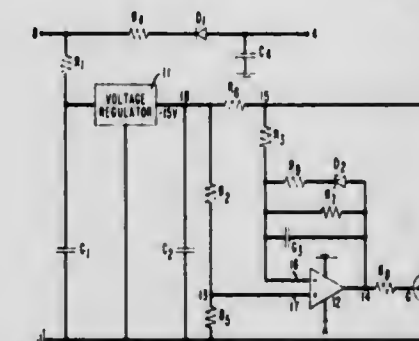
James E. Morris, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 11, 1981, Ser. No. 329,868

Int. Cl.<sup>3</sup> H03F 3/16

U.S. Cl. 330-277

9 Claims



1. A circuit for biasing a field effect transistor comprising: a differential amplifier (12) with an output conductor adapted to be coupled to the gate (G) of the transistor, a first input (17) of the amplifier coupled to a reference potential portion (13) and a second input (16) of the amplifier coupled to a means (R<sub>6</sub>) for sampling the source current (I<sub>s</sub>) of the transistor, said amplifier adapted to control the gate voltage in response to changes in the source current to keep the source-to-drain voltage and the source current of the transistor essentially constant for gate currents no greater than a desired value;  
characterized in that said circuit further includes: means (R<sub>8</sub>) for producing a voltage difference between the output of the amplifier and the conductor to be coupled to the gate electrode in response to currents generated at said gate electrode; and  
means (D<sub>2</sub>, R<sub>3</sub>, R<sub>9</sub>) coupled to the second input of the amplifier, which means is responsive to said voltage between the output of the amplifier and gate conductor when said gate current exceeds a desired value for causing a change in the voltage at the second input of the amplifier sufficient to adjust the output of the amplifier so that said gate current is kept below a maximum value.

4,419,633

## PHASE LOCK LOOP

Donald E. Phillips, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 29, 1980, Ser. No. 221,133

Int. Cl.<sup>3</sup> H03L 7/06

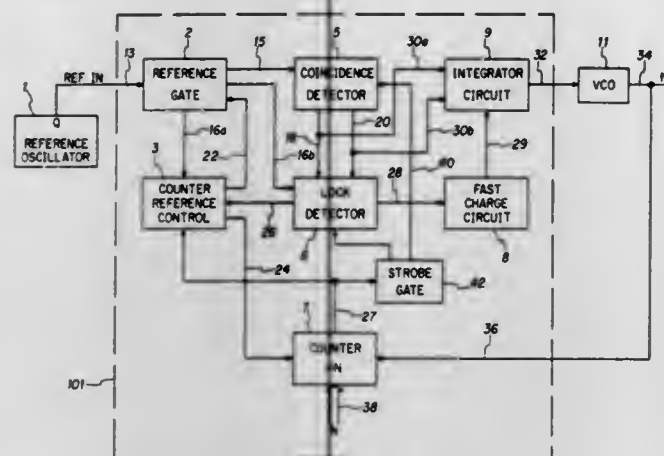
U.S. Cl. 331-17

6 Claims

1. A precision variable frequency source comprising: coincident detector means for detecting the difference between a first pulse and a second pulse and to provide a third pulse having a pulse width that represents the difference between the first pulse and the second pulse when the first pulse occurs earlier in time than the second pulse and to provide a fourth pulse having a pulse width that represents the difference between the first pulse and the second pulse when the second pulse occurs earlier in time than the first pulse;  
reference oscillator means for providing the first pulse;  
integrator means for integrating the third pulse and the fourth pulse and to provide a control signal;  
lock detector means for comparing the first pulse with the second pulse and to provide a fast charge activate signal when the falling edge of the first pulse occurs prior to the



rising edge of the second pulse or when the falling edge of the second pulse occurs prior to the rising edge of the first pulse;  
fast charge means responsive to the fast charge activate signal for accelerating the operation of the integrator means;



voltage controlled oscillator means for providing an output signal having a frequency that is controlled by the control signal; and  
counter means for providing the second pulse every selected number of cycles of the frequency of the output signals.

4,419,634

#### OSCILLATOR WHOSE FREQUENCY IS CONTROLLABLE BY A CURRENT VARIATION

Paul Druegh, and Kalixt von Winnicki, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

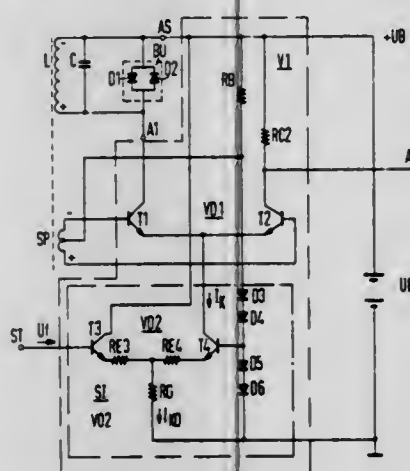
Filed Jan. 21, 1981, Ser. No. 226,850

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003302

Int. Cl.<sup>3</sup> H03B 5/12

U.S. Cl. 331-117 R

10 Claims



1. An oscillator whose frequency is controllable by a current change, comprising:

- an amplifier including an input and an output, including a constant current source having a control input for receiving a control signal which determines the output current of said amplifier, said amplifier comprising an emitter-coupled differential amplifier including first and second transistors each including an emitter connected to said emitter of the other and a collector connected to a supply potential, and said constant current source connected to said emitters;
- a parallel resonant circuit connected to said output and including a constant inductance and capacitance, said resonant circuit connected between said collector of said first transistor and the supply potential;

- a feedback connection connecting said parallel resonant circuit to said input of said amplifier; and
- a voltage limiter connected in parallel with said parallel resonant circuit.

4,419,635

#### SLOTLINE REVERSE-PHASED HYBRID RING COUPLER

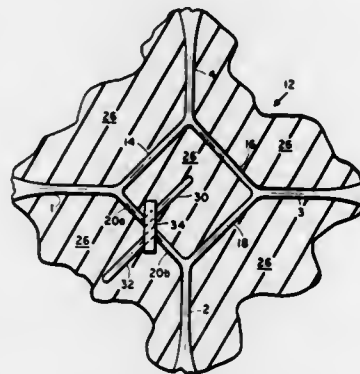
John Reindel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 24, 1981, Ser. No. 305,231

Int. Cl.<sup>3</sup> H01P 5/107, 5/18, 5/22

U.S. Cl. 333-116

11 Claims



1. A microwave hybrid ring coupler comprising: a dielectric substrate having first and second sides; a metallized layer formed on the dielectric substrate first side; first, second, third and fourth sections of slotline transmission medium formed in said metallized layer and interconnected so as to form a substantially enclosed area of metallized layer, the fourth slotline transmission medium having a separation formed therein and having a first slotline portion extending from one side of said separation and a second slotline portion extending from the other side of said separation;
- a first shorted slotline extending from one end of said first portion;
- a second shorted slotline extending from one end of said second portion; and
- a slotline-to-microstrip-to-slotline transition coupled to said first and second slotline portions.

4,419,636

#### LOW FREQUENCY WIDE BAND SIGNAL COUPLER

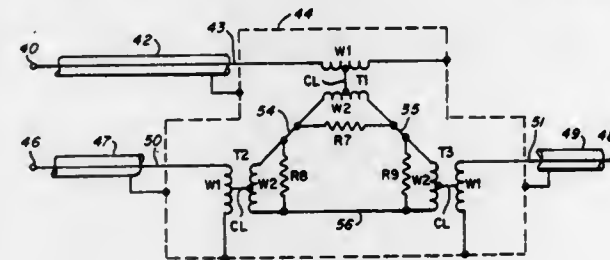
Hong Yu, 2 Parrish Hill Dr., Nashua, N.H. 03063

Filed Oct. 22, 1981, Ser. No. 313,770

Int. Cl.<sup>3</sup> H03H 7/48

U.S. Cl. 333-131

6 Claims



1. A low frequency, wide band signal coupler comprising: an input terminal for receiving an input signal in the frequency range of 1 KHz to 900 MHz;
- a first output terminal;
- a second output terminal;
- three transformers each having a pair of windings including a first and second winding;

means coupling the input and first and second output terminals to respective first windings of the respective three transformers;  
means coupling the three second windings in a series circuit, three isolation resistors,  
and means coupling the isolation resistors each respectively across one of said second windings.

4,419,637

#### MAGNETOSTATIC WAVE DIOPTRIC DEVICE

Gerard Volluet, and Pierre Hartemann, both of Paris, France, assignors to Thomson-CSF, Paris, France

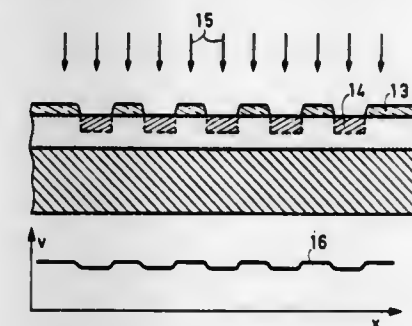
Filed Jan. 28, 1982, Ser. No. 343,752

Claims priority, application France, Feb. 13, 1981, 81 02865

Int. Cl.<sup>3</sup> H03H 9/30, 9/40

U.S. Cl. 333-147

14 Claims



1. A device for controlling the propagation of magnetostatic waves in the extent of a layer of magnetic material of predetermined thickness epitaxially grown on a non-magnetic crystal-line substrate, said device comprising: biasing means for applying a magnetic field to said layer, transducer means for exciting said magnetostatic waves in said layer, and arranged in the path of the magnetostatic waves emerging from said transducer means, at least one ion implanted region wherein the propagation velocity of said magnetostatic waves is modified by local reduction of the effective thickness of said layer; the surface of said layer remaining substantially planar, and said effective thickness reduction arising from degenerated magnetic properties induced without removal of said magnetic material.

4,419,638

#### NEGATIVE RESISTANCE ELEMENT

Kenneth C. Johnson, Chaddle, England, assignor to International Computers Limited, Stevenage, England

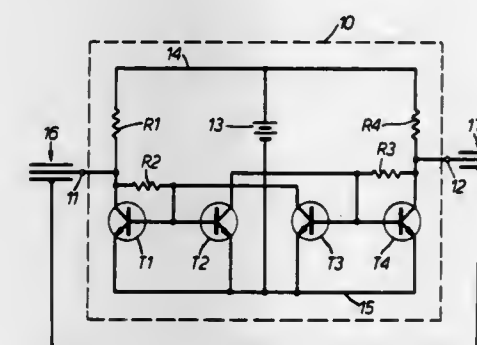
Filed Nov. 24, 1981, Ser. No. 324,432

Claims priority, application United Kingdom, Nov. 27, 1980, 8038141

Int. Cl.<sup>3</sup> H03H 11/52

U.S. Cl. 333-217

2 Claims



1. A negative resistance element including first and second terminals; a current path through the terminals; a resistor means connected in the current path; and a current mirror arrangement so responsive to current flow into one of the terminals as to produce a current flow through the resistor means in such direction as to increase the voltage at the other terminal relative to said one of the terminals from the value

that would prevail in the absence of the current mirror arrangement, in which the current mirror arrangement includes two pairs of transistors, each including first and second transistors whose bases are connected, with all of the emitters of the two pairs of transistors interconnected, and in which for each transistor pair the collector of the first transistor is electrically interconnected with its base, to one of said terminals and with the collector of the second transistor of the other pair, and in which the areas of the bases of the first transistors of the two pairs are made accurately equal to each other, whilst the areas of the bases of the second transistors of the two pairs are made accurately equal to each other with the first transistor base areas a predetermined number of times greater than the base areas of the second transistors, whereby currents through the first and second transistors of a pair are always held in the same ratio to each other as the ratio of base areas.

4,419,639

#### KEY ASSEMBLY

Karl-Helz Bauer, Gerold Eckert, both of Bad Neustadt, and Wolfgang Labude, Constance, all of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

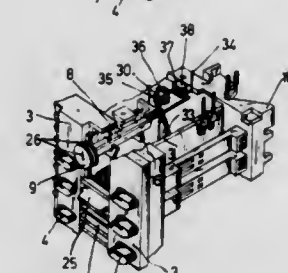
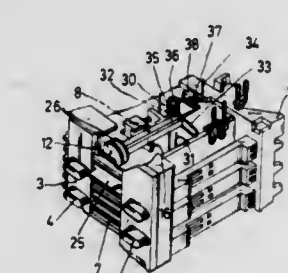
Filed Sep. 14, 1981, Ser. No. 301,659

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039401

Int. Cl.<sup>3</sup> H03J 1/06, 7/02

U.S. Cl. 334-7

13 Claims

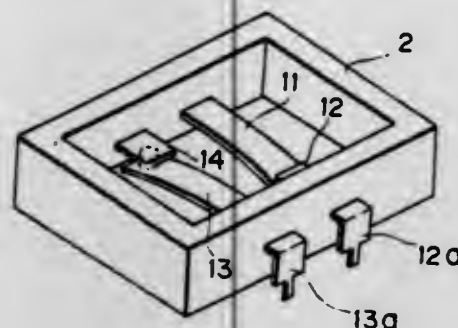


1. A key assembly for a receiving unit having a plurality of communications channels, comprising a casing with a recess for receiving a cover member, a plurality of mutually releasable depressible keys adapted to switch on storable, selectively adjustable electrical values supplied by channel memories, further comprising in association with said keys a plurality of depressible and rotatable knobs adapted to be rotated by means of a tool, a slidable cover member positioned in said recess and normally covering said knobs to conceal them, said knobs being adapted to provide channel tuning, and further comprising:

a switch for controlling an operating function of said unit, a removable push rod and mounting means for mounting said push rod so that it is normally held by said cover member in a position wherein it holds said switch in an ON condition, said switch having means to move said push rod in a direction out of said casing and to switch to an OFF condition when said cover member is moved from holding said push rod, and wherein said push rod also constitutes said tool.

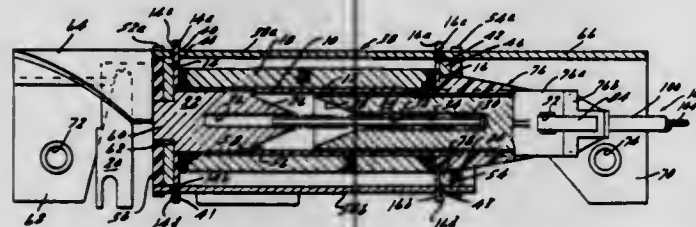


**4,419,640**  
**UNITARY CONTACT-TERMINAL BLADES**  
**INTEGRALLY FORMED IN A MOLDED BASE**  
 Shunichi Agatahama, Osaka, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan  
 Filed Dec. 10, 1980, Ser. No. 214,629  
 Claims priority, application Japan, Dec. 17, 1979, 54-163922; Nov. 13, 1980, 55-160426  
 Int. Cl.<sup>3</sup> H01H 67/00  
 U.S. Cl. 335—106 3 Claims



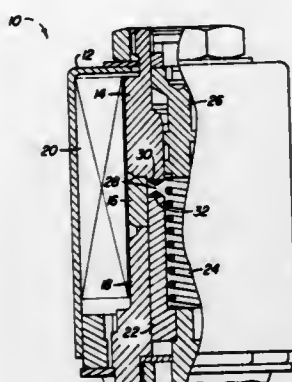
1. A contact switching device, comprising:  
 at least one pair of blade contacts, which comprise  
 a stationary contact member having one end forming a first external lead terminal and having a free end opposite said one end, and  
 a resilient movable contact member forming a second external lead terminal and having a free end opposite said one end,  
 said stationary and movable contact members overlapping each other at their free ends and being adapted for contacting each other; and  
 an insulating base molded as a unit with said first and second external lead terminals for supporting, in position said external lead terminals.

**4,419,641**  
**SOLENOID**  
 Michael Slavin, Troy, and Ellsworth S. Miller, Mt. Clemens, both of Mich., assignors to Lectron Products, Inc., Rochester, Mich.  
 Filed Apr. 26, 1982, Ser. No. 371,976  
 Int. Cl.<sup>3</sup> H01F 7/00  
 U.S. Cl. 335—219 5 Claims



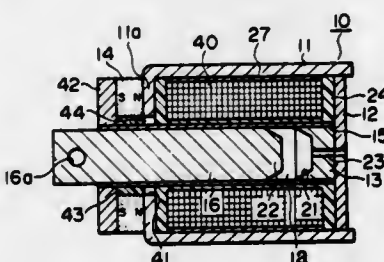
1. The combination with a solenoid of the type having a bobbin on which an electromagnetic coil is wound and a plunger axially slidable in said bobbin and normally extending axially beyond one end of said coil, and a Bowden cable of the type having an inner axially movable wire and an outer sheath around and supporting said wire, of  
 closure means on and carried by the mentioned end of said bobbin enclosing and slidably accepting and sealing the extending portion of said plunger, and  
 attaching means mounting said Bowden cable on said closure means in coaxial alignment with said plunger with said sheath fixed to and held by said closure means and said wire fixed to and movable with said plunger.

**4,419,642**  
**SOLENOID WITH SATURABLE ELEMENT**  
 Kenneth D. Kramer, Waterloo, Iowa; Kenneth J. Stoss, Stillwater, Okla., and Gregory E. Sparks, Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.  
 Filed Jan. 28, 1982, Ser. No. 343,651  
 Int. Cl.<sup>3</sup> H01F 7/08  
 U.S. Cl. 335—227 10 Claims



1. A solenoid comprising:  
 a cylindrical pole element;  
 a hollow cylindrical armature element axially movable with respect to the pole element;  
 an air gap interposed between the armature and pole elements, the gap, armature element and pole element comprising at least a portion of a magnetic flux circuit;  
 an annular magnetically permeable and saturable member located in the air gap, the saturable member being formed of material other than that of the armature element and pole element and having an abrupt magnetic saturation point at a flux density lower than the flux density at which magnetic saturation occurs in the armature element and the pole element; and  
 coil means surrounding the elements for creating a flow of magnetic flux through the flux circuit to generate a force which acts axially upon the armature element.

**4,419,643**  
**SELF-SUSTAINING SOLENOID**  
 Shin Ojima; Kiichiro Tada, both of Yao; Toru Yoshimura, Kashihara; Naoki Yoshikawa, Sakurai, and Yoshinao Naito, Nara, all of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan  
 Filed Apr. 14, 1982, Ser. No. 368,251  
 Claims priority, application Japan, Apr. 22, 1981, 56-58366[U]  
 Int. Cl.<sup>3</sup> H01H 7/16  
 U.S. Cl. 335—234 14 Claims

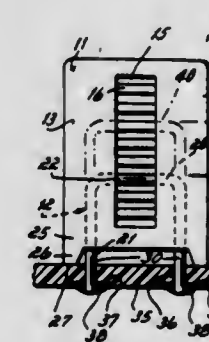


1. A self-sustaining solenoid comprising:  
 operating and release coil means supplied with an operating and a release current;  
 a moving magnetic core disposed in the operating and release coil means substantially coaxially therewith in a manner to be movable along the axis thereof, one end of the moving magnetic core projecting out from one end of the coil means;

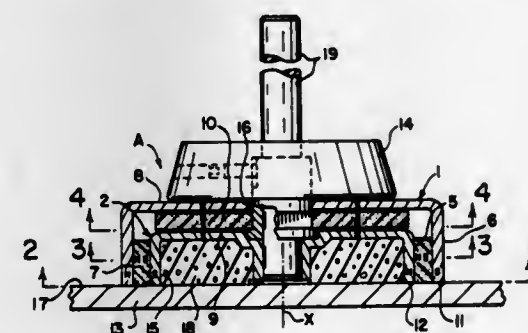
a fixed receiver disposed in the operating and release coil means at one end thereof, for receiving the moving magnetic core when the latter is attracted into the operating and release coil means, the fixed receiver being made of a magnetic material;  
 magnetic yoke means provided on the outside of the operating and release coil means to extend between the fixed receiver and the outer peripheral surface of the moving magnetic core for magnetic connection therebetween;  
 permanent magnet means disposed near at least one of the magnetically connecting portions between the magnetic yoke means and the moving magnetic core and between the magnetic yoke means and the fixed receiver in such a manner that one of the magnetic poles of the permanent magnet means is magnetically connected to the magnetic yoke means and the other pole of the permanent magnet means is magnetically connected to at least one of the moving magnetic core and the fixed receiver on which side the permanent magnet means is disposed, magnetic fluxes emanating from the permanent magnet means being mostly confined within a closed magnetic path running through the moving magnetic core, the fixed receiver and the magnetic yoke means when the moving magnetic core is in contact with the fixed receiver; and  
 magnetic gap means provided in at least one of the magnetically connecting portions between the both ends of the magnetic yoke means and the moving magnetic core and the fixed receiver on which side the permanent magnet means is disposed, the magnetic gap means having a size smaller than the distance between the moving magnetic core and the fixed receiver in the state of the former being held in its released position spaced apart from the latter and being so designed as to permit the passage therethrough most of the magnetic fluxes of the permanent magnet means when the moving magnetic core is held at its released position.

in the space between and magnetizing the said side walls of said body members and magnetically separated by non-magnetic mediums into at least two separate parts at diametrical regions corresponding to the diametrically separated regions of said body members, and a rotatable second permanent magnet disposed in the space between and magnetizing the said base end walls of said body members, said rotatable magnet being magnetized across the thickness thereof between the said base end walls with at least two pole pairs of alternating magnetic polarity to cause the poles of said rotatable second magnet, in one relative rotative position thereof, to reinforce and increase the magnetic flux in said body members and, in a second relative rotative position, to oppose and reduce the magnetic flux in said body members.

**4,419,645**  
**MULTIPLE POSITION HALF-TURN INDUCTOR**  
 Robert D. Lennon, Cincinnati, Ohio, assignor to Standex International Corporation, Salem, N.H.  
 Filed Aug. 14, 1981, Ser. No. 292,940  
 Int. Cl.<sup>3</sup> H01F 15/02  
 U.S. Cl. 336—65 8 Claims



**4,419,644**  
**SWITCHABLE PERMANENT MAGNETIC HOLDING DEVICE**  
 Horst Baermann, Rosrath, Fed. Rep. of Germany, assignor to Max Baermann GmbH, Bergisch-Gladbach, Fed. Rep. of Germany  
 Filed Jan. 14, 1983, Ser. No. 457,881  
 Int. Cl.<sup>3</sup> H01F 7/02  
 U.S. Cl. 335—288 14 Claims



1. An inductor comprising:  
 a coil form;  
 a U-shaped one-half turn coil at least partially embedded in said coil form;  
 said coil having two extending legs and a bight portion;  
 said coil form comprising:  
 two lateral blocks of plastic into which said legs are embedded;  
 and a window between said blocks;  
 indicia in said window indicating the inductance value of the coil by the position of the bight portion of the coil in said window;  
 said coil having a portion of its legs embedded in said lateral blocks of plastic, the remainder of said legs projecting below said coil form;  
 the bight portion of said coil lying across said window and at least a segment thereof being visible through said window.

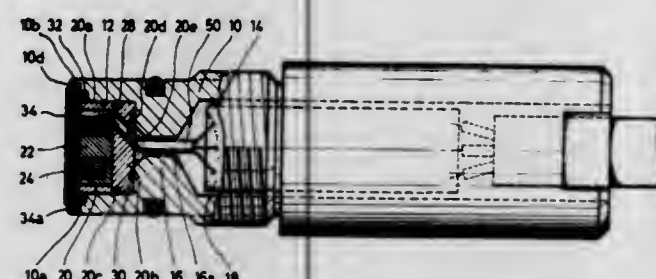
**4,419,646**  
**ELECTRIC PROXIMITY SENSOR**  
 Eduard Hermle, Kirchstrasse 20, D-7303 Neuhausen a.d. Fildern, Fed. Rep. of Germany  
 Continuation of Ser. No. 212,757, Dec. 4, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 425,013  
 Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2951968.  
 Int. Cl.<sup>3</sup> H01F 27/02  
 U.S. Cl. 336—90 11 Claims

1. An on-off switchable permanent magnetic holding device for releasably holding of or onto ferromagnetic articles, said device comprising first and second pole shoes in the form of outer and inner hollow body members of magnetically conductive material and open to one side, said hollow body members being supported in fixed concentrically nested relation one within the other with their open sides facing in the same direction and their respective peripheral side walls and base end walls disposed in spaced relation to each other and their rim edge pole faces disposed in a common article-holding plane, each of said body members being identically separated at corresponding diametrical regions thereof by respective non-magnetic mediums into at least two separated pole parts, a stationary first permanent magnet of strip-like form fixedly disposed

1. An electric proximity sensor of the type which in use is exposed to pressure fluid and which comprises a casing having an interior chamber space open at one axial end and bounded circumferentially by a sidewall and at the opposite axial end by a transverse wall, a pick-up coil and pot core unit disposed within said interior space, a closure closing said one axial end and an O-ring seal circumferentially sealing between said clo-



sure and said sidewall, characterized in that a separate insert member is provided between said unit and said walls bounding said interior space, said insert member being dimensioned to fit closely with respect to said walls and comprising a cavity which is open toward said one axial end, said cavity being dimensioned to receive said unit with a close fit, said insert and said unit substantially filling said interior space, said sensor further comprising means defining a shoulder which extends



circumferentially around the inside perimeter of said sidewall at said one axial end of said casing, said closure having a circumferential margin which is disposed to radially overlap said shoulder, said O-ring seal being disposed on said shoulder, and means for retaining said closure on said casing such that said O-ring seal is axially compressed against said shoulder by the circumferential margin of said closure and forms a circumferential seal between said closure and said casing.

#### 4,419,647 LIQUID-COOLED TRANSFORMER FOR LARGE POWER RATINGS

Max Herzog, Stuttgart, Fed. Rep. of Germany, assignor to Transformatoren Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

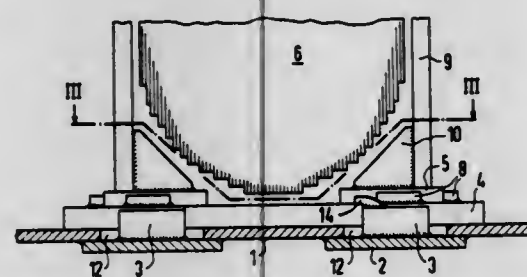
Filed Mar. 26, 1981, Ser. No. 247,813

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012550

Int. Cl.<sup>3</sup> H01F 27/02

U.S. Cl. 336—92

5 Claims



1. Liquid-cooled transformer for large power ratings, comprising a tank having a bottom with cutouts formed therein, large-area base plates resting on said bottom of said tank, an active part having ends and being mounted in said tank, a pressure device, and means for positively locking said active part and said pressure device to said base plates without play, said base plates being disposed under one of said ends of said active part, said at least one base plate having corners including outside corners as seen in longitudinal direction of said active part, at least said outside corners being disposed above said cutouts formed in said tank bottom, said locking means including stopping blocks having a shape matched to said base plate positively locking said outside corners in position without play, said outside corners of said base plates having recesses formed therein, said recesses forming corners with inside angles for supporting said base plates in the longitudinal and transverse directions on said stopping blocks, and said locking means including inserts supporting said stopping blocks and oil tightly closing off said cutouts.

#### 4,419,648 CURRENT CONTROLLED VARIABLE REACTOR

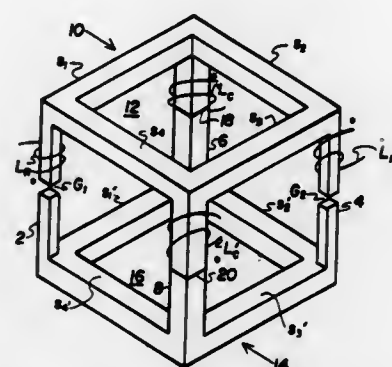
Winfried Seipel, Lebanon Township, Hunterdon County, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 24, 1981, Ser. No. 257,018

Int. Cl.<sup>3</sup> H01H 85/50

U.S. Cl. 336—215

7 Claims



1. A variable reactor, comprising a first pair of legs, said legs having gaps therein, a second pair of legs that are free of gaps, a first structure providing paths for magnetic flux between given ends of said first and second pairs of legs, a second structure providing paths for magnetic flux between the other ends of said first and second pairs of legs, serially connected reactor windings respectively wound on each of said first pair of legs, and serially connected control windings respectively wound on each of said second pair of legs.

#### 4,419,649 CIRCUIT BREAKER FOR USE ON AC AND DC CIRCUITS

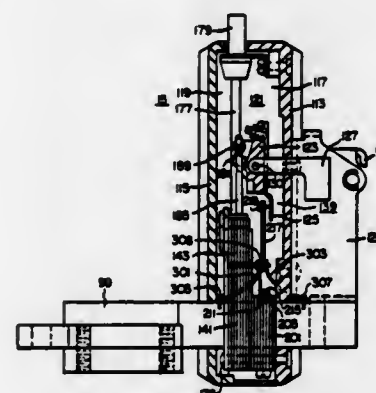
Eugene J. Walker, and James P. Ellsworth, both of Beaver, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1981, Ser. No. 318,226

Int. Cl.<sup>3</sup> H01H 71/16

U.S. Cl. 337—70

14 Claims



1. A circuit breaker adapted for use on AC and DC circuits, comprising: separable contacts; an interrupter mechanism for operating said contacts between open and closed positions; a trip device operable when actuated to cause said interrupter mechanism to automatically open said contacts; a conductor connected in series with said contacts; and an induction operated thermal trip assembly comprising means inductively coupled to said conductor for generating heat as a result of current induced therein by AC current flow through said conductor, said thermal trip assembly also comprising a bimetal member thermally coupled to said heat generating means and so positioned with respect to said trip device that deflection of said bimetal member due to heat generated as a result of AC current flow above a first predetermined level is operable

to actuate said trip device and cause said interrupter mechanism to open said contacts; said thermal trip assembly also comprising thermal conduction means for thermally coupling said bimetal member to said conductor such that heat generated in said conductor by the flow of DC current therein is transmitted by conduction through said thermal conduction means to said bimetal member; whereby DC current flow through said conductor above a second predetermined level is operable to generate heat deflecting said bimetal member to actuate said trip device and cause said interrupter means to open said contacts.

#### 4,419,650 LIQUID CONTACT RELAY INCORPORATING GAS-CONTAINING FINELY RETICULAR SOLID MOTOR ELEMENT FOR MOVING CONDUCTIVE LIQUID

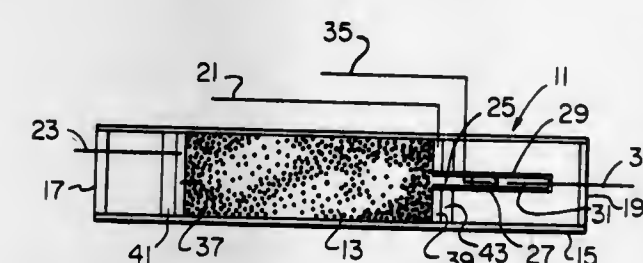
Frank T. John, Williamsville, N.Y., assignor to Georgina Chrysalis Hirtle, Springfield, Calif.

Filed Aug. 23, 1979, Ser. No. 69,249

Int. Cl.<sup>3</sup> H01H 61/00

U.S. Cl. 337—119

38 Claims



1. A liquid contact relay which comprises a body of solid material containing gas in a multiplicity of intercommunicating volumes therein, which body is of a sufficient resistance to the flow of electricity so that as electricity is passed through it the material thereof is heated and readily transfers heat to the gas contained therein so as to heat and expand such gas, an electrically conductive liquid which alternately completes and opens a relay circuit in different positions of such liquid, and means for operatively connecting the expandable gas of the body with the conductive liquid so that when electricity is passed through the material the gas therein is expanded and such expansion causes movement of the liquid to change the relay circuit to open or closed state from its previous condition.

#### 4,419,651 HIGH VOLTAGE CURRENT LIMITING FUSE HAVING A FUSE ELEMENT SUSCEPTIBLE TO OXIDATION AND ESPECIALLY SUITED FOR HIGH OPERATING TEMPERATURES

John G. Leach, Hickory, N.C., assignor to General Electric Company, King of Prussia, Pa.

Filed Jun. 24, 1982, Ser. No. 391,772

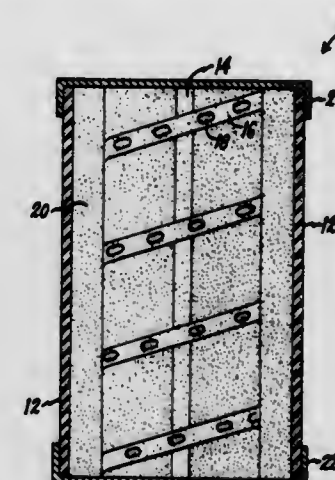
Int. Cl.<sup>3</sup> H01H 85/04

U.S. Cl. 337—159

4 Claims

1. A hot-running current limiting fuse for running at high operating temperatures in the range of 125° to 250° C. and having a fuse element of a metallic material which in the presence of free air is highly susceptible under said high temperature conditions to the formation thereon of a brittle weakly-adherent oxide coating, said fuse element having a predetermined time-current characteristic and a predetermined thickness dimension, said current limiting fuse comprising a sealed, non-porous casing enclosing the fuse element so as to provide a sealed environment for the fuse element and so as to severely limit oxygen diffusion into said environment, a pulverulent filler within the casing in which the fuse element is located, a gas within the casing in which said element and filler are located, said gas being of such a character as to make no significant improvement in the corona performance of the fuse as

compared to the fuse's corona performance with free air therein, said fuse element having a thickness dimension sufficiently great that the oxide layer that may accumulate onto said fuse element over a period of 15 years in service does not significantly affect said predetermined time-current character-



istic of the fuse element during said period, the seal of the casing being sufficiently effective that the oxygen entry rate is sufficiently significantly limited over said 15 year period to limit the thickness of any such oxide layer to less than approximately 2 percent of the thickness dimension of said fuse element.

#### 4,419,652 TEMPERATURE SENSOR

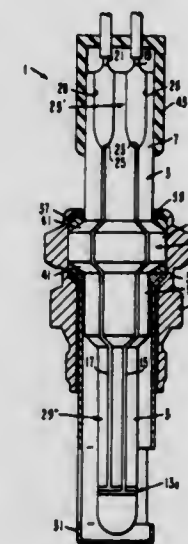
Willard R. Balmforth, Wood County; David C. Weber, Lucas County, and Michael L. Gibbons, Seneca County, all of Ohio, assignors to Bendix Autolite Corp., Fostoria, Ohio

Filed Oct. 9, 1981, Ser. No. 309,877

Int. Cl.<sup>3</sup> H01C 3/04

U.S. Cl. 338—28

6 Claims



1. In a temperature sensing apparatus having a generally cylindrical dielectric support with a first end surface portion, a center surface portion and a second end surface portion, temperature sensing film means on said first end surface portion, and a threaded fixturing shell encapsulating at least the center portion of said support, the improvement comprising: a continuous integral protuberance extending from said center surface portion; an electrically conductive film means extending from said temperature sensing means at said first end surface portion, along said protuberance and terminating at said second end surface portion; and a dielectric coating encasing at least said conductive film means at said protuberance, said protuberance providing a mounting seat for the threaded fixturing shell and said



dielectric coating providing electrical isolation between said conductive film means and said fixturing shell to assure that a signal generated by said sensing film means is transmitted to said second end surface portion without interruption.

4,419,653

## VARIABLE RESISTANCE SWITCH

Helmut Waigand, St. Georgen, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,394

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039256

Int. Cl.<sup>3</sup> H01C 10/10

U.S. Cl. 338—114

5 Claims



1. Variable resistance switch of a continuously-variable resistance pressure-dependent measurement sensor for triggering a switching operation of an electrical evaluating circuit through a compressive loading, comprising an elastic layer formed of elastomeric material interspersed with electrically conductive particles and being deformable with increasing application of force, said elastic layer being pan-shaped and having a lower substantially planar surface, and a conductive surface being in contact with said lower substantially planar surface of said elastic layer.

4,419,654

## TRACTOR DATA CENTER

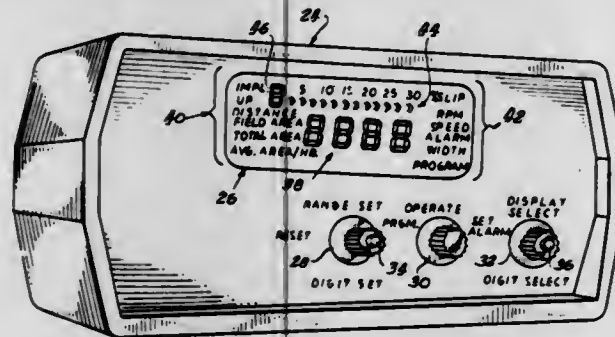
Robert C. Funk, Liberty, Ill., assignor to Dickey-John Corporation, Anuburn, Ill.

Filed Jul. 17, 1981, Ser. No. 284,571

Int. Cl.<sup>3</sup> B60Q 1/00

U.S. Cl. 340—52 R

17 Claims



1. A monitoring apparatus for a vehicle including a plurality of sensors for detecting a plurality of vehicle functions and conditions and for producing corresponding sensor signals, said monitoring apparatus comprising: a console including operator actuatable control means, and control circuit means including means for calculating wheel slippage of at least one drive wheel of said vehicle, said calculating means including means responsive to sensor signals corresponding to the ground speed of said vehicle and to sensor signals corresponding in a predetermined fashion to the rotational speed of said at least one drive wheel for calculating a predetermined relationship therebetween; and said control circuit means including recording means responsive to actuation of said operator actuatable control means for recording said calculated relationship as a reference value when said vehicle is being operated under conditions where there is substantially no slippage of said drive wheel, thereby calibrating said calculating means to calculate wheel slippage in response to said sensor signals corresponding

to ground speed and to rotational speed and in accordance with said reference value.

4,419,655

## GOLF COURSE PLAY INDICATOR DEVICES

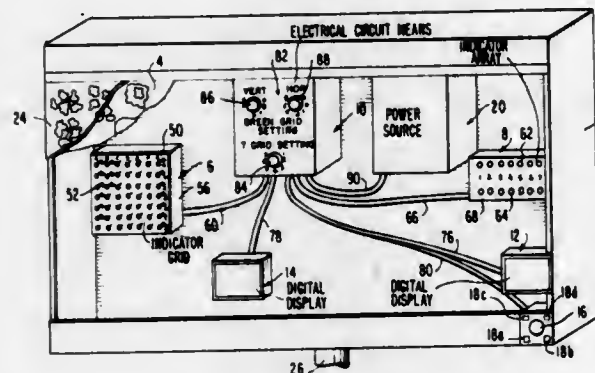
Brian E. May, Amsterdam, N.Y., assignor to Precision Golf Design, Inc., Ballston Spa, N.Y.

Filed Jul. 30, 1980, Ser. No. 173,951

Int. Cl.<sup>3</sup> G08B 23/00; A63B 67/02

U.S. Cl. 340—323 R

14 Claims



1. A golf course play indicator device comprising: a display panel which carries a graphic representation of the layout of a hole of a golf course including the tee and the green comprising a cup, a grid of a multiplicity of electrically energizable indicators arranged in vertical and horizontal rows within said representation of said green, an array of a multiplicity of electrically energizable indicators arranged in two spaced apart rows within said representation of said tee, an electrically energizable and changeable digital display unit to indicate the distance from the tee to said cup on said green, electrical circuit means comprising first switch means to selectively energize one of said indicators of said grid to indicate said cup position on said green and second switch means to energize one indicator in each of said two rows in said array to indicate a tee-off line on said tee,

and means to automatically change said digital display of distance in response to changes made to said first and second switch means.

4,419,656

## METHOD AND APPARATUS FOR DIGITAL CONVERTER TESTING

Edwin A. Sloane, Los Altos, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Nov. 7, 1980, Ser. No. 204,979

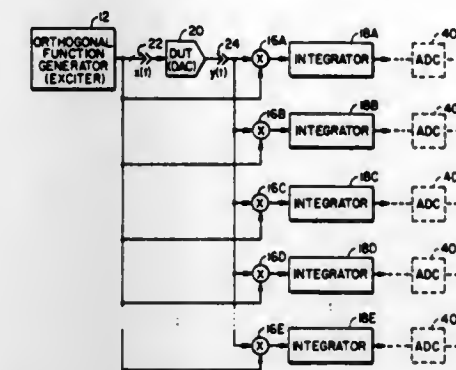
Int. Cl.<sup>3</sup> H03K 13/02

U.S. Cl. 340—347 CC

20 Claims

1. A method for calibrating a digital-to-analog converter comprising the steps of: generating a digital signal consisting of a set of orthogonal functions, each orthogonal function being binary weighted such that the synthesis of said digital signal is a substantially maximum entropy function; applying said digital signal to the input of a digital-to-analog converter to be calibrated in order to produce an output response signal; multiplying the output response signal by an orthogonal function; and integrating the multiplied signal through a calibrated analog

signal integrator for the duration of the orthogonal function duration to produce an estimate of the dynamic weight of



each selected bit of the digital-to-analog converter to be tested.

4,419,657

## SPEECH DIGITIZATION SYSTEM

Richard T. Gagnon, Rochester, Mich., assignor to Federal Screw Works, Detroit, Mich.

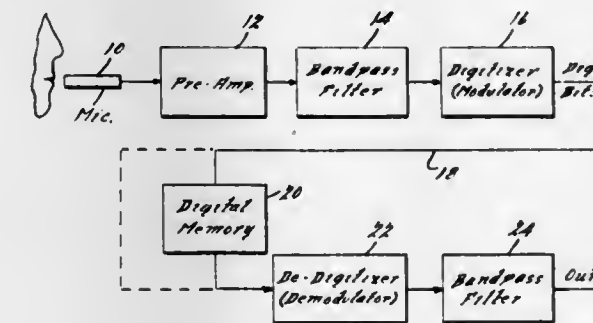
Continuation of Ser. No. 880,996, Feb. 24, 1978, abandoned.

This application Jan. 17, 1982, Ser. No. 338,521

Int. Cl.<sup>3</sup> H03K 13/05

U.S. Cl. 340—347 R

13 Claims



1. In a companded speech digitization system including a digitizer circuit for generating a digital approximation of a bipolar analog audio input signal and a de-digitizer circuit for substantially reconstructing said audio signal from said digital approximation; a digitizer circuit comprising: digitizer means for producing said digital approximation by converting said analog audio signal to a digital output signal in accordance with an amplitude function signal, including comparator means for comparing said audio signal to a reference signal that is directly related to said amplitude function signal; and

generator means responsive to said digital output signal for generating said amplitude function signal in accordance with said digital output signal, including averaging means for converting said digital output signal to a corresponding analog signal and circuit means for subtracting amplitude bias from said amplitude function signal so that a substantial duty cycle is maintained on at least the least significant bit in said digital output signal throughout the entire amplitude range of said audio input signal comprising a bias network for producing an offset signal having a magnitude which serves to substantially center the duty cycle spread of at least said least significant bit in said digital output signal at fifty percent and an amplifier having associated therewith a gain which serves to restrict the duty cycle spread of at least said least significant bit in said digital output signal, said amplifier having said analog signal connected to its positive input thereof and said offset signal connected to its negative input thereof.

4,419,658

## PORTABLE COMBINATION LAMP, SMOKE DETECTOR AND POWER FAILURE ALARM

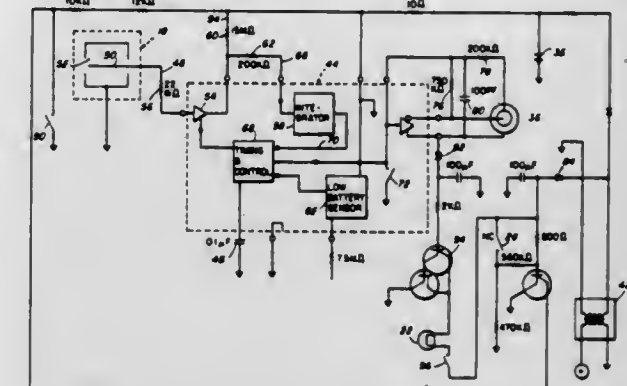
Anthony M. Jarosz, Dracut, Mass., and Randy R. Stevens, Delray Beach, Fla., assignors to T. J. Company, Ayer, Mass.

Filed Apr. 1, 1981, Ser. No. 249,929

Int. Cl.<sup>3</sup> G08B 19/00, 23/00

U.S. Cl. 340—521

4 Claims



1. A portable personal warning device adapted to detect smoke or power failure, comprising in combination:

- a small portable housing;
- a lamp and a reflector mounted to said housing and directed outwardly from one side thereof;
- a smoke detector mounted in said housing and in communication with ambient air;
- audible alarm means operatively connected to said smoke detector and responsive thereto;
- a continuous power interruption detecting means mounted in said housing and connectable to available AC power;
- DC power storage means mounted in said housing, including battery recharging means for recharging said DC power storage means;
- circuit means connected to said lamp, said smoke detector, said audible alarm means, said power interruption detecting means and said DC power storage means;
- control means connected to said circuit means for actuating said lamp and said audible alarm means in the event of an interruption of AC power or smoke detected by said detector; and
- low and continuous DC power sensing means connected to said DC power storage means and to said circuit means and to said audible alarm means for actuating said audible alarm means in the event of low DC power.

4,419,659

## INTRUSION DETECTION SYSTEM USING LEAKY TRANSMISSION LINES

Robert K. Harman, Kanata, Ontario, Canada, Ronald W. Clifton, Nepean, Ontario, Canada, and Russell E. Patterson, Ottawa, Ontario, Canada, assignors to Control Data Canada, Ltd., Ottawa, Canada

Filed Jul. 14, 1981, Ser. No. 283,314

Claims priority, application Canada, Apr. 16, 1981, 375684

Int. Cl.<sup>3</sup> G08B 13/24

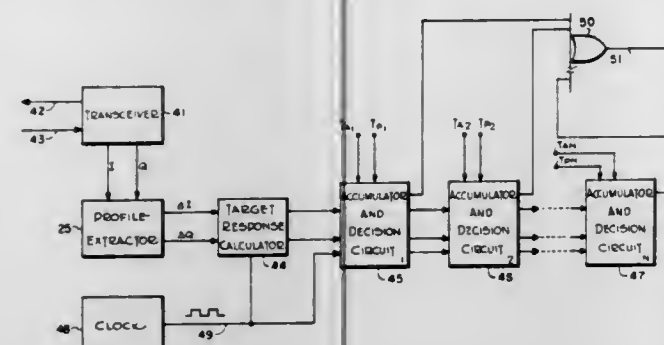
U.S. Cl. 340—552

17 Claims

1. An intrusion detection system comprising an antenna located within the perimeter of an area to be protected, a leaky transmission line extending around the perimeter so that the presence of an intruder alters the electromagnetic coupling between the antenna and transmission line, an RF transmitter coupled to one of the antenna and transmission line and a receiver coupled to the other, means detecting incremental



changes in the in-phase and quadrature components of signals received at said receiver and means separately measuring and



accumulating magnitude and phase angle of said incremental changes to track and indicate the presence of an intruder.

4,419,660

## ELECTRIC FILTER EQUIPMENT

Bernt Bergdahl, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

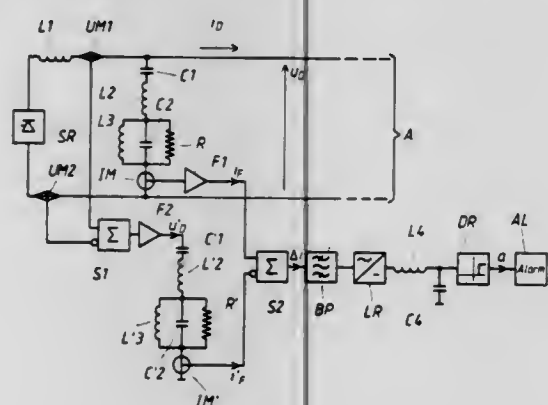
Filed Jun. 16, 1981, Ser. No. 274,140

Claims priority, application Sweden, Jul. 8, 1980, 8005008

Int. Cl.<sup>3</sup> G08B 21/00; H03H 7/10

U.S. Cl. 340—653

6 Claims



1. In an HVDC converter plant having a pair of DC voltage output lines, a harmonic filter comprising:

- a main electrical harmonic filter connected between said output lines for suppressing harmonic signals;
- a model filter having a filter structure and frequency response substantially the same as said main electrical harmonic filter, and a power handling ability substantially less than said main electrical harmonic filter, said model filter connected to receive a fractional representative portion of the voltage on said output lines;
- means connected to structurally corresponding portions of said filters for providing first and second currents representing currents flowing through each of said filters; and
- means for sensing a difference between said first and second currents, said means generating an indicating signal when said difference changes whereby an unacceptable change in said main electrical filter is detected.

4,419,661

## DUAL CATHODE-RAY TUBE DISPLAY SYSTEM FOR TEXT EDITING

Seiji Hetsugi, Kawasaki, Japan, assignor to New Nippon Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 3, 1980, Ser. No. 165,826

Claims priority, application Japan, Jul. 4, 1979, 54-84818; Jul. 4, 1979, 54-84819; Jul. 4, 1979, 54-84820; Jul. 4, 1979, 54-84821

Int. Cl.<sup>3</sup> G09G 1/16

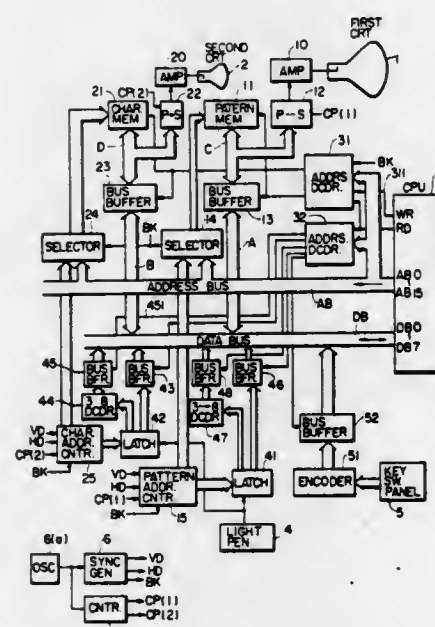
U.S. Cl. 340—707

14 Claims

1. A cathode-ray tube display device in which scanning lines are divided into a number of picture elements, the brightness of

each picture element is controlled, and an image of characters, figures or the like is displayed on the screen thereof in a plurality of picture element matrices extending vertically and horizontally comprising:

- a first cathode-ray tube;
- means for raster scanning said first cathode-ray tube;
- first memory means including a first memory having addresses corresponding to addresses of picture elements on the screen of said first cathode-ray tube, said first memory storing data to be displayed on the screen of said first cathode-ray tube, said first memory means reading said first memory in synchronization with raster scanning of said first cathode-ray tube to display the data stored in said first memory on the screen of said first cathode-ray tube;
- a second cathode-ray tube;
- means for scanning said second cathode-ray tube in synchronization with the raster scanning of said first cathode-ray tube;
- second memory means including a second memory having addresses corresponding to addresses of picture elements in a block obtained by dividing picture elements on the



screen of said first cathode-ray tube into a plurality of blocks each including a predetermined number of picture elements, said second memory means reading said second memory in synchronization with the raster scanning of said first cathode-ray tube wherein the data for a block stored in said second memory is displayed on the screen of said second cathode-ray tube;

- first position discriminating means including a light pen having a tip adapted to be applied to the screen of said first and second cathode-ray tubes to detect raster light and for outputting position data representative of the position of said tip of said light pen on the screen of one of said first and second cathode-ray tubes;
- second position discriminating means for discriminating among said plurality of blocks by dividing all of the picture elements on the screen of said first cathode-ray tube in one block to which said position data outputted by said first position discriminating means belongs to output block position data; and
- transferring means for transferring the picture element data for one block between said first and second memory means.

4,419,662

## CHARACTER GENERATOR WITH LATCHED OUTPUTS

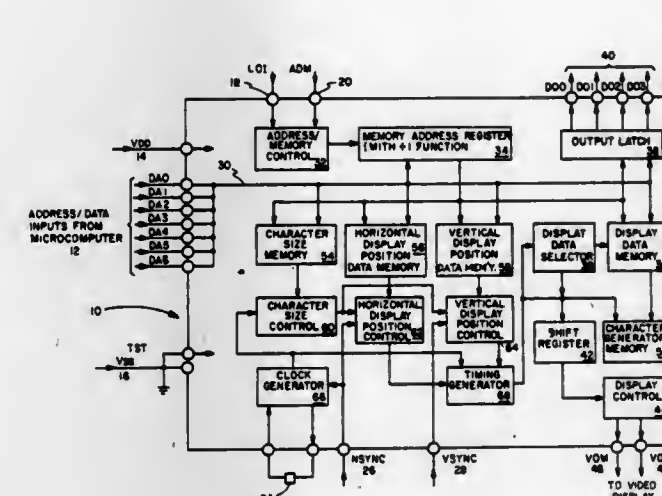
Jeffery A. Puskas, Prospect Heights; Peter C. Skerlos, Arlington Heights, and Thomas J. Zato, Palatine, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed May 4, 1981, Ser. No. 260,639

Int. Cl.<sup>3</sup> G09G 1/16

U.S. Cl. 340—750

6 Claims



1. A system for converting a plurality of parallel output signals representing video information from a microcomputer into latched control signals and characters for presentation in a dot matrix form on the display face of a cathode ray tube in a television receiver, wherein ordered character display positions are scanned in successive lines on said display face with said microcomputer output signals including character code signals, memory address code signals and timing pulse signals, said system comprising:

- bus means for receiving said plurality of microcomputer parallel output signals and for converting said signals into a series of coded digital signals;
- first memory means coupled to said bus means for sequentially storing data representative of said control signals and said characters in a plurality of addressable memory locations, the spatial position of each of said memory locations corresponding to the positions of said characters as displayed on the face of said cathode ray tube;
- address register means coupled to said bus means and responsive to said timing pulse signals for providing said memory address code signals to said first memory means when a first edge of said timing pulse signal is received by said bus means and for providing said character code signals to said first memory means for storage therein when a second edge of said timing pulse signal is received by said bus means;
- second memory means adapted to store dot matrix images representing said characters in a plurality of addressable memory locations therein;
- control means coupled to said second memory means and said first memory means for selecting and reading out particular ones of said dot matrix images from said second memory means according to the sequential storage of said characters in said first memory means and for providing said dot matrix images to said cathode ray tube; and
- latch means including a plurality of latches coupled to said bus means for receiving said coded digital signals and for converting said coded digital signals to a plurality of latched output control signals for controlling video and nonvideo functions in said television receiver in response to the video information received from said microcomputer.

4,419,663

## DISPLAY DEVICE

Tadao Kohashi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

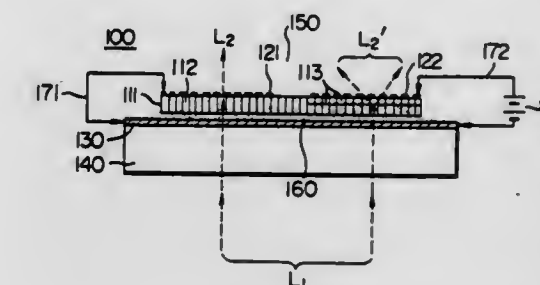
Filed Mar. 7, 1980, Ser. No. 128,039

Claims priority, application Japan, Mar. 14, 1979, 54-30363; Mar. 14, 1979, 54-30364; Nov. 7, 1979, 54-144617

Int. Cl.<sup>3</sup> G09G 3/34

U.S. Cl. 340—783

115 Claims



1. A display device for controlling a display of light comprising:

- a composite body including a porous substance member and liquid material impregnated in said porous substance member, said liquid material having an index of refraction substantially equal to the index of refraction of said porous substance member and having a resistivity selected to permit the operation of said display device;
- at least one first electrode disposed proximate a surface of said composite body;
- at least one second electrode disposed proximate a surface of said composite body; and
- means for applying a signal voltage between said first and second electrodes to move the liquid material in the porous substance member, whereby the liquid impregnation factor of the porous substance member is controlled by the movement of the liquid material in the porous substance member in response to the signal voltage to control the display of light.

4,419,664

## CO-ORDINATE ADDRESSING OF SMECTIC DISPLAY CELLS

William A. Crossland, Harlow; David Coates, and Peter J. Ayliffe, both of Bishop's Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

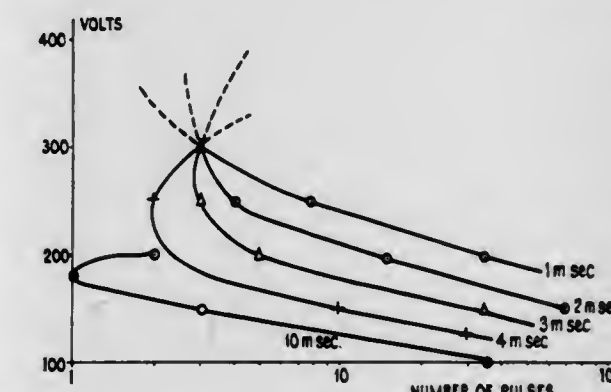
Filed Dec. 23, 1980, Ser. No. 219,559

Claims priority, application United Kingdom, Jan. 16, 1980, 8001499

Int. Cl.<sup>3</sup> G09G 3/36

U.S. Cl. 340—784

14 Claims

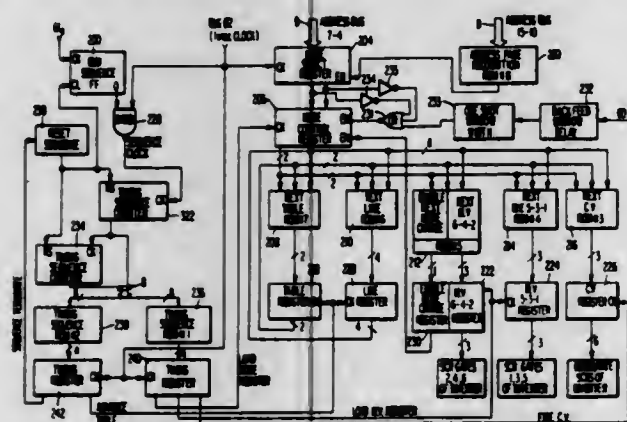


1. A method of co-ordinate matrix addressing in internally electroded liquid crystal display cell which has a layer of smectic material sandwiched between two electroded plates crossing over a second array on the other plate defining therebetween a set of elemental volumes of liquid crystal each



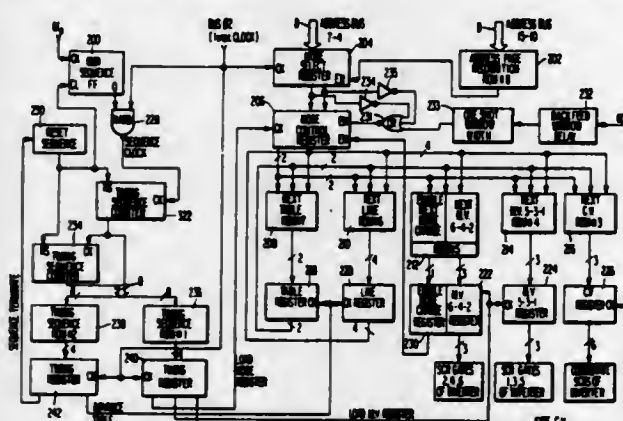
(f) injecting said pulse code signal generated in step (e) onto the utility's power lines for transmission to a plurality of coded receiver units remotely located at said loads to effect said desired control command.

## U.S. Cl. 340—825.06



- (a) transmitting a first binary injection message representing said desired control command from said master control station to each of said plurality of substation injection units in turn;
- (b) transmitting a second binary injection message representing said desired control command received in step (a) from each of said substation injection units in turn to said master control station;
- (c) verifying at said master control station that said second binary message is the same as said first binary message;
- (d) transmitting a binary commence keying command signal from said master control station to all of said substation injection units simultaneously;
- (e) generating a pulse code signal representing said first

**George P. Gurr, Dunwoody, and Bruce J. Nelson, Lilburn, both of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga. Division of Ser. No. 53,710, Jul. 2, 1979, Pat. No. 4,348,668. This application Aug. 6, 1982, Ser. No. 406,038 Int. Cl.<sup>3</sup> H04Q 9/00; H02J 3/10; H04B 3/54 U.S. Cl. 340-825.06 5 Claims**

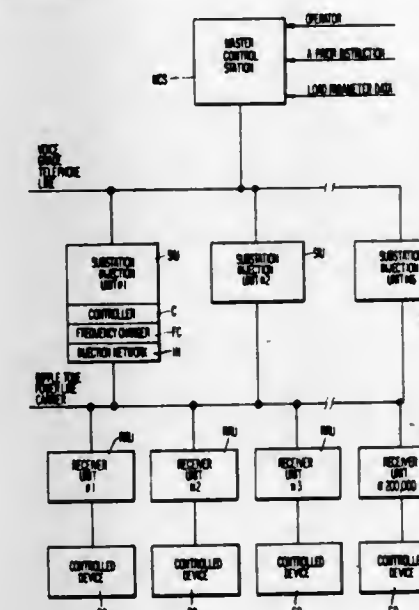


means for prioritizing and executing said group control commands.

## 409

**George P. Gurr, Dunwoody, and Bruce J. Nelson, Lilburn, both of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.**  
**Division of Ser. No. 53,710, Jul. 2, 1979, Pat. No. 4,348,668.**  
**This application Aug. 6, 1982, Ser. No. 406,094**  
**Int. Cl.<sup>3</sup> H04Q 9/00; H04B 3/54**

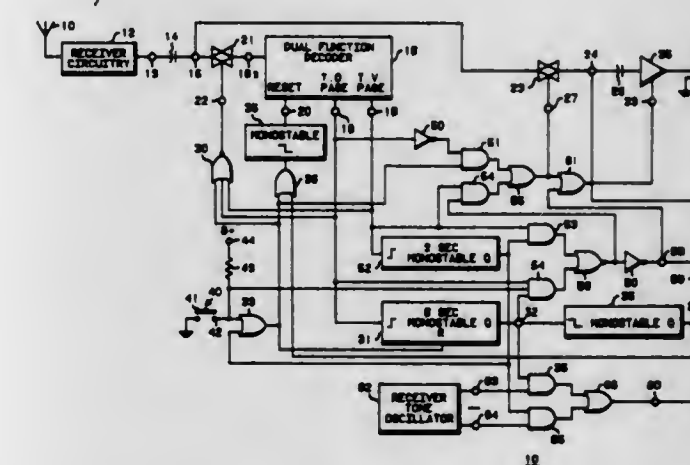
## 1 Claims



wherein said substation injection unit further comprises:  
means connected to said power lines for detecting each pulse  
in said pulse code signals; and  
means in said second data processor means for determining

**Charles J. Ganucheau, Jr., North Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**  
**Filed Sep. 25, 1981, Ser. No. 305,571**  
**Int. Cl.<sup>3</sup> G08B 5/22**

U.S. Cl. 340—825.44



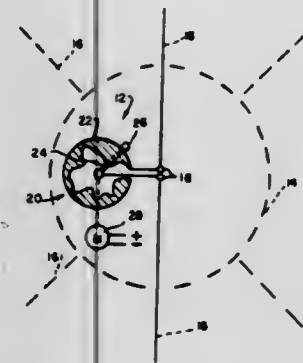
wherein said tone only alert means includes received audio inhibit means enabled in response to the creation of said tone only mode by the reception of said first predetermined signal code, for inhibiting, during said tone only alert mode, any coupling of said received audio signals to said audio transducer means by said actuation/deactuation of said switch means.



**4,419,669**  
**CONTROLLED SCINTILLATION RATE DECOY**  
 Donald M. Slager, Long Beach, and William C. Barker, Pacific Palisades, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 4, 1971, Ser. No. 103,906  
 Int. Cl.<sup>3</sup> H01Q 15/14; G01S 7/38  
 U.S. Cl. 343—18 D

10 Claims U.S. Cl. 343—786

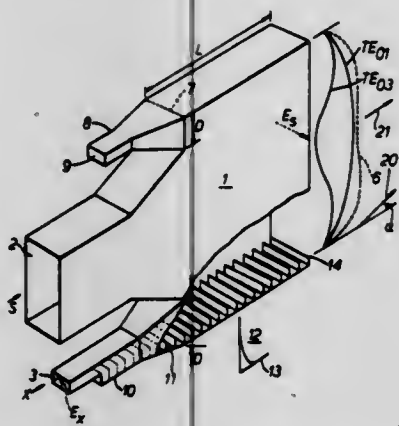


1. A controlled scintillation radar decoy comprising:  
 a decoy body;  
 microwave reflectors mounted on said body for reflecting incident radar energy in a manner to simulate the radar cross-section of a larger space vehicle to be protected; and  
 means for varying the reflectivity of said reflectors in random manner and at a relatively slow rate in such a way as to introduce into radar energy reflecting from the decoy a randomly varying scintillation effect simulating the varying scintillation of said space vehicle.

**4,419,670**  
**DUAL FEED BOX HORN ANTENNA**  
 Stewart C. Hill, Leicester, England, assignor to The Marconi Company Limited, Chelmsford, England  
 Filed Nov. 12, 1981, Ser. No. 320,684  
 Claims priority, application United Kingdom, Nov. 13, 1980, 8036535

Int. Cl.<sup>3</sup> H01Q 25/00, 19/17  
 U.S. Cl. 343—779

6 Claims

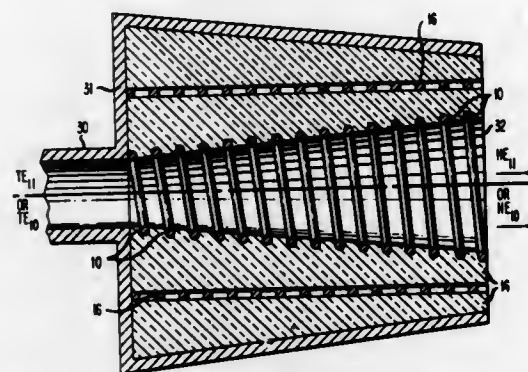


1. An antenna including a reflector and a box horn positioned at a focus of said reflector so as to illuminate it, the body of the box horn being dimensioned to support the TE<sub>01</sub> and TE<sub>03</sub> modes of a signal applied to a first input port thereof and to direct the resultant signal towards said reflector; and a second input port off-set from the axis of the box horn and being arranged to accept a higher frequency than said first port, one wall of the box horn being arranged to launch said higher frequency as a surface wave directed towards said reflector.

**4,419,671**  
**SMALL DUAL FREQUENCY BAND HYBRID MODE FEED**

Anthony R. Noerpel, Long Branch, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Oct. 28, 1981, Ser. No. 315,619  
 Int. Cl.<sup>3</sup> H10Q 13/02

3 Claims

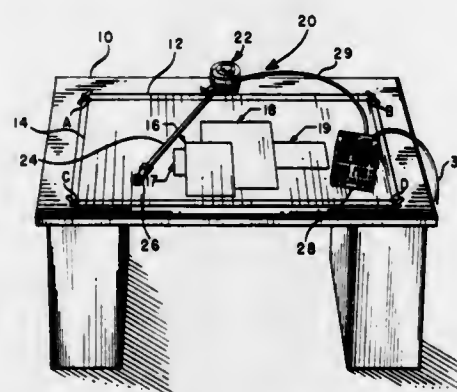


1. A dual frequency band, hybrid mode feed comprising:  
 a hollow waveguide body (12) comprising an inner surface; and  
 a helically wound wire structure (10) bonded to the inner surface of the waveguide body with a dielectric layer (14) having a predetermined thickness which permits a predetermined mode to propagate at a first frequency band; and  
 a periodic tuned grid structure (16) which is embedded in the dielectric layer between the helically wound wire structure and the inner surface of the waveguide body at a predetermined depth from the helically wound wire structure to permit said predetermined mode to propagate at a second frequency band.

**4,419,672**  
**POINT LOCATOR AND GRAPHICS DIGITIZER SYSTEM**  
 Edwin A. Hird, 10200 DeSoto Ave., #331, Chatsworth, Calif. 91311

Filed Apr. 1, 1977, Ser. No. 783,608  
 Int. Cl.<sup>3</sup> G01D 5/16

28 Claims

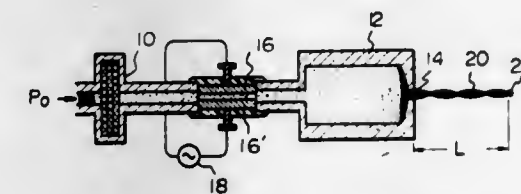


1. A point locator system comprising:  
 a housing and a movable cursor, the housing including a base portion having means for mounting the base in a selected position along a generally planar surface and a second portion movable relative to the base in response to the positioning of the cursor;  
 a thin band, curved in cross-section, coupling the cursor to the housing and being movable relative to the base portion of the housing;  
 means fixedly mounting the cursor to the distal end of the band;  
 a first potentiometer mounted within the housing and being connected across a voltage source and including a movable arm coupled to respond to movement of the band

along one coordinate of a coordinate system capable of mathematically specifying the location of a selected point on said surface, said movable arm thereby generating a first signal representative of the position of the cursor along said one coordinate;  
 a second potentiometer mounted within the housing and being connected across a voltage source and including a movable arm coupled to respond to movement of the band along an other coordinate of a coordinate system capable of mathematically specifying the location of a selected point on said surface, said movable arm thereby generating a second signal representative of the position of the cursor along said other coordinate; and  
 means for receiving said first and second signals for recording thereof.

**4,419,673**  
**INK DROPLET EJECTION SYSTEM**  
 Yutaka Ebi, and Akinori Mizuno, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan  
 Filed Oct. 2, 1981, Ser. No. 308,019  
 Claims priority, application Japan, Oct. 10, 1980, 55-141608  
 Int. Cl.<sup>3</sup> G01D 15/18

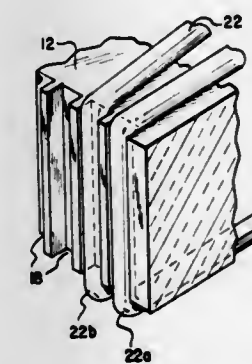
7 Claims



1. A fluid droplet ejection system comprising:  
 a fluid inlet passageway supplied with fluid under pressure;  
 a fluid ejection head having a nozzle communicated with the inlet passageway for ejecting a stream of the fluid from the nozzle; and  
 electric field applying means for periodically applying an electric field to the fluid in the inlet passageway to thereby separate the stream of the fluid from the nozzle into successive droplets;  
 the electric field being applied to the fluid in a direction perpendicular to an intended direction of fluid flow.

**4,419,674**  
**WIRE WOUND FLAT-FACED CHARGE PLATE**  
 Surinder K. Bahl; Margene C. Howell, and Loy D. Pace, all of Dayton, Ohio, assignors to Mead Corporation, Dayton, Ohio  
 Filed Feb. 12, 1982, Ser. No. 348,476  
 Int. Cl.<sup>3</sup> G01D 15/18

13 Claims

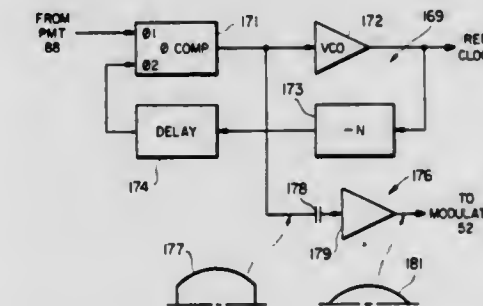


1. A planar-faced charge plate structure comprising,  
 an electrically nonconductive substrate having an upper and a lower surface, and at least one end face normal to said upper surface,  
 a plurality of electrically conductive wires extending across

at least said upper surface and said end face of said substrate; and  
 means for securing said wires to said substrate, the outwardly facing surfaces of said wires along said end face of said substrate being in parallel, spaced coplanar relationship with each other and with said end face and forming charge electrodes.

**4,419,675**  
**IMAGING SYSTEM AND METHOD FOR PRINTED CIRCUIT ARTWORK AND THE LIKE**  
 Don B. Neumann, Laguna Beach; Lyle K. Norton, Santa Ana, and Eric V. Olson, Long Beach, all of Calif., assignors to American Hoechst Corporation, Somerville, N.J.  
 Filed May 24, 1979, Ser. No. 42,133  
 Int. Cl.<sup>3</sup> G01D 9/42; H04N 1/22; G03B 41/00

4 Claims



1. In a system for use in the manufacture of printed circuit boards: a source of data representative of artwork to be formed on the circuit boards, laser means for providing a beam of coherent radiation, means for modulating the beam in accordance with the data, means for holding an output medium in position to be scanned by the beam, means for effecting scanning of the output medium by the modulated beam to form an image of the artwork on the output beam, means for sensing the position of the beam and providing a reference signal corresponding to the position of the beam on the output medium, means responsive to the reference signal for synchronizing the modulation of the beam with the position of the beam on the output medium, and means for shifting the phase of the reference signal forward in time to compensate for any delay between the generation of the reference signal and the arrival of the modulated beam on the output medium.

2. In a method utilizing a laser beam to produce artwork for printed circuit boards, the steps of: providing data signals defining the artwork to be produced, modulating the laser beam in accordance with the data signals, scanning the modulated laser beam across an output medium to form an image of the artwork on the output medium, monitoring the position of the beam and providing a reference signal corresponding to the position of the beam on the output medium, synchronizing the modulation of the beam in accordance with the reference signal, and shifting the phase of the reference signal forward in time to compensate for any delay between the generation of the reference signal and the arrival of the modulated beam on the output medium.



4,419,676

# METHOD OF RECORDING SIGNALS ON BANDS BY MEANS OF LASER BEAMS AND APPARATUS FOR CARRYING OUT THE METHOD

Attila Markus Lenk; Andras Podmaniczky, and Szabolcs Tokes, all of Budapest, Hungary, assignors to Magyar Tudományos Akadémia Számítástechnikai és Automatizálási Kutató Intézete, Budapest, Hungary

PCT No. PCT/HU80/00009, § 371 Date Aug. 11, 1981, § 102(e) Date Aug. 11, 1981, PCT Pub. No. WO81/01767, PCT Pub. Date Jun. 25, 1981.

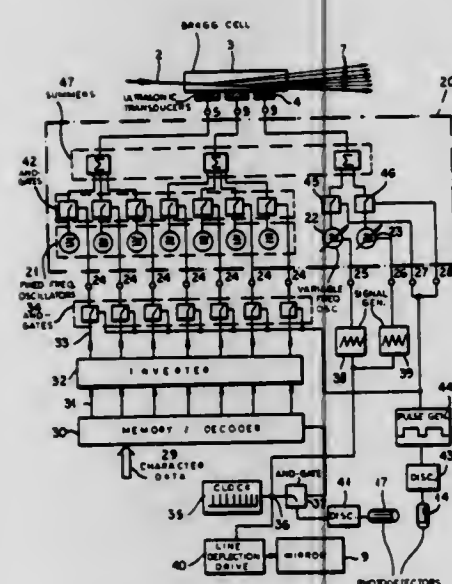
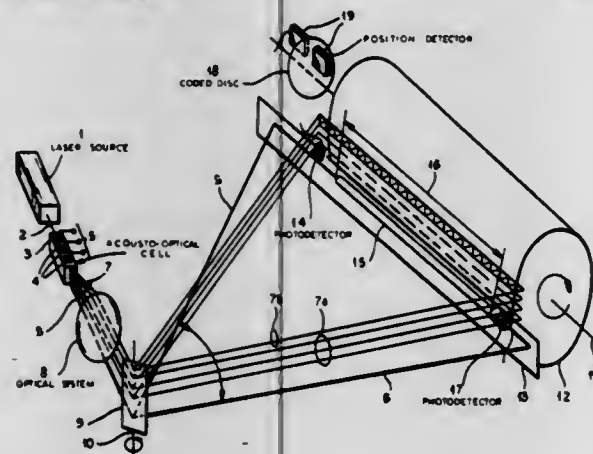
PCT Filed Dec. 11, 1980, Ser. No. 293,202

Claims priority, application Hungary, Dec. 18, 1979, 3252

Int. Cl.<sup>3</sup> G01D 9/42

U.S. Cl. 346—108

12 Claims



1. In a method of recording signals on a band by means of laser means, comprising the steps of projecting a plurality of character recording laser beams propagating in a common plane onto a recording surface, deflecting said beams to scan respective raster lines on discrete recording bands of said surface, generating said character recording laser beams simultaneously in each recording point of each band in accordance with the shape of the character signal falling on the corresponding points. Wherein the improvement is that said recording surface is illuminated by means of said character recording laser beams only in locations that do not comprise any character, the passage of said character recording laser beams towards locations of said recording surface that comprise characters or signals is blocked, at least one band gap illuminating laser beam in addition to the recording laser beams is generated to propagate together and in a common plane therewith, and the band gaps of the recording surface are illuminated by said band gap illuminating laser beams.

4,419,677

# INK JET RECORDING APPARATUS

Yukio Kasugayama, Yokohama; Koji Terasawa, Fuchu, and Yoshihumi Hattori, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

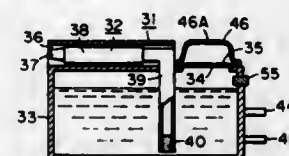
Continuation of Ser. No. 195,354, Oct. 9, 1980, abandoned. This application Nov. 24, 1982, Ser. No. 444,216

Claims priority, application Japan, Oct. 17, 1979, 54-132825

Int. Cl.<sup>3</sup> G01D 15/16

U.S. Cl. 346—140 R

3 Claims



1. A compact ink jet recording apparatus comprising:  
a compact recording liquid container having an elastic plug provided in an aperture formed in a wall of said container, wherein said plug prevents escape of recording liquid from said container;  
a recording head integral with said container for effecting printing, while moving longitudinally along printing paper, by discharging recording liquid supplied from said container;  
a vent;  
a vent filter mounted above the vent, for preventing the passage of the recording liquid while permitting the passage of gases therethrough;  
pressurizing means provided above said vent filter, to manually apply pressure to the interior of said recording liquid container through said vent filter; and  
a recording liquid supply device including:  
a cylindrical supply body for storing recording liquid therein;  
a piston member fitted to said body for manually changing volume of the recording liquid stored in said body;  
and  
an ink supply member mounted to said body for communicating with the interior of said body.

4,419,678

# INK JET RECORDING APPARATUS

Yukio Kasugayama, Yokohama; Koji Terasawa, Fuchu, and Yoshihumi Hattori, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

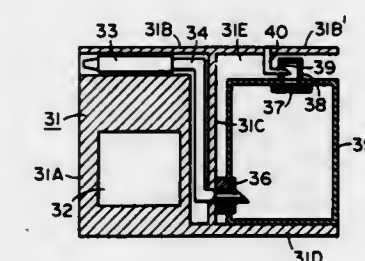
Filed Oct. 9, 1980, Ser. No. 195,350

Claims priority, application Japan, Oct. 17, 1979, 54-132824

Int. Cl.<sup>3</sup> G01D 15/16

U.S. Cl. 346—140 R

3 Claims



1. An ink jet recording apparatus comprising:  
recording means for discharging recording liquid in response to an electrical signal;  
a supply tube, having a tip end, for feeding the recording liquid to said recording means; and

recording liquid reservoir means for storing the recording liquid therein, said reservoir means comprising a wall surface, a first elastic blind portion provided in said wall surface for receiving said tip end of said supply tube for insertion thereto, an atmosphere communicating member, and a second elastic blind portion provided in said wall surface for receiving said atmosphere communicating member for insertion thereto to communicate between the interior of said reservoir means and the atmosphere, and upon said atmosphere communicating member being inserted into said second blind position, said reservoir means further comprising two chambers for preventing leakage of the recording liquid to the outside thereof.

4,419,679

# GUADRASCAN STYLI FOR USE IN STAGGERED RECORDING HEAD

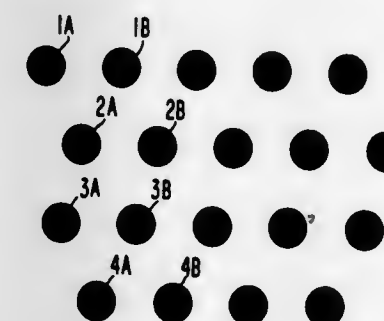
Sherman L. Rutherford, Portola Valley; Arthur E. Bliss, Sunnyvale, and Noel J. Schmidt, Palo Alto, all of Calif., assignors to Benson, Inc., San Jose, Calif.

Filed Jun. 3, 1980, Ser. No. 155,937

Int. Cl.<sup>3</sup> G01D 15/06; G03G 15/44

U.S. Cl. 346—155

8 Claims



1. A recording head comprising four staggered rows of styli wherein the styli in each row are spaced two styli diameters apart center-to-center, each styli having a substantially circular cross-section, each row being separated from the adjacent row by a distance in excess of the diameter of each styli and each row being staggered relative to the adjacent row or rows by at least one-half diameter of the styli, and wherein the second row of styli is staggered by one styli diameter relative to the first row, the third row of styli is staggered by one-half styli diameter relative to the first row, and the fourth row of styli is staggered by one styli diameter relative to the third row and one-half styli diameter relative to the second row.

4,419,680

# ELECTROGRAPHIC PRINTING SYSTEM

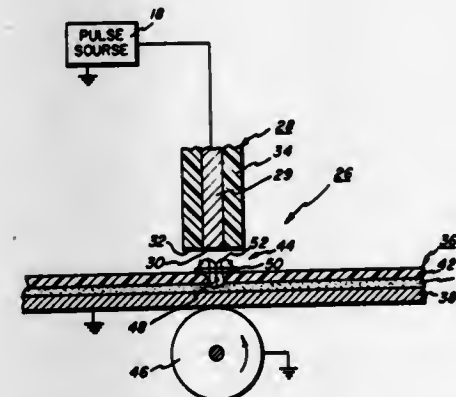
Nicholas K. Sheridan, Saratoga; David K. Biegelsen, and Michael A. Berkovitz, both of Woodside, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 7, 1980, Ser. No. 166,219

Int. Cl.<sup>3</sup> G01D 15/08

U.S. Cl. 346—163

17 Claims



1. An electrographic printing system wherein printing is

accomplished in a recording gap between oppositely opposed electrode means between which a recording medium is transposed comprising

print electrode means comprising at least one print electrode and a dielectric collar surrounding the print end portion of said print electrode,  
a thin dielectric layer forming a part of said recording medium and facing said print electrode means,  
the end portion of said print electrode and the end surface of said collar being substantially flush and disposed adjacent to said dielectric layer,  
complement electrode means positioned for conducting current through said recording medium via said print electrode means,  
a conductive solid pigment medium being a constituent of said complement electrode means,  
circuit means connected to apply a potential difference between said print and complement electrode means to induce current flow and discharge therebetween sufficient to create an aperture in said dielectric layer and the erosion of a minute portion of said pigment medium there-through whereby a pigment particle aerosol is created between said print electrode means and said dielectric layer,  
said dielectric collar contributing to the local confinement and dwell period of said aerosol at the lip of said aperture to permit the deposition of said particles therefrom on said dielectric layer substantially in the form of a torus around said aperture lip thereby optimizing the confinement and ultimate resolution of formed pigment marks on said recording medium.

4,419,681

# ZENER DIODE

Albert Schmitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

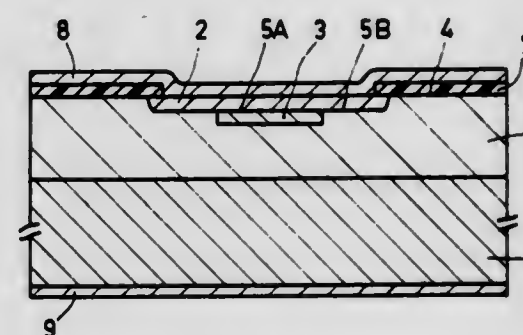
Filed Sep. 18, 1980, Ser. No. 188,198

Claims priority, application Netherlands, Oct. 18, 1979, 7907680

Int. Cl.<sup>3</sup> H01L 27/70

U.S. Cl. 357—13

10 Claims



1. A semiconductor device having a Zener diode comprising a semiconductor body having  
a highly doped substrate layer of a first conductivity type,  
a first semiconductor region of an epitaxial layer extending from said substrate layer to a surface of said body and also being of said first conductivity type, said epitaxial layer having a thickness of at least 10  $\mu\text{m}$  and at most 35  $\mu\text{m}$ , and a resistivity of at least 0.5 Ohm cm and at most 2 Ohm cm to provide a positive differential resistance upon breakdown, and said substrate layer having a higher doping concentration than said epitaxial layer,  
a second semiconductor region of a second conductivity type situated within said first semiconductor region, said second semiconductor region also adjoining said surface,  
a third semiconductor region of said first conductivity type disposed at a distance from said surface in said first semiconductor region and bounded by said second semiconductor region, said third semiconductor region having a



1. A semiconductor integrated circuit device comprising:  
a semiconductor body of a first conductivity type;  
an insulating layer disposed on a major surface of said semiconductor body;  
an interconnection layer disposed on said insulating layer so as to overlie a first portion of said semiconductor body, which first portion comprises a surface portion at said major surface and an interior portion formed in said semiconductor body under said surface portion, and wherein a series capacitance is formed of the capacitance across said insulating layer between said interconnection layer and said body and through a depletion layer formed in said body beneath said insulating layer, and  
further including means for reducing said series capacitance

415

1. A semiconductor device comprising:
  - (a) a semiconductor substrate of a first conductivity type including a first semiconductor region of said first conductivity type exposed to one of the principal surfaces of said semiconductor substrate, said first semiconductor region having an impurity concentration higher than that of said semiconductor substrate, a second semiconductor region of a second conductivity type formed in said first semiconductor region to be exposed to said one principal surface, a third semiconductor region of said second conductivity type formed at a position spaced apart from said first semiconductor region to be exposed at said one principal surface, and a fourth semiconductor region of said second conductivity type formed between said first and third semiconductor regions to make contact therewith and to be exposed to said one principal surface, said fourth semiconductor region having an impurity concentration lower than that of said third semiconductor region;
  - (b) a passivation film covering said one principal surface of said semiconductor substrate; and
  - (c) first, second and third electrodes making ohmic contact with said first, second and third semiconductor regions through openings in said passivation film, respectively, said second electrode extending on said passivation film beyond a portion of said first semiconductor region between said second and fourth semiconductor regions and to a point on said passivation film under which said fourth semiconductor region exists, said first electrode being in ohmic contact with said first semiconductor region at a portion thereof remote from said fourth semiconductor region, and a portion of said third electrode remote from said first and second electrodes extending to a point on

PIXEL NO.	1	2	3	4	
CHANNEL NO.	1	2	3	4	
	Y+I	Y+Q	Y-I	Y-Q	
	X	X	X	X	
	2	0	0	0	
	Y-I	Y-Q	Y+I	Y+Q	

1. A method of transmitting samples of a color television signal, said method comprising sequentially transmitting in each of a plurality of channels a separable set of color components of each sample of said television signal, samples in any one channel being cosited with respect to corresponding samples in the remaining channel or channels, any one channel of said plurality being separable with respect to the remaining channel or channels, whereby at least approximate separation into color components is possible when only one channel is available due to dropouts, and complete color separation is possible when all channels are available.



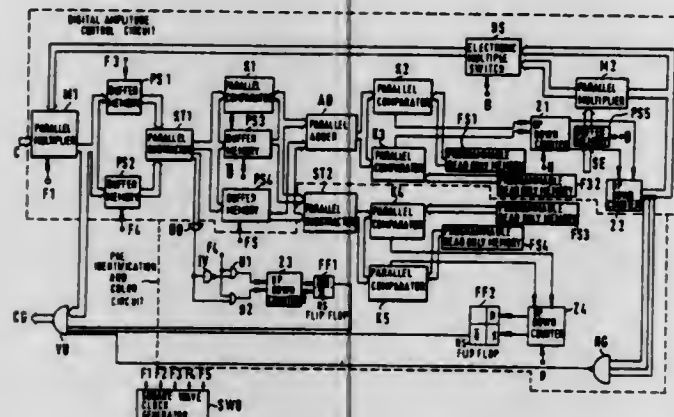
**4,419,688**  
**COLOR-TELEVISION RECEIVER WITH AT LEAST ONE DIGITAL INTEGRATED CIRCUIT FOR PROCESSING THE COMPOSITE COLOR SIGNAL**

Leslie Miskin, Gundelfingen, and Peter M. Flamm, Freiburg, both of Fed. Rep. of Germany, assignors to IIT Industries, Inc., New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,218  
 Claims priority, application European Pat. Off., Oct. 3, 1980, 80106654.9

Int. Cl.<sup>3</sup> H04N 9/535, 9/49  
 U.S. Cl. 358—27

8 Claims



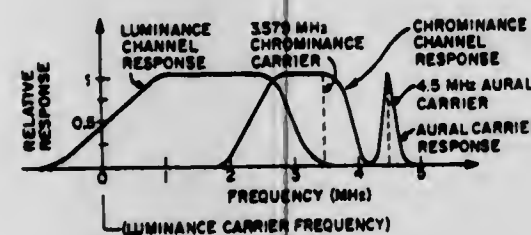
1. A color television receiver comprising:
  - a first digital circuit responsive to a received digital chrominance signal and a digital amplitude control signal produced automatically in said first digital circuit to control the amplitude of said received signal;
  - a second digital circuit coupled to given ones of a plurality of outputs of said first digital circuit to provide PAL identification and color killer action;
  - and
  - a third digital circuit coupled to another output of said plurality of outputs of said first digital circuit and given ones of a plurality of outputs of said second digital circuit to provide a controlled digital chrominance signal.

**4,419,689**  
**DIGITAL COLOR MODULATOR**  
 Gilbert E. Russell, Hayward, and Hee Wong, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 216,470, Dec. 15, 1980, abandoned.  
 This application Aug. 3, 1982, Ser. No. 404,801  
 Int. Cl.<sup>3</sup> H04N 9/535

U.S. Cl. 358—37

1 Claim



1. Apparatus for precompensating a digital luminance signal representing a serial dot-by-dot video luminance for cross-modulation between the luminance and chrominance channels in NTSC receivers due to high-frequency digital transitions in the luminance signal, the apparatus comprising:
  - means for detecting, in the situation where two adjacent dark dots are preceded by or followed by an adjacent light dot, the transition from a light to a dark dot or a dark to a light dot, as appropriate; and

means for increasing the luminance amplitude of the dark dot immediately adjacent the white dot.

**4,419,690**  
**METHOD AND APPARATUS FOR PRODUCING A HALF-TONE REPRODUCTION**

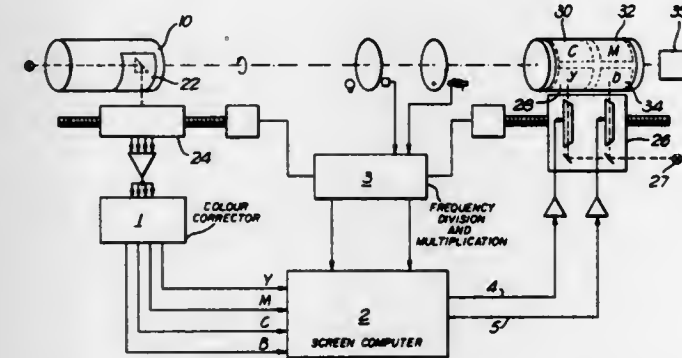
Philippe Hammes, Massy, France, assignor to Crosfield Electronics Limited, London, England

Filed Aug. 27, 1981, Ser. No. 296,670  
 Claims priority, application United Kingdom, Sep. 1, 1980, 8028176

U.S. Cl. 358—75

Int. Cl.<sup>3</sup> H04N 1/46

24 Claims



1. A method of making a half-tone reproduction of an original image by exposing an output surface to a scanning beam which assumes conditions in accordance with the value of a control signal, comprising, for the generation of the control signal, the steps of:
  - (a) generating position signals representing the position of the scanning beam within a half-tone dot area of a screen grid, each successive position in the screen grid of the scanning beam being determined by the repeated addition of small increments to the previous position, and, at each successive position, the position signals being compared with a predetermined value to detect the crossing of the border of the dot area;
  - (b) comparing each of the position signals with a picture signal representing the picture density at the corresponding point of the original image to be reproduced; and
  - (c) combining the results of the comparisons to generate the control signal which causes the scanning beam to write on the output surface in accordance with the result of the combination of results.

**4,419,691**  
**METHOD FOR THE IMPROVED REPRODUCTION OF IMAGE IN REPRODUCTION TECHNOLOGY**

Gerhard Sing, Schonkirchen, and Klaus Wellendorf, Kitzberg b. Kiel, both of Fed. Rep. of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

PCT No. PCT/DE81/00016, § 371 Date Sep. 16, 1981, § 102(e)  
 Date Sep. 16, 1981, PCT Pub. No. WO81/02206, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 17, 1981, Ser. No. 302,421  
 Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002781

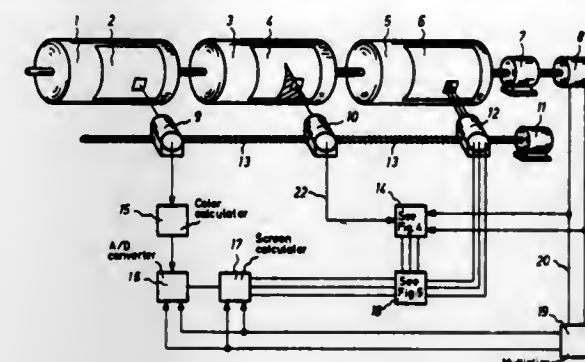
U.S. Cl. 358—75

Int. Cl.<sup>3</sup> H04N 1/40

4 Claims

1. A method for combined reproduction of pictures and line drawings comprising the steps of optoelectronically scanning a picture original with a first scanning element and generating a first recording signal for the screened reproduction of said picture original, controlling a plurality of separately drivable recording beams by the first recording signal for forming raster dots for the screened reproduction of said picture original, said plurality of recording beams having a finer resolution than the scanning element, optoelectronically scanning a line drawing original with a second scanning element and generating a

second recording signal for a refined line reproduction of said line drawings and controlling said plurality of recording beams



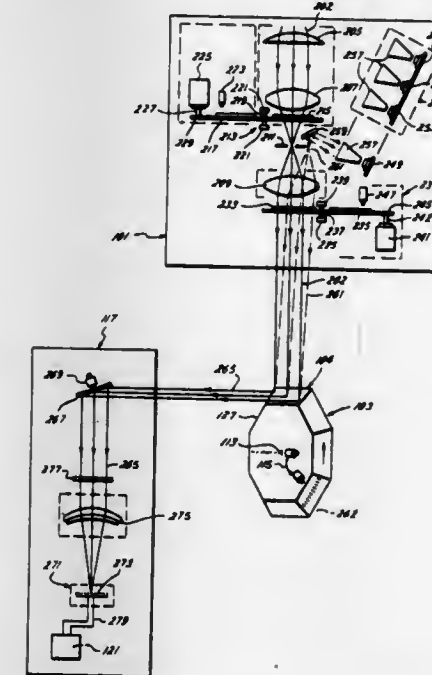
by the second recording signal, wherein for refined reproduction of said line drawing original the recording beams are individually controlled by the second recording signal.

**4,419,692**  
**HIGH SPEED INFRARED IMAGING SYSTEM**  
 James E. Modisette, and Ralph B. Johnson, both of San Antonio, Tex., assignors to Texas Medical Instruments, Inc., San Antonio, Tex.

Filed Dec. 31, 1981, Ser. No. 336,088  
 Int. Cl.<sup>3</sup> H04N 7/18

U.S. Cl. 358—113

20 Claims



1. A method of calibrating an imaging system having a plurality of detectors, comprising:
  - adjusting a slueable radiance source within about the range of radiance to be sensed by the imaging system,
  - sensing the slueable radiance with a plurality of detectors, and
  - clamping the output of each detector of said plurality to an internal reference.

**4,419,693**  
**ERROR CONCEALMENT IN DIGITAL TELEVISION SIGNALS**

James H. Wilkinson, Tadley, Near Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 248,861  
 Claims priority, application United Kingdom, Apr. 2, 1980, 8011090

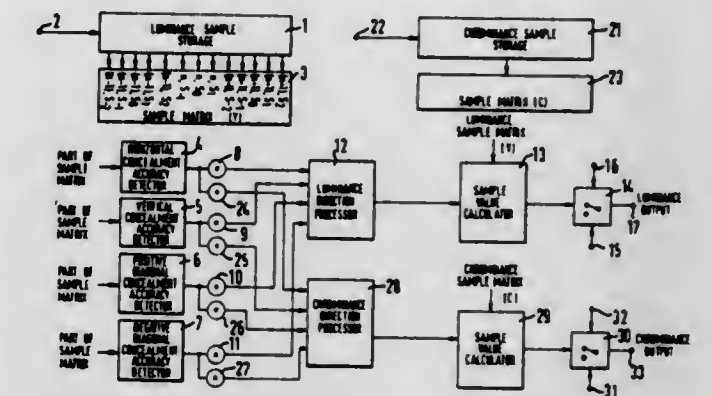
Int. Cl.<sup>3</sup> H04N 5/21  
 U.S. Cl. 358—167

14 Claims

1. A method of concealing errors in a digital television

signal, which television signal comprises a plurality of sample signals corresponding respectively to sample positions along a horizontal scan line of a television picture made up of a plurality of such lines, the method comprising, in respect of each said sample signal which is in error:

- selecting from a plurality of algorithms a preferred algorithm for correcting such error sample signal;



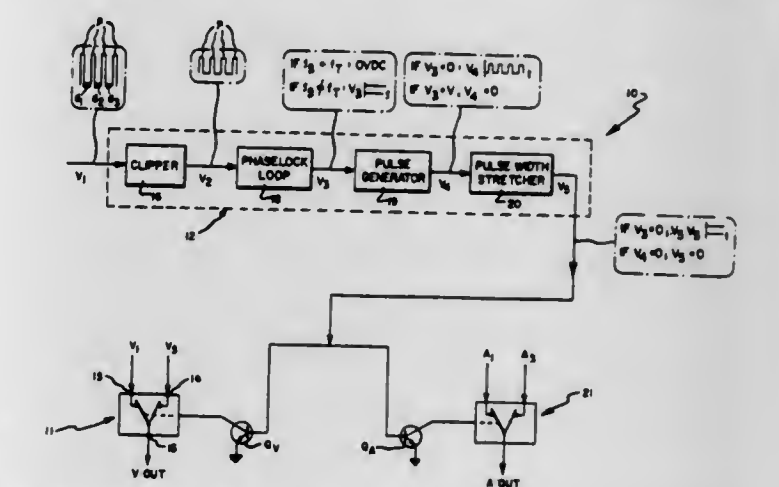
- calculating a corrected value of said error sample signal using said preferred algorithm;
- substituting said corrected value of said error sample signal for said error sample signal so as to conceal the error; and
- supplying said digital television signal having said corrected values of said error sample signal to an output for use in a television signal processing device.

**4,419,694**  
**FREQUENCY-SENSITIVE SWITCHING CIRCUIT AND METHOD**  
 Friedrich Vesterling, Blasdel, N.Y., assignor to WNY Hospital Television, Inc., Buffalo, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,775  
 Int. Cl.<sup>3</sup> H04N 5/44

U.S. Cl. 358—181

10 Claims



1. A switching circuit, comprising:
  - a switch having a first input terminal adapted to be supplied with a first signal normally having a repetitious series of pulses, having a second input terminal adapted to be supplied with a second signal, and having an output terminal, said switch being operable in response to a command signal to electrically connect said output terminal alternatively with said first input terminal or with said second input terminal; and
  - a sampling circuit adapted to be supplied with said first signal and arranged to produce said command signal for operating said switch, said sampling circuit being arranged to sense the pulse frequency in said first signal and operable to connect said output and first input terminals whenever the sensed pulse frequency differs from a desired frequency by less than a known amount, and operable to connect said output and second input terminals







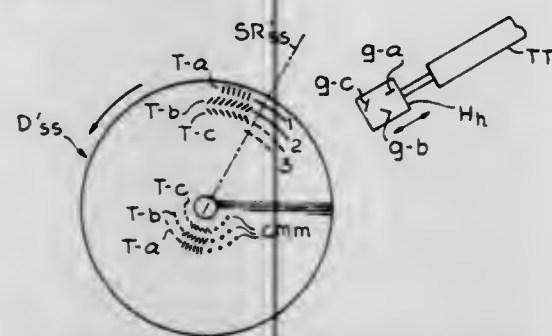
# 4,419,700 DUAL-TRACK SPIRAL RECORDING AND ASSOCIATED SYSTEM

Herbert U. Ragle, and Norman S. Blessum, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 807,155, Jun. 16, 1977, Pat. No. 4,166,282. This application Dec. 18, 1978, Ser. No. 970,442  
Int. Cl.<sup>3</sup> G11B 21/10

U.S. Cl. 360—77

33 Claims



1. A high density digital data recording medium comprised of at least two co-recorded "spiral" interleaved tracks wherein each track is comprised of recording transitions aligned in at least one of two orthogonal skewed directions with respect to the respective track direction.

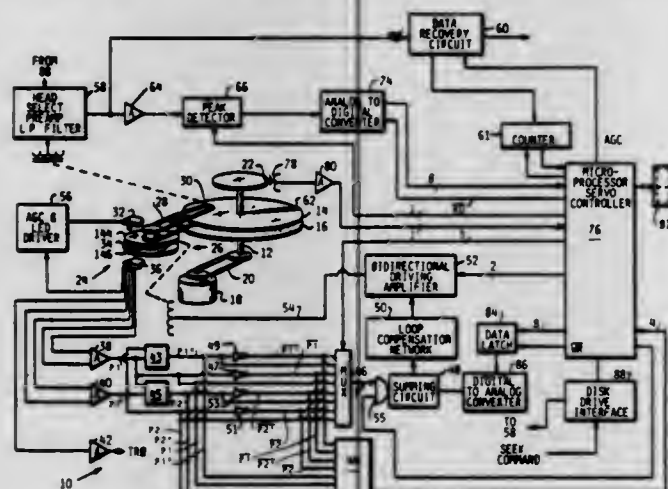
# 4,419,701 DATA TRANSDUCER POSITION CONTROL SYSTEM FOR ROTATING DISK DATA STORAGE EQUIPMENT

Joel N. Harrison, Campbell; Donald V. Daniels, Santa Cruz, and Bruce R. Peterson, San Jose, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Sep. 21, 1981, Ser. No. 304,209

Int. Cl.<sup>3</sup> G11B 17/00, 21/00  
U.S. Cl. 360—77

16 Claims



1. In a method for digitally controlling a continuous torque generating rotary actuator for a data transducer in a rotating disk data storage device having a multiplicity of concentric data tracks on at least one major surface of a said rotating disk in order to move said transducer from one said track to a selected other of said tracks in response to track selection information supplied from a host machine to which said device is connected and to keep said transducer centered in each selected track, said method comprising the steps of:

- sensing an initial position of said transducer and storing said sensed position as a digital number;
- receiving and storing as a digital number each track selection command;
- electro-optically sensing movement of said transducer, converting said sensed movement to polyphase signals, processing said polyphase signals to define track boundaries, putting out said track boundary signals as digital signals, and digitally counting said boundaries relative to said stored initial sensed position depending on the direc-

tion of movement of said transducer away from or towards said initial sensed position, so that said transducer location is always known by digital counting;

- calculating a seek command for said transducer in response to each said received and stored track selection command in reference to said counted transducer location;
- moving said transducer from its present location to a said selected track by operating said actuator in response to said digital seek command and said sensed track boundary signals and signalling arrival of said transducer at said selected track to said host;
- reading prestored data on a sector portion of said disk with said transducer, converting said read data to digital information, processing said digital information to generate a track centerline offset correction number, converting said number to analog and applying it, in conjunction with a selected one of said polyphase signals, to said actuator to move said transducer into alignment with centerline of said track and keep it aligned there while said transducer is located at said track.

# 4,419,702 AUTO-REVERSE DEVICE FOR A TWO-REEL TYPE TAPE RECORDER

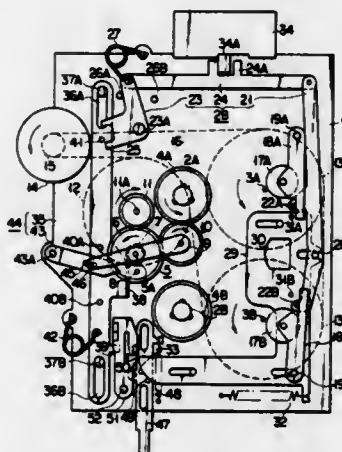
Shinsaku Tanaka, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed May 27, 1981, Ser. No. 268,097

Claims priority, application Japan, Jun. 20, 1980, 55-83703; Oct. 14, 1980, 55-142396; Oct. 14, 1980, 55-142397; Oct. 14, 1980, 55-142398

Int. Cl.<sup>3</sup> G11B 15/06, 15/26  
U.S. Cl. 360—96.4

6 Claims



1. An auto-reverse device for a two-reel type tape recorder comprising:

- a pair of reel shafts each provided with a working rotator to respectively rotate together therewith;
- a magnetic head;
- a pair of capstans disposed on both sides of said magnetic head respectively;
- a pair of pinch rollers disposed correspondingly to said capstans and being arranged to be alternately pressed against their corresponding capstans;
- a reversible motor for driving said capstans to rotate;
- a pinch roller shift mechanism coupled to said pinch rollers for shifting the positions of said pinch rollers relative to said capstans in synchronism with a change of the rotating direction of said motor;
- a driving rotator driven by said motor;
- an intermediate rotator engaging said driving rotator and selectively engaging one of said working rotators in an alternative way to transmit the turning force of said driving rotator to the engaged one of said working rotators;
- a rocking member mounted coaxially with said driving rotator, urged in the same direction as the rotating direc-

tion of said driving rotator by the turning force of said driving rotator, and being rockable in synchronism with a change of the rotating direction of said motor, thereby separating said intermediate rotator from one of said working rotators and causing said intermediate rotator to engage the other of said working rotators; and a transmission mechanism coupled to said pinch roller shift mechanism receiving the turning force of said motor in response to the rocking action of said rocking member, for thereby actuating said pinch roller shift mechanism to shift the position of said pinch rollers.

# 4,419,703 DISC CARTRIDGE LOADING MECHANISM

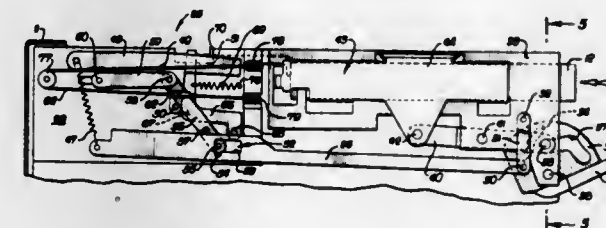
Norman P. Gruczelak, Thousand Oaks, and Phillip S. Bryer, Woodland Hills, both of Calif., assignors to DMA Systems Corporation, Goleta, Calif.

Filed Nov. 16, 1981, Ser. No. 321,410

Int. Cl.<sup>3</sup> G11B 5/012

U.S. Cl. 360—97

12 Claims



1. In a magnetic disc storage system of the type including a housing having an open-ended compartment adapted for receipt of a disc cartridge, the cartridge including a housing having a wall having first and second openings therein, the first opening having a movable door extending thereacross, the second opening being adapted for receipt of an opener rod for opening and closing said door, a wall at the closed end of said compartment having an opening therein positioned to be aligned with said first opening in said cartridge housing wall, and a head carriage movable through said opening in said compartment wall and said first opening in said cartridge housing wall for engaging the disc in said cartridge, a door activation mechanism comprising:

- a movable shutter in said system housing adapted for movement between a first position sealing said opening in said compartment wall and a second position clear of said opening;
- means for moving said shutter;
- an opener rod mounted for linear movement in said system housing;
- means for moving said opener rod into said second opening in said cartridge housing wall for opening and closing said cartridge door; and
- means responsive to a cartridge being inserted into said compartment for inhibiting operation of said shutter moving means until said cartridge is fully inserted into said compartment.

# 4,419,704 BERNOULLI PLATE FOR STABILIZATION OF FLEXIBLE MAGNETIC DISK

Anton J. Radman, Ogden; Randall C. Bauck, East Layton, and Peter S. Kleczkowski, Ogden, all of Utah, assignors to Iomega Corporation, Ogden, Utah

Filed Apr. 24, 1981, Ser. No. 257,482

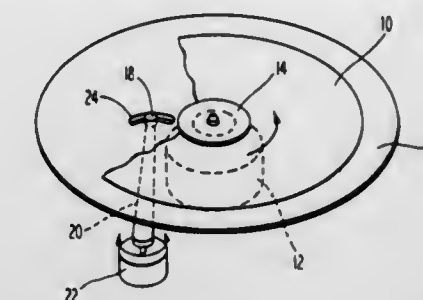
Int. Cl.<sup>3</sup> G11B 3/60, 17/32

U.S. Cl. 360—102

8 Claims

1. Method of manufacturing a Bernoulli plate for juxtaposition to a rotating magnetic disk so that said disk is stabilized, said method comprising the steps of: providing a substantially flat, virgin plate consisting of a first relatively soft metal;

pointed tool to form annular uplifted portions surrounding pits in said surface in a coining operation; and



coating said coined plate with a layer of a second, relatively harder metal, whereby sharp edges, burrs and the like in said plate formed in said coining operation are smoothed.

# 4,419,705 FERRITE BEVELED CORE FOR MAGNETIC HEAD

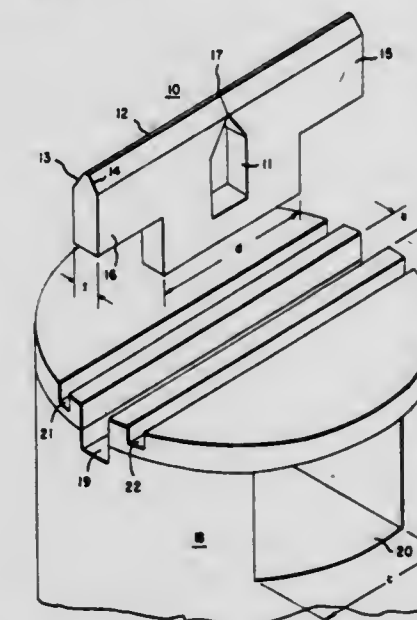
Ralph D. Brower, and Paul D. Losee, both of Layton, Utah, assignors to Iomega Corporation, Ogden, Utah

Filed May 1, 1981, Ser. No. 259,706

Int. Cl.<sup>3</sup> G11B 5/60

U.S. Cl. 360—103

9 Claims



1. A core for a magnetic head assembly comprising: a T-shaped ferrite member having an aperture for receiving a transducing coil and a beveled edge along the top of the T for disposition adjacent to a magnetic recording medium.

# 4,419,706 MODE SWITCHING MECHANISM FOR A CASSETTE TAPE RECORDER

Sylvan Cole, 8376 Westlawn Ave., Los Angeles, Calif. 90045

Filed Apr. 27, 1982, Ser. No. 372,440

Int. Cl.<sup>3</sup> G11B 5/54

U.S. Cl. 360—105

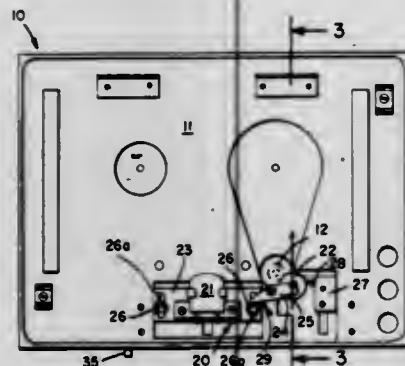
2 Claims

1. A retracting mechanism for disengaging a magnetic head and a pinch roller from a magnetic tape for use in combination with a tape recorder which includes a base plate, a capstan drive for driving the magnetic tape in a tape cassette and an electronic circuit, said retracting mechanism comprising:

- a magnetic head disposed adjacent to the magnetic tape and electrically coupled to the electronic circuit;
- slidable mounting means for mounting said magnetic head slidably coupled to the base plate so that said magnetic head may move bidirectionally in a direction orthogonal to the direction which the magnetic tape travels across the



- face of said magnetic head in order to engage the magnetic tape;
- c. a lever arm which is pivotally coupled to the base plate and disposed adjacent, but not contiguous to, said capstan drive;
  - d. a pinch roller the axis of which is rotatably coupled to said lever arm;
  - e. first resiliently biasing means for resiliently biasing said lever arm so that said pinch roller pinches the magnetic tape against the capstan drive;



- f. second resiliently biasing means for resiliently biasing said slidable mounting means so that said magnetic head engages the magnetic tape; and
- g. coupling means for coupling said lever arm and said slidable mounting means so that when said slidable mounting means moves said magnetic head away from the magnetic tape said coupling means pivotally moves said lever arm so that said pinch roller disengages said magnetic tape whereby said pinch roller is mechanically independent of said magnetic head when said magnetic head and said pinch roller engage the magnetic tape.

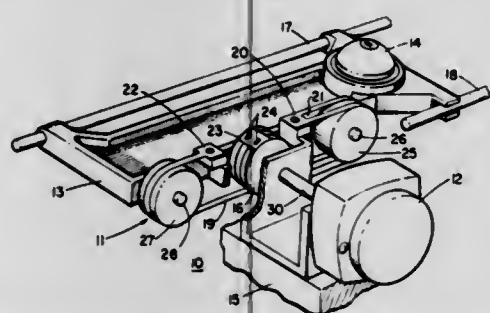
**4,419,707**  
**FLEXIBLE BAND POSITIONING DEVICE FOR A READ/WRITE HEAD**

James G. Woodier, Morton Grove, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 12, 1981, Ser. No. 243,167  
Int. Cl.<sup>3</sup> G11B 5/55

U.S. Cl. 360—106

5 Claims



1. Apparatus for positioning a read/write head over a record means, said apparatus comprising:
- a stepper motor mounted on a support frame, said motor having an output shaft;
  - a drum mounted on said output shaft;
  - a carriage for supporting said read/write head, said carriage mounted on, at least one guide surface located on said support frame;
  - a pair of spaced apart idler rollers rotatably mounted on said carriage;
  - a flexible band wrapped at least partially around said drum, said band having two ends coming off said drum, each end passing around a different idler roller before being secured to said frame, wherein each idler roller is positioned so that portions of said band coming off said drum lie in a plane substantially parallel to the path of travel of said carriage, and portions of the band coming off each roller

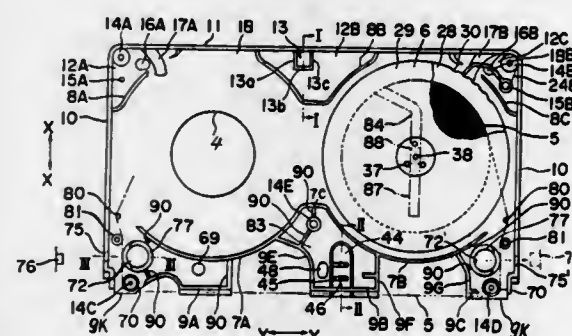
are secured to the frame so that each is parallel to said plane, whereby angular displacement of said drum through a specific angle results in a corresponding linear displacement of said carriage, said linear displacement being of the same magnitude along the entire path of travel of said carriage.

**4,419,708**  
**MAGNETIC RECORDING TAPE CARTRIDGE**  
Kenji Ogiro; Masayuki Fujisaki, both of Yokohama, and Shini-chi Gotoh, Kyoto, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 28, 1981, Ser. No. 287,555  
Claims priority, application Japan, Jul. 28, 1980, 55-105602  
Int. Cl.<sup>3</sup> G11B 23/04

U.S. Cl. 360—132

4 Claims



1. A magnetic recording tape cartridge comprising:
- (a) a bottom section and a top section assembled together by a fastening means so as to provide a cartridge case having a front wall, a bottom wall and a tape chamber with a plurality of openings formed in said front wall,
  - (b) at least one tape reel accommodated in said tape chamber, rotatably mounted relative to a drive shaft insertion hole defined in the bottom wall of said bottom section of the cartridge case,
  - (c) a magnetic recording tape wound around said reel, the intermediate portion of said recording tape being stretched running along a predetermined path defined by said front wall,
  - (d) a lid member hingedly mounted on the cartridge case and having a generally straight lid plate disposed generally parallel with the front wall to close said openings of the front wall to protect the magnetic recording tape situated along the front wall, said lid member being rotated in a direction away from said front wall when used, said lid plate being provided with a pair of openings at the lower end portion in the both lateral end portions of the cartridge case so as to expose the corresponding portions of the front wall of the cartridge case for abutting onto a pair of positioning members provided in a cartridge mounting holder of a tape player,
  - (e) a pair of through-hole defined in the bottom wall of the tape player for receiving at least one standard pin of the tape player with the diameter of the hole being larger than the diameter of the standard pin to loosely receive the standard pin in the hole, and
  - (f) means for positioning the cartridge case on a predetermined position of the tape player, having a movable member resiliently biased by means of a resilient member to oppose the hole so as to resiliently engage with the standard pin inserted inside the cartridge case through the hole when the cartridge case is mounted on the tape player thereby clamping the standard pin between the movable member and a portion of the wall of the hole to cause the cartridge case to be detouchably secured in position.

**4,419,709**  
**CASE FOR A DISC-SHAPED RECORDING MEDIUM**  
Takashi Saito; Osamu Tajima, and Masafumi Mochizuki, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

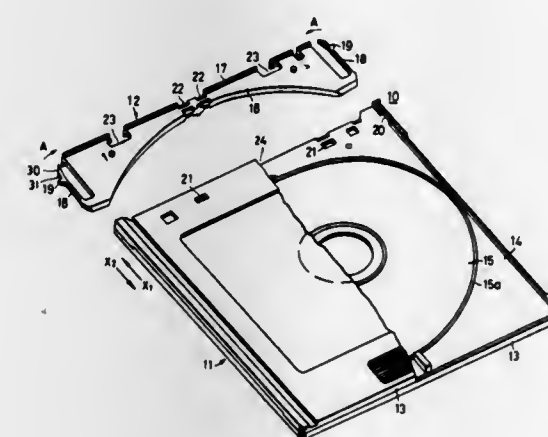
Filed May 14, 1981, Ser. No. 263,851

Claims priority, application Japan, May 15, 1980, 55-66678[U]

Int. Cl.<sup>3</sup> G11B 5/82, 25/04

U.S. Cl. 360—133

5 Claims



1. A case for a disc-shaped recording medium used in a reproducing apparatus, said reproducing apparatus having an inserting opening through which said case is inserted, a turntable for rotating said disc-shaped recording medium, and locking means and engagement releasing means at the innermost part of said reproducing apparatus and opposite to said inserting opening, with said turntable positioned between said innermost part and said opening, said case comprising:

- a jacket having a space for accommodating said disc-shaped recording medium and an opening for enabling said disc-shaped recording medium to go in and out of said jacket; and
  - a closing member inserted through said opening of said jacket for closing said opening of said jacket, said closing member unitarily having a pair of bendable elastic engaging arms on both sides thereof,
- said closing member being locked by said locking means upon insertion into said innermost part of said reproducing apparatus together with said jacket,
- said engaging arms and said jacket having means for preventing said closing member from slipping out of said jacket when said closing member is inserted into a predetermined position within said jacket,
- said engagement releasing means having engagement releasing members which make contact with and push against sloping surfaces of said engaging arms for bending said engaging arms inwardly, upon an insertion of said closing member into the innermost part of said reproducing apparatus, together with said jacket;
- said engaging arms and said engagement releasing members having a deviation preventing engaging part at least at a part where said engaging arms and said engagement releasing members respectively make contact, for preventing a deviation so that said engaging arms and said engagement releasing members do not miss each other within a plane which is perpendicular to a plane in which said closing member extends.

**4,419,710**  
**CASE FOR A DISC-SHAPED RECORDING MEDIUM**  
Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryuzo Abe, both of Yokohama; Yasuhiro Yusa, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

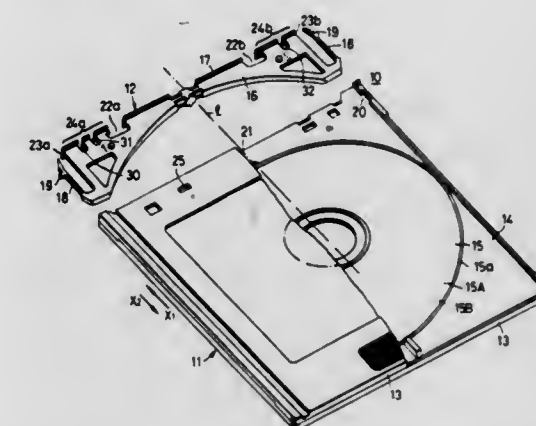
Filed Jul. 30, 1981, Ser. No. 288,291

Claims priority, application Japan, Jul. 31, 1980, 55-108490[U]

Int. Cl.<sup>3</sup> G11B 25/04, 5/82; B65D 85/30

U.S. Cl. 360—133

5 Claims



1. A case for a disc-shaped recording medium used in a reproducing apparatus, said reproducing apparatus having a turntable for rotating said disc-shaped recording medium, closing member locking means at the innermost part of said disc shaped recording medium reproducing apparatus, and N detection switches located at the innermost part of said reproducing apparatus and disposed asymmetrically on the left and right sides with respect to a line which passes through the center of said turntable in the disc insertion direction, said case comprising:

- a jacket for accommodating said disc-shaped recording medium; and
- a closing member for closing an opening of said jacket and being locked by said locking means and confront said detection switches when said disc-shaped recording medium is loaded into said reproducing apparatus, said closing member having cutout desired areas which are symmetrical on the left and right sides, each of said sides having N desired sections where cutouts are selectively formed for discrimination between types of said recording medium, said cutout desired sections being positioned for discrimination at symmetrical locations on the left and right side and being brought to confront the same detection switch out of said N detection switches when said closing member is reversed with respect to up and down together with said jacket and said disc-shaped recording medium, one cutout desired section of said pair of cutout desired sections which are symmetrical on the left and right sides being selectively cutout or non-cutout for discriminating a first side of said disc-shaped recording medium, and the other cutout desired section being selectively cutout or non-cutout for discriminating a second side of said disc-shaped recording medium.

**4,419,711**  
**METHOD AND APPARATUS FOR THE PROTECTION OF ELECTRICAL EQUIPMENT FROM HIGH VOLTAGE TRANSIENTS**

Herb J. J. Seguin, 7840-44th Ave., Edmonton, Alberta, Canada P6K 0Z1

Continuation-in-part of Ser. No. 108,215, Dec. 28, 1979, Pat. No. 4,328,523. This application Jul. 6, 1981, Ser. No. 280,366

Int. Cl.<sup>3</sup> H02H 3/20

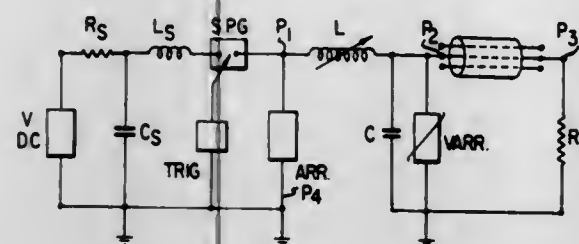
U.S. Cl. 361—111

36 Claims

1. A high voltage transient protection unit for connection between a power source and a load comprising:



a recoverable spark gap electrically connected to the power source;  
 an L-C filter electrically connected to said recoverable spark gap; and  
 a voltage variable resistor electrically connected to said L-C filter and to the load; and



a first means for connecting said recoverable spark gap to a first grounding circuit; and  
 a second means for connecting said filter and said voltage variable resistor to a separate and distinct grounding circuit.

4,419,712

### ELECTRONIC DOOR LOCKING SYSTEM FOR AN AUTOMOTIVE VEHICLE

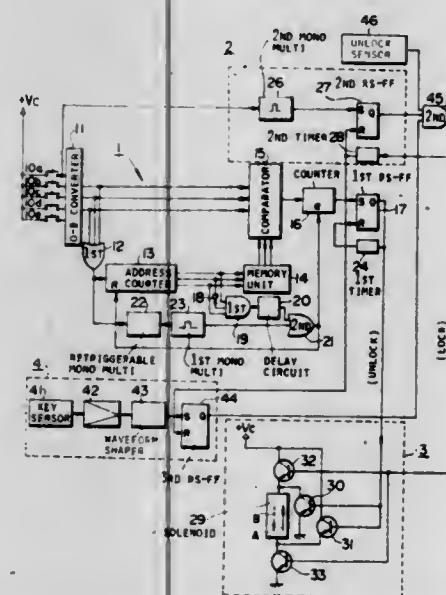
Keiichi Shimizu, Tokyo, and Haruo Mochida, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa and Kokusan Kinzoku Kogyo Co., Ltd., Tokyo, both of Japan

Filed Apr. 29, 1982, Ser. No. 373,286

Claims priority, application Japan, Apr. 30, 1981, 56-66013  
 Int. Cl.<sup>3</sup> E05B 49/00

U.S. Cl. 361-172

7 Claims



2. An electronic door locking system for an automotive vehicle for locking vehicle doors which comprises:

- means for inputting a sequence of unlocking coded numbers and at least one locking coded number and outputting signals corresponding thereto;
- means for generating an unlock command signal in response to a sequence of unlocking coded numbers outputted from said means for inputting coded numbers;
- means for generating a lock command signal in response to at least one locking coded number outputted from said means for inputting coded numbers;
- an AND gate one input terminal of which is connected to said means for generating a lock command signal;
- means for locking/unlocking the vehicle doors connected to said means for generating an unlock command signal for unlocking the vehicle doors in response to the unlock command signal outputted from said means for generating an unlock command signal and connected to

the output terminal of said AND gate for locking the vehicle doors;

(f) means for detecting the presence of the ignition key the output terminal of which is connected to the other input terminal of said AND gate, for outputting a signal to said AND gate to pass the door locking command signal outputted from said means for generating a lock command signal to said means for locking/unlocking the vehicle doors,

whereby the vehicle doors can be locked when at least one predetermined door-locking coded number is inputted to the system and when the ignition key is extracted from the ignition keyhole and brought near the means for detecting the presence of the ignition key.

4,419,713

### MULTIPLE ELECTRODE SERIES CAPACITOR

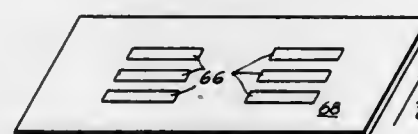
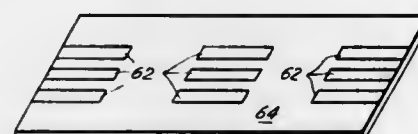
Solomon Levinson, Forest Hills, N.Y., assignor to Centre Engineering, Inc., State College, Pa.

Filed Jul. 6, 1981, Ser. No. 281,010

Int. Cl.<sup>3</sup> H01G 4/42

U.S. Cl. 361-321

10 Claims



1. A high voltage non-discoidal multiple electrode series capacitor comprising a dielectric material and a plurality of first and second planar electrodes embedded therein, said structure of said dielectric material and said first and second electrodes being integral and having a substantially rectangular shape having width, depth and height dimensions, said plurality of first planar electrodes having dimensions in the width and depth directions of said structure being spaced apart and being located in a first row extending across the width of said structure with the outer electrodes of the row of said plurality of first electrodes extending to each side edge of said dielectric material, a first space formed between each pair of adjacent first planar electrodes, each of said first spaces being substantially uniform, said plurality of second planar electrodes having dimensions in the width and depth directions of said structure being spaced apart and being located in a second row extending across the width of the structure with a second space formed between each pair of adjacent second planar electrodes, the number of said plurality of second planar electrodes being one less than the number of said plurality of first planar electrodes, said first and second rows being parallel to and in alignment with each other and spaced apart by a gap from each other with each of said second planar electrodes bridging a respective one of said first spaces between said first electrodes, electrical junction means connected at the side edges of said dielectric to provide an electrical junction at each side edge of said outer electrodes of said first row and for said multiple electrode series capacitor, said multiple electrode series capacitor being formed by a plurality of series capacitor subsections with each subsection being formed by a pair of first electrodes and a bridging second electrode, wherein each of said first planar electrodes is of substantially uniform size and the capacitance value of said capacitor subsections is substantially equal.

4,419,714

### LOW INDUCTANCE CERAMIC CAPACITOR AND METHOD FOR ITS MAKING

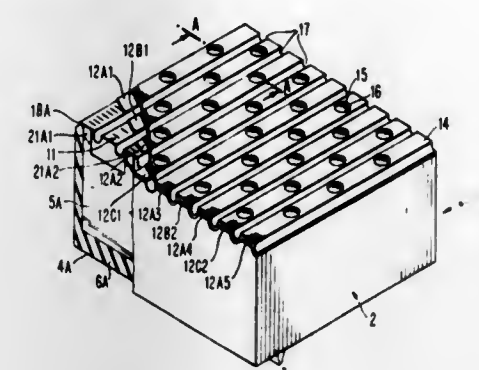
Charles H. Locke, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,819

Int. Cl.<sup>3</sup> H01G 4/34, 13/00; H01L 1/02

U.S. Cl. 361-321

24 Claims



1. In a capacitor structure having a ceramic body of particular length, width, and height the structure including multiple capacitor plates located at intervals displaced in the body in the direction of the body length, each plate having one or more tabs, the tabs being exposed at a common body face, the capacitor additionally having one or more buses for selectively electrically interconnecting the tabs such that the buses may be electrically interconnected to establish one or more capacitors of particular capacitance value and voltage rating, the improvement comprising providing grooves in the capacitor body at the common face to align the tabs in groups and to insure separation of the resulting tab groups.

4,419,715

### BUS BAR ASSEMBLY FOR PANELBOARDS AND SWITCHBOARDS

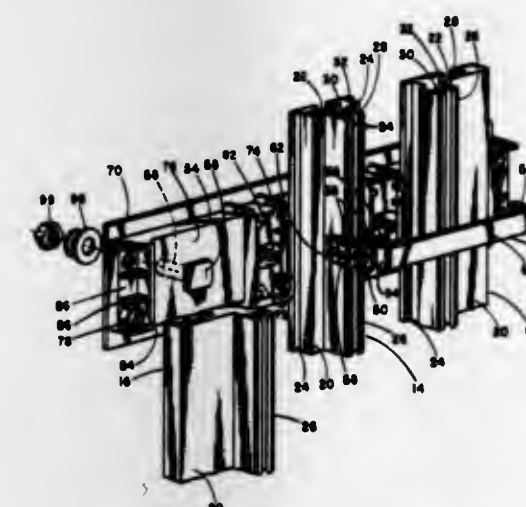
Daniel G. Pear, Peru, Ind., assignor to Square D Company, Palatine, Ill.

Filed Apr. 6, 1981, Ser. No. 251,424

Int. Cl.<sup>3</sup> H02B 1/20

U.S. Cl. 361-335

13 Claims



1. A bus bar assembly comprising:

a plurality of aluminum bus bars having a generally rectangular cross-sectioned base portion and an integrally connected generally U-shaped cross-sectioned plug-on portion projecting upwardly therefrom and extending continuously throughout the length of said bus bar, said base portion having a T-shaped slot extending continuously throughout the length of said bus bar on the side opposite said plug-on portion; said plug-on portion comprising a solid section projecting upwardly from one side of said bus bar, said solid section having a bottom portion inte-

grally connected to said base portion and a top portion spaced from said base portion, and including a pair of spaced apart upwardly projecting legs extending from the top portion of said solid section longitudinally along the length of the bus bar forming a center indentation; said base portion of each said bus bar having a predetermined width, said plug-on portion each having a width substantially less than said predetermined width,

a plug-on extension having opposite spring held jaws in overlapping engagement with the outer edges of said projecting legs of said plug-on portion of each bus bar

a plurality of parallel, spaced apart, generally rectangular insulating bases having a top portion and a bottom portion, said bases supporting said bus bars on said top portion, each insulating base including a pair of ribs intermediate adjacent bus bars and having separate channels engaged with the base of each bus bar, the bottom portion of said insulating bases having a plurality of recesses including a nut receiving recess beneath the center of each channel, said insulating bases having an aperture providing a passage from each said top channel portion to said respective nut receiving recess;

a T-bolt for each channel of each insulating base having a head received in said T-slot of a respective bus bar and a shaft extending through said respective passage; and

a nut wholly contained in each said nut receiving recess threadingly receiving said T-bolt and securing each said bus bar to said respective insulating base.

4,419,716

### VAPOR PROOF HOUSING ASSEMBLY AND SYSTEM

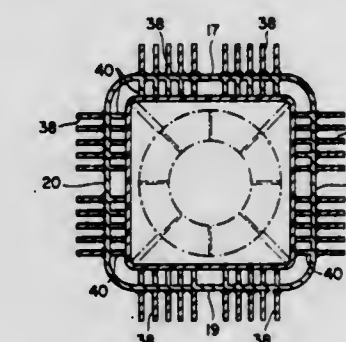
Stephen Koo, 83-59 Charlecoite Ridge, Jamaica, N.Y. 11432

Filed Jan. 3, 1983, Ser. No. 455,421

Int. Cl.<sup>3</sup> F21V 33/00

U.S. Cl. 362-96

11 Claims



1. A sealed vapor proof housing assembly for isolating an electrical device from the ambient atmosphere external of said housing comprising: a hollow casing having a removable door for providing access to the interior of the casing; means for securing said door against said casing to provide a sealed enclosure within the interior thereof; a first multiple number of heat exchange fins projecting from said casing into the ambient atmosphere; a second multiple number of heat exchange fins projecting from said casing within said enclosure; a sleeve liner disposed within said enclosure contiguous to said second multiple number of heat exchange fins for forming a compartment within said enclosure; said sleeve liner having two open ends with each open end being recessed a predetermined distance from said casing to provide a clearance space at each open end between said sleeve liner and said casing, said electrical device being mounted upon said sleeve liner in said compartment and a power driven fan for circulating a cooling fluid in a closed circulating pattern through said compartment and said enclosure in intimate contact with said second multiple number of heat exchange fins.



4,419,717

**CEILING SUPPORTED LIGHTING FIXTURES**

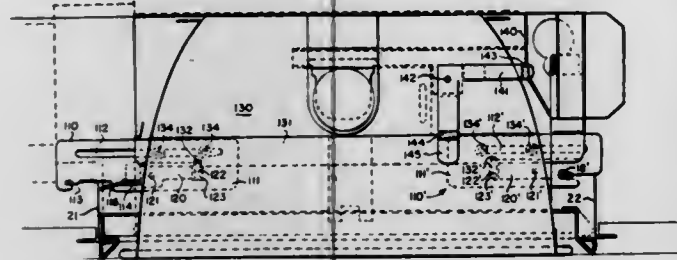
Edison A. Price, New York, and Fulgencio Bengochea, East Meadow, both of N.Y., assignors to Edison Price, Incorporated, New York, N.Y.

Filed Oct. 2, 1981, Ser. No. 307,803

Int. Cl.<sup>3</sup> F21S 1/02

U.S. Cl. 362-148

13 Claims



1. In a ceiling supported lighting fixture having end plates and a device connected to the end plates for clamping the fixtures into a desired position on a ceiling support member, the improvement wherein the clamping device comprises two clamping plates on each end of the fixture, each having a notch therein for receiving a ceiling support member; and means for locking a track in the notches to prevent inadvertent relative movement, the locking means comprising mounting means for mounting the clamping plates to the side plate in parallel with respect thereto to effect alignment of the notch and a track, and a latch member on at least one clamping plate having an end portion disposed perpendicular to the clamping plate and wherein the locking means is movable between an unlocked position wherein the ceiling supports are free to be received in the notches and a locked position wherein the end portion biases the received support members into the notches under tension.

4,419,718

**POCKET FLASHLIGHT**

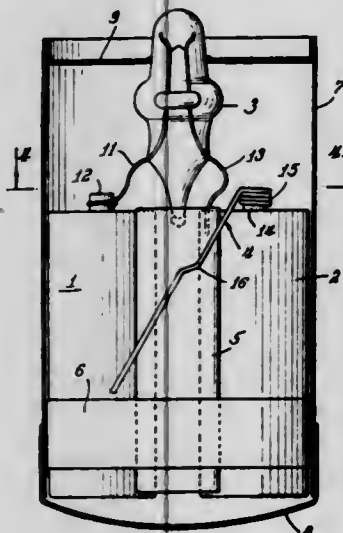
Paul R. Chabria, West Chicago, Ill., assignor to Press-A-Lite Corporation, West Chicago, Ill.

Filed Jun. 12, 1981, Ser. No. 273,229

Int. Cl.<sup>3</sup> F21L 15/00

U.S. Cl. 362-205

1 Claim



1. In a flashlight comprising first and second dry cells spaced apart in upright position and supported by a body of insulating material, each said cell having a center post positive terminal at the top thereof and an exposed metal can negative terminal, a lamp connected in series between said positive terminal of said first cell and said negative terminal of said second cell, switching means comprising a spring wire conductor connected at one terminus thereof to said positive terminal of said second cell and extending diagonally downwardly over said insulating body toward said first cell, the free end of said spring wire conductor being normally spaced from said exposed metal can

negative terminal, and a flexible jacket covering said cells and switching means through which said spring wire conductor may be pressed inwardly to bring said free end of said spring wire conductor into electrical engagement with said exposed metal can negative terminal, the improvement in said switching means comprising a bend in said spring wire conductor forming a fulcrum approximately midway between said terminus and said free end of said spring wire conductor to engage said insulating body and limit the bending of said spring wire conductor essentially to the portion thereof between said fulcrum and said free end thereof when said spring wire conductor is pressed inwardly to engage said negative terminal of said first cell to light said flashlight.

4,419,719

**LUMINAIRE**

Kornelis Boer, and Hugo De Widt, both of Oss, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

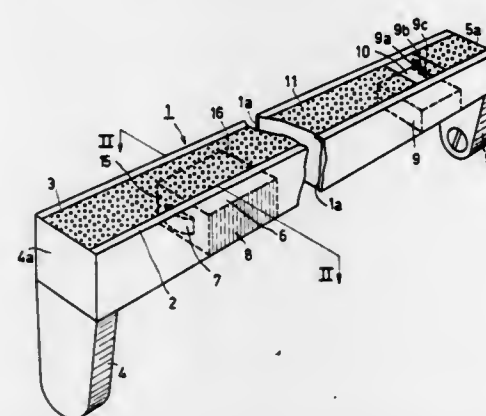
Filed May 18, 1981, Ser. No. 264,264

Claims priority, application Netherlands, Jun. 13, 1980, 8003434

Int. Cl.<sup>3</sup> F21S 2/00

U.S. Cl. 362-218

8 Claims



1. A luminaire for at least one tubular discharge lamp comprising an elongate thin walled housing with lamp accommodating means positioned at the ends of said housing, at least one electric stabilization ballast situated in the housing, the housing being filled with a quantity of cured foamed plastics material, characterized in that said housing is trough-shaped with generally U-shaped cross-section and the cured foamed plastics material extends to the open side of said housing and is cured within said luminaire.

4,419,720

**TROUBLE LAMP**

Theodore W. Kenney, 13239 Lupine, Trona, Calif. 93562

Filed Oct. 6, 1981, Ser. No. 308,982

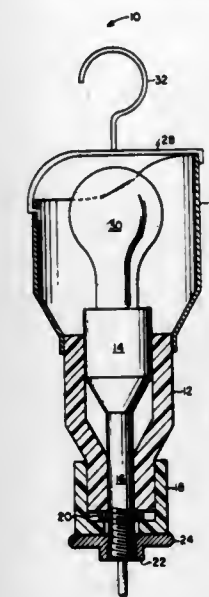
Int. Cl.<sup>3</sup> F21V 7/00

U.S. Cl. 362-285

1 Claim

1. A trouble lamp comprising:  
a hollow body member having opposed open ends;  
a tubular shield mounted on said body member at one end thereof and a cylindrical cup shaped extension member telescopically mounted on the other end;  
a socket for an electrical light bulb slidably mounted within said one end of said body member and having a rigid cylindrical conduit integral therewith and extending through said other end of said body member and said cup shaped extension member;  
said cup shaped extension member having a bottom portion bored to receive said conduit;  
fastening means integrally connecting said conduit to said bottom portion;  
said shield having an inner portion wherein the bulb may be positioned to more or less completely rest beneath the rim of said said shield and a side portion which shields light from one side only; and

said socket and conduit having outer surfaces complementary to inner surfaces of said body member and dimensioned for slip friction fit therebetween and permitting



manipulation of said socket within said one end of said body between a fully extended position, a median side shielding position and a fully retracted position thereof.

4,419,721

**SEARCHLIGHT WITH MODULAR CONTROL MECHANISM**

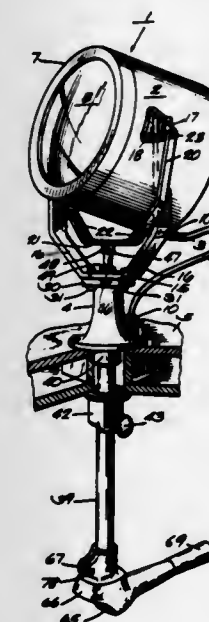
Brian R. Gregoire, Brookfield, and Rupert O. Yantz, West Bend, both of Wis., assignors to Phoenix Products Company, Inc., Milwaukee, Wis.

Filed Dec. 21, 1981, Ser. No. 332,404

Int. Cl.<sup>3</sup> B60Q 1/00

U.S. Cl. 362-368

12 Claims



1. In a searchlight control system of the type including a support base having a pedestal for attachment to a structural element on which a searchlight is to be mounted and a rotatable member supported on the pedestal, an azimuth yoke attached to the rotatable member for rotation therewith, a searchlight pivotally supported in the azimuth yoke, an elevation yoke attached to the searchlight, and a control mechanism operatively associated with the azimuth yoke and the elevation yoke for positioning the searchlight,

the improvement in which the control mechanism comprises:

(1) an upper torque tube journaled within the pedestal and having a first end attached to the rotatable member

of the support base and a second end extending from the pedestal of the support base, the upper torque tube consisting of a hollow tubular shaft;

(2) an upper push rod positioned inside the upper torque tube and having a first end attached to the elevation yoke and a second end extending from the pedestal of the support base;

(3) a lower torque having a first end connected to the upper torque tube and a second control end remote therefrom, the lower torque tube consisting of a hollow tubular shaft;

(4) a push rod coupling having a first end connected to the upper push rod and a second end remote therefrom;

(5) a lower push rod having a first end connected to the second end of the push rod coupling and a second control end remote therefrom; and

(6) control means operatively connected to the control end of the lower torque tube and the control end of the lower push rod to rotate the lower torque tube to position the searchlight in azimuth and to reciprocate the lower push rod to position the searchlight in elevation.

4,419,722

**LIGHT EMITTING DIODE HOLDER**

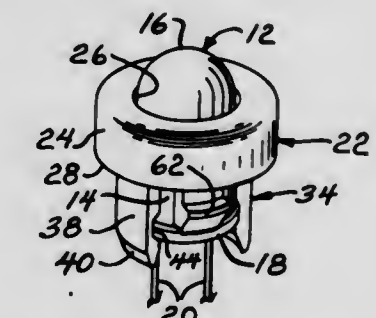
George J. Bury, 25380 Dering La., Lake Villa, Ill. 60046

Filed May 7, 1982, Ser. No. 375,912

Int. Cl.<sup>3</sup> F21V 21/00

U.S. Cl. 362-396

7 Claims



1. A holder of the resilient plastic material for mounting to a light emitting device in an aperture in a panel comprising a body having a central channel for receiving said light emitting device, said body being of larger transverse dimensions than said aperture to lie against said panel, a first pair of relatively short fingers on said body in diametrically opposed relation about said channel to extend through said aperture and having outwardly projecting tapered shoulders to wedgingly engage the opposite side of said panel to retain said holder in said aperture, and a second pair of relatively long fingers on said body in diametrically opposed relation to one another and spaced ninety degrees from each of said first pair of fingers about said channel, and means on said second pair of fingers disposed inwardly thereof to retain a light emitting device therein, where each of said relatively long fingers has an inner margin lying on a cylinder of substantially the same diameter as said channel, and each of said relatively short fingers has an inner margin lying on a cylinder of larger diameter than said aperture and hence spaced from a light emitting device held by said relatively long fingers to permit flexing of said relatively short fingers upon insertion of said holder in said panel aperture.

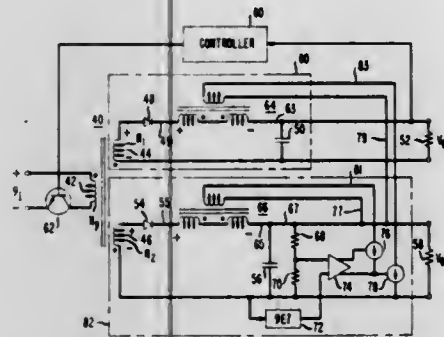


# 4,419,723 REGULATION OF MULTIPLE-OUTPUT DC-DC CONVERTERS

Thomas G. Wilson, Jr., Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Oct. 29, 1981, Ser. No. 316,496  
Int. Cl.<sup>3</sup> H02M 3/335

U.S. Cl. 363—21

8 Claims

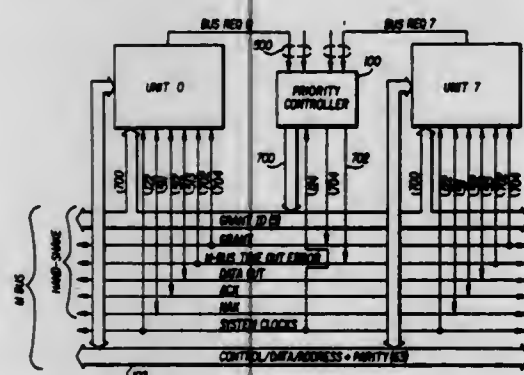


1. A DC-to-DC converter comprising an input circuit for accepting a DC voltage source and including a power switch and a primary winding of a power transformer including at least first and second secondary windings first and second output circuits coupled to the first and second secondary windings and including first and second inductors with adjustable permeance, respectively, means for regulating a voltage output of the first output circuit by controlling an on-off cycle of the power switch, and means response to a voltage output of the second output circuit to generate a bias current operative for adjusting a permeance of at least the second inductor to a value remaining substantially constant during any one on-off cycle of operation of the power switch wherein the second inductor of the second output circuit as so adjusted is operative to counteract a drift in magnitude of an output voltage.

4,419,724  
MAIN BUS INTERFACE PACKAGE  
Michael H. Branigin, Penly; Edward G. Sherbert, Plymouth Meeting, and Joseph F. Krasucki, Jr., Downingtown, all of Pa., assignors to Sperry Corporation, New York, N.Y.  
Filed Apr. 14, 1980, Ser. No. 140,285  
Int. Cl.<sup>3</sup> G06F 3/04

U.S. Cl. 364—200

7 Claims



1. In a bus control system having a plurality of units connected to a common bus, each unit including means for producing a bus request signal and an expected destination code identifying a unit as an expected destination unit when it desires to communicate with another unit connected to said common bus, said system further including a priority controller responsive to bus request signals generated by said units for generating a grant identification for identifying one of said

units as a source unit having access to said common bus, said grant identification being applied to all said units, the improvement comprising:

a lock register in each of said units, each of said lock registers having a plurality of stages, each of the stages corresponding to one of said units;  
means in each of said units for selectively setting corresponding stages in said lock registers when the unit corresponding to said stages is unavailable for communication and selectively resetting corresponding stages in said lock register when the unit corresponding to said stages is available for communication;  
means in each said unit responsive to an expected destination code generated in said unit and to the lock register in said unit for inhibiting the means in said unit for producing a bus request signal;  
whereby a unit does not produce a bus request signal when the expected destination unit with which it desires to communicate is unavailable for communication with it, said means for selectively setting and resetting the stages of said lock registers comprising:  
first means in each said unit for generating a code representing the identity of said unit;  
second means in each said unit for comparing the generated code for the unit with the grant identification produced by said priority controller and producing an enable data out signal for gating data from the unit to said common bus, the unit in which said enable data out signal is produced being designated a source unit;  
the data produced by said source unit including a lock bit and a destination identification code identifying one of said units as a destination unit, said data being applied over said common bus to all said units connected thereto;  
third means in each of said units for comparing said generated code with said destination identification code and generating an acknowledge signal upon an equal comparison, said acknowledge signal being applied over said bus to all said units; and,  
fourth means in each of said units responsive to said acknowledge signal, said grant identification, said destination identification code and said lock bit for selectively setting and resetting the stages of said lock register corresponding to said source unit and said destination unit.

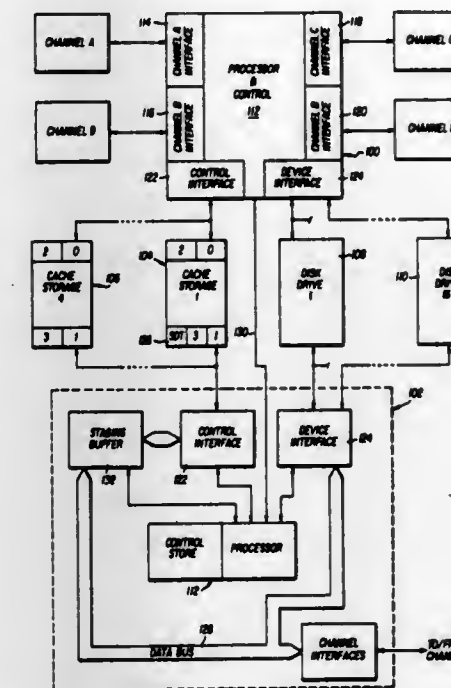
4,419,725  
CACHE/DISK SUBSYSTEM WITH TAGALONG COPY  
Benjamin T. George, Sunnyvale, and Patricia C. Chen, Cupertino, both of Calif., assignors to Sperry Corporation, New York, N.Y.  
Filed Nov. 14, 1980, Ser. No. 207,094  
Int. Cl.<sup>3</sup> G06F 13/00, 11/16

U.S. Cl. 364—200

4 Claims

1. In a cache/disk system having a host processor, a disk drive device for driving a disk, a cache store providing space for storing segments of data, a segment descriptor table store for storing a table of segment descriptor entries, there being an entry in said table corresponding to each segment of data resident in said cache store, and a storage control unit for controlling transfers of data between said host processor, said cache store, and said disk, the improvement comprising:  
means providing additional storage space in said cache store at the end of each data segment storage space;  
first means in said storage control unit for forming a new segment descriptor table entry each time a data segment in said cache store is written to;  
second means responsive to said first means for replacing the segment descriptor table entry corresponding to a written-to data segment with the new segment descriptor table entry for the written-to data segment; and,

third means responsive to said first means for storing a copy of each new segment descriptor table entry in said cache



store in the additional storage space at the end of its corresponding written-to data segment.

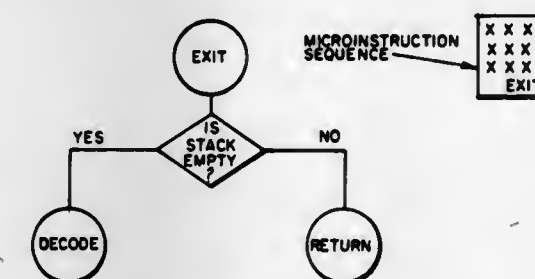
# 4,419,726 INSTRUCTION DECODING IN DATA PROCESSING APPARATUS

Albert J. Weidner, Tempe, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 16, 1981, Ser. No. 225,701  
Int. Cl.<sup>3</sup> G06F 9/36, 9/42

U.S. Cl. 364—200

12 Claims



1. An instruction decoding system for a data processing apparatus in which alternative instruction interpretations are dependent upon the operational state of at least a part of said apparatus comprising:

instruction register means (25, 26) for storing an instruction; subroutine stack means (27, 28) for generating a generic exit signal which can indicate either a return command or a decode command;  
detection means (34) for detecting the status of said stack means and producing a control signal representative of said status;  
instruction decoding means (29, 30, 36, 37, 38) connected to said instruction register means and to said detection means and functioning to produce instruction execution signals based upon the combination of said instruction and said control signal from said detection means in order to determine whether said exit signal is a return command or a decode command in response to said control signal; and an arithmetic or logical function means (39) having an input connected to said instruction decoding means and responsive to said instruction execution signals to perform a predetermined arithmetic or logical operation.

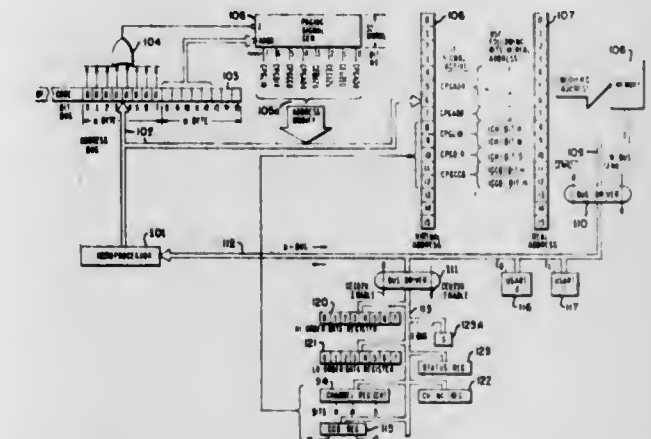
# 4,419,727 HARDWARE FOR EXTENDING MICROPROCESSOR ADDRESSING CAPABILITY

Thomas O. Holtey, Newton, and Robert C. Miller, Braintree, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 304, Jan. 2, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,502  
Int. Cl.<sup>3</sup> G06F 9/36

U.S. Cl. 364—200

13 Claims



1. In a computer system having at least one microprocessor, a plurality of address modification registers, and a memory having memory locations addressed by real addresses, said memory containing instruction words executable by said microprocessor, some of said instruction words being short type instruction words having shorter address fields than others of said instruction words and being capable of addressing a first number of said memory locations which is less than the total number of locations in said memory, an apparatus for extending the addressing capability of said short type instruction words comprising:

(a) means for detecting whether an instruction word currently being executed by said microprocessor is a short type instruction word;  
(b) signal generating means activated by said detecting means and when said detecting means indicates that said instruction word currently being executed is a short type instruction word, said signal generating means generating a predetermined number of control signals; and  
(c) first means coupled to said signal generating means and to said address modification registers, said first means responding to said control signals and to data stored in said address modification registers to convert said address fields of said short type instructions being executed by said microprocessor into real addresses for addressing said memory locations in said memory, the number of real addresses which can be formed by said first means being greater than said first number of memory locations.

# 4,419,728 CHANNEL INTERFACE CIRCUIT PROVIDING VIRTUAL CHANNEL NUMBER TRANSLATION AND DIRECT MEMORY ACCESS

Allen L. Larson, Thornton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 22, 1981, Ser. No. 276,060  
Int. Cl.<sup>3</sup> G06F 3/00

U.S. Cl. 364—200

15 Claims

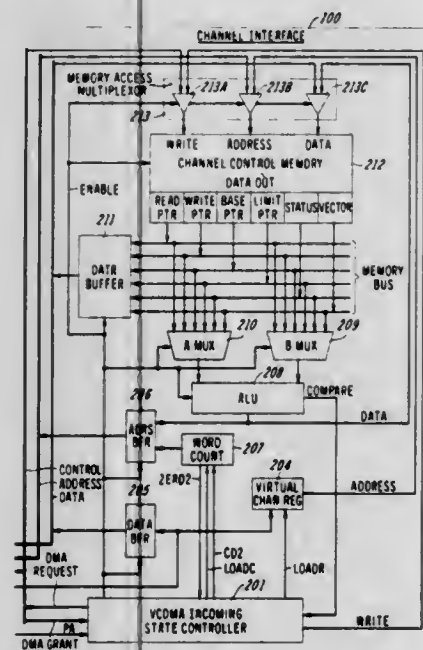
1. In a data communication system wherein a communication channel (120) carries data messages, each of which contains a header field having a destination address and a virtual channel number, a processor (101) having data, address and control buses and an associated memory (102) connected to said data, address and control buses, a channel interface circuit (100) for interconnecting said data, address and control buses with said communication channel (120) comprising: interface means (119, 201, 204, 205) connected to said com-



munication channel (120) and responsive to a data message appearing thereon for receiving said data message when said destination address identifies said processor (101);

wherein said interface means (119, 201, 204, 205) includes incoming state controller means (201) responsive to said received data message for seizing said data, address and control busses;

channel control memory means (212, 213) connected to said interface means (119, 201, 204, 205) and responsive to said received data message for translating said virtual channel number to a hardware address identifying a memory storage location in said processor memory (102);



driver means (206) connected to both said channel control memory means (212, 213) and to said address bus and responsive to said hardware address for placing said hardware address on said address bus to activate said identified memory store location in said processor memory (102); and

wherein said interface means (119, 201, 204, 205) is also connected to said data bus and is responsive to said received data message for directly storing the data portion of said data message as received in said activated memory store location via said data bus.

#### 4,419,729 AUTOMATIC SPEED CONTROL FOR HEAVY VEHICLES

Robert D. Krieder, Sullivan, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 27, 1980, Ser. No. 200,798

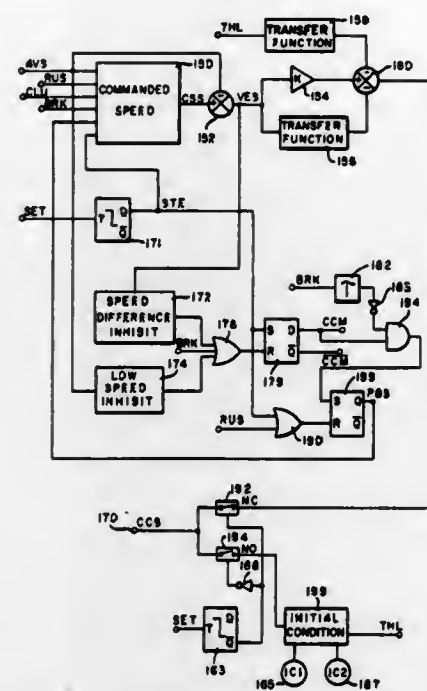
Int. Cl.<sup>3</sup> G06G 7/70; B60K 37/00

U.S. Cl. 364-426

13 Claims

1. An automatic speed control for a vehicle comprising:  
means for generating an actual speed signal proportional to the actual speed of the vehicle;  
means for generating a commanded speed signal proportional to the desired speed of the vehicle;  
means for generating a speed error signal proportional to the difference between said actual and commanded speed signals;  
means for generating a control signal as a function of said speed error signal wherein said control signal regulates said actual vehicle speed to reduce said error signal; and  
means for limiting the commanded speed signal to a set value when it exceeds a predetermined limit, said limiting means including means for comparing said commanded speed signal with said predetermined limit, for transmitting the commanded speed signal unmodified if the command speed signal is less than the limit, and for transmitting said set value as the commanded speed signal if the com-

manded speed signal is in excess or equal to the limit, wherein said comparing means includes a unity gain amplifier having at least one gain resistance which is variable



to change the gain of the amplifier and means for changing the gain of the amplifier when said commanded speed signal is greater than or equal to said predetermined limit.

#### 4,419,730 METHOD AND SYSTEM FOR CONTROLLING THE SETTING TEMPERATURE OF A VEHICLE AIR CONDITIONER

Yoji Ito, Kariya; Yozo Inoue, Chiryu, and Kiyoshi Hara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

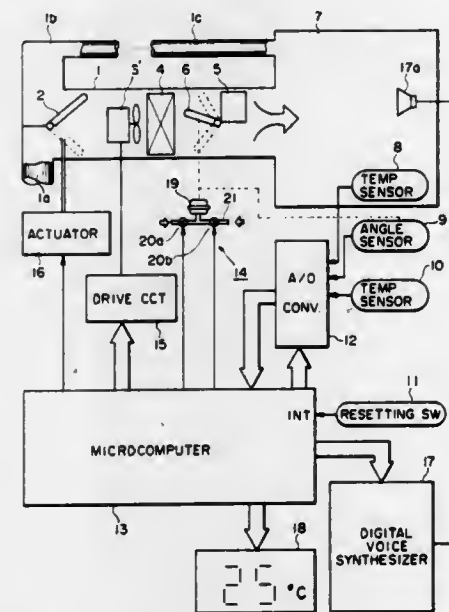
Filed Jan. 9, 1981, Ser. No. 223,744

Claims priority, application Japan, Feb. 18, 1980, 55-19565; Mar. 5, 1980, 55-27825; Jul. 18, 1980, 55-98894

Int. Cl.<sup>3</sup> G05D 23/00; H04M 1/00

U.S. Cl. 364-424

12 Claims



1. An apparatus for controlling an air conditioner mounted on a motor vehicle, said air conditioner being operable at a variable reference temperature setting, comprising:  
means for generating a command signal in response to an instruction given by a vehicle occupant;  
a voice synthesizer; and  
data processing means for generating a vocal announcement

code indicative of a temperature value in response to a first occurrence of said command signal to cause said voice synthesizer to generate a vocal announcement of said temperature value to allow said vehicle occupant to give a subsequent instruction, and resetting said reference temperature setting to said temperature value in response to a second occurrence of said command signal.

#### 4,419,731 APPARATUS FOR ESTIMATING SLANT VISIBILITY IN FOG

Alan W. Puffett, Bedford, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB80/00046, § 371 Date Nov. 17, 1980, § 102(e) Date Nov. 17, 1980, PCT Pub. No. WO80/02073, PCT Pub. Date Oct. 2, 1980

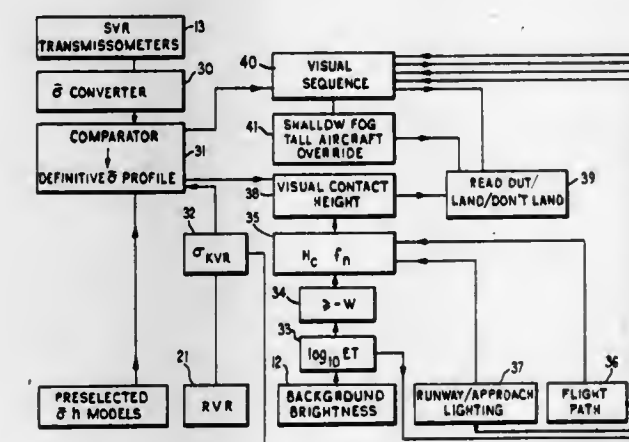
PCT Filed Mar. 18, 1980, Ser. No. 224,563

Claims priority, application United Kingdom, Mar. 19, 1979, 7909508

Int. Cl.<sup>3</sup> G01C 3/08; G06F 15/48

U.S. Cl. 364-428

17 Claims



1. An apparatus for estimating slant visual range in fog comprising:

a transmissometer array, having at least three transmissometer elements at respectively greater differing heights  $h_1$ ,  $h_2$  and  $h_3$  above the ground and disposed for operation between the differing heights and ground level, for generating transmissometer signals indicative of a fog strength; and

a slant visual range (SVR) computer coupled to said transmissometer array so as to receive the transmissometer signals therefrom, said SVR computer having:

means for converting the transmissometer signals into signals  $\sigma_{h1}$ ,  $\sigma_{h2}$ ,  $\sigma_{h3}$  representing the mean integral of extinction coefficient between said respectively greater heights  $h_1$ ,  $h_2$ ,  $h_3$ , above ground and ground level;

means for storing a predetermined set of extinction coefficient  $\sigma_h$  function models, each model characterising a different type of fog pattern, each model having predetermined criteria for its selection and use, and containing at least one empirical constant;

means for selecting one of the models in accordance with values of  $\sigma_{h1}$ ,  $\sigma_{h2}$ ,  $\sigma_{h3}$  determined by said converting means;

means for determining the values of the empirical constant in the selected model thus obtaining a definitive extinction coefficient profile,

means for storing values representing airfield lighting and accepting values representing flight path and background brightness, and

means for estimating slant visual range from the definitive profile and the airfield lighting, background brightness and flight path values.

#### 4,419,732 METHOD AND APPARATUS FOR AN AIRCRAFT INNER LOOP ELEVATOR CONTROL SYSTEM

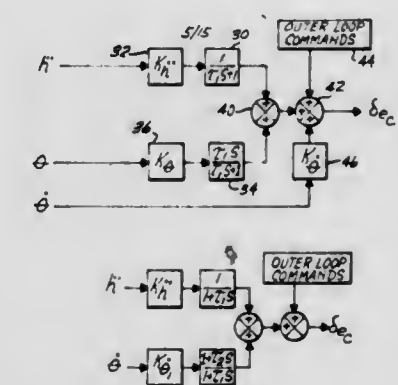
Antonius A. Lambregts, Issaquah, and Rolf Hansen, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 14, 1981, Ser. No. 301,911

Int. Cl.<sup>3</sup> G06G 7/78; G05D 1/12

U.S. Cl. 364-428

7 Claims



1. In an aircraft flight control system wherein inner loop damping signals are combined with outer loop command signals to produce an elevator control signal, improved inner loop damping signal apparatus comprising:

means for providing a signal  $h$  representative of aircraft vertical acceleration;

means for amplifying said  $h$  signal by a predetermined gain factor  $K_h$ ;

means for providing a signal  $\theta$  representative of aircraft pitch;

means for amplifying said  $\theta$  signal by a predetermined gain factor  $K_\theta$ ;

low pass filter means for attenuating said  $h$  signal above a predetermined frequency  $\omega$ ;

high pass filter means for attenuating said  $\theta$  signal below said frequency  $\omega$ ;

means for providing a signal  $\theta$  representative of aircraft pitch rate;

means for amplifying said  $\theta$  signal by a predetermined gain factor  $K_\theta$ ; and

summer means for summing said low pass filtered  $h$  signal, said high pass filtered  $\theta$  signal, said amplified  $\theta$  signals and the outer loop command signal to thereby produce the control signal.

#### 4,419,733 TIME DEVIATION AND INADVERTENT INTERCHANGE CORRECTION FOR AUTOMATIC GENERATION CONTROL

Charles W. Ross, Lansdale, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Apr. 20, 1981, Ser. No. 255,610

Int. Cl.<sup>3</sup> G06G 7/635

U.S. Cl. 364-493

4 Claims

3. Apparatus for controlling each area of a multiple-area interconnected electric power system for providing net-interchange tie-line bias control from an improved area control error signal provided so that said error signal is indicative of the sum of the load change in the area and the unscheduled energy transfer with the system as determined from signals available for each area representing the following measurements and settings: net interchange schedule setting, net interchange measurements, scheduled system frequency setting, system frequency measurement, an area frequency bias, and a control weighting factor, comprising:

means for producing a first different signal by comparing the net interchange measurement and setting;

means for integrating said first difference signal to produce a



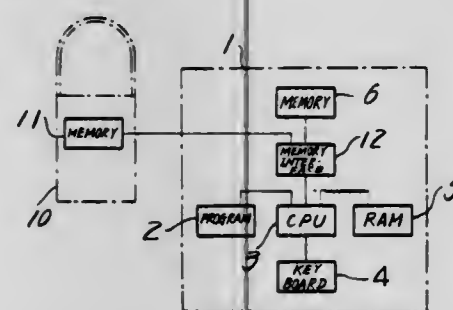




supplying to a transfer control means a transfer signal in response to an operation of an operator after a set operation of an element requiring a setting value being set; said transfer control means including; an oscillator means for generating clock signals; and a counter means supplied with said clock signals and said transfer signal for supplying to said first and second selector circuits, when said transfer signal is supplied thereto, a counter output having a value successively varying upon counting said clock signals and for delivering a first read signal and a second write signal, said first read signal being for reading said setting value of said first non-volatile memory for each value of said counter output and said second write signal being for writing said setting value of said first non-volatile memory read out by said first read signal into said second non-volatile memory; said first selector circuit being adapted to receive said address output, counter output and transfer signal for delivering to said first non-volatile memory said counter output as a first address signal upon the receipt of said transfer signal and for delivering to said first non-volatile memory said address signal as said first address signal when no transfer signal is supplied to said first selector circuit; said second selector circuit being adapted to receive said counter output, a third address signal delivered from said processing section and a second read signal for outputting to said second non-volatile memory said third address signal as a second address signal upon the receipt of said second read signal and for outputting to said second non-volatile memory said counter output as the second address signal when no second read signal is supplied to said second selector circuit; said setting device further comprising a control means for monitoring the output of a power supply to deliver a non-volatile memory control signal to said first and second non-volatile memories; said processing section comprising a programmed means for outputting said second read signal and said third address signal to receive from said data bus a plurality of said setting values stored in said second non-volatile memory, and for carrying out a predetermined protective control operation with respect to an operating element corresponding to said setting value by using said received setting values.

**4,419,738**  
**UNIT-PRICE PRESETTING METHOD FOR ELECTRONIC CASH REGISTERS**  
Yasuyoshi Takahashi; Shigeo Sakiguchi, and Teruyoshi Sato, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 96,197, Nov. 20, 1979, abandoned, which is a continuation of Ser. No. 807,304, Jun. 16, 1977, abandoned. This application Nov. 6, 1981, Ser. No. 318,815  
Claims priority, application Japan, Jun. 16, 1976, 51-70788; Jun. 16, 1976, 51-70789

Int. Cl.<sup>3</sup> G06F 15/20  
U.S. Cl. 364—900 2 Claims



1. A method for presetting unit-price data corresponding to a plurality of commodity codes into a plurality of electronic cash registers, each register provided with a built-in memory

for storing said unit-price data and keyboard means for presetting unit-price data into said built-in memory, said keyboard means including commodity keys and numeral keys, comprising:

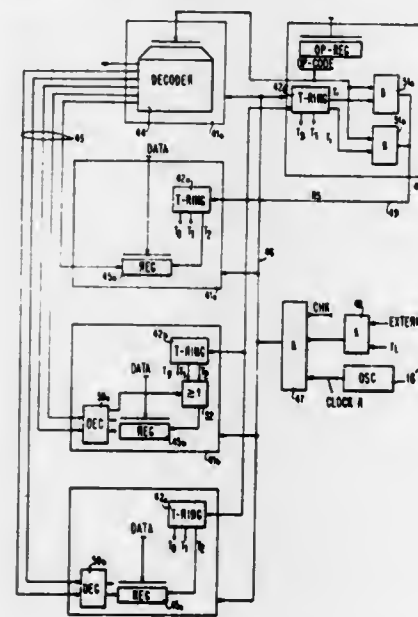
providing each of said electronic cash registers with a portable memory input/output (I/O) connection and interface means for coupling unit-price data from said keyboard means to said I/O connection and from said I/O connection to said built-in memory; connecting a portable memory unit to said portable memory I/O connection of at least one cash register; setting unit-price data into the built-in memory of said at least one cash register and simultaneously in the portable memory unit connected thereto by means of an operation of said keyboard means; sequentially transferring said portable memory unit from said at least one cash register to the I/O connection of others of said cash registers; transferring unit-price data from said portable memory for storage in the built-in memory of each of said others of said cash registers when said portable memory is connected to the I/O connection of each of the others of said cash registers; wherein said others of electronic cash registers to which are connected the electronic cash register portable memory unit for storing the unit-price data for each commodity code are provided with a transfer key such that upon operation of said transfer key the unit-price data in said portable memory unit is transferred therefrom to be stored in the memory of said others of said electronic cash registers.

**4,419,739**  
**DECENTRALIZED GENERATION OF SYNCHRONIZED CLOCK CONTROL SIGNALS HAVING DYNAMICALLY SELECTABLE PERIODS**

Arnold Blum, Gechingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 98,573, Nov. 29, 1979, abandoned. This application Jan. 25, 1982, Ser. No. 342,541

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853523

Int. Cl.<sup>3</sup> G06F 9/00  
U.S. Cl. 364—900 6 Claims



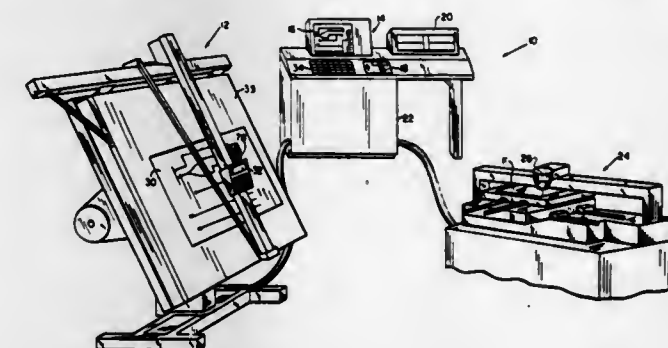
1. Apparatus for generating clock control signals in a micro-programmed digital processing system having a plurality of circuitized chips, each of the chips having local switching points therein, said apparatus comprising:

(a) first circuit means, located on each chip requiring same,

for generating, when started, a fixed number of clock timing signals;  
(b) master clock circuit means, operatively coupled to each of said first circuit means, for generating clock signals and for synchronously driving said first circuit means with respect to each other;  
(c) second circuit means, operatively coupled to said first circuit means, for receiving and decoding operation codes of the micro instructions and for deriving OP-CODE control signals therefrom for use, in conjunction with said clock signals, in developing clock control signals for application to the switching points of each of the individual chips; and  
(d) third circuit means responsive to said OP-CODES and operatively coupled to each of said first circuit means for generating a reset signal therefor to reset each of said first circuit means to their initial timing interval whenever the need arises at any point within a timing cycle to reduce the maximum number of clock timing signals provided per cycle by said first circuit means.

**4,419,740**  
**METHOD FOR STORING AND RETRIEVING DATA**  
Charles M. Hevenor, Jr., Bolton, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.  
Division of Ser. No. 104,196, Dec. 17, 1978, Pat. No. 4,352,165.  
This application Apr. 19, 1982, Ser. No. 369,461  
Int. Cl.<sup>3</sup> G06F 3/13, 3/06, 13/06

U.S. Cl. 364—900 9 Claims



1. In a data processing system, a method of recording data defining a graphic workpiece comprising:  
dividing the graphic workpiece into a plurality of contiguous zones containing data to be entered into a memory, and associating each data entry with a respective single zone;  
providing a data storage memory having a plurality of memory locations for receiving and storing said zoned data resulting from the division of the graphic workpiece;  
dividing the plurality of said memory locations in the storage memory into groups of locations, and assigning a memory address to each group for identification; and  
storing said data associated with any one zone of the graphic workpiece into a respective group of memory locations having a said assigned address for subsequent retrieval.

**4,419,741**  
**READ ONLY MEMORY (ROM) HAVING HIGH DENSITY MEMORY ARRAY WITH ON PITCH DECODER CIRCUITRY**

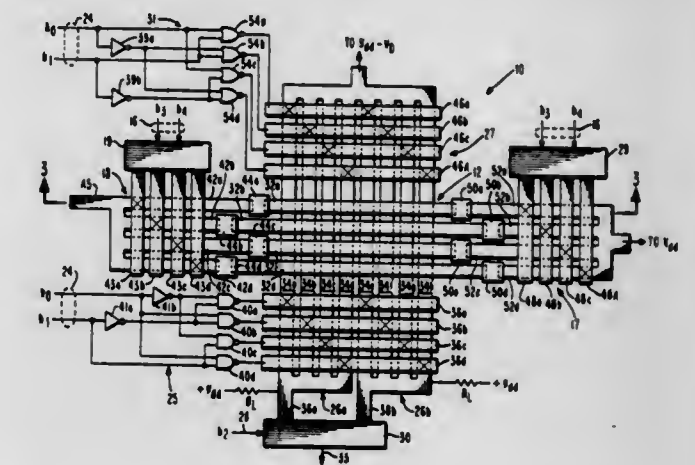
Roger G. Stewart, Neshaic Station, N.J., and Moshe Mazin, Scotia, N.Y., assignors to RCA Corporation, New York, N.Y.  
Continuation-in-part of Ser. No. 116,313, Jan. 28, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,343

Int. Cl.<sup>3</sup> G11C 5/06, 17/06  
U.S. Cl. 365—72 8 Claims

1. A Read Only Memory (ROM) comprising a substrate  
(A) a high density memory array including:  
(1) a first plurality of substantially parallel lines of a semi-

conductor material of one conductivity type on said substrate,

(2) a second plurality of substantially parallel lines of a material different from the semiconductor material of the first lines and said second lines crossing said first lines,  
(3) insulating means between said first and second lines and having openings therethrough at some of the intersections of the first and second lines so that at said intersections the second line contacts the first line to form a diode;  
(B) a line selector including:  
(1) a first plurality of substantially parallel lines of the same semiconductor material as the first lines of the memory array and of a given conductivity type, said first lines being of a number equal to the number of the second lines of the memory array;  
(2) a second plurality of substantially parallel conductive lines which are substantially perpendicular to and cross over the first lines of the selector, insulation between



said first and second selector lines at each of their intersections, and the portion of each of the first selector lines at each of said intersections being of a conductivity type opposite to that of said given conductivity type to form a MOS transistor with the second line at each of said intersections; and  
(3) an output line connected to at least two of said first selector lines; and

(C) means electrically connecting each of the first selector lines to a separate one of the second memory array lines and along one side of the memory array, said connecting means being separate metal contacts each extending between and overlapping an end of a first selector line and an end of a second line of the memory array with said metal contacts being staggered in the direction in which the parallel lines extend in order to enable said metal contacts to overlap the ends of said lines while occupying the minimum space necessary in a direction substantially perpendicular to the direction in which said substantially parallel semiconductor lines extend.

**4,419,742**  
**SHIFT REGISTER FOR MAGNETIC DOMAIN PROPAGATION MEMORY**  
Claude Battarel, Magagnosc, France, assignor to Crouzet, Paris, France

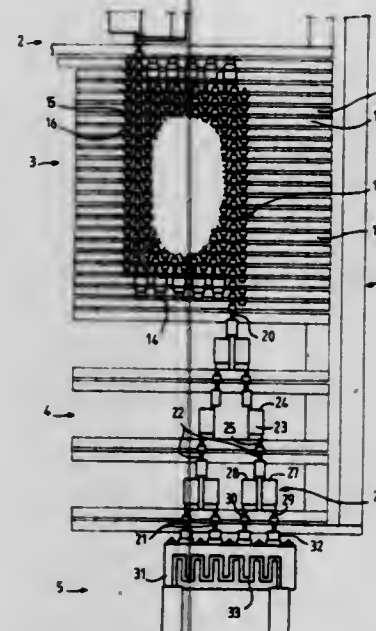
Filed Oct. 29, 1980, Ser. No. 201,738  
Claims priority, application France, Nov. 7, 1979, 79 27447  
Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365—87 15 Claims

1. A storage register for propagating magnetic domains in a propagation channel comprising an insulating substrate, a soft magnetic layer overlying the insulating substrate, in which is formed the propagation channel, a hard magnetic layer overlying the soft magnetic layer, except in the areas defining the

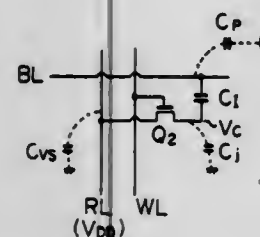


propagation channel, an insulating layer overlying the soft and hard magnetic layers, a shift conduction layer in a Greek border pattern overlying the insulating layer, constituted by parallel segments perpendicular to the propagation channel, the propagation channel, comprising a writing box, upstream the propagation channel, a reading box, downstream the propagation channel, narrow zones for the storage of the domains, widened boxes for the growth of the domains, and a zone, upstream and adjacent the reading box, for the growth of the



domains including intermediate boxes for increasing of the domains and, there between, zones for storing the domains, characterized in that the intermediate increasing boxes of the zone adjacent the reading box have a large surface compared to that of said widened boxes and comprise at least one lateral shoulder, said intermediate increasing boxes being not covered by the shift conduction layer, and means being provided for creating, at least at the level of said reading box and said zone adjacent the reading box, a pulsating external magnetic field.

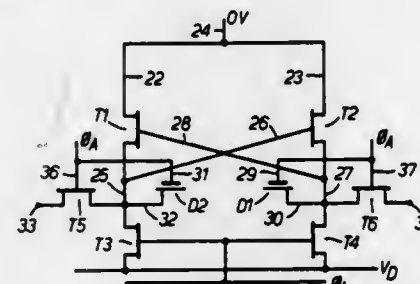
**4,419,743**  
**SEMICONDUCTOR MEMORY DEVICE**  
Masao Taguchi, Sagami, and Takashi Ito, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Filed Jul. 10, 1981, Ser. No. 282,266  
Claims priority, application Japan, Jul. 18, 1980, 55-98426  
Int. Cl.<sup>3</sup> G11C 11/24  
U.S. Cl. 365-149 21 Claims



1. A semiconductor memory device comprising:  
a reference potential line;  
a plurality of bit lines;  
a plurality of word lines;  
dynamic cells, each of said dynamic cells comprising a capacitor having first and second electrodes, and a field effect type switching transistor, said dynamic cells arrayed at intersecting points of said plurality of bit lines and said plurality of word lines, one of the source electrode and the drain electrode of said field effect type switching transistor being connected to said reference potential line, the other of the source electrode and the drain electrode being connected to said first electrode of said capacitor,

each of said plurality of bit lines being commonly connected to said second electrodes of said capacitors of said dynamic cells arrayed along each of said plurality of bit lines, each of said plurality of word lines being commonly connected to the gate electrodes of said field effect type switching transistors of said dynamic cells arrayed along each of said plurality of word lines, the first electrode of said capacitor extending from said other of the source electrode and the drain electrode of said field effect type switching transistor, over the gate electrode, to said one of the source electrode and the drain electrode of said field effect type switching transistor.

**4,419,744**  
**NON-VOLATILE STATIC RAM ELEMENT**  
Phillip Rutter, Plymstock, England, assignor to Plessey Overseas Limited, Ilford, England  
Filed Aug. 19, 1981, Ser. No. 294,358  
Claims priority, application United Kingdom, Jan. 9, 1981, 8100592  
Int. Cl.<sup>3</sup> G11C 11/40  
U.S. Cl. 365-154 21 Claims

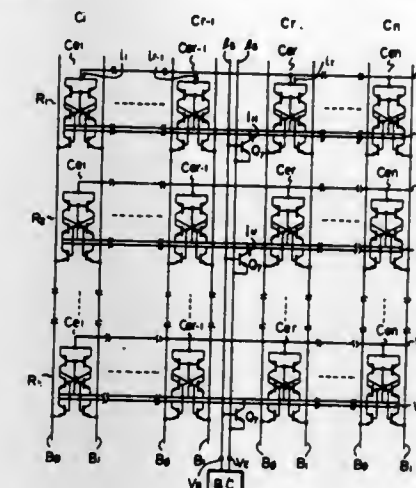


1. A random access memory element comprising a pair of field effect transistors having source electrodes coupled to a reference potential and each having a drain electrode cross coupled to the gate electrode of the other transistor to form a flip-flop circuit; a load coupled to each field effect transistor; a semiconductor memory element coupled between the drain electrode of each transistor and a reference potential and wherein each memory element comprises a semiconductor substrate having a region of a first conductivity type provided with a diffused region of opposite conductivity type; a charge trapping dielectric layer overlying a surface portion of each of the diffused region and the region of first conductivity type; a gate electrode overlying the charge trapping dielectric layer and wherein the diffused region has a surface doping concentration such that the surface portion of the diffused region inverts in conductivity type when a predetermined amount of charge of a suitable polarity is trapped in the charge trapping dielectric layer and the concentration of charge of opposite polarity attracted to the inverted region approaches degeneracy.

**4,419,745**  
**SEMICONDUCTOR MEMORY DEVICE**  
Kazuhiro Toyoda, Yokohama, and Chikai Ono, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Filed Aug. 20, 1980, Ser. No. 179,793  
Claims priority, application Japan, Aug. 30, 1979, 54-110719  
Int. Cl.<sup>3</sup> G11C 11/40  
U.S. Cl. 365-174 7 Claims

5. A semiconductor memory device comprising:  
a semiconductor substrate;  
a plurality of word lines formed on said semiconductor substrate;  
a plurality of injection logic memory cells formed in said semiconductor substrate in a matrix form and commonly connected to each of said plurality of word lines;  
current sources, respectively connected to said plurality of

word lines, only a single one of said current sources operatively connected at approximately the middle of a corresponding one of said plurality of word lines;  
a bias circuit for providing a bias voltage to said current sources; and

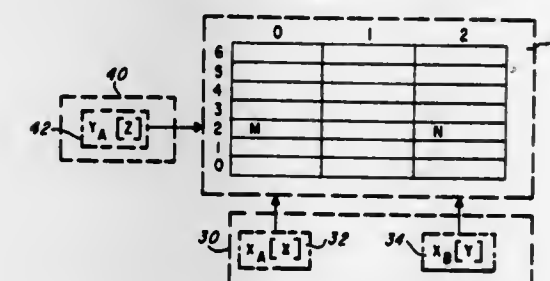


only a single pair of bias lines, operatively connected between said bias circuit and said current sources, extending across the middle of each of said plurality of word lines and orthogonal to each of said plurality of word lines.

**4,419,746**  
**MULTIPLE POINTER MEMORY SYSTEM**  
Arthur C. Hunter, Lubbock, and Stephen P. Hamilton, Midland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.  
Filed Oct. 14, 1980, Ser. No. 196,808  
Int. Cl.<sup>3</sup> G11C 13/00  
U.S. Cl. 365-189 8 Claims

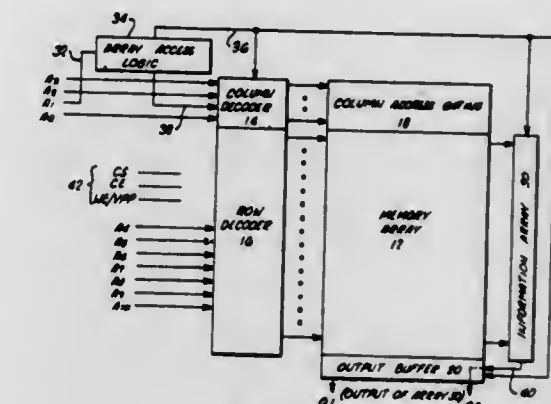
ADDRESS LOCATION	TABLE	STATE
$X_A(0), Y_A(3) =$	AA =	00
$X_B(1), Y_B(7) =$	BB =	11
$X_A(0), Y_B(7) =$	AB =	01
$X_B(1), Y_A(3) =$	BA =	10

TABLE 1



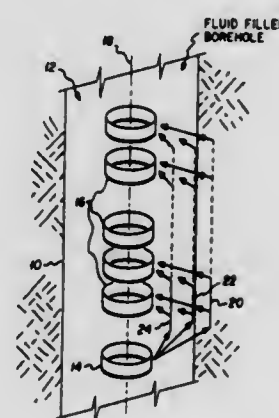
1. A memory system comprising:  
a memory means for selectively storing and outputting data words in a plurality of memory locations in response to a received address signal indicative of a particular one of said memory locations;  
a selection means for generating a particular one of a set of select signals; and  
a plurality of address pointer registers coupled to said memory means and to said selection means each address pointer register for storing an address signal therein capable of addressing at least two locations anywhere in said memory means in response to receiving a corresponding select signal.

**4,419,747**  
**METHOD AND DEVICE FOR PROVIDING PROCESS AND TEST INFORMATION IN SEMICONDUCTORS**  
Larry T. Jordan, Pleasanton, Calif., assignor to Seeq Technology, Inc., San Jose, Calif.  
Continuation-in-part of Ser. No. 301,592, Sep. 14, 1981, abandoned. This application Feb. 5, 1982, Ser. No. 346,162  
Int. Cl.<sup>3</sup> G11C 17/00, 29/00  
U.S. Cl. 365-201 20 Claims



1. A device for providing a user with semiconductor processing and test information relating to a primary circuit disposed upon a semiconductor chip, said device comprising:  
a programmable memory array having a plurality of storage locations disposed on the semiconductor chip adjacent the primary circuit;  
addressing means for accessing selected individual storage locations in said plurality of storage locations;  
programming means for programming semiconductor processing and test information into said selected storage locations accessed by said addressing means; and  
output means for providing output signals representative of the semiconductor processing and test information programmed into said selected individual storage locations accessed by said addressing means.

**4,419,748**  
**CONTINUOUS WAVE SONIC LOGGING**  
Robert W. Siegfried, II, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.  
Continuation of Ser. No. 222,433, Jan. 5, 1981, abandoned. This application May 5, 1983, Ser. No. 490,208  
Int. Cl.<sup>3</sup> G01V 1/40, 1/28  
U.S. Cl. 367-31 5 Claims



1. A sonic borehole logging system comprising:  
a transmitting transducer for transmitting acoustic signals in a borehole;  
transmitter means coupled to said transmitting transducer for causing said transmitting transducer to transmit a continuous sine wave signal at a preselected frequency;  
a plurality of receiving transducers displaced linearly at a



plurality of preselected distances from said transmitting transducer, and receiver sampling means coupled to said transmitter means and to said receiving transducers for recording only instantaneous samples of the amplitude of the acoustic signals received by said receiving transducers at times synchronized with a preselected point on each cycle of said continuous sine wave signal.

4,419,749

# MAGNETIC REPRODUCING APPARATUS CAPABLE OF RECEIVING RADIO BROADCAST PROGRAMS

Yutaka Nokihara, Hironori Nakajyo, and Kimio Yoshida, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

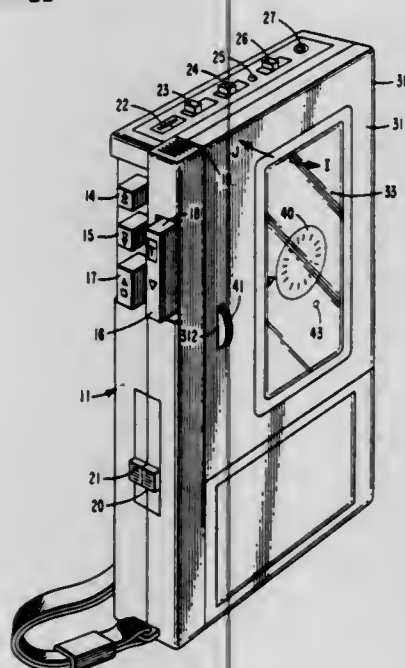
Filed Jun. 17, 1981, Ser. No. 274,507

Claims priority, application Japan, Jul. 15, 1980, 55-96760

Int. Cl.<sup>3</sup> G11B 31/00, 1/04; H04B 1/08

U.S. Cl. 369-11

4 Claims



1. Magnetic reproducing apparatus comprising a holding portion for insertion of a tape cassette, said holding portion including a pair of reel holders, a capstan and at least one first electrode, and a tuner unit to receive radio broadcast programs, said tuner unit being of substantially the same shape and size as said tape cassette and including a pair of first receiving portions on one side to receive said reel holders, a second receiving portion on said one side to receive said capstan, tuning means for varying the tuning frequency of said tuner unit, and at least one second electrode mounted on said tuner unit as an output terminal for said tuner unit to contact said at least one first electrode in response to insertion of said tuner unit in said holding portion, wherein said tuner unit further comprises control means positioned at the front of said tuner unit for controlling said tuning means, and said holding portion further comprises a cassette cover having a hole for manually operating said control means from outside said holding portion when said tuner unit is inserted in said holding portion.

4,419,750

# CONSTANT TRACK WIDTH OPTICAL DISK RECORDING

Dennis G. Howe, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,617

Int. Cl.<sup>3</sup> G11B 7/00

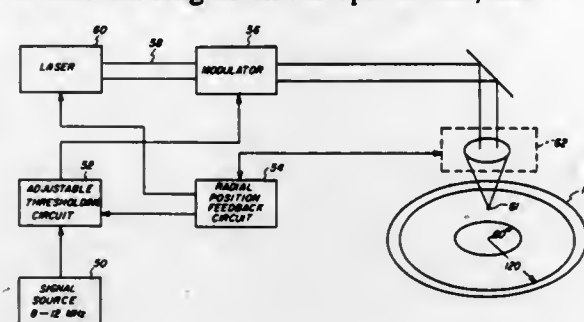
U.S. Cl. 369-111

22 Claims

1. A method for forming, on an optical disk, an information record that has a total fractional bandwidth greater than about

3 and a substantially constant track width, said method comprising the steps of:

- (a) focusing a recording beam on the optical disk;
- (b) providing relative movement between the optical disk and the recording beam focused thereon;
- (c) modulating the recording beam to expose information marks of different lengths on the optical disk; and



- (d) controlling (i) the size of the focused recording beam, (ii) the velocity of relative movement between the optical disk and the recording beam, and (iii) the modulation of the recording beam so that the maximum energy density received by the optical disk during exposure of the marks of information is approximately the same for all marks.

4,419,751

# MULTIPOINT MODEM AND THE USE THEREOF IN A METHOD AND A SYSTEM FOR TESTING A MULTILEVEL COMMUNICATION NETWORK

Jean Cholat-Namy, Juan-Les-Pins; Simon Huon, Roquefort-Les-Pins, and Philippe Thirion, Nice, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

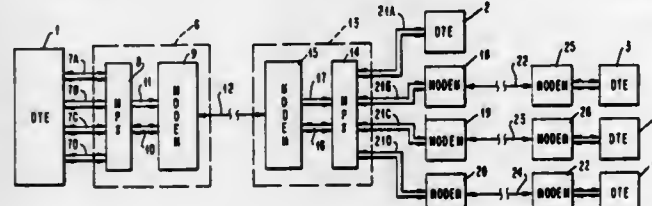
Filed Oct. 28, 1981, Ser. No. 315,794

Claims priority, application European Pat. Off., Nov. 28, 1980, 80430025.9

Int. Cl.<sup>3</sup> H04J 3/14

U.S. Cl. 370-13

17 Claims



1. A multipoint modem suitable for use in a multilevel link and of the type comprising several input/output interfaces (7A-7D) that may respectively receive the bits of several data sub-channels, multiplexing means (42, 43-46, 56) for multiplexing together the data bits received through those of the interfaces which are active to form a single train of bits in accordance with a multiplexing configuration, and transmitter means (75) for sending said train of bits over a transmission channel, characterized in that it includes:

- means (36) for detecting a test request received from one of the interfaces,
- means (30) responsive to a test request to generate a test configuration code for identifying the interface that supplied said test request,
- means (11) responsive to said test configuration code to cause said multiplexing means to assume a test configuration such that only that interface which received the detected test request will be active,
- storage means (73) for storing a test command received at the interface that received the test request, said command including an indication of the test to be performed and a link level identifier,
- decoder means (74) for decoding said link level identifier, and

means (67, 73) for applying the received test command and the test configuration code to said transmitter means for transmission over said channel if said link level identifier indicates a link level other than that which includes the modem.

4,419,752

# CIRCUIT ARRANGEMENT FOR TRANSMITTING TWO SIGNALS OVER ONE LINE IN OPPOSITE DIRECTIONS

Paul Sonnenberger; Wilhelm Graffenberger, both of Hamburg, Fed. Rep. of Germany; Adriaan Cense, Wycken, Netherlands, and Petrus A. M. Van Westen, Oeffelt, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

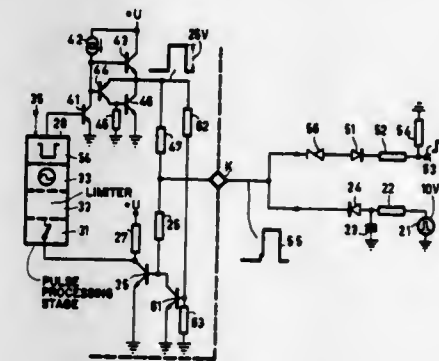
Filed Jul. 10, 1981, Ser. No. 282,200

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029054

Int. Cl.<sup>3</sup> H04N 5/04

U.S. Cl. 370-29

2 Claims



1. A circuit arrangement, having a first portion included within a semiconductor body and a second portion disposed outside said semiconductor body, for transmitting a first pulse-shaped signal from a first signal source in said second portion, via a connecting terminal of said semiconductor body, to a first receiving circuit in said first portion, and for transmitting a second pulse-shaped signal from a second signal source in said first portion, in the reverse direction via said connecting terminal, to a second receiving circuit in said second portion, characterized in that said circuit arrangement further comprises first switching means, comprising, in said second portion, a diode coupled between said first signal source and said connecting terminal, for coupling said first signal source to said first receiving circuit when said first pulse-shaped signal is to be transmitted to said first receiving circuit, and second switching means comprising, in said first portion, a first transistor having a base connected to said second signal source, an emitter connected to ground and a collector connected to a positive supply source via a current source, a second transistor having a base connected to the collector of said first transistor, a collector connected to said positive supply source, and an emitter coupled to said connecting terminal, a third transistor having a base also connected to the collector of said first transistor, an emitter connected to the emitter of said second transistor, and a collector coupled to ground, and a fourth transistor having a base connected to the collector of said third transistor, an emitter connected to ground, and a collector connected to the emitters of said second and third transistor, said first, second and fourth transistors being of the same conductivity type and opposite that of said third transistor, and in said second portion, a diode coupled between said connecting terminal and said second receiving circuit, for decoupling said second signal source from said second receiving circuit when said first switching means is conductive.

1037 O.G.—15

4,419,753

# NETWORK CONNECTION SYSTEM

Takuhito Kojima, Yamato; Yasuo Satake, Kawasaki, and Toru Masuda, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

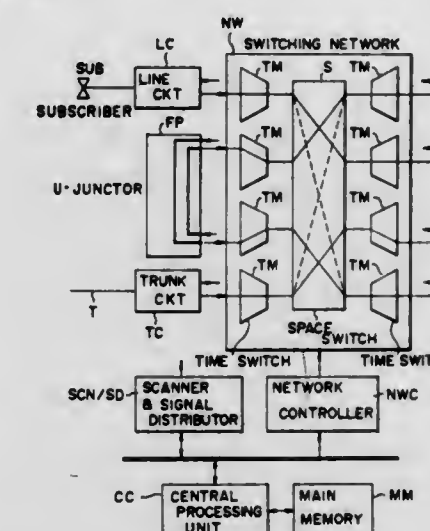
Filed Oct. 1, 1980, Ser. No. 192,811

Claims priority, application Japan, Oct. 6, 1979, 54-129136

Int. Cl.<sup>3</sup> H04J 3/06; H04Q 11/04; H04M 3/56

U.S. Cl. 370-62

8 Claims



1. A network connection system for an electronic exchange of the time division system type or the space division system type, employing electronic contacts, the electronic exchange including a switching network having trunk lines and subscriber lines connected to subscribers, said network connection system comprising a U-junction operatively connected to at least two trunk lines of the switching network of the electronic exchange, for selectively establishing an operable connection between at least two trunk lines, so that the U-junction acts as a combination of an outgoing and an incoming trunk, the electronic exchange controlling the connection between the trunks, between subscribers or between each subscriber and each trunk by controlling both the switching network and the U-junction.

4,419,754

# FURNACE ELECTRODE

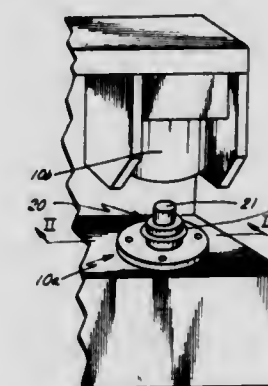
George J. Sitek, and Roger L. Bredeweg, both of Stevensville, Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 5, 1982, Ser. No. 355,212

Int. Cl.<sup>3</sup> H05B 3/00

U.S. Cl. 373-118

23 Claims



1. An electrode assembly for use on one or more electrodes of a resistance furnace used for heating resistive crucibles for the fusion of small analytical samples contained therein, said assembly comprising: an electrically conductive electrode body having a surface facing generally toward a crucible to be heated by the electrode and shaped to receive an insert; and an electrically conductive insert made of a wear-resistant



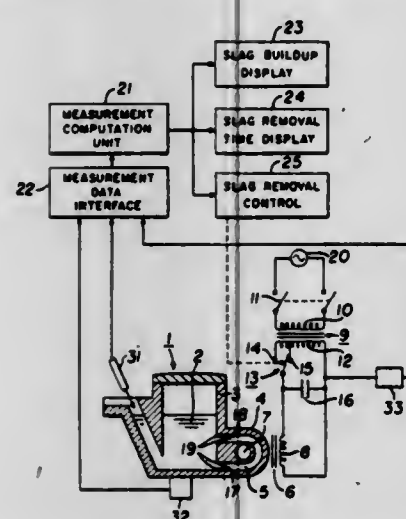
material and having a mating surface to said surface of said electrode, said assembly including collar means threadably engaging said electrode body for mechanically and removably securing said insert to said electrode in electrical contact therewith.

#### 4,419,755 METHOD FOR MEASURING THE EXTENT OF SLAG DEPOSIT BUILDUP IN A CHANNEL INDUCTION FURNACE

Tsuguharu Ohmori, and Shizuo Hayashi, both of Suzuka, Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan  
Filed Sep. 23, 1982, Ser. No. 421,909  
Claims priority, application Japan, Sep. 29, 1981, 56-156887  
Int. Cl.<sup>3</sup> H05B 5/04

U.S. Cl. 373-145

3 Claims



3. A method for measuring the extent of slag deposit buildup in a channel induction furnace during operation, the furnace including a container portion for holding molten metal, a channel portion in communication with the container portion and heating means for supplying power to heat metal in the channel portion, the heating means supplying power at a first level for maintaining the molten metal in the container portion at an operating temperature, the method comprising the steps of: during a first measurement interval when there are substantially no slag deposits in the furnace, increasing the power supplied by the heating means to a second level  $P_0$  greater than the first level by a specified amount; measuring during the first measurement interval the quantities  $W_0$ ,  $H_0$ ,  $T_0$  and  $N_0$ , where  $W_0$  is the weight of molten metal in the furnace,  $H_0$  is the time required for the molten metal in the container portion to rise by a predetermined amount above the operating temperature after the power supplied by the heating means is increased to  $P_0$ ,  $T_0$  is the operating temperature before the power supplied by the heating means is increased and  $N_0$  is the first level of power supplied by the heating means during the first measurement interval; determining a first temperature rise factor  $S_0$  according to the relationship  $S_0 = W_0/H_0$ ; during a second measurement interval at a selected time after the first measurement interval, increasing the power supplied by the heating means to a second level  $P_1$  greater than the first level by a specified amount; measuring during the second measurement interval the quantities  $W_1$ ,  $H_1$ ,  $T_1$  and  $N_1$ , where  $W_1$  is the weight of molten metal in the furnace,  $H_1$  is the time required for the molten metal in the container portion to rise by a predetermined amount above the operating temperature after the power supplied by the heating means is increased to  $P_1$ ,  $T_1$  is the operating temperature before the power supplied by the heating means is increased and  $N_1$  is the first level of power supplied by the heating means during the second measurement interval; determining a second temperature rise factor  $S_1$  according to the relationship  $S_1 = W_1/H_1$ ; determining a corrected second temperature rise factor  $S_1'$  according to the relationship

$$S_1' = \frac{P_0 - (T_0/T_1)N_1}{P_1 - (T_0/T_1)N_1} S_1$$

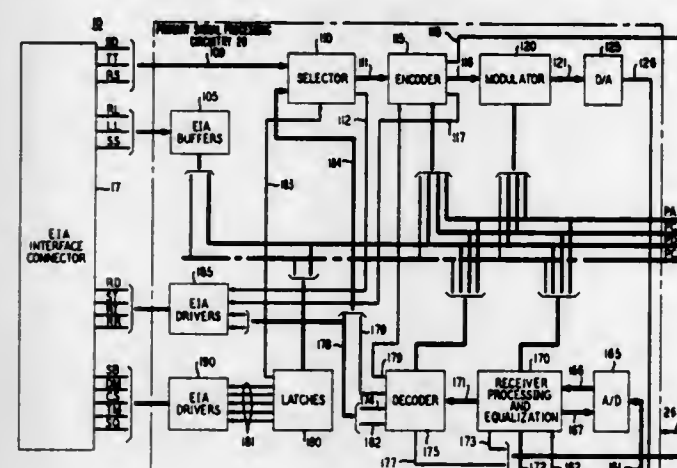
determining a quantity  $f$  indicative of the extent of slag buildup in the furnace during the second measurement interval according to the relationship  $f = C(S_0 - S_1')$  where  $C$  is a proportionality constant.

#### 4,419,756 VOICEBAND DATA SET

Enrique Cheng-Qulspe, Marlboro; Thomas M. Dennis, Ocean; Emanuel J. Fulcomer, Jr., Little Silver; George Malek, Wana-massa, and Shih Y. Tong, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Jun. 5, 1980, Ser. No. 156,869  
Int. Cl.<sup>3</sup> H04B 1/54; G06F 3/00

U.S. Cl. 375-7

47 Claims



1. A data set for processing data applied to said data set to generate transmit telephone voiceband data signals representing said data, said data set characterized by signal processing means which includes a plurality of addressable registers, a bus common to said registers, and a controller means for addressing said registers and for writing into each register via said bus at least a first associated information signal, the values of the information signals in said registers specifying the manner in which said data are to be processed, said signal processing means further including circuit means distinct from said controller means for processing said data in accordance with said information signal values to generate said transmit telephone voiceband data signals, and means for applying said transmit telephone voiceband data signals to a telephone line.

#### 4,419,757

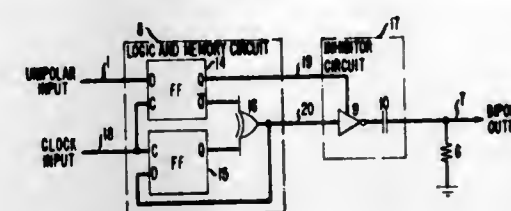
TRANSFORMERLESS BIPOLAR CONVERTER  
Cosmo H. De Gennaro, Long Valley, and Neil Hooper, Randolph Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Mar. 16, 1981, Ser. No. 244,297  
Int. Cl.<sup>3</sup> H03K 5/01

U.S. Cl. 375-17

7 Claims

1. Apparatus for converting a two-level input signal to a three-level output signal such that one of the two levels of the input signal is coded as the center level of the three levels and the other of the two levels of the input signal is coded alternately as one or the other of the outer levels of the output signal, the apparatus comprising:  
means for alternately charging and discharging a capacitor through a load resistor responsive to successive occurrences of the other of the two levels of the input signal; and

means for inhibiting the charging or discharging of the capacitor through the load resistor responsive to the occurrence of the one of the two levels of the input signals,



the alternately charging and discharging means providing one or the other of the outer levels of the three level output signal across the load resistor, the inhibiting means providing the center level of the three level output signal across the load resistor.

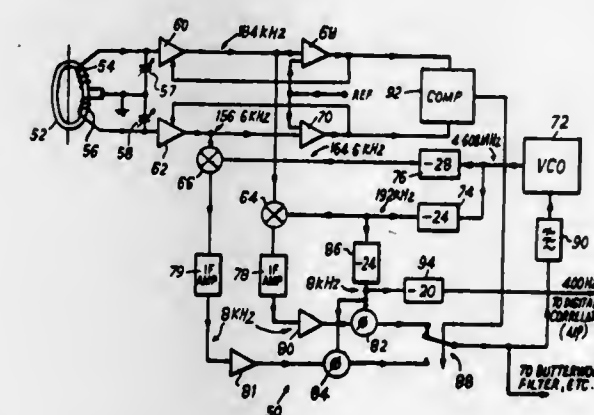
#### 4,419,758 TRANSMISSION SYSTEMS FOR TRANSMITTING SIGNALS OVER POWER DISTRIBUTION NETWORKS, AND TRANSMITTERS FOR USE THEREIN

Howard A. Dorey, Godalming, England, assignor to Sangamo Weston Limited, Enfield, England  
Filed Feb. 17, 1981, Ser. No. 235,277  
Claims priority, application United Kingdom, Feb. 18, 1980, 8005454

Int. Cl.<sup>3</sup> H04B 7/02

U.S. Cl. 375-38

23 Claims



1. A receiver for coupling to a power distribution network to receive a signal transmitted over the network and comprising at least two carrier signals having different frequencies and each modulated with a digital signal, at least a portion of the digital signal modulating each carrier signal representing the same message and the carrier frequencies being locked together, the receiver comprising:  
input circuit means for receiving the modulated carrier signals;  
means for sensing which of the first and second modulated carrier signals is being most strongly received;  
variable frequency oscillator means; and  
phase-locked loop means responsive to the sensing means to lock the frequency of said oscillator means to whichever of the first and second modulated carrier signals is being most strongly received and to demodulate at least that carrier signal to derive the digital signal therefrom, said phase-locked loop comprising:  
means for deriving first and second intermediate signals from the first and second modulated carrier signals respectively, and third and fourth intermediate signals, substantially equal in frequency to the first and second intermediate signals respectively, from said oscillator means;  
a first phase detector responsive to the first modulated carrier signal and a signal derived from the first and third intermediate frequency signals to produce a first output signal having a DC component dependent on the phase

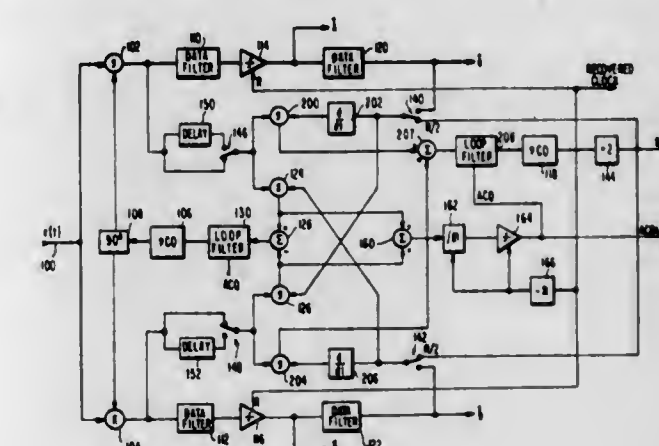
difference therebetween, said first output signal also containing said digital signal;  
a second phase detector responsive to the second and fourth intermediate frequency signals to produce a second output signal having a DC component dependent on the phase difference therebetween, said second output signal also containing said digital signal;  
low pass filter means; and  
switching means responsive to the sensing means to apply to said oscillator means, via the low pass filter means, whichever of the first and second output signals corresponds to the modulated carrier signal being most strongly received, to vary the frequency of said oscillator means in the sense which tends to reduce the phase difference producing the output signal.

#### 4,419,759 CONCURRENT CARRIER AND CLOCK SYNCHRONIZATION FOR DATA TRANSMISSION SYSTEM

John J. Poklemba, Ijamsville, Md., assignor to Communications Satellite Corporation, Washington, D.C.  
Filed Aug. 5, 1980, Ser. No. 175,479  
Int. Cl.<sup>3</sup> H03L 7/06

U.S. Cl. 375-97

16 Claims



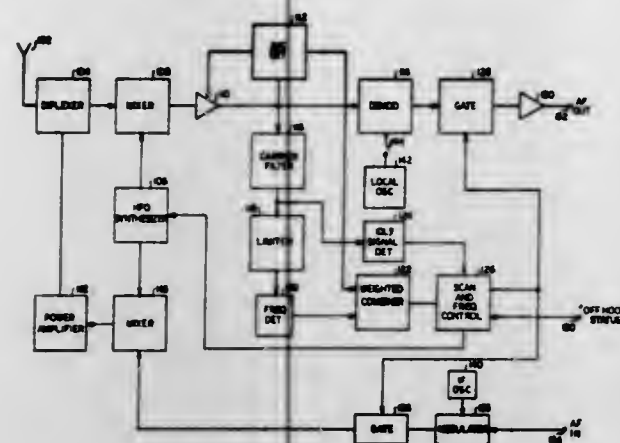
1. In an apparatus for deriving concurrent carrier and clock synchronization from a received signal, said received signal including at least a first carrier modulated with at least a first data signal, said apparatus including:  
(a) a carrier recovery network for providing an estimated carrier signal comprising:  
first mixing means for mixing said received signal with said estimated carrier signal and providing a first mixing means output;  
data recovery means for sampling and comparing said first mixing means output to obtain an estimate of said at least first data signal;  
second mixing means for combining said first mixing means output and said at least first data signal estimate and providing a carrier phase error signal as an output; and  
first voltage controlled oscillator means for providing said estimated carrier signal in accordance with said carrier phase error signal; and  
(b) a clock recovery network comprising:  
differentiating means for receiving said at least first data signal estimate and providing as an output the time derivative thereof;  
third mixing means for combining the outputs of said differentiating means and said first mixing means to obtain a clock phase error signal; and  
second voltage controlled oscillator means providing said estimated clock signal in accordance with said clock phase error signal, said estimated clock signal being provided as a sampling signal to said data recovery means.







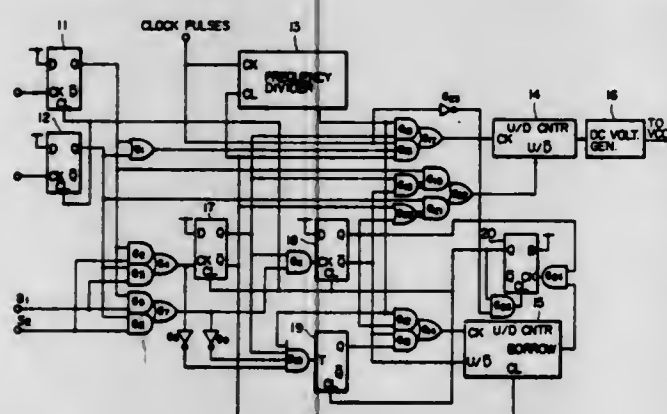
(d) means for comparing the measurements of the ground stations' signals provided by (b) and (c) means so as to



enable said means for selecting to select "best" ground signal.

**4,419,767**  
**AUTOMATIC DIGITAL CONTROL DEVICE FOR EXACT FREQUENCY TUNING OF A RECEIVER**  
Minoru Motohashi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan  
Filed Nov. 24, 1981, Ser. No. 324,705  
Claims priority, application Japan, Nov. 27, 1980, 55-167096; Dec. 4, 1980, 55-171207

Int. Cl.<sup>3</sup> H03J 7/22  
U.S. Cl. 455-164 9 Claims



1. In a tuning frequency automatic control device of a receiver of the type comprising first frequency varying means for varying the tuning frequency of said receiver in a first direction at a first speed in response to a first instruction signal and detection means for detecting the tuning condition of said receiver and producing a first detection signal (S<sub>1</sub>) when said receiver is detuned in one direction from a desired station and a second detection signal (S<sub>2</sub>) when said receiver is detuned in another direction from said desired station, the improvement comprising:

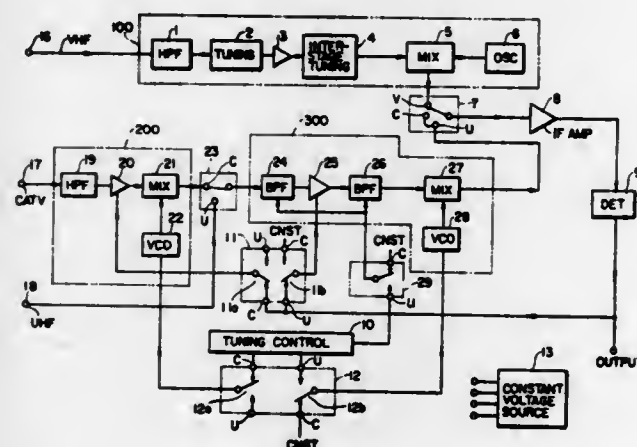
second frequency varying means for varying the tuning frequency of said receiver for at least a first period of time in a second direction opposite to said first direction and at a second speed slower than said first speed in response to a second detection signal subsequent to a first detection signal;

third frequency varying means for varying said tuning frequency in said first direction at said second speed in response to a first detection signal subsequent to said subsequent second detection signal; and

halt signal generating means for halting the variation of said tuning frequency by said third frequency varying means after a second period of time which is half of said first period of time.

**4,419,768**  
**WIDEBAND TUNER FOR VHF, CATV AND UHF TELEVISION SIGNALS**  
Sadahiko Yamashita, Sagami-hara, and Mitsuo Saito, Kawasaki, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan  
Filed Sep. 29, 1981, Ser. No. 306,854  
Claims priority, application Japan, Sep. 30, 1980, 55-137206; Oct. 1, 1980, 55-138162; Oct. 1, 1980, 55-138163; Oct. 8, 1980, 55-141696

Int. Cl.<sup>3</sup> H04B 1/26, 1/16  
U.S. Cl. 455-180 16 Claims



1. A wideband tuner having a plurality of manually controlled selector switches for operating the tuner in one of first, second and third reception modes, comprising:

first, second and third input terminals adapted to receive signals of low, medium and high frequency bands in response to said first, second and third reception modes, respectively;

a first tuning section coupled to receive signals of the low frequency band from said first input terminal for converting the received signals to a lower intermediate frequency for application to an intermediate frequency video amplifier;

a second tuning section coupled to receive signals of the medium frequency band from said second input terminal for converting the received signals to a higher intermediate frequency;

a third tuning section for converting an input signal applied thereto to said lower intermediate frequency;

first switching means for selectively coupling to said third tuning section the output of said second tuning section in response to said second reception mode or signals of the high frequency band from said third input terminal in response to said third reception mode; and

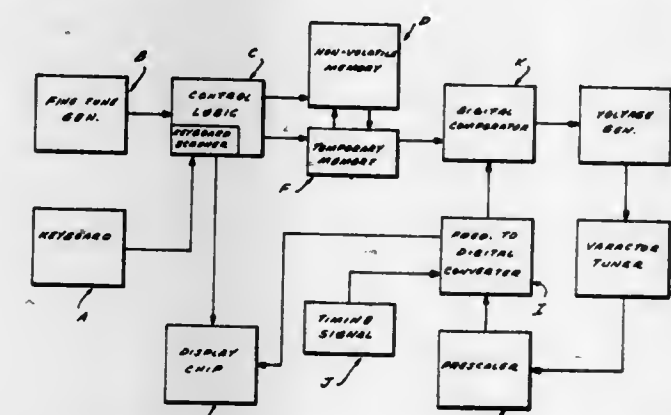
second switching means for selectively coupling to said video amplifier the output of said first tuning section in response to said first reception mode or the output of said third tuning section in response to said second or third reception mode; said second tuning section including a first differential mode modulator for modulating a first carrier at a manually controlled frequency higher than the frequency of a medium frequency band modulating signal in response to said second reception mode, and said third tuning section including a second differential mode modulator for modulating a second carrier at a frequency lower than said higher intermediate frequency in response to said second reception mode and modulating a third carrier at a manually controlled frequency higher than the frequency of a high frequency band modulating signal in response to said third reception mode.

**4,419,769**  
**DIGITAL TUNING SYSTEM FOR A VARACTOR TUNER EMPLOYING FEEDBACK MEANS FOR IMPROVED TUNING ACCURACY**

Elias Cohen, El Paso, Tex., assignor to General Instrument Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 191,676, Sep. 29, 1980, abandoned, which is a continuation of Ser. No. 52,074, Jun. 25, 1979, abandoned, which is a continuation of Ser. No. 903,956, May 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 664,710, Mar. 8, 1976, abandoned. This application Mar. 19, 1982, Ser. No. 359,767

Int. Cl.<sup>3</sup> H04B 1/16  
U.S. Cl. 455-182 11 Claims

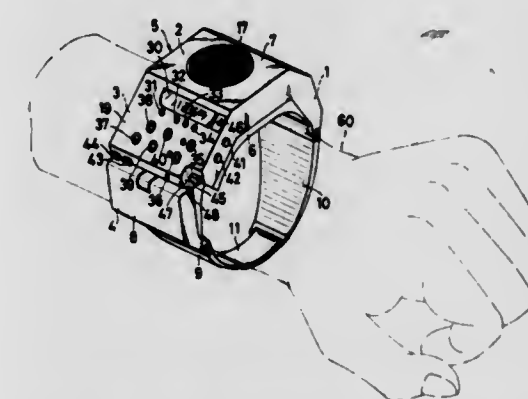


1. A tuning system for use in a communications receiver or the like of the type having a signal controlled tuning element, said system comprising means for storing a plurality of first digital numbers representative of respective tuning frequencies, a signal selector, a temporary memory, means for addressing said storage means, in accordance with the actuation of said signal selector, to select one of said first digital numbers and transfer same to said temporary memory, user actuatable means for altering the contents of said temporary memory to provide a fine tuning adjustment, said altering means comprising an actuation member, said actuation member being rotatable, to alter the contents of said temporary memory, and displaceable to cause the contents of said temporary memory to be written into said storage means at said addressed location, means for sensing the frequency at which said element is tuned, means for converting said sensed frequency into a second digital number, means for comparing the contents of said tem-

porary memory and said second digital number for generating a signal representative of the difference therebetween, and means, operably connected to said comparing means, for generating a tuning signal in accordance with said difference signal, said tuning signal being applied to said element to control same.

**4,419,770**  
**WRIST AM RADIO RECEIVER**  
Hiroyuki Yagi, Iwaki, and Takashi Baba, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed Apr. 26, 1982, Ser. No. 372,189  
Claims priority, application Japan, May 2, 1981, 56-67493; Feb. 19, 1982, 57-25523

Int. Cl.<sup>3</sup> H04B 1/08  
U.S. Cl. 455-301 16 Claims



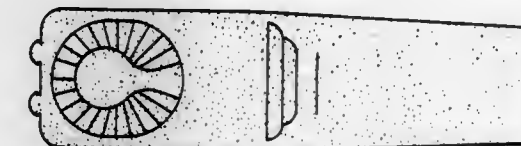
1. A wrist AM radio receiver comprising a bracelet-like structure adapted to be removably wrapped about a user's wrist, a bar antenna, a circuit board having thereon oscillating means forming a reference oscillation source, said bar antenna and said circuit board having oscillating means thereon being spaced apart within said bracelet-like structure in the direction in which the latter is wrapped, and at least a speaker also disposed in said bracelet-like structure between said bar antenna and said circuit board with oscillating means thereon so as to minimize the influence on said bar antenna of pulses from said reference oscillation source.



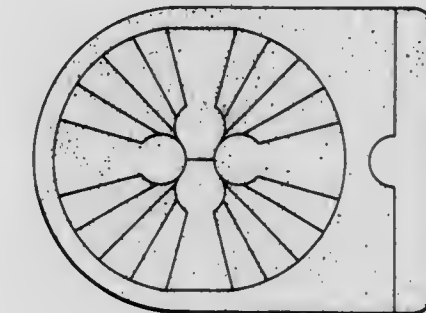
# DESIGNS

DECEMBER 6, 1983

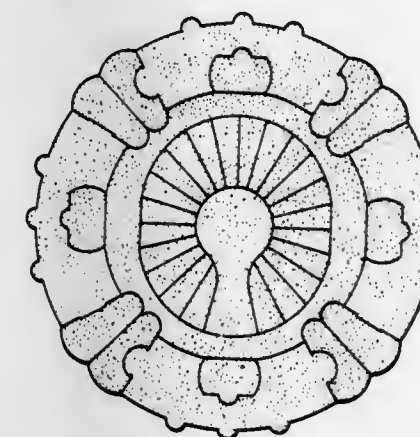
271,629  
COVERED HAT  
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94015  
Filed Apr. 20, 1981, Ser. No. 255,612  
Term of patent 14 years  
Int. Cl. D02-03  
U.S. Cl. D2-253



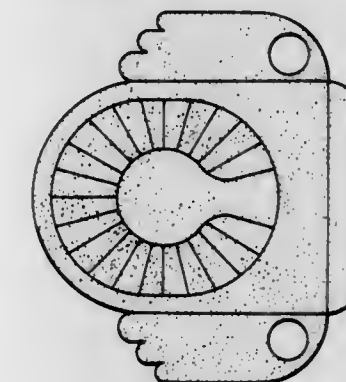
271,631  
SPECTATOR HAT  
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94015  
Filed Apr. 20, 1981, Ser. No. 255,615  
Term of patent 14 years  
Int. Cl. D02-03  
U.S. Cl. D2-253



271,630  
SPACE HAT  
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94015  
Filed Apr. 20, 1981, Ser. No. 255,614  
Term of patent 14 years  
Int. Cl. D02-03  
U.S. Cl. D2-253



271,632  
WINGED HAT  
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94015  
Filed Apr. 20, 1981, Ser. No. 255,613  
Term of patent 14 years  
Int. Cl. D02-03  
U.S. Cl. D2-253





271,633

## SPORT SHOE

Gino Casetta, Pontelongo, Italy, assignor to Simod Patents N.A.N.V., Curacao, Netherlands Antilles

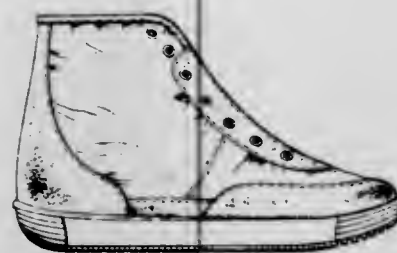
Filed Nov. 12, 1980, Ser. No. 206,163

Claims priority, application Italy, May 16, 1980, 61932B/80

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-310



271,636

## SOFA

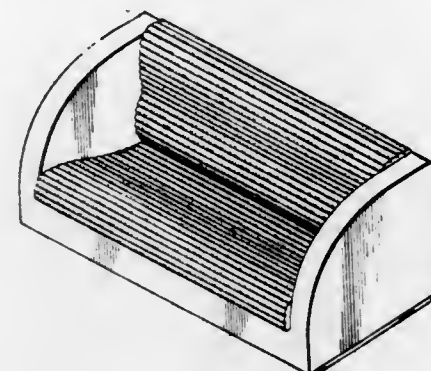
Jan H. Matthias, Beverly Hills, Calif., assignor to Casa Bella Imports, Inc., Miami, Fla.

Filed Aug. 17, 1981, Ser. No. 293,398

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-63



271,634

## COMBINED SNACK TRAY AND LITTER BASKET FOR AN AUTOMOBILE

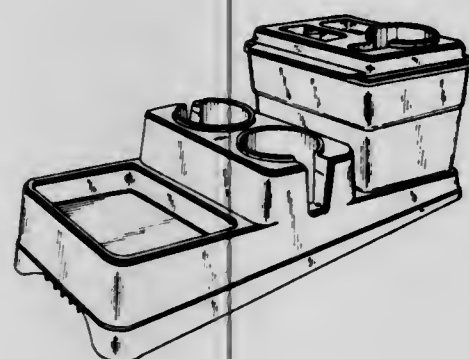
Gary L. Rockwell, 205 Willowcrest Way, LaGrange, Ga. 30240

Filed Feb. 12, 1982, Ser. No. 348,269

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D3-40



271,637

## CHAIR

Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besenato, Italy

Filed Apr. 13, 1981, Ser. No. 253,383

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-75



271,635

## BROOM SHROUD

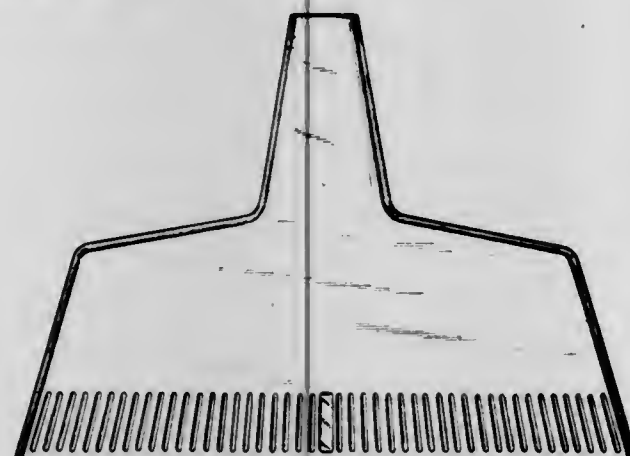
Charles E. Nichols, Woodridge, Ill., and David A. Jones, Kettering, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Dec. 1, 1981, Ser. No. 326,312

Term of patent 14 years

Int. Cl. D4-01

U.S. Cl. D4-04



271,638

## FLUSH MOUNTED DRAWING IMPLEMENT HOLDER

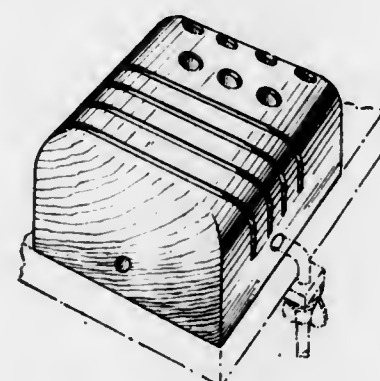
Tim Basaldua, Jr., 1911 W. Wabansia Ave., Chicago, Ill. 60622

Filed Jun. 15, 1981, Ser. No. 273,658

Term of patent 14 years

Int. Cl. D6-99

U.S. Cl. D6-113



271,639

## CAP HOLDER

Harry P. Capers, Jr., 9615 Richmond, Houston, Tex. 77063

Filed Jul. 6, 1981, Ser. No. 280,828

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-116



271,641

## SHOE RACK

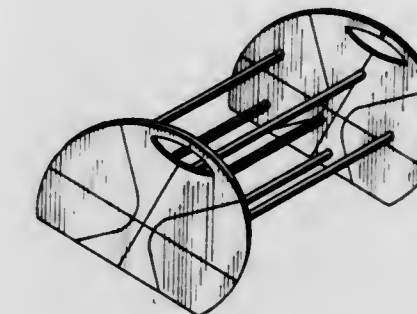
Robert L. Bowsher, 212 19th Ave., Moline, Ill. 61265

Filed Jul. 27, 1981, Ser. No. 289,828

Term of patent 14 years

Int. Cl. D06-04

U.S. Cl. D6-153



271,642

## DESK

Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577

Filed Apr. 23, 1981, Ser. No. 256,820

Term of patent 14 years

Int. Cl. D06-04

U.S. Cl. D6-162



271,640

## PLANT HANGER

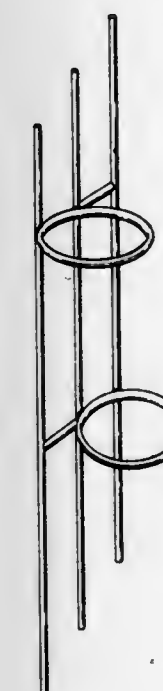
Zoltan V. Gyebnar, 2340 Starr Ave., #3, Oregon, Ohio 43616

Filed Sep. 3, 1981, Ser. No. 299,040

Term of patent 14 years

Int. Cl. D6-06

U.S. Cl. D6-137



271,643

## CHEST

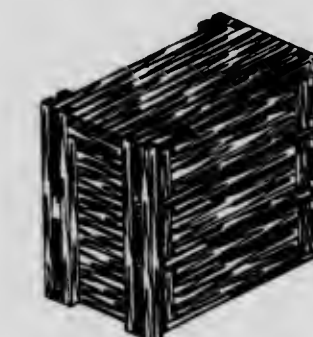
Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577

Filed Apr. 23, 1981, Ser. No. 256,802

Term of patent 14 years

Int. Cl. D06-04

U.S. Cl. D6-165

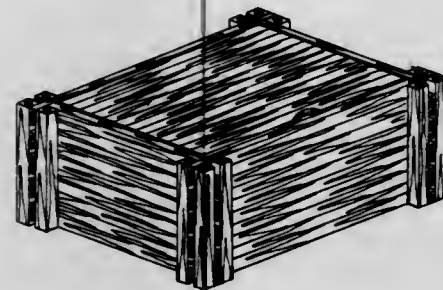




271,644  
CHEST

Robert V. Thompson, Boatyard Condominiums, 75th Ave. Julia McLeod, 815 W. Bridge St., Yerington, Nev. 89447  
North, Myrtle Beach, S.C. 29577  
Filed Apr. 23, 1981, Ser. No. 256,920  
Term of patent 14 years  
Int. Cl. D06—04

U.S. Cl. D6—167

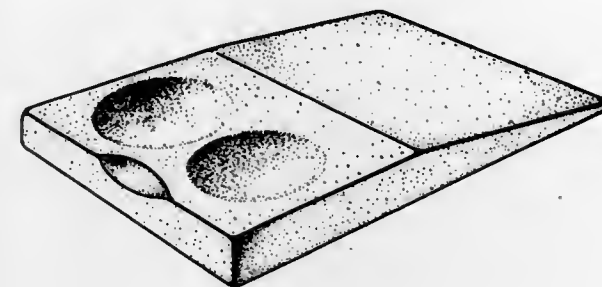


## 271,647

## BODY TORSO SUPPORT PAD

Filed Jul. 22, 1981, Ser. No. 285,327  
Term of patent 14 years  
Int. Cl. D6—09

U.S. Cl. D6—201

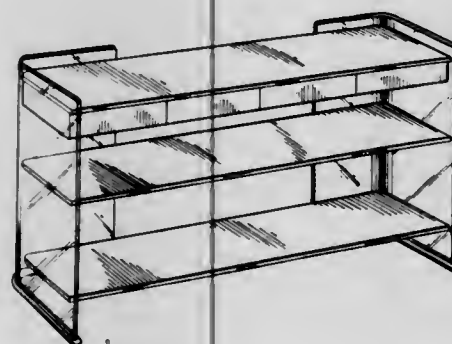


## 271,645

## COMBINED SHELF AND STORAGE UNIT

Enrico Tonucci, Pesaro, Italy, assignor to Fiam s.r.l., Tavullia, Italy  
Filed Mar. 17, 1981, Ser. No. 244,636  
Term of patent 14 years  
Int. Cl. D6—04

U.S. Cl. D6—172

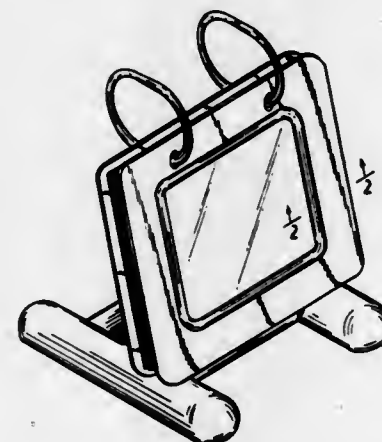


## 271,648

## PHOTOGRAPH DISPLAY

Vincent Di Bartolo, Cresskill, N.J., assignor to Mateflex/Mele Corporation, Utica, N.Y.  
Filed Nov. 9, 1981, Ser. No. 319,699  
Term of patent 14 years  
Int. Cl. D6—07

U.S. Cl. D6—234



## 271,646

## ETAGERE

Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577  
Filed Apr. 23, 1981, Ser. No. 256,796  
Term of patent 14 years  
Int. Cl. D06—04

U.S. Cl. D6—186



## 271,649

## BODY OF A GARMENT HANGER

John H. Batts, East Grand Rapids, and Bredeveg, Robert, Zeeland, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.  
Filed Jul. 6, 1981, Ser. No. 280,338  
Term of patent 14 years  
Int. Cl. D6—08

U.S. Cl. D6—253



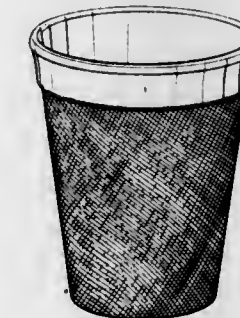
## 271,650

## EMBOSSED BEVERAGE OR PACKAGING CUP

Van D. Groenewold; Hubert E. Christian, and James P. Schwartz, all of Phoenix, Ariz., assignors to WMF Container Corporation, Phoenix, Ariz.  
Continuation of Ser. No. 29,799, Apr. 13, 1979, abandoned. This application Sep. 3, 1981, Ser. No. 299,238

The portion of the term of this patent subsequent to May 25, 1996, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D07—01; D09—03

U.S. Cl. D7—6



## 271,652

## ACID-ETCHED PATTERN FOR GLASSWARE

Jon R. Saffell, Glen Dale, W. Va., assignor to Lenox Crystal, Incorporated, Lawrenceville, N.J.  
Filed Jun. 16, 1981, Ser. No. 274,123  
Term of patent 14 years  
Int. Cl. D07—01

U.S. Cl. D7—39

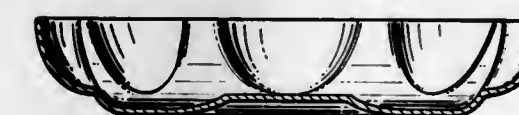
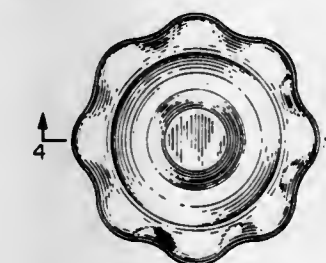


## 271,651

## SCALLOPED BOWL

Lawrence M. Knutson, Prior Lake, Minn., assignor to Decra Stone, Inc., Prior Lake, Minn.  
Division of Ser. No. 97,165, Nov. 26, 1979, abandoned, which is a division of Ser. No. 873,965, Jan. 31, 1978, Pat. No. Des. 263,668. This application Nov. 12, 1981, Ser. No. 320,226  
Term of patent 14 years  
Int. Cl. D07—01

U.S. Cl. D7—29



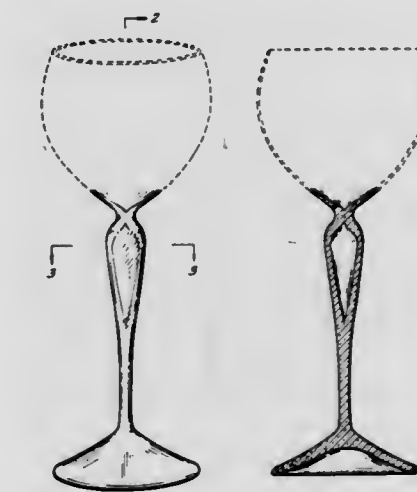
## 271,653

## STEM AND A BASE OF A BOWL OF A STEMWARE GLASS

Michael Boehm, Selb, Fed. Rep. of Germany, assignor to Rosenthal Aktiengesellschaft, Fed. Rep. of Germany  
Filed Aug. 17, 1981, Ser. No. 293,343  
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 7043

Term of patent 14 years  
Int. Cl. D07—01

U.S. Cl. D7—39





271,654

## ICE-SPOON

Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland

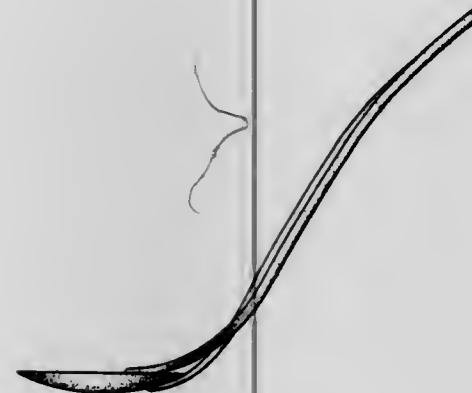
Filed Dec. 22, 1981, Ser. No. 333,437

Claims priority, application Hague, Jun. 26, 1981, 71 564

Term of patent 14 years

Int. Cl. D07-03

U.S. Cl. D7-47



271,655

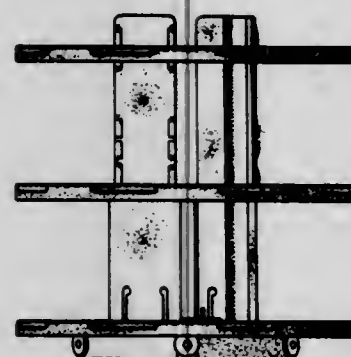
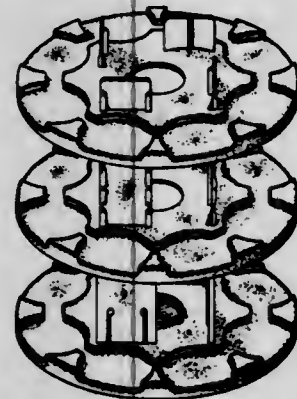
ROTATABLE RACK FOR FOOD JARS OR THE LIKE  
Jody L. Numbers, Scottsdale, Ariz., assignor to Monterey Laboratories, Inc., Las Vegas, Nev.

Filed Jun. 26, 1981, Ser. No. 277,702

Term of patent 14 years

Int. Cl. D7-07; D6-04

U.S. Cl. D7-71



271,656

## CAVIAR-SPOON

Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland

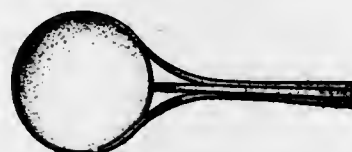
Filed Dec. 22, 1981, Ser. No. 333,438

Claims priority, application Hague, Jun. 26, 1981, 71 564

Term of patent 14 years

Int. Cl. D07-03

U.S. Cl. D7-104



271,657

## SPOON OR SIMILAR ARTICLE

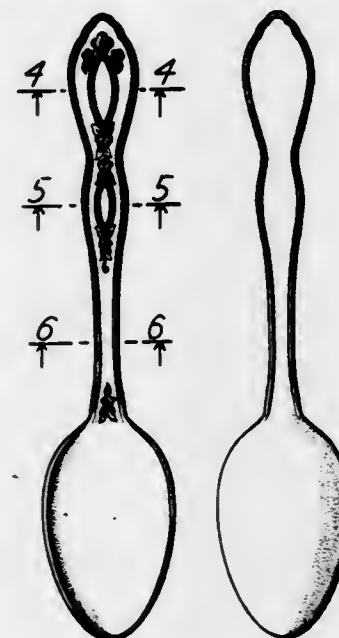
Colin B. Richmond, II, Oneida, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Feb. 9, 1982, Ser. No. 347,118

Term of patent 14 years

Int. Cl. D07-03

U.S. Cl. D7-137



271,658

MOUNTING TOOL FOR A GUIDE TUBE FOR CABLES  
IN A FIRE WALL

Bengt E. Legerius, Nyköping, and Hans W. Siebert, Oxelösund, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sep. 5, 1980, Ser. No. 184,231

Claims priority, application Sweden, Mar. 14, 1980, 80-0537

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-14



271,660

## MOLDED FRAME MAKER MITRE BOX WITH CLAMPS

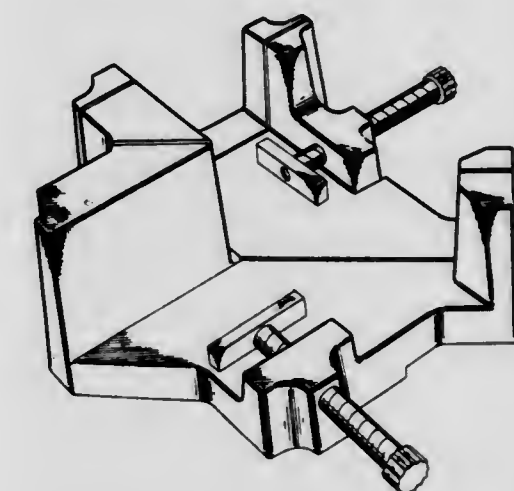
I. James Elmore, Simsbury, and Robert F. West, West Simsbury, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Oct. 21, 1981, Ser. No. 313,684

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-71



271,659

## COMBINATION POCKET TOOL

Paul R. Fayle, P.O. Box 1121, Lexington, Va. 24450

Filed Oct. 22, 1979, Ser. No. 87,461

Term of patent 14 years

Int. Cl. D07-99

U.S. Cl. D8-18



271,661

## CLOSURE DEVICE

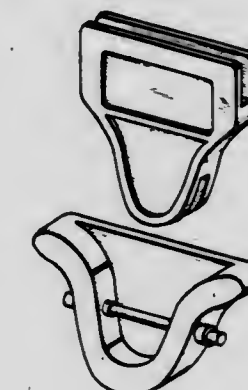
Ted Stark, Jersey City, N.J., assignor to M&amp;M Luggage Co., Inc., Jersey City, N.J.

Filed Apr. 9, 1981, Ser. No. 252,478

Term of patent 14 years

Int. Cl. D8-07

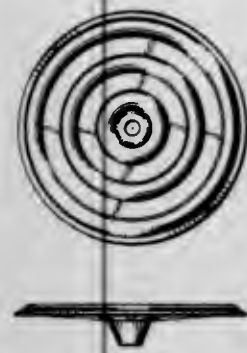
U.S. Cl. D8-339





**271,662**  
**DECK PLATE**  
Ben S. Jones, 16173 Notre Dame, Mount Clemens, Mich. 48043  
Filed Dec. 11, 1981, Ser. No. 329,678  
Term of patent 14 years  
Int. Cl. D8—08

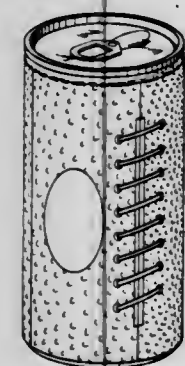
U.S. Cl. D8—399



**271,663**  
**BEVERAGE CAN**  
John F. Stark, Satellite Beach, and Ronald W. Morrison, Ormond Beach, both of Fla., assignors to Starmax, Inc., Satellite Beach, Fla.

Filed Nov. 3, 1980, Ser. No. 203,383  
Term of patent 14 years  
Int. Cl. D9—03

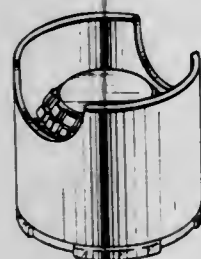
U.S. Cl. D9—307



**271,664**  
**COMBINED TYPEHEAD CONTAINER AND TYPEHEAD**  
George T. Cowan, Jr., Winchester, and Robert E. Griffith, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

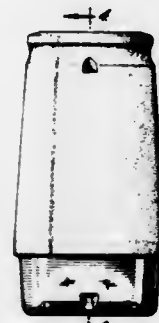
Filed May 5, 1981, Ser. No. 260,619  
Term of patent 14 years  
Int. Cl. D9—03

U.S. Cl. D9—337



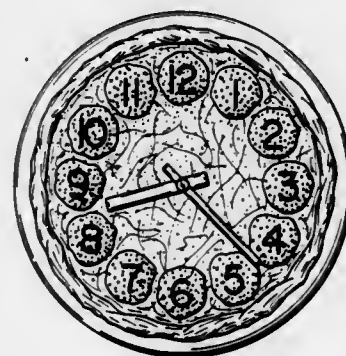
**271,665**  
**CONTAINER FOR LIQUIDS OR THE LIKE**  
Paul D. Garwood, Delran; Delmar F. Macaulay, Moorestown, and Ernst J. Schmid, Cinnaminson, all of N.J., assignors to Campbell Soup Company, Camden, N.J.  
Filed Aug. 11, 1982, Ser. No. 407,304  
Term of patent 14 years  
Int. Cl. D9—01

U.S. Cl. D9—370



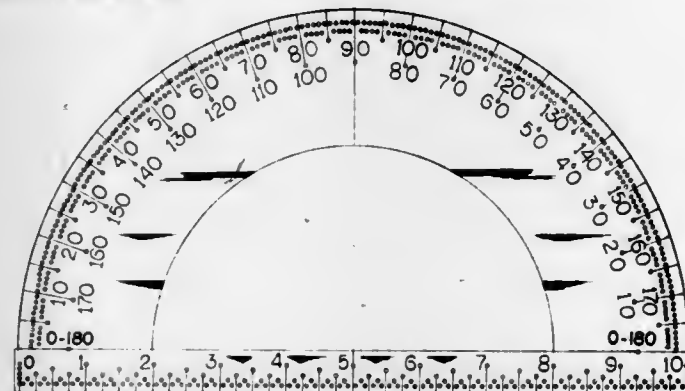
**271,666**  
**PIZZA FACED CLOCK**  
Molly K. Flemate, 1447 Colt Way, San Jose, Calif. 95121  
Filed Oct. 26, 1981, Ser. No. 315,239  
Term of patent 14 years  
Int. Cl. D10—01

U.S. Cl. D10—6



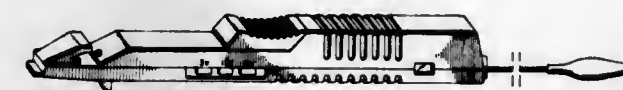
**271,667**  
**PROTRACTOR**  
Fahim R. Sidrak, 4649 Norwich Rd., Wilmington, N.C. 28405  
Continuation-in-part of Ser. No. 118,671, Feb. 5, 1980. This application Oct. 20, 1981, Ser. No. 313,308  
Term of patent 14 years  
Int. Cl. D10—04

U.S. Cl. D10—65



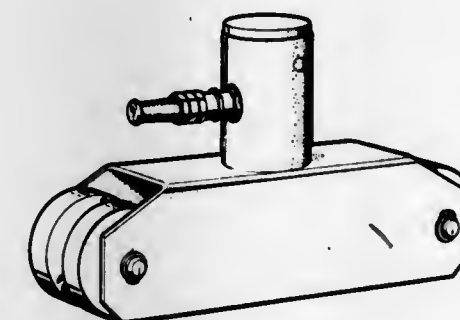
**271,668**  
**VOLTAGE DETECTOR**  
Masao Tanaka, Ichikawa, Japan, assignor to Kabushiki Kaisha Carmate, Tokyo, Japan  
Filed Nov. 2, 1981, Ser. No. 317,454  
Claims priority, application Japan, Jun. 16, 1980, 55-23979  
Term of patent 14 years  
Int. Cl. D10—04

U.S. Cl. D10—78



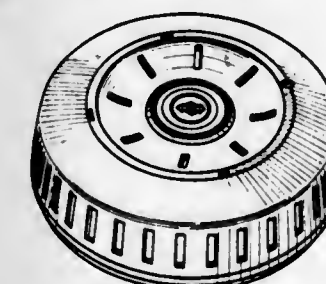
**271,669**  
**CABLE TENSION SENSOR**  
Hakan Öhrnell, and Leif Näslund, both of Karlstad, Sweden, assignors to Handelsbolaget Öhrnellteknik, Karlstad, Sweden  
Filed Oct. 8, 1981, Ser. No. 309,797  
Claims priority, application Sweden, Apr. 7, 1981, 81-0910  
Term of patent 14 years  
Int. Cl. D10—04

U.S. Cl. D10—83



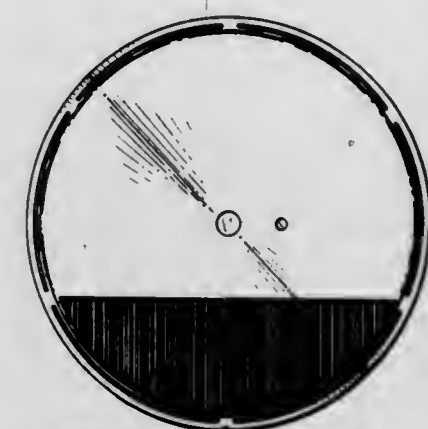
**271,670**  
**FIRE AND SMOKE DETECTOR**  
Nobuei Takai, and Katsura Yamamoto, both of Tokyo, Japan, assignors to Nittan Company, Limited, Tokyo, Japan  
Filed Jun. 22, 1981, Ser. No. 276,321  
Term of patent 14 years  
Int. Cl. D10—05

U.S. Cl. D10—106



**271,671**  
**SMOKE DETECTOR**  
Hugh P. Thornton, Jr., Acton, Mass., assignor to American District Telegraph Company, Jersey City, N.J.  
Filed Nov. 9, 1981, Ser. No. 319,149  
Term of patent 14 years  
Int. Cl. D10—05

U.S. Cl. D10—106



**271,672**  
**BRACELET**  
Gianni Bulgari, Rome, Italy, assignor to Ditta Sotirio Bulgari di Costantino e Giorgio Bulgari S.a.s., Rome, Italy  
Filed Feb. 5, 1982, Ser. No. 346,336  
Claims priority, application Italy, Aug. 7, 1981, 35958/81[U]  
Term of patent 14 years  
Int. Cl. D11—01

U.S. Cl. D11—5



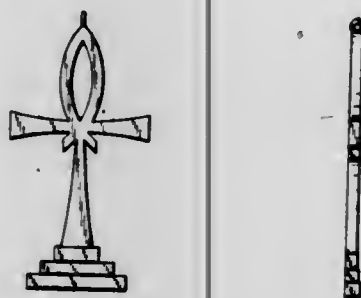


271,673

## RELIGIOUS MEDAL

Dale T. Vick, 1731 N. Holyoke, Wichita, Kans. 67208  
 Filed Jan. 27, 1982, Ser. No. 343,382  
 Term of patent 14 years  
 Int. Cl. D11-01

U.S. Cl. D11-96



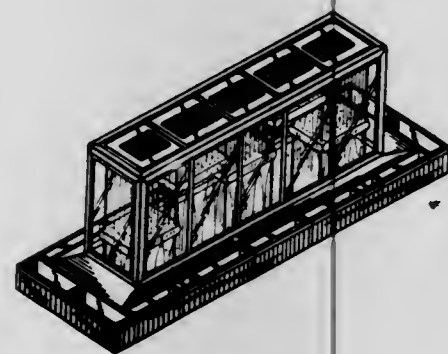
271,674

## KINETIC SCULPTURE

Hugh T. Greenlee, Gates Mills, and Roy P. Hess, Vermillion, both of Ohio, assignors to W. R. Grace & Co., New York, N.Y.

Filed Jul. 1, 1981, Ser. No. 279,479  
 Term of patent 14 years  
 Int. Cl. D11-02

U.S. Cl. D11-131

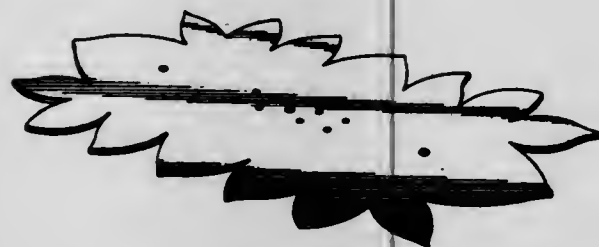


271,675

## FLORAL ARRANGEMENT BASE

Melvin R. Nichols, 3017 Monticello, Dallas, Tex. 75205  
 Filed Aug. 10, 1981, Ser. No. 291,561  
 Term of patent 14 years  
 Int. Cl. D11-02

U.S. Cl. D11-147

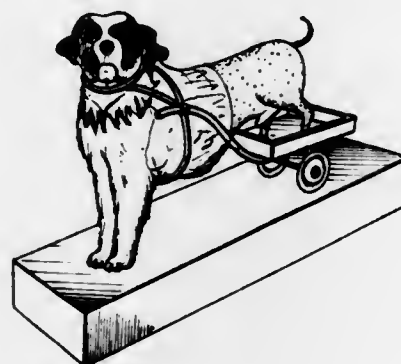


271,676

## WHEELED DOG STATUETTE

James R. Ivy, 9001 Glacier, Apt. 138, Texas City, Tex. 77590  
 Filed Feb. 6, 1981, Ser. No. 232,381  
 Term of patent 14 years  
 Int. Cl. D11-02

U.S. Cl. D11-158

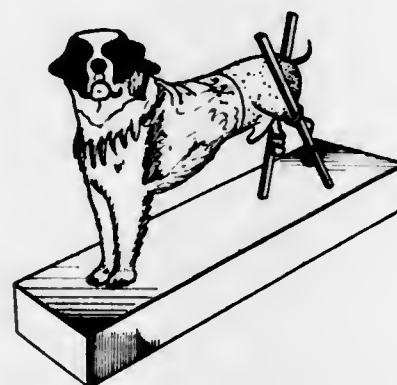


271,677

## DOG STATUETTE

James R. Ivy, Apt. 138, 9001 Glacier, Texas City, Tex. 77590  
 Filed Feb. 6, 1981, Ser. No. 232,382  
 Term of patent 14 years  
 Int. Cl. D11-02

U.S. Cl. D11-158



271,678

## FLAG

Dale R. Hemphill, 1435 Fallcreek Dr., Mishawaka, Ind. 46544  
 Continuation-in-part of Ser. No. 330,150, Dec. 14, 1981,  
 abandoned. This application May 17, 1982, Ser. No. 378,525  
 Term of patent 14 years  
 Int. Cl. D11-05

U.S. Cl. D11-173



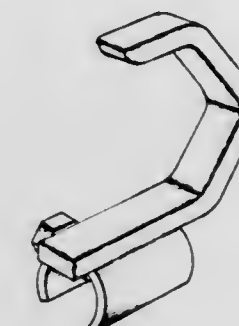
271,680

## VEHICLE CARRIER ATTACHMENT

Nikolas K. Boshco, 2866 Verde Vista Dr., Santa Barbara, Calif. 93105

Filed Jul. 17, 1981, Ser. No. 284,357  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-157



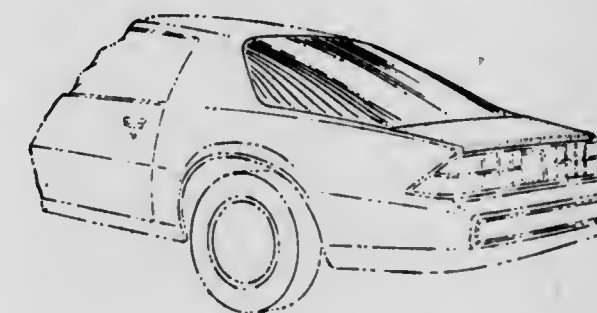
271,681

## COMBINED REAR WINDOW AND TRUNK LID FOR AN AUTOMOBILE

Roger E. Hugnet, West Bloomfield, and Jerry P. Palmer, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1981, Ser. No. 231,004  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-183

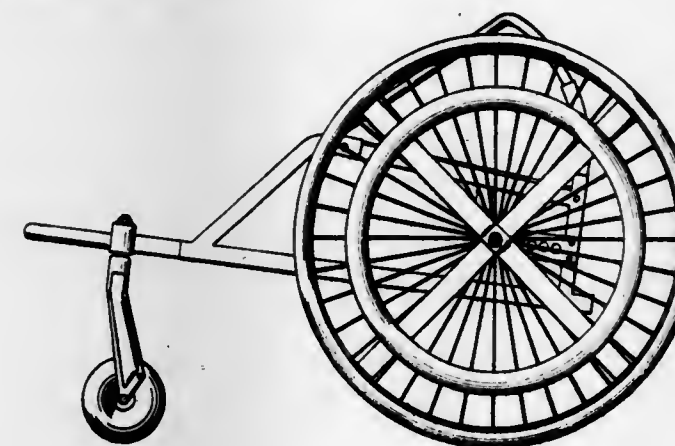


271,679

## WHEELCHAIR

Jeffrey P. Minnebraker, Westlake Village, Calif., assignor to Quadra Wheelchairs, Inc., Westlake Village, Calif.  
 Filed Mar. 24, 1981, Ser. No. 246,999  
 Term of patent 14 years  
 Int. Cl. D12-12

U.S. Cl. D12-131



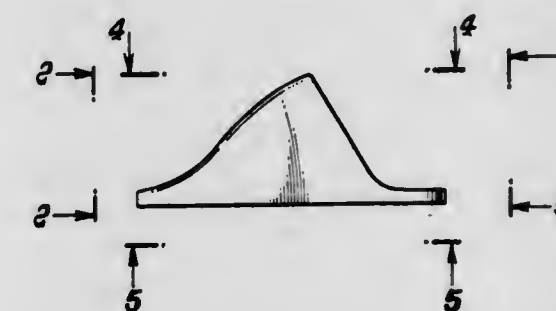
271,682

## MARINE VENTILATOR FITTING

Alexander S. O. MacDougall, 495 Valley Club Rd., Santa Barbara, Calif. 93108

Filed Nov. 16, 1981, Ser. No. 321,467  
 Term of patent 14 years  
 Int. Cl. D12-16

U.S. Cl. D12-317

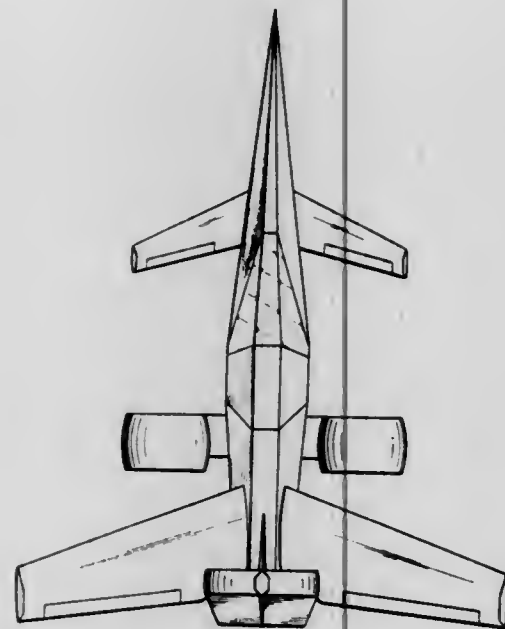




271,683

**VERTICAL TAKEOFF AND LANDING AIRCRAFT**  
Robert T. Clifton, Houston, Tex., assignor to Dyna Con Tech Corporation, South Houston, Tex.  
Filed Aug. 21, 1981, Ser. No. 295,224  
Term of patent 14 years  
Int. Cl. D12-07

U.S. Cl. D12-326

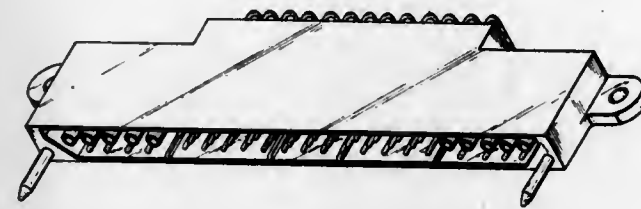


271,685

**MULTI-CONTACT ELECTRICAL CONNECTOR PLUG**  
Albert Casciotti, Hershey, and Robert D. Hollyday, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 28, 1981, Ser. No. 335,046  
Term of patent 14 years  
Int. Cl. D13-03

U.S. Cl. D13-24

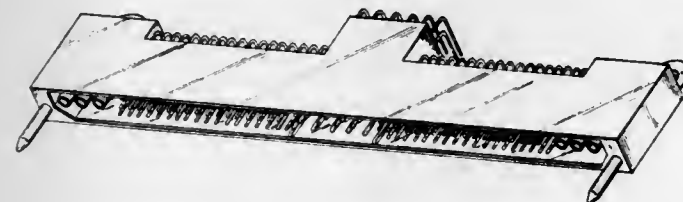


271,686

**MIXED TERMINAL ELECTRICAL CONNECTOR PLUG**  
Albert Casciotti, Hershey, and Robert D. Hollyday, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 28, 1981, Ser. No. 335,047  
Term of patent 14 years  
Int. Cl. D13-03

U.S. Cl. D13-24

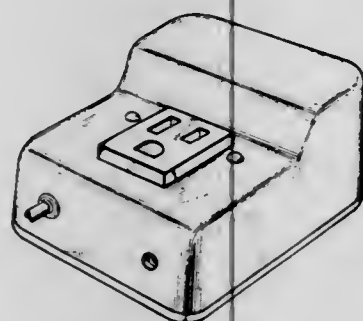


271,684

**COMBINED CONDUCTIVITY MONITOR AND CONTROLLER**  
William J. Berry, Jr., Durham, N.C., assignor to Darco Water Systems, Inc., Durham, N.C.

Filed Mar. 10, 1980, Ser. No. 128,634  
Term of patent 14 years  
Int. Cl. D13-03

U.S. Cl. D13-11

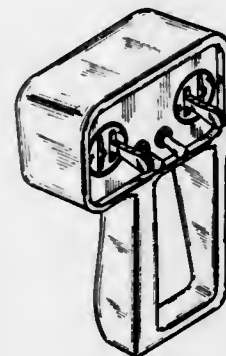


271,687

**REMOTE CONTROL HANDLE FOR CRANE**  
Edward E. Griffiths, 6499 Trinidad Dr., San Jose, Calif. 95120

Filed Dec. 5, 1979, Ser. No. 100,701  
Term of patent 14 years  
Int. Cl. D13-03

U.S. Cl. D13-32



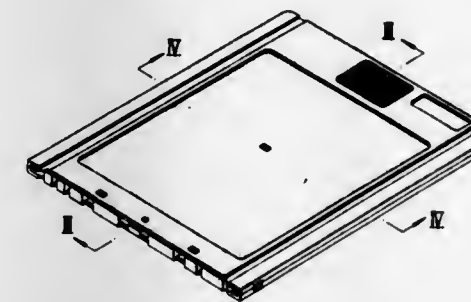
271,688

**PRE-RECORDED CARTRIDGE VIDEO/AUDIO DISK**  
Osamu Tajima, Ayase; Takashi Yamamura, Yokohama; Masafumi Mochizuki, Yamato, and Yoichi Mita, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 166,781, Jul. 7, 1980. This application Jul. 15, 1981, Ser. No. 283,624  
Claims priority, application Japan, Feb. 1, 1980, 55-14482

Term of patent 14 years  
Int. Cl. D14-99; D16-99

U.S. Cl. D14-11



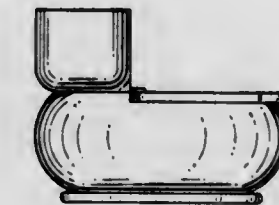
271,690

**TELEPHONE SUPPORT**

Ron Strobel, 2345 NW. Market Pl., Bend, Oreg. 97701  
Filed Jan. 26, 1981, Ser. No. 228,216

Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-60



271,689

**TELEPHONE UNIT**

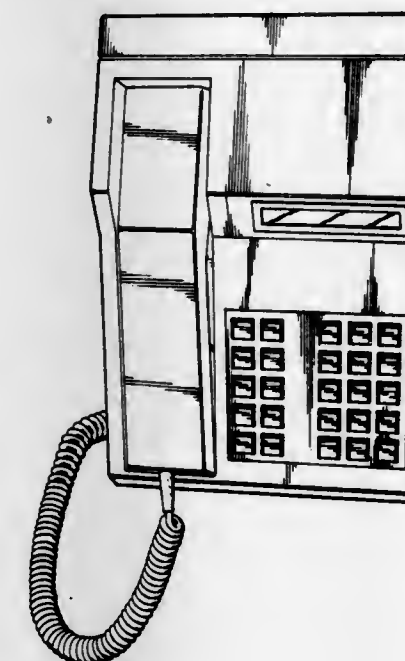
Armand J. Gerniers, Mariakerke, Belgium, assignor to GTE ATEA, Herentals, Belgium

Filed Jan. 21, 1981, Ser. No. 226,637

Claims priority, application Benelux, Jul. 22, 1980, DM/000277

Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-58



271,691

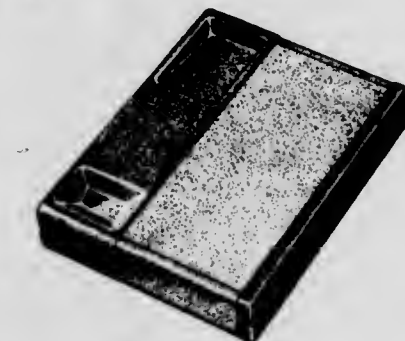
**TELEPHONE STAND**

Ghanshyam A. Bhat, Marlboro; Donald M. Genaro, Haworth, both of N.J.; John N. McGarvey, Drexel Hill, Pa.; Albert C. Stiekler, Little Silver, N.J.; Gordon E. Sylvester, Jamaica, N.Y., and Daniel W. Tyler, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 5, 1981, Ser. No. 308,507

Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-60





271,692

**CASING FOR AUDITORY TRAINER RECEIVER**

Wayne E. Morris, Brooklyn Park, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Dec. 8, 1980, Ser. No. 213,854

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D14-70



271,693

**TELEPHONE HANDSET**

Bayard F. Kessler, Novation, Inc., 20409 Priarie, Chatsworth, Calif. 91311

Filed Sep. 1, 1981, Ser. No. 298,281

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-63



271,694

**AUDIO AMPLIFIER**

Toshihito Nomura, and Hirotsuka Imai, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

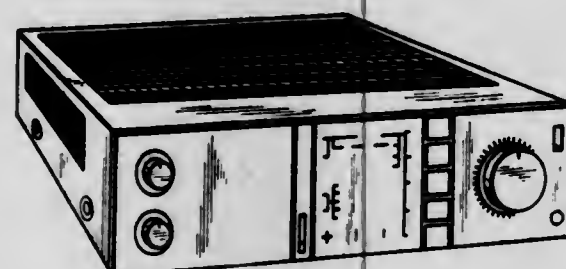
Filed Jul. 8, 1981, Ser. No. 281,262

Claims priority, application Japan, Jan. 9, 1981, 56-274

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-96



271,695

**MICROCOMPUTER ANALYZER**

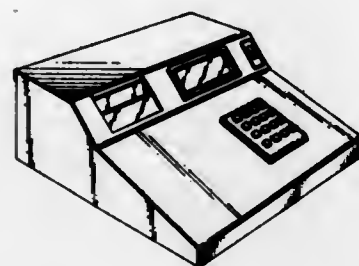
James C. Tuma, Minneapolis, and Donald A. Farland, New Hope, both of Minn., assignors to MRM Computers, Inc., Minneapolis, Minn.

Filed Sep. 14, 1981, Ser. No. 301,511

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D14-106



271,696

**MULTI-PRODUCT FUEL DISPENSER**

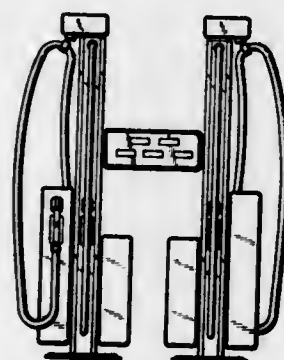
John A. Todd, Salisbury, Md., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 952,166, Oct. 17, 1978, Pat. No. Des. 260,897. This application Apr. 23, 1981, Ser. No. 256,290

Term of patent 14 years

Int. Cl. D15-02

U.S. Cl. D15-9.2



271,697

**TRAY FOR A MECHANICAL PRECIOUS METAL RECOVERY DEVICE**

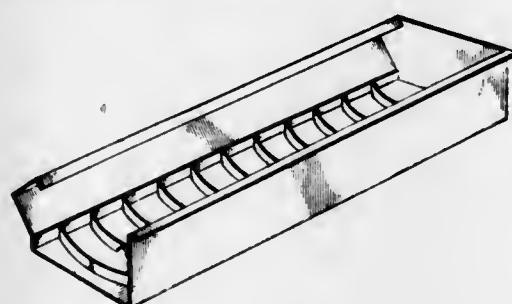
James L. Weir, Camarillo, Calif., assignor to Au Equipment Associates, Ltd., Westlake Village, Calif.

Filed Nov. 23, 1981, Ser. No. 324,383

Term of patent 14 years

Int. Cl. D15-99

U.S. Cl. D15-147



271,698

**RING FOR COUPLING CAMERA TO ENDOSCOPE**

Yoshio Shishido, Sagami-hara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

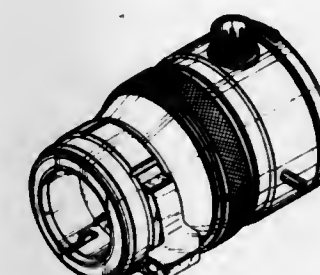
Filed Apr. 8, 1981, Ser. No. 252,073

Claims priority, application Japan, Oct. 8, 1980, 55-41981

Term of patent 14 years

Int. Cl. D16-05

U.S. Cl. D16-38



271,700

**HOLDER FOR FLOPPY DISCS**

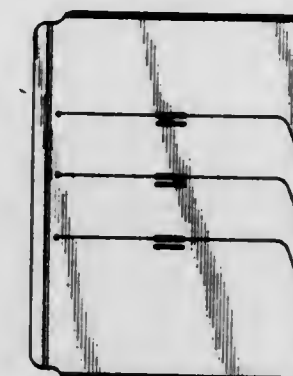
Donald L. Boughner, Churchville, and John M. Quincey, Pavilion, both of N.Y., assignors to BOK Plastics, Inc., Leroy, N.Y.

Filed May 18, 1981, Ser. No. 264,471

Term of patent 14 years

Int. Cl. D19-04

U.S. Cl. D19-33



271,701

**PLAYING CARD**

Frank J. Wirken, Overland Park, Kans., assignor to Jack-Poker, Ltd., Kansas City, Mo.

Filed Jun. 5, 1981, Ser. No. 270,605

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-42



271,699

**HOLDER FOR A RULE BOOK AND SCORE CARD**

Roy C. Draddy, 9 Dunfries Pl., Floreat Park, Australia

Filed Jan. 30, 1980, Ser. No. 230,283

Claims priority, application Australia, Aug. 4, 1980, 81698

Term of patent 14 years

Int. Cl. D19-04

U.S. Cl. D19-26



271,702

**SPACESHIP TOY**

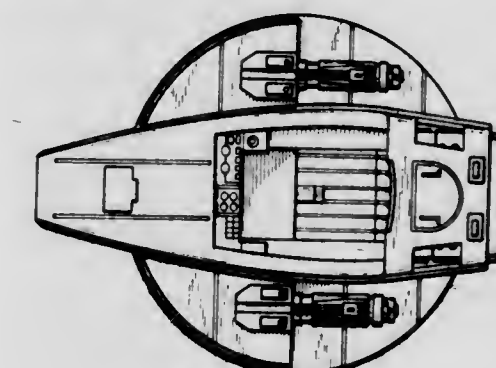
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 4, 1982, Ser. No. 345,742

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-87





271,703  
DOLL

Brian R. Pennington, 2408 Shawnee Dr., Great Bend, Kans.  
67530

Filed Nov. 30, 1981, Ser. No. 325,740

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-150



271,705

COMBINED ESCUTCHEON AND DIVERTER VALVE  
CONTROL FOR BATHTUB/SOWER UNITS

Wolfgang Fabian, Mannheim, Fed. Rep. of Germany, assignor to  
American Standard Inc., New York, N.Y.

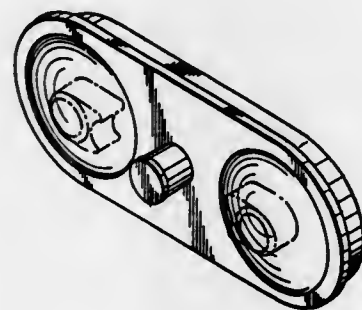
Division of Ser. No. 92,874, Nov. 9, 1979. This application May  
14, 1982, Ser. No. 378,363

Claims priority, application Fed. Rep. of Germany, Jun. 13,  
1979, 79/3

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-26



271,704  
FAUCET

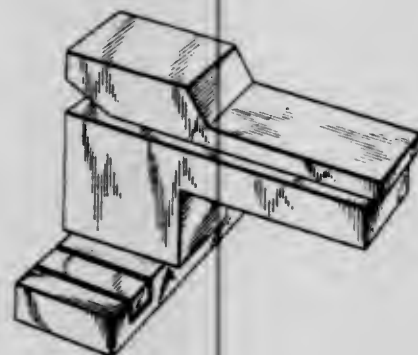
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc.,  
Long Island City, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,581

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-23



271,706  
SPOUT

Wolfgang Fabian, Mannheim, Fed. Rep. of Germany, assignor to  
American Standard Inc., New York, N.Y.

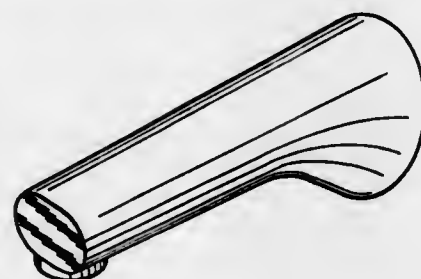
Division of Ser. No. 92,874, Nov. 9, 1979. This application May  
14, 1982, Ser. No. 378,366

Claims priority, application Fed. Rep. of Germany, Jun. 13,  
1979, 79/3

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-32



271,707

SEWERLESS TOILET OR SIMILAR ARTICLE

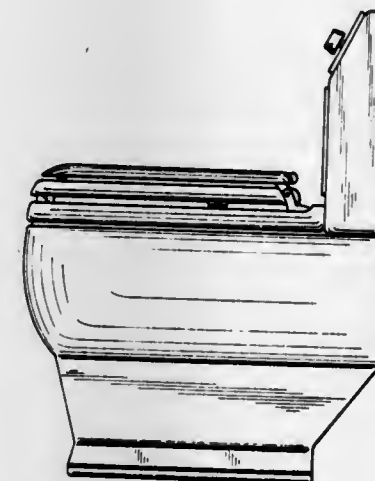
Kenneth J. De Graw, Montvale, and Earl W. Nickerson, Ocean  
City, both of N.J., assignors to American Standard Inc., New  
York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,267

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-48



271,708

SEWERLESS TOILET OR SIMILAR ARTICLE

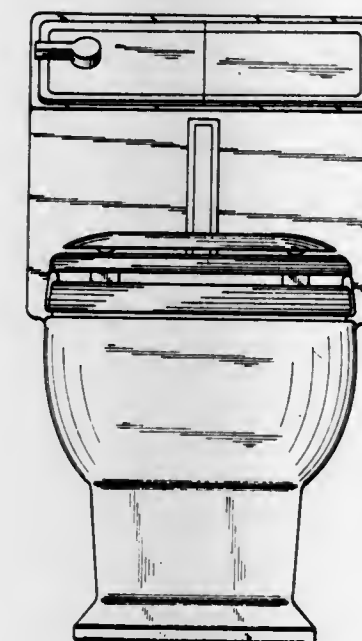
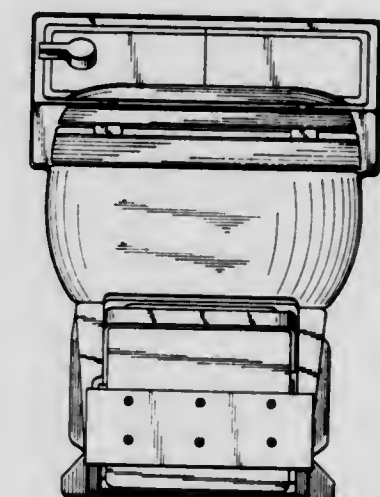
Kenneth J. DeGraw, Montvale, and Earl W. Nickerson, Ocean  
City, both of N.J., assignors to American Standard Inc., New  
York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,268

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-48



271,709

WOOD FUELED WATER HEATER OR THE LIKE

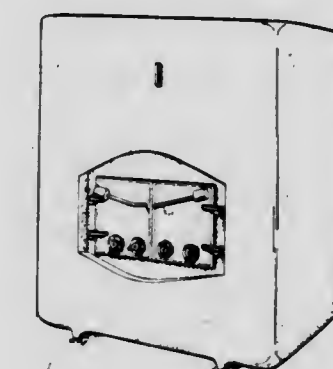
Fred R. Snow, Jr., Box 77, Rte. 3, Dobson, N.C. 27017

Filed Dec. 2, 1981, Ser. No. 326,672

Term of patent 14 years

Int. Cl. D23-97

U.S. Cl. D23-86





**271,710  
STOVE**

Richard A. Russo, Abington, Mass., assignor to Russo Manufacturing Corp., Randolph, Mass.

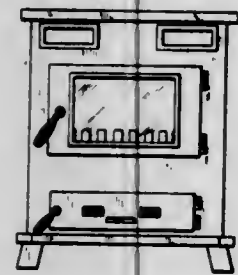
Filed Aug. 3, 1981, Ser. No. 289,785

The portion of the term of this patent subsequent to Mar. 23, 1996, has been disclaimed.

Term of patent 14 years

Int. Cl. D23—03

U.S. Cl. D23—97



**271,712  
EVAPORATIVE COOLER**

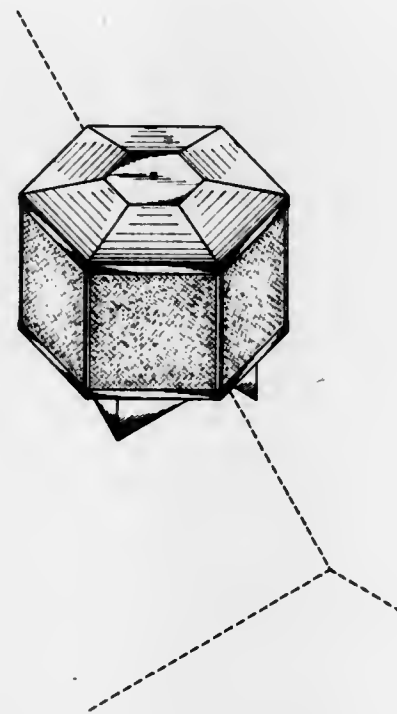
Kaywood R. Rodgers, and Myrtle H. Rodgers, both of 712 E St., Taft, Calif. 93268

Filed Dec. 19, 1980, Ser. No. 218,425

Term of patent 14 years

Int. Cl. D23—04

U.S. Cl. D23—139



**271,711**

**FIREPLACE HEAT EXCHANGER**

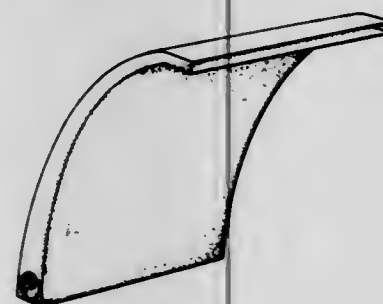
Allen L. Stewart, P.O. Box 241, Clayton, N.C. 27520

Filed May 26, 1981, Ser. No. 267,030

Term of patent 14 years

Int. Cl. D23—03

U.S. Cl. D23—136



**271,713  
COMBINED STARTER VENT AND WATER SHEDDING  
VENTILATION STRIP**

Robert M. Hicks, 124 Main St., Westford, Mass. 01886

Filed Mar. 24, 1980, Ser. No. 133,542

Term of patent 14 years

Int. Cl. D23—04

U.S. Cl. D23—151



**271,714  
DISPOSABLE STAPLE CARTRIDGE FOR LINEAR  
CLOSURE SURGICAL STAPLER**

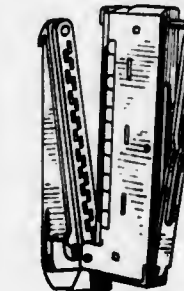
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jul. 2, 1981, Ser. No. 279,681

Term of patent 14 years

Int. Cl. D24—02

U.S. Cl. D24—27



**271,716  
BEVERAGE CART**

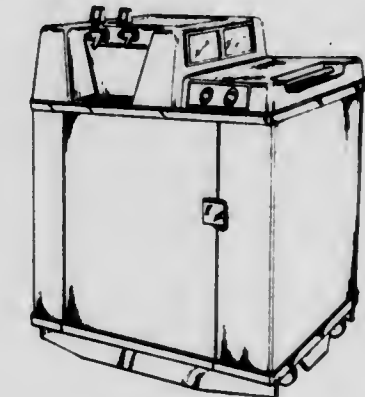
G. Merle Bachmann, Stone Mountain; Charles L. Davis, Atlanta, and Samuel C. Crosby, Decatur, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 2, 1981, Ser. No. 239,690

Term of patent 14 years

Int. Cl. D12—02

U.S. Cl. D34—14



**271,715  
PORTABLE BLOWER**

Katsumi Kiyooka, Warabi, Japan, assignor to Komatsu Zenoah Co., Tokyo, Japan

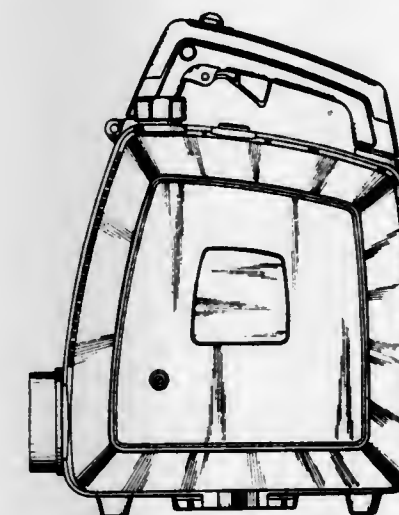
Filed Mar. 20, 1981, Ser. No. 229,292

Claims priority, application Japan, Jul. 31, 1980, 55-30853

Term of patent 14 years

Int. Cl. D15—05

U.S. Cl. D32—15



**271,717  
ELEVATED CREEPER FOR AUTOMOTIVE MECHANICS**

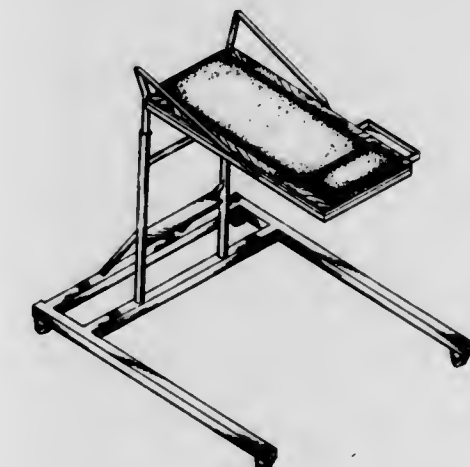
Clarence W. Linn, 1501 Academy, Lodi, Calif. 95240

Filed Jul. 8, 1981, Ser. No. 281,259

Term of patent 14 years

Int. Cl. D12—14

U.S. Cl. D34—17





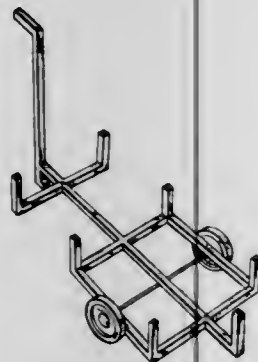
**271,718**  
**MOBILE TRASH BAG HOLDER**  
 Joseph A. John, Jr., and Sandra S. John, both of 8714 Link Ave., St. Louis, Mo. 63121  
 Filed Jan. 26, 1981, Ser. No. 228,249  
 Term of patent 14 years  
 Int. Cl. D12-02

U.S. Cl. D34-24



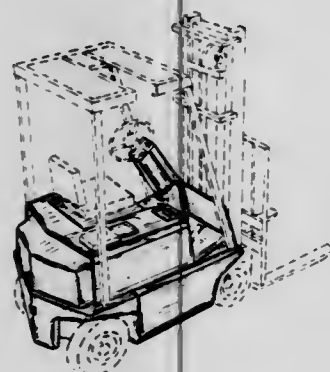
**271,719**  
**CART**  
 W. Lynn Streiff, 3230 Inspiration Dr., Colorado Springs, Colo. 80917  
 Division of Ser. No. 22,713, Mar. 22, 1979, Pat. No. Des. 263,691. This application Dec. 3, 1981, Ser. No. 327,268  
 Term of patent 14 years  
 Int. Cl. D12-02

U.S. Cl. D34-26



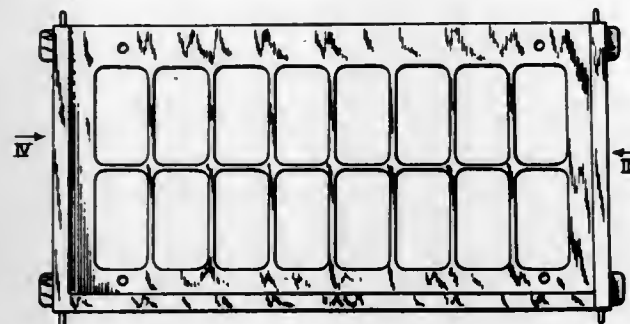
**271,720**  
**LIFT TRUCK BODY**  
 Warner K. Brown, Battle Creek, Mich., and Dennis M. Lanci, Renton, Wash., assignors to Clark Equipment Company, Buchanan, Mich.  
 Filed Jul. 30, 1981, Ser. No. 288,625  
 Term of patent 14 years  
 Int. Cl. D12-05

U.S. Cl. D34-37



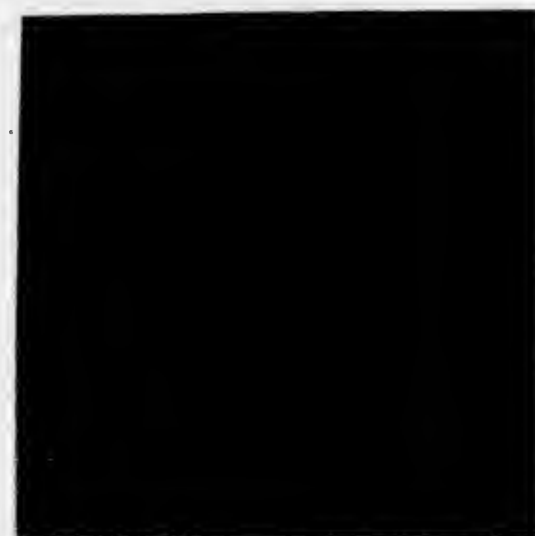
**271,721**  
**STORAGE BIN**  
 Robert T. Howitt, Leominster, Mass., assignor to Frem Corporation, Worcester, Mass.  
 Filed Oct. 19, 1981, Ser. No. 312,742  
 Term of patent 14 years  
 Int. Cl. D9-04

U.S. Cl. D34-40



**271,722**  
**TEXTILE FABRIC**  
 Richard Vipiana, Paris, France, assignor to Celine S.A., Paris, France  
 Filed Jun. 25, 1981, Ser. No. 277,402  
 Term of patent 14 years  
 Int. Cl. D5-05

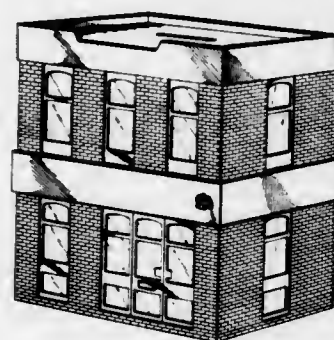
U.S. Cl. D92-1 P



**271,723**  
**MONEY BOX**  
 Matthew Lutos, London, England, assignor to Barclays Bank PLC, London, England  
 Filed Jun. 15, 1982, Ser. No. 388,600  
 Claims priority, application United Kingdom, Dec. 24, 1981, 1004365

Term of patent 14 years  
 Int. Cl. D31-00

U.S. Cl. D99-41



## LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF DECEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Aarding Weerstands B.V.: See—  
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- Abbott Laboratories: See—  
 Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,419,461, Cl. 521-126.000.
- Abe, Ryuzo: See—  
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- Abrams, John C., to Potters Industries, Inc. Conductive paste, electroconductive body and fabrication of same. 4,419,279, Cl. 252-514.000.
- Achtenberg, Theo: See—  
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- Ackermann, Jurgen; Moretto, Hans-Heinrich; Kniege, Wilfried; and Rauer, Werner, to Bayer Aktiengesellschaft. Flame-repellent polysiloxane molding compositions. 4,419,474, Cl. 524-195.000.
- Adams, Bertram C.: See—  
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- Adams, Kenneth E.; and Adams, Bertram C. Tow bar head for aircraft. 4,418,936, Cl. 280-493.000.
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- Advanced Mechanical Technology, Inc.: See—  
 Schuetz, Mark A., 4,419,074, Cl. 431-354.000.
- Aeroquip Corporation: See—  
 Nelson, Roger, 4,418,450, Cl. 24-265.0CD.
- Agatsuma, Shunichi, to Omron Tateisi Electronics Co. Unitary contact-terminal blades integrally formed in a molded base. 4,419,640, Cl. 335-106.000.
- Agfa-Gevaert Aktiengesellschaft: See—  
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- Agnese, Gino: See—  
 Ghelli, Giovanni; Bruschi, Enrico; and Agnese, Gino, 4,419,515, Cl. 546-5.000.
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- Ainslie, Norman G.; Krzanowski, James E.; and Palmateer, Paul H., to International Business Machines Corp. High melting point process for Au:Sn:80:20 brazing alloy for chip carriers. 4,418,857, Cl. 228-124.000.
- Aisin Seiki Kabushiki Kaisha: See—  
 Fujimori, Fumio, 4,418,797, Cl. 188-73.370.
- Katagiri, Masayoshi; Nomura, Yoshihisa; Kawaguchi, Hiroshi; Nishina, Shuho; and Miura, Eiji, 4,418,964, Cl. 303-6.00C.
- Yamamoto, Junji; and Harada, Shingo, 4,418,956, Cl. 296-216.000.
- Akihiro, Hirai: See—  
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- Akiyama, Toshimitsu; and Kasamatsu, Tadashi, to K-Three Products Kabushiki Kaisha. Method of producing corrugated cardboards and apparatus. 4,419,173, Cl. 156-470.000.
- Aktiebolaget Bofors: See—  
 Boberg, Tore, 4,419,153, Cl. 149-22.000.
- Aktiebolaget Draco: See—  
 Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., 4,419,364, Cl. 424-300.000.
- Aktiengesellschaft Adolph Saurer: See—  
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- Akzona Incorporated: See—  
 Clemence, Dudley A.; and Das, Pankaj K., 4,419,322, Cl. 264-343.000.
- Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., 4,419,140, Cl. 106-273.00N.
- Albany International Corp.: See—  
 Bolton, Joseph A.; and Dufresne, Louis L., 4,419,249, Cl. 210-783.000.
- Josef, Michael J.; and Lanthier, Joseph D., 4,418,726, Cl. 139-383.00A.
- Alberta Energy Company Ltd.: See—  
 Jagodzinski, Richard F.; and Kerr, Richard K., 4,419,337, Cl. 423-574.00R.
- Alexander, Brian S., to Hollister Incorporated. Ostomy appliance and faceplate attachment thereof. 4,419,100, Cl. 604-339.000.
- Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., to Colgate-Palmolive Company. Agglomerated bentonite particles for incorporation in heavy duty particulate laundry softening detergent compositions. 4,419,250, Cl. 252-8.600.
- Allen, John D., Jr.: See—  
 McCulla, William H.; and Allen, John D., Jr., 4,418,989, Cl. 350-486.000.
- Allen Organ Company: See—  
 Whitefield, John T., 4,418,601, Cl. 84-1.260.
- Allen, Susan M.: See—  
 Barry, Brian; Sadler, John H. R.; Allen, Susan M.; and Artt, David W., 4,419,044, Cl. 415-117.000.
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 O'Connor, John W., 4,418,935, Cl. 280-461.00A.
- Allmer, Franz, to Canon Corporation. Bidirectionally operative tie exchanging apparatus. 4,418,625, Cl. 104-9.000.
- Allred, David D.: See—  
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- Alpert, Nathaniel M.: See—  
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- Altman, Vladimir. Stopping fixture. 4,418,592, Cl. 82-34.00C.
- Alumax, Inc.: See—  
 Arnold, J. Edgar, 4,418,435, Cl. 15-4.000.
- Alwani, Dru: See—  
 Nelsen, Suzanne; Ozari, Yehuda; Alwani, Dru; and Wotier, Edward, 4,419,471, Cl. 524-100.000.
- Alwani, Dru W.: See—  
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- ALZA Corporation: See—  
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- AM General Corporation: See—  
 Goodell, Fred L.; and Ellison, Michael J., 4,418,737, Cl. 152-416.000.
- Amca International Corporation: See—  
 Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,418,561, Cl. 72-406.000.
- Amchem Products, Inc.: See—  
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- American Can Company: See—  
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- Oppermann, Walter J., 4,419,373, Cl. 426-234.000.
- American Carbons, Inc.: See—  
 Bowen, Mack D.; and Purdy, Kenneth R., 4,419,185, Cl. 201-4.000.
- American Cyanamid Company: See—  
 Chang, Eugene Y. C.; and Behrens, Rudolf A., 4,419,493, Cl. 525-76.000.
- Child, Ralph G.; and Lang, Stanley A., Jr., 4,419,354, Cl. 424-248.560.
- Feldman, Allan M.; and Forgione, Peter S., 4,419,294, Cl. 260-453.00A.
- Pong, Richard G. S.; Nandagiri, Arun; Bilynskyj, Oleh M.; and Hunter, Le Roy, 4,418,846, Cl. 222-189.000.
- Zoltan, Bart J., 4,419,016, Cl. 368-10.000.
- American Hoechst Corporation: See—  
 Neumann, Don B.; Norton, Lyle K.; and Olson, Eric V., 4,419,675, Cl. 346-108.000.
- American Home Products Corporation: See—  
 Wei, Peter H. L.; and Bell, Stanley C., 4,419,516, Cl. 546-119.000.
- American Hospital Supply Corporation: See—  
 Deaton, David W., 4,419,093, Cl. 604-49.000.
- American Newspaper Publishers Association: See—  
 Moynihan, John T., 4,419,132, Cl. 106-27.000.
- American Sawmill Machinery Company: See—  
 Dwyer, Liam D., 4,419,534, Cl. 174-10.000.
- American Standard Inc.: See—  
 Hart, James E.; Spalding, Willard P.; and Kyllonen, Allen W., 4,418,799, Cl. 188-153.00R.
- American Tourister, Inc.: See—  
 Bradley, Leonard R.; Schmitt, Wayne I.; and Macedo, Antone F., Jr., 4,418,804, Cl. 190-18.00A.
- Ammon, J. Preston; Weaver, Harry R.; and Norman, Richard O., to Elfab Corporation. Method of manufacturing a printed circuit card edge connector having a pull through bellows contact a lay-over insulator. 4,418,475, Cl. 29-842.000.
- AMP Incorporated: See—  
 Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,418,983, Cl. 350-96.210.
- Brown, Christopher K.; and Wion, Donald A., 4,418,453, Cl. 29-33.00M.



- MacDougall, Alan R., 4,418,974, Cl. 339-75.00M.  
 Ampex Corporation: See—  
 Morrison, Eric F., 4,419,686, Cl. 358-13.000.  
 Amsterdam Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V.: See—  
 Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., 4,418,484, Cl. 37-63.000.  
 Ancona, Frank A. Fish bait protector. 4,418,490, Cl. 43-25.200.  
 Anderson, Ardis L.: See—  
 Boyer, Lyndon D.; Anderson, Ardis L.; and Britton, Michael W., 4,418,752, Cl. 166-267.000.  
 Anderson-Cook, Inc.: See—  
 Killop, James T., 4,418,454, Cl. 29-90.00B.  
 Anderson, Gary W.; and Stake, Dennis G., to Electronic Equipment Development Ltd. Nonmagnetic lead handling system. 4,418,815, Cl. 198-476.000.  
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 Hort, Eugene V.; Anderson, Lowell R.; and Alwani, Dru W., 4,419,266, Cl. 252-392.000.  
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 Angelini, Sergio, to Brevetti Elettrolavori Superfiniture S.R.L. Method and apparatus for continuously chromium-plating. 4,419,194, Cl. 204-25.000.  
 Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, to Mobil Oil Corporation. Catalytic conversion of shale oil. 4,419,218, Cl. 208-59.000.  
 Anglo-American Clays Corporation: See—  
 Cook, Jerry A.; and Cobb, Gary L., 4,419,228, Cl. 209-9.000.  
 Ani-live Film Service, Inc.: See—  
 Cooper, Sidney; and Jacob, Ezekiel J., 4,419,430, Cl. 430-109.000.  
 Ankeny, V. Scott, to Taffco Equipment Company. Vehicle spare tire carrier. 4,418,851, Cl. 224-42.000.  
 Ansie, William K.; Van Haastert, J. A.; and Cleary, James D., to Figgie International Inc. Gas filter container. 4,419,110, Cl. 55-356.000.  
 Aoki, Hiroyuki: See—  
 Oshima, Masaharu; Ikezawa, Kenji; and Aoki, Hiroyuki, 4,419,213, Cl. 204-425.000.  
 Apblett, William R., Jr.; and Rehn, Irwin M., to Electric Power Research Institute, Inc. Spall-resistant steel tubing or other steel articles subjected to high temperature steam and method. 4,419,144, Cl. 148-6.200.  
 Apcom, Inc.: See—  
 Murphy, Robert A.; and Fehrmann, George L., 4,419,567, Cl. 219-336.000.  
 Applegate, Edward R. Vehicle fuel cap locking device. 4,418,553, Cl. 70-164.000.  
 Appliance Design Probe Inc.: See—  
 McGaw, John, 4,419,565, Cl. 219-222.000.  
 Applied Materials, Inc.: See—  
 Kirshman, Samson, 4,419,076, Cl. 432-253.000.  
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 Arai, Ryuji: See—  
 Chiba, Yoshiharu; Umezawa, Hidetsugu; Sakabe, Takao; and Arai, Ryuji, 4,418,729, Cl. 139-452.000.  
 Arai, Yoshihiro; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording media and process of producing them. 4,419,404, Cl. 428-336.000.  
 Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., to Abbott Laboratories. Catalyst for making polyurethanes. 4,419,461, Cl. 521-126.000.  
 Ardac, Inc.: See—  
 Gorgone, Robert L.; and Dolejs, Anthony H., 4,418,824, Cl. 209-534.000.  
 Arendt, Henry P.: See—  
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 Arie, Simon; Courvoisier, Guy; and Prost, Jean-Louis, to Battelle Memorial Institute. Process for measuring and analyzing potentials of piezo-electric origin generated by a rigid member made of an organic material. 4,418,577, Cl. 73-772.000.  
 Arlt, Dieter; and Klein, Gerhard, to Bayer Aktiengesellschaft. Preparation of nitriles from formamides. 4,419,297, Cl. 260-465.200.  
 Armstrong World Industries, Inc.: See—  
 Hager, Nathaniel E., Jr., 4,419,023, Cl. 374-179.000.  
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 Arnold, J. Edgar, to Alumax, Inc. Carbon butt cleaning apparatus and method. 4,418,435, Cl. 15-4.000.  
 Arntz, Oscar S.; and Engstrom, Thord I. Filtering and collecting device for water drains. 4,419,232, Cl. 210-164.000.  
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 ASEA Aktiebolag: See—  
 Bergdahl, Bernd, 4,419,660, Cl. 340-653.000.  
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 Ashihara, Yoshihiro: See—  
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 Asselin, George F., to UOP Inc. Recovery of aromatic hydrocarbons and a non-aromatic raffinate stream from a hydrocarbon charge stock. 4,419,226, Cl. 208-325.000.  
 Astle, William H., to Tri Tool Inc. Pipe end preparation and cutoff tool. 4,418,591, Cl. 82-4.00C.  
 Ataka, Saburo: See—  
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 Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., to University of Manchester Institute of Science and Technology, The; and Simon-Hartley Limited. Growth of biomass. 4,419,243, Cl. 210-618.000.  
 Atkinson, Ivor B.; and Holdstock, Barry C. Preparation of cross-linked hydrogel copolymers for contact lenses. 4,419,463, Cl. 523-106.000.  
 Atlantic Richfield Company: See—  
 Emery, Leonard W., 4,418,751, Cl. 166-261.000.  
 Miller, Richard F., 4,419,106, Cl. 44-62.000.  
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 Atlas Aluminium-Fahrzeugtechnik GmbH: See—  
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 Atsumi, Tomiaki; Kuse, Kazumasa; and Deto, Junji, to Toyota Jidosha Kabushiki Kaisha. Cushioned mounting device with a mass member forming a sub-oscillation system and means for restricting cushioning movement. 4,418,898, Cl. 267-63.00R.  
 Audeh, Costandi A., to Mobil Oil Corporation. Process for improving the yield of shale oil. 4,419,217, Cl. 208-11.00R.  
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 August Hohnholz KG: See—  
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- Beckman Instruments, Inc.: See—  
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- Becton Dickinson and Company: See—  
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- Bell, Richard L.: See—  
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- Bell, Stanley C.: See—  
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- Bell Telephone Laboratories, Incorporated: See—  
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- Levinstein, Hyman J.; and Vratny, Frederick, 4,419,201, Cl. 204-192.00E.
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- Belter, Jerome G., to Dana Corporation. Fluid seal for engine crankshaft applications. 4,418,920, Cl. 277-50.000.
- Benasutti, John E., to Burroughs Corporation. Electrical connector for printed wiring board. 4,418,972, Cl. 339-14.00R.
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- Bengtsson, Bengt A. Apparatus for loading objects. 4,419,039, Cl. 414-590.000.
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- Bennett, Michael C., to Becton Dickinson and Company. Needle shield. 4,419,098, Cl. 604-263.000.
- Benson, Inc.: See—  
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- Bentley, Arthur P. Rotary engine. 4,418,663, Cl. 123-243.000.
- Benton, William M., to Vericard Corporation. Output power modulated wind responsive apparatus. 4,419,587, Cl. 290-44.000.
- Benveniste, Victor M., to Eaton Semi-Conductor Implantation Corporation. Treating workpiece with beams. 4,419,584, Cl. 250-492.200.
- Bergdahl, Bernt, to ASEA Aktiebolag. Electric filter equipment. 4,419,660, Cl. 340-653.000.
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- Berkovitz, Michael A.: See—  
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- Bernard, Gary A.: See—  
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- Berner, Godwin; Rembold, Manfred; and Rody, Jean, to Ciba-Geigy Corporation. Piperidine compositions for light stabilization. 4,419,472, Cl. 524-102.000.
- Beroff, Howard; Dodd, Namassivaya; and Jewusiak, Stephen J., to Ethicon, Inc. Non-metallic, bio-compatible hemostatic clips. 4,418,694, Cl. 128-326.000.
- Bertails, Jean P.; Perrin, Cristian; and Tallaron, Louis, to Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux (EFCIS). Integrated circuit amplifier functioning in class AB and incorporating CMOS (metal oxide semiconductor) technology. 4,419,631, Cl. 330-255.000.
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- Beschke, Helmut: See—  
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- Bettendorf Stanford Inc.: See—  
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- Biegelsen, David K.: See—  
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- Bindon, Jeffrey P. Electrolytic halogen generators. 4,419,207, Cl. 204-237.000.
- Biomass Development S.A.: See—  
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- Biotronik Mess- und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin: See—  
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- Bjornholt, John E., to Motorola Inc. Augmented phase-locked loop for very wide range acquisition and method therefor. 4,419,760, Cl. 375-120.000.
- Black & Decker Inc.: See—  
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- Black, Geoffrey M.: See—  
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- Blad, Leiv H., to Lockheed Corporation. Automated lay-up machine. 4,419,170, Cl. 156-361.000.
- Blair, George R.: See—  
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- Blakely, Donald W., deceased: See—  
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- Bleching, Chester J., to Ford Motor Company. Low noise vortex shedding fluid flow sensor. 4,418,578, Cl. 73-861.220.
- Blessum, Norman S.: See—  
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- Blickle, Karl: See—  
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- Bliss, Arthur E.: See—  
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- Blum, Arnold, to International Business Machines Corporation. Decentralized generation of synchronized clock control signals having dynamically selectable periods. 4,419,739, Cl. 364-900.000.

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- Bodrov, Igor S.; Gudiz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., to Moskovsky Institut Khimicheskogo Mashinostroenia. Sewer plant for compressor station of gas pipeline system. 4,418,530, Cl. 60-39.181.
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- Boer, Kornelis; and De Widt, Hugo, to U.S. Philips Corporation. Luminaire. 4,419,719, Cl. 362-218.000.
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- Boginskaya, Lidia M.: See—  
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- Borg-Warner Corporation: See—  
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- Borst, Gaylord M., to Outboard Marine Corporation. Power assisted steering for marine propulsion device. 4,419,084, Cl. 440-58.000.
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- Bosso, Joseph F.: See—  
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- Bowers, Rex A.: See—  
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- Brand, Leonard J.; and Nadelson, Jeffrey, to Sandoz, Inc. Isoxazoly indolamines. 4,419,353, Cl. 424-248.400.
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- Brauer, Lothar. Gas analysis sensor for measuring concentration of gas constituent. 4,419,211, Cl. 204-408.000.
- Breant, Claude, to Rhone-Poulenc Industries. N,N-Diethylheptanamide fragrances. 4,419,281, Cl. 252-522.00R.
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- Bredeweg, Roger L.: See—  
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- Breger, Joseph L. Presbyopic contact lens. 4,418,991, Cl. 351-161.000.
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- Breuer Electric Mfg. Co.: See—  
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- British Petroleum Company Limited, The: See—  
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- Broadbent, Merle Y.: See—  
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- Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., to Fiber Industries, Inc. Self crimping yarn and process. 4,419,313, Cl. 264-167.000.
- Brookhart, Todd E.: See—  
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- Brower, Ralph D.; and Losee, Paul D., to Iomega Corporation. Ferrite beveled core for magnetic head. 4,419,705, Cl. 360-103.000.
- Brown, Boveri & Cie AG: See—  
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- Brown, Christopher K.; and Wion, Donald A., to AMP Incorporated. Heating apparatus for shrink tubing. 4,418,453, Cl. 29-33.00M.
- Brown, Morton E., to Southern Gas Association. Apparatus for phase measurement. 4,419,624, Cl. 324-83.00D.
- Brown, Morton E., to Southern Gas Association. Signal source for compressor analog. 4,419,735, Cl. 364-803.000.
- Brown, Paul; and O'Brien, Joseph, to Metpath Inc. Method and apparatus for collecting saliva. 4,418,702, Cl. 128-760.000.
- Broze, Guy J.: See—  
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- Brunswick Corporation: See—  
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- Bruschi, Enrico: See—  
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- Bryer, Phillip S.: See—  
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- Bucken, Bernd: See—  
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- Buckley, John A. Foldable cover for a truck bed, 4,418,954, Cl. 296-100.000.
- Budapesti Muszaki Egyetem: See—  
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- Buddy L Corporation: See—  
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- Buffet, Jacques. Implantable cardiac stimulator having therapeutic diagnostic functions, 4,418,695, Cl. 128-419.0PG.
- Bufkin, B. George: See—  
Gooch, Jan W.; Bufkin, B. George; and Wildman, Gary C., 4,419,139, Cl. 106-252.000.
- Bugaut, Andree; and Cotteret, Jean, to L'Oreal. Chlorine-substituted nitro-para-phenylenediamines, a process for their preparation and their use in dyeing keratin fibres, 4,419,101, Cl. 8-415.000.
- Burk, Ronnie F., to Deere & Company. Low pressure fluid supply system, 4,419,055, Cl. 417-396.000.
- Burke, John F.: See—  
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- Burkemper Methods, Inc.: See—  
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- Burlington Industries, Inc.: See—  
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- Wang, Kenneth Y.; and McConnell, Bobby L., 4,419,160, Cl. 156-73.200.
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- Burroughs Corporation: See—  
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- Ragle, Herbert U.; and Blessum, Norman S., 4,419,700, Cl. 360-77.000.
- Shultz, Richard E.; and Voecks, William E., Jr., 4,418,907, Cl. 271-157.000.
- Bury, George J. Light emitting diode holder, 4,419,722, Cl. 362-396.000.
- Busatis-Werke GmbH u.Co K.G. Boge GmbH: See—  
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- Busch, Lloyd E.: See—  
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- Bush, Darrell, to Core Laboratories, Inc. Method of coating core samples, 4,419,314, Cl. 264-130.000.
- Buswell, Harrie R. Continuous tube refrigeration system, 4,418,546, Cl. 62-115.000.
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- Butler, Neal R.; and Carson, Alan R., to Honeywell Inc. Ultra fast driver circuit, 4,419,593, Cl. 307-268.000.
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- Byers, John E. Sharpening device for single edge type cutting blades, 4,418,588, Cl. 76-88.000.
- C. C. Bouldin Inc.: See—  
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- Cady, William R.: See—  
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- Cahill, Dermot J., to Chubb Security Installations Limited. Security transfer arrangements, 4,418,628, Cl. 109-19.000.
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- Campbell, George W.; and Muench, Jerome T., to United States Borax & Chemical Corporation. Boric acid having improved handling properties, 4,419,387, Cl. 427-215.000.
- Canada, Her Majesty the Queen in right of: See—  
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- Canon Inc.: See—  
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- Canon Kabushiki Kaisha: See—  
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- Nagashima, Nao, 4,419,006, Cl. 355-14.00R.
- Canon Corporation: See—  
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- Caracciolo, Vincent P., to Du Pont de Nemours, E. I., and Company. Distillation of 1,4-butanediol, 4,419,189, Cl. 203-77.000.
- Carlini, Gerardo P. V. High pressure centrifugal fluid delivery machine, 4,419,046, Cl. 415-127.000.
- Caron, Bernard G.: See—  
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- Carpenter, Charles B.: See—  
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- Carrona, John J.: See—  
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- Carson, Alan R.: See—  
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- Caruso, Fred A.: See—  
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- Casati, Francois M.: See—  
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- Cassidy, Bruce M.: See—  
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- Caterpillar Tractor Co.: See—  
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- Catt, John D.; and Temple, Davis L., Jr., to Mead Johnson & Company. Isethionic acid salt of 9-cyclohexyl-2-propoxy-9H-purine-6-amine and compositions containing an effective bronchodilating concentration of it, 4,419,358, Cl. 424-253.000.
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- Cedrone, Nicholas J.; and Lee, Kenneth R., to Daymarc Corporation. Broad band contactor assembly for testing integrated circuit devices, 4,419,626, Cl. 324-158.00P.
- Celanese Corporation: See—  
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- Centre Engineering, Inc.: See—  
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- Cerny, Daryl D.: See—  
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- Cerone, Daniel J. Pool ladder, 4,418,792, Cl. 182-93.000.
- Chabria, Paul R., to Press-A-Lite Corporation. Pocket flashlight, 4,419,718, Cl. 362-205.000.
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- Champion Spark Plug Europe S.A.: See—  
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- Chang, Eugene Y. C.; and Behrens, Rudolf A., to American Cyanamid Company. Sulfur-vulcanizable blends of ethylene-vinyl acetate copolymer elastomers and polyacrylate elastomers, 4,419,493, Cl. 525-76.000.
- Chang, Wen-Hsuan: See—  
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- Chapman, Ronald R.: See—  
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- Charles, Robert G.; and Gavalier, John R., to Westinghouse Electric Corp. Method for the preparation of brittle superconducting material in ultrafine particle form, 4,419,125, Cl. 75-0.50B.
- Chatziiosifidis, Ioannis: See—  
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- Chemap AG: See—  
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- Chemische Werke Huls AG: See—  
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- Chemplex Company: See—  
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- Chen, Juei-Lung. Method for making hollow pendants, 4,419,193, Cl. 204-18.100.
- Chen, Nai Y.: See—  
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- Chen, Patricia C.: See—  
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- Cheng, Dah Y.; and Wiersma, Steve J., to International Power Technology, Inc. Apparatus and method for thermal membrane distillation, 4,419,187, Cl. 202-200.000.
- Cheng, Dah Y.; and Wiersma, Steve J., to International Power Technology, Inc. Composite membrane for a membrane distillation system, 4,419,242, Cl. 210-500.200.
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- Chevron Research Company: See—  
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- Sanitelli, Donald S.; and Blakely, Donald W., deceased, 4,419,273, Cl. 502-80.000.
- Chiba, Yoshiharu; Umezawa, Hidetsugu; Sakabe, Takao; and Arai, Ryuji, to Nissan Motor Co., Ltd. Shuttleless loom weft detaining device, 4,418,729, Cl. 139-452.000.
- Chicago Digital Incorporated: See—  
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- Chicago Dryer Company: See—  
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- Chichester, Willard L., to Clark Equipment Company. Method and means for bleeding hydraulic brakes, 4,418,803, Cl. 188-352.000.
- Child, Francis W., to Child Laboratories Inc. Implant for inhibiting mastitis in dairy cattle, 4,418,686, Cl. 128-1.00R.
- Child Laboratories Inc.: See—  
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- Christian, Donald K. Vending machine for newspaper, magazines and the like, 4,418,836, Cl. 221-37.000.
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- Chubb Security Installations Limited: See—  
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- Chulada, Edmund C.; and Nelson, David A., to Ingersoll-Rand Company. Field replaceable screw conveyor inserts, 4,419,090, Cl. 494-53.000.
- Ciba-Geigy Corporation: See—  
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- Falk, Robert A.; Borsodi, Istvan; and Reinehr, Dieter, 4,419,298, Cl. 260-501.160.
- Karrer, Friedrich, 4,419,512, Cl. 544-70.000.
- McLachlan, Donald R., 4,419,365, Cl. 424-320.000.
- Meyer, Willy; and Fory, Werner, 4,419,121, Cl. 71-92.000.
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- Cities Service Company: See—  
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- Citizen Watch Co., Ltd.: See—  
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- Clair, Paul W., to Iowa State University Research Foundation, Inc. Front axle suspension system for a vehicle chassis, 4,418,932, Cl. 280-112.00R.
- Clark, Chester F.: See—  
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- Clark Equipment Company: See—  
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- Rittmann, Udo, 4,418,796, Cl. 188-71.500.
- Clark, Gary T.: See—  
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- Clark, Robert W., Jr., to Saint E. Company, Inc., The. Thermally powered heat transfer systems, 4,418,547, Cl. 62-116.000.
- Class Press, Inc.: See—  
Erwin, Paul R., 4,419,080, Cl. 434-172.000.
- Claussen, Nils; and Steeb, Jorg. Production of high-strength ceramic bodies of alumina and unstabilized zirconia with controlled microstructures, 4,419,311, Cl. 264-60.000.
- Clay, Irene. Washing and rinsing vessel with debris catching channel, 4,418,829, Cl. 220-74.000.
- Cleary, James D.: See—  
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- Cleaver, Laird C.: See—  
Baron, Walter J.; and Cleaver, Laird C., 4,418,747, Cl. 165-95.000.
- Clemence, Dudley A.; and Das, Pankaj K., to Akzona Incorporated. Method for dilating plastics using volatile swelling agents, 4,419,322, Cl. 264-343.000.
- Clemenson, James T.: See—  
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- Clement, Anton, to August Thiele. Chain coupling or locking link, 4,418,526, Cl. 59-85.000.
- Clifton, Ronald W.: See—  
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- Coal Industry (Patents) Limited: See—  
Harrington, Peter F., 4,418,579, Cl. 73-861.230.
- Coates, David: See—  
Crossland, William A.; Coates, David; and Ayliffe, Peter J., 4,419,664, Cl. 340-784.000.
- Cobb, Gary L.: See—  
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- Cobean, Richard W.: See—  
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- Coffy, Rene L.; and Azeau, Jean J. E., to Societe Nationale Industrielle Aerospatiale. Laminated stop of curved shape, particularly for the rotors of helicopters, 4,419,398, Cl. 428-174.000.
- Cohen, Daniel. Self-supporting, table-mounted, support apparatus for receptacles, 4,418,883, Cl. 248-312.100.
- Cohen, Elias, to General Instrument Corporation. Digital tuning system for a varactor tuner employing feedback means for improved tuning accuracy, 4,419,769, Cl. 455-182.000.
- Cohen, Sheppard: See—  
Barakitis, Nikolaos; and Cohen, Sheppard, 4,419,607, Cl. 315-73.000.
- Cohn, Arthur, to Electric Power Research Institute, Inc. Method of manufacturing a fluid cooled blade or vane, 4,418,455, Cl. 29-156.80H.
- Cole, Sylvan. Mode switching mechanism for a cassette tape recorder, 4,419,706, Cl. 360-105.000.
- Colgate-Palmolive Company: See—  
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,419,250, Cl. 252-8.600.
- Hayes, Harry; and Harvey, Kenneth, 4,419,342, Cl. 424-54.000.
- Vesborg, Steen, 4,418,862, Cl. 229-41.00C.
- Collin, Everett E., to Nordson Corporation. Apparatus and method for film packaging, 4,418,511, Cl. 53-427.000.
- Colten, Jerrold L., to Bristol Corporation. Modular heating cable assembly, 4,419,569, Cl. 219-528.000.
- Combustion Engineering, Inc.: See—  
Middleton, John A.; and O'Dwyer, Thomas L., 4,418,893, Cl. 266-192.000.
- Commissariat a l'Energie Atomique: See—  
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- Commonwealth of Australia: See—  
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- Communications Satellite Corporation: See—  
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- Compagnie Europeenne du Zirconium Cezus: See—  
Galle, Serge; Hautdidier, Jerome; and Soulet, Christian, 4,418,556, Cl. 72-62.000.
- Compagnie Generale des Etablissements Michelin: See—  
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- Conde, James C.; and Larsen, Paul S., to Babcock & Wilcox Company, The. Rotor construction for rotary regenerative air heater, 4,418,742, Cl. 165-8.000.
- Condon, William T., to Twin Disc, Incorporated. Trunnion seal and cross venting system for a cardan-type universal joint, 4,419,086, Cl. 464-14.000.



- Cone, Donald R.: See—  
Westerberg, Eugene R.; and Cone, Donald R., 4,419,182., Cl. 156-644.000.
- Congleton, Wayne L., to Dolco Packaging Corporation. Molding apparatus having a vented female mold member for forming foamed egg cartons. 4,419,068., Cl. 425-398.000.
- Connelly, Marc: See—  
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- Conroy, Thomas P.: See—  
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- Conoco Inc.: See—  
Boyer, Lyndon D.; Anderson, Ardis L.; and Britton, Michael W., 4,418,752., Cl. 166-267.000.
- Sifferman, Thomas R., 4,418,755., Cl. 166-281.000.
- Yoon, Heeyoung, 4,418,653., Cl. 123-3.000.
- Conrad, Ulrich: See—  
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- Container Corporation of America: See—  
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- Continental Alloys A.A.: See—  
Tanson, Aloyse, 4,419,127., Cl. 75-10.00R.
- Continental-Wirt Electronics Corporation: See—  
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- Control Data Canada, Ltd.: See—  
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- Control Data Corporation: See—  
Walker, David M.; and Carrona, John J., 4,419,580., Cl. 250-396.00R.
- Cook, Jerry A.; and Cobb, Gary L., to Anglo-American Clays Corporation. Process for producing high brightness clays utilizing magnetic beneficiation and calcining. 4,419,228., Cl. 209-9.000.
- Cooper Industries, Inc.: See—  
Vincent, Robert R.; and Clemenson, James T., 4,418,769., Cl. 173-134.000.
- Cooper, Sidney; and Jacob, Ezekiel J., to Ani-live Film Service, Inc. Dry transfer of electrophotographic images. 4,419,430., Cl. 430-109.000.
- Copyco, Ltd.: See—  
Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,419,428., Cl. 430-77.000.
- Coran, Aubert Y.; Patel, Raman; and Williams, Debra, to Monsanto Company. Compositions of urethane rubber and nylon. 4,419,499., Cl. 525-424.000.
- Core Laboratories, Inc.: See—  
Bush, Darrell, 4,419,314., Cl. 264-130.000.
- Cormier, Milton J., to University of Georgia Research Foundation, Inc. Use of N-(6 aminoethyl)-5-chloro-1-naphthalenesulfonamide, N-(6 aminoethyl)-5-chloro-2-naphthalenesulfonamide, or N-(6 aminoethyl)-5-bromo-2-naphthalenesulfonamide in the uterus to prevent pregnancy. 4,419,366., Cl. 424-321.000.
- Cornell, William D.: See—  
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- Corning Glass Works: See—  
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- Costerton, John W. F., to Her Majesty the Queen in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources. Biofilm removal. 4,419,248., Cl. 210-764.000.
- Costisella, Burkhard: See—  
Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440., Cl. 430-377.000.
- Cotteret, Jean: See—  
Bugaut, Andree; and Cotteret, Jean, 4,419,101., Cl. 8-415.000.
- Coughlin, James E.; Sommerfeld, Eugene G.; and Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Ternary adhesive systems. 4,419,476., Cl. 524-284.000.
- Coulter Systems Corporation: See—  
Kuehnle, Manfred R., 4,419,004., Cl. 355-3.0TR.
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- Courneya, Calice G. Apparatus for extracting potable water. 4,418,549., Cl. 62-260.000.
- Courvoisier, Guy: See—  
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- Cowart, Ronald G., Sr. Method and apparatus for automatically facing saw blades having varying configurations of teeth. 4,418,589., Cl. 76-112.000.
- Cox, Allen R.: See—  
Burkhart, Robert W.; Cox, Allen R.; and Hartley, John D., 4,418,473., Cl. 29-603.000.
- Cox, David; Cairns, Hugh; Chadwick, Nigel; and Suschitzky, John L., to Fisons Limited. Pyranquinolinones and analogs thereof. 4,419,352., Cl. 424-248.400.
- Cox, Joseph A., to EA Industries, Incorporated. Method and apparatus for shaping the edges of green brick and separating the same. 4,419,065., Cl. 425-301.000.
- Cox, Michael W. Ice skate. 4,418,928., Cl. 280-11.140.
- CPC International Inc.: See—  
Dean, Donald H.; and Dooley, Margaret M., 4,419,450., Cl. 435-253.000.
- Crawford, Thomas C.; and Jasys, Vytautas J., to Pfizer Inc. Preparation of halomethyl esters (and related esters) of penicillanic acid 1,1-dioxide. 4,419,284., Cl. 260-245.20R.
- Creech, David C.: See—  
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- Crenshaw, Edward L., to Milliken Research Corporation. Methods for the production of multi-level surface patterned materials. 4,418,451., Cl. 26-2.00R.
- Crone, John M., Jr., to Texaco Inc. Catalyst and method of making the same. 4,419,394., Cl. 427-434.500.
- Crosfield Electronics Limited: See—  
Hammes, Philippe, 4,419,690., Cl. 358-75.000.
- Crossland, William A.; Coates, David; and Ayliffe, Peter J., to International Standard Electric Corporation. Co-ordinate addressing of smectic display cells. 4,419,664., Cl. 340-784.000.
- Crossley, Roger; and Dickinson, Kay H., to John Wyeth and Brother Limited. Imidazylalkylthioimidazoles. 4,419,362., Cl. 424-273.00R.
- Crouzet: See—  
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- Crutchfield, Marvin M., to Monsanto Company. Dialkyl glyoxylate surfactants. 4,419,258., Cl. 252-89.100.
- Cullie, Eugene C., to Teledyne Farris Engineering. Blow down ring locking device. 4,418,714., Cl. 137-478.000.
- Cuneo, Andrew A., Jr.; and Loftus, James J., to United States of America, Army. EM Sensor for determining impedance of EM field. 4,419,622., Cl. 324-57.00R.
- Cutler, Barry L. Rotary carpet cleaning pad. 4,418,438., Cl. 15-230.000.
- Cutler, Duncan B.: See—  
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- CXA Ltd/CXA LTEE: See—  
Davitt, Alan L.; and Yuill, Kenneth A., 4,419,154., Cl. 149-40.000.
- Czubatyj, Wolodymyr; Singh, Rajendra; Doehler, Joachim; Allred, David D.; and Reyes, Jaime M., to Energy Conversion Devices, Inc. Photovoltaic device having incident radiation directing means for total internal reflection. 4,419,533., Cl. 136-259.000.
- Dahms, Wolfgang, to Schering Aktiengesellschaft. Method for galvanic deposition of copper. 4,419,192., Cl. 204-15.000.
- Dai-ichi Kogyo Seiyaku Co., Ltd.: See—  
Tokunaga, Mototsugu, 4,419,457., Cl. 521-65.000.
- Daimler-Benz Aktiengesellschaft: See—  
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- Niemeier, Gerd; and Conrad, Ulrich, 4,418,675., Cl. 123-501.000.
- Dakota Plastics Company: See—  
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- Dana Corporation: See—  
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- Daniels, Donald V.: See—  
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- Dantinne, Pierre G. Apparatus for continuously polishing the pressure roller of a coiling machine. 4,418,503., Cl. 51-252.000.
- Darton, Richard C.: See—  
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- Das, Pankaj K.: See—  
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- Dasi Industries, Inc.: See—  
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- Dauben, William G.; and Brookhart, Todd E., to University of California, The Regents of the. Stereoccontrolled synthesis of steroidal side chains. 4,419,287., Cl. 260-397.100.
- Davenport, Lawrence J., deceased; and Davenport, Nancy, executrix, to Younger Manufacturing Company. Ophthalmic progressive power lens and method of making same. 4,418,992., Cl. 351-169.000.
- Davenport, Nancy, executrix: See—  
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- Davidson, James P.: See—  
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- Davis, Eugene E.: See—  
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- Davis, James A.; and Koch, Robert C., to Firestone Tire & Rubber Company, The. Wood derived, thermoplastic ester mixtures as a substitute for petroleum-derived components in compounded rubber stocks. 4,419,470., Cl. 524-76.000.
- Davis, Rhetta Q., to Dow Chemical Company, The. Epoxy resin powder coatings having low gloss. 4,419,495., Cl. 525-109.000.
- Davis, Thomas: See—  
Kukes, Simon G.; and Davis, Thomas, 4,419,225., Cl. 208-251.00R.
- Davitt, Alan L.; and Yuill, Kenneth A., to CXA Ltd/CXA LTEE. Delay composition for detonators. 4,419,154., Cl. 149-40.000.
- Day, Curtis H.; and Loup, Ronald L., to Double A Products Company. Solenoid operated directional valves having modular construction. 4,418,720., Cl. 137-625.650.
- Day, David R.; and McElroy, Lucian G. Fluid stripping apparatus including a strap for interconnecting adjacent airbags. 4,418,442., Cl. 15-312.00A.
- Day, Paul L., to Park-Ohio Industries, Inc. Method for quenching heated workpieces. 4,419,149., Cl. 148-131.000.

- Daymarc Corporation: See—  
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- De Laire, Inc.: See—  
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- de Mets N.V.: See—  
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- Dean, Donald H.; and Dooley, Margaret M., to CPC International Inc. Plasmid cloning vector for *Bacillus subtilis*. 4,419,450., Cl. 435-253.000.
- Deaton, David W., to American Hospital Supply Corporation. Method of receiving and disposing of fluids from the body. 4,419,093., Cl. 604-49.000.
- Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, to Rhone-Poulenc Industries. 2,3,6,7-Tetrahydrothiazolo[3,2-a]pyrimidine derivatives having anti-rheumatic properties and pharmaceutical compositions containing them. 4,419,356., Cl. 424-251.000.
- Deere & Company: See—  
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- Halabiya, Sabah, 4,418,923., Cl. 277-167.500.
- Herren, Kenneth E., 4,418,485., Cl. 37-244.000.
- Kramer, Kenneth D.; Stoss, Kenneth J.; and Sparks, Gregory E., 4,419,642., Cl. 335-227.000.
- Dees, John R.: See—  
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- De Gennaro, Cosmo H.; and Hooper, Neil, to Bell Telephone Laboratories, Incorporated. Transformerless bipolar converter. 4,419,757., Cl. 375-17.000.
- De Gleria, Katalin: See—  
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- Degussa AG: See—  
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- Dehnert, Johannes; and Loeffler, Hermann, to BASF Aktiengesellschaft. Diazo dyes having a coupler component attached to a sulfaphenyl-azo-phenyl-azo-radical. 4,419,290., Cl. 260-186.000.
- De Lathauwer, Rene; Van Opstal, Martin; and Dijkstra, Albert J., to Safinco. Process for the directed interesterification of a triglyceride oil or oil mixture and triglyceride oils or oil mixture thus interesterified. 4,419,291., Cl. 260-410.700.
- Delet, Victoria. Support brassiere. 4,418,696., Cl. 128-476.000.
- Dellinger, Vernon D.: See—  
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- Delron Research and Development Corporation: See—  
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- De Meo, Franco: See—  
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- de Mets, Albert, to de Mets N.V. Continuous operation press. 4,419,062., Cl. 425-101.000.
- Denk, Hans: See—  
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- Dennis, Thomas M.: See—  
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., 4,419,756., Cl. 375-7.000.
- DeRosa, Richard T., to Boeing Company, The. Twin tension/torsion beam rotor system. 4,419,051., Cl. 416-140.000.
- DeSantis, Raymond P., to PTK-Pentronix, Inc. Lapping machine and method. 4,418,501., Cl. 51-157.000.
- De Schepper, Achille; and Van Peteghem, Antoine, to Metallurgie Hoboken-Overpelt. Liquid-liquid extraction. 4,419,338., Cl. 423-658.500.
- Deto, Junji: See—  
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- Detelbach, Alfred; and Henzler, Roland, to Reich Spezialmaschinen GmbH. Applicator for applying adhesive to a work piece. 4,418,640., Cl. 118-411.000.
- Deutschmann, Herbert, to MTU Motoren-und Turbinen-Union Friedrichshafen GmbH. Reciprocating internal combustion engine with disconnectable exhaust turbochargers. 4,418,536., Cl. 60-602.000.
- Devine, Thomas M., Jr., to General Electric Company. Method of making apparatus for the exchange of heat using zirconium stabilized ferritic stainless steels. 4,418,859., Cl. 228-183.000.
- Devro, Inc.: See—  
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- de Waal, J. F. Fluid flow augmentor. 4,418,880., Cl. 244-199.000.
- De Widt, Hugo: See—  
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- de Witt, Bartholomeus M.: See—  
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- Dholakia, Anil R.; and Ruggeri, Vincent J., to RCA Corporation. Grinding apparatus. 4,418,500., Cl. 51-125.500.
- Diamond Carpet Mills, Incorporated: See—  
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- Diamond Shamrock Corporation: See—  
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- Diaz, Stephen H.; and Horsma, David A., to Raychem Corporation. Method of encapsulation. 4,419,156., Cl. 156-49.000.
- Dickey-john Corporation: See—  
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- Dickinson, Kay H.: See—  
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- Diehl GmbH & Co.: See—  
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- Diel, Paul A., to Pitney Bowes Inc. Imprinting apparatus with relocatable printing device. 4,418,619., Cl. 101-269.000.
- Diery, Helmut; and Hille, Martin, to Hoechst Aktiengesellschaft. Addition products from ethylene oxide-propylene oxide block polymers and bis-glycidyl ethers, a process for their preparation and their use. 4,419,265., Cl. 252-331.000.
- Dieterich, Charles B.: See—  
Christopher, Todd J.; and Dieterich, Charles B., 4,419,699., Cl. 358-340.000.
- Dietrich, William J., Sr.; and Sizelove, Cary L., to DMI, Inc. Adjustable tillage implement positioning apparatus. 4,418,761., Cl. 172-271.000.
- Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; Raff, Lothar; Rieger, Franz; and Wiedenmann, Hans-Martin, to Robert Bosch GmbH. Method and apparatus to measure the operating temperature of solid electrolyte-type gas sensors. 4,419,190., Cl. 204-1.00T.
- Dietz, Hermann; Hofelder, Gerhard; Muller, Klaus; and Reber, Harald, to Robert Bosch GmbH. Combination gas oxygen concentration and combustion light sensor. 4,419,212., Cl. 204-424.000.
- Dietzsch, Kurt; and Knoblauch, Rainer, to Suddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. K.G. Electronic circuit for controlling a heating or air-conditioning apparatus in a motor vehicle. 4,418,743., Cl. 165-12.000.
- DiGiacomo, Hector; Raos, Robert R.; and Zabko, Al L., to General Battery Corporation. Wrapping apparatus for industrial battery plates. 4,418,464., Cl. 29-564.600.
- Dijkstra, Albert J.: See—  
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- Dikstein, Shabtay; and Segal, Mark, to Yisum Research Development Company of the Hebrew University of Jerusalem. Stimulant. 4,419,367., Cl. 424-330.000.
- Dillarstone, Alan: See—  
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- Di Loreto, Joseph, to Precision Valve Corporation. Child resistant closure. 4,418,842., Cl. 222-153.000.
- DiMartino, John M., to Line Fast Corporation. Telescopic retractable stacker key locking device. 4,419,034., Cl. 410-83.000.
- di Riccio, Leo: See—  
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- DiRoss, James. Engine valve. 4,418,658., Cl. 123-80.00D.
- Dischert, Robert A.; and Oakley, Charles B., to RCA Corporation. Compatible component digital system. 4,419,687., Cl. 358-13.000.
- Dittmer, William H.: See—  
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- Diversified Electronics, Inc.: See—  
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- Djordjevic, Ilija, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,418,667., Cl. 123-387.000.
- DMA Systems Corporation: See—  
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- DMI, Inc.: See—  
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- Dobson, Robert L., to Goodyear Tire & Rubber Company, The. Safety support system. 4,418,734., Cl. 152-158.000.
- Dr.-Ing. Rudolf Hell GmbH: See—  
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- Sing, Gerhard; and Wellendorf, Klaus, 4,419,691., Cl. 358-75.000.
- Doddi, Namassivaya: See—  
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- Doehler, Joachim: See—  
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- Dolco Packaging Corporation: See—  
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- Dolejs, Anthony H.: See—  
Gorgone, Robert L.; and Dolejs, Anthony H., 4,418,824., Cl. 209-534.000.
- Dolnik, Thomas G.: See—  
Jindrick, James A.; Hurley, James R.; Gilker, Clyde; Nohria, Naresh K.; Baranowski, James A.; and Dolnik, Thomas G., 4,419,619., Cl. 323-257.000.
- Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, to Toray Industries; and Toyota Jidosha Kabushiki Kaisha. Method for making carbon/metal composite pretreating the carbon with tetraisopropyl titanate. 4,419,389., Cl. 427-294.000.



Donovan, James T.; and Webster, E. Graham, to Sperry Corporation. Transport lock actuator. 4,418,516, Cl. 56-228.000.

Donovan, James T.: See—  
Ehrhart, Philip J.; Donovan, James T.; and Webster, E. Graham, 4,418,517, Cl. 56-228.000.

Dooley, Margaret M.: See—  
Dean, Donald H.; and Dooley, Margaret M., 4,419,450, Cl. 435-253.000.

Dorey, Howard A., to Sangamo Weston Limited. Transmission systems for transmitting signals over power distribution networks, and transmitters for use therein. 4,419,738, Cl. 375-38.000.

Dorman, Linneaus C.; and Bangs, Leigh B., to Dow Chemical Company. The Immunological agglutination assays with dyed or colored latex and kits. 4,419,453, Cl. 436-534.000.

Dorn, Maximilian: See—  
Meyer, Heinz; Dorn, Maximilian; and Seidl, Hans, 4,419,197, Cl. 204-159.200.

Dorr-Oliver Incorporated: See—  
Klinkowski, Peter R., 4,419,209, Cl. 204-296.000.

Dory, Jacques. Ultrasonic scanning probe with mechanical sector scanning means. 4,418,698, Cl. 128-660.000.

Dotta, Angelo. Sealed package for wound dressing adhesive tape. 4,418,822, Cl. 206-441.000.

Double A Products Company: See—  
Day, Curtis H.; and Loup, Ronald L., 4,418,720, Cl. 137-625.650.

Dover Corporation: See—  
McMath, Jack A., 4,418,730, Cl. 141-207.000.

Dow Chemical Company, The: See—  
Davis, Rhetta Q., 4,419,495, Cl. 525-109.000.

Dorman, Linneaus C.; and Bangs, Leigh B., 4,419,453, Cl. 436-534.000.

Hay, Robert A., II; and Bergman, Oswald, 4,419,167, Cl. 156-290.000.

Hefner, Robert E., Jr., 4,419,299, Cl. 260-929.000.

Henton, David E.; and O'Brien, Teresa M., 4,419,496, Cl. 525-301.000.

McKendry, Lennon H.; Ricks, Michael J.; and Rogers, Richard B., 4,419,514, Cl. 544-334.000.

Peet, Norton P.; and Sunder, Shyam, 4,419,357, Cl. 424-251.000.

Schell, Joseph G., Jr., 4,419,269, Cl. 502-169.000.

Schwartz, James E., 4,419,481, Cl. 524-551.000.

Thomson, Timothy; and Peters, Ferman, 4,419,510, Cl. 536-84.000.

Dow Corning Corporation: See—  
Gutek, Beth L., 4,419,402, Cl. 428-266.000.

Speier, John L.; and Liles, Donald T., 4,419,060, Cl. 425-8.000.

Downs, Edward T., Jr.; and Komorek, Julius. Air control apparatus. 4,418,719, Cl. 137-625.310.

Doyle, Richard F.; Gausman, Thomas E.; and Myers, Edward T., to North American Philips Consumer Electronics Corp. Means for affixing an electronic component on a supporting medium. 4,419,536, Cl. 174-52.00R.

Drouillard, James R.: See—  
Wanlass, Bert R.; and Drouillard, James R., 4,418,498, Cl. 49-425.000.

Druegh, Paul; and von Winnicki, Kalixt, to Siemens Aktiengesellschaft. Oscillator whose frequency is controllable by a current variation. 4,419,634, Cl. 331-117.00R.

Dubey, Michael B.: See—  
Schloni, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J., 4,418,527, Cl. 60-39.050.

Dubiel, Oswald; Hirtisier, Karl R.; Muller, Johann, deceased; and by Muller, Christine, executrix, to Paul-Heinz Wagner. Screw assembly with torque determination. 4,418,590, Cl. 81-467.000.

Dufft, Jürgen, to Lucas Industries Limited. Hydraulic pressure master cylinder. 4,418,534, Cl. 60-585.000.

Dufresne, Louis L.: See—  
Bolton, Joseph A.; and Dufresne, Louis L., 4,419,249, Cl. 210-783.000.

Dumas, Jean A.; and Naudin, Hildebert, to Societe Anonyme Rubson S.A.F. Device for absorbing moisture in a closed space. 4,419,111, Cl. 55-388.000.

Dunbar, Glenn G. Material handler. 4,418,953, Cl. 294-67.00A.

Dunlap, James G. Scissor tail dump trailer apparatus. 4,418,959, Cl. 298-19.00V.

Du Pont de Nemours, E. I., and Company: See—  
Brittelli, David R.; and Ripka, William C., 4,419,517, Cl. 546-144.000.

Caracciolo, Vincent P., 4,419,189, Cl. 203-77.000.

Coughlin, James E.; Sommerfeld, Eugene G.; and Strolle, Clifford H., 4,419,476, Cl. 524-284.000.

Gorondy, Emery J., 4,419,102, Cl. 8-471.000.

Jayawant, Madhusudan D., 4,419,246, Cl. 210-721.000.

Duvall, David S.: See—  
Gupta, Dinesh K.; and Duvall, David S., 4,419,416, Cl. 428-656.000.

Dwyer, Daniel T.: See—  
Whitney, John A.; Dwyer, Daniel T.; and Sorenson, Peter F., 4,418,774, Cl. 177-210.0FF.

Dwyer, Liam D., to American Sawmill Machinery Company. End cap for communications cables. 4,419,534, Cl. 174-10.000.

Dynamit Nobel Aktiengesellschaft: See—  
Osterhagen, Gerhard; and Feige, Siegfried, 4,419,158, Cl. 156-66.000.

Dzewaltowski, Victor F.: See—  
Reda, Kazimierz J.; Dzewaltowski, Victor F.; and Gile, Richard H., 4,419,612, Cl. 318-571.000.

Dziuba, Peter: See—  
Ehringer, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goett, Manfred, 4,418,785, Cl. 180-255.000.

Dzung, John C.; Perkey, Harry J.; and Schmitz, George J., to Motorola, Inc. Moisture and dust seal arrangement for a portable radio or the like. 4,418,830, Cl. 220-81.00R.

E. R. Squibb & Sons, Inc.: See—  
Jensen, Ole R., 4,419,174, Cl. 156-513.000.

Neirincx, Rudi D., 4,419,339, Cl. 424-1.100.

EA Industries, Incorporated: See—  
Cox, Joseph A., 4,419,065, Cl. 425-301.000.

East, Philip C., to Canada, Her Majesty the Queen in right of. Dead time compensation circuit. 4,419,579, Cl. 250-374.000.

Eastman Kodak Company: See—  
Fleischer, Jean C.; Clark, Gary T.; and Weaver, Max A., 4,419,289, Cl. 260-158.000.

Howe, Dennis G., 4,419,750, Cl. 369-111.000.

Molair, Michel F.; and Williams, John V., 4,419,434, Cl. 430-207.000.

Noonan, John M.; Ryan, Raymond W.; and Houle, James F., 4,419,437, Cl. 430-270.000.

Reczek, James A.; and Elwood, James K., 4,419,435, Cl. 430-223.000.

Sublett, Bobby J., 4,419,507, Cl. 528-302.000.

Eaton Corporation: See—  
Johnson, Oliver W., 4,418,710, Cl. 137-117.000.

Surman, James J., 4,418,568, Cl. 73-202.000.

Zajac, John, 4,418,646, Cl. 118-733.000.

Eaton Semi-Conductor Implantation Corporation: See—  
Benveniste, Victor M., 4,419,584, Cl. 250-492.200.

Ebara Corporation: See—  
Ishihara, Hideo; Ohshita, Takahiro; and Saito, Harumitsu, 4,419,330, Cl. 422-143.000.

Ebauches Electroniques, S.A.: See—  
Meyrat, Clement, 4,419,018, Cl. 368-69.000.

Ebert, Hans: See—  
Niernann, Hermann; Reichert, Gunter; Ebert, Hans; and Neumann, Friedrich, 4,419,104, Cl. 23-293.00R.

Ebi, Yutaka; and Mizuno, Akinori, to Ricoh Company, Ltd. Ink droplet ejection system. 4,419,673, Cl. 346-75.000.

Ebihara, Tadashi, to Nippon Piston Ring Co., Ltd. Powder molding method and powder compression molded composite article having a rest-curve like boundary. 4,419,413, Cl. 428-58.000.

Echte, Adolf: See—  
Brandstetter, Franz; Echte, Adolf; Naarmann, Herbert; and Priebe, Edmund, 4,419,478, Cl. 524-318.000.

Eckert, Gerold: See—  
Bauer, Karl-Heinz; Eckert, Gerold; and Labude, Wolfgang, 4,419,639, Cl. 334-7.000.

Eckert, Wayne L., to Burlington Industries, Inc. Muffler for a textile interlacing jet. 4,418,789, Cl. 181-255.000.

Eckhardt, Sandor: See—  
Elekes, Ilona; Intistoris, Laszlo; Medzihradsky, Kalman; Otvos, Laszlo; Medzihradsky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522, Cl. 549-557.000.

Eckstein, John P., to American Can Company. Multiple layer flexible sheet structure. 4,418,841, Cl. 222-107.000.

Ecomard, Andre, to Institut Francais du Petrole. Device for regulating the pressure of a fluid supplied to a feeding circuit from a fluid source. 4,418,535, Cl. 60-602.000.

Edamatu, Michisuke: See—  
Nakashima, Atushi; Edamatu, Michisuke; and Kushi, Kenji, 4,418,641, Cl. 118-429.000.

Edison Price, Incorporated: See—  
Price, Edison A.; and Bengochea, Fulgencio, 4,419,717, Cl. 362-148.000.

Egawa, Takeshi: See—  
Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, 4,419,000, Cl. 354-173.100.

Egbert, Leigh B.: See—  
Johnson, Richard C.; Seshamani, Venkatraman; and Egbert, Leigh B., 4,418,650, Cl. 122-4.00D.

Ege, Sigmund, to International Standard Electric Corporation. Back-up for high voltage cable pressurizing system. 4,419,056, Cl. 417-426.000.

Eggert, Albert; Gahleitner, Erwin; and Kwiatkowski, Joachim, to Robert Bosch GmbH. Hearing aid with audio path duct extension element, and extension element attachment. 4,418,787, Cl. 181-130.000.

Egyt Gyogyszervegyeszeti Gyar: See—  
Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355, Cl. 424-249.000.

Ehco, Inc.: See—  
Erickson, Frederick J., 4,418,678, Cl. 126-9.00R.

Ehrhart, Philip J.; Donovan, James T.; and Webster, E. Graham, to Sperry Corporation. Actuating mechanism for harvester transport lock. 4,418,517, Cl. 56-228.000.

Ehrhart, Philip J.: See—  
Koch, Earl E.; Gamber, A. Dale; and Ehrhart, Philip J., 4,418,518, Cl. 56-228.000.

Ehringer, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goett, Manfred, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Steered and driven axle-end assembly. 4,418,785, Cl. 180-255.000.

Eichler, Kenneth M.: See—  
Trosky, William J.; Eichler, Kenneth M.; Mandel, Alan F.; and Moore, William H., 4,418,795, Cl. 187-29.00R.

Eidenschink, Rudolf; Romer, Michael; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschränkter Haftung. Fluorine-containing 4,4'-bis-(cyclohexyl)-biphenyl derivatives, and dielectrics and electro-optical display elements containing them. 4,419,264, Cl. 252-299.630.

Eidenschink, Rudolf: See—  
Praefcke, Klaus; Schmidt, Dietmar; and Eidenschink, Rudolf, 4,419,263, Cl. 252-299.630.

Eisenberg, Abraham. Brush bristle cleaning system. 4,418,436, Cl. 15-104.00R.

Elbers, Arthur H.: See—  
Sullivan, Floyd A.; Elbers, Arthur H.; and Trierweiler, Charles M., 4,418,938, Cl. 280-661.000.

Electric Power Research Institute, Inc.: See—  
Appelt, William R., Jr.; and Rehn, Irwin M., 4,419,144, Cl. 148-6.200.

Cohn, Arthur, 4,418,455, Cl. 29-156.80H.

Electronic Equipment Development Ltd.: See—  
Anderson, Gary W.; and Stake, Dennis G., 4,418,815, Cl. 198-476.000.

Electrostatic Equipment Corporation: See—  
Gillette, Donald J.; and Hajek, Bedrich, 4,418,642, Cl. 118-624.000.

Elekes, Ilona; Intistoris, Laszlo; Medzihradsky, Kalman; Otvos, Laszlo; Medzihradsky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, to Chino Gyogyszervgyeszeti Termekgyara Rt. Hexitols containing free carboxy groups and a process for the preparation thereof. 4,419,522, Cl. 549-557.000.

Elfab Corporation: See—  
Ammon, J. Preston; Weaver, Harry R.; and Norman, Richard O., 4,418,475, Cl. 29-842.000.

Eli Lilly and Company: See—  
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,419,447, Cl. 435-76.000.

Baltz, Richard H.; Kirst, Herbert A.; Wild, Gene M.; and Seno, Eugene T., 4,419,508, Cl. 536-7.100.

Hsiung, Hansen M., 4,419,509, Cl. 536-27.000.

Elliott Brothers (London) Limited: See—  
Stephenson, Michael D.; and Waller, Winston A., 4,419,012, Cl. 356-141.000.

Ellis, Franklin H.: See—  
Behl, Robert S.; and Ellis, Franklin H., 4,419,091, Cl. 604-20.000.

Ellis, J. Patrick: See—  
Baskins, Lew E.; and Ellis, J. Patrick, 4,419,616, Cl. 320-2.000.

Ellison, Michael J.: See—  
Goodell, Fred L.; and Ellison, Michael J., 4,418,737, Cl. 152-416.000.

Ellsworth, James P.: See—  
Walker, Eugene J.; and Ellsworth, James P., 4,419,649, Cl. 337-70.000.

Elwood, James K.: See—  
Reczek, James A.; and Elwood, James K., 4,419,435, Cl. 430-223.000.

Ely, Robert T., to Bloom Engineering Company, Inc. Noncontact temperature sensing method and apparatus for ladle preheating. 4,419,022, Cl. 374-125.000.

Embre, Milton L.; Knollman, Dieter J. H.; and Martin, Earl O., to Bell Telephone Laboratories, Incorporated. Battery feed circuit. 4,419,542, Cl. 179-77.000.

Emerson Electric Co.: See—  
Krusenmark, Kenneth J.; and Stackhouse, James L., Jr., 4,418,597, Cl. 83-478.000.

Nichols, Jimmy B., 4,418,839, Cl. 222-14.000.

Emery, Leonard W., to Atlantic Richfield Company. In-situ combustion process. 4,418,751, Cl. 166-261.000.

Emkay Manufacturing Company: See—  
Kaplan, Alan, 4,419,379, Cl. 427-10.000.

Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, to Nissan Motor Company, Limited. Plasma ignition system using photothyristors for internal combustion engine. 4,418,660, Cl. 123-143.00B.

Energy Conversion Devices, Inc.: See—  
Czubatyj, Wolodymyr; Singh, Rajendra; Doehler, Joachim; Allred, David D.; and Reyes, Jaime M., 4,419,533, Cl. 136-259.000.

Nath, Prem, 4,419,530, Cl. 136-251.000.

Englar, William J.: See—  
Willard, Miles J.; and Englar, William J., 4,419,375, Cl. 426-272.000.

Engler, Walter; Erdmannsdorfer, Hans; Muller, Heinz; and Wagner, Manfred, to Filterwerk Mann & Hummel GmbH. Engine air intake filter with fumes-absorbing substance. 4,418,662, Cl. 123-198.00D.

English, Michael F.: See—  
Benitez, Francisco M.; and English, Michael F., 4,419,503, Cl. 526-237.000.

Engstrom, Thord I.: See—  
Armtyr, Oscar S.; and Engstrom, Thord I., 4,419,232, Cl. 210-164.000.

Enso-Gutzeit OY: See—  
Matula, Jouni, 4,419,109, Cl. 55-192.000.

Erdmannsdorfer, Hans: See—  
Engler, Walter; Erdmannsdorfer, Hans; Muller, Heinz; and Wagner, Manfred, 4,418,662, Cl. 123-198.00D.

Erich, Bock: See—  
Willi, Rauschert; Erich, Bock; and Gerald, Rieger, 4,418,624, Cl. 102-473.000.

Erickson, Frederick J., to Ehco, Inc. Insulated barbeque unit. 4,418,678, Cl. 126-9.00R.

Erwin, Paul R., to Class Press, Inc. Method and apparatus for teaching grammar. 4,419,080, Cl. 434-172.000.

Esmond, William G. Pleated kidney. 4,419,237, Cl. 210-321.200.

Espenscheid, Wilton F.: See—  
Strom, E. Thomas; and Espenscheid, Wilton F., 4,418,961, Cl. 299-5.000.

Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, to Robert Bosch GmbH. Glow plug, particularly for diesel engine. 4,418,661, Cl. 123-145.00A.

Esselte Pendaflex Corporation: See—  
Becker, Werner; Kistner, Heinz; and Schrotz, Kurt, 4,419,171, Cl. 156-384.000.

Esselte Pendaflex Corporation: See—  
Koch, Ulf, 4,419,571, Cl. 235-1.00C.

Etablissements Francois Salomon et Fils, S.A.: See—  
Salomon, Georges P. J., 4,418,937, Cl. 280-613.000.

Ethicon, Inc.: See—  
Beroff, Howard; Doddi, Namassivaya; and Jewusiak, Stephen J., 4,418,694, Cl. 128-326.000.

Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, to Toyo Boseki Kabushiki Kaisha. Image forming material and method. 4,419,438, Cl. 430-275.000.

Evans, Lyon E.: See—  
Weber, Ronald J.; and Evans, Lyon E., 4,418,506, Cl. 52-209.000.

Evans, William P.: See—  
Leger, Violeta Z.; and Evans, William P., 4,419,422, Cl. 429-194.000.

Ex-Cell-O Corporation: See—  
Reda, Kazimierz J.; Dzewaltowski, Victor F.; and Gile, Richard H., 4,419,612, Cl. 318-571.000.

Exxon Production Research Co.: See—  
Warren, Hollie B., Jr.; and Pauley, Thomas A., 4,418,570, Cl. 73-304.00R.

Exxon Research & Engineering Co.: See—  
Benitez, Francisco M.; and English, Michael F., 4,419,503, Cl. 526-237.000.

Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., 4,419,222, Cl. 208-120.000.

Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,419,200, Cl. 204-186.000.

Long, Robert B.; and Caruso, Fred A., 4,419,219, Cl. 208-86.000.

Young, David A., 4,419,195, Cl. 204-78.000.

F. C. Brown Rentals, Inc.: See—  
Moody, Albert L., 4,418,681, Cl. 126-343.50R.

Fabre, Jean-Louis: See—  
Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,419,356, Cl. 424-251.000.

Fairchild Camera & Instrument Corp.: See—  
Sloane, Edwin A., 4,419,656, Cl. 340-347.00C.

Vora, Madhukar B.; and Hingharh, Herma J., 4,418,468, Cl. 29-577.00C.

Fairchild Swearingen Corporation: See—  
Swearingen, Edward J., Jr., 4,419,053, Cl. 416-234.000.

Falk, Robert A.; Borsodi, Istvan; and Reinher, Dieter, to Ciba-Geigy Corporation. Ethanolamine salts of di-perfluoroalkyl group containing acids. 4,419,298, Cl. 260-501.160.

Falxa, Martin L.; and Himmelwright, Richard S., to Polaroid Corporation. Photosensitive silver halide emulsion. 4,419,442, Cl. 430-567.000.

Familant, Harold M.: See—  
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,419,313, Cl. 264-167.000.

Farge, Daniel: See—  
Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,419,356, Cl. 424-251.000.

Farfayre, Antoine: See—  
Nussli, Jacques; Marandas, Georges J. P.; and Farfayre, Antoine, 4,419,603, Cl. 313-346.00R.

Faucher, Joseph E.; Wright, Richard R.; Pane, Francis C., Jr.; Kwoka, David; and Striebel, Edmund E., to United Technologies Corporation. Fuel nozzle for gas turbine engine. 4,418,543, Cl. 60-742.000.

Fazekas, Carl F.: See—  
Gottschalk, Robert E.; and Fazekas, Carl F., 4,418,994, Cl. 352-78.00R.

Fearnley, Charles: See—  
Strasilla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, 4,419,344, Cl. 424-70.000.

Feaster, Fred T. Intraocular lens. 4,418,431, Cl. 3-13.000.

Federal Screw Works: See—  
Gagnon, Richard T., 4,419,657, Cl. 340-347.00R.

Fedorovsky, Boris B.: See—  
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741, Cl. 164-454.000.

Fehrmann, George L.: See—  
Murphy, Robert A.; and Fehrmann, George L., 4,419,567, Cl. 219-336.000.



- Feige, Siegfried: See—  
Osterhagen, Gerhard; and Feige, Siegfried, 4,419,158, Cl. 156-66.000.
- Fekete, Gyorgy: See—  
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsador, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- Feldman, Allan M.; and Forgione, Peter S., to American Cyanamid Company. Carbodiimide oligomers of tertiary aliphatic isocyanates. 4,419,294, Cl. 260-453.00A.
- Feldstein, Nathan. Method for rendering non-platable semiconductor substrates platable. 4,419,390, Cl. 427-304.000.
- Fendt, Alfons: See—  
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621, Cl. 324-51.000.
- Ferrell, Robert D. Vehicular thoroughfares for power generation. 4,418,542, Cl. 60-668.000.
- Ferrentino, Antonio, to Industrie Pirelli Societa per Azioni. Process and apparatus for manufacturing telecommunication cables filled with expandable powder. 4,419,157, Cl. 156-56.000.
- Fiber Industries, Inc.: See—  
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,419,313, Cl. 264-167.000.
- Ficher, Robert G.: See—  
Rosenberg, Barnett; Van Camp, Loretta; Ficher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., 4,419,351, Cl. 424-245.000.
- Ficke, William H.; and McIntyre, Robert N., to Western Electric Company, Inc. Method for forming seals with heat shrinkable materials. 4,419,304, Cl. 264-25.000.
- Figgie International Inc.: See—  
Ansie, William K.; Van Haastert, J. A.; and Cleary, James D., 4,419,110, Cl. 55-356.000.
- Filature Saint Andre: See—  
Lemaire, Paul, 4,418,523, Cl. 57-207.000.
- Filiaggi, Adriano: See—  
Bejot, Emile; and Filiaggi, Adriano, 4,419,625, Cl. 324-142.000.
- Filterwerk Mann & Hummel GmbH: See—  
Engler, Walter; Erdmannsdorfer, Hans; Muller, Heinz; and Wagner, Manfred, 4,418,662, Cl. 123-198.00D.
- Finet, Alain; Nerone, Louis R.; and Zenisek, Michael J., to Stock Equipment Company. Conveyor calibration technique. 4,418,773, Cl. 177-16.000.
- Firelite Products Inc.: See—  
Piffath, Rodney S., 4,419,069, Cl. 431-89.000.
- Firestone Tire & Rubber Company, The: See—  
Bohm, Georg G. A.; Vescelius, Lee E.; and Hamed, Gary R., 4,419,469, Cl. 524-68.000.
- Davis, James A.; and Koch, Robert C., 4,419,470, Cl. 524-76.000.
- Firstov, Vladislav D.: See—  
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715, Cl. 137-508.000.
- Fischer, Ernest J., to Breuer Electric Mfg. Co. Noise suppressor for vacuum sweepers and the like. 4,418,443, Cl. 15-326.000.
- Fischer, Hermann, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Offset printing machine ink distribution and drying system. 4,418,620, Cl. 101-350.000.
- Fischer, Robert R.; and Urschel, Joe R., to Urschel Laboratories, Incorporated. Cylinder for use with other components in processing material. 4,419,414, Cl. 428-575.000.
- Fischer, Theodore E., to Polyplex Plastics, Inc. Vinyl repair composition and method. 4,419,162, Cl. 156-94.000.
- Fisher, Paul C.: See—  
Williams, Raymond S.; and Fisher, Paul C., 4,419,464, Cl. 523-161.000.
- Fisons Limited: See—  
Cox, David; Cairns, Hugh; Chadwick, Nigel; and Suschitzky, John L., 4,419,352, Cl. 424-248.000.
- Flamm, Peter M.: See—  
Miskin, Leslie; and Flamm, Peter M., 4,419,688, Cl. 358-27.000.
- Flanagan, Joseph E.: See—  
Witucki, Edward F.; and Flanagan, Joseph E., 4,419,286, Cl. 260-349.000.
- Fleischer, Donald W.: See—  
Asmundsson, Einar; Hart, Robert P.; and Fleischer, Donald W., 4,418,571, Cl. 73-304.00C.
- Fleischer, Jean C.; Clark, Gary T.; and Weaver, Max A., to Eastman Kodak Company. Isothiazole type azo dyes containing imidazo type couplers. 4,419,289, Cl. 260-158.000.
- Flournoy, Norman E., to Texaco Inc. Magnetic method and apparatus for measuring wall thickness. 4,418,574, Cl. 73-601.000.
- Flowers, Thomas. Boring tool. 4,419,032, Cl. 408-112.000.
- FMC Corporation: See—  
Fusy, Joel L., 4,418,718, Cl. 137-615.000.
- Orlando, Franklin P.; and Mortensen, Donald G., 4,418,521, Cl. 56-330.000.
- Talafuse, Larry J., 4,418,947, Cl. 285-168.000.
- Fohl, Artur, to REPA Feinstanzwerk GmbH. Automatic roll-up device for safety belts. 4,418,878, Cl. 242-107.300.
- Folsom, Lawrence R., to Mechanical Technology Incorporated. Free-piston stirling engine inertial cancellation system. 4,418,533, Cl. 60-520.000.
- Fomichev, Mikhail M.: See—  
Bodrov, Igor S.; Gudz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530, Cl. 60-39.181.
- Ford Motor Company: See—  
Blechinger, Chester J., 4,418,578, Cl. 73-861.220.
- Pierce, Stanley L., 4,418,585, Cl. 74-695.000.
- Stockton, Thomas R., 4,418,777, Cl. 180-65.00E.
- Tabar, Ronald J.; and Killgoar, Paul C., Jr., 4,419,480, Cl. 524-525.000.
- Forgach, Lilla: See—  
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsador, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- Forgione, Peter S.: See—  
Feldman, Allan M.; and Forgione, Peter S., 4,419,294, Cl. 260-453.00A.
- Formax, Inc.: See—  
Sandberg, Kenneth; and Stoub, James, 4,418,446, Cl. 17-32.000.
- Fortune, William S. Hot air soldering and resoldering system. 4,419,566, Cl. 219-230.000.
- Fory, Werner: See—  
Meyer, Willy; and Fory, Werner, 4,419,121, Cl. 71-92.000.
- Foster, Dean H.; Mersereau, Robert E.; and Silverman, Harold, to Pitney Bowes Inc. Inserter gauging system. 4,418,515, Cl. 53-457.000.
- Foster, John S.; and Zehmer, John A. M., III, to United States of America, Navy. Munroe effect breaching device. 4,418,622, Cl. 102-307.000.
- Foster Wheeler Energy Corporation: See—  
Johnson, Richard C.; Seshamani, Venkatraman; and Egbert, Leigh B., 4,418,650, Cl. 122-4.00D.
- Fox, Duke. Bicycle transmission assembly. 4,418,784, Cl. 180-221.000.
- Fox Mfg. Co.: See—  
Frydel, Edmund W., 4,418,593, Cl. 82-36.00R.
- Fralish, Mark R., to J. I. Case Company. Endless chain type lawn mower. 4,418,519, Cl. 56-244.000.
- Frame, James R. Electronic water treating device. 4,419,206, Cl. 204-228.000.
- Franchini, Ivan: See—  
Grilli, Walter; De Meo, Franco; and Franchini, Ivan, 4,419,152, Cl. 148-12.00F.
- Franco, Gerard: See—  
Christensen, Gay A.; Franco, Gerard; and Wildey, Theron L., 4,419,736, Cl. 364-900.000.
- Frankel, Milton B.; and Witucki, Edward F., to United States of America, Air Force. Azido fluorodinitro amines. 4,419,285, Cl. 260-349.000.
- Frankl, Gerald P. Apparatus for recovering and recycling animal waste. 4,419,239, Cl. 210-413.000.
- Franklin Electric Co., Inc.: See—  
Whitney, John A.; Dwyer, Daniel T.; and Sorenson, Peter F., 4,418,774, Cl. 177-210.00F.
- Franklin, Leonard N., Jr.; and Hegler, Gary G., to General Motors Corporation. Hydraulic pump rotating group axial alignment structure. 4,419,058, Cl. 418-133.000.
- Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung: See—  
Kalthoff, Jorg F.; and Winkler, Siegfried, 4,418,563, Cl. 73-12.000.
- Frazier, Wallace N. Roof-mounted solar collector device. 4,418,685, Cl. 126-428.000.
- Frcska, Miklos: See—  
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715, Cl. 137-508.000.
- French, James R. Pipe cleaning apparatus. 4,418,437, Cl. 15-104.090.
- French, Robert C.: See—  
Nebergall, Perry A.; and French, Robert C., 4,419,095, Cl. 604-96.000.
- Freudenstein, Ferdinand: See—  
Maki, E. Roland; and Freudenstein, Ferdinand, 4,418,586, Cl. 74-831.000.
- Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Riccio, Leo, to Memorex Corporation. Magnetic coating composition. 4,419,257, Cl. 252-62.540.
- Frey, Thomas: See—  
Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, 4,418,661, Cl. 123-145.00A.
- Frey-Wigger, Paul. Device for enhancing the versatility of cranes or the like. 4,418,791, Cl. 182-2.000.
- Fricker, Wolfgang-Peter; and Scholz, Manfred, to Kraftwerk Union Aktiengesellschaft; and Grunzweig & Hartmann Montage GmbH. Heat insulating casing. 4,418,724, Cl. 138-149.000.
- Fried, Krupp Gesellschaft mit beschränkter Haftung: See—  
Friedrich, Ronald; and Hammecke, Werner, deceased, 4,418,740, Cl. 164-287.000.
- Friedl, Edward L. Ground surface drainage apparatus. 4,419,231, Cl. 210-164.000.
- Friedman, Joseph: See—  
Friefeld, Jerome M.; and Friedman, Joseph, 4,418,683, Cl. 126-400.000.
- Friedrich, Heinz: See—  
Wolfgang, Bergstein; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,419,272, Cl. 502-84.000.

- Friedrich, Ronald; and Hammecke, Werner, deceased (by Hammecke, Marie Elise Gisela, heiress), to Fried. Krupp Gesellschaft mit beschränkter Haftung. Centrifugal caster. 4,418,740, Cl. 164-287.000.
- Friefeld, Jerome M.; and Friedman, Joseph, to Rockwell International Corporation. Separated phase thermal storage system. 4,418,683, Cl. 126-400.000.
- Frima, Heico J.; and Le Poole, Jan B., to U.S. Philips Corporation. Metal wire cathode for electron beam apparatus. 4,419,561, Cl. 219-121.00B.
- Frohbach, Louis A. Apparatus for controlling a wind propelled sailing device. 4,418,631, Cl. 114-39.000.
- Frohberger, Paul-Ernst: See—  
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinplugg, ans, 4,419,361, Cl. 424-273.00R.
- Frost, Rodney I.; and Montierth, Max R., to Corning Glass Works. Filter apparatus and method of filtering. 4,419,108, Cl. 55-97.000.
- Frydel, Edmund W., to Fox Mfg. Co. Form tool holder. 4,418,593, Cl. 82-36.00R.
- Fuchigami, Mitsuru; Ishiguro, Mamoru; and Ohye, Hideo, to Mitsubishi Paper Mills, Ltd. Color-forming sheet for no-carbon copying paper. 4,418,941, Cl. 282-27.500.
- Fuji Electric Company, Ltd.: See—  
Ohmori, Tsuguharu; and Hayashi, Shizuo, 4,419,755, Cl. 373-145.000.
- Fuji Electrochemical Co., Ltd.: See—  
Torii, Michihiro; and Kobayashi, Hiroaki, 4,418,471, Cl. 29-596.000.
- Fuji Jukogyo Kabushiki Kaisha: See—  
Momose, Shinroku; and Mizunuma, Tokuchi, 4,418,532, Cl. 60-316.000.
- Fuji Photo Film Co., Ltd.: See—  
Arai, Yoshihiro; and Nahara, Akira, 4,419,404, Cl. 428-336.000.
- Fujita, Susumu, 4,419,002, Cl. 354-187.000.
- Hosoi, Noriyuki; Hoshi, Yoshiyuki; and Matsukawa, Hiroharu, 4,418,942, Cl. 282-27.500.
- Kuwazima, Shigeru; Kato, Eiichi; and Yamada, Minoru, 4,419,439, Cl. 430-375.000.
- Mifune, Hiroyuki; Fuseya, Yoshiharu; and Ikenoue, Shinpei, 4,419,443, Cl. 430-600.000.
- Sugiyama, Masatoshi; Nakanishi, Ichiro; and Suzuki, Yoshiaki, 4,419,388, Cl. 427-288.000.
- Fuji Xerox Co., Ltd.: See—  
Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696, Cl. 358-294.000.
- Fujie, Masakatsu; Matsuno, Junichi; and Furuya, Masao, to Hitachi, Ltd. Recording sheet conveying system of pressure fixing type electrostatic printing apparatus. 4,419,003, Cl. 355-3.0FU.
- Fujii, Toshihiro: See—  
Kosaka, Shuhei; and Fujii, Toshihiro, 4,419,254, Cl. 252-37.000.
- Fujimori, Fumio, to Aisin Seiki Kabushiki Kaisha. Sliding caliper disc brakes. 4,418,797, Cl. 188-73.370.
- Fujimoto, Sakae, to Ricoh Company, Ltd. Sheet feeding apparatus. 4,418,904, Cl. 271-37.000.
- Fujimoto, Tsutomu, to Kubota, Ltd. Tractive force sensing system for tractor. 4,418,758, Cl. 172-7.000.
- Fujisaki, Masayuki: See—  
Ogiro, Kenji; Fujisaki, Masayuki; and Gotoh, Shinichi, 4,419,708, Cl. 360-132.000.
- Fujita, Minoru; and Nishida, Shigeo, to Rinzei Co., Ltd., by said Shigeo Nishida. Method of manufacturing shoe sole material and shoes products made by the same. 4,418,483, Cl. 36-28.000.
- Fujita, Susumu, to Fuji Photo Film Co., Ltd. Lens extension and retracting mechanism for use in a photographic camera of folding type. 4,419,002, Cl. 354-187.000.
- Fujita, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Method of simultaneously forming buried resistors and bipolar transistors by ion implantation. 4,418,469, Cl. 29-577.00C.
- Fujitsu Limited: See—  
Kikuchi, Hideo, 4,419,596, Cl. 307-603.000.
- Kojima, Takuhito; Satake, Yasuo; and Masuda, Toru, 4,419,753, Cl. 370-62.000.
- Nogami, Masaharu, 4,419,179, Cl. 156-613.000.
- Taguchi, Masao; and Ito, Takashi, 4,419,743, Cl. 365-149.000.
- Toyoda, Kazuhiro; and Ono, Chikai, 4,419,745, Cl. 365-174.000.
- Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of fibers of poly-p-phenylene-terephthalamide. 4,419,317, Cl. 264-184.000.
- Fujizaki Pharmaceutical Co., Ltd.: See—  
Kasahara, Yasushi; Ashihara, Yoshihiro; Sugiyama, Masami; and Harada, Takahiro, 4,419,445, Cl. 435-20.000.
- Fukino, Masato: See—  
Nakayama, Masafumi; Yanai, Tokiyoshi; and Fukino, Masato, 4,418,779, Cl. 180-141.000.
- Fukuda, Masao, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method and apparatus therefor. 4,418,772, Cl. 177-1.000.
- Fukumoto, Chihiro; Furukawa, Tokinobu; and Oda, Chikao, to Hitachi, Ltd. Process for continuous production of high impact polystyrene. 4,419,488, Cl. 525-53.000.
- Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiro, to Nissan Motor Co., Ltd. Shock absorber. 4,418,802, Cl. 188-282.000.
- Fukuzawa, Akira: See—  
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; and Ozaki, Tsuyoshi, 4,419,128, Cl. 75-46.000.
- Fulcomer, Emanuel J., Jr.: See—  
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., 4,419,756, Cl. 375-7.000.
- Fumez, Andre R.: See—  
Beckerick, Philippe J.; Hamelin, Patrice R.; and Fumez, Andre R., 4,419,196, Cl. 204-157.10R.
- Funk, Robert C., to Dickey-john Corporation. Tractor data center. 4,419,654, Cl. 340-52.00R.
- Furukawa, Tokinobu: See—  
Fukumoto, Chihiro; Furukawa, Tokinobu; and Oda, Chikao, 4,419,488, Cl. 525-53.000.
- Furusawa, Teruo: See—  
Ichinose, Shiro; Machida, Saneto; Murakami, Shotoku; and Furusawa, Teruo, 4,419,613, Cl. 318-632.000.
- Furuya, Masao: See—  
Fujie, Masakatsu; Matsuno, Junichi; and Furuya, Masao, 4,419,003, Cl. 355-3.0FU.
- Fuse, Mario: See—  
Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696, Cl. 358-294.000.
- Fuseya, Yoshiharu: See—  
Mifune, Hiroyuki; Fuseya, Yoshiharu; and Ikenoue, Shinpei, 4,419,443, Cl. 430-600.000.
- Fusy, Joel L., to FMC Corporation. Method and apparatus for controlling articulated fluid loading arms upon emergency disconnection. 4,418,718, Cl. 137-615.000.
- G. D. Societa per Azioni: See—  
Seragnoli, Enzo, 4,418,705, Cl. 131-84.00R.
- G. L. Rexroth GmbH: See—  
Muncke, Ludwig; and Kaus, Wolfgang, 4,418,955, Cl. 296-190.000.
- Gaede, Georg, to Bayerische Motoren Werke Aktiengesellschaft. Process for preventing the pumping of a hydraulic valve clearance compensating element in valve operating mechanisms or internal combustion engines. 4,418,659, Cl. 123-90.460.
- GAF Corporation: See—  
Hort, Eugene V.; Anderson, Lowell R.; and Alwani, Dru W., 4,419,266, Cl. 252-392.000.
- Nelsen, Suzanne; Ozari, Yehuda; Alwani, Dru; and Wotier, Edward, 4,419,471, Cl. 524-100.000.
- Gagnon, Richard T., to Federal Screw Works. Speech digitization system. 4,419,657, Cl. 340-347.00R.
- Gahleitner, Erwin: See—  
Eggert, Albert; Gahleitner, Erwin; and Kwiatkowski, Joachim, 4,418,787, Cl. 181-130.000.
- Gal, Laszlo: See—  
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715, Cl. 137-508.000.
- Galambos, Janos: See—  
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsador, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- Gale, George M., to Rubber and Plastics Research Association of Great Britain. Extruder mixer. 4,419,014, Cl. 366-99.000.
- Galle, Serge; Hautdidier, Jerome; and Soulet, Christian, to Compagnie Europeenne du Zirconium Cezus. Precision local expansion shaping process and apparatus for metal tubes of substantial length. 4,418,556, Cl. 72-62.000.
- Gallina, Ferenc, to Van Leer Verpackungen GmbH. Single tablet dispensing box. 4,418,838, Cl. 221-246.000.
- Gamber, A. Dale: See—  
Koch, Earl E.; Gamber, A. Dale; and Ehrhart, Philip J., 4,418,518, Cl. 56-228.000.
- Gambon, Thomas F. Quick acting coupler. 4,418,946, Cl. 285-73.000.
- Gang-Nail Systems, Inc.: See—  
Moyer, Anthony M.; and Kelly, Robert H., 4,418,509, Cl. 52-693.000.
- Ganuchau, Charles J., Jr., to Motorola, Inc. Combined tone only and tone voice multiple alert pager. 4,419,668, Cl. 340-825.440.
- Garavuso, Gerald M., to Xerox Corporation. Sheet feeding apparatus. 4,418,905, Cl. 271-98.000.
- Gardner, Bruce: See—  
Woolnough, James; Gardner, Bruce; and May, David A., 4,418,739, Cl. 160-120.000.
- Gardner, David P., Sr. Automatic toothpaste dispenser. 4,418,840, Cl. 222-96.000.
- Garner, H. Douglas, to United States of America, National Aeronautics and Space Administration. Magnetic heading reference. 4,418,480, Cl. 33-349.000.
- Garner, Richard L.; and Winans, Luther, Jr., to Becton Dickinson and Company. Oxygen scavenging system for anaerobiosis. 4,419,451, Cl. 435-298.000.
- Garrocho, Jose M. Photographic paper punch. 4,418,596, Cl. 83-98.000.
- Gauchard, Fernand. Apparatus for dispersing liquids. 4,418,623, Cl. 102-369.000.
- Gaughan, Edmund J.: See—  
Pallos, Ferenc M.; and Gaughan, Edmund J., 4,419,523, Cl. 560-12.000.



- Gausman, Thomas E.: See—  
Doyle, Richard F.; Gausman, Thomas E.; and Myers, Edward T., 4,419,536, Cl. 174-52.00R.
- Gavaler, John R.: See—  
Charles, Robert G.; and Gavaler, John R., 4,419,125, Cl. 75-0.50B.
- Gehring, Johann: See—  
Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,419,204, Cl. 204-206.000.
- Geier, Heinz: See—  
Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, 4,418,661, Cl. 123-145.00A.
- Gellatly, John S., to Western Electric Company, Inc. Method and apparatus for welding metal parts coated with a thermoplastic. 4,419,557, Cl. 219-86.250.
- Gemmell, Robert M.; and Hildebrand, David B., to Mostek Corporation. Temperature compensated reference circuit. 4,419,594, Cl. 307-297.000.
- General Battery Corporation: See—  
DiGiacomo, Hector; Raos, Robert R.; and Zabko, Al L., 4,418,464, Cl. 29-564.600.
- General Electric Company: See—  
Ashby, Bruce A.; and Schroeter, Siegfried H., 4,419,405, Cl. 428-412.000.
- Borman, Willem F. H.; Kramer, Morton; and Reilly, Eugene P., 4,419,485, Cl. 525-437.000.
- Devine, Thomas M., Jr., 4,418,859, Cl. 228-183.000.
- Leach, John G., 4,419,651, Cl. 337-159.000.
- Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., 4,418,470, Cl. 29-577.00C.
- Sidebottom, Donald L., 4,418,744, Cl. 165-25.000.
- Smetana, Andrew; and Hanson, James M., 4,418,973, Cl. 339-31.00L.
- Vostovich, Joseph E., 4,419,475, Cl. 524-264.000.
- General Instrument Corporation: See—  
Cohen, Elias, 4,419,769, Cl. 455-182.000.
- General Motors Corporation: See—  
Franklin, Leonard N., Jr.; and Hegler, Gary G., 4,419,058, Cl. 418-133.000.
- Kauffman, Allen L., 4,418,587, Cl. 74-867.000.
- Maki, E. Roland; and Freudenstein, Ferdinand, 4,418,586, Cl. 74-831.000.
- Miller, Larry D., 4,418,939, Cl. 280-803.000.
- O'Keefe, John J., II, 4,418,975, Cl. 339-91.00R.
- Sigety, Stephen, Jr., 4,418,440, Cl. 15-250.210.
- Smith, Richard H., 4,419,113, Cl. 55-484.000.
- Sullivan, Floyd A.; Elbers, Arthur H.; and Trierweiler, Charles M., 4,418,938, Cl. 280-661.000.
- Wanlass, Bert R.; and Drouillard, James R., 4,418,498, Cl. 49-425.000.
- General Signal Corporation: See—  
Liddard, Roy, 4,419,015, Cl. 366-349.000.
- General Texas Corporation: See—  
VanNess, David; Hines, Joseph; and Wells, William E., 4,419,300, Cl. 261-106.000.
- Genge, Charles A. Adjustable portable saw guide device. 4,418,902, Cl. 269-258.000.
- Genis, Igor A.: See—  
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741, Cl. 164-454.000.
- Genovese, Joseph. Backpack shelter apparatus. 4,418,854, Cl. 224-154.000.
- George, Benjamin T.; and Chen, Patricia C., to Sperry Corporation. Cache/disk subsystem with tagalong copy. 4,419,725, Cl. 364-200.000.
- George, Kurudamannil A., to Proctor & Schwartz, Inc. Apparatus for plaiting tow onto a conveyor. 4,418,856, Cl. 226-118.000.
- Georges, Jean-Francois M.; and Parus, Roger, to Avions Marcel Dassault-Breguet Aviation; and Thomson-CSF. Aircraft piloting aid system. 4,419,079, Cl. 434-43.000.
- Georgetown University: See—  
Rahman, Aquilur; and Schein, Philip S., 4,419,348, Cl. 424-180.000.
- Georgia-Pacific Corporation: See—  
Kimbrell, Melvin, Sr., deceased, 4,418,863, Cl. 229-49.000.
- Gerald, Rieger: See—  
Willi, Rauschert; Erich, Bock; and Gerald, Rieger, 4,418,624, Cl. 102-473.000.
- Gerber, Heinz J., to Gerber Scientific, Inc. Eyeglasses and other lenses of variable focal length and means and method for varying such focal length. 4,418,990, Cl. 351-41.000.
- Gerber Scientific, Inc.: See—  
Gerber, Heinz J., 4,418,990, Cl. 351-41.000.
- Gerber Scientific Instrument Company, The: See—  
Hevenor, Charles M., Jr., 4,419,740, Cl. 364-900.000.
- Gerboth, Patrick L.; and Jozwiak, Stanley E., Jr., to SGM Co., Inc. Low noise centrifugal blower. 4,419,049, Cl. 415-206.000.
- Gerbus, Leo H. Marine float. 4,418,634, Cl. 114-263.000.
- Ghandour, Edmond. Returning ball toy. 4,418,494, Cl. 46-61.000.
- Ghelli, Giovanni; Bruchi, Enrico; and Agnese, Gino, to Luigi Stoppani S.p.A. Two stage process for preparing 2,6-pyridinedicarboxylic acid. 4,419,515, Cl. 546-5.000.
- Gibbons, Michael L.: See—  
Balmforth, Willard R.; Weber, David C.; and Gibbons, Michael L., 4,419,652, Cl. 338-28.000.
- Gibson, Ian P., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Metal coatings. 4,419,202, Cl. 204-192.00N.
- Giken Kogyo Kabushiki Kaisha: See—  
Mizobe, Masatoshi, 4,418,764, Cl. 173-12.000.
- Gilbert, Paul H., to United States of America, Navy. Phase demodulator utilizing a frequency divider, synchronous filter, and phase comparator. 4,419,630, Cl. 329-50.000.
- Gile, Richard H.: See—  
Reda, Kazimierz J.; Dzewaltowski, Victor F.; and Gile, Richard H., 4,419,612, Cl. 318-571.000.
- Gilker, Clyde: See—  
Jindrick, James A.; Hurley, James R.; Gilker, Clyde; Nohria, Naresh K.; Baranowski, James A.; and Dolnik, Thomas G., 4,419,619, Cl. 323-257.000.
- Gillette, Donald J.; and Hajek, Bedrich, to Electrostatic Equipment Corporation. Build control apparatus and method. 4,418,642, Cl. 118-624.000.
- Gilliland, Keith E.; and Morris, Richard W., to Boeing Company, The. Rub strip assembly having lengthwise groove for receiving snap-in member. 4,418,508, Cl. 52-282.000.
- Girault, Jean-Pierre Y. B.: See—  
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, 4,419,045, Cl. 415-119.000.
- Glass Medic, Inc.: See—  
Matles, William B., 4,419,305, Cl. 264-36.000.
- Glover, Douglas W.: See—  
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,418,983, Cl. 350-96.210.
- Goedegebuure, Gerard W. H.: See—  
Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., 4,418,484, Cl. 37-63.000.
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Bayer, Ernst; and Schumann, Wilhelm, 4,419,490, Cl. 525-61.000.
- Hicks, James E., to RCA Corporation. Horizontal deflection circuit. 4,419,608, Cl. 315-408.000.
- Hidaka, Kunihiko: See—  
Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, 4,418,802, Cl. 188-282.000.
- Hidasi, Gyorgy: See—  
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezo; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524, Cl. 562-506.000.
- Hidy, Ivan: See—  
Elekes, Ilona; Institoris, Laszlo; Medzihradsky, Kalman; Otvos, Laszlo; Medzihradsky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522, Cl. 549-557.000.
- Higashi, Hidehiro: See—  
Yoshida, Shin-ichi; Yano, Takemitsu; and Higashi, Hidehiro, 4,419,275, Cl. 502-322.000.
- Higgins, Michael R. Convection barbecue pit. 4,418,615, Cl. 99-331.000.
- Higgins, Rudolph S., to Texasgulf Inc. Multiple-bed solution mining of an inclined structure. 4,418,960, Cl. 299-5.000.
- Hildebrand, David B.: See—  
Gemmill, Robert M.; and Hildebrand, David B., 4,419,594, Cl. 307-297.000.
- Hill, Amos G.: See—  
Lutz, Bruce L.; Voth, Harold W.; and Hill, Amos G., 4,418,873, Cl. 241-294.000.
- Hill, Harold I.; and Targowski, Roger W. Mounting apparatus. 4,419,020, Cl. 374-12.000.
- Hill, Stewart C., to Marconi Company Limited, The. Dual feed box horn antenna. 4,419,670, Cl. 343-779.000.
- Hille, Martin: See—  
Diery, Helmut; and Hille, Martin, 4,419,265, Cl. 252-331.000.
- Hillstrom, Ernst G. K.: See—  
Johansson, Lennart R.; and Hillstrom, Ernst G. K., 4,418,997, Cl. 353-111.000.
- Himmelwright, Richard S.: See—  
Falke, Martin L.; and Himmelwright, Richard S., 4,419,442, Cl. 430-567.000.
- Hindersinn, Raymond R., to Occidental Chemical Corporation. Pultruded reinforced phenolic resin products. 4,419,400, Cl. 428-245.000.
- Hines, Joseph: See—  
VanNess, David; Hines, Joseph; and Wells, William E., 4,419,300, Cl. 261-106.000.
- Hingarh, Hermaj K.: See—  
Vora, Madhukar B.; and Hingarh, Hermaj K., 4,418,468, Cl. 29-577.000.
- Hiratsuka, Kozo: See—  
Kamibayashi, Masato; Tsuchiya, Shinji; and Hiratsuka, Kozo, 4,419,518, Cl. 546-279.000.
- Hird, Edwin A. Point locator and graphics digitizer system. 4,419,672, Cl. 346-33.00M.
- Hirsch, Arthur E., to J. I. Case Company. Unloading valve for hi-lo hydraulic system. 4,418,709, Cl. 137-115.000.
- Hirtle, Georgina Chrystal: See—  
John, Frank T., 4,419,650, Cl. 337-119.000.
- Hirtliefer, Karl R.: See—  
Dubiel, Oswald; Hirtliefer, Karl R.; Muller, Johann, deceased; and Muller, Christine, executrix, 4,418,590, Cl. 81-467.000.
- Hitachi, Ltd.: See—  
Fujie, Masakatsu; Matsuno, Junichi; and Furuya, Masao, 4,419,003, Cl. 355-3.0FU.
- Fukamoto, Chihiro; Furukawa, Tokinobu; and Oda, Chikao, 4,419,488, Cl. 525-53.000.
- Imai, Iwao; and Sone, Masazumi, 4,419,547, Cl. 200-19.00R.
- Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, 4,419,604, Cl. 313-385.000.
- Muto, Nobuyoshi; Sakai, Keiji; and Matsuda, Yasuo, 4,419,615, Cl. 318-811.000.
- Nate, Kazuo; Kobayashi, Toshio; and Isogai, Tokio, 4,419,506, Cl. 526-316.000.
- Sakai, Yoshio; and Nakamura, Hideo, 4,419,684, Cl. 357-40.000.
- Sugawara, Yoshitaka; Kamei, Tatsuya; and Sakurai, Tetsuma, 4,419,685, Cl. 357-53.000.
- Tsuzurabara, Mamoru; and Kitakaze, Seiji, 4,419,606, Cl. 315-39.510.
- Hitachi Maxell, Ltd.: See—  
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- Hitomi, Chiyoji: See—  
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- Hlavay, Sandor: See—  
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- Ho, Stanley S., to Monsanto Company. Phenolic foams. 4,419,460, Cl. 521-123.000.
- Hobbs, Charles F., to Monsanto Company. Catalyst and reverse disproportionation process. 4,419,526, Cl. 585-435.000.
- Hobbs, Charles F., to Monsanto Company. Catalyst and reverse disproportionation process. 4,419,527, Cl. 585-435.000.
- Hoch, Louis; and Lutkowski, Lawrence, to Becton Dickinson and Company. Multiple sample needle assembly. 4,418,703, Cl. 128-766.000.
- Hoeberechts, Arthur M. E.: See—  
Kuhl, Walter H.; Van Leunen, Johannes A. J.; van der Eijk, Bart; van der Bolt, Antonius J. J. M.; and Hoeberechts, Arthur M. E., 4,418,452, Cl. 445-35.000.
- Hoechst Aktiengesellschaft: See—  
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- Niermann, Hermann; Reichert, Gunter; Ebert, Hans; and Neumann, Friedrich, 4,419,104, Cl. 23-293.00R.
- Hoffer, John C.: See—  
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,418,983, Cl. 350-96.210.
- Hoffer, Steven D.: See—  
Weber, Kenneth E.; and Hoffer, Steven D., 4,419,191, Cl. 204-1.00T.
- Hoffman, Jarett D., to United States of America, Agriculture. Artificial host egg for rearing trichogramma. 4,418,647, Cl. 119-1.000.
- Hoffmann, Gerhard: See—  
Graser, Fritz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,419,427, Cl. 430-58.000.
- Hoffmann, Jurgen, to Sartorius GmbH. Tubular filter element for the filtration of fluids. 4,419,241, Cl. 210-493.500.
- Hoffmann-La Roche Inc.: See—  
Petrzika, Martin, 4,419,262, Cl. 252-299.610.
- Hofmann, Gloris R., to Brunswick Corporation. Alternator for ignition system and auxiliary power. 4,418,677, Cl. 123-599.000.
- Hofmann, Manfred: See—  
Hartel, Volker; and Hofmann, Manfred, 4,418,897, Cl. 267-140.100.
- Hoge, John H., to Molecrete Corporation. Method of preparing cementitious compositions for tunnel backfill. 4,419,135, Cl. 106-88.000.
- Holdstock, Barry C.: See—  
Atkinson, Ivor B.; and Holdstock, Barry C., 4,419,463, Cl. 523-106.000.
- Holfelder, Gerhard: See—  
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- Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, 4,418,661, Cl. 123-145.00A.
- Hollaus, Reinhard: See—  
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- Hollister Incorporated: See—  
Alexander, Brian S., 4,419,100, Cl. 604-339.000.
- Holmes, Allen B., to United States of America, Army. Fluidic valve and pulsing device. 4,418,721, Cl. 137-810.000.
- Holtey, Thomas O.; and Miller, Robert C., to Honeywell Information Systems Inc. Hardware for extending microprocessor addressing capability. 4,419,727, Cl. 364-200.000.
- Holtrop, John W., to United States of America, Navy. Electrohydraulic control system. 4,418,610, Cl. 91-368.000.
- Holzer, Walter. Electro-magnetic valves particularly for household appliances. 4,418,886, Cl. 251-30.000.
- Homer Ion Laboratory Co., Ltd.: See—  
Matsumoto, Junji; Kamiya, Shohei; and Sugihara, Yasuhiko, 4,418,687, Cl. 128-1.00C.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Hasegawa, Shumpei; and Yamato, Akihiro, 4,418,674, Cl. 123-491.000.
- Iwao, Suminari, 4,418,676, Cl. 123-580.000.
- Honeywell Inc.: See—  
Butler, Neal R.; and Carson, Alan R., 4,419,593, Cl. 307-268.000.
- Honeywell Information Systems Inc.: See—  
Holtey, Thomas O.; and Miller, Robert C., 4,419,727, Cl. 364-200.000.
- Hongu, Masayuki: See—  
Yamamoto, Yoshihiro; Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 4,419,695, Cl. 358-198.000.
- Honig, Gunter: See—  
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- Hooper, Neil: See—  
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- Hopkins, Thomas R., to Lubrizol Corporation. The Method for continuous production of invert emulsion polymers. 4,419,466, Cl. 523-324.000.
- Hoppe, Renate: See—  
Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440, Cl. 430-377.000.
- Horgan, William J., Jr., to Blumcraft of Pittsburgh. Panic handle for doors. 4,418,949, Cl. 292-92.000.



- Horiuchi, Toshiaki: See—  
Ohshita, Masayuki; Horiuchi, Toshiaki; Yamanaka, Takashi; and Usui, Yoshihiro, 4,419,553, Cl. 200-144.00B.
- Horsma, David A.: See—  
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- Hort, Eugene V.; Anderson, Lowell R.; and Alwani, Dru W., to GAF Corporation. Corrosion inhibitors containing 3-dialkyl-3-(1-ethylpentyl)-prop-1-yne, 4,419,266, Cl. 252-392.000.
- Horton Industries, Inc.: See—  
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- Horton, Tommy A.; and Augustyn, Michael D., to United States of America, Navy. Apparatus for containing a leakage of PCB compound, 4,419,230, Cl. 210-114.000.
- Hoshi, Yoshiyuki: See—  
Hosoi, Noriyuki; Hoshi, Yoshiyuki; and Matsukawa, Hiroharu, 4,418,942, Cl. 282-27.500.
- Hosiden Electronics Co., Ltd.: See—  
Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643, Cl. 335-234.000.
- Hosoi, Noriyuki; Hoshi, Yoshiyuki; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Microcapsule sheet for pressure-sensitive recording paper, 4,418,942, Cl. 282-27.500.
- Hosokawa, Shuui: See—  
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- Houle, James F.: See—  
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- Howard, Durrell U. Remotely adjustable steering compensator, 4,418,931, Cl. 280-94.000.
- Howe, Dennis G., to Eastman Kodak Company. Constant track width optical disk recording, 4,419,750, Cl. 369-111.000.
- Howell, Frank H. Aluminum furnace skim recovery system, 4,418,892, Cl. 266-137.000.
- Howell, Margene C.: See—  
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- Howell, Thomas J.: See—  
Barrett, James H.; Howell, Thomas J.; and Lein, George M., Jr., 4,419,245, Cl. 210-681.000.
- Howley, Peter M.; Sarver, Nava; and Law, Ming-Fan, to United States of America, Health and Human Services. Recombinant DNA process utilizing a papilloma virus DNA as a vector, 4,419,446, Cl. 435-68.000.
- Hsiung, Hansen M., to Eli Lilly and Company. Process for de-acyanethylation blocked nucleotides, 4,419,509, Cl. 536-27.000.
- Hsu, Charles J. Water detecting or absorbing device for use in and removal from a tank with a limited opening, 4,419,236, Cl. 210-282.000.
- Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, to Exxon Research and Engineering Co. Electrical coalescence of liquid emulsions, 4,419,200, Cl. 204-186.000.
- Huber, Lajos: See—  
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- Hucal, Taras: See—  
Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,419,200, Cl. 204-186.000.
- Huckaby, Edward E.: See—  
Winkelman, Henry T., Jr.; and Huckaby, Edward E., 4,418,967, Cl. 312-107.000.
- Hudson, George A., deceased (by White, Richard L., administrator); and Reiff, Helmut F., to Mobay Chemical Corporation. Aliphatic solvent compatible isocyanates, 4,419,293, Cl. 260-453.0AB.
- Hudson, Hal R.: See—  
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,418,507, Cl. 52-241.000.
- Hudson's Bay Oil and Gas Company Limited: See—  
Jagodzinski, Richard F.; and Kerr, Richard K., 4,419,337, Cl. 423-574.00R.
- Huggins, Orville C.; and Mistyurik, John D., to Monarch Marking Systems, Inc. Label printing apparatus with constant pressure printing mechanism, 4,418,618, Cl. 101-68.000.
- Hughes Aircraft Company: See—  
Peters, John W., 4,419,385, Cl. 427-99.000.
- Wysocki, Joseph A.; Blair, George R.; and Vince, Michael R., 4,418,984, Cl. 350-96.330.
- Hughes Helicopters, Inc.: See—  
Price, Leonard W., 4,418,607, Cl. 89-33.0CA.
- Hughes, Jack. Pistol and removable cartridge shaped barrel insert, 4,418,488, Cl. 42-75.00B.
- Huljak, Robert J.: See—  
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- Hundt, Eckart; and Trautenberg, Elmar, to Siemens Aktiengesellschaft. Method for processing ultrasonic echo signals of both directionally reflecting as well as nondirectionally scattering objects, particularly for ultrasonic image processing in the field of substance or tissue investigation, 4,418,575, Cl. 73-607.000.
- Hunter, Arthur C.; and Hamilton, Stephen P., to Texas Instruments Incorporated. Multiple pointer memory system, 4,419,746, Cl. 365-189.000.
- Hunter, John J. Apparatus for making pipe coupling joint, 4,418,458, Cl. 29-237.000.
- Hunter, Le Roy: See—  
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- Huon, Simon: See—  
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- Hurley, James R.: See—  
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- Husch, Bruno: See—  
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- Hutchinson-Mapa: See—  
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- Huzyak, Paul E., to Gulf & Western Manufacturing Co. Roll coolant distribution header, 4,418,559, Cl. 72-201.000.
- Hwang, Ying-Chen: See—  
Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., 4,418,470, Cl. 29-577.00C.
- Hyde, Jack, to Koppers Company, Inc. Blast furnace stove wall, 4,419,075, Cl. 432-217.000.
- Hyder, Marvin W.; and Weinstock, Steven F., to Leslie Metal Arts Company. Rotary-position catch for rotatable shelf units, 4,418,970, Cl. 312-305.000.
- I-Temp Corporation: See—  
Larson, Roger R., 4,419,166, Cl. 156-272.400.
- Ichikawa, Rinjiro; and Hitomi, Chiyoji, to Toyo Boseki Kabushiki Kaisha. Transparent conductive film, 4,419,399, Cl. 428-215.000.
- Ichinose, Shiro; Machida, Saneto; Murakami, Shotoku; and Furusawa, Teruo, to Toshin Kogyo Co. Ltd. Apparatus for intermittently driving endless belt in automatic screen printing machine, 4,419,613, Cl. 318-632.000.
- Iijima, Yasuo: See—  
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- Ikenoue, Shinpei: See—  
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- Ikezawa, Kenji: See—  
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- Illinois Tool Works Inc.: See—  
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- Imai, Iwao; and Sone, Masazumi, to Nissan Motor Company, Ltd.; and Hitachi, Ltd. Ignition distributor for internal combustion engine, 4,419,547, Cl. 200-19.00R.
- Imai, Iwao: See—  
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,418,660, Cl. 123-143.00B.
- Imai, Kazuhiro; Tamura, Zenzo; and Kobayashi, Shin-ichiro, to Yamanouchi Pharmaceutical Co., Ltd. Method of detecting fluorescent materials and apparatus for their detection, 4,419,452, Cl. 436-89.000.
- Imai, Koji: See—  
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- Imai, Takashi: See—  
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- Imamura, Yoshinori: See—  
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- Imperial Chemical Industries PLC: See—  
Backhouse, Alan J.; Bromley, Charles; and Thompson, Morice W., 4,419,465, Cl. 523-201.000.
- Rose, John B., 4,419,486, Cl. 525-534.000.
- Smith, Leslie H., 4,419,363, Cl. 424-285.000.
- Imura, Toshinori: See—  
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- Inagaki, Junichi: See—  
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- Inagaki, Koichi: See—  
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- Inata, Hiroo: See—  
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- Indata Corporation: See—  
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- Industrie Pirelli Societa per Azioni: See—  
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- Ingard, Karl U.: See—  
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- Ingersoll-Rand Company: See—  
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- Inkares AG: See—  
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- Inoue, Naomitsu: See—  
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- Inoue, Yozo: See—  
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- Institoris, Laszlo: See—  
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- Institut Francais du Petrole: See—  
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- Institut National de la Sante et de la Recherche Medicale-INSERM: See—  
Quash, Gerard A., 4,419,444, Cl. 435-7.000.
- Instrumentarium Oy: See—  
Kinanen, Ilmari, 4,419,764, Cl. 378-153.000.
- International Business Machines Corp.: See—  
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- Bahr, Dietrich J.; and Briska, Marian, 4,419,392, Cl. 427-404.000.
- Blum, Arnold, 4,419,739, Cl. 364-900.000.
- Bowlds, Patsy A.; Cassidy, Bruce M.; Graham, Arthur E.; Huljak, Robert J.; Stafford, Donald W.; and Tao, Deh C., 4,419,024, Cl. 400-120.000.
- Burkhart, Robert W.; Cox, Allen R.; and Hartley, John D., 4,418,473, Cl. 29-603.000.
- Cholat-Namy, Jean; Huon, Simon; and Thirion, Philippe, 4,419,751, Cl. 370-13.000.
- Grombone, Anthony; and Van Cleave, George W., 4,419,010, Cl. 355-133.000.
- Harper, James M. E.; Heiblum, Mordehai; and Kaufman, Harold R., 4,419,203, Cl. 204-192.00R.
- Kellogg, Robert M., 4,418,945, Cl. 285-70.000.
- Locke, Charles H., 4,419,714, Cl. 361-321.000.
- Norgren, Kent S.; and Stucka, Stephen E., 4,419,592, Cl. 307-241.000.
- International Computers Limited: See—  
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- International Design Corporation: See—  
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- International Flavors & Fragrances Inc.: See—  
Boden, Richard M., 4,419,280, Cl. 252-522.00R.
- International Harvester Co.: See—  
Boetto, Charles, 4,418,763, Cl. 172-776.000.
- International Paper Company: See—  
McFarland, William W.; and Beavers, Baxter, 4,418,861, Cl. 229-23.00A.
- International Power Technology, Inc.: See—  
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- Cheng, Dah Y.; and Wiersma, Steve J., 4,419,242, Cl. 210-500.200.
- International Standard Electric Corporation: See—  
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- Ege, Sigmund, 4,419,056, Cl. 417-426.000.
- Roberts, Daniel F. T., 4,419,146, Cl. 148-23.000.
- Iomega Corporation: See—  
Brower, Ralph D.; and Losee, Paul D., 4,419,705, Cl. 360-103.000.
- Radman, Anton J.; Bauck, Randall C.; and Kleczkowski, Peter S., 4,419,704, Cl. 360-102.000.
- Ionna, Samuel A., to Williamson Company, The. Duct fitting, 4,418,943, Cl. 285-12.000.
- Iowa State University Research Foundation, Inc.: See—  
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- Irie, Kenji: See—  
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- Irokawa, Shoichi; Imai, Koji; Sakurai, Takeichi; and Goto, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Multiterminal DC power transmission system, 4,419,591, Cl. 307-45.000.
- Isaka, Akihiko, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Drive shaft supporting device for a music box with a plate frame, 4,418,603, Cl. 84-95.00R.
- Ishida, Hiroaki, to Seiko Koki Kabushiki Kaisha. Automatic focusing device for the camera, 4,418,998, Cl. 354-405.000.
- Ishida, Minoru: See—  
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- Ishida, Takashi: See—  
Tominari, Noboru; and Ishida, Takashi, 4,418,673, Cl. 123-478.000.
- Ishiguro, Mamoru: See—  
Fuchigami, Mitsuru; Ishiguro, Mamoru; and Ohye, Hideo, 4,418,941, Cl. 282-27.500.
- Ishihara, Hideo; Ohshita, Takahiro; and Saito, Harumitsu, to Ebara Corporation. Thermal reactor of fluidizing bed type, 4,419,330, Cl. 422-143.000.
- Ishihara, Kiyomitsu, to Yoshida Kogyo K. K. Automatic control of the length of article row to be injection-molded, 4,419,306, Cl. 264-40.500.
- Ishii, Toshihiko; and Sato, Tadao, to National Institute for Researches in Inorganic Materials. Process for producing rhombohedral system boron nitride, 4,419,335, Cl. 423-290.000.
- Ishijima, Shizuo; Kiritani, Takeshi; and Hayashi, Yukio, to Asahi Kasei Kogyo Kabushiki Kaisha. Organic phosphoric ester containing water-dispersible aluminum paste as foaming agent in light-weight foamed concrete, 4,419,134, Cl. 106-87.000.
- Ishikawa, Shozo: See—  
Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,419,428, Cl. 430-77.000.
- Ishikawa, Yasuki: See—  
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,418,660, Cl. 123-143.00B.
- Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, to Hitachi, Ltd. Light sensitive screen, 4,419,604, Cl. 313-385.000.
- Ishizaki, Morio, to Ishizaki Press Kogyo Co., Ltd. Battery container and lid, 4,419,420, Cl. 429-185.000.
- Ishizaki Press Kogyo Co., Ltd.: See—  
Ishizaki, Morio, 4,419,420, Cl. 429-185.000.
- Isobe, Yukihiko; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, to TDK Electronics Co., Ltd. Magnetic recording medium and production thereof, 4,419,406, Cl. 428-422.000.
- Isogai, Tokio: See—  
Nate, Kazuo; Kobayashi, Toshio; and Isogai, Tokio, 4,419,506, Cl. 526-316.000.
- Issleib, Juergen: See—  
Krautkremer, Franz; and Issleib, Juergen, 4,418,633, Cl. 114-144.00E.
- Italtector ITM S.p.A.: See—  
Grilli, Walter; De Meo, Franco; and Franchini, Ivan, 4,419,152, Cl. 148-12.00F.
- Ito, Hideo; and Yabuta, Keiichiro, to Nissan Motor Company, Limited. Method of steering a wheeled vehicle having at least two pairs of steerable road wheels, 4,418,780, Cl. 180-142.000.
- Ito, Hisao: See—  
Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696, Cl. 358-294.000.
- Ito, Osamu; and Nishizawa, Kazunori, to Kao Soap Co., Ltd. Twisted yarn and twisted bundle of yarns, 4,418,524, Cl. 57-239.000.
- Ito, Tadao; and Hashimoto, Akio, to Nippon Light Metal Company Limited. Method for manufacture of aluminum alloy casting, 4,419,143, Cl. 148-3.000.
- Ito, Takashi: See—  
Taguchi, Masao; and Ito, Takashi, 4,419,743, Cl. 365-149.000.
- Ito, Yoichiro: See—  
Kolobow, Theodor; and Ito, Yoichiro, 4,419,089, Cl. 494-45.000.
- Ito, Yoji; Inoue, Yozo; and Hara, Kiyoshi, to Nippondenso Co., Ltd. Method and system for controlling the setting temperature of a vehicle air conditioner, 4,419,730, Cl. 364-424.000.
- Itoh, Kikuo: See—  
Tachikawa, Kyoji; Sekine, Hisashi; Itoh, Kikuo; and Iijima, Yasuo, 4,419,145, Cl. 148-11.50F.
- Itoh, Yoshiyasu: See—  
Etoh, Kunio; Tanaka, Toshiyuki; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438, Cl. 430-275.000.
- Itou, Hiroshi: See—  
Yamauchi, Yasutaka; and Itou, Hiroshi, 4,418,666, Cl. 123-339.000.
- ITT Industries, Inc.: See—  
Miskin, Leslie; and Flamm, Peter M., 4,419,688, Cl. 358-27.000.
- Sprockhoff, Volker, 4,418,963, Cl. 303-3.000.
- Weiler, Rolf; and Bohm, Peter, 4,418,613, Cl. 92-98.00D.
- Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor wafer with alignment marks and method for manufacturing semiconductor device, 4,418,467, Cl. 29-574.000.
- Iwamoto, Kenji; and Kuroyanagi, Makoto, to Nippon Soken, Inc. Supercharger for an internal combustion engine, 4,418,537, Cl. 60-611.000.
- Iwao, Suminari, to Honda Giken Kogyo Kabushiki Kaisha. Carburetion system for a V-type internal combustion engine, 4,418,676, Cl. 123-580.000.
- Iwata, Kazuroh: See—  
Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, 4,418,802, Cl. 188-282.000.
- Izume, Takatomo; and Okado, Chihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Resistive welder having a controlled output voltage unaffected by secondary circuit disconnection, 4,419,559, Cl. 219-110.000.
- J. I. Case Company: See—  
Fralish, Mark R., 4,418,519, Cl. 56-244.000.
- Hirsch, Arthur E., 4,418,709, Cl. 137-115.000.
- Pedersen, Carl O.; and Maurer, Herman J., 4,419,040, Cl. 414-687.000.
- J. M. Voith GmbH: See—  
Laucks, Rudolf; and Blicke, Karl, 4,419,085, Cl. 440-93.000.
- Jackman, Anthony D., to Bettix Limited. Single-mouth squeeze-bottle dispensing container, 4,418,843, Cl. 222-158.000.
- Jackson, W. Shaun; and Bohm, Leslie E. Pannier and mounting arrangement for cycles, 4,418,850, Cl. 224-32.00A.
- Jacob, Ezekiel J.: See—  
Cooper, Sidney; and Jacob, Ezekiel J., 4,419,430, Cl. 430-109.000.
- Jacobs, Morton: See—  
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,418,561, Cl. 72-406.000.
- Jacobsen, Stephen C.; Luntz, Richard D.; and Hanover, Barry K., to Motion Control, Inc. Ionophoretic electrode structure, 4,419,092, Cl. 604-20.000.
- Jacobson, Irvin D.; Volstadt, Frank R.; and Passerelli, David P., to Perfection Corporation. Angle cock valve, 4,418,888, Cl. 251-216.000.



Jacobson, Robert L., administrator: See—  
Santilli, Donald S.; and Blakely, Donald W., deceased, 4,419,273, Cl. 502-80.000.

Jagodzinski, Richard F.; and Kerr, Richard K., to Hudson's Bay Oil and Gas Company Limited; and Alberta Energy Company Ltd. Process and apparatus for reacting sulphur-containing material with oxidizing gas, 4,419,337, Cl. 423-574.00R.

Jalali, Bijan; and Tran, Luan G., to Mattel, Inc. Electronic target game, 4,418,917, Cl. 273-313.000.

James, Claude: See—  
Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,419,356, Cl. 424-251.000.

Jan Stenerud and Company, Inc.: See—  
Stenerud, Jan, 4,418,910, Cl. 273-55.00B.

Janes, George S.; and Schlier, Robert E., to Jersey Nuclear-Avco Isotopes, Inc. Use of autoionization transition absorption peaks in isotopically selective photoexcitation, 4,419,582, Cl. 250-424.000.

Janzito, Richard, to Martin Distributors. Triple contact seal, 4,418,922, Cl. 277-152.000.

Japan Marine Machinery Development Association: See—  
Yoshimi, Kazuhiko; Shimizu, Kazuyuki; Watari, Takashi; and Kusumoto, Katsunori, 4,418,632, Cl. 114-102.000.

Japan Storage Battery Company Ltd.: See—  
Sakai, Yasuharu; Mural, Nobuaki; and Nakano, Kiyotaka, 4,418,562, Cl. 274-444.000.

Jaros, Anthony M.; and Stevens, Randy R., to T. J. Company. Portable combination lamp, smoke detector and power failure alarm, 4,419,658, Cl. 340-521.000.

Jarva, Curt: See—  
Wolfson, William; Grondstra, Jan W.; and Jarva, Curt, 4,419,734, Cl. 364-567.000.

Jasys, Vytautas J.: See—  
Crawford, Thomas C.; and Jasys, Vytautas J., 4,419,284, Cl. 260-245.20R.

Jayawant, Madhusudan D., to Du Pont de Nemours, E. I., and Company. Removal of heavy metal ions, 4,419,246, Cl. 210-721.000.

Jeneric Industries, Inc.: See—  
Prasad, Arun, 4,419,325, Cl. 420-464.000.

Jensen, Ole R., to E. R. Squibb & Sons, Inc. Apparatus for manufacturing ostomy pouches, 4,419,174, Cl. 156-513.000.

JEOL Ltd.: See—  
Nakagawa, Seiichi, 4,419,581, Cl. 250-396.0ML.

Jerome, Robert J.: See—  
Teyssie, Philippe J.; Jerome, Robert J.; and Broze, Guy J., 4,419,482, Cl. 524-560.000.

Jersey Nuclear-Avco Isotopes, Inc.: See—  
Janes, George S.; and Schlier, Robert E., 4,419,582, Cl. 250-424.000.

Jewusiak, Stephen J.: See—  
Beroff, Howard; Dodd, Namassivaya; and Jewusiak, Stephen J., 4,418,694, Cl. 128-326.000.

Jin, Sungho, to Bell Telephone Laboratories, Incorporated. High-remnance Fe-Ni and Fe-Ni-Mn alloys for magnetically actuated devices, 4,419,148, Cl. 148-120.000.

Jindrick, James A.; Hurley, James R.; Gilker, Clyde; Nohria, Naresh K.; Baranowski, James A.; and Dolnik, Thomas G., to McGraw-Hill Education Company. Microprocessor controlled voltage regulating transformer, 4,419,619, Cl. 323-257.000.

Jobst Institute, Inc.: See—  
Montgomery, John R., 4,418,477, Cl. 33-179.000.

Mummert, Thomas A., 4,418,690, Cl. 128-24.00R.

Joby, Michael J., to Lucas Industries Limited. Fuel systems for gas turbine engines, 4,418,529, Cl. 60-39.281.

Joh, Choon S. Deodorizing boot stand, 4,418,434, Cl. 12-128.00B.

Johannes, Gerhardus A., to Handelsmaatschappij Twentex B.V. Filing cabinet, 4,418,968, Cl. 312-184.000.

Johannesen, Donald D.; and Haluda, Raymond P., to Bendix Corporation, The. Disc brake with wedge pins, 4,418,798, Cl. 188-73.450.

Johansson, Lennart R.; and Hillstrom, Ernst G. K., to Victor Hasselblad Aktiebolag. Slide projector with circular slides magazine, 4,418,997, Cl. 353-111.000.

John, Frank T., to Hirtle, Georgina Chrystall. Liquid contact relay incorporating gas-containing finely reticular solid motor element for moving conductive liquid, 4,419,650, Cl. 337-119.000.

John Wyeth and Brother Limited: See—  
Crossley, Roger; and Dickinson, Kay H., 4,419,362, Cl. 424-273.00R.

John Zink Company: See—  
Schwartz, Robert, 4,419,071, Cl. 431-202.000.

Johnsen & Jorgensen Limited: See—  
Mancini, Gerardo; Searle, Richard J.; and Davis, Eugene E., 4,418,826, Cl. 215-231.000.

Johnson, David W., Jr.; MacChesney, John B.; and Rabinovich, Eliezer M., to Bell Telephone Laboratories, Incorporated. Fabrication of sintered high-silica glasses, 4,419,115, Cl. 65-3.120.

Johnson, Edwin A.; and Leung, Chun K., to Bendix Corporation, The. Fuel distribution control system for an internal combustion engine, 4,418,669, Cl. 123-436.000.

Johnson, Kenneth C., to International Computers Limited. Negative resistance element, 4,419,638, Cl. 333-217.000.

Johnson, Kenneth R., to Rexham Corporation. Machine and method for making substantially air-free sealed pouches, 4,418,512, Cl. 53-434.000.

Johnson, Oliver W., to Eaton Corporation. Pilot control valve for load sensing hydraulic system, 4,418,710, Cl. 137-117.000.

Johnson, Ralph B.: See—  
Modisette, James E.; and Johnson, Ralph B., 4,419,692, Cl. 358-113.000.

Johnson, Reuben C. Three compartment travel bag, 4,418,806, Cl. 190-111.000.

Johnson, Richard C.; Seshamani, Venkatraman; and Egbert, Leigh B., to Foster Wheeler Energy Corporation. Fluidized bed heat exchanger having an insulated fluid cooled air distributor plate assembly, 4,418,650, Cl. 122-4.00D.

Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., to Amca International Corporation. Apparatus for manufacture of tunnel tubes, 4,418,561, Cl. 72-406.000.

Jon, Min-Chung; and Palazzo, Vito, to Western Electric Co., Inc. Nondestructive real-time method for monitoring the quality of a weld, 4,419,562, Cl. 219-130.010.

Jones, Gordon H.; and Young, John, to Syntex (U.S.A.) Inc. Naphthoquinone anti-psoriatic agents, 4,419,368, Cl. 424-331.000.

Jones, Gordon H.: See—  
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,419,347, Cl. 424-177.000.

Jones, Richard W. Apparatus and method for sampling a liquid, 4,418,581, Cl. 73-864.340.

Jones, W. Steven: See—  
Wagaman, Kerry L.; Clark, Chester F.; Henderson, Larry D.; and Jones, W. Steven, 4,419,155, Cl. 149-109.600.

Jordan, Carmel T. Modular animal trap, 4,418,493, Cl. 43-67.000.

Jordan, Larry T., to Seeg Technology, Inc. Method and device for providing process and test information in semiconductors, 4,419,747, Cl. 365-201.000.

Josef, Michael J.; and Lanthier, Joseph D., to Albany International Corp. Double loop seam for corrugator belts, 4,418,726, Cl. 139-383.00A.

Jozwiak, Stanley E., Jr.: See—  
Gerboth, Patrick L.; and Jozwiak, Stanley E., Jr., 4,419,049, Cl. 415-206.000.

Julian, John D. Electrodes for electrochemical cells current generating cells and rechargeable accumulators, 4,419,424, Cl. 429-217.000.

Jurgen, Hofmann: See—  
Reus, Josef; Wewer, Hans; and Jurgen, Hofmann, 4,419,333, Cl. 423-235.000.

K-Three Products Kabushiki Kaisha: See—  
Akiyama, Toshimitsu; and Kasamatsu, Tadashi, 4,419,173, Cl. 156-470.000.

Kabushiki Kaisha Ishida Koki Seisakusho: See—  
Fukuda, Masao, 4,418,772, Cl. 177-1.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: See—  
Isaka, Akihiko, 4,418,603, Cl. 84-95.00R.

Kadnikova, Galina I.: See—  
Kolesnik, Anatoly G.; Kadnikova, Galina I.; Morozova, Lilia V.; and Boginskaya, Lidia M., 4,419,341, Cl. 424-52.000.

Kajita, Shuji: See—  
Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, 4,419,317, Cl. 264-184.000.

Kalbskopf, Reinhard; and Baumberger, Otto, to Societa Italiana Vetro - SIV - S.p.A. Heating glass pane, 4,419,570, Cl. 219-522.000.

Kallae, Elis; and Starell, Karl-Erik, to Orsa Kattingfabrik AB. Device for tensioning chains, 4,418,891, Cl. 254-260.000.

Kallman, Robert A. Holding device, 4,418,733, Cl. 383-11.000.

Kalthoff, Jorg F.; and Winkler, Siegfried, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung. Method of determining the impact fracture toughness K<sub>IC</sub> by means of impact tests, 4,418,563, Cl. 73-12.000.

Kamei, Tatsuya: See—  
Sugawara, Yoshitaka; Kamei, Tatsuya; and Sakurai, Tetsuma, 4,419,685, Cl. 357-53.000.

Kamibayashi, Masato; Tsuchiya, Shinji; and Hiratsuka, Kozo, to Tokyo Tanabe Co. L.T.D. 1,4-Dihydropyridine derivatives, 4,419,518, Cl. 546-279.000.

Kamimoto, Shohei: See—  
Sato, Norio; and Kamimoto, Shohei, 4,418,778, Cl. 180-132.000.

Kamiya, Shohei: See—  
Matsumoto, Junji; Kamiya, Shohei; and Sugihara, Yasuhiko, 4,418,687, Cl. 128-1.00C.

Kamyr AB: See—  
Backlund, Ake, 4,419,184, Cl. 162-49.000.

Kanazawa, Akira, to Olympus Optical Co., Ltd. Laser device for an endoscope, 4,418,689, Cl. 128-6.000.

Kane, John F.; and Weinhold, Kerry L., to Armstrong World Industries, Inc. Apparatus and process for ultrasonically identifying and coating articles having differing characteristics, 4,419,384, Cl. 427-57.000.

Kansy, Samir: See—  
Rosenberg, Barnett; Van Camp, Loretta; Fisher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., 4,419,351, Cl. 424-245.000.

Kanto Jidosha Kogyo Kabushiki Kaisha: See—  
Yamamoto, Junji; and Harada, Shingo, 4,418,956, Cl. 296-216.000.

Kao Soap Co., Ltd.: See—  
Ito, Osamu; and Nishizawa, Kazunori, 4,418,524, Cl. 57-239.000.

Kaplan, Alan, to Emkay Manufacturing Company. Crystal plating method, 4,419,379, Cl. 427-10.000.

Karger, Robert, to Vereinigte Elektrizitätswerke Westfalen Aktiengesellschaft. Process for cooling and separating chlorides and fluorides from gas mixtures, 4,419,334, Cl. 423-240.000.

Karpati, Egon: See—  
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsador, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. N-Substituted polyalkyl-piperidine-4-spirooxazolones, 4,419,512, Cl. 544-70.000.

Kasahara, Yasushi; Ashihara, Yoshihiro; Sugiyama, Masami; and Harada, Takahiro, to Fujizoki Pharmaceutical Co., Ltd. Method for determining the activity of cholinesterases, 4,419,445, Cl. 435-20.000.

Kasai, Shin: See—  
Sato, Michio; Kasai, Shin; and Kawaguchi, Yutaka, 4,418,876, Cl. 242-18.00G.

Kasamatsu, Tadashi: See—  
Akiyama, Toshimitsu; and Kasamatsu, Tadashi, 4,419,173, Cl. 156-470.000.

Kasori, Mituo; Takano, Takeshi; Maki, Hironori; and Ogino, Naohiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-component glass optical fiber for optical communication, 4,418,985, Cl. 350-96.340.

Kasparian, Hagop; and Kasparian, Kaspar. Power system and method, 4,418,540, Cl. 60-649.000.

Kasparian, Kaspar: See—  
Kasparian, Hagop; and Kasparian, Kaspar, 4,418,540, Cl. 60-649.000.

Kasugayama, Yukio; Terasawa, Koji; and Hattori, Yoshihumi, to Canon Kabushiki Kaisha. Ink jet recording apparatus, 4,419,677, Cl. 346-140.00R.

Kasugayama, Yukio; Terasawa, Koji; and Hattori, Yoshihumi, to Canon Kabushiki Kaisha. Ink jet recording apparatus, 4,419,678, Cl. 346-140.00R.

Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigetoshi; and Kitahara, Makoto, to Copyer Co., Ltd.; and Canon Inc. Electrophotographic light-sensitive media having a dis-azo compound, 4,419,428, Cl. 430-77.000.

Katagiri, Masayoshi; Nomura, Yoshihisa; Kawaguchi, Hiroshi; Nishina, Shuho; and Miura, Eiji, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Braking hydraulic pressure control valve in a dual-circuit brake system, 4,418,964, Cl. 303-6.00C.

Kato, Eiichi: See—  
Kuwazima, Shigeru; Kato, Eiichi; and Yamada, Minoru, 4,419,439, Cl. 430-375.000.

Kato, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Vacuum circuit interrupter and method of producing the same, 4,419,551, Cl. 200-144.00B.

Katoh, Yoshio: See—  
Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438, Cl. 430-275.000.

Kaucic, Robert A.: See—  
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,418,561, Cl. 72-406.000.

Kaufeldt, Roland. Device for automatically tightening spokes in spoke wheels, 4,418,738, Cl. 157-1.550.

Kauffman, Allen L., to General Motors Corporation. Hydraulic system pressure control for a power transmission, 4,418,587, Cl. 74-867.000.

Kaufman, Benjamin J.; Sawicki, Robert A.; and Levine, Stephen A., to Texaco Inc. Lubricating oil containing keto amide as friction reducing agent, 4,419,255, Cl. 252-51.50A.

Kaufman, Harold R.: See—  
Harper, James M. E.; Heiblum, Mordehai; and Kaufman, Harold R., 4,419,203, Cl. 204-192.00R.

Kaus, Wolfgang: See—  
Muncke, Ludwig; and Kaus, Wolfgang, 4,418,955, Cl. 296-190.000.

Kawabata, Takashi; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, to Canon Kabushiki Kaisha. Focus detecting device with varying pitch cylindrical lens element, 4,419,574, Cl. 250-204.000.

Kawaguchi, Hiroshi: See—  
Katagiri, Masayoshi; Nomura, Yoshihisa; Kawaguchi, Hiroshi; Nishina, Shuho; and Miura, Eiji, 4,418,964, Cl. 303-6.00C.

Kawaguchi, Yutaka: See—  
Sato, Michio; Kasai, Shin; and Kawaguchi, Yutaka, 4,418,876, Cl. 242-18.00G.

Kawakami, Hiromi: See—  
Yamamoto, Yoshihiro; Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 4,419,695, Cl. 358-198.000.

Kawamura, Yoshio, to Kawasaki Jukogyo Kabushiki Kaisha. Air cleaner, 4,419,112, Cl. 55-480.000.

Kawasaki Jukogyo Kabushiki Kaisha: See—  
Kawamura, Yoshio, 4,419,112, Cl. 55-480.000.

Kawasaki, Teruo; Kogawa, Kouichi; and Nomura, Hiroyuki, to Nissan Motor Company, Limited. Wiper intermittent motion control device, 4,419,611, Cl. 318-443.000.

Kearney-National, Inc.: See—  
Osborne, Anthony, 4,419,549, Cl. 200-50.00A.

Keating, Kenneth B.: See—  
Breda, Ernest J.; and Keating, Kenneth B., 4,419,198, Cl. 204-180.00P.

Kehl, Christof, to Dr.-Ing. Rudolf Hell GmbH. Method for the visual inspection of the reproduction quality of drawing elements and elements for the execution of the method, 4,419,426, Cl. 430-30.000.

Keil, Rudolf; Auracher, Franz; and Stockmann, Michael, to Siemens Aktiengesellschaft. Planar waveguide lens, its utilization and method for its manufacture, 4,418,980, Cl. 350-96.130.

Keim, Kodo. Fuel supplement supplying device for an internal combustion engine, 4,418,654, Cl. 123-25.00A.

Kelley, Donald W.: See—  
Greene, C. Lawrence; Creech, David C.; and Kelley, Donald W., 4,419,372, Cl. 426-104.000.

Kellogg, Robert M., to International Business Machines Corporation. Sterile connectors, 4,418,945, Cl. 285-70.000.

Kelly, John A.; and Soderquist, Cynthia A., to Naico Chemical Company. Method of scavenging dissolved oxygen in steam generating equipment using ammonia or amine neutralized erythorbic acid, 4,419,327, Cl. 422-17.000.

Kelly, Joseph D.: See—  
Valimont, James L.; and Kelly, Joseph D., 4,419,176, Cl. 156-556.000.

Kelly, Robert H.: See—  
Moyer, Anthony M.; and Kelly, Robert H., 4,418,509, Cl. 52-693.000.

Kelm, Edward C.; and Kurtin, Stephen. Tone activated hold circuit, 4,419,543, Cl. 179-81.00R.

Kelso, Charles R.; and Walter, Richard P., to Bendix Corporation, The. Dual solenoid distributor pump, 4,418,671, Cl. 123-450.000.

Kendall Company, The: See—  
Patel, Bhupendra C., 4,419,094, Cl. 604-93.000.

Van Overloop, Ronald R., 4,419,568, Cl. 219-441.000.

Kendall, James M.; and Walsh, John V., to United States of America, National Aeronautics and Space Administration. Pressure lockdown method and device for coal conversion systems, 4,418,722, Cl. 138-42.000.

Kenlock Corporation: See—  
Takahashi, Shoichiro, 4,419,025, Cl. 403-14.000.

Kennecott Corporation: See—  
Hailey, Laurence N., 4,419,161, Cl. 156-89.000.

Kennedy, Carl S.; and Hack, Theodore A., to Naico Chemical Company. Synthetic post-pickle fluid, 4,419,253, Cl. 252-34.700.

Kennedy, Melvin R.; and Nagel, Dietmar, to Buddy L Corporation. Miniature racing vehicle and wrist-borne launching platform assembly, 4,418,495, Cl. 46-206.000.

Kenney, Theodore W. Trouble lamp, 4,419,720, Cl. 362-285.000.

Kernforschungsanlage Julich GmbH: See—  
Heybutzki, Helmut; Krug, Wolfgang; and Seferiadis, Johann, 4,418,544, Cl. 62-55.000.

Kerpel-Fronius, Sandor: See—  
Elekes, Ilona; Institoris, Laszlo; Medzihradsky, Kalman; Otvos, Laszlo; Medzihradsky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522, Cl. 549-557.000.

Kerr, Richard K.: See—  
Jagodzinski, Richard F.; and Kerr, Richard K., 4,419,337, Cl. 423-574.00R.

Kessler, Gerald. Extruded fin-type weatherstrip, 4,419,315, Cl. 264-145.000.

Ketchledge, Raymond W., to Bell Telephone Laboratories, Incorporated. Reactance meter, 4,419,623, Cl. 324-57.00Q.

Keuffel & Esser Company: See—  
Pillitteri, Noreen J., 4,419,432, Cl. 430-179.000.

Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsador, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, to Richter Gedeon Vegyeszeti Gyar RT. Nitro-substituted polycyclic derivatives useful in the treatment of psoriasis, 4,419,359, Cl. 424-256.000.

Kibby, Robert M., to Reynolds Metals Company. Aluminum purification system, 4,419,126, Cl. 75-10.00R.

Kiencke, Uwe: See—  
Boning, Bernhard; Nagel, Rudolf; Honig, Gunter; Kiencke, Uwe; and Theuerkauf, Heinz, 4,418,567, Cl. 73-35.000.

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Kikuchi, Hideo, to Fujitsu Limited. Power on clear circuit, 4,419,596, Cl. 307-603.000.

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Tabar, Ronald J.; and Killgoar, Paul C., Jr., 4,419,480, Cl. 524-525.000.

Killop, James T., to Anderson-Cook, Inc. Burnishing toothed power transmission members, 4,418,454, Cl. 29-90.00B.

Klipper, Gerhard; and Grimmer, Johannes, to BASF Aktiengesellschaft. Continuous preparation of phthalimide, 4,419,519, Cl. 548-480.000.

Kim, Chang J.: See—  
Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., 4,419,222, Cl. 208-120.000.

Kim, Daiuk: See—  
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Kim, Jaime S. Piano pedal extension, 4,418,604, Cl. 84-232.000.

Kim, Ki-Hwan; Yoo, Kwang-Keun; and Lee, Tae-Ho, to Office of Monopoly. Method for expanding tobacco and apparatus therefor, 4,418,706, Cl. 131-296.000.

Kim, Syng N., to Wilco Corporation. Illuminated push-button switch assembly, 4,419,555, Cl. 200-314.000.

Kimbrell, Melvin, Sr., deceased (by Kimbrell, Melvin D., Jr., executor), to Georgia-Pacific Corporation. Produce tray with reinforced corner construction, 4,418,863, Cl. 229-49.000.

Kimbrell, Melvin D., Jr., executor: See—  
Kimbrell, Melvin, Sr., deceased, 4,418,863, Cl. 229-49.000.

Kimura, Kenji, to Olympus Optical Company Limited. Apparatus for driving objective lens in tracking direction, 4,419,614, Cl. 318-653.000.



- Kinanen, Ilmari, to Instrumentarium Oy. Slit collimator in a panoramic X-ray apparatus. 4,419,764, Cl. 378-153.000.
- Kinberg, Benjamin. Action game. 4,418,908, Cl. 273-1.0GE.
- Kinetic Systems, Inc.: See—
- Wyatt, Richard J., 4,419,345, Cl. 424-153.000.
- Kingsley, William, to Xerox Corporation. Multi-mode document handling system. 4,419,007, Cl. 353-14.0SH.
- Kinoshita, Takao: See—
- Kawabata, Takashi; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,419,574, Cl. 250-204.000.
- Kiraly, Arpad: See—
- Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsodan, Bela; Zajec nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- Kiraly nee Soos, Gyongyver: See—
- Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsodan, Bela; Zajec nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- Kiritani, Takeshi: See—
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- Kirshman, Samson, to Applied Materials, Inc. Wafer tray construction. 4,419,076, Cl. 432-253.000.
- Kirst, Herbert A.: See—
- Baltz, Richard H.; Kirst, Herbert A.; Wild, Gene M.; and Seno, Eugene T., 4,419,508, Cl. 536-7.100.
- Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd. Pulsive noise removing apparatus. 4,419,541, Cl. 381-7.000.
- Kistner, Heinz: See—
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- Kitada, Ritsuo: See—
- Ueshima, Michio; Takahashi, Yoshiyuki; Kitada, Ritsuo; and Nagai, Isao, 4,419,270, Cl. 502-209.000.
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- Kitahiro, Isamu: See—
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- Kitakaze, Seiji: See—
- Tsuzurabara, Mamoru; and Kitakaze, Seiji, 4,419,606, Cl. 315-39.510.
- Kitamura, Atsushi: See—
- Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389, Cl. 427-294.000.
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- Kleczkowski, Peter S.: See—
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- Kleemann, Axel: See—
- Wolfgang, Bergstein; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,419,272, Cl. 502-84.000.
- Klein, Gerhard: See—
- Arlt, Dieter; and Klein, Gerhard, 4,419,297, Cl. 260-465.200.
- Klemm, Dieter; and Ulith, Peter, to Voith GmbH. Method of operation of a pump-turbine between part-load operation and reverse pumping operation. 4,419,047, Cl. 415-150.000.
- Klinkowski, Peter R., to Dorr-Oliver Incorporated. Solid polymeric electrolyte. 4,419,209, Cl. 204-296.000.
- Klish, William J.: See—
- Nichols, Buford L., Jr.; Klish, William J.; and Potts, Vivian E., 4,419,369, Cl. 426-2.000.
- Klump, Walter, to Rheinmetall GmbH. Arrangement for pre-selecting the cadence of firing bursts of a pressurized gas loader of a gun. 4,418,608, Cl. 89-193.000.
- Klynas, Scott S., to Mattel, Inc. Electronic percussion synthesizer. 4,418,598, Cl. 84-1.030.
- Kniege, Wilfried: See—
- Ackermann, Jurgen; Moretto, Hans-Heinrich; Kniege, Wilfried; and Rauer, Werner, 4,419,474, Cl. 524-195.000.
- Knight, Alan. Wedge with flanges. 4,418,890, Cl. 254-104.000.
- Knight, John C., to Xerox Corporation. Glow discharge apparatus with squirrel cage electrode. 4,418,645, Cl. 118-715.000.
- Knoblauch, Rainer: See—
- Dietzsch, Kurt; and Knoblauch, Rainer, 4,418,743, Cl. 165-12.000.
- Knoder, Reinhard; Harbach, Friedrich; and Weiler, Ludwig, to Brown, Boveri & Cie AG. Individual rechargeable electric cell. 4,419,418, Cl. 429-104.000.
- Knoder, Reinhold, to Brown, Boveri & Cie AG. Rechargeable electric storage battery. 4,419,419, Cl. 429-104.000.
- Knoll, Gunther: See—
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- Knollman, Dieter J. H.: See—
- Embree, Milton L.; Knollman, Dieter J. H.; and Martin, Earl O., 4,419,542, Cl. 179-77.000.
- Knufelmann, Manfred: See—
- Brandner, Burkhard; Knufelmann, Manfred; and Blauhut, Reinhold, 4,418,668, Cl. 123-416.000.
- Kobayashi, Hiroaki: See—
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- Kobayashi, Shin-ichiro: See—
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- Kobayashi, Toshio: See—
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- Kober, Kasimir, to Chicago Dryer Company. Heated smoothing roll. 4,418,486, Cl. 38-58.000.
- Koch, Earl E.; Gamber, A. Dale; and Ehrhart, Philip J., to Sperry Corporation. Mechanism for spring loading a transport lock. 4,418,518, Cl. 56-228.000.
- Koch, Robert C.: See—
- Davis, James A.; and Koch, Robert C., 4,419,470, Cl. 524-76.000.
- Koch, Ulf, to Esselte Pendeflex Corporation. Stepped-down mechanical counting mechanism. 4,419,571, Cl. 235-1.00C.
- Kochackis, Donald G. Vending machine security cage. 4,418,551, Cl. 70-18.000.
- Kogawa, Kouichi: See—
- Kawasaki, Teruo; Kogawa, Kouichi; and Nomura, Hiroyuki, 4,419,611, Cl. 318-443.000.
- Kogure, Yoichiro: See—
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- Kohara, Koujiro; and Miyano, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing heat-insulating member and device therefor. 4,419,307, Cl. 264-46.500.
- Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Display device. 4,419,663, Cl. 340-783.000.
- Kohira, Takeo: See—
- Etoh, Kunio; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438, Cl. 430-275.000.
- Koistinen, Arnold A., to Dakota Plastics Company. Support structure for small floral arrangement. 4,418,496, Cl. 47-41.120.
- Kojima, Takuhito; Satake, Yasuo; and Masuda, Toru, to Fujitsu Limited. Network connection system. 4,419,753, Cl. 370-62.000.
- Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, to Kitasato Institute, The. Interferon inducer, a process for producing the same and pharmaceutical composition containing the same. 4,419,349, Cl. 424-195.000.
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- Shimizu, Keiichi; and Mochida, Haruo, 4,419,712, Cl. 361-172.000.
- Kolesnik, Anatoly G.; Kadnikova, Galina I.; Morozova, Lilia V.; and Boginskaya, Lidia M., to Rizhsky Meditsinsky Institut. Drug for treatment of dental caries. 4,419,341, Cl. 424-52.000.
- Kolobow, Theodor; and Ito, Yoichiro, to United States of America, Health and Human Services. Blood cell separator. 4,419,089, Cl. 494-45.000.
- Kolonia, Robert A. Hand tool and a core reinforced molded synthetic material handle therefor. 4,418,732, Cl. 145-2.00R.
- Kolta, Rezso: See—
- Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524, Cl. 562-506.000.
- Komorek, Julius: See—
- Downs, Edward T., Jr.; and Komorek, Julius, 4,418,719, Cl. 137-625.310.
- Kondou, Sadao: See—
- Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, 4,419,541, Cl. 381-7.000.
- Kondow, Ryotaro: See—
- Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Matsuzawa, Kunio, 4,419,737, Cl. 364-900.000.
- Koni, Tsuyoshi; and Urushida, Yoshihisa, to Citizen Watch Co., Ltd. Flow restrictor. 4,418,723, Cl. 138-42.000.
- Konishioku Photo Industry Co., Ltd.: See—
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- Konno, Seishi: See—
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- Kontz, Robert F., to Owens-Illinois, Inc. Automatic cup dispensing apparatus. 4,418,837, Cl. 221-222.000.
- Koo, Stephen. Vapor proof housing assembly and system. 4,419,716, Cl. 362-96.000.
- Koppers Company, Inc.: See—
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- Korbuly, Jozsef: See—
- Balazs, Karoly; Firstov, Vladislav D.; Freska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Yuri F., 4,418,715, Cl. 137-508.000.
- Kornatowski, Boleslaw, to Singer Company, The. Combination hand-wheel and handwheel clutch for sewing machines. 4,418,809, Cl. 192-67.00R.
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- Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, to Egyt Gyogyszervegyezeti Gyar. Condensed as-triazine derivatives and method of using the same. 4,419,355, Cl. 424-249.000.

- Kozponti Banyaszati Fejlesztési Intezet: See—
- Balazs, Karoly; Firstov, Vladislav D.; Freska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Yuri F., 4,418,715, Cl. 137-508.000.
- Kraftwerk Union Aktiengesellschaft: See—
- Fricker, Wolfgang-Peter; and Scholz, Manfred, 4,418,724, Cl. 138-149.000.
- Kramer, Kenneth D.; Stoss, Kenneth J.; and Sparks, Gregory E., to Deere & Company. Solenoid with saturable element. 4,419,642, Cl. 335-227.000.
- Kramer, Morton: See—
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- Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinplugg, ans, to Bayer Aktiengesellschaft. Combating fungi with 1-phenoxo-1-imidazol-1-yl-4-fluoro-butane derivatives. 4,419,361, Cl. 424-273.00R.
- Kranzer, Leonard S. Photosensitive plate. 4,419,436, Cl. 430-260.000.
- Krasucki, Joseph F., Jr.: See—
- Brannigan, Michael H.; Sherbert, Edward G.; and Krasucki, Joseph F., Jr., 4,419,724, Cl. 364-200.000.
- Krause, Bernd, to Xomox Corporation. Fire safe seat for a valve. 4,418,889, Cl. 251-306.000.
- Krautkremer, Franz; and Isleib, Juergen, to Schottel-Werft, Josef Becker GmbH & Co. KG. Apparatus for controlling a watercraft. 4,418,633, Cl. 114-144.00E.
- Krautkremer, Franz; and Lais, Siegfried, to Schottel-Werft Josef Becker GmbH & Co. KG. Water-jet drive mechanism for driving and controlling of particularly shallow-draught watercrafts. 4,419,082, Cl. 440-42.000.
- Kress, Kenneth A., to United States of America, America. Solid state neutron detector. 4,419,578, Cl. 250-390.000.
- Kretz, Rolf H., to Process Engineering Company SA. Continuous fermentation in series of main vessels with auxiliary vessel provided. 4,419,448, Cl. 435-161.000.
- Krieder, Robert D., to Bendix Corporation. The. Automatic speed control for heavy vehicles. 4,419,729, Cl. 364-426.000.
- Krishna, Rajamani: See—
- Voetter, Heinz; Van Meurs, Hubrecht C. A.; Darton, Richard C.; and Krishna, Rajamani, 4,419,215, Cl. 208-11.00R.
- Kroha, Walter: See—
- Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440, Cl. 430-377.000.
- Kropp, Lev. Inertial conveyor. 4,418,816, Cl. 198-773.000.
- Kroy Inc.: See—
- Bradshaw, Franklin C.; and Connoy, Thomas P., 4,419,175, Cl. 156-554.000.
- Krug, Wolfgang: See—
- Heybutzki, Helmut; and Stackhouse, James L., Jr., to Emerson Electric Co. Anti-kickback device. 4,418,597, Cl. 83-478.000.
- Krutch, Charles M., to Mobil Oil Corporation. Polystyrene foam extrusion into a foam assisting atmosphere. 4,419,309, Cl. 264-53.000.
- Krzanowski, James E.: See—
- Ainslie, Norman G.; Krzanowski, James E.; and Palmateer, Paul H., 4,418,857, Cl. 228-124.000.
- Kubota, Masashi; and Noda, Toru, to Mitsubishi Paper Mills, Ltd. Photographic material. 4,419,433, Cl. 430-206.000.
- Kubota Ltd.: See—
- Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,419,129, Cl. 420-584.000.
- Teraoka, Akira; and Nakamura, Tadashi, 4,418,783, Cl. 180-209.000.
- Kubota, Yuichi: See—
- Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,419,406, Cl. 428-422.000.
- Kubota, Ltd.: See—
- Fujimoto, Tsutomu, 4,418,758, Cl. 172-7.000.
- Kuehnle, Manfred R., to Coulter Systems Corporation. Method and apparatus for making transparencies electrostatically. 4,419,004, Cl. 355-3.0TR.
- Kuehnle, Manfred R., to Coulter Systems Corporation. Imaging method and apparatus. 4,419,005, Cl. 355-3.0TR.
- Kuhl, Gunter H.: See—
- Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, 4,419,218, Cl. 208-59.000.
- Kuhl, Walter H.; Van Leunen, Johannes A. J.; van der Eijk, Bart; van der Bolt, Antonius J. J. M.; and Hoebrechts, Arthur M. E., to U.S. Philips Corporation. X-Ray detector. 4,418,452, Cl. 445-35.000.
- Kuhnel, Frank, to VDO Adolf Schindling AG. Device for the capacitive measurement of the filling level of fluid to a container. 4,418,569, Cl. 73-304.00C.
- Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, to VEB Filmfabrik Wolfen. Process for the introduction of hydrophobic photographic additives. 4,419,440, Cl. 430-377.000.
- Kuindersma, Pieter I., to U.S. Philips Corporation. Electret transducer. 4,419,545, Cl. 179-111.00E.
- Kukes, Simon G.; and Davis, Thomas, to Phillips Petroleum Company. Demetallization of heavy oils. 4,419,225, Cl. 208-251.00R.
- Kulite Semiconductor Products: See—
- Kurtz, Anthony D.; and Weinstein, Donald, 4,419,620, Cl. 323-280.000.
- Kunkel, Arden L., to Weyerhaeuser Company. Cleaning labyrinthine system with foamed solvent and pulsed gas. 4,419,141, Cl. 134-22.120.
- Kuriakose, Areekatthazhayil K., to Norton Company. Silicon carbide production and furnace. 4,419,336, Cl. 423-345.000.
- Kuroyanagi, Makoto: See—
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- Kurtin, Stephen: See—
- Kelm, Edward C.; and Kurtin, Stephen, 4,419,543, Cl. 179-81.00R.
- Kurtz, Anthony D.; and Weinstein, Donald, to Kulite Semiconductor Products. Linearizing circuits for a semiconductor pressure transducer. 4,419,620, Cl. 323-280.000.
- Kuse, Kazumasa: See—
- Atsumi, Tomiaki; Kuse, Kazumasa; and Deto, Junji, 4,418,898, Cl. 267-63.00R.
- Kushi, Kenji: See—
- Nakashima, Atushi; Edamatu, Michisuke; and Kushi, Kenji, 4,418,641, Cl. 118-429.000.
- Kushida, Machiro; Takasugi, Tsuneji; and Irie, Kenji, to Citizen Watch Co. Ltd. Bicolored polyhedral body of aluminum. 4,419,409, Cl. 428-469.000.
- Kusumoto, Katsunori: See—
- Yoshimi, Kazuhiko; Shimizu, Kazuyuki; Watari, Takashi; and Kusumoto, Katsunori, 4,418,632, Cl. 114-102.000.
- Kuwazima, Shigeru; Kato, Eiichi; and Yamada, Minoru, to Fuji Photo Film Co., Ltd. Process for forming photographic images. 4,419,439, Cl. 430-375.000.
- Kuze, Yoshikazu. Sequence control system. 4,419,761, Cl. 377-16.000.
- Kwiatkowski, Joachim: See—
- Eggert, Albert; Gahleitner, Erwin; and Kwiatkowski, Joachim, 4,418,787, Cl. 181-130.000.
- Kwoka, David: See—
- Faucher, Joseph E.; Wright, Richard R.; Pane, Francis C., Jr.; Kwoka, David; and Striebel, Edmund E., 4,418,543, Cl. 60-742.000.
- Kyllonen, Allen W.: See—
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- Kyono, Tetsuyuki: See—
- Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389, Cl. 427-294.000.
- L. D. Schreiber Cheese Co., Inc.: See—
- Streeter, Robert R.; Whitehorn, Vincent J.; and Nicholas, Earl C., 4,418,616, Cl. 99-458.000.
- La Gard, Inc.: See—
- Uyeda, Tim M., 4,418,555, Cl. 70-366.000.
- La Telemecanique Electrique: See—
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- Laboratorios Serobiologicos S.A.: See—
- Pauly, Marc, 4,419,343, Cl. 424-59.000.
- Labude, Wolfgang: See—
- Bauer, Karl-Heinz; Eckert, Gerold; and Labude, Wolfgang, 4,419,639, Cl. 334-7.000.
- LaForce, Jean, to Stringer, Carl; Stringer Oil and Gas Company, Inc.; and Stringer, Carl T. Clamping method and apparatus for solid phase welding. 4,418,860, Cl. 228-196.000.
- Lahrs, Jurgen: See—
- Henning, Hans-Joachim; Lahrs, Jurgen; and Liebsch, Dietrich, 4,419,295, Cl. 260-453.0PH.
- Lais, Siegfried: See—
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- Lakatos, Edward J.; and Talmadge, Paul C., to Perkin-Elmer Corporation. The. Apparatus useful for positioning a light filter. 4,419,575, Cl. 250-226.000.
- Lakin, David F., to Lucas Industries Limited. Fuel injection pumping apparatus. 4,418,670, Cl. 123-446.000.
- Lamarque, Dominique; and Soster, Marie C., to SOCAPEX. Tool unit for collective breaking of optical fibres. 4,418,855, Cl. 225-96.000.
- Lambot, Honore J., to Societe Anonyme Diamant Boart. Process for retrieving a coring barrel comprising two tubes and retrieving device for such a process. 4,418,770, Cl. 175-58.000.
- Lambregts, Antonius A.; and Hansen, Rolf, to Boeing Company, The. Method and apparatus for an aircraft inner loop elevator control system. 4,419,732, Cl. 364-428.000.
- Lancaster, Patrick R., III; and Lancaster, William G., to Lantech, Inc. Stretch wrapping apparatus and process. 4,418,510, Cl. 53-399.000.
- Lancaster, William G.: See—
- Lancaster, Patrick R., III; and Lancaster, William G., 4,418,510, Cl. 53-399.000.
- Landa, Benzon, to Savin Corporation. Large capacity combination magazine and sheet feeder for copying machines. 4,418,903, Cl. 271-10.000.
- Landis, H. Richard, to Landis Plastics Inc. Large volume container with gasketless seal. 4,418,833, Cl. 220-306.000.
- Landis Plastics Inc.: See—
- Landis, H. Richard, 4,418,833, Cl. 220-306.000.
- Lang, Josef; Hollaus, Reinhard; Reeh, Ulrike; Denk, Hans; and Harbrich, Reiner, to Siemens Aktiengesellschaft. Photo-voltaic solar module. 4,419,531, Cl. 136-251.000.
- Lang, Stanley A., Jr.: See—
- Child, Ralph G.; and Lang, Stanley A., Jr., 4,419,354, Cl. 424-248.560.
- Langenhorst, Christoph: See—
- Langenhorst, Gunter; and Langenhorst, Christoph, 4,418,746, Cl. 165-76.000.



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- Nishino, Atsushi; Suzuki, Tadashi; and Sonetaka, Kazunori, 4,419,302, Cl. 261-142.000.
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- Terada, Jiro; and Nitta, Tsuneharu, 4,419,021, Cl. 374-101.000.
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- Matsushita, Tetsuo: See—  
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- Matsuura, Norio. Tilt top gulf tee, 4,418,916, Cl. 273-207.000.
- Matsuzawa, Hideshi: See—  
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- Matsuzawa, Kunio: See—  
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- Maurer, Herman J.: See—  
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- Max Baermann GmbH: See—  
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- Wichelhaus, Winfried; Weppner, Werner; and Hartwig, Peter, 4,419,421, Cl. 429-191.000.
- May, Brian E., to Precision Golf Design, Inc. Golf course play indicator devices, 4,419,655, Cl. 340-323.00R.
- May, David A.: See—  
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- May, Ronald L.; and Snow, Nicholas J., Jr., to Sappucker, Inc. System and method for converting wellhead gas to liquefied petroleum gases (LPG), 4,419,114, Cl. 62-17.000.
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Harrop, Kenneth T.; and McArtor, Robert D., 4,418,522, Cl. 57-80.000.
- McCall, Thomas F. Thermally coupled extractive distillation process, 4,419,188, Cl. 203-24.000.
- McCandless, Thomas J.: See—  
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- McConnell, Bobby L.: See—  
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- McDaniel, Max P., to Phillips Petroleum Company. Partially hydrolyzed silicate treatment of catalyst support, 4,419,268, Cl. 502-158.000.
- McElroy, Lucian G.: See—  
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- McGaw, John, to Appliance Design Probe Inc. Two-mode steam brush curler, 4,419,565, Cl. 219-222.000.
- McGill Manufacturing Company, Inc.: See—  
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- McGinniss, Vincent D.: See—  
Slimers, Francis A.; and McGinniss, Vincent D., 4,419,382, Cl. 427-40.000.
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- McIntyre, Robert N.: See—  
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- McKenna, Owen P.: See—  
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- McKinley, John A., to Owens-Illinois, Inc. Snap action bottle finish tester and method, 4,418,564, Cl. 73-12.000.
- McLachlan, Donald R., to Ciba-Geigy Corporation. Method of treating Alzheimer's disease, 4,419,365, Cl. 424-320.000.
- McMath, Jack A., to Dover Corporation. Automatic shut-off nozzle with vapor return seal, 4,418,730, Cl. 141-207.000.
- McNeill, Robert C., to Ogden Structural Products, Inc. Method of fabricating a composite structure of concrete and steel network, 4,418,463, Cl. 29-527.400.
- Mead Corporation: See—  
Bahl, Surinder K.; Howell, Margene C.; and Pace, Loy D., 4,419,674, Cl. 346-75.000.
- Mead Johnson & Company: See—  
Catt, John D.; and Temple, Davis L., Jr., 4,419,358, Cl. 424-253.000.
- Mechanical Technology Incorporated: See—  
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- Medovar, Boris I.: See—  
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- Medzihradsky-Schweiger, Hedvig: See—  
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- Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522, Cl. 549-557.000.
- Mefina S.A.: See—  
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- Melchior, Bernd, to August Hohnholz KG. Process of producing transparent foamed plastics materials, 4,419,459, Cl. 521-59.000.
- Memorex Corporation: See—  
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- Menious, Claude C. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Rotary piston motor, 4,419,057, Cl. 418-36.000.
- Mennicken, Gerhard: See—  
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- Merck Patent Gesellschaft mit beschränkter Haftung: See—  
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- Praefcke, Klaus; Schmidt, Dietmar; and Eidenschink, Rudolf, 4,419,263, Cl. 252-299.630.
- Merkel, Jerome P., to United Sprinkler, Inc. Storage rack structural sprinkler system, 4,418,757, Cl. 169-54.000.
- Mersereau, Robert E.: See—  
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- Merten, Rudolf: See—  
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- Messana, Anthony. Golf tee, 4,418,909, Cl. 273-33.000.
- Messerschmitt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung: See—  
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- Schulze, Carsten; Lotter, Kurt; and Malefakis, Jakob, 4,418,708, Cl. 137-15.200.
- Messmer, Andras: See—  
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- Metallurgie Hoboken-Overpelt: See—  
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- Metpath Inc.: See—  
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- Metzeler Kautschuk GmbH: See—  
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- Meyer, Franz J., to Siemens Aktiengesellschaft. Device for the attenuation of the movement of reel motors in tape recorders during standstill of the tape drive roller, 4,419,609, Cl. 318-7.000.
- Meyer, Heinz; Dorn, Maximilian; and Seidl, Hans, to Peroxide-Chemie GmbH. Process for cross-linking of non-polar polymers in high frequency electric alternating fields, 4,419,197, Cl. 204-159.200.
- Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. N-Phenylsulfonfyl-N'-pyrimidinylureas, 4,419,121, Cl. 71-92.000.
- Meyn, Cornelis: See—  
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- Meyn, Pieter; and Meyn, Cornelis, 4,418,445, Cl. 17-11.000.
- Meyn Machinefabrik BV: See—  
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- Meyrat, Clement, to Ebauches Electroniques, S.A. Electronic watch with control means for selecting and correcting time data, 4,419,018, Cl. 368-69.000.
- Micheron, Francois, to Thomson-CSF. Piezoelectric transducer made from a polymer material and process for manufacturing same, 4,419,599, Cl. 310-311.000.
- Micheron, Francois: See—  
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- Mickey, Carl F., to W. F. Mickey Body Company, Inc. Pivotal bolster plate, 4,418,934, Cl. 280-438.00R.
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- Midland-Ross Corporation: See—  
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- Mifune, Hiroyuki; Fuseya, Yoshiharu; and Ikenoue, Shinpei, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material, 4,419,443, Cl. 430-600.000.
- Mika, Gyorgy: See—  
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- Miki, Yukio: See—  
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- Mikuni Kogyo Co., Ltd.: See—  
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- Miller, C. Fredrick. Deep bonding methods and apparatus, 4,418,858, Cl. 228-159.000.
- Miller, Ellsworth S.: See—  
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- Miller, J. Wayne; and Ward, John W., to Union Oil Company of California. Desulfurization of hydrocarbons, 4,419,224, Cl. 208-244.000.
- Miller, John D.; and Reed, Clayton L., to Pall Corporation. Multiple cartridge filter assembly with removable filter cartridge array, 4,419,234, Cl. 210-232.000.
- Miller, Larry D., to General Motors Corporation. Storage of a seat belt on a door, 4,418,939, Cl. 280-803.000.
- Miller, Melvin E.: See—  
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- Miller, Richard F., to Atlantic Richfield Company. Hydrocarbon oils with improved pour points, 4,419,106, Cl. 44-62.000.
- Miller, Robert C.: See—  
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- Miller, Roscoe E. Enema apparatus improvements relating to double contrast studies, 4,419,099, Cl. 604-275.000.
- Miller, Warren H., Jr., to Harris Corporation. Focus compensation linkage, 4,419,576, Cl. 250-234.000.
- Milliken Research Corporation: See—  
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- Mahaffey, Robert L., Jr., 4,419,473, Cl. 524-104.000.
- Minolta Camera Kabushiki Kaisha: See—  
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- Tominaga, Shinji; Imura, Toshinori; and Nakamura, Ikushi, 4,419,001, Cl. 354-173.100.
- Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, 4,419,000, Cl. 354-173.100.
- Miskin, Leslie; and Flamm, Peter M., to ITT Industries, Inc. Color-television receiver with at least one digital integrated circuit for processing the composite color signal, 4,419,688, Cl. 358-27.000.
- Missun, Heinz E. Offset indicator extension, 4,418,476, Cl. 33-172.00B.
- Mistyurik, John D.: See—  
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- Mita Industrial Co., Ltd.: See—  
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- Mitamura, Zenzou; Oosawa, Takashi; and Yonezawa, Akihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric lamp, 4,419,602, Cl. 313-332.000.
- Mitco Corporation: See—  
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- Mitsubishi Denki Kabushiki Kaisha: See—  
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- Ohshita, Masayuki; Horiuchi, Toshiaki; Yamanaka, Takashi; and Usui, Yoshihiro, 4,419,553, Cl. 200-144.00B.
- Mitsubishi Paper Mills, Ltd.: See—  
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- Kubota, Masashi; and Noda, Toru, 4,419,433, Cl. 430-206.000.
- Mitsubishi Rayon Company, Ltd.: See—  
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- Yata, Yukio; and Inagaki, Koichi, 4,418,986, Cl. 350-128.000.
- Miura, Eiji: See—  
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- Miyajiri, Tetsuo: See—  
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- Miyano, Susumu: See—  
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- Mizrahi, Sadi: See—  
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- Mizunuma, Tokuchi: See—  
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- Mobay Chemical Corporation: See—  
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- Loane, Charles M., Jr., 4,419,131, Cl. 75-257.000.
- Mobil Oil Corporation: See—  
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- Audeh, Costandi A., 4,419,217, Cl. 208-11.00R.
- Audeh, Costandi A., 4,419,456, Cl. 518-703.000.
- Herrington, F. John, 4,419,087, Cl. 493-439.000.
- Herrington, F. John, 4,419,159, Cl. 156-66.000.
- Krutchon, Charles M., 4,419,309, Cl. 264-53.000.
- LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Steven S., 4,419,220, Cl. 208-111.000.
- Park, Hee Chung P., 4,419,411, Cl. 428-516.000.



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 Moyer, Anthony M.; and Kelly, Robert H., to Gang-Nail Systems, Inc. Structural joint connector, 4,418,509, Cl. 52-693.000.  
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- Neuman, Marcel, to Biomass Development S.A. Machine for continuously densifying ligno-cellulosic or like materials. 4,419,066, Cl. 425-371,000.
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- Nitto Boseki Co., Ltd.: See—  
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- Nolin, Roger J. Simultaneously locking and unlocking dead bolt and lock latch with panic unlocking. 4,418,552, Cl. 70-107,000.
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- Nomura, Yoshihisa: See—  
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- Noonan, John M.; Ryan, Raymond W.; and Houle, James F., to Eastman Kodak Company. Image-forming compositions and elements containing ionic polyester dispersing agents. 4,419,437, Cl. 430-270,000.
- Nordquist, Albert W.: See—  
Tollefsen, Kjell T.; and Nordquist, Albert W., 4,418,605, Cl. 84-434,000.
- Nordson Corporation: See—  
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- Norgren, Kent S.; and Stucka, Stephen E., to International Business Machines Corporation. Bidirection data switch sequencing circuit. 4,419,592, Cl. 307-241,000.
- Noritsu Koki Co., Ltd.: See—  
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- Norman, Richard O.: See—  
Ammon, J. Preston; Weaver, Harry R.; and Norman, Richard O., 4,418,475, Cl. 29-842,000.
- North American Philips Consumer Electronics Corp.: See—  
Doyle, Richard F.; Gausman, Thomas E.; and Myers, Edward T., 4,419,536, Cl. 174-52,00R.

- Norton Company: See—  
Kuriakose, Areekatthazhayil K., 4,419,336, Cl. 423-345,000.
- Norton, Lyle K.: See—  
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- Notenboom, Gerardus J. A. M.: See—  
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- Nowak, Florian I. Collet closing mechanism. 4,418,925, Cl. 279-50,000.
- Nukem GmbH: See—  
Reus, Josef; Wewer, Hans; and Jurgen, Hofmann, 4,419,333, Cl. 423-235,000.
- Nuovo Pignone S.p.A.: See—  
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- Nussli, Jacques; Marandas, Georges J. P.; and Farayre, Antoine, to U.S. Philips Corporation. Bialkaline photocathode having increased spectral sensitivity and method of manufacturing same. 4,419,603, Cl. 313-346,00R.
- Oakley, Charles B.: See—  
Dischert, Robert A.; and Oakley, Charles B., 4,419,687, Cl. 358-13,000.
- O'Brien, Joseph: See—  
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- O'Brien, Steven M., to Sperry Corporation. Automatic synchronous switch for a plurality of asynchronous oscillators. 4,419,629, Cl. 328-72,000.
- O'Brien, Teresa M.: See—  
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- Occidental Chemical Corporation: See—  
Hauffe, Dieter; Muller, Gerhard; Rausch, Werner; and Volling, Gudrun, 4,419,199, Cl. 204-181,00R.
- Hindersinn, Raymond R., 4,419,400, Cl. 428-245,000.
- O'Connor, John W., to Allis-Chalmers Corporation. Pin lock for adjustable link of a three-point hitch. 4,418,935, Cl. 280-461,00A.
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Fukumoto, Chihiro; Furukawa, Tokinobu; and Oda, Chikao, 4,419,488, Cl. 525-53,000.
- Oda, Naoki: See—  
Nakagawa, Katsuyuki; and Oda, Naoki, 4,419,072, Cl. 431-266,000.
- O'Dwyer, James B.: See—  
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- O'Dwyer, Thomas L.: See—  
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- Office of Monopoly: See—  
Kim, Ki-Hwan; Yoo, Kwang-Keun; and Lee, Tae-Ho, 4,418,706, Cl. 131-296,000.
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- Ogden Structural Products, Inc.: See—  
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- Ogino, Naohiko: See—  
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- Ogino, Kenji; Fujisaki, Masayuki; and Gotoh, Shinichi, to Hitachi Maxell, Ltd. Magnetic recording tape cartridge. 4,419,708, Cl. 360-132,000.
- Ogurtsov, Anatoly P.: See—  
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- O'Hara, Robert J. Multi-cable conduit for floors and walls. 4,419,535, Cl. 174-48,000.
- Ohmori, Tsuguharu; and Hayashi, Shizuo, to Fuji Electric Company, Ltd. Method for measuring the extent of slag deposit buildup in a channel induction furnace. 4,419,755, Cl. 373-145,000.
- Ohmuro, Shigeru: See—  
Yamamoto, Yoshihiro; Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 4,419,695, Cl. 358-198,000.
- Ohshita, Masayuki; Horiuchi, Toshiaki; Yamanaka, Takashi; and Usui, Yoshihiro, to Mitsubishi Denki Kabushiki Kaisha. Vacuum type circuit breaker. 4,419,553, Cl. 200-144,00B.
- Ohshita, Takahiro: See—  
Ishihara, Hideo; Ohshita, Takahiro; and Saito, Harumitsu, 4,419,330, Cl. 422-143,000.
- Ohta, Shigeto: See—  
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- Ohye, Hideo: See—  
Fuchigami, Mitsuru; Ishiguro, Mamoru; and Ohye, Hideo, 4,418,941, Cl. 282-27,500.
- Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, to Hosiden Electronics Co., Ltd. Self-sustaining solenoid. 4,419,643, Cl. 335-234,000.
- Okada, Masahiro: See—  
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- Okado, Chihiro: See—  
Izume, Takatomo; and Okado, Chihiro, 4,419,539, Cl. 219-110,000.
- O'Keefe, John J., II, to General Motors Corporation. Electrical connector for a slide-in component. 4,418,975, Cl. 339-91,00R.
- Okuyama, Yasuhiko; and Takezono, Takashi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Electronic clock. 4,419,017, Cl. 368-64,000.
- Olah, George A., to PCUK - Produits Chimiques Ugine Kuhlmann. Regioselective preparation of  $\alpha$ - or  $\beta$ -naphthol. 4,419,528, Cl. 568-741,000.
- Olin Corporation: See—  
Gray, Thomas J., 4,419,208, Cl. 204-290,00R.
- Pryor, Michael J.; Tyler, Derek E.; and Yarwood, John C., 4,419,177, Cl. 156-601,000.
- Olson, Eric V.: See—  
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- Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., to Aktiebolaget Draco. Bronchospasmodic carbamate derivatives. 4,419,364, Cl. 424-300,000.
- Olympus Optical Co., Ltd.: See—  
Kanazawa, Akira, 4,418,689, Cl. 128-6,000.
- Kimura, Kenji, 4,419,614, Cl. 318-653,000.
- Omron Tateisi Electronics Co.: See—  
Agatahama, Shunichi, 4,419,640, Cl. 335-106,000.
- Ono, Chikai: See—  
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- Oosawa, Takashi: See—  
Mitamura, Zenzou; Oosawa, Takashi; and Yonezawa, Akihiro, 4,419,602, Cl. 313-332,000.
- Oota, Hiroyuki; and Narita, Ryuho, to Tokyo Shibaura Denki Kabushiki Kaisha. Control device for coffee extractor. 4,418,614, Cl. 99-280,000.
- Oota, Yoshihiko: See—  
Shiraishi, Yuma; and Oota, Yoshihiko, 4,419,698, Cl. 358-330,000.
- Oppermann, Walter J., to American Can Company. Method of heating contents in a self venting container. 4,419,373, Cl. 426-234,000.
- Optilon W. Erich Heilmann GmbH: See—  
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- Orgill, Dennis P.: See—  
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- Orlando, Franklin P.; and Mortensen, Donald G., to FMC Corporation. Harvester with selective force balanced shaking mechanism. 4,418,521, Cl. 56-330,000.
- Orsa Kattingfabrik AB: See—  
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- Orszagos Koolaj es Gazipari Troszt: See—  
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- Osaka Gas, Ltd.: See—  
Yamamoto, Mitsuo; Namazugoshi, Takeo; and Seto, Hiroyoshi, 4,419,163, Cl. 156-94,000.
- Osborne, Anthony, to Kearney-National, Inc. Operating mechanism for an electric switch. 4,419,549, Cl. 200-50,00A.
- O'Shea, William F., Jr., to Continental-Wirt Electronics Corporation. Connector structure for flat cable. 4,418,977, Cl. 339-99,00R.
- Oshima, Akio: See—  
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- Oshima, Masaharu; Ikezawa, Kenji; and Aoki, Hiroyuki, to Nissan Motor Company, Limited. Oxygen sensing element formed as laminate of thin layers on substrate provided with heater and lead wires. 4,419,213, Cl. 204-425,000.
- Osika, Thomas F., to McGill Manufacturing Company, Inc. Electric switches for receiving unitary internal contact/wire terminal elements. 4,419,554, Cl. 200-284,000.
- Osterhagen, Gerhard; and Feige, Siegfried, to Dynamit Nobel Aktiengesellschaft. Process and apparatus for the production of a pipe of foam material with a closure. 4,419,158, Cl. 156-66,000.
- Otis Elevator Company: See—  
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- Otis Engineering Corporation: See—  
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- Yonker, John H.; and Arendt, Henry P., 4,418,756, Cl. 166-383,000.
- Otvos, Laszlo: See—  
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- Outboard Marine Corporation: See—  
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- Owens-Corning Fiberglass Corporation: See—  
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- Harrop, Kenneth T.; and McArthur, Robert D., 4,418,522, Cl. 57-80,000.
- Owens-Illinois, Inc.: See—  
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- McKinley, John A., 4,418,564, Cl. 73-12,000.
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- Ozari, Yehuda: See—  
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- Ozawa, Takashi: See—  
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- P.V. Machining, Inc.: See—  
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- P. V. Tool Inc.: See—  
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- Pace, Loy D.: See—  
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- Pack Image, Inc.: See—  
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- Page, James H., to Western Manufacturing Company, Inc. Balanced implement transport vehicle. 4,418,762, Cl. 172-311.000.
- Palazzo, Vito: See—  
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- Pall Corporation: See—  
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- Pallos, Ferenc M.; and Gaughan, Edmund J., to Stauffer Chemical Company. N-(Benzenesulfonyl) carbamates-herbicide antidotes. 4,419,523, Cl. 560-12.000.
- Pallos, Laszlo: See—  
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- Palma, James F. Apparatus and method for drilling dowel holes. 4,419,031, Cl. 408-1.00R.
- Palmateer, Paul H.: See—  
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- Panavision, Incorporated: See—  
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- Pane, Francis C., Jr.: See—  
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- Paragon Optical, Inc.: See—  
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- Paramount Die & Machine Products: See—  
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- Park, Hee Chung P., to Mobil Oil Corporation. Multi-layer polypropylene film structure and method of forming same. 4,419,411, Cl. 428-516.000.
- Park-Ohio Industries, Inc.: See—  
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- Parks, Earl L.: See—  
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- Parma Corporation: See—  
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- Partridge, Randall D.: See—  
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- Parus, Roger: See—  
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- Paschal, James H., Jr., to Otis Engineering Corporation. Well tool. 4,418,750, Cl. 166-214.000.
- Paschke, Edward E.; and Throne, James L., to Standard Oil Company (Indiana). Foamed thermoplastic resin comprising poly (p-methylenebenzoate). 4,419,462, Cl. 521-134.000.
- Passerelli, David P.: See—  
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- Patel, Arvind M.: See—  
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- Patel, Bhupendra C., to Kendall Company, The. Suprapubic catheter system. 4,419,094, Cl. 604-93.000.
- Patel, Gajendra M., to GTE Automatic Electric Incorporated. Apparatus separating hybrid substrate from carrier plate. 4,418,459, Cl. 29-239.000.
- Patel, Raman: See—  
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- Patterson, Robert J., II, to United Technologies Corporation. Multi-piece rotary atomizer disk. 4,419,061, Cl. 425-8.000.
- Patterson, Russell E.: See—  
Harman, Robert K.; Clifton, Ronald W.; and Patterson, Russell E., 4,419,659, Cl. 340-552.000.
- Paul, Dieter G., to Sperry Corporation. Asynchronous status register. 4,419,762, Cl. 377-66.000.
- Paul-Heinz Wagner: See—  
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- Paul, William A. Apparatus for handling gasket-forming material. 4,419,168, Cl. 156-351.000.
- Paul Wurth S.A.: See—  
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- Paulukonis, Richard S. Modular pressure letdown valve. 4,418,717, Cl. 137-614.200.
- Paulley, Thomas A.: See—  
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- Pauly, Marc, to Laboratorios Serobiologicos S.A. Composition usable notably as a cosmetic product allowing a tanning of the skin comprising the use of aminoacids. 4,419,343, Cl. 424-59.000.
- Pavlichenko, Georgy S.: See—  
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- PCUK - Produits Chimiques Ugine Kuhlmann: See—  
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- Pear, Daniel G., to Square D Company. Bus bar assembly for panelboards and switchboards. 4,419,715, Cl. 361-335.000.
- Pearson, Glenn A. Fire retardant concentrates and methods. 4,419,401, Cl. 428-262.000.
- Pechacek, Raymond E., to Hahn & Clay. Shell layer wrapping machine and method of positioning vessel sections of a multi-layer vessel. 4,418,560, Cl. 72-296.000.
- Pedain, Josef: See—  
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- Pedersen, Carl O.; and Maurer, Herman J., to J. I. Case Company. Backhoe swing mechanism. 4,419,040, Cl. 414-687.000.
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- Peet, Norton P.; and Sunder, Shyam, to Dow Chemical Company, The. 3-(1H-Tetrazol-5-yl)-4(3H)-quinazolinones. 4,419,357, Cl. 424-251.000.
- Pei, David C. T., to Bettendorf Stanford Inc. Method of baking bread. 4,419,374, Cl. 426-243.000.
- Pellow, Terrence R., to Rolls-Royce Limited. Modular gas turbine engine. 4,418,528, Cl. 60-39.161.
- Pendergraft, Billy D. Bumper mounted foldable crane hoist. 4,419,038, Cl. 414-543.000.
- Penhasi, Harry A., to Beckman Instruments, Inc. Motion sensing apparatus. 4,418,950, Cl. 292-144.000.
- Peresie, Henry J.: See—  
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- Perfection Corporation: See—  
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- Perkey, Harry J.: See—  
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- Perkin-Elmer Corporation, The: See—  
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- Perkins, William G.; and Shriver, Clem B., to Goodyear Tire & Rubber Company, The. Novel process for deep stretch forming of polyesters. 4,419,320, Cl. 264-296.000.
- Peroxide-Chemie GmbH: See—  
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- Perrin, Cristian: See—  
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- Peters, Ferman: See—  
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- Peters, John W., to Hughes Aircraft Company. Low temperature process for depositing an oxide dielectric layer on a conductive surface and multilayer structures formed thereby. 4,419,385, Cl. 427-99.000.
- Peters Machinery Company, Subsidiary of Katy Industries, Inc.: See—  
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- Petershack, Victor D.: See—  
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- Peterson, Bruce R.: See—  
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- Petocz, Lujza: See—  
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- Petrzalka, Martin, to Hoffmann-La Roche Inc. Pyridazines. 4,419,262, Cl. 252-299.610.
- Pfaff Industriemaschinen GmbH: See—  
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- Pfizer Inc.: See—  
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- Sarges, Reinhard, 4,419,521, Cl. 549-404.000.
- Phillips Cables Ltd.: See—  
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- Phillips, Donald E., to Rockwell International Corporation. Phase lock loop. 4,419,633, Cl. 331-17.000.
- Phillips Petroleum Company: See—  
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- McDaniel, Max P., 4,419,268, Cl. 502-158.000.
- Shioyama, Tod K.; and Straw, Jim J., 4,419,525, Cl. 568-401.000.
- Phipps, John P., to Motorola, Inc. Solid-state relay and regulator. 4,419,586, Cl. 250-551.000.
- Phoenix Products Company, Inc.: See—  
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- Photovolt Corporation: See—  
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- Piccirilli, Robert M.; Chang, Wen-Hsuan; Porter, Samuel, Jr.; O'Dwyer, James B.; and Lee, Kyu-Wang, to PPG Industries, Inc. Elastomeric coating compositions. 4,419,407, Cl. 428-423.100.
- Piedmont, James R.; and Hacsakaylo, Michael, to United States of America, Army. Method of making a linear light detecting diode integrated circuit. 4,418,466, Cl. 29-572.000.
- Pierce, Stanley L., to Ford Motor Company. Four speed ratio transverse automatic transmission. 4,418,585, Cl. 74-695.000.
- Piffath, Rodney S., to Firelite Products Inc. Flame igniter. 4,419,069, Cl. 431-89.000.
- Pigman, John H.: See—  
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- Pilachowski, Martin T.; and Ritz, Alan J., to Wacker Corporation. Trash pump with resilient liner. 4,419,048, Cl. 415-196.000.
- Pillitteri, Noreen J., to Keuffel & Esser Company. Diazotype composition stabilization. 4,419,432, Cl. 430-179.000.
- Pinches, Anthony: See—  
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- Pinter, Andras: See—  
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- Pioneer Electronic Corporation: See—  
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- Piper, Harlow H., to Caterpillar Tractor Co. Position indicator for a truck body. 4,418,636, Cl. 116-28.00R.
- Pippard, David A.: See—  
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- Pitney Bowes Inc.: See—  
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- Foster, Dean H.; Mersereau, Robert E.; and Silverman, Harold, 4,418,515, Cl. 53-457.000.
- Plahm, Jack E., to Rexham Corporation. Packaging machine with means for closing flexible pouches around a nozzle. 4,418,513, Cl. 53-434.000.
- Plessey Overseas Limited: See—  
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- Pletcher, Erwin C. Orthodontic bracket. 4,419,078, Cl. 433-10.000.
- Poclain: See—  
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- Podmaniczky, Andras: See—  
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- Pohang Iron & Steel Co., Ltd.: See—  
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- Pohl, Ludwig: See—  
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- Poklemba, John J., to Communications Satellite Corporation. Concurrent carrier and clock synchronization for data transmission system. 4,419,759, Cl. 375-97.000.
- Polaroid Corporation: See—  
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- Pollman, Frederic W., to Sundstrand Corporation. Reversible regenerating electric vehicle drive. 4,419,610, Cl. 318-12.000.
- Polyplex Plastics, Inc.: See—  
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- Pompei, Michel: See—  
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- Pompili, Antonio: See—  
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- Ponomarenko, Yuri F.: See—  
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- Ponomarev, Ivan K.: See—  
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- Popovics, Sandor. Accelerator additive for cementitious compositions. 4,419,138, Cl. 106-90.000.
- Porchet, Marcel. Curved glass ice-scraper. 4,418,439, Cl. 15-236.00R.
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- Potters Industries, Inc.: See—  
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- Potts, Vivian E.: See—  
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- Poundstone, William W. Method of forming multifocal lens blank. 4,419,119, Cl. 65-39.000.
- Povh, Dusan: See—  
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- Powell, Stuart A., to P.V. Machining, Inc. Method and apparatus for reducing and classifying mineral crystalline and brittle noncrystalline material. 4,418,871, Cl. 241-1.000.
- Poweray Infrared Corporation: See—  
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- PPG Industries, Inc.: See—  
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- Wisner, Marco; and Bosso, Joseph F., 4,419,467, Cl. 523-414.000.
- Praefcke, Klaus; Schmidt, Dietmar; and Eidenschink, Rudolf, to Merck Patent Gesellschaft mit beschränkter Haftung. Liquid crystalline cyclohexylcarbonitrile derivatives. 4,419,263, Cl. 252-299.630.
- Prange, Charles J., to Sewer Rodding Equipment Co. Sewer pipe tester. 4,418,572, Cl. 73-432.00R.
- Prasad, Arun, to Jeneric Industries, Inc. Dental alloys for porcelain-fused-to-metal restorations. 4,419,325, Cl. 420-464.000.
- Pratt-Read Corporation: See—  
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- Pratt, Roy E.: See—  
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- Precision Golf Design, Inc.: See—  
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- Precision Valve Corporation: See—  
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- Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: See—  
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- Prescher, Gunther: See—  
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- Press-A-Lite Corporation: See—  
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- Price, Edison A.; and Bengochea, Fulgencio, to Edison Price, Incorporated. Ceiling supported lighting fixtures. 4,419,717, Cl. 362-148.000.
- Price, Leonard W., to Hughes Helicopters, Inc. Single barrel externally powdered gun. 4,418,607, Cl. 89-33.00CA.
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- Procter & Gamble Company, The: See—  
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- Proctor & Schwartz, Inc.: See—  
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- Pruski, John A.: See—  
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- Pryor, Michael J.; Tyler, Derek E.; and Yarwood, John C., to Olin Corporation. Process for electromagnetically casting or reforming strip materials. 4,419,177, Cl. 156-601.000.
- PTX-Pentronix, Inc.: See—  
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- Puffett, Alan W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Apparatus for estimating slant visibility in fog. 4,419,731, Cl. 364-428.000.
- Puletti, Paul P.; and Stubler, Catherine E., to National Starch and Chemical Corporation. Heat resistant hot melt adhesives. 4,419,494, Cl. 525-95.000.
- Purdy, Kenneth R.: See—  
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- Purvis, James E. Boiler structure. 4,418,649, Cl. 122-15.000.
- Puskas, Jeffery A.; Skerlos, Peter C.; and Zato, Thomas J., to Zenith Radio Corporation. Character generator with latched outputs. 4,419,662, Cl. 340-750.000.
- Puskas, Tivadar: See—  
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- Quadco Component Systems, Inc.: See—  
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- Quantum Corporation: See—  
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- Quantz, James B., to Machine Design Incorporated. Apparatus for cracking nuts at high production rates. 4,418,617, Cl. 99-571.000.



- Quash, Gerard A., to Institut National de la Sante et de la Recherche Medicale-INSERM. Novel supports carrying side chains, processes for obtaining these supports, process for attaching organic compounds having carbohydrate residues one said supports, products and reagents resulting from said chemical fixation. 4,419,444, Cl. 435-7.000.
- Rasch, Hans, to W. Schlafhorst & Co. Double-sided open end spinning machine. 4,418,525, Cl. 57-264.000.
- Rabe, William T.; and Roberts, Maurice P., to TRW Inc. Steering apparatus. 4,418,781, Cl. 180-155.000.
- Rabinovich, Eliezer M.: See—  
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- Racek, Alfred. Gas lighter. 4,419,073, Cl. 431-344.000.
- Raden, Daniel S.: See—  
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- Radman, Anton J.; Bauck, Randall C.; and Kleczkowski, Peter S., to Iomega Corporation. Bernoulli plate for stabilization of flexible magnetic disk. 4,419,704, Cl. 360-102.000.
- Raff, Lothar: See—  
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- Ragen Precision Industries, Inc.: See—  
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- Ragle, Herbert U.; and Blessum, Norman S., to Burroughs Corporation. Dual-track spiral recording and associated system. 4,419,700, Cl. 360-77.000.
- Rahman, Aquilur; and Schein, Philip S., to Georgetown University. Anthracene glycoside compositions, their use and preparation. 4,419,348, Cl. 424-180.000.
- Raines, Charles D., to Horton Industries, Inc. Friction interface unit for a clutch and a brake. 4,418,807, Cl. 192-18.00A.
- Raos, Robert R.: See—  
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- Rapp, Willard E., to Western Electric Co. Wire cutting and insulation softening apparatus. 4,418,465, Cl. 29-566.100.
- Raskin, Gregory D. Electronic signal level control apparatus for acoustical-electrical transducer instrument. 4,418,599, Cl. 381-1.050.
- Rasmussen GmbH: See—  
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- Ratkowski, Donald J.; and Lue, Ping-Chang, to Paragon Optical, Inc. Contact lens composition, article and method of manufacture. 4,419,505, Cl. 526-279.000.
- Raue, Roderich, to Bayer Aktiengesellschaft. Process for the preparation of trimethine dyes. 4,419,511, Cl. 542-471.000.
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- Rausch, Werner: See—  
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- RCA Corporation: See—  
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- Dholakia, Anil R.; and Ruggeri, Vincent J., 4,418,500, Cl. 51-125.500.
- Dischert, Robert A.; and Oakley, Charles B., 4,419,687, Cl. 358-13.000.
- Hicks, James E., 4,419,608, Cl. 315-408.000.
- Stewart, Roger G.; and Mazin, Moshe, 4,419,741, Cl. 365-72.000.
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- Reczek, James A.; and Elwood, James K., to Eastman Kodak Company. Photographic products and processes employing 6-heterocyclazo-3-pyridinol nondiffusible cyan dye-releasing compounds and precursors thereof. 4,419,435, Cl. 430-223.000.
- Reda, Kazimierz J.; Dzwialowski, Victor F.; and Gile, Richard H., to Ex-Cell-O Corporation. Single workhead electro-mechanical internal grinding machine with grinding spindle directly on cross slide. 4,419,612, Cl. 318-571.000.
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- Reed, Floyd W. Cotton module transport processes. 4,419,042, Cl. 414-786.000.
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- Rees, Karl, to Sulzer Brothers Limited. Steam generator having a superheater tube bank. 4,418,652, Cl. 122-468.000.
- Reetz, Manfred T.; and Chatziiosifidis, Ioannis, to Bayer Aktiengesellschaft. Preparation of tertiary alkyl cyanides. 4,419,296, Cl. 260-464.000.
- Regal International, Inc.: See—  
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- Regal Ware, Inc.: See—  
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- Rehn, Irwin M.: See—  
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- Reich Spezialmaschinen GmbH: See—  
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- Reiff, Helmut F.: See—  
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- Reindel, John, to United States of America, Navy. Slotline reverse-phase hybrid ring coupler. 4,419,635, Cl. 333-116.000.
- Reinecke, Erich, to WABCO Fahrzeugbremsen GmbH. Load-controlled brake pressure control unit. 4,418,965, Cl. 303-22.00R.
- Reinehr, Dieter: See—  
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- Renz, Klaus: See—  
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- REPA Feinstanzwerk GmbH: See—  
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- Reus, Josef; Wewer, Hans; and Jurgen, Hofmann, to Nukem GmbH. Process for removal of nitrogen oxides. 4,419,333, Cl. 423-235.000.
- Reuter, Herbert; Saran, Herbert, deceased (by Muller, Karin Saran nee, heiress); and Witthaus, Martin, to Henkel Kommanditgesellschaft Auf Aktien. Method for the production of a suds-stabilized silicone-containing detergent. 4,419,260, Cl. 252-174.130.
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- Rexnord Inc.: See—  
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- Rheinmetall GmbH: See—  
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- Breant, Claude, 4,419,282, Cl. 252-522.00R.
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- Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., to Akzona Incorporated. Alkoxyated diquaternary ammonium compounds. 4,419,140, Cl. 106-273.00N.
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- Ricoh Company, Ltd.: See—  
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- Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, to Chemische Werke Huls AG. Fire retardant fine particulate expandable styrene polymers. 4,419,458, Cl. 521-56.000.
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- Myers, Robert M., 4,419,277, Cl. 252-500.000.
- Smolanoff, Joel R., 4,419,360, Cl. 424-258.000.
- Swithenbank, Colin, 4,419,122, Cl. 71-98.000.
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- Roland, Billy F. Knock down chair. 4,419,028, Cl. 403-353.000.
- Roldan, Bayani E., to Bell & Howell Company. Method and apparatus for storing a length of web. 4,418,874, Cl. 242-3G.
- Rolls-Royce Limited: See—  
Barry, Brian; Sadler, John H. R.; Allen, Susan M.; and Artt, David W., 4,419,044, Cl. 415-117.000.
- Pellow, Terrence R., 4,418,528, Cl. 60-39.161.
- Romer, Michael: See—  
Eidenschink, Rudolf; Romer, Michael; and Pohl, Ludwig, 4,419,264, Cl. 252-299.630.
- Romick, Jerome M. Medication handling system and reusable dispensing container. 4,418,823, Cl. 206-538.000.
- Rosen, Borje O. Fluid filtering device. 4,419,240, Cl. 210-444.000.
- Rosdy, Bela: See—  
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsador, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- Rose, Edward, to Peters Machinery Company, Subsidiary of Katy Industries, Inc. Finger cookie orienting apparatus. 4,418,814, Cl. 198-406.000.
- Rose, John B., to Imperial Chemical Industries PLC. Sulphonated polyaryletherketones. 4,419,486, Cl. 525-534.000.
- Rose, Peter W. Apparatus for preparing meat food products having reduced shrinkage. 4,419,205, Cl. 204-228.000.
- Rose, Stanley E. Spacial mechanism and method. 4,419,041, Cl. 414-739.000.
- Rosenberg, Barnett; Van Camp, Loretta; Ficher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., to Research Corporation. Platinum-dioxypyrimidine complexes. 4,419,351, Cl. 424-245.000.
- Ross, Charles W., to Leeds & Northrup Company. Time deviation and inadvertent interchange correction for automatic generation control. 4,419,733, Cl. 364-493.000.
- Ross, James W. Multi-stage electrical control system. 4,419,589, Cl. 307-39.000.
- Rosselet, Jean, to Mefina S.A. Mechanism for a rotating projectile fuze. 4,418,621, Cl. 102-238.000.
- Roth, Christoph: See—  
Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440, Cl. 430-377.000.
- Roth, Martin; and Kiendl, Helmut, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung. System for releasably securing movable support elements on space vehicles. 4,419,033, Cl. 410-32.000.
- Rothmans of Pall Mall Canada Limited: See—  
Schmelzer, Juergen F., 4,419,627, Cl. 328-4.000.
- Rottmaier, Ludwig; and Merten, Rudolf, to Bayer Aktiengesellschaft. Hydroxyalkyl- and alkoxyalkyl-triazolidine-3,5-dione compounds and their processes for their preparation. 4,419,520, Cl. 548-264.000.
- Rowe, Eugene H., to B. F. Goodrich Company, The. Toughened polyester resins. 4,419,487, Cl. 525-38.000.
- Rowland, Floyd C., to Rexar Industries, Inc. Attachment for catheter tube. 4,419,097, Cl. 604-174.000.
- Roydhouse, Richard H. Mercury filtering apparatus and method. 4,419,107, Cl. 55-5.000.
- Rubber and Plastics Research Association of Great Britain: See—  
Gale, George M., 4,419,014, Cl. 366-99.000.
- Rubio Salas, Roque. Device for controlling the cation saturation in interchanging filters. 4,419,229, Cl. 210-85.000.
- Rubricius, Jeanette L.: See—  
LeVeen, Eric G.; LeVeen, Robert F.; and Rubricius, Jeanette L., 4,418,693, Cl. 128-303.00R.
- Rudle, Manfred: See—  
Stoll, Kurt; and Rudle, Manfred, 4,418,711, Cl. 137-269.000.
- Ruggeri, Vincent J.: See—  
Dholakia, Anil R.; and Ruggeri, Vincent J., 4,418,500, Cl. 51-125.500.
- Rule, Charles E., to SCM Corporation. Cream/alcohol-containing beverages. 4,419,378, Cl. 426-592.000.
- Ruspino, James G.: See—  
Gurubatham, Vincent P.; and Ruspino, James G., 4,418,868, Cl. 239-228.000.
- Russell, Gilbert E.; and Wong, Hee, to National Semiconductor Corporation. Digital color modulator. 4,419,689, Cl. 358-37.000.
- Russell, Thomas D., to Babcock & Wilcox Company, The. Boiler loading system. 4,418,541, Cl. 60-667.000.
- Ruth, Charles N. Method and apparatus for separating a lid from a container. 4,418,460, Cl. 29-403.300.



- Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., to Benson, Inc. Guadrascan styli for use in staggered recording head. 4,419,679, Cl. 346-155.000.
- Rutter, Phillip, to Plessey Overseas Limited. Non-volatile static ram element. 4,419,744, Cl. 365-154.000.
- Ryan, James J., Jr. Baseball/softball cart. 4,418,930, Cl. 280-47.190.
- Ryan, Raymond W.: See—  
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- SAB Industri AB: See—  
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,418,801, Cl. 188-202.000.
- Sadler, John H. R.: See—  
Barry, Brian; Sadler, John H. R.; Allen, Susan M.; and Artt, David W., 4,419,044, Cl. 415-117.000.
- Saeki, Yukio; and Inoue, Naomitsu, to Sumitomo Durez Company, Ltd. Powder phenolic resin composition for dry process resin-bonded felt. 4,419,477, Cl. 524-290.000.
- Safinco: See—  
De Lathauwer, Rene; Van Opstal, Martin; and Dijkstra, Albert J., 4,419,291, Cl. 260-410.700.
- Saint E. Company, Inc.: See—  
Clark, Robert W., Jr., 4,418,547, Cl. 62-116.000.
- St. John, Peter A., to Baxter Travenol Laboratories, Inc. Ultrasonic bubble detector. 4,418,565, Cl. 73-19.000.
- Saito, Harumitsu: See—  
Ishihara, Hideo; Ohshita, Takahiro; and Saito, Harumitsu, 4,419,330, Cl. 422-143.000.
- Saito, Mitsuo: See—  
Yamashita, Sadahiko; and Saito, Mitsuo, 4,419,768, Cl. 455-180.000.
- Saito, Takashi; Tajima, Osamu; and Mochizuki, Masafumi, to Victor Company of Japan, Ltd. Case for a disc-shaped recording medium. 4,419,709, Cl. 360-133.000.
- Sakabe, Takao: See—  
Chiba, Yoshiharu; Umezawa, Hidetsugu; Sakabe, Takao; and Arai, Ryuji, 4,418,729, Cl. 139-452.000.
- Sakai, Keijiro: See—  
Muto, Nobuyoshi; Sakai, Keijiro; and Matsuda, Yasuo, 4,419,615, Cl. 318-811.000.
- Sa'at, Shinji: See—  
Kawabata, Takashi; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,419,574, Cl. 250-204.000.
- Sakai, Yasuharu; Murai, Nobuaki; and Nakano, Kiyotaka, to Japan Storage Battery Company Ltd. Control device for a small press. 4,418,562, Cl. 72-444.000.
- Sakai, Yoshio; and Nakamura, Hideo, to Hitachi, Ltd. Semiconductor integrated circuit. 4,419,684, Cl. 357-40.000.
- Sakamoto, Junji: See—  
Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, 4,419,541, Cl. 381-7.000.
- Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, to Sumitomo Naugatuck Co., Ltd. Thermoplastic resin composition excellent in color development. 4,419,491, Cl. 525-67.000.
- Sakata, Fusao: See—  
Tanaka, Hiroshi; and Sakata, Fusao, 4,419,181, Cl. 156-640.000.
- Sakiguchi, Shigeo: See—  
Takahashi, Yasuyoshi; Sakiguchi, Shigeo; and Sato, Teruyoshi, 4,419,738, Cl. 364-900.000.
- Sakurai, Masaki: See—  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,419,710, Cl. 360-133.000.
- Sakurai, Takeichi: See—  
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- Sakurai, Tetsuma: See—  
Sugawara, Yoshitaka; Kamei, Tatsuya; and Sakurai, Tetsuma, 4,419,685, Cl. 357-53.000.
- Salnikov, Andrei F.: See—  
Bodrov, Igor S.; Gudzh, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530, Cl. 60-39.181.
- Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. S.A. Latching apparatus for use with ski binding. 4,418,937, Cl. 280-613.000.
- Salon, Guy: See—  
Pouderoux, Pierre; Salon, Guy; and Nguyen-Thanh, Thong, 4,418,748, Cl. 165-134.000.
- Sandberg, Kenneth; and Stoub, James, to Formax, Inc. Mold assembly for food patty molding machine. 4,418,446, Cl. 17-32.000.
- Sandel, Dan S. Disposable surgical instrument platform and container. 4,418,821, Cl. 206-370.000.
- Sanders, William J.; Snyder, Marvin K.; and Harter, James W., to Butler Manufacturing Company. Roof aperture system for selective collection and control of solar energy for building heating, cooling and daylighting. 4,418,684, Cl. 126-419.000.
- Sandoz, Inc.: See—  
Brand, Leonard J.; and Nadelson, Jeffrey, 4,419,353, Cl. 424-248.400.
- Sangamo Weston, Inc.: See—  
Gurr, George P.; and Nelson, Bruce J., 4,419,665, Cl. 340-825.060.  
Gurr, George P.; and Nelson, Bruce J., 4,419,666, Cl. 340-825.060.  
Gurr, George P.; and Nelson, Bruce J., 4,419,667, Cl. 340-825.060.
- Sangamo Weston Limited: See—  
Dorey, Howard A., 4,419,758, Cl. 375-38.000.
- Sankar, Thiagas S.: See—  
Warner, Glenfield, 4,418,700, Cl. 128-694.000.
- Sankin Industry Co., Ltd.: See—  
Nakagawa, Katsuyuki; and Oda, Naoki, 4,419,072, Cl. 431-266.000.
- Sano, Yoshimoto: See—  
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, 4,419,349, Cl. 424-195.000.
- Sanshin Kogyo Kabushiki Kaisha: See—  
Taguchi, Michihiro, 4,419,083, Cl. 440-56.000.
- Santa, Richard E. Baseball glove former & carrier. 4,418,849, Cl. 223-78.000.
- Santilli, Donald S.; and Blakely, Donald W., deceased (by Jacobson, Robert L., administrator), to Chevron Research Company. Clay-based sulfur sorbent. 4,419,273, Cl. 502-80.000.
- Santini, Thomas F., to De Laire, Inc. Vapor dispersing process. 4,419,326, Cl. 422-4.000.
- Santucci, Nicola, to Nuovo Pignone S.p.A. Weft insertion devices on looms having a motionless weft reserve. 4,418,727, Cl. 139-448.000.
- Sanyo Electric Co., Ltd.: See—  
Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, 4,419,541, Cl. 381-7.000.
- Okuyama, Yasuhiko; and Takezono, Takashi, 4,419,017, Cl. 368-64.000.
- Sappsucker, Inc.: See—  
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- Saran, Herbert, deceased: See—  
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- Sarges, Reinhard, to Pfizer Inc. 6-Halo-4-chromanamines useful as intermediates to make chiral hydantoins. 4,419,521, Cl. 549-404.000.
- Sartorius GmbH: See—  
Hoffmann, Jurgen, 4,419,241, Cl. 210-493.500.
- Sarver, Nava: See—  
Howley, Peter M.; Sarver, Nava; and Law, Ming-Fan, 4,419,446, Cl. 435-68.000.
- Sasaki, Yutaka; Mori, Kunio; Moriya, Kiyoshi; and Utsumi, Hiroshi, to Nitto Chemical Industry Co., Ltd. Process for regenerating antimony containing oxide catalyst comprising an aqueous ammonia impregnation. 4,419,267, Cl. 502-26.000.
- Sasser, Thurman: See—  
Bellar, Dennis; and Sasser, Thurman, 4,418,996, Cl. 353-33.000.
- Satake, Yasuo: See—  
Kojima, Takuhito; Satake, Yasuo; and Masuda, Toru, 4,419,753, Cl. 370-62.000.
- Satchell, Fred E.; Cornell, William D.; Uitz, Mark O.; and Walker, Clarence L., to Sherwood Medical Company. Pipettor mechanism and disposable tip and piston assembly. 4,418,580, Cl. 73-864.130.
- Sato, Akira: See—  
Nakagawa, Ryueichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; and Ozaki, Tsuyoshi, 4,419,128, Cl. 75-46.000.
- Sato, Michio; Kasai, Shin; and Kawaguchi, Yutaka, to Nitto Boseki Co., Ltd. Method of winding a strand of relatively rigid glass fiber onto a rotating strand winding sleeve. 4,418,876, Cl. 242-18.000.
- Sato, Norio; and Kamimoto, Shohei, to Nissan Motor Company, Limited. Battery operated forklift with a motor driven power steering system. 4,418,778, Cl. 180-132.000.
- Sato, Shosuke: See—  
Takahashi, Mutsumi; Uwabe, Toshio; Nagase, Toshio; Sato, Shosuke; and Matsuzawa, Hideshi, 4,419,572, Cl. 235-69.000.
- Sato, Tadao: See—  
Ishii, Toshihiko; and Sato, Tadao, 4,419,335, Cl. 423-290.000.
- Sato, Teruyoshi: See—  
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- Sato, Yoshiro, to Tohoku Metal Industries, Ltd. Transient-noise simulators. 4,419,628, Cl. 328-67.000.
- Sattlegger, Hans; Schnurrbusch, Karl; and Achtenberg, Theo, to Bayer Aktiengesellschaft. Organopolysiloxane molding compositions. 4,419,484, Cl. 524-731.000.
- Sauer, Heinz, to Rasmussen GmbH. Clamp for hoses or the like. 4,418,448, Cl. 24-20.0TT.
- Saurer-Allma GmbH: See—  
Zimmermann, Hanns; and Preisenhammer, Peter, 4,418,899, Cl. 269-32.000.
- Savin Corporation: See—  
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- Sawicki, Robert A.: See—  
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- Sawyer, George N., to Trane CAC, Inc. Variable capacity multiple compressor refrigeration system. 4,418,548, Cl. 62-175.000.
- Schaffer, Clarence S. Spoked wheel covers. 4,418,962, Cl. 301-37.00P.
- Scheepswerf en Machinefabriek "De Liesbosch" B.V.: See—  
Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., 4,418,484, Cl. 37-63.000.
- Schein, Philip S.: See—  
Rahman, Aquilur; and Schein, Philip S., 4,419,348, Cl. 424-180.000.
- Scheinflug, ans: See—  
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinflug, ans, 4,419,361, Cl. 424-273.00R.
- Schell, Joseph G., Jr., to Dow Chemical Company, The. Transition metal containing catalyst. 4,419,269, Cl. 502-169.000.

- Schellenberg, Walter. Container closure and a frangible inner closure. 4,418,831, Cl. 220-258.000.
- Schepakin, Mikhail B.: See—  
Bodrov, Igor S.; Gudzh, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530, Cl. 60-39.181.
- Schering Aktiengesellschaft: See—  
Dahms, Wolfgang, 4,419,192, Cl. 204-15.000.
- Schimmel, Vernon R., to Symons Corporation. Double-hinge corner for a concrete forming structure. 4,418,884, Cl. 249-11.000.
- Schlecht, Karl. Concrete pump tractor trailer assembly. 4,418,713, Cl. 137-351.000.
- Schlier, Robert E.: See—  
Jones, George S.; and Schlier, Robert E., 4,419,582, Cl. 250-42.000.
- Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J. Pre-cooler for gas turbines. 4,418,527, Cl. 60-39.050.
- Schlumberger Technology Corporation: See—  
Sinha, Bikash K., 4,419,600, Cl. 310-361.000.
- Schmelzer, Juergen F., to Rothmans of Pall Mall Canada Limited. Measuring the moisture content of materials. 4,419,627, Cl. 328-4.000.
- Schmidt, Dietmar: See—  
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- Schmidt, Noel J.: See—  
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- Schmitt, Wayne I.: See—  
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- Schmitz, Albert, to U.S. Philips Corporation. Zener diode. 4,419,681, Cl. 357-13.000.
- Schmitz, George J.: See—  
Dzung, John C.; Perkey, Harry J.; and Schmitz, George J., 4,418,830, Cl. 220-81.00R.
- Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuo, to Chemplex Company. Composite structures. 4,419,408, Cl. 428-424.400.
- Schnee, Edward A.: See—  
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- Schneider, Helmut, to Inkares A.G. Container which can be opened with one hand. 4,418,832, Cl. 220-260.000.
- Schneider, Ronald A. Liquid compositions for display devices. 4,419,283, Cl. 252-600.000.
- Schneider, Rudolf; and Husch, Bruno, to Busatis-Werke GmbH u.Co. K.G. Boge GmbH. Thrust swivel bearing on mowing knives supported in swinging levers of mower cutting systems. 4,418,520, Cl. 56-297.000.
- Schnurrbusch, Karl: See—  
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- Scholz, Manfred: See—  
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- Schottel-Werft Josef Becker GmbH & Co KG: See—  
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- Schottel-Werft, Josef Becker GmbH & Co. KG: See—  
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- Schroeter, Siegfried H.: See—  
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- Schrotz, Kurt: See—  
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- Schuch, Gerhard: See—  
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621, Cl. 324-51.000.
- Schuetz, Mark A., to Advanced Mechanical Technology, Inc. High efficiency gas burner. 4,419,074, Cl. 431-354.000.
- Schultz, Steven C.; and Vaughn, Thomas A., to Nichols-Homesfield, Inc. Rotary latch for screen door. 4,418,951, Cl. 292-202.000.
- Schulze, Carsten; Lotter, Kurt; and Malefakis, Jakob, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung. Two-dimensional, unilateral oblique shock diffuser as the air inlet for a gas turbine jet engine for the propulsion of heavy-duty aircraft. 4,418,708, Cl. 137-15.200.
- Schulze, Dietmar: See—  
Bollinger, Helmut; Bucken, Bernd; Schulze, Dietmar; and Wilberg, Rudiger, 4,419,380, Cl. 427-38.000.
- Schumann, Wilhelm: See—  
Bayer, Ernst; and Schumann, Wilhelm, 4,419,490, Cl. 525-61.000.
- Schwartz, James E., to Dow Chemical Company, The. Small particle size latex useful as a pressure sensitive adhesive. 4,419,481, Cl. 524-551.000.
- Schwartz, Robert, to John Zink Company. Portable high-flow rate flare for smokeless burning of viscous liquid fuels. 4,419,071, Cl. 431-202.000.
- Schweiger, Richard G. Process of making films, fibers or other shaped articles consisting of, or containing, polyhydroxy polymers. 4,419,316, Cl. 264-184.000.
- SCM Corporation: See—  
Rule, Charles E., 4,419,378, Cl. 426-592.000.
- Suderman, Darrel R., 4,419,371, Cl. 426-94.000.
- Scott, John W.: See—  
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- Scott Paper Company: See—  
Varona, Eugenio, 4,419,403, Cl. 428-288.000.
- Scott, Richard H., to Western Electric Company, Inc. Sheet stock transfer apparatus. 4,418,906, Cl. 271-99.000.
- Sealright Co. Inc.: See—  
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- Searle, Richard J.: See—  
Mancini, Gerardo; Searle, Richard J.; and Davis, Eugene E., 4,418,826, Cl. 215-231.000.
- Seeq Technology, Inc.: See—  
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- Seferiadis, Johann: See—  
Heybutzki, Helmut; Krug, Wolfgang; and Seferiadis, Johann, 4,418,544, Cl. 62-55.000.
- Segal, Mark: See—  
Dikstein, Shabtay; and Segal, Mark, 4,419,367, Cl. 424-330.000.
- Seguin, Herb J. J. Method and apparatus for the protection of electrical equipment from high voltage transients. 4,419,711, Cl. 361-111.000.
- Sehm, Eugene J., to B. F. Goodrich Company, The. Polymerization process for carboxyl containing polymers. 4,419,502, Cl. 526-209.000.
- Seidel, Horst: See—  
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- Seidl, Hans: See—  
Meyer, Heinz; Dorn, Maximilian; and Seidl, Hans, 4,419,197, Cl. 204-159.200.
- Seiko Koki Kabushiki Kaisha: See—  
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- Seipel, Winfried, to Hewlett-Packard Company. Current controlled variable reactor. 4,419,648, Cl. 336-215.000.
- Sekine, Hisashi: See—  
Tachikawa, Kyoji; Sekine, Hisashi; Itoh, Kikuo; and Iijima, Yasuo, 4,419,145, Cl. 148-11.50F.
- Semenov, Mikhail K.: See—  
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- Semiconductor Energy Laboratory Co., Ltd.: See—  
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- Semien, George A. Article tray for automobiles. 4,418,626, Cl. 108-8.000.
- Seno, Eugene T.: See—  
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,419,447, Cl. 435-76.000.
- Baltz, Richard H.; Kirst, Herbert A.; Wild, Gene M.; and Seno, Eugene T., 4,419,508, Cl. 536-7.100.
- Seragnoli, Enzo, to G. D. Societa per Azioni. Method and relative manufacturing machine for simultaneously producing two continuous cigarette rods. 4,418,705, Cl. 131-84.00R.
- Serrano, Angel B. Nozzle hood for moulding pipes. 4,418,885, Cl. 249-100.000.
- Seshamani, Venkatraman: See—  
Johnson, Richard C.; Seshamani, Venkatraman; and Egbert, Leigh B., 4,418,650, Cl. 122-4.00D.
- Seto, Hiroyoshi: See—  
Yamamoto, Mitsuo; Namazugoshi, Takeo; and Seto, Hiroyoshi, 4,419,163, Cl. 156-94.000.
- Seton Company: See—  
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- Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., to SAB Industri AB. Rail vehicle slack adjuster. 4,418,801, Cl. 188-202.000.
- Severns, James G., to United States of America, Navy. Thermophotovoltaic power source. 4,419,532, Cl. 136-253.000.
- Seward, Larry O.; and Warman, Bradley, to Procter & Gamble Company, The. Cake mix containing a lipophilic emulsifier system. 4,419,377, Cl. 426-554.000.
- Sewer Rodding Equipment Co.: See—  
Prange, Charles J., 4,418,572, Cl. 73-432.00R.
- SGM Co., Inc.: See—  
Gerboth, Patrick L.; and Jozwiak, Stanley E., Jr., 4,419,049, Cl. 415-206.000.
- Shaffer, James D., to Goodway Transport, Inc. Pallet carrier. 4,418,853, Cl. 224-42.410.
- Shamir, Amos, to Paramount Die & Machine Products. Fuse plug. 4,418,978, Cl. 339-99.00R.
- Shapiro, Richard N. Dual container apparatus. 4,418,819, Cl. 206-216.000.
- Sharp Kabushiki Kaisha: See—  
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- Shaw, Philip L., to Lindeman (Holdings) Limited. Juice drainer. 4,419,238, Cl. 210-338.000.
- Shell Internationale Research Maatschappij B.V.: See—  
Voetter, Heinz; Van Meurs, Hubrecht C. A.; Darton, Richard C.; and Krishna, Rajamani, 4,419,215, Cl. 208-11.00R.
- Shell Oil Company: See—  
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- Shepherd, David: See—  
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- Sherbert, Edward G.: See—  
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- Sheridon, Nicholas K.; Biegelsen, David K.; and Berkovitz, Michael A., to Xerox Corporation. Electrophoretic printing system. 4,419,680, Cl. 346-163.000.
- Sherman, Philip B., to Texaco Inc. Recovery of solvent from a hydrocarbon extract. 4,419,227, Cl. 208-326.000.
- Sherstobitov, Igor V.: See—  
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- Sherwood Medical Company: See—  
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- Shibukawa, Nobuyuki: See—  
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- Shida, Mitsuzo: See—  
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- Shiga, Tsutomu; and Nimura, Takayasu, to Nippondenso Co., Ltd. Alternator assembly having a rectifier device in thermal contact with case and cover. 4,419,597, Cl. 310-68.00D.
- Shikano, Hiroshi; and Harada, Tsutomu. Packing materials. 4,419,455, Cl. 501-95.000.
- Shiley, Inc.: See—  
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- Shim, Joosup; and Law, Derek A., to Mobil Oil Corporation. Aqueous lubricant. 4,419,251, Cl. 252-32.70E.
- Shim, Joosup, to Mobil Oil Corporation. Aqueous lubricant. 4,419,252, Cl. 252-32.70E.
- Shimano Industrial Company Limited: See—  
Nakajima, Hideki, 4,418,877, Cl. 242-84.21R.
- Shimano, Keizo, 4,418,584, Cl. 74-594.200.
- Shimano, Keizo, to Shimano Industrial Company Limited. Gear crank for a bicycle. 4,418,584, Cl. 74-594.200.
- Shimizu, Hideo: See—  
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- Shimizu, Kazuyuki: See—  
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- Shimizu, Keiichi; and Mochida, Haruo, to Nissan Motor Company, Limited; and Kokusan Kinzoku Kogyo Co., Ltd. Electronic door locking system for an automotive vehicle. 4,419,712, Cl. 361-172.000.
- Shimomoto, Yasuharu: See—  
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- Shin-Etsu Chemical Co., Ltd.: See—  
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- Shinbori, Takeyoshi, to NHK Spring Co., Ltd. Apparatus for controlling the friction between the leaf springs of a laminated leaf spring assembly. 4,418,896, Cl. 267-36.00R.
- Shinko Machinery Works Inc.: See—  
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- Shinoda, Nobuhiko: See—  
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- Shinoura, Osamu: See—  
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- Shioyama, Tod K.; and Straw, Jim J., to Phillips Petroleum Company. Recovery and rejuvenation of Wacker-type catalysts. 4,419,525, Cl. 568-401.000.
- Shipley Company Inc.: See—  
Gulla, Michael; and Connelly, Marc, 4,419,183, Cl. 156-666.000.
- Shirai, Shigeji, to Shinko Machinery Works Inc. Cutter grinding machine. 4,418,499, Cl. 51-3.000.
- Shiraishi, Yuma; and Oota, Yoshihiko, to Victor Company of Japan, Ltd. Color video signal recording and/or reproducing system. 4,419,698, Cl. 358-330.000.
- Shriver, Clem B.: See—  
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- Shubow, Calvin; and Skinner, Robert V., to Quadco Component Systems, Inc. Bonded aggregate structures and production thereof. 4,419,133, Cl. 106-85.000.
- Shultz, Richard E.; and Voeks, William E., Jr., to Burroughs Corporation. Automatic reloader-elevator for cut sheet printing apparatus. 4,418,907, Cl. 271-157.000.
- Sidebottom, Donald L., to General Electric Company. Air conditioning control system with user power up mode selection. 4,418,744, Cl. 165-25.000.
- Sidorenko, Igor G.: See—  
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- Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741, Cl. 164-454.000.
- Siegfried, Robert W., II, to Atlantic Richfield Company. Continuous wave sonic logging. 4,419,748, Cl. 367-31.000.
- Siemens Aktiengesellschaft: See—  
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621, Cl. 324-51.000.
- Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,419,204, Cl. 204-206.000.
- Branston, David, 4,419,605, Cl. 313-485.000.
- Druegh, Paul; and von Winnicki, Kalixt, 4,419,634, Cl. 331-117.00R.
- Herberg, Helmut, 4,419,683, Cl. 357-38.000.
- Hundt, Eckart; and Trautenberg, Elmar, 4,418,575, Cl. 73-607.000.
- Keil, Rudolf; Auracher, Franz; and Stockmann, Michael, 4,418,980, Cl. 350-96.130.
- Lang, Josef; Hollaus, Reinhard; Reeh, Ulrike; Denk, Hans; and Habrich, Reiner, 4,419,531, Cl. 136-251.000.
- Meyer, Franz J., 4,419,609, Cl. 318-7.000.
- Siemens Gammasonics, Inc.: See—  
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- Hawman, Eric G., 4,419,763, Cl. 378-149.000.
- Sifferman, Thomas R., to Conoco Inc. Methods of inhibiting the flow of water in subterranean formations. 4,418,755, Cl. 166-281.000.
- Sigety, Stephen, Jr., to General Motors Corporation. Windshield wiper apparatus. 4,418,440, Cl. 15-250.210.
- Silverman, Harold: See—  
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- Simmons, Robert A., to Bantam Systems, Inc. Method of manufacture of ventilated sheet metal floor members. 4,418,558, Cl. 72-177.000.
- Simon-Hartley Limited: See—  
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- Simon, Robert H. M., to Monsanto Company. Process for preparing ABS polymeric polyblends. 4,419,492, Cl. 525-71.000.
- Sin, Yoon K.; and Kim, Daiuk, to Pohang Iron & Steel Co., Ltd. Non-metallic catalyst compositions for oxidation of ammonia and process for making the catalyst. 4,419,274, Cl. 502-304.000.
- Sing, Gerhard; and Wellendorf, Klaus, to Dr.-Ing. Rudolf Hell GmbH. Method for the improved reproduction of image in reproduction technology. 4,419,691, Cl. 358-75.000.
- Singer Company, The: See—  
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- Singh, Rajendra: See—  
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- Sinha, Bikash K., to Schlumberger Technology Corporation. Stress-compensated quartz resonators. 4,419,600, Cl. 310-361.000.
- Sisson, Albert E., to Bendix Corporation. The Electrically controlled unit injector. 4,418,867, Cl. 239-88.000.
- Sitek, George J.; and Bredeweg, Roger L., to Leco Corporation. Furnace electrode. 4,419,754, Cl. 373-118.000.
- Sizelove, Cary L.: See—  
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- Skerlos, Peter C.: See—  
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- Skinner, Robert V.: See—  
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- Skinnger, Robert T. J.: See—  
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- Skotchinsky Institut Gornogo Dela: See—  
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- Skrabut, Eugene M.: See—  
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- Slager, Donald M.; and Barker, William C., to TRW Inc. Controlled scintillation rate decoy. 4,419,669, Cl. 343-18.00D.
- Slaughter, Edward R., to United Technologies Corporation. Titanium-diboride dispersion strengthened iron materials. 4,419,130, Cl. 75-244.000.
- Slavin, Michael; and Miller, Ellsworth S., to Lectron Products, Inc. Solenoid. 4,419,641, Cl. 335-219.000.
- Slee, Andrew M.: See—  
Stroz, John J.; and Slee, Andrew M., 4,419,346, Cl. 424-151.000.
- Sliemers, Francis A.; and McGinniss, Vincent D., to Battelle Development Corporation. Plasma polymerized color coatings. 4,419,382, Cl. 427-40.000.
- Sloane, Edwin A., to Fairchild Camera & Instrument Corp. Method and apparatus for digital converter testing. 4,419,656, Cl. 340-347.00C.
- Smetana, Andrew; and Hanson, James M., to General Electric Company. Wedge base lamp socket assembly. 4,418,973, Cl. 339-31.00L.
- Smith, Leslie H., to Imperial Chemical Industries PLC. Alkanolamine derivatives. 4,419,363, Cl. 424-285.000.
- Smith, Richard H., to General Motors Corporation. Diesel exhaust particulate trap with axially stacked filters. 4,419,113, Cl. 55-484.000.
- Smith, Roger M.; and Smith, Steven J. Adapter frame for roto-tillers. 4,418,731, Cl. 144-194.000.

- Smith, Steven J.: See—  
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- Smith, Thomas W. Centrifugal pump. 4,419,043, Cl. 415-7.000.
- Smolanoff, Joel R., to Rohm and Haas Company. Arthropod repellants. 4,419,360, Cl. 424-258.000.
- Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: See—  
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- Snow, Nicholas J., Jr.: See—  
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- Snyder, Marvin K.: See—  
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- SOCAPEX: See—  
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- Societa Italiana Vetro - SIV - S.p.A.: See—  
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- Societe Anonyme Diamant Boart: See—  
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- Societe Anonyme Rubson S.A.F.: See—  
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- Societe d'Assistance Technique pour Produits Nestle S.A.: See—  
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- Maillard, Francois; and Shepherd, David, 4,419,449, Cl. 435-170.000.
- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: See—  
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- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": See—  
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- Societe Nationale Industrielle Aerospatiale: See—  
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- Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux (EFCIS): See—  
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- Soclof, Sidney I., to Rockwell International Corporation. Method of forming lateral bipolar transistors. 4,419,150, Cl. 148-187.000.
- Soderquist, Cynthia A.: See—  
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- Solitec, Inc.: See—  
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- Somfai, Eva: See—  
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- Sommerfeld, Eugene G.: See—  
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- Sone, Masazumi: See—  
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- Imai, Iwao; and Sone, Masazumi, 4,419,547, Cl. 200-19.00R.
- Sonetaka, Kazunori: See—  
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- Sonnenberger, Paul; Graffenberger, Wilhelm; Cense, Adriaan; and Van Westen, Petrus A. M., to U.S. Philips Corporation. Circuit arrangement for transmitting two signals over one line in opposite directions. 4,419,752, Cl. 370-29.000.
- Sony Corporation: See—  
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- Yagi, Hiroyuki; and Baba, Takashi, 4,419,770, Cl. 455-301.000.
- Yamamoto, Yoshihiro; Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 4,419,695, Cl. 358-198.000.
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- Sorenson, Peter F.: See—  
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- Sosnowski, Stanislaw J. A.; and Skinnger, Robert T. J., to Lucas Industries Limited. Liquid fuel injection pumping apparatus. 4,419,054, Cl. 417-294.000.
- Soster, Marie C.: See—  
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- Soulet, Christian: See—  
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- Southern Gas Association: See—  
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- Spalding, Willard P.: See—  
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- Spann, Donald C. Orthopedic support package and method. 4,418,514, Cl. 53-436.000.
- Sparks, Gregory E.: See—  
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- Spector, George: See—  
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- Speier, John L.; and Liles, Donald T., to Dow Corning Corporation. Apparatus for rapidly freezing molten metals and metalloids in particulate form. 4,419,060, Cl. 425-8.000.
- Spenser, Douglas S.: See—  
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- Sperry Corporation: See—  
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- Donovan, James T.; and Webster, E. Graham, 4,418,516, Cl. 56-228.000.
- Ehrhart, Philip J.; Donovan, James T.; and Webster, E. Graham, 4,418,517, Cl. 56-228.000.
- George, Benjamin T.; and Chen, Patricia C., 4,419,725, Cl. 364-200.000.
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- O'Brien, Steven M., 4,419,629, Cl. 328-72.000.
- Paul, Dieter G., 4,419,762, Cl. 377-66.000.
- Weidner, Albert J., 4,419,726, Cl. 364-200.000.
- Spitz, Erich; and Micheron, Francois, to Thomson-CSF. Piezoelectrically controlled piezoresistor. 4,419,598, Cl. 310-311.000.
- Spohr, Horst, to Bautex Adolf Stover KG. Process for producing slats for a vertical slatted venetian blind. 4,418,461, Cl. 29-407.000.
- Sprague Electric Company: See—  
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- Riley, Donald J.; and Scott, John W., 4,419,259, Cl. 252-142.000.
- Springer, Virgil E., to Regal International, Inc. Reinforced carboxy nitrile polymer compositions containing particulate nickel. 4,419,479, Cl. 524-413.000.
- Sprockhoff, Volker, to ITT Industries, Inc. Control system for a vehicular braking system incorporating a hydrodynamic brake and a friction brake. 4,418,963, Cl. 303-3.000.
- Square D Company: See—  
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- Stachnik, John. Variable range sighting mechanism for use with archery bow. 4,418,479, Cl. 33-265.000.
- Stackhouse, James L., Jr.: See—  
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- Stake, Dennis G.: See—  
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- Stamm, Johann A., to Rockwell International Corporation. Turbine meter rotor. 4,419,052, Cl. 416-214.00A.
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- Standex International Corporation: See—  
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- Stanton, Austin N. Rotary motion transformer. 4,418,656, Cl. 123-58.00A.
- Starell, Karl-Erik: See—  
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- Starke, Roy R., to United States of America, Air Force. Two-way flow valve. 4,418,716, Cl. 137-605.000.
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- Pallos, Ferenc M.; and Gaughan, Edmund J., 4,419,523, Cl. 560-12.000.
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- Steen, Mark E.: See—  
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- Stefanini, Zorro: See—  
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- Stein Industri: See—  
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- Steinmann, Phyllis R. Mathematical teaching/learning aid and method of use. 4,419,081, Cl. 434-188.000.
- Steinmetz, Arthur, to Riedel-de Haen Aktiengesellschaft. Process for the preparation of a 2-alkylphenol. 4,419,529, Cl. 568-772.000.
- Stenerud, Jan, to Jan Stenerud and Company, Inc. Football kicking tee. 4,418,910, Cl. 273-55.00B.
- Stephan, Willi: See—  
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- Stephenson, Michael D.; and Waller, Winston A., to Elliott Brothers (London) Limited. Position measuring system. 4,419,012, Cl. 356-141.000.



- Stepp, Lee W., to Halliburton Company. Method and apparatus for gravel packing a zone in a well. 4,418,754, Cl. 166-278.000.
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- Stevens, Randy R.: See—
- Jarosz, Anthony M.; and Stevens, Randy R., 4,419,658, Cl. 340-521.000.
- Stewart, Roger G.; and Mazin, Moshe, to RCA Corporation. Read only memory (ROM) having high density memory array with on pitch decoder circuitry. 4,419,741, Cl. 365-72.000.
- Stiebel, Ariel, to Wagen of America, Inc. Apparatus and method for monitoring and controlling resistance spot welding. 4,419,558, Cl. 219-109.000.
- Stobb, Inc.: See—
- Stobb, Walter J., 4,419,035, Cl. 414-71.000.
- Stobb, Walter J., to Stobb, Inc. Method and apparatus for moving bundles of sheets. 4,419,035, Cl. 414-71.000.
- Stock Equipment Company: See—
- Finet, Alain; Nerone, Louis R.; and Zenisek, Michael J., 4,418,773, Cl. 177-16.000.
- Stockmann, Michael: See—
- Keil, Rudolf; Auracher, Franz; and Stockmann, Michael, 4,418,980, Cl. 350-96.130.
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- Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,419,204, Cl. 204-206.000.
- Stoll, Kurt; and Rudle, Manfred. Valve insert and valves designed therewith. 4,418,711, Cl. 137-269.000.
- Stoll, Milton. Methods and apparatus for producing coherent of monolithic elements. 4,419,180, Cl. 156-617.0SP.
- Stone, Orison W., to Pack Image, Inc. Basket carrier for bottles having transverse dividers inserted through the bottom wall. 4,418,818, Cl. 206-196.000.
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- Stoub, James: See—
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- Stowe, David W., to Gould Inc. Quadrature fiber-optic interferometer matrix. 4,418,981, Cl. 350-96.150.
- Strahan, Travis R. Mounting bracket for gunsight. 4,418,487, Cl. 42-1.0ST.
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- Stringer, Carl: See—
- LaForce, Jean, 4,418,860, Cl. 228-196.000.
- Stringer, Carl T.: See—
- LaForce, Jean, 4,418,860, Cl. 228-196.000.
- Stringer Oil and Gas Company, Inc.: See—
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- Coughlin, James E.; Sommerfeld, Eugene G.; and Strolle, Clifford H., 4,419,476, Cl. 524-284.000.
- Strom, E. Thomas; and Espenscheid, Wilton F., to Mobil Oil Corporation. Method for restoring contaminants to base levels in previously leached formations. 4,418,961, Cl. 299-5.000.
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- Stucka, Stephen E.: See—
- Norgren, Kent S.; and Stucka, Stephen E., 4,419,592, Cl. 307-241.000.
- Sublett, Bobby J., to Eastman Kodak Company. Copolyester adhesives. 4,419,507, Cl. 528-302.000.
- Suddesche Kuehlerfabrik Julius Fr. Behr GmbH & Co. K.G.: See—
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- Sugihara, Yasuhiko: See—
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- Sugimoto, Terutaka. Perfumed pendant. 4,419,395, Cl. 428-28.000.
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- Sugiura, Takeo: See—
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- Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Case for a disc-shaped recording medium. 4,419,710, Cl. 360-133.000.
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- Sugiyama, Masatoshi; Nakanishi, Ichiro; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Waterproofing method for ink jet records. 4,419,388, Cl. 427-288.000.
- Sullivan, Floyd A.; Elbers, Arthur H.; and Trierweiler, Charles M., to General Motors Corporation. Vehicle strut suspension with camber adjustment. 4,418,938, Cl. 280-661.000.
- Sulzer Brothers Limited: See—
- Rees, Karl, 4,418,652, Cl. 122-468.000.
- Sumitomo Durez Company, Ltd.: See—
- Saeki, Yukio; and Inoue, Naomitsu, 4,419,477, Cl. 524-290.000.
- Sumitomo Electric Industries Limited: See—
- Nakahara, Motohiro; Yoshioka, Naoki; Yokota, Hiroshi; Miyajiri, Tetsuo; and Watanabe, Minoru, 4,419,116, Cl. 65-3.120.
- Sumitomo Naugatuck Co., Ltd.: See—
- Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, 4,419,491, Cl. 525-67.000.
- Sun Chemical Corporation: See—
- Yanutola, Michael J., 4,419,483, Cl. 524-701.000.
- Sun Electric Corporation: See—
- Beck, James E.; and Patel, Arvind M., 4,418,566, Cl. 73-23.000.
- Sunder, Shyam: See—
- Peet, Norton P.; and Sunder, Shyam, 4,419,357, Cl. 424-251.000.
- Sundstrand Corporation: See—
- Pollman, Frederic W., 4,419,610, Cl. 318-12.000.
- Sung, Rodney L., to Texaco Inc. Maleic anhydride-amine reaction product corrosion inhibitor for alcohols. 4,419,105, Cl. 44-53.000.
- Surman, James J., to Eaton Corporation. Hot film fluid flowmeter with auxiliary flow sensing. 4,418,568, Cl. 73-202.000.
- Suschitzky, John L.: See—
- Cox, David; Cairns, Hugh; Chadwick, Nigel; and Suschitzky, John L., 4,419,352, Cl. 424-248.400.
- Sussman, Milton H., to Warner Lambert Technologies, Inc. Microscope objective. 4,418,988, Cl. 350-414.000.
- Suzuki, Tadashi: See—
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- Suzuki, Yoshiaki: See—
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- Svensson, Leif A.: See—
- Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., 4,419,364, Cl. 424-300.000.
- Swanland, Robert C.: See—
- Haines, Stephen W.; Marshall, Stephen R.; Steen, Mark E.; and Swanland, Robert C., 4,418,944, Cl. 285-24.000.
- Swanson, Robert C.: See—
- Lenzini, Albert A.; Swanson, Robert C.; Roberts, James T.; and Pruski, John A., 4,418,976, Cl. 339-91.00R.
- Sway, Boris. Gravity fed water treatment apparatus. 4,419,235, Cl. 210-282.000.
- Swearingen, Edward J., Jr., to Fairchild Swearingen Corporation. Propeller spinner. 4,419,053, Cl. 416-234.000.
- Swenson, Oscar J. Manual torque magnifying impact tool. 4,418,768, Cl. 173-93.500.
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- Behl, Robert S.; and Ellis, Franklin H., 4,419,091, Cl. 604-20.000.
- Symons Corporation: See—
- Schimmel, Vernon R., 4,418,884, Cl. 249-11.000.
- Syntex (U.S.A.) Inc.: See—
- Jones, Gordon H.; and Young, John, 4,419,368, Cl. 424-331.000.

- Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,419,347, Cl. 424-177.000.
- Szponry, Laszlo: See—
- Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsados, Bela; Zajec nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szponry, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- T. J. Company: See—
- Jarosz, Anthony M.; and Stevens, Randy R., 4,419,658, Cl. 340-521.000.
- Tabar, Ronald J.; and Killgoar, Paul C., Jr., to Ford Motor Company. Soft, fatigue resistant elastomer articles. 4,419,480, Cl. 524-525.000.
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- Tada, Kiichiro: See—
- Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643, Cl. 335-234.000.
- Tafco Equipment Company: See—
- Ankeny, V. Scott, 4,418,851, Cl. 224-42.060.
- Taguchi, Masao; and Ito, Takashi, to Fujitsu Limited. Semiconductor memory device. 4,419,743, Cl. 365-149.000.
- Taguchi, Michihiro, to Yamaha Hatsudoki Kabushiki Kaisha; and Sashin Kogyo Kabushiki Kaisha. Tilt lever returning mechanism for outboard engine. 4,419,083, Cl. 440-56.000.
- Taig, Alistair G., to Bendix Corporation, The. Locking device. 4,418,583, Cl. 74-501.50R.
- Tajima, Osamu: See—
- Saito, Takashi; Tajima, Osamu; and Mochizuki, Masafumi, 4,419,709, Cl. 360-133.000.
- Takada, Juichiro. Coupling assembly for the drive device of a passive vehicle occupant restraint belt system. 4,418,940, Cl. 280-804.000.
- Takahara, Shoichiro: See—
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- Takahashi, Makoto: See—
- Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,419,129, Cl. 420-584.000.
- Takahashi, Mutsumi; Uwabe, Toshio; Nagase, Toshio; Sato, Shosuke; and Matsuzawa, Hideshi, to Tokyo Keiki Company Ltd.; and Tote Co. Ltd. Check digit calculator. 4,419,572, Cl. 235-69.000.
- Takahashi, Nobuhiro, to Wako Kemikaru Kabushiki Kaisha. Impregnant for making semi-rigid or rigid resin foams. 4,419,261, Cl. 252-182.000.
- Takahashi, Shoichiro, to Kenlock Corporation. Locking device in a telescopic tubular tripod leg element assembly. 4,419,025, Cl. 403-14.000.
- Takahashi, Yasuyoshi; Sakiguchi, Shigeo; and Sato, Teruyoshi, to Tokyo Electric Co., Ltd. Unit-price presetting method for electronic cash registers. 4,419,738, Cl. 364-900.000.
- Takahashi, Yoshiyuki: See—
- Ueshima, Michio; Takahashi, Yoshiyuki; Kitada, Ritsuo; and Nagai, Isao, 4,419,270, Cl. 502-209.000.
- Takanashi, Hiroshi; and Takahara, Shoichiro, to Sharp Kabushiki Kaisha. Polarizer arrangement for a significant improvement in viewing angle characteristic in a liquid crystal display. 4,418,987, Cl. 350-337.000.
- Takano, Takeshi: See—
- Kasori, Mituo; Takano, Takeshi; Maki, Hironori; and Ogino, Naohiko, 4,418,985, Cl. 350-96.340.
- Takasago Perfumery Co., Ltd.: See—
- Yamanaka, Tohr; and Imai, Takashi, 4,419,292, Cl. 260-410.90R.
- Takashima, Kiyoshi, to Matsushita Electric Works, Ltd. Plug socket with working condition display. 4,418,979, Cl. 339-113.00L.
- Takasugi, Tsuneji: See—
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- Takenouchi, Mutsuo: See—
- Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696, Cl. 358-294.000.
- Takezono, Takashi: See—
- Okuyama, Yasuhiko; and Takezono, Takashi, 4,419,017, Cl. 368-64.000.
- Talafuse, Larry J., to FMC Corporation. Swivel joint for improved bearing and seal life. 4,418,947, Cl. 285-168.000.
- Tallaron, Louis: See—
- Bertails, Jean P.; Perrin, Cristian; and Tallaron, Louis, 4,419,631, Cl. 330-255.000.
- Talmadge, Paul C.: See—
- Lakatos, Edward J.; and Talmadge, Paul C., 4,419,575, Cl. 250-226.000.
- Tama, Francine. Electrode attachment method. 4,418,697, Cl. 128-640.000.
- Tamamura, Sadao: See—
- Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, 4,419,349, Cl. 424-195.000.
- Tamura, Zenzo: See—
- Imai, Kazuhiro; Tamura, Zenzo; and Kobayashi, Shin-ichiro, 4,419,452, Cl. 436-89.000.
- Tanaka, Atsuo: See—
- Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389, Cl. 427-294.000.
- Tanaka, Hiroshi; and Sakata, Fusao, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for etching metallic sheet. 4,419,181, Cl. 156-640.000.
- Tanaka, Kazushi: See—
- Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,419,406, Cl. 428-422.000.
- Tanaka, Masaki; and Yamaguchi, Koichi, to Shin-Etsu Chemical Co., Ltd. Method of imparting improved touch to a fabric. 4,419,391, Cl. 427-387.000.
- Tanaka, Shinsaku, to Tanashin Denki Co., Ltd. Auto-reverse device for a two-reel type tape recorder. 4,419,702, Cl. 360-96.400.
- Tanaka, Toshikiyo: See—
- Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438, Cl. 430-275.000.
- Tanaka, Yasuo: See—
- Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, 4,419,604, Cl. 313-385.000.
- Tanaka, Yoshihiro: See—
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- Tanashin Denki Co., Ltd.: See—
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- Tao, Deh C.: See—
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- Targowski, Roger W.: See—
- Lidi, Harold I.; and Targowski, Roger W., 4,419,020, Cl. 374-12.000.
- Tateoka, Kiyoshi; and Hayashida, Yoshihiro, to Tokico Ltd. Pneumatic servo booster. 4,418,611, Cl. 91-369.00A.
- Taylor, James M. Single-fluke anchor. 4,418,635, Cl. 114-304.000.
- TDK Electronics Co., Ltd.: See—
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- Teijin Limited: See—
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- Teledyne Farris Engineering: See—
- Cullie, Eugene C., 4,418,714, Cl. 137-478.000.
- Teletype Corporation: See—
- Lenzini, Albert A.; Swanson, Robert C.; Roberts, James T.; and Pruski, John A., 4,418,976, Cl. 339-91.00R.
- Woodier, James G., 4,419,707, Cl. 360-106.000.
- Temple, Davis L., Jr.: See—
- Catt, John D.; and Temple, Davis L., Jr., 4,419,358, Cl. 424-253.000.
- Tenny, Alfred M. Method of removing soluble sulfide residue from scrubber water waste. 4,419,247, Cl. 210-726.000.
- Terada, Jiro; and Nitta, Tsuneharu, to Matsushita Electric Industrial Co., Ltd. Multi-functional sensing or measuring system. 4,419,021, Cl. 374-101.000.
- Teraoka, Akira; and Nakamura, Tadashi, to Kubota, Ltd. Tractor. 4,418,783, Cl. 180-209.000.
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- Kasugayama, Yukio; Terasawa, Koji; and Hattori, Yoshihumi, 4,419,678, Cl. 346-140.00R.
- Texaco Inc.: See—
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- Crone, John M., Jr., 4,419,394, Cl. 427-434.500.
- Flournoy, Norman E., 4,418,574, Cl. 73-601.000.
- Kaufman, Benjamin J.; Sawicki, Robert A.; and Levine, Stephen A., 4,419,255, Cl. 252-51.50A.
- Morel, Thomas J.; and Haynes, Stewart, Jr., 4,418,753, Cl. 166-273.000.
- Sherman, Philip B., 4,419,227, Cl. 208-326.000.
- Sung, Rodney L., 4,419,105, Cl. 44-53.000.
- Texas Instruments Incorporated: See—
- Henderson, Alva E., 4,419,540, Cl. 381-51.000.
- Hunter, Arthur C.; and Hamilton, Stephen P., 4,419,746, Cl. 365-189.000.
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- Texas Medical Instruments, Inc.: See—
- Modisette, James E.; and Johnson, Ralph B., 4,419,692, Cl. 358-113.000.
- Texasgulf Inc.: See—
- Higgins, Rudolph S., 4,418,960, Cl. 299-5.000.
- Teyssie, Philippe J.; Jerome, Robert J.; and Broze, Guy J., to Unibra Societe Anonyme. Products containing polymer chains, the preparation and use thereof. 4,419,482, Cl. 524-560.000.
- Theisen, Peter; and Riechert, Klaus-Dieter, to Biotronik Mess- und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin. Intravenous pacemaker electrode. 4,418,704, Cl. 128-785.000.
- Theuerkauf, Heinz: See—
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- Thevenin, Jean-Claude P. H. P.: See—  
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- Volluet, Gerard; and Hartmann, Pierre, 4,419,637, Cl. 333-147.000.
- Thomson, Timothy; and Peters, Ferman, to Dow Chemical Company, The. Method for controlling cellulose etherification reaction, 4,419,510, Cl. 536-84.000.
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- Tokyo Electric Co., Ltd.: See—  
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- Tokyo Keiki Company Ltd.: See—  
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- Matsukawa, Naohiro, 4,419,142, Cl. 148-1.500.
- Mitamura, Zenzou; Oosawa, Takashi; and Yonezawa, Akihiro, 4,419,602, Cl. 313-332.000.
- Nokihara, Yutaka; Nakajyo, Hironori; and Yoshida, Kimio, 4,419,749, Cl. 369-11.000.
- Oota, Hiroyuki; and Narita, Ryuuho, 4,418,614, Cl. 99-280.000.
- Tanaka, Hiroshi; and Sakata, Fusao, 4,419,181, Cl. 156-640.000.
- Wakamatsu, Hidekazu; and Kogure, Yoichiro, 4,418,539, Cl. 60-646.000.
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- Tokyo Tanabe Co. L.T.D.: See—  
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- Tollefsen, Kjell T.; and Nordquist, Albert W., to Pratt-Read Corporation. Keyboard for musical instrument, 4,418,605, Cl. 84-434.000.
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- Tominaga, Shinji; Imura, Toshinori; and Nakamura, Ikushi, to Minolta Camera Kabushiki Kaisha. Motor driven film wind-up and rewind device for cameras, 4,419,001, Cl. 354-173.100.
- Tominari, Noboru; and Ishida, Takashi, to Mikuni Kogyo Co., Ltd.; and Noboru Tominari. Electronic control fuel injection system for spark ignition internal combustion engine, 4,418,673, Cl. 123-478.000.
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- Toray Industries: See—  
Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389, Cl. 427-294.000.
- Torii, Michihiro; and Kobayashi, Hiroaki, to Fuji Electrochemical Co., Ltd. Method of producing a stator yoke of a small-sized motor, 4,418,471, Cl. 29-596.000.
- Toshiba Ceramics Co., Ltd.: See—  
Reiji, Oguma; and Akihiro, Hirai, 4,419,118, Cl. 65-18.200.
- Toshiba Silicones Limited: See—  
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- Toshin Kogyo Co. Ltd.: See—  
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- Totec Co. Ltd.: See—  
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- Tottey, Robert. Amusement device, 4,418,912, Cl. 273-138.00R.
- Toyo Boseki Kabushiki Kaisha: See—  
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- Ichikawa, Rinjiro; and Hitomi, Chiyoji, 4,419,399, Cl. 428-215.000.
- Toyoda, Kazuhiro; and Ono, Chikai, to Fujitsu Limited. Semiconductor memory device, 4,419,745, Cl. 365-174.000.
- Toyota Jidosha Kabushiki Kaisha: See—  
Atsumi, Tomiaki; Kuse, Kazumasa; and Deto, Junji, 4,418,898, Cl. 267-63.00R.
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- Nagase, Masaomi, 4,418,665, Cl. 123-339.000.
- Yamauchi, Yasutaka; and Ito, Hiroshi, 4,418,666, Cl. 123-339.000.
- Tran, Luan G.: See—  
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- Trane CAC, Inc.: See—  
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- Transformator Union Aktiengesellschaft: See—  
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- Transkrit Corporation: See—  
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- Trautenberg, Elmar: See—  
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- TRD Inc.: See—  
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- TRE Semiconductor Equipment Corporation: See—  
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- Tri Tool Inc.: See—  
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- Trierweiler, Charles M.: See—  
Sullivan, Floyd A.; Elbers, Arthur H.; and Trierweiler, Charles M., 4,418,938, Cl. 280-661.000.
- Trosky, William J.; Eichler, Kenneth M.; Mandel, Alan F.; and Moore, William H., to Westinghouse Electric Corp. Elevator servicing methods and apparatus, 4,418,795, Cl. 187-29.00R.
- Trudeau, William H., to Gulf & Western Manufacturing Company. Bellows seal for ball and socket joints, 4,419,027, Cl. 403-134.000.
- Trukenbrod, Karl: See—  
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- TRW Inc.: See—  
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- Slager, Donald M.; and Barker, William C., 4,419,669, Cl. 343-18.00D.
- Tsuchiya, Shinji: See—  
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- Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, to Nippon Oil Company, Limited. Process for producing novel hydrogenated resin from five-member cyclic compounds having a conjugated double bond and/or Diels-Alder addition products thereof, 4,419,497, Cl. 525-338.000.
- Tsuzurabara, Mamoru; and Kitakaze, Seiji, to Hitachi, Ltd. Magnetron, 4,419,606, Cl. 315-39.510.
- Tubaro, Bruno. Plug valve, 4,418,887, Cl. 251-152.000.
- Turco, Vincenzo; and Pompili, Antonio, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for forming projectiles for smooth bore shooting guns, 4,419,318, Cl. 264-274.000.
- Turner, William D. Transfer organ, 4,418,602, Cl. 84-1.260.
- Twin Disc, Incorporated: See—  
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- Tyler, Derek E.: See—  
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- Tyryshkina, Galina B.: See—  
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- Uitz, Mark O.: See—  
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- Ulith, Peter: See—  
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- Umezawa, Hidetsugu: See—  
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- Unibra Societe Anonyme: See—  
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- Union Carbide Corporation: See—  
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- Leger, Violeta Z.; and Evans, William P., 4,419,422, Cl. 429-194.000.
- Leger, Violeta Z., 4,419,423, Cl. 429-197.000.
- Union Oil Company of California: See—  
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- Ward, John W., 4,419,271, Cl. 502-65.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: See—  
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- Puffett, Alan W., 4,419,731, Cl. 364-428.000.
- United Sprinkler, Inc.: See—  
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- United States Borax & Chemical Corporation: See—  
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- United States of America
- Agriculture: See—  
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- Walker, Harrell L., 4,419,120, Cl. 71-79.000.
- Air Force: See—  
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- Frankel, Milton B.; and Witucki, Edward F., 4,419,285, Cl. 260-349.000.
- Reiner, Richard W., 4,419,595, Cl. 307-355.000.
- Starke, Roy R., 4,418,721, Cl. 137-810.000.
- Witucki, Edward F.; and Flanagan, Joseph E., 4,419,286, Cl. 260-349.000.
- America: See—  
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- Army: See—  
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- Grinwald, Israel M., 4,418,852, Cl. 224-42.230.
- Holmes, Allen B., 4,418,721, Cl. 91-368.000.
- Piedmont, James R.; and Hascakaylo, Michael, 4,418,466, Cl. 29-572.000.
- Health and Human Services: See—  
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- Kolobow, Theodore; and Ito, Yoichiro, 4,419,089, Cl. 494-45.000.
- National Aeronautics and Space Administration: See—  
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- Kendall, James M.; and Walsh, John V., 4,418,722, Cl. 138-42.000.
- Navy: See—  
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- Gilbert, Paul H., 4,419,630, Cl. 329-50.000.
- Holtrop, John W., 4,418,610, Cl. 91-368.000.
- Horton, Tommy A.; and Augustyn, Michael D., 4,419,230, Cl. 210-114.000.
- Madigosky, Walter M.; and Lee, Gilbert F., 4,418,573, Cl. 73-574.000.
- Reindel, John, 4,419,635, Cl. 333-116.000.
- Severns, James G., 4,419,532, Cl. 136-253.000.
- Wagman, Kerry L.; Clark, Chester F.; Henderson, Larry D.; and Jones, W. Steven, 4,419,155, Cl. 149-109.600.
- U.S. Philips Corporation: See—  
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- Frima, Heico J.; and Le Poole, Jan B., 4,419,561, Cl. 219-121.00B.
- Kuhl, Walter H.; Van Leunen, Johannes A. J.; van der Eijk, Bart; van der Bolt, Antonius J. J. M.; and Hoebrechts, Arthur M. E., 4,418,452, Cl. 445-35.000.
- Kuindersma, Pieter I., 4,419,545, Cl. 179-111.00E.
- Liefkens, Adrianus C. H. J.; and Notenboom, Gerardus J. A. M., 4,419,415, Cl. 428-594.000.
- Nussli, Jacques; Marandas, Georges J. P.; and Farayre, Antoine, 4,419,603, Cl. 313-346.00R.
- Schmitz, Albert, 4,419,681, Cl. 357-13.000.
- Sonnenberger, Paul; Graffenberger, Wilhelm; Cense, Adriaan; and Van Westen, Petrus A. M., 4,419,752, Cl. 370-29.000.
- United Technologies Corporation: See—  
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- Gupta, Dinesh K.; and Duvall, David S., 4,419,416, Cl. 428-656.000.
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- University of California, The Regents of the: See—  
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- University of Delaware: See—  
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- University of Georgia Research Foundation, Inc.: See—  
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- University of Manchester Institute of Science and Technology, The: See—  
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- University of Southern Mississippi: See—  
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- UOP Inc.: See—  
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- Urschel, Joe R.: See—  
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- Urschel Laboratories, Incorporated: See—  
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- Urushida, Yoshihisa: See—  
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- Us, Vasily I.: See—  
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- USM Corporation: See—  
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- Usui, Yoshihiro: See—  
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- Utsumi, Hiroshi: See—  
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- Uwabe, Toshio: See—  
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- Uyeda, Tim M., to La Gard, Inc. Cylinder type lock and key, 4,418,555, Cl. 70-366.000.
- Valimont, James L.; and Kelly, Joseph D., to PPG Industries, Inc. Apparatus comprising arrangement of vacuum cups to assemble one or more bent glass sheets with a sheet of flexible interlayer material, 4,419,176, Cl. 156-556.000.
- Valjent, Jean-Pierre: See—  
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- Van Leer Verpackungen GmbH: See—  
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- Van Camp, Loretta: See—  
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- Van Cleave, George W.: See—  
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- van den Berg, Johan H., to Champion Spark Plug Europe S.A. Spacer for rotatably connecting wiper blade parts, 4,418,441, Cl. 15-250.420.
- Vanderburgh, Garret K. Vehicle tire, 4,418,736, Cl. 152-354.00R.
- van der Bolt, Antonius J. J. M.: See—  
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- van der Eijk, Bart: See—  
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- Vanderleest, Siebold, to Boeing Company, The. Scoop and inlet for auxiliary power units and method, 4,418,879, Cl. 244-53.00B.
- van der Lely, Cornelis. Subsoil planar tool and shear bolt therefor, 4,418,760, Cl. 172-271.000.
- Van Der Sar, Jacob C.: See—  
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- Van Haastert, J. A.: See—  
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- Van Leunen, Johannes A. J.: See—  
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- VanNess, David; Hines, Joseph; and Wells, William E., to General Texas Corporation. Non-corrosive, non-staining evaporative cooler, 4,419,300, Cl. 261-106.000.
- Van Opstal, Martin: See—  
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- Van Overloop, Ronald R., to Kendall Company, The. Wet dressings heater, 4,419,568, Cl. 219-441.000.



- Van Peteghem, Antoine: See—  
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- Van Westen, Petrus A. M.: See—  
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- Vapor Energy, Inc.: See—  
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- Varona, Eugenio, to Scott Paper Company. Water dispersible premoistened wiper, 4,419,403, Cl. 428-288.000.
- Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., to Belgorodsky Zavod Energeticheskogo Mashinostroenia. Heat exchanger, 4,418,749, Cl. 165-139.000.
- Vaughn, Thomas A.: See—  
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- VDO Adolf Schindling AG: See—  
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- VEB Filmfabrik Wolfen: See—  
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- Lischewski, Regina, geb. Werndl; Marx, Jorg; Walter, Reinhard; and Mockel, Peter, 4,419,431, Cl. 430-179.000.
- VEB Hochvakuum Dresden: See—  
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- Veeco Instruments Inc.: See—  
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- Veeder Industries, Inc.: See—  
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- Veltman, Constantius H. M.: See—  
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- Verbatim Corporation: See—  
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- Vereinigte Elektrizitätswerke Westfalen Aktiengesellschaft: See—  
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- Vericard Corporation: See—  
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- Versteeg, Gijbert: See—  
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- Vesborg, Steen, to Colgate-Palmolive Company. Hexagonal box, 4,418,862, Cl. 229-41.00C.
- Vescelius, Lee E.: See—  
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- Vesterling, Friedrich, to WNY Hospital Television, Inc. Frequency-sensitive switching circuit and method, 4,419,694, Cl. 358-181.000.
- Vickers, Incorporated: See—  
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- Vickery, Brian H.: See—  
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- Victor Company of Japan, Ltd.: See—  
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- Shiraishi, Yuma; and Oota, Yoshihiko, 4,419,698, Cl. 358-330.000.
- Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Koji, 4,419,710, Cl. 360-133.000.
- Victor Hasselblad Aktiebolag: See—  
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- Vidal, Stella M. Drain filter having filamentary surface irregularities to entangle hair and debris, 4,418,432, Cl. 4-286.000.
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- Vincent, Robert R.; and Clemenson, James T., to Cooper Industries, Inc. Hammer starting mechanism, 4,418,769, Cl. 173-134.000.
- Vindez, Pierre G., to P. V. Tool Inc. Interchangeable valve system for hydraulic reversal of positive feed drill, 4,418,767, Cl. 173-19.000.
- Visymonde Investment PTE Ltd.: See—  
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- Vitko, Joseph, Jr.: See—  
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- Voecks, William E., Jr.: See—  
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- Voetter, Heinz; Van Meurs, Hubrecht C. A.; Darton, Richard C.; and Krishna, Rajamani, to Shell Internationale Research Maatschappij B.V. Method of pre-heating particles of a hydrocarbon-bearing substrate and an apparatus therefor, 4,419,215, Cl. 208-11.00R.
- Voith GmbH: See—  
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- Volgstadt, Frank R.: See—  
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- Volkswagenwerk Aktiengesellschaft: See—  
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- Volluet, Gerard; and Hartemann, Pierre, to Thomson-CSF. Magneto-static wave dioptric device, 4,419,637, Cl. 333-147.000.
- Von der Ropp, Hubert, to Licentia Patent-Verwaltungs-G.m.b.H. Epitaxial reactor, 4,419,332, Cl. 422-245.000.
- Von Geldern, Rudolf C., to Maatschappij van Berkel's Patent N.V. Variable data product bar code sales system, 4,419,573, Cl. 235-383.000.
- Von Schnering, Hans-Georg: See—  
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- Vora, Madhukar B.; and Hingarh, Hermaj K., to Fairchild Camera & Instrument Corporation. Process for fabricating a logic structure utilizing polycrystalline silicon Schottky diodes, 4,418,468, Cl. 29-577.00C.
- Voss, Earl W., to Diversified Electronics, Inc. Sequencer for pump motors or the like, 4,419,590, Cl. 307-41.000.
- Vostovich, Joseph E., to General Electric Company. Heat resistant ethylene-propylene rubber with improved tensile properties and insulated conductor product thereof, 4,419,475, Cl. 524-264.000.
- Voth, Harold W.: See—  
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- W. L. Gore & Associates, Inc.: See—  
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- W. Schlafhorst & Co.: See—  
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- WABCO Fahrzeugbremsen GmbH: See—  
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- Wacker Corporation: See—  
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- Wada, Yoshinori, to Ricoh Company, Ltd. Facsimile apparatus, 4,419,697, Cl. 358-257.000.
- Wagaman, Kerry L.; Clark, Chester F.; Henderson, Larry D.; and Jones, W. Steven, to United States of America, Navy. Method for preparing ternary mixtures of ethylenediamine dinitrate, ammonium nitrate and potassium nitrate, 4,419,155, Cl. 149-109.600.
- Wagen of America, Inc.: See—  
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- Wagner, Manfred: See—  
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- Yonker, John H.; and Arendt, Henry P., to Otis Engineering Corporation. Method and apparatus for performing operations in well tubing. 4,418,756, Cl. 166-383.000.
- Yoo, Kwang-Keun: See—  
Kim, Ki-Hwan; Yoo, Kwang-Keun; and Lee, Tae-Ho, 4,418,706, Cl. 131-296.000.
- Yoon, Heeyoung, to Conoco Inc. Alcohol fuel dual-catalyst treatment apparatus and method. 4,418,653, Cl. 123-3.000.
- Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Camera capable of automatic film advancing and rewinding. 4,419,000, Cl. 354-173.100.
- Yoshida, Kimio: See—  
Nokihara, Yutaka; Nakajyo, Hironori; and Yoshida, Kimio, 4,419,749, Cl. 369-11.000.
- Yoshida Kogyo K. K.: See—  
Ishihara, Kiyomitsu, 4,419,306, Cl. 264-40.500.
- Yoshida, Shin-ichi; Yano, Takemitsu; and Higashi, Hidehiro, to Catalysts & Chemicals Industries Co., Ltd. Method of hydrotreating catalyst manufacture. 4,419,275, Cl. 502-322.000.
- Yoshihara, Kenji: See—  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,419,710, Cl. 360-133.000.
- Yoshii, Takashi: See—  
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, 4,419,147, Cl. 148-31.500.
- Yoshikawa, Naoki: See—  
Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643, Cl. 335-234.000.
- Yoshimatsu, Shiro: See—  
Nakagawa, Ryoichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; and Ozaki, Tsuyoshi, 4,419,128, Cl. 75-46.000.
- Yoshimi, Kazuhiko; Shimizu, Kazuyuki; Watari, Takashi; and Kusumoto, Katsunori, to Nippon Kokan Kabushiki Kaisha; and Japan Marine Machinery Development Association. Method for operating a rigid marine sail. 4,418,632, Cl. 114-102.000.
- Yoshimoto, Teruo: See—  
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,419,129, Cl. 420-584.000.
- Yoshimura, Toru: See—  
Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643, Cl. 335-234.000.
- Yoshioka, Naoki: See—  
Nakahara, Motohiro; Yoshioka, Naoki; Yokota, Hiroshi; Miyajiri, Tetsuo; and Watanabe, Minoru, 4,419,116, Cl. 65-3.120.
- Young, David A., to Exxon Research & Engineering Co. Electrolytic recovery of cobalt oxo catalysts. 4,419,195, Cl. 204-78.000.
- Young, Jerry W., to Sealright Co. Inc. Object processing apparatus. 4,418,644, Cl. 118-669.000.
- Young, John: See—  
Jones, Gordon H.; and Young, John, 4,419,368, Cl. 424-331.000.
- Younger Manufacturing Company: See—  
Davenport, Lawrence J., deceased; and Davenport, Nancy, executrix, 4,418,992, Cl. 351-169.000.
- Yu, Hong. Low frequency wide band signal coupler. 4,419,636, Cl. 333-131.000.
- Yuill, Kenneth A.: See—  
Davitt, Alan L.; and Yuill, Kenneth A., 4,419,154, Cl. 149-40.000.
- Yusa, Yasuhiro: See—  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,419,710, Cl. 360-133.000.
- Zabko, Al L.: See—  
DiGiacomo, Hector; Raos, Robert R.; and Zabko, Al L., 4,418,464, Cl. 29-564.600.
- Zahnradfabrik Friedrichshafen Aktiengesellschaft: See—  
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goett, Manfred, 4,418,785, Cl. 180-255.000.
- Zaidel, Simon A.: See—  
Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., 4,418,470, Cl. 29-577.00C.
- Zajac, John, to Eaton Corporation. Load lock valve. 4,418,646, Cl. 118-733.000.
- Zajer nee Balazs, Maria: See—  
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsados, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- Zato, Thomas J.: See—  
Puskas, Jeffery A.; Skerlos, Peter C.; and Zato, Thomas J., 4,419,662, Cl. 340-750.000.
- Zehmer, John A. M., III: See—  
Foster, John S.; and Zehmer, John A. M., III, 4,418,622, Cl. 102-307.000.
- Zenisek, Michael J.: See—  
Finet, Alain; Nerone, Louis R.; and Zenisek, Michael J., 4,418,773, Cl. 177-16.000.
- Zenith Radio Corporation: See—  
Puskas, Jeffery A.; Skerlos, Peter C.; and Zato, Thomas J., 4,419,662, Cl. 340-750.000.
- Ziegmeyer, Lynn J. Elevatable grinding wheel motor support. 4,418,502, Cl. 51-166.0MH.
- Zimmermann, Hanns; and Preisenthaler, Peter, to Saurer-Allma GmbH. Pneumatically driven clamping device, in particular a machine vice. 4,418,899, Cl. 269-32.000.
- Ziolko, Francis J., to Devro, Inc. Method and apparatus for processing stuffed sausage casing. 4,418,447, Cl. 17-34.000.
- Zoecon Corporation: See—  
Greene, C. Lawrence; Creech, David C.; and Kelley, Donald W., 4,419,372, Cl. 426-104.000.
- Zoltan, Bart J., to American Cyanamid Company. Device for indicating last medication usage. 4,419,016, Cl. 368-10.000.
- Zoltan, Sandor: See—  
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezo; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524, Cl. 562-506.000.
- Zsados, Bela: See—  
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsados, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359, Cl. 424-256.000.
- Zurek, Thomas E., to Midland-Ross Corporation. Welding control with automatic percent heat adjustment. 4,419,560, Cl. 219-117.100.



# LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF DECEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Aine, Harry E.: See—  
Block, Barry, Re. 31,459., Cl. 338-47.000.  
American Petro Mart, Inc.: See—  
Carlson, Lee G., Re. 31,456., Cl. 210-676.000.  
Avtex Fibers Inc.: See—  
Bockno, Gregory C., Re. 31,457., Cl. 428-224.000.  
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. Re. 31,455., Cl. 71-115.000.  
Beta S/A: See—  
Olsen, Niels J.; and Weir, Henry J., Re. 31,453., Cl. 38-143.000.  
Block, Barry, to Aine, Harry E.; and Block, Barry. Solid state force transducer and method of making same. Re. 31,459., Cl. 338-47.000.  
Bockno, Gregory C., to Avtex Fibers Inc. Viscose rayon. Re. 31,457., Cl. 428-224.000.  
British Broadcast Corporation: See—  
Dalton, Christopher J.; and Roe, Graham D., Re. 31,460., Cl. 358-140.000.  
Carlson, Lee G., to American Petro Mart, Inc. High capacity folded moving bed ion exchange apparatus and method for treating phosphoric acid. Re. 31,456., Cl. 210-676.000.  
Dalton, Christopher J.; and Roe, Graham D., to British Broadcast Corporation. Method and apparatus for standards conversion of television signals. Re. 31,460., Cl. 358-140.000.  
Hymes, Alan C., to LecTec Corporation. Monitoring and stimulation electrode. Re. 31,454., Cl. 128-641.000.  
LecTec Corporation: See—  
Hymes, Alan C., Re. 31,454., Cl. 128-641.000.  
Nolte, Albert C., Jr.: See—  
Trattner, Burton C., Re. 31,458., Cl. 429-100.000.  
Olsen, Niels J.; and Weir, Henry J., to Beta S/A. Laundry feeding apparatus. Re. 31,453., Cl. 38-143.000.  
Roe, Graham D.: See—  
Dalton, Christopher J.; and Roe, Graham D., Re. 31,460., Cl. 358-140.000.  
Rohm and Haas Company: See—  
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 31,455., Cl. 71-115.000.  
Swithenbank, Colin: See—  
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 31,455., Cl. 71-115.000.  
Trattner, Burton C., to Nolte, Albert C., Jr., a part interest. Adapter for dry cell batteries. Re. 31,458., Cl. 429-100.000.  
Weir, Henry J.: See—  
Olsen, Niels J.; and Weir, Henry J., Re. 31,453., Cl. 38-143.000.  
Yih, Roy Y.: See—  
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 31,455., Cl. 71-115.000.

# LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Anderson, Donald R.; and Frisque, Alvin J., to Nalco Chemical Company. Process for rapid dissolving water-soluble vinyl addition polymers using water-in-oil emulsions. B1 1,028,576., 12-6-83, Cl. 523-336.000.  
Bell Telephone Laboratories, Incorporated: See—  
Farmer, Wayne D.; and Newhall, Edmund E., B1 3,597,549., Cl. 370-88.000.  
Boys, John T., to Standard Pressed Steel Co. Apparatus for and method of determining rotational and linear stiffness. B1 3,982,419., 12-6-83, Cl. 73-862.240.  
Farmer, Wayne D.; and Newhall, Edmund E., to Bell Telephone Laboratories, Incorporated. High speed data communication system. B1 3,597,549., 12-6-83, Cl. 370-88.000.  
Frisque, Alvin J.: See—  
Anderson, Donald R.; and Frisque, Alvin J., B1 1,028,576., Cl. 523-336.000.  
Keane, Francis X., to Kinco, Ltd. Hospital Bed. B1 3,434,165., 12-6-83, Cl. 5-61.000.  
Kinco, Ltd.: See—  
Keane, Francis X., B1 3,434,165., Cl. 5-61.000.  
Nalco Chemical Company: See—  
Anderson, Donald R.; and Frisque, Alvin J., B1 1,028,576., Cl. 523-336.000.  
Newhall, Edmund E.: See—  
Farmer, Wayne D.; and Newhall, Edmund E., B1 3,597,549., Cl. 370-88.000.  
Okaya, Akira, to Patlex Corp. Dielectric microwave resonator. B1 3,237,132., 12-6-83, Cl. 333-211.000.  
Patlex Corp.: See—  
Okaya, Akira, B1 3,237,132., Cl. 333-211.000.  
Standard Pressed Steel Co.: See—  
Boys, John T., B1 3,982,419., Cl. 73-862.240.

# LIST OF DESIGN PATENTEEES

- American District Telegraph Company: See—  
Thornton, Hugh P., Jr., 271,671., Cl. D10-106.000.  
American Standard Inc.: See—  
De Graw, Kenneth J.; and Nickerson, Earl W., 271,707., Cl. D23-48.000.  
DeGraw, Kenneth J.; and Nickerson, Earl W., 271,708., Cl. D23-48.000.  
Fabian, Wolfgang, 271,705., Cl. D23-26.000.  
Fabian, Wolfgang, 271,706., Cl. D23-32.000.  
AMP Incorporated: See—  
Casciotti, Albert; and Hollyday, Robert D., 271,685., Cl. D13-24.000.  
Casciotti, Albert; and Hollyday, Robert D., 271,686., Cl. D13-24.000.  
Au Equipment Associates, Ltd.: See—  
Weir, James L., 271,697., Cl. D15-147.000.  
Bachmann, G. Merle; Davis, Charles L.; and Crosby, Samuel C., to Coca-Cola Company, The. Beverage cart. 271,716., 12-6-83, Cl. D34-14.000.  
Barclays Bank PLC: See—  
Lutos, Matthew, 271,723., Cl. D99-41.000.  
Basaldua, Tim, Jr. Flush mounted drawing implement holder. 271,638., 12-6-83, Cl. D6-113.000.  
Batts, John H.; and Bredeveg, Robert, to John Thomas Batts, Inc. Body of a garment hanger. 271,649., 12-6-83, Cl. D6-253.000.  
Bell Telephone Laboratories, Incorporated: See—  
Bhat, Ghanshyam A.; Genaro, Donald M.; McGarvey, John N.; Stickler, Albert C.; Sylvester, Gordon E.; and Tyler, Daniel W., 271,691., Cl. D14-60.000.  
Berry, William J., Jr., to Darco Water Systems, Inc. Combined conductivity monitor and controller. 271,684., 12-6-83, Cl. D13-11.000.  
Bhat, Ghanshyam A.; Genaro, Donald M.; McGarvey, John N.; Stickler, Albert C.; Sylvester, Gordon E.; and Tyler, Daniel W., to Bell Telephone Laboratories, Incorporated. Telephone stand. 271,691., 12-6-83, Cl. D14-60.000.  
Boehm, Michael, to Rosenthal Aktiengesellschaft. Stem and a base of a bowl of a stemware glass. 271,653., 12-6-83, Cl. D7-39.000.  
BOK Plastics, Inc.: See—  
Boughner, Donald L.; and Quincey, John M., 271,700., Cl. D19-33.000.  
Boshco, Nikolas K. Vehicle carrier attachment. 271,680., 12-6-83, Cl. D12-157.000.  
Boughner, Donald L.; and Quincey, John M., to BOK Plastics, Inc. Holder for floppy discs. 271,700., 12-6-83, Cl. D19-33.000.  
Bowsher, Robert L. Shoe rack. 271,641., 12-6-83, Cl. D6-153.000.  
Bredeveg, Robert: See—  
Batts, John H.; and Bredeveg, Robert, 271,649., Cl. D6-253.000.  
Brown, Warner K.; and Lanci, Dennis M., to Clark Equipment Company. Lift truck body. 271,720., 12-6-83, Cl. D34-37.000.  
Bulgari, Gianni, to Ditta Sotirio Bulgari di Costantino e Giorgio Bulgari S.a.s. Bracelet. 271,672., 12-6-83, Cl. D11-5.000.  
Campbell Soup Company: See—  
Garwood, Paul D.; Macaulay, Delmar F.; and Schmid, Ernst J., 271,665., Cl. D9-370.000.  
Capers, Harry P., Jr. Cap holder. 271,639., 12-6-83, Cl. D6-116.000.  
Casa Bella Imports, Inc.: See—  
Matthias, Jan H., 271,636., Cl. D6-63.000.  
Casciotti, Albert; and Hollyday, Robert D., to AMP Incorporated. Multi-contact electrical connector plug. 271,685., 12-6-83, Cl. D13-24.000.  
Casciotti, Albert; and Hollyday, Robert D., to AMP Incorporated. Mixed terminal electrical connector plug. 271,686., 12-6-83, Cl. D13-24.000.  
Casetta, Gino, to Simod Patents N.A.N.V. Sport shoe. 271,633., 12-6-83, Cl. D2-310.000.  
Celine S.A.: See—  
Vipiana, Richard, 271,722., Cl. D92-1.00P.  
Christian, Hubert E.: See—  
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., 271,650., Cl. D7-6.000.  
Clark Equipment Company: See—  
Brown, Warner K.; and Lanci, Dennis M., 271,720., Cl. D34-37.000.  
Clifton, Robert T., to Dyna Con Tech Corporation. Vertical takeoff and landing aircraft. 271,683., 12-6-83, Cl. D12-326.000.  
Coca-Cola Company, The: See—  
Bachmann, G. Merle; Davis, Charles L.; and Crosby, Samuel C., 271,716., Cl. D34-14.000.  
Cowan, George T., Jr.; and Griffith, Robert E., to International Business Machines Corporation. Combined typehead container and typehead. 271,664., 12-6-83, Cl. D9-337.000.  
Crosby, Samuel C.: See—  
Bachmann, G. Merle; Davis, Charles L.; and Crosby, Samuel C., 271,716., Cl. D34-14.000.  
Darco Water Systems, Inc.: See—  
Berry, William J., Jr., 271,684., Cl. D13-11.000.  
Davis, Charles L.: See—  
Bachmann, G. Merle; Davis, Charles L.; and Crosby, Samuel C., 271,716., Cl. D34-14.000.  
Decra Stone, Inc.: See—  
Knutson, Lawrence M., 271,651., Cl. D7-29.000.  
De Graw, Kenneth J.; and Nickerson, Earl W., to American Standard Inc. Sewerless toilet or similar article. 271,707., 12-6-83, Cl. D23-48.000.  
DeGraw, Kenneth J.; and Nickerson, Earl W., to American Standard Inc. Sewerless toilet or similar article. 271,708., 12-6-83, Cl. D23-48.000.  
De Lozada, Rudy. Covered hat. 271,629., 12-6-83, Cl. D2-253.000.  
De Lozada, Rudy. Space hat. 271,630., 12-6-83, Cl. D2-253.000.  
De Lozada, Rudy. Spectator hat. 271,631., 12-6-83, Cl. D2-253.000.  
De Lozada, Rudy. Winged hat. 271,632., 12-6-83, Cl. D2-253.000.  
Di Bartolo, Vincent, to Mateflex/Mele Corporation. Photograph display. 271,648., 12-6-83, Cl. D6-234.000.  
Ditta Sotirio Bulgari di Costantino e Giorgio Bulgari S.a.s.: See—  
Bulgari, Gianni, 271,672., Cl. D11-5.000.  
Drackett Company, The: See—  
Nichols, Charles E.; and Jones, David A., 271,635., Cl. D4-04.000.  
Draddy, Roy C. Holder for a rule book and score card. 271,699., 12-6-83, Cl. D19-26.000.  
Dresser Industries, Inc.: See—  
Todd, John A., 271,696., Cl. D15-9.200.  
Dyna Con Tech Corporation: See—  
Clifton, Robert T., 271,683., Cl. D12-326.000.  
Elmore, J. James; and West, Robert F., to Stanley Works, The. Molded frame maker mitre box with clamps. 271,660., 12-6-83, Cl. D8-71.000.  
Fabian, Wolfgang, to American Standard Inc. Combined escutcheon and diverter valve control for bathtub/shower units. 271,705., 12-6-83, Cl. D23-26.000.  
Fabian, Wolfgang, to American Standard Inc. Spout. 271,706., 12-6-83, Cl. D23-32.000.  
Fayle, Paul R. Combination pocket tool. 271,659., 12-6-83, Cl. D8-18.000.  
Fiam s.r.l.: See—  
Tonucci, Enrico, 271,645., Cl. D6-172.000.  
Flemate, Molly K. Pizza faced clock. 271,666., 12-6-83, Cl. D10-6.000.  
Fratelli Saporiti: See—  
Offredi, Giovanni, 271,637., Cl. D6-75.000.  
Frem Corporation: See—  
Howitt, Robert T., 271,721., Cl. D34-40.000.

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# LIST OF DESIGN PATENTEEES

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- Garwood, Paul D.; Macaulay, Delmar F.; and Schmid, Ernst J., to Campbell Soup Company. Container for liquids or the like. 271,665., 12-6-83, Cl. D9-370.000.  
Genaro, Donald M.: See—  
Bhat, Ghanshyam A.; Genaro, Donald M.; McGarvey, John N.; Stickler, Albert C.; Sylvester, Gordon E.; and Tyler, Daniel W., 271,691., Cl. D14-60.000.  
General Mills, Inc.: See—  
Richmond, Colin B., II, 271,657., Cl. D7-137.000.  
General Motors Corporation: See—  
Hughet, Roger E.; and Palmer, Jerry P., 271,681., Cl. D12-183.000.  
Germiers, Armand J., to GTE ATEA. Telephone unit. 271,689., 12-6-83, Cl. D14-58.000.  
Green, David T., to United States Surgical Corporation. Disposable staple cartridge for linear closure surgical stapler. 271,714., 12-6-83, Cl. D24-27.000.  
Greenlee, Hugh T.; and Hess, Roy P., to W. R. Grace & Co. Kinetic sculpture. 271,674., 12-6-83, Cl. D11-131.000.  
Griffith, Robert E.: See—  
Cowan, George T., Jr.; and Griffith, Robert E., 271,664., Cl. D9-337.000.  
Griffiths, Edward E. Remote control handle for crane. 271,687., 12-6-83, Cl. D13-32.000.  
Groenewold, Van D.; Christian, Hubert E.; and Schwartz, James P., to WMF Container Corporation. Embossed beverage or packaging cup. 271,650., 12-6-83, Cl. D7-6.000.  
GTE ATEA: See—  
Germiers, Armand J., 271,689., Cl. D14-58.000.  
Gyebnar, Zoltan V. Plant hanger. 271,640., 12-6-83, Cl. D6-137.000.  
Handelsbolaget Ohrnellteknik: See—  
Ohrnell, Hakan; and Naslund, Leif, 271,669., Cl. D10-83.000.  
Hemphill, Dale R. Flag. 271,678., 12-6-83, Cl. D11-173.000.  
Hess, Roy P.: See—  
Greenlee, Hugh T.; and Hess, Roy P., 271,674., Cl. D11-131.000.  
Hicks, Robert M. Combined starter vent and water shedding ventilation strip. 271,713., 12-6-83, Cl. D23-151.000.  
Hollyday, Robert D.: See—  
Casciotti, Albert; and Hollyday, Robert D., 271,685., Cl. D13-24.000.  
Casciotti, Albert; and Hollyday, Robert D., 271,686., Cl. D13-24.000.  
Howitt, Robert T., to Frem Corporation. Storage bin. 271,721., 12-6-83, Cl. D34-40.000.  
Hughet, Roger E.; and Palmer, Jerry P., to General Motors Corporation. Combined rear window and trunk lid for an automobile. 271,681., 12-6-83, Cl. D12-183.000.  
Imai, Hirotsuka: See—  
Nomura, Toshihito; and Imai, Hirotsuka, 271,694., Cl. D14-96.000.  
Interdica S.A.: See—  
Kanoui, Joseph, 271,654., Cl. D7-47.000.  
Kanoui, Joseph, 271,656., Cl. D7-104.000.  
International Business Machines Corporation: See—  
Cowan, George T., Jr.; and Griffith, Robert E., 271,664., Cl. D9-337.000.  
Ivy, James R. Wheeled dog statuette. 271,676., 12-6-83, Cl. D11-158.000.  
Ivy, James R. Dog statuette. 271,677., 12-6-83, Cl. D11-158.000.  
Jack-Poker, Ltd.: See—  
Wirken, Frank J., 271,701., Cl. D21-42.000.  
John Thomas Batts, Inc.: See—  
Batts, John H.; and Bredeveg, Robert, 271,649., Cl. D6-253.000.  
Johnno, Joseph A., Jr.; and Johnno, Sandra S. Mobile trash bag holder. 271,718., 12-6-83, Cl. D34-24.000.  
Johnno, Sandra S.: See—  
Johnno, Joseph A., Jr.; and Johnno, Sandra S., 271,718., Cl. D34-24.000.  
Jones, Ben S. Deck plate. 271,662., 12-6-83, Cl. D8-399.000.  
Jones, David A.: See—  
Nichols, Charles E.; and Jones, David A., 271,635., Cl. D4-04.000.  
Kabushiki Kaisha Carmate: See—  
Tanaka, Masao, 271,668., Cl. D10-78.000.  
Kanoui, Joseph, to Interdica S.A. Ice-spoon. 271,654., 12-6-83, Cl. D7-47.000.  
Kanoui, Joseph, to Interdica S.A. Caviar-spoon. 271,656., 12-6-83, Cl. D7-104.000.  
Kessler, Bayard F. Telephone handset. 271,693., 12-6-83, Cl. D14-63.000.  
Kiyooka, Katsumi, to Komatsu Zenoah Co. Portable blower. 271,715., 12-6-83, Cl. D32-15.000.  
Knutson, Lawrence M., to Decra Stone, Inc. Scalloped bowl. 271,651., 12-6-83, Cl. D7-29.000.  
Komatsu Zenoah Co.: See—  
Kiyooka, Katsumi, 271,715., Cl. D32-15.000.  
Lanci, Dennis M.: See—  
Brown, Warner K.; and Lanci, Dennis M., 271,720., Cl. D34-37.000.  
Legerius, Bengt E.; and Siebert, Hans W., to Telefonaktiebolaget L M Ericsson. Mounting tool for a guide tube for cables in a fire wall. 271,658., 12-6-83, Cl. D8-14.000.  
Lenox Crystal, Incorporated: See—  
Saffell, Jon R., 271,652., Cl. D7-39.000.  
Linn, Clarence W. Elevated creeper for automotive mechanics. 271,717., 12-6-83, Cl. D34-17.000.  
Lutos, Matthew, to Barclays Bank PLC. Money box. 271,723., 12-6-83, Cl. D99-41.000.



## LIST OF DESIGN PATENTEES

- M&M Luggage Co., Inc.: See—  
Stark, Ted, 271,661, Cl. D8-339,000.
- Macaulay, Delmar F.: See—  
Garwood, Paul D.; Macaulay, Delmar F.; and Schmid, Ernst J., 271,665, Cl. D9-370,000.
- MacDougall, Alexander S. O. Marine ventilator fitting. 271,682, 12-6-83, Cl. D12-317,000.
- Mateflex/Mele Corporation: See—  
Di Bartolo, Vincent, 271,644, Cl. D6-234,000.
- Mathias, Jan H., to Casa Bella Imports, Inc. Sofa. 271,636, 12-6-83, Cl. D6-63,000.
- McGarvey, John N.: See—  
Bhat, Ghanshyam A.; Genaro, Donald M.; McGarvey, John N.; Stickler, Albert C.; Sylvester, Gordon E.; and Tyler, Daniel W., 271,691, Cl. D14-60,000.
- McLeod, Julia. Body torso support pad. 271,647, 12-6-83, Cl. D6-201,000.
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- Wilkes, Kenneth R., to Quaker Oats Company, The. Spaceship toy. 271,702, 12-6-83, Cl. D21-87,000.
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- Hetherington, Ernest E., to Fred A. Stewart Inc. Pamela Hetherington coronation. 5,154, 12-6-83, Cl. 68,000.
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- Mikkelsen, Inc.: See—  
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- Superior Farming Company: See—  
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- Warriner, William A., to Jackson & Perkins Company. Rose plant Jacgum. 5,152, 12-6-83, Cl. 10,000.

## LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 6TH DAY OF DECEMBER, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

- Colquhoun, Howard M.; and Lewis, David F. Production of aromatic polyketones. T103,703, 12-6-83, Cl. 528-125,000.
- Haylock, John C.: See—  
Tuller, Harold W.; Vanderkooi, Nicholas, Jr.; Haylock, John C.; and Largman, Theodore, T103,701, Cl. 524-293,000.
- Largman, Theodore: See—  
Tuller, Harold W.; Vanderkooi, Nicholas, Jr.; Haylock, John C.; and Largman, Theodore, T103,701, Cl. 524-293,000.
- Lewis, David F.: See—  
Colquhoun, Howard M.; and Lewis, David F., T103,703, Cl. 528-125,000.
- Short, James N.: See—  
Willcox, Kenneth W.; and Short, James N., T103,702, Cl. 524-429,000.
- Tuller, Harold W.; Vanderkooi, Nicholas, Jr.; Haylock, John C.; and Largman, Theodore. Nucleated polyester composition containing red phosphorus. T103,701, 12-6-83, Cl. 524-293,000.
- Vanderkooi, Nicholas, Jr.: See—  
Tuller, Harold W.; Vanderkooi, Nicholas, Jr.; Haylock, John C.; and Largman, Theodore, T103,701, Cl. 524-293,000.
- Willcox, Kenneth W.; and Short, James N. Stabilization of polymer blends with metal nitrites. T103,702, 12-6-83, Cl. 524-429,000.



# CLASSIFICATION OF PATENTS

ISSUED DECEMBER 6, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

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		6	4,419,186	230	4,419,567	458.1	4,419,583	361	4,419,599	
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12	4,418,764	200	4,419,187	352	4,419,569	505.1	4,419,585	107	4,418,967	
				528	4,419,570	551	4,419,586	184	4,418,968	
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48	4,419,535		4,419,191	359	4,418,834	8.6	4,419,250	385	4,419,604	
52 R	4,419,536	15	4,419,192	404	4,418,835	32.7 E	4,419,251	485	4,419,605	
65 R	4,419,537	18.1	4,419,193	CLASS 221		34.7	4,419,252	CLASS 315		
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		CLASS 178		206	4,418,845	331	4,419,263	811	4,419,615	
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111 E	4,419,545	404	4,419,211	78	4,418,849	600	4,419,269	CLASS 323		
		111 E	4,419,212	CLASS 224		112 R	4,419,270	CLASS 324		
		CLASS 180		4,419,213		112 R	4,419,271	257	4,419,619	
9.62	4,418,775			32 A	4,418,850	438 R	4,419,272	280	4,419,620	
19 H	4,418,776	CLASS 206		42.06	4,418,851	461 A	4,419,273	CLASS 325		
65 E	4,418,777	196	4,418,818	42.23	4,418,852	493	4,419,274	CLASS 326		
132	4,418,778	216	4,418,819	42.41	4,418,853	613	4,419,275	51	4,419,621	
141	4,418,779	279	4,418,805	154	4,418,854	661	4,419,276	57 Q	4,419,622	
142	4,418,780	334	4,418,820	CLASS 225		803	4,419,277	57 R	4,419,623	
155	4,418,781	370	4,418,821	96	4,418,855	804	4,419,278	142	4,419,624	
190	4,418,782	441	4,418,822	CLASS 226		123.7	4,419,279	158 P	4,419,625	
209	4,418,783	538	4,418,823	118	4,418,856	245.2 R	4,419,280	CLASS 328		
221	4,418,784			CLASS 208		349	4,419,281	CLASS 329		
255	4,418,785	8 R	4,419,214	118	4,418,857	397.1	4,419,282	CLASS 330		
		11 R	4,419,215	124	4,418,858	410.7 R	4,419,283	CLASS 331		
116	4,418,786		4,419,216	159	4,418,859	453 A	4,419,284	CLASS 332		
130	4,418,787	59	4,419,217	183	4,418,860	453 AB	4,419,285	CLASS 333		
224	4,418,788	86	4,419,218	196	4,418,861	453 PH	4,419,286	CLASS 334		
255	4,418,789	111	4,419,219	CLASS 229		464	4,419,287	CLASS 335		
268	4,418,790	113	4,419,220	23 A	4,418,862	465.2	4,419,288	CLASS 336		
		120	4,419,221	41 C	4,418,863	501.16	4,419,289	CLASS 337		
		CLASS 182		4,419,222	4,418,864	929	4,419,290	CLASS 338		
2	4,418,791		4,419,223	49	4,418,865	106	4,419,291	CLASS 339		
93	4,418,792	244	4,419,224	52 B	4,418,866	106	4,419,292	CLASS 340		
129	4,418,793	251 R	4,419,225	69	4,418,867	118	4,419,293	CLASS 341		
		CLASS 187		325	4,418,868	142	4,419,294	CLASS 342		
		326	4,419,226	CLASS 209		327	4,419,295	CLASS 343		
17	4,418,794		4,419,227	1 C	4,419,571	9	4,419,303	CLASS 344		
29 R	4,418,795	9	4,419,228	69	4,419,572	25	4,419,304	CLASS 345		
		CLASS 188		383	4,419,573	36	4,419,305	CLASS 346		
				534	4,419,574	40.5	4,419,306	CLASS 347		
71.5	4,418,796	CLASS 210				46.5	4,419,307	CLASS 348		
73.37	4,418,797	4,419,229		55	4,418,866	53	4,419,308	CLASS 349		
73.45	4,418,798	114	4,419,230	88	4,418,867	59	4,419,309	CLASS 350		
153 R	4,418,799	164	4,419,231	228	4,418,868	60	4,419,310	CLASS 351		
195	4,418,800		4,419,232	317	4,418,869	82	4,419,311	CLASS 352		
202	4,418,801		4,419,233	533.8	4,418,870	130	4,419,312	CLASS 353		
282	4,418,802	169	4,419,234	CLASS 241		145	4,419,313	CLASS 354		
352	4,418,803	232	4,419,235	CLASS 242		167	4,419,314	CLASS 355		
		282	4,419,236	CLASS 243		184	4,419,315	CLASS 356		
		CLASS 190		4,419,237		19 V	4,419,316	CLASS 357		
18 A	4,418,804	321.2	4,419,238	1	4,418,871	85	4,419,317	CLASS 358		
111	4,418,806	338	4,419,239	187	4,418,872	457	4,419,318	CLASS 359		
		CLASS 192		294	4,418,873	19 V	4,419,319	CLASS 360		
0.076	4,418,810	444	4,419,240	DIG. 3	4,418,874	5	4,419,320	CLASS 361		
18 A	4,418,807	493.5	4,419,241	18 G	4,418,875			CLASS 362		
18 R	4,418,808	500.2	4,419,242	84.21 R	4,418,877			CLASS 363		
67 R	4,418,809	629	4,419,243					CLASS 364		
81 C	4,418,811	676	4,419,244					CLASS 365		

92	4,419,647	40	4,419,684	101	4,419,021	52	4,419,341	30	4,419,426		
215	4,419,648	53	4,419,685	125	4,419,022	54	4,419,342	58	4,419,427	CLASS 523	
		CLASS 337		179	4,419,023	59	4,419,343	77	4,419,428	106	4,419,466
70	4,419,649	13	4,419,686		CLASS 375	70	4,419,344	83	4,419,429	161	4,419,466
119	4,419,650		4,419,687	7	4,419,756	151	4,419,345	109	4,419,430	201	4,419,466
159	4,419,651	27	4,419,688	17	4,419,757	177	4,419,346	179	4,419,431	334	4,419,466
		CLASS 338		38	4,419,758	180	4,419,347		4,419,432	326	B1 Re.28,576
28	4,419,652	75	4,419,689	97	4,419,759	195	4,419,348	206	4,419,433	416	4,419,466
47	Re.31,459	120	4,419,690	120	4,419,760	225	4,419,349	207	4,419,434	424	4,419,468
114	4,419,653		4,419,691			245	4,419,350	223	4,419,435		CLASS 524
		CLASS 339				248.4	4,419,351	260	4,419,436	68	4,419,469
14 R	4,418,972	113	4,419,692	16	4,419,761	248.56	4,419,352	270	4,419,437	76	4,419,470
17 L	4,418,971	181	4,419,694	66	4,419,762	249	4,419,353	275	4,419,438	100	4,419,471
31 L	4,418,973	258	4,419,695		CLASS 378	249	4,419,354	375	4,419,439	102	4,419,472
75 M	4,418,974	197	4,419,697	149	4,419,763	251	4,419,355	377	4,419,440	104	4,419,473
91 R	4,418,975	334	4,419,696	133	4,419,764	253	4,419,356		4,419,441	102	4,419,474
	4,418,976	340	4,419,699		CLASS 381	256	4,419,357	567	4,419,442	195	4,419,475
99 R	4,418,977					258	4,419,359	600	4,419,443	284	4,419,476
113 L	4,418,978	77	4,419,700	1.05	4,418,599	273 R	4,419,360		4,419,444	290	4,419,477
	4,418,979		4,419,701	7	4,419,541		4,419,361	89	4,419,069	318	4,419,478
		CLASS 340	96.4	51	4,419,540	285	4,419,362	126	4,419,070	525	4,419,480
52 R	4,419,654	97	4,419,702		CLASS 383	300	4,419,363	202	4,419,071	551	4,419,481
323 R	4,419,655	102	4,419,703	11	4,418,733	320	4,419,364	266	4,419,072	560	4,419,482
347 CC	4,419,656	103	4,419,704		CLASS 400	330	4,419,366	354	4,419,073	701	4,419,483
347 R	4,419,657	105	4,419,706	120	4,419,024	331	4,419,367		4,419,074	731	4,419,484
521	4,419,658	106	4,419,707		CLASS 403		4,419,368		CLASS 432		CLASS 525
552	4,419,659	132	4,419,708	14	4,419,025	8	4,419,060	217	4,419,075	38	4,419,487
653	4,419,660	133	4,419,709	104	4,419,026		4,419,061	253	4,419,076	53	4,419,488
707	4,419,661		4,419,710	134	4,419,027	101	4,419,062		CLASS 433	54.5	4,419,489
750	4,419,662			353	4,419,028	107	4,419,063	5	4,419,077	61	4,419,490
783	4,419,663	111	4,419,711	408	4,419,029	256	4,419,064	10	4,419,078	67	4,419,491
784	4,419,664	172	4,419,712		CLASS 405	301	4,419,065		CLASS 434	76	4,419,492
825.06	4,419,665	321	4,419,713	278	4,419,030	371	4,419,066	43	4,419,079	95	4,419,493
	4,419,666		4,419,714		CLASS 408	392	4,419,067	172	4,419,080	109	4,419,494
825.44	4,419,667	335	4,419,715			398	4,419,068	188	4,419,081	301	4,419,495
	4,419,668			1 R	4,419,031		4,419,369		CLASS 435	338	4,419,496
18 D	4,419,669	96	4,419,716	112	4,419,032	2	4,419,370	7	4,419,444	424	4,419,497
779	4,419,670	148	4,419,717		CLASS 410	7	4,419,371	20	4,419,445	426	4,419,498
786	4,419,671	205	4,419,718	32	4,419,033	94	4,419,372	68	4,419,446	437	4,419,499
		368	4,419,721	83	4,419,034	234	4,419,373	76	4,419,447	534	4,419,500
33 M	4,419,672	396	4,419,722		CLASS 414	243	4,419,374	161	4,419,448		CLASS 526
75	4,419,673			71	4,419,035	272	4,419,375	170	4,419,449	122	4,419,501
108	4,419,674			160	4,419,036	402	4,419,376	253	4,419,450	209	4,419,502
	4,419,675	21	4,419,723	489	4,419,037	592	4,419,377	298	4,419,451	237	4,419,503
140 R	4,419,676			543	4,419,038	594	4,419,378		CLASS 436	262	4,419,504
	4,419,677			590	4,419,039		4,419,379	89	4,419,452	279	4,419,505
155	4,419,678	200	4,419,724	687	4,419,040	10	4,419,380	534	4,419,453	316	4,419,506
163	4,419,679		4,419,725	739	4,419,041	38	4,419,381		CLASS 440		CLASS 528
	4,419,680		4,419,726	786	4,419,042	39	4,419,382	42	4,419,082	302	4,419,507
		CLASS 350			CLASS 415	40	4,419,383	56	4,419,083		CLASS 536
96.13	4,418,980	424	4,419,727			47	4,419,384	58	4,419,084	42	4,419,508
96.15	4,418,981	426	4,419,728	7	4,419,043	57	4,419,385	93	4,419,085	7.1	4,419,509
96.20	4,418,982	428	4,419,729	117	4,419,044	99	4,419,386		CLASS 445	84	4,419,510
96.21	4,418,983	429	4,419,730	119	4,419,045	109	4,419,387	35	4,418,452	471	4,419,511
96.33	4,418,984	432	4,419,731	127	4,419,046	215	4,419,388		CLASS 455		CLASS 542
96.34	4,418,985	438	4,419,732	150	4,419,047	288	4,419,389	36	4,419,765	70	4,419,512
128	4,418,986	567	4,419,733	196	4,419,048	294	4,419,390	62	4,419,766	222	4,419,513
337	4,418,987	800	4,419,734	206	4,419,049	304	4,419,391	164	4,419,767	344	4,419,514
414	4,418,988	903	4,419,735		CLASS 416	387	4,419,392	180	4,419,768		CLASS 546
486	4,418,989		4,419,736	46	4,419,050	404	4,419,393	182	4,419,769		CLASS 548
		CLASS 351				434.5	4,419,394	301	4,419,770	5	4,419,515
41	4,418,990		4,419,737	140	4,419,051				CLASS 464	119	4,419,516
161	4,418,991		4,419,738	214 A	4,419,052				CLASS 493	144	4,419,517
169	4,418,992		4,419,740	234	4,419,053				CLASS 494	279	4,419,518
		CLASS 352			CLASS 417	28	4,419,395	14	4,419,086		CLASS 549
57	4,418,993	72	4,419,741	294	4,419,054	40	4,419,396	439	4,419,087	264	4,419,520
78 R	4,418,994	87	4,419,742	396	4,419,055	141	4,419,397	444	4,419,088	480	4,419,519
129	4,418,995	149	4,419,743	426	4,419,056	171	4,419,398		CLASS 495		CLASS 550
		154	4,419,744		CLASS 418	215	4,419,399		CLASS 496		CLASS 551
		174	4,419,745			245	Re.31,457		CLASS 501		CLASS 552
		189	4,419,746			262	4,419,400	45	4,419,089	404	4,419,521
33	4,418,996	201	4,419,747	36	4,419,057	266	4,419,401	53	4,419,090	557	4,419,522
111	4,418,997			133	4,419,058	288	4,419,402		CLASS 502		CLASS 553
		CLASS 353		150	4,419,059	294	4,419,403		CLASS 503		CLASS 554
			4,419,014		CLASS 419	336	4,419,404		CLASS 504		CLASS 555
		CLASS 354	349	67	4,419,324	412	4,419,405	95	4,419,454	12	4,419,523
132	4,418,999		4,419,015		CLASS 420	422	4,419,406		4,419,455		CLASS 556
173.1	4,419,000	31	4,419,748	464	4,419,325	423.1	4,419,407		CLASS 505		CLASS 557
187	4,419,001			584	4,419,129	424.4	4,419,408		CLASS 506		CLASS 558
405	4,419,002				CLASS 422	516	4,419,409	26	4,419,267		CLASS 559
	4,418,998	10	4,419,016				4,419,410	65	4,419,271		CLASS 560
		CLASS 355	64		4,419,326	542.8	4,419,411	80	4,419,272	401	4,419,525
3 FU	4,419,003	69	4,419,017	4	4,419,327	548	4,419,412	84	4,419,273	741	4,419,526
3 TR	4,419,004	74	4,419,018	17	4,419,328	575	4,419,413	158	4,419,274	772	4,419,527
	4,419,005		4,419,019	62	4,419,329	594	4,419,414	169	4,419,275		CLASS 561
14 R	4,419,006			111	4,419,330	636	4,419,415	209	4,419,276	435	4,419,528
14 SH	4,419,007	11	4,419,749	143	4,419,331	692	4,419,416	304	4,419,277		CLASS 562
38	4,419,008	111	4,419,750	170	4,419,332		4,419,417	322	4,419,278		CLASS 563
103	4,419,009			245				347	4,419,279		CLASS 564
133	4,419,010	13	4,419,751		CLASS 423	100	Re.31,458		CLASS 507		CLASS 565
		29	4,419,752	235	4,419,333	104	4,419,418	703	4,419,456	20	4,419,091
		62	4,419,753	240	4,419,334		4,419,419		CLASS 521	93	4,419,092
1	4,419,011	88	B1 3,597,549	290	4,419,335	185	4,419,420		CLASS 522	49	4,419,093
141	4,419,012			345	4,419,336	191	4,419,421		CLASS 523	93	4,419,094
400	4,419,013			374 R	4,419,337	194	4,419,422	56	4,419,458	96	4,419,095
		CLASS 357		658.5	4,419,338	197	4,419,423	59	4,419,459	132	4,419,096
			4,419,754		CLASS 424	217	4,419,424	65	4,419,460	174	4,419,097
13	4,419,681	118	4,419,755	1.1	4,419,339			123	4,419,461	263	4,419,098
23	4,419,682	145			4,419,340			126	4,419,462	275	4,419,099
38	4,419,683	12	4,419,020	19		7	4,419,425	134	4,419,463	339	4,419,100



## CLASSIFICATION OF DESIGNS

D2— 253	271,629	172	271,645	339	271,661	173	271,677	70	271,692	86	271,709
	271,630	186	271,646	399	271,662	96	271,678	96	271,694	97	271,710
	271,631	201	271,647	307	271,663	106	271,679	106	271,695	136	271,711
	271,632	234	271,648	337	271,664	157	271,680	9.2	271,696	139	271,712
	271,633	253	271,649	370	271,665	183	271,681	147	271,697	151	271,713
D3— 310	271,634	6	271,650	6	271,666	317	271,682	38	271,698	27	271,714
D4— 04	271,635	29	271,651	65	271,667	326	271,683	26	271,699	15	271,715
D6— 63	271,636	39	271,652	78	271,668	11	271,684	33	271,700	14	271,716
	271,637	75	271,653	83	271,669	24	271,685	42	271,701	17	271,717
	271,638	113	271,654	106	271,670	32	271,686	87	271,702	24	271,718
	271,639	116	271,655	106	271,671	150	271,703	150	271,703	26	271,719
	271,640	137	271,656	5	271,672	11	271,687	23	271,704	37	271,720
	271,641	153	271,657	96	271,673	58	271,688	26	271,705	40	271,721
	271,642	162	271,658	131	271,674	60	271,689	32	271,706	41	271,722
	271,643	165	271,659	147	271,675	63	271,690	48	271,707		271,723
	271,644	167	271,660	158	271,676		271,691		271,708		

## CLASSIFICATION OF PLANTS

P— 10	5,152	47	5,151	68	5,153	5,154
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4 :	4,418,476	4,419,283	01 :	4,419,162	4,418,948	4,419,549	4,419,722
	4,418,547	4,419,286	02 :	4,418,784	4,419,728	4,419,665	4,419,763
	4,418,658	4,419,287	04 :	4,418,473	4,418,515	4,419,666	1,028,576
	4,418,901	4,419,316		4,418,648	4,418,619	4,419,667	4,418,582
	4,419,041	4,419,347		4,418,854	4,419,063	4,419,043	4,418,583
	4,419,175	4,419,350		4,418,924	4,419,475	4,419,375	4,418,709
	4,419,586	4,419,385		4,419,081	4,419,521	Re.31,456	4,418,774
	4,419,726	4,419,387		4,419,300	4,419,575	4,418,443	4,418,781
	4,419,760	4,419,397		4,419,505	4,419,740	4,418,446	4,418,798
5 :	4,419,256	4,419,436		4,419,589	4,418,561	4,418,486	4,418,828
6 :	4,418,434	4,419,528	06 :	Re.31,459	4,419,189	4,418,553	4,418,911
	4,418,459	4,419,543		4,418,455	4,419,246	4,418,558	4,419,059
	4,418,474	4,419,566		4,418,468	4,419,340	4,418,566	4,419,099
	4,418,494	4,419,595		4,418,505	4,419,403	4,418,636	4,419,253
	4,418,527	4,419,635		4,418,521	4,419,498	4,418,679	4,419,319
	4,418,551	4,419,656		4,418,552	4,419,500	4,418,688	4,419,357
	4,418,591	4,419,669		4,418,555	4,419,538	4,418,736	4,419,358
	4,418,598	4,419,680		4,418,683	4,419,556	4,418,761	4,419,383
	4,418,604	4,419,686		4,418,712	4,418,432	4,418,763	4,419,412
	4,418,607	4,419,689		4,418,767	4,418,482	4,418,814	4,419,414
	4,418,610	4,419,701		4,418,790	4,418,833	4,418,833	4,419,447
	4,418,626	4,419,703		4,418,821	4,418,512	4,418,884	4,419,508
	4,418,639	4,419,720		4,418,827	4,418,513	4,418,920	4,419,509
	4,418,645	4,419,725		4,418,849	4,418,531	4,418,971	4,419,554
	4,418,646	4,419,747		4,418,858	4,418,594	4,418,976	4,419,569
	4,418,722	4,419,762		4,418,874	4,418,635	4,418,981	4,419,608
	4,418,825	4,418,492	8 :	4,418,892	4,418,685	4,418,991	4,419,699
	4,418,860	4,418,768		4,418,984	4,418,716	4,419,037	4,419,715
	4,418,863	4,418,769		4,418,992	4,418,830	4,419,070	4,418,678
	4,418,917	4,418,835		4,418,994	4,418,907	4,419,084	4,418,731
	4,418,919	4,418,871		4,419,029	4,418,909	4,419,086	4,418,932
	4,418,921	4,418,947		4,419,038	4,418,936	4,419,094	4,418,933
	4,418,928	4,419,010		4,419,069	4,418,962	4,419,100	4,419,040
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	4,419,191	4,419,322		4,419,679	4,418,839	4,419,577	4,418,744
	4,419,231	4,419,325		4,419,700	4,419,185	4,419,654	4,418,915
	4,419,242	4,419,346		4,419,706	4,419,228	4,419,662	4,419,024
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	4,419,273	4,419,600		4,418,692	4,419,366	4,419,718	4,419,331



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26 :	4,418,440	4,418,438	4,418,978	4,419,371		4,419,649	4,419,578
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	4,418,868	4,419,217	4,419,411	4,419,268		4,418,548	4,419,323
	4,418,922	4,419,218	4,419,430	4,419,525		4,418,560	4,419,373
	4,418,938	4,419,219	4,419,432	4,419,590		4,418,570	4,419,590
	4,418,939	4,419,220	4,419,434	4,418,502		4,418,599	4,419,619
	4,418,970	4,419,251	4,419,435	4,418,959		4,418,609	4,419,721
	4,419,027	4,419,252	4,419,437	4,418,959			

04 :	271,650	271,693	18 :	271,678	271,681	36 :	271,708	42 :	271,685
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	271,687	271,641	26 :	271,662	271,707	39 :	271,690	54 :	271,652
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## PLANT PATENTS

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DEFENSIVE PUBLICATIONS APPLICATIONS  
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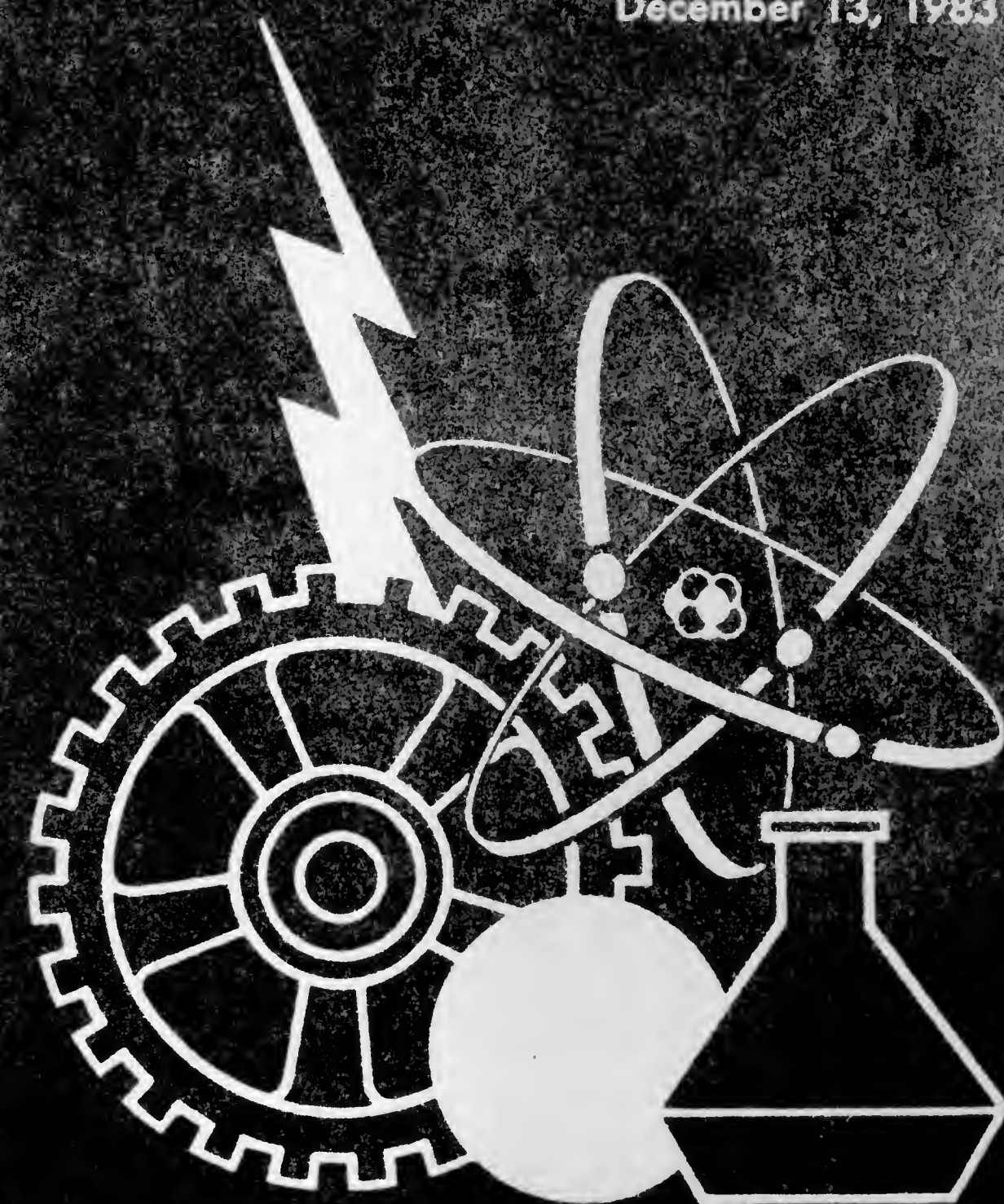
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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	\$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

Dec. 3, 1982.

GERALD J. MOSSINGHOFF,  
Commissioner of Patents  
and Trademarks.

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,331,045, Re. S.N. 537,644, Filed Sept. 30, 1983, Cl. 74/867, PNEUMATIC CONTROL SYSTEM FOR AN AUTOMATIC VEHICLE TRANSMISSION, Ferdinand Piech, et al., Owner of Record: Volkswagenwerk Aktiengesellschaft, Wolfsburg, West Germany, Attorney or Agent: Granville M. Brumbaugh, et al., Ex. Gp.: 352

4,374,997, Re. S.N. 530,257, Filed Sept. 8, 1983, Cl. 292/8, REMOTE CONTROL ARRANGEMENT, Haruo Mochida, Owner of Record: Nissan Motor Co., Ltd., Yokohama City, Japan, Attorney or Agent: Arthur Schwartz, Ex. Gp.: 351

4,394,159, Re. S.N. 530,633, Filed Sept. 9, 1983, Cl. 71/98, 2-CHLORO-3-PHENOXY OR PHENYLTHIO 6-(6-) NITRO ANILINES, Wolfgang Buck, et al., Owner of Record: Celamerck GmbH Co., Rhein, Germany, Attorney or Agent: Walter G. Weissenberger, Ex. Gp.: 113

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the gen-

eral public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

### No Publications This Issue

#### Patents Available for License or Sale

3,620,043. SPLINE-TYPE PIVOTS, UNIVERSAL JOINTS AND FLEXIBLE COUPLINGS. *James A. Oliff*, Parkhurst & Oliff, 277 So. Washington St., Alexandria, Va., 22314, 703-836-6400.

3,832,965. SUBMERSIBLE TRANSPORT APPARATUS. *Paul J. Walker*, P.O. Box 2769, Nipawin Saskatchewan, Canada SOE IEO.

3,847,139. DEVICE FOR AID IN DETECTING BREAST CANCER. *Eric Flam*, 29 Ainsworth Ave., East Brunswick, N.J. 08816.

3,982,332. SPEED READING AID AND METHOD. Correspondence to: *Lusthoff & Brendemuhl*, 2914 S. Harlem Ave., Box. L., Riverside, Ill. 60546.

4,004,501. TACO HOLDING TRAY. *Lois L. Guerrero*, 84 Pukihae St., Bayshore Tower, Hilo, Hawaii, 96720.

4,136,764. MOTHER ALICE'S BREAD VENDING MACHINE. *Alice Johnson*, 8650 Belford Ave. #1, Los Angeles, Calif. 90045.

4,193,375. A FLOOR PROTECTING DOOR PAINTING SHIELD. *Stan Sharland*, 12322 Quartz Pl., Garden Grove, Calif., 92643. (714) 636-6127.

4,302,883. EXACTO-MAC. *Exacto-Mac Ltd. Partnership*, c/o Thompson, Weir & Barclay, P.O. Box 2044, New Haven, Conn. 06521.

4,304,276. ROUTER TABLE FOR CUTTING LAMINATED PLASTICS, Correspondence to: *Benasutti and Murray*, 1020 Suburban Station Bldg., 1617 John F. Kennedy Blvd., Philadelphia, Pa. 19103.

4,357,137. SHAFT COUPLING. *James A. Oliff*, Parkhurst & Oliff, 277 So. Washington St., Alexandria, Va. 22314. (703) 836-6400.

4,376,152. CRIMPED THERMOPLASTIC FILAMENT. *Robert A. Bennett*. Correspondence to: F. Eugene Davis, IV, 30 Oak St., Stamford, Conn. 06905.

4,376,162. CRIMPED THERMOPLASTIC FILAMENT. *Robert A. Bennett*. Correspondence to F. Eugene Davis, IV, 30 Oak St., Stamford, Conn. 06905.

4,377,727. STETHOSCOPE HAVING MEANS FOR MEASURING PULSE FREQUENCY. Correspondence to: *Joseph C. Schwalbach*, 1010 Second Ave., Suite 1607, San Diego, Calif. 92101.

4,392,006. SOLAR-CELL ACTIVATION SYSTEM. *Lawrence Apelian*, 51 So. Coleman Rd., Centereach, N.Y. 11720.

The following patents are offered by Terence G. Hare, Sr., 21146 Caberfae Hwy. 55, Wellston, Mich. 49689.

3,948,372. CENTRIFUGAL CLUTCH.  
3,994,095. SAFETY WINDOW.

DECEMBER 13, 1983

U.S. PATENT AND TRADEMARK OFFICE

1037 OG 11

4,377,215. SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLES.

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, Aerospace Control Systems Dept., General Electric Co., P.O. Box 5000, Binghamton, N.Y. 13902.

4,366,476. RASTER DISPLAY GENERATING SYSTEM.

Applications for license may be addressed to: General Electric Co., Component Products Group, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801-2204. Attention: Patent Counsel.

3,872,705. APPARATUS FOR MANUFACTURING SLOTTED CORE STRUCTURES.

4,308,479. MAGNET ARRANGEMENT FOR AXIAL FLUX FOCUSING FOR TWO-POLE PERMANENT MAGNET A.C. MACHINES.

4,385,502. DEFROST CONTROL DEVICE AND METHOD OF OPERATING SUCH.

Applications for license should be addressed to: Division Patent Counsel, Space Systems Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

4,374,081. CURE OF EPOXY SYSTEMS AT REDUCED PRESSURES.

4,390,583. ALUMINA-ALUMINA COMPOSITE.

4,398,200. FEED APERTURES WITH CROSSPOLARIZATION COMPENSATION FOR LINEAR POLARIZATION.

4,399,547. RECEIVER OF PULSED PHASE MODULATED SIGNALS.

4,400,825. ADJUSTABLE SLIT RADIOGRAPHIC APPARATUS.

Applications for licenses should be addressed to: Technology Programs Patent Counsel, Power Systems Sector, General Electric Co., 1 River Rd., Bldg. #2, R.M. 413, Schenectady, N.Y. 12345.

4,201,760. MOLTEN SALT SYNTHESIS OF LITHIUM BETA-ALUMINATE POWDER.

4,209,236. SOLAR CENTRAL RECEIVER HELIOSTAT REFLECTOR ASSEMBLY.

4,209,312. CONTROLLIG SIZE IN GLAUBER'S SALT CRYSTAL FORMATION.

4,209,573. SULFUR ELECTRODE CONTAINER AND METHODS OF MANUFACTURE.

4,212,287. INSULATION INTEGRATOR.

4,219,653. PROCESS AND APPARATUS FOR SEPARATING PARTICULATE MATTER FROM GASEOUS MEDIA.

4,216,278. PROCESS OF MAKING ELECTRODE STRUCTURE FOR MOLTEN CARBONATE FUEL CELLS.

4,227,942. PHOTOVOLTAIC SEMICONDUCTOR DEVICES AND METHODS OF MAKING SAME.

4,242,426. ELECTROLYTE STRUCTURE WITH STRONTIUM TITANATE MATRIX FOR MOLTEN CARBONATE FUEL CELLS.

4,246,891. LOW REFLECTION LOSS CUSP LIKE REFLECTOR FOR SOLAR ENERGY COLLECTOR.

4,252,003. REDUCED POWER CONSUMPTION AIR CONDITIONING.

4,252,107. SOLAR TRACKING CONCENTRATOR.

4,252,543. PROCESS FOR QUENCHING AND

4,261,705. CLEANING A FUEL GAS MIXTURE. SYSTEM AND METHOD FOR HANDLING LOCK GAS IN A COAL GASIFIER SYSTEM.

4,267,879. METHOD FOR FORMING GLAUBER'S SALT CRYSTALS OF REDUCED SIZE BY INCLUDING A FLUORIDINE-CONTAINING SURFACTANT.

### Examination

Pursuant to the provisions of 37 C.F.R. 1.341(c), an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys and agents will be held on Tues., Apr. 10, 1984.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent and Trademark Office in patent cases must pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

37 C.F.R. 1.341(f) provides, in pertinent part, "Officers and employees of the United States who are disqualified by statute (18 U.S.C. 203, 205) from practicing as attorneys or agents in proceedings or other matters before Government departments or agencies, may not be registered, \* \* \* but officers or employees whose official duties require the preparation and prosecution of applications for patent may be registered (on compliance with the regulations in this part) or recognized to practice, to the extent necessary to carry out their official duties." If you are an officer or employee of the United States who is not disqualified for registration under 37 C.F.R. 1.341(f) when you apply to take the examination, your application for registration must be accompanied by your supervisor's verified statement that your official duties as a United States officer or employee require that you prepare and prosecute applications for patent. After passing the examination, you will be considered eligible for registration. If you are disqualified for registration under 37 C.F.R. 1.341(f) when you apply, approval of your application to take the examination will be subject to the following conditions.

1. If you pass the examination, you will not be registered so long as you remain disqualified for registration under 37 C.F.R. 1.341(f). However, if within one (1) year from the date notification of passing is mailed, your status changes and you are no longer disqualified under 37 C.F.R. 1.341(f), you will be considered eligible for registration upon satisfactory proof of your change in status.
2. If you have not become registered within one (1) year from the date notification of passing is mailed, you may not become registered thereafter except upon taking and passing another regularly scheduled examination.

The examination will be given under the supervision of the Office of Personnel Management (formerly Civil Service Commission), and may be taken in any of the cities in which the Office of Personnel Management regularly conducts examinations. Applications to take the examination must be filed in the Patent and Trademark Office together with a \$75 fee not later than Jan. 31, 1984.

Application blanks may be obtained from the Clerk, Office of Enrollment and Discipline, Bldg. 4, 11th Floor, Room E14, Crystal Plz., Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Clerk, Office of Enrollment and Discipline.

WILLIAM FELDMAN,  
Director, Office of  
Enrollment and Discipline.



**Patent Cooperation Treaty (PCT) Update**  
 I. Accession to the Patent Cooperation Treaty (PCT) by Mauritania and Listing of PCT Member Countries.  
 The Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) that Mauritania deposited its instrument of accession to the PCT on January 13, 1983. Therefore, according to PCT Article 63(2), Mauritania may be designated in international applications filed on and after April 13, 1983.

tion (WIPO) that Mauritania deposited its instrument of accession to the PCT on January 13, 1983. Therefore, according to PCT Article 63(2), Mauritania may be designated in international applications filed on and after April 13, 1983.

## Listing of PCT Member Countries

Country	Ratification or Accession	Date of Ratification or Accession	Date from which Country may be Designated
(1) Central African Republic*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark	Ratification	01 September 1978	01 December 1978
(21) Austria**	Ratification	23 January 1979	23 April 1979
(22) Monaco	Ratification	22 March 1979	22 June 1979
(23) Netherlands**	Ratification	10 April 1979	10 July 1979
(24) Romania	Accession	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein**	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium**	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982
(33) Mauritania*	Accession	13 January 1983	13 April 1983

\*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member countries. A designation of any country is an indication that all OAPI countries have been designated. Note: Only one designation fee is due regardless of the number of OAPI member countries designated.

\*\*Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member countries are available through PCT, except for France and Belgium, for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries.

## II. Change in International Fees Effective January 1, 1984

On October 4, 1983 the PCT Assembly in its tenth session (4th Ordinary) held in Geneva, Switzerland, fixed U.S. dollar amounts for the changed international fees that are set in Swiss francs in the Schedule of Fees annexed to the PCT Regulations.

Effective January 1, 1984, for U.S. applicants filing PCT international applications in the United States Receiving Office, the amounts of the international fees are:

Basic Fee (first 30 pages)	\$295.00
Basic Supplemental Fee (each page over 30)	\$6.00
Designation fee (per country or region)	\$70.00

The Transmittal and Search Fees remain unchanged:  
 Transmittal Fee \$ 125.00

## Search Fee

For the U.S. Patent and Trademark Office as Searching Authority:

No prior corresponding U.S. application	\$500.00
Prior corresponding U.S. application	\$250.00
Supplemental Search Fee for each additional invention	\$125.00

For the European Patent Office (EPO) as Searching Authority:

Search Fee for each application	\$670.00
Supplemental Search Fee for each additional invention	payable directly to the EPO.

A listing of current PCT fees appears in each issue of the *Official Gazette*.

Nov. 14, 1983.

GERALD J. MOSSINGHOFF,  
 Commissioner of Patents  
 and Trademarks.

## PATENT NOTICES

## Certificates of Correction for the Week of Dec. 13, 1983

D. 257,360	4,371,303	4,390,772	4,403,285
D. 269,184	4,373,551	4,391,723	4,403,387
D. 269,185	4,374,871	4,391,859	4,403,760
D. 269,275	4,375,459	4,392,061	4,404,496
4,093,213	4,375,616	4,392,482	4,404,979
4,264,195	4,376,548	4,392,623	4,404,997
4,293,704	4,379,117	4,393,125	4,405,002
4,293,954	4,379,354	4,393,324	4,405,418
4,295,699	4,379,357	4,394,002	4,405,702
4,299,917	4,380,771	4,394,508	4,405,838
4,306,299	4,381,079	4,395,476	4,405,942
4,345,360	4,381,310	4,396,430	4,406,248
4,349,576	4,381,318	4,396,987	4,406,309
4,353,326	4,381,382	4,397,177	4,406,600
4,353,448	4,382,293	4,397,732	4,406,899
4,356,923	4,382,430	4,398,420	4,407,098
4,357,496	4,382,560	4,398,633	4,407,574
4,358,600	4,383,097	4,398,769	4,407,835
4,363,211	4,385,887	4,399,027	4,408,058
4,365,125	4,385,987	4,399,644	4,408,125
4,366,574	4,386,108	4,400,197	4,408,269
4,368,351	4,387,024	4,400,372	4,408,342
4,368,978	4,387,619	4,400,481	4,408,743
4,369,664	4,388,669	4,400,600	4,408,744
4,370,190	4,389,122	4,401,940	4,409,146
4,370,521	4,389,704	4,402,179	4,409,343
4,370,572	4,390,378	4,402,758	

## Disclaimers

4,229,289.—*John G. Victor, Darien, Ill.* FLUIDIZED BED APPARATUS AND PROCESS. Patent dated Oct. 21, 1980. Disclaimer filed Oct. 27, 1983, by the assignee, *Institute of Gas Technology*.

Hereby enters this disclaimer to claims 6, 10 and 12 of said patent.

4,304,345.—*E. Michael Carlin, Milpitas, Calif.* MODULAR BIDIRECTIONAL TRACTOR FEED ASSEMBLY. Patent dated Dec. 8, 1981. Disclaimer filed Oct. 20, 1983, by the assignee, *Xerox Corp.*

Hereby enters this disclaimer to claims 1-10 of said patent.



# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the

table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
Arizona	Birmingham Public Library	(205) 254-2555
California	Tempe: Science Library, Arizona State University	(602) 965-7140
	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

\*Collection organized by subject matter.

\*\*Call only between the hours of 10:00 a.m. and 5:00 p.m.

## PATENT EXAMINING CORPS RENE D. TEGTMEYER, Assistant Commissioner WILLIAM FELDMAN, Deputy Assistant Commissioner CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director	1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director	11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director	3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director	3-09-82
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director	1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director	5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director	3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director	1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGN, GROUP 290—KENNETH L. CAGE, Director	1-30-81
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director	7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director	11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director	9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,243,822 to 3,248,737, inclusive  
Plant Patents . . . . . Numbers 2,616 to 2,627 inclusive



## REEXAMINATIONS

DECEMBER 13, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,218,438 (150th)**  
**ANTICOCCIDIAL COMBINATIONS COMPRISING NICARBAZIN AND THE POLYETHER ANTIBIOTICS**  
 Maurice E. Callender, Indianapolis, and Thomas K. Jeffers, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.  
 Reexamination Request No. 90/000,258, Sep. 17, 1982.  
 Reexamination Certificate for Patent No. 4,218,438, issued Aug. 19, 1980, Ser. No. 12,165, Feb. 14, 1979.  
 Int. Cl.<sup>3</sup> A61K 31/505, 31/34  
 U.S. Cl. 424—251

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 15-17 and 31-33, having been finally determined to be unpatentable, are cancelled.

Claims 1, 2, and 18 are determined to be patentable as amended:

Claims 3-14 and 19-30, dependent on amended claims, are determined to be patentable.

New claims 34-41 are added and determined to be patentable.

1. A process for controlling coccidiosis in poultry which comprises orally administering to the poultry a feedstuff comprising a first component which is a polyether antibiotic selected from the group consisting of monensin, laidlomycin, grisorixin, lenoremycin, salinomycin, narasin, lonomycin, alborixin, antibiotic 204A, etheromycin, lasalocid, isolasalocid A, lysocellin, and antibiotic A23187, and a second component which is selected from the group consisting of nicarbazin and 4,4'-dinitrocarbanilide, said components being present in the feedstuff in amounts which, in combination, are synergistic as to at least one coccidiosis-causing strain of Eimeria.

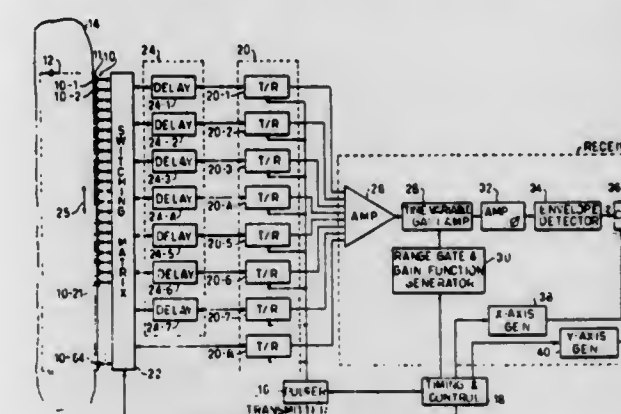
**B1 4,305,296 (148th)**  
**ULTRASONIC IMAGING METHOD AND APPARATUS WITH ELECTRONIC BEAM FOCUSING AND SCANNING**  
 Philip S. Green; Dilip G. Saraf, both of Atherton, and James F. Havlice, Los Altos, all of Calif., assignors to SRI International, Menlo Park, Calif.  
 Reexamination Request No. 90/000,350, Mar. 24, 1983.  
 Reexamination Certificate for Patent No. 4,305,296, issued Dec. 15, 1981, Ser. No. 119,937, Feb. 8, 1980.  
 Int. Cl.<sup>3</sup> G01N 29/04  
 U.S. Cl. 73—626

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-28 is confirmed.

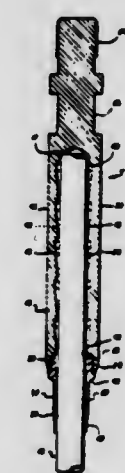
1. In pulsed ultrasonic imaging apparatus for imaging a section within an object, which apparatus includes a linear transducer array and pulse transmitter means for energizing transducer elements of the array for beaming ultrasonic energy pulses into the section, beam focusing means for focusing of the transducer array at different range zones within the section to be imaged, beam scanning means for scanning the section to be imaged, range gated signal processing means responsive to the output

from the transducer array for processing signals received from the range zone at which the beam is focused, and means for control of said beam focusing and range gated signal processing means to provide line segment signals



from each of the range zones for use in visual display of the section to be imaged, a line segment signal for a single range zone being obtained with each operation of the pulse transmitter means.

**B1 4,360,288 (149th)**  
**FIBERGLASS SUCKER ROD CONSTRUCTION**  
 Woodrow T. Rutledge, Jr.; Russell P. Rutledge; John E. Freeman, and Steven D. Clark, all of Big Spring, Tex., assignors to Fiberflex Products, Inc., Big Spring, Tex.  
 Reexamination Request No. 90/000,318, Jan. 20, 1983.  
 Reexamination Certificate for Patent No. 4,360,288, issued Nov. 23, 1982, Ser. No. 76,373, Sep. 17, 1979.  
 Int. Cl.<sup>3</sup> F16B 11/00; F04B 47/02  
 U.S. Cl. 403—268



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 6-8, having been finally determined to be unpatentable, are cancelled.

Claims 1-4 and 9 are determined to be patentable as amended:



Claims 5 and 10, dependent on amended claims, are determined to be patentable.

New claims 11-16 are added and determined to be patentable.

1. A sucker rod construction for use in producing oil wells, said sucker rod construction comprising:

a [first] connector member having an outer surface and being formed to define a rod receptacle having a closed axially [outer] inner end and an open axially [inner] outer end, said rod receptacle having a plurality of integrally formed axially spaced apart outwardly converging tapered frusto-conical [annular] internal surfaces, [each of said surfaces having substantially the same taper] said outer surface of said connector member and said internal surfaces defining between them a rod receptacle wall, said outer surface being substantially cylindrical laterally adjacent all said frusto-conical internal surfaces except the one

most near said axially outer open end of said rod receptacle, the outside surface of the connector member laterally adjacent that one internal surface most near the said open end having a gradual axially convergent taper whereby the rod receptacle wall along said one internal surface is less thick at portions nearer said open end than at portions nearer and laterally adjacent the axially upper reach of said one internal surface;

a cylindrical fiberglass rod having an end having a uniformly cylindrical uninterrupted outer surface being received within said rod receptacle through said [inner] outer end and cooperating therewith to define an annular chamber between said outer surface of said end of said rod and said outwardly converging tapered frusto-conical surfaces;

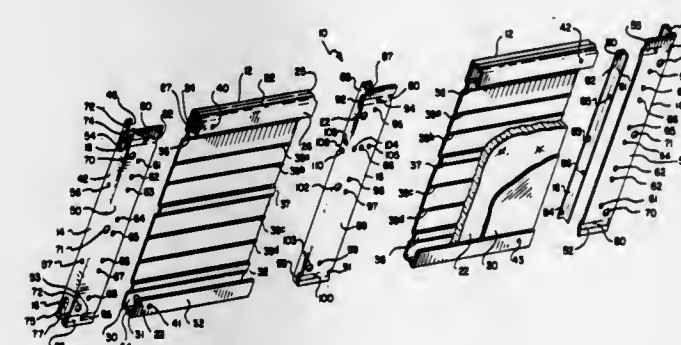
and a body of initially liquid adhesive material filling said annular chamber that cures to bond to said outer surface of said end of said rod and to harden to form a plurality of shear and compression resistant frusto-conical wedges to cooperate with said frusto-conical surfaces.

## REISSUES

### DECEMBER 13, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,461  
METHOD OF PREPARING A SECTION FOR AN OVERHEAD DOOR  
David O. Martin, Salt Lake City, and Lawrence G. Martin, Bountiful, both of Utah, assignors to Martin Overhead Door and Electronics Co., Salt Lake City, Utah  
Original No. 4,347,653, dated Sep. 7, 1982, Ser. No. 246,805, Mar. 23, 1981. Division of Ser. No. 59,880, Jul. 23, 1979, Pat. No. 4,284,119. Application for reissue Sep. 29, 1982, Ser. No. 426,751  
Int. Cl.<sup>3</sup> B23P 19/00  
U.S. Cl. 29—526 R 7 Claims



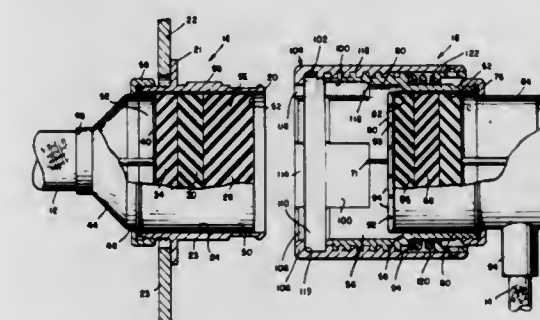
6. A method of preparing a section for an overhead door system comprising:

forming a section facing for the section by shaping a generally rectangular sheet of metal with a hem and a longitudinal channel along each edge of the section facing;

fabricating end stiles for the section by forming a metal stock into end stiles having a front face, a side wall and a rear face, and hem-receiving grooves adjacent each end of the rear face, the front face overlapping the end of the section facing with the ends of the rear face fitting within the channels with the hem receiving grooves receiving the hems therein while the side wall encloses the end of the section;

preparing support means at the side wall inside the end stile for securing the end of the section facing to the end stile; and assembling the section by mounting an end stile to each end of the section facing and securing the end of the section facing to the end stile with the support means.

Re. 31,462  
ELECTRICAL CONNECTOR  
Larry L. McCormick, and Ben F. Selk, both of Los Angeles, Calif., assignors to Automation Industries, Inc., Greenwich, Conn.  
Original No. 3,848,950, dated Nov. 19, 1974, Ser. No. 287,184, Sep. 7, 1972. Application for reissue May 13, 1981, Ser. No. 253,650  
Int. Cl.<sup>3</sup> H01R 13/629  
U.S. Cl. 339—90 R 33 Claims



5. An electrical connector including the combination of a plug section, a first set of electrical contacts in said section, a receptacle section, said receptacle section being effective to mate with said plug section, a second set of electrical contacts in said second section, a zero pitch breech lock on said sections effective to releasably secure said sections together when they are mated, and means operatively interconnected with said breech lock for moving one of said sets of contacts into and out of engagement with the other of said sets of contacts when said breech lock secures said sections together and releases them from each other.

Re. 31,463  
RADIOPHARMACEUTICAL CHELATES AND METHOD OF EXTERNAL IMAGING  
Michael D. Loberg, New Brunswick, N.J.; Patrick S. Callery, Luthersville, Md., and Malcolm Cooper, Chicago, Ill., assignors to Research Corporation, New York, N.Y.  
Original No. 4,017,596, dated Apr. 12, 1977, Ser. No. 609,545, Sep. 2, 1975. Continuation-in-part of Ser. No. 555,037, Mar. 3, 1975, abandoned. Application for reissue May 8, 1980, Ser. No. 148,052  
Int. Cl.<sup>3</sup> A61K 43/00, 49/00; C07C 101/20  
U.S. Cl. 424—1.1 24 Claims

1. A chelate of technetium-99m, cobalt-57, gallium-67, gallium-68, indium-111 or indium-113m and a substituted iminodiacetic acid [ ], said chelate, upon intravenous administration, being liver and/or gallbladder selective.



## PLANT PATENTS

GRANTED DECEMBER 13, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,155

### ROSE CV. AROCLIDD

Joseph L. Moon, Wasco, and Jack E. Christensen, Ontario, both of Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jul. 1, 1982, Ser. No. 394,479

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—2

1 Claim

1. A new and distinct variety of rose as a sport of the rose cv. Double Delight (U.S. Plant Pat. No. 3,847) characterized in that it is a climber and flowers on second season's wood, with a large flowering flush in the spring followed by intermittent flowering during the remainder of the growing season and otherwise having the characteristics of the parent rose Double Delight.

5,156

### ROSE PLANT CV. AROCHER

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 22, 1982, Ser. No. 390,898

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—11

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized in its flower coloration is initially essentially pink and turns to a deep blood red, its large flower size, its abundant production of flowers, and its wavy leaflet margins.

5,157

### HYBRID GRANDIFLORA ROSE CV. SHREVEPORT

Reimer Kordes, Aspern Krs. Pinneberg, Fed. Rep. of Germany, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 14, 1982, Ser. No. 388,028

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—17

1 Claim

1. A new and distinct variety of rose plant of the hybrid Grandiflora class, substantially as herein shown and described being particularly characterized in its profusion of brightly colored, leathery foliage covering even the lowest branches; its upright habit and highly branched bush; its above average resistance to disease and its vigor.

5,158

### BEGONIA PLANT NAMED ENCORE

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sep. 15, 1982, Ser. No. 418,489

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of begonia named Encore, as described and illustrated, and particularly characterized by its bright pink double flowers, dark green, firm to crisp glabrous foliage with serrated edges; excellent keeping qualities, and by its continuous year round flowering.



# PATENTS

GRANTED DEC. 13, 1983

## ERRATA

For CLASS	See PATENT NO.
135-120 .....	4,420,017
206-315 .....	4,420,024
502-180 .....	4,420,415
502-168 .....	4,420,416
502-169 .....	4,420,417
502-077 .....	4,420,418
502-068 .....	4,420,419
502-261 .....	4,420,420
502-316 .....	4,420,421
381-094 .....	4,420,655
381-015 .....	4,420,658



# PATENTS

GRANTED DECEMBER 13, 1983

## GENERAL AND MECHANICAL

4,419,771

### PASSIVE DISPENSER

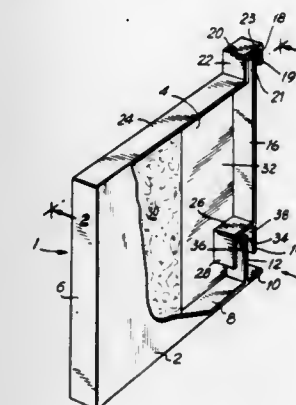
Randall G. Richards, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Filed Feb. 8, 1982, Ser. No. 346,975

Int. Cl.<sup>3</sup> E03D 9/02, 9/03

U.S. Cl. 4-228

8 Claims



1. A non-siphoning passive dispenser for containing a quantity of a solution isolated from a body of liquid in which the dispenser is immersed and for causing a predetermined volume of said solution to issue from the dispenser solely under conditions of gravity flow in response to the level of said body of liquid being lowered from a first elevation to a second elevation, the dispenser comprising:

a product reservoir containing a solute into which said liquid flows to form said solution when the level of said body of liquid rises from said second elevation to said first elevation, said quantity of solution being stored therein; venting means in fluid communication with said reservoir, and a discharge/refill conduit disposed below said venting means, said conduit connecting the reservoir with the body of liquid and comprising two chambers in fluid communication with each other, one chamber being adjacent to said reservoir to form an air trap chamber and the other chamber being adjacent to said body of liquid to form an air refill chamber, said air trap chamber and said air refill chamber having wall segments of equal length such that said solution issues from the dispenser due to non-siphonic flow; a transfer port connecting said air trap and air refill chambers, the cross-sectional area of said transfer port normal to fluid flow being smaller than the cross-sectional area of said air trap chamber normal to fluid flow such that air in said conduit is not completely displaced by said liquid when the level of said body of liquid rises from the second elevation to the first elevation, the air being entrapped in said air trap chamber and forming, upon cessation of flow into said reservoir, an air lock in said conduit which substantially isolates said solution from said body of liquid.

4,419,772

### WATER SAVER

Clark K. Smith, 1004 Wedgewood La., Durham, N.C. 27713

Filed Jan. 12, 1982, Ser. No. 338,884

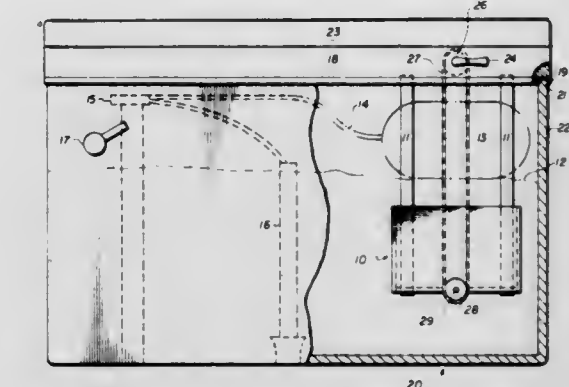
Int. Cl.<sup>3</sup> E30D 1/20

U.S. Cl. 4-364

20 Claims

1. A device for saving water in toilet water closets and the like, comprising in combination:  
a reservoir disposed within the closet oriented so that at least a portion of said reservoir is below an associated normal water level,  
means for admitting water into said reservoir,  
means for discharging water from said water closet,  
means for cooperating with said reservoir to incrementally

retain amounts of water in said reservoir varying from zero to the full capacity of said reservoir upon flushing water from the water closet,



means external of said water closet for incrementally positioning said means for cooperating whereby the amount of water used in flushing the toilet can be varied in accordance with demand.

4,419,773

### ADJUSTABLE TANK DISCHARGE VALVE FOR CONTROLLING FLUSH WATER VOLUME

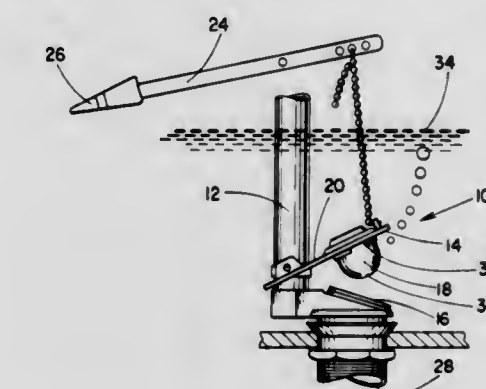
Donald E. Sullivan, 1493 Fahlander Dr. S., Columbus, Ohio 43229

Filed Mar. 12, 1982, Ser. No. 357,731

Int. Cl.<sup>3</sup> E03D 1/34

U.S. Cl. 4-392

15 Claims



1. An improved adjustable discharge valve closure of the type providing a selective water volume flush for the tank of a water closet, said discharge valve closure including a sealing portion and a buoyancy chamber portion attached to a mounting arm member at one end of said member, the other end of said member being pivotally attached to said tank for pivotal movement of the valve closure into and out of sealing engagement with the discharge valve seat, said buoyancy chamber portion, in the closed operable position of the valve closure, including a relatively lower drain hole and a relatively higher bleeder port formed through a wall of the buoyancy chamber portion said bleeder port being connected with gas at atmospheric pressure when said closure is in its closed position; wherein the improvement permits manual adjustment of the water volume of a flush and comprises mounting at least the portion of the wall of the buoyancy chamber through which the bleeder port is formed for rotary movement about the center axis of the valve closure, which movement due to the pivotal movement of said mounting arm will vary the distance of said bleeder port from said tank bottom.



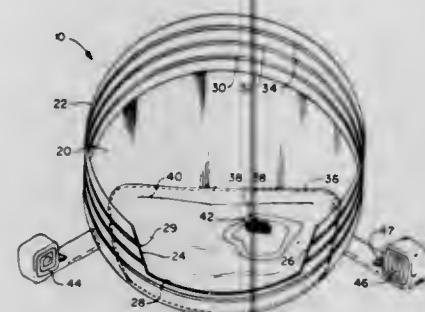
4,419,774

**DISPOSABLE SHAMPOO BASIN**

Rosemary T. Hajek, 615 Shamrock Rd., Bel Air, Md. 21014  
 Filed Dec. 20, 1982, Ser. No. 451,399  
 Int. Cl.<sup>3</sup> A54D 19/08, 19/10

U.S. Cl. 4-516

12 Claims



1. In a system for use in washing the hair of a patient on a bed and having a base, a wall around the base and means including a quantity of soft particulate matter for supportively sealing at a patient's head/neck/shoulder area, the improvement comprising: the means for supportively sealing including a part of said wall and a bag, and means in said bag for adjustably contouring said bag for water-tight fit to a patient's neck.

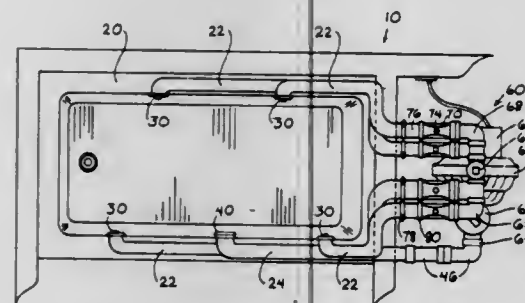
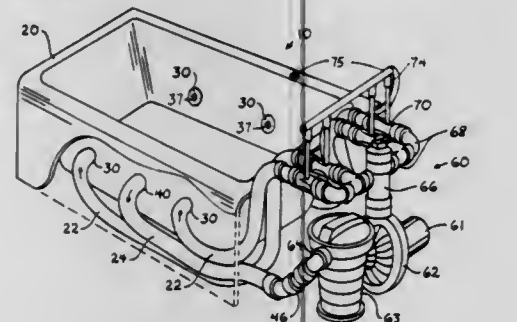
4,419,775

**WHIRLPOOL BATH**

Thomas P. Ebert, 1611 Sheffield Ct., Elgin, Ill. 60120  
 Filed Aug. 10, 1981, Ser. No. 291,818  
 Int. Cl.<sup>3</sup> A61H 33/02; E03C 1/02

U.S. Cl. 4-542

14 Claims



1. A whirlpool bath for installation in an in-place bathtub comprising said bathtub and a pump assembly, said pump assembly being connected to said bathtub through at least one flexible inlet pipe; said flexible inlet pipe serving to take water from said pump to said bathtub and to permit said installation

in said in-place bathtub; and at least one flexible outlet pipe, said flexible outlet pipe serving to return water from said bathtub to said pump and said flexible inlet pipe and said flexible outlet pipe permitting said installation in said in-place bathtub; wherein:

- (a) said inlet pipe is connected at one end to an inlet means within said bathtub for the purpose of providing whirlpool action in said bathtub, and said inlet pipe is connected at the other end to said pump;
- (b) a water and air mixing means operatively situated between said pump and said inlet pipe, said water and air mixing means being connected to said pump and between said pump and said flexible inlet pipe—whereby said water and air mixing means combine with said flexible inlet pipe to provide whirlpool action; and
- (c) a recirculating means for returning water from said bathtub to said pump.

4,419,776

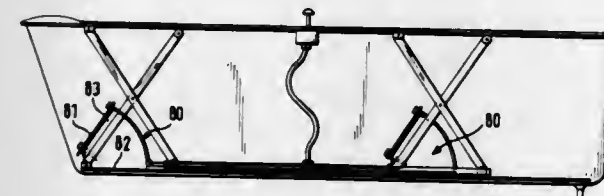
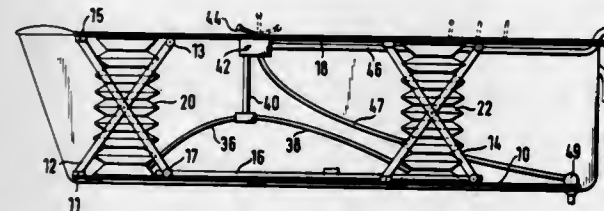
**BATHTUB ASSEMBLY FOR HANDICAPPED PERSONS**

Peter Schmidt, D7989 Enkenhofen Gde. Argenbühl, Fed. Rep. of Germany  
 Filed May 27, 1982, Ser. No. 382,536  
 Claims priority, application Fed. Rep. of Germany, Sep. 1, 1981, 3134516

Int. Cl.<sup>3</sup> A47K 3/12

U.S. Cl. 4-564

6 Claims



1. In a bathtub assembly for handicapped persons of the type having a bottom plate, a lifting plate, and a guide means intermediate the bottom plate and the lifting plate, the guide means being of the type having at least two scissors-like rocking lever sets, lift means which can be filled with water for lifting the lifting plate, and a manually-operated valve connectable with and responsive to a household water supply for controlling the lift means, the lift means having at least one collapsible hollow body closed at the ends, one end fastened at the bottom plate and the other end fastened to one of the lifting plate and the guide frame, the collapsible hollow body having a wall operable for folding with minimal stretch and which folds flat when the lifting plate is lowered, the hollow body having a water connection and being inflated by filling with water, the improvement wherein the guide means comprises pairs of identical guide frames connected to each end of the bottom plate and each end of the lifting plate, a longitudinal strut jointed to one end of each rocking lever of one guide frame of one pair of guide frames and to one longitudinally opposite end of a rocking lever of another guide frame of the opposite pair of guide frames, transverse axles jointed to transversely opposite ends of a rocking lever of each guide frame of each pair of identical guide frames, said struts and axles being mounted parallel to the bottom plate, and said struts and axles being operable to synchronously move the lifting plate parallel to itself; and wherein the hollow body comprises a hose having a diameter of about three inches, and means attached to the hose for

folding the hose into zigzag form when the lifting plate is lowered.

4,419,777

**BABY BED ROCKING MECHANISM**

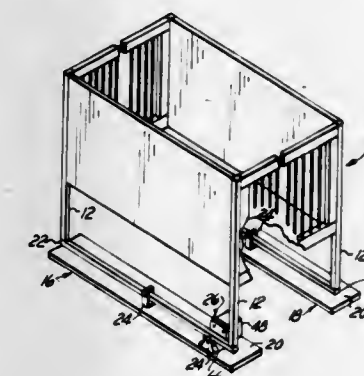
Paraque Parker, Pontiac, Mich., assignor to Harold P. Parker, Pontiac, Mich.

Filed May 4, 1981, Ser. No. 260,277

Int. Cl.<sup>3</sup> A97D 9/02

U.S. Cl. 5-108

6 Claims



1. A mechanism for rocking a bed and the like, said mechanism comprising a pair of transverse rocker members secured to the legs of the bed, a base member supporting each of said transverse rocker members, pivot means between each of said transverse rocker members and each of said base members for pivotably supporting said transverse rocker members relative to said base members and power drive means for positively oscillating one of said transverse rocker members relative to a corresponding base member, said power drive means comprising a prime mover fastened to said base member by a first bracket, said prime mover having a rotatable output shaft passed through a journal bearing in a sidewall of said first bracket, said power drive means further comprising an eccentric member mounted on said output shaft of said prime mover, a stub shaft having an axis of rotation in alignment with the axis of rotation of said output shaft mounted on said eccentric member, said stub shaft being passed through a journal bearing in another sidewall of said first bracket, and a cam follower in the form of a second bracket mounted below said transverse rocker member, said second bracket having an elongated slot in at least one sidewall thereof, each of said elongated slots being provided with substantially parallel sides disposed substantially parallel to the longitudinal axis of said one of said rocker members and said parallel sides of each of said slots being further disposed at a distance from each other corresponding to the width of the eccentric member wherein said eccentric member is disposed between said parallel sides of each of said elongated slots of said second bracket and between said sidewalls of said first bracket.

4,419,778

**FURNITURE SUSPENSION SYSTEM**

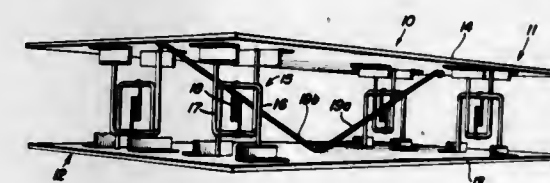
Harold Griffith, R.R. #4, Springdale, Ark. 72764, assignor to Harold Griffith, Springdale, Ark.

Filed Aug. 10, 1981, Ser. No. 291,172

Int. Cl.<sup>3</sup> A47C 23/08

U.S. Cl. 5-244

12 Claims



1. A suspension system for furniture comprising a base, a first generally U-shaped member, a second generally U-shaped member and a suspension spring, the first generally U-shaped

member having the ends thereof fixedly attached to the base with the second generally U-shaped member having the ends thereof fixedly attached to the furniture such that a portion of said first generally U-shaped member passes through the space bordered by said second generally U-shaped member and a portion of said second generally U-shaped member passes through the space bordered by said first generally U-shaped member and such that a portion of said first generally U-shaped member is directly above a portion of said second generally U-shaped member, said suspension spring having one end attached to the first generally U-shaped member proximate the portion thereof directly above said second generally U-shaped member and having the other end attached to the second generally U-shaped member proximate the portion thereof directly below said first generally U-shaped member.

4,419,779

**PILLOW CONSTRUCTION AND METHOD**

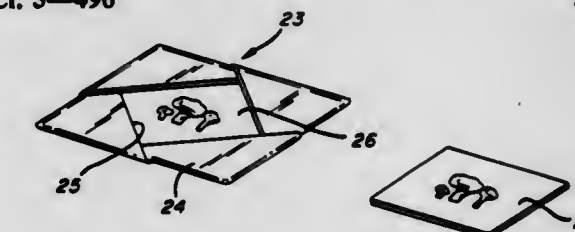
Larry Janesh, 3326 Lenox, Youngstown, Ohio 44502

Filed Apr. 8, 1982, Ser. No. 366,718

Int. Cl.<sup>3</sup> A47G 9/00

U.S. Cl. 5-490

5 Claims



1. A pillow construction comprising a plurality of outwardly extending portions, each of a length equal to its width, each of said outwardly extending portions being joined along one longitudinal edge to a square center portion in an offset oppositely disposed relation to one another with the longitudinal edge of said outwardly extending portions of a length less than that of said square center portion and greater than that of one-half the length of said center portion, each of said outwardly extending portions being folded to define a triangle with its free edges parallel with and joined to said square center portion, a decorative insert placed within an area defined by said triangles.

4,419,780

**HONEY DRYING VENTILATOR FOR BEEHIVES**

Vladimir Shaparew, 3371 Trafalgar Rd., R.R. #1, Oakville, Ontario, Canada (L5J 4Z2)

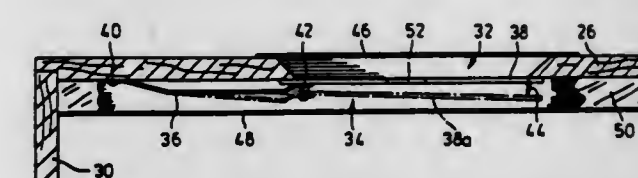
Filed Jan. 27, 1981, Ser. No. 228,774

Claims priority, application Canada, Oct. 17, 1980, 362605

Int. Cl.<sup>3</sup> A01K 47/06

U.S. Cl. 6-1

9 Claims



1. A honey drying ventilator for beehives, having substantially the same outer dimension as a honey super, and intended for installation above the top-most honey super, comprising: a frame having front, back and side members; an opening through one of said front, back or side members; and a closure element capable of covering and uncovering at least a portion of said opening upon change of ambient air temperature said closure element having a first portion thereof which may change its physical positioning upon change of ambient air temperature, and a second rigid por-



tion thereof adapted to cover said opening; said closure element being arranged so that said rigid portion is swingably moved with respect to said opening to the extent that said opening is substantially fully covered by said rigid portion at any temperature below a predetermined temperature of the ambient air.

4,419,781

## DIPSTICK WIPER APPARATUS

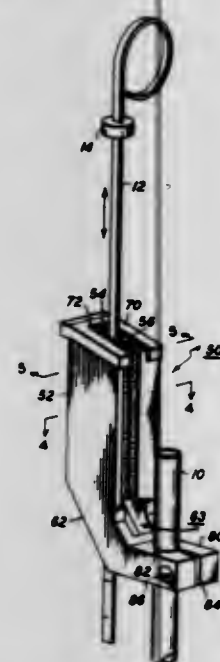
Dennis J. Meegan, 4 Meadowbrook Dr., Auburn, N.Y. 13021

Filed Apr. 22, 1982, Ser. No. 370,717

Int. Cl.<sup>3</sup> G01F 15/12

U.S. Cl. 15—210 B

7 Claims



1. Dipstick wiper apparatus comprising a housing having a generally rectilinear portion and a foot portion, said rectilinear portion having a top, a bottom and a plurality of sides, said housing being open at the top and bottom thereof and said sides defining an opening extending longitudinally between the top and bottom thereof, one of said sides having an opening there-through the other of said sides being closed, said foot portion being disposed at said bottom, a body of wiper material also generally rectilinear and having a top, a bottom and a plurality of sides, a slit extending longitudinally through said body between its top and bottom and laterally through one side thereof, said body being disposed in said longitudinal opening with said slit exposed through the open top and bottom of said rectilinear housing portion and through said opening in one side of said rectilinear housing portion for receiving said dipstick when inserted longitudinally into said slit and presenting said body for observation to said opening in said one side, said foot portion defining a generally "L" shape with said rectilinear body portion and having means for connection of said apparatus to a dipstick tube.

4,419,782

## FILL-UP INDICATION ARRANGEMENT FOR A VACUUM CLEANER

Erhard Sobczyk, Schalksmuehle, and Paul-Ulrich Uibel, Ennepetal, both of Fed. Rep. of Germany, assignors to Vorwerk &amp; Co Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,752

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041005

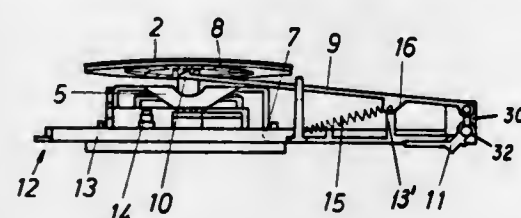
Int. Cl.<sup>3</sup> A47L 9/19; G01L 7/08

U.S. Cl. 15—339

3 Claims

1. A fill-up indication arrangement for a vacuum cleaner with an insertable filter bag, comprising a diaphragm mounted on a base in said cleaner communicating on one side thereof with the interior of the filter bag and with the exterior of the vacuum cleaner on the other side thereof and movable in

upward and downward directions in response to the change in pressure differential between the interior of the filter bag and the exterior of the vacuum cleaner; a turnable indicator disc operatively connected to said diaphragm and adapted to move in response to the movement of said diaphragm; an angular gearing interconnected between said diaphragm and said disc to translate the movement of said diaphragm into the movement of said indicator disc, said angular gearing including a pivotable gear sector mounted on an axle on said base provided



with teeth and cooperating with said diaphragm and a rod-like stop carried by said indicator disc, said teeth being interengageable with said stop; said gear sector being adapted to pivot about said axle in response to movement of said diaphragm; said indicator disc being provided with a plurality of locking teeth positioned along a circular track in a spaced relationship with one another on the surface of said disc; and additional locking means including an elongated lever formed with a counter-locking tooth at one end thereof, said counter-locking tooth being engageable with said locking teeth.

4,419,783

## REMOTE CONTROL FOR A VACUUM CLEANER MOTOR

Cennert O. Steffen, Taby, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

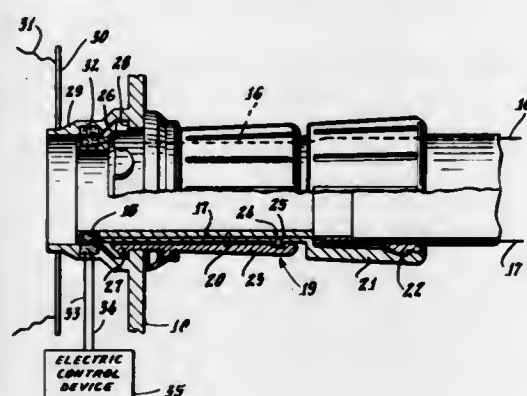
Filed May 13, 1982, Ser. No. 377,691

Claims priority, application Sweden, Jun. 18, 1981, 8103840

Int. Cl.<sup>3</sup> A47L 9/00

U.S. Cl. 15—339

6 Claims



3. A remote control device for an electric motor of a vacuum cleaner having a hose including an operating handle connected to a suction nozzle, comprising: an electric control device for said motor mounted on said operating handle and being manually operable, electric conduits extending along said hose and being connected to said electric control device, a first coil connected to one of said conduits, said coil being arranged to surround the end of the hose which is connected to said vacuum cleaner, a second coil magnetically coupled to said first coil and connected to said electric control device, a tubular connecting part for said hose, a tubular flange on said vacuum cleaner for insertion of said connecting part, said first coil being arranged in said connecting part, and said second coil being arranged in said tubular flange.

4,419,784

## PORTABLE BRUSH VACUUM CLEANER

Franz Lex, Annenstrasse 6, Graz, Austria

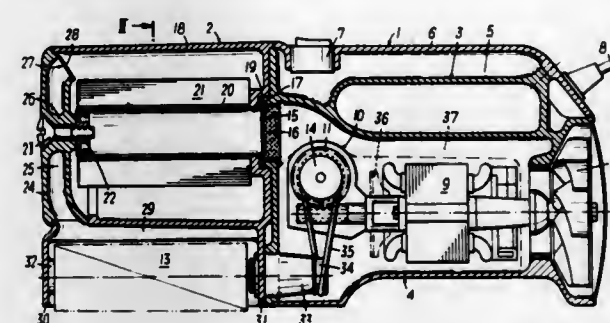
Filed Jun. 5, 1981, Ser. No. 271,091

Claims priority, application Austria, Jun. 10, 1980, 3040/80

Int. Cl.<sup>3</sup> A47L 5/26

U.S. Cl. 15—344

9 Claims



1. A handheld vacuum for removing dust from an object comprising:  
a casing;  
an electric motor disposed within said casing;  
suction means connected to said electric motor for removing said dust;  
gear reduction means connected to said electric motor;  
at least one cylindrical cleaning brush connected to and driven via said gear reduction means;  
a dust collector provided on said casing;  
fluid inlet means formed in said dust collector;  
fluid outlet means formed in said dust collector communicating with said suction means;  
at least one suction channel fluidly communicating with said fluid inlet means;  
a brush housing separate from said dust container and disposed adjacent said at least one cylindrical cleaning brush and forming a suction chamber fluidly communicating with said at least one suction channel; and  
baffle means operatively associated with said brush housing and longitudinally disposed adjacent an upper portion of said at least one cylindrical cleaning brush, said baffle means defining a surface portion of said suction chamber for preventing said dust from returning to said object.

4,419,785

## BOLT EYELET WITH BOLT-ENGAGING SHOULDER FOR ELECTRICAL TRANSMISSION LINES

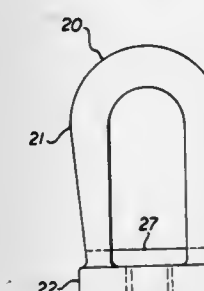
Carson H. McWhirter, Birmingham, Ala., assignor to Interpace Corporation, Whippany, N.J.

Filed Dec. 21, 1981, Ser. No. 332,951

Int. Cl.<sup>3</sup> F16L 3/12

U.S. Cl. 16—1 R

3 Claims



1. A bolt eyelet in combination with a bolt having a stem, a head and a longitudinal axis comprising:  
a U-shaped loop having an axis and loop ends;  
a horseshoe shaped base disposed in a plane generally perpendicular to a central plane of said loop and integrally formed with said loop, said base having U-shaped aperture for receiving said stem of said bolt, said aperture having a semicircular end and being elongated in a transverse direction normal to the central plane of said loop, the length of said aperture being greater than a cross section of said

bolt head, the loop ends being attached to said base at opposite ends of a diameter of the semicircular and of said aperture in the same plane as the central plane of the loop and wherein

said base includes a shoulder, said shoulder and said loop being disposed on the same side of said base, said shoulder being positioned above and spanning across an end of said aperture located away from said ends of said loop to provide space for the entry of said bolt prior to a securing of said bolt to said eyelet;

whereby upon the placing of said bolt into position in the eyelet, the bolt head will be in the same plane as the shoulder and during a normal tightening of the bolt, the head will contact the shoulder to automatically align the bolt axis with the central plane of the loop and the loop axis and thereby facilitate the tightening and positioning of the bolt.

4,419,786

## DOOR CLOSER ASSEMBLY

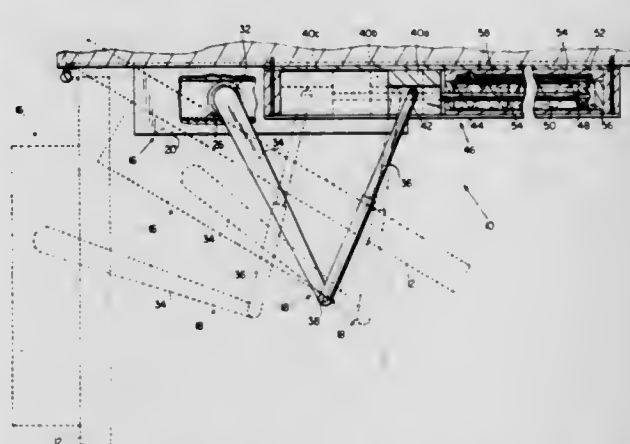
Walter E. Surko, Jr., Southington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 8, 1981, Ser. No. 223,398

Int. Cl.<sup>3</sup> E05F 3/00, 15/04

U.S. Cl. 16—51

27 Claims



1. In a door closer assembly for connection between door and frame members relatively movable between open and closed positions, said closer assembly including a door closer having a control element supported for movement in one and an opposite direction, first biasing means for yieldably resisting movement of the control element in the one direction from one position to another position and for moving the control element from the other position to the one position, mounting means for attaching the door closer to one of the members, linking means connected to the door closer for movement with the control element, and connecting means for securing said linking means to the other of the members to move the control element in the one direction in response to movement of the door member in an opening direction relative to the frame member, the improvement wherein said connecting means comprises means for securing an operating portion of said linking means to the other of the members for movement along a predetermined path relative to the other member from one location to another location spaced a substantial linear distance from said one location in response to movement of the door in an opening direction beyond a predetermined position to an open position and retaining means for releasably retaining said connecting means at said other location while the door is in said open position and until the door returns to a closed position.



4,419,787

**DOOR CLOSER ASSIST LINKAGE**

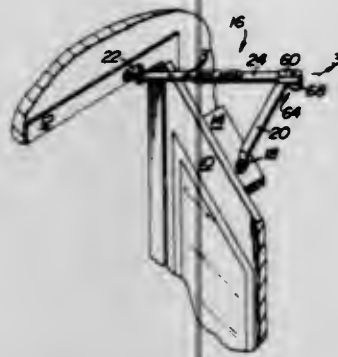
Sidney Lieberman, Leola, Pa., assignor to Dorma Door Controls Inc., Reamstown, Pa.

Continuation of Ser. No. 166,334, Jul. 7, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 422,000

Int. Cl.<sup>3</sup> E05F 1/12

U.S. Cl. 16—65

8 Claims



1. A control linkage for use with a door closer and a door for transmitting force therebetween, the door closer being mounted on one of a door or a frame and the distal end of said control linkage being connected to a point of anchorage on the other of said door or frame, said control linkage having a door open limit position and comprising a first elongated arm connected to the output shaft of the door closer, a second elongated arm pivotably coupled to said first arm and having one end thereof pivotably coupled to said point of anchorage, and means interconnecting said arms to first resiliently bias said arms against relative rotation toward said door-open limit position as said arms approach said position and then limit said arms against movement beyond said position, said means interconnecting said arms comprising resilient biasing means coupled to one of said arms and adapted to come into force-transmitting engagement with the other of said arms only when said control linkage approaches said door open limit position, said resilient biasing means providing a force in opposition to movement of said arms toward said door-open limit position, and a dead stop member coupled to said other arm for engagement with said one of said arms when said control linkage is in said door-open limit position, said resilient biasing means being so configured and arranged as to provide a bias for said arms and the door away from the door-open limit position to aid the closer in closing the door, said resilient biasing means comprising a spring member anchored to said one of said arms, said spring member being a torsion spring having one end thereof fixedly coupled to said one of said arms, an abutment disposed on the other of said arms, and said spring member having a free end thereof which contacts said abutment only when said control linkage approaches said door open limit position, and hinge means pivotably interconnecting said arms, said hinge means comprising a pivot pin having one end thereof affixed to said one of said arms, said other of said arms being pivotably received on said pivot pin, and said one end of said spring member being non-rotatably affixed to said pivot pin.

4,419,788

**ADJUSTABLE SPRING HINGE**

Adrian S. Probst, Columbus, N.C., assignor to Bommer Industries, Inc., Landrum, S.C.

Filed Jun. 9, 1981, Ser. No. 271,995

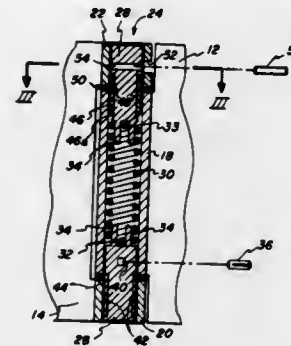
Int. Cl.<sup>3</sup> E05F 1/12

U.S. Cl. 16—300

8 Claims

1. A spring hinge comprising a pair of hinge leaves having hollow knuckles on adjacent edges located in end to end axial alignment to form a hollow hinge barrel, first and second pintles positioned in respective ends of the hinge barrel and extending into and between axially aligned knuckles of adjacent leaves to maintain them in axial alignment during their relative movement, means fixing said first pintle to a knuckle of one of said pair of said hinge leaves to prevent relative rota-

tional movement therebetween, a torsion spring located in said hollow barrel and extending between said first and second pintles, said spring having each of its end portions operatively connected to a respective adjacent pintle to prevent relative rotation therebetween, a bushing carried on a reduced diameter portion of the peripheral surface of said second pintle and extending axially therealong to engage the inner surfaces of adjacent knuckles, said bushing having a circumferential groove on its outer surface, a resiliently deformable thrust washer positioned between the adjacent ends of said adjacent



knuckles in circumferentially surrounding relation to said bushing, said washer having an internal diameter which is less than the internal diameter of said barrel and the external diameter of the bushing adjacent its groove to reside in said bushing groove and thereby retain said second pintle in said barrel while permitting its rotational movement about the axis of the same, and means for adjustably rotatably positioning said second pintle and fixing it against rotation in one direction relative to a knuckle of the other of said pair of hinge leaves whereby the torsional force exerted by said spring between said pair of hinge leaves may be adjusted.

4,419,789

**TORSION HINGE**

Tatsuhiko Matsui, Tokyo; Yasumasa Okada, Hino, and Minoru Shimatsu, Koganei, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

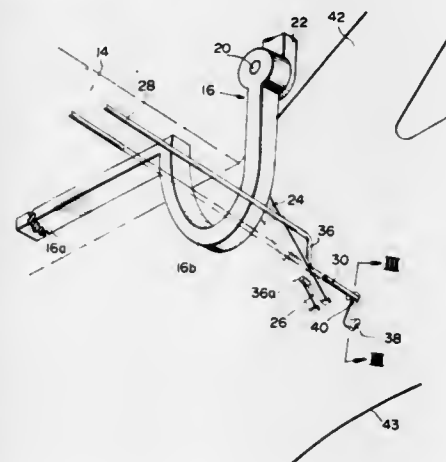
Filed Oct. 6, 1980, Ser. No. 194,529

Claims priority, application Japan, Oct. 9, 1979, 54-140870[U]

Int. Cl.<sup>3</sup> E05F 1/12

U.S. Cl. 16—308

6 Claims



1. An opening mechanism for use with a vehicle trunk having a pivotally opening trunk lid, comprising:

- (a) a relatively thin inner panel in the vehicle trunk having an S-shaped torsion bar mounting hole formed entirely therethrough;
- (b) a torsion bar having a bent first end portion inserted into said mounting hole wherein a bar portion adjacent one side of the bar bend is constrained against rotation by

4,419,791

**METHOD OF UNROLLING AND PIECING A LAP**  
Hugo Schär, Neftenbach, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Continuation of Ser. No. 928,894, Jul. 28, 1978, abandoned. This application Dec. 6, 1982, Ser. No. 447,312

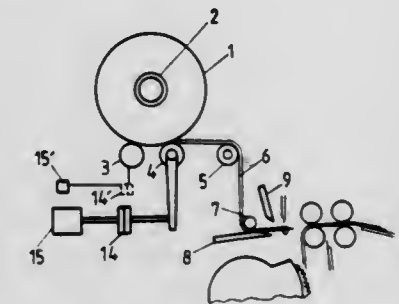
Claims priority, application Switzerland, Aug. 24, 1977, 10361/77

Int. Cl.<sup>3</sup> D01G 19/08

U.S. Cl. 19—215

3 Claims

abutment against a first recess end of said mounting hole and a bar portion adjacent the other side of said bar bend is also constrained against rotation by abutment against a second recess end of said mounting hole, said torsion bar extending substantially parallel to the trunk lid and having a second end portion; and  
(c) mounting means associated with the trunk lid for engaging said torsion bar second end portion and constraining said second end portion against rotation relative to said mounting means, said torsion bar being twisted about its axis when the trunk lid is closed causing said torsion bar to generate a torsional force urging the trunk lid to open.



4,419,790  
**FILLING TUBE FOR FILLING TUBULAR CASINGS WITH PASTY MATERIAL**

Herbert Niedecker, Am Ellerhang 8, D 6140 Königstein 2, Fed. Rep. of Germany

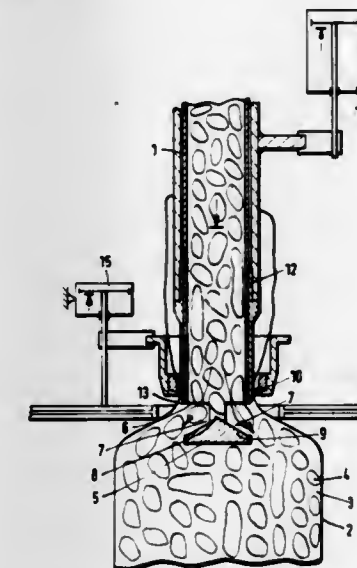
Continuation of Ser. No. 213,784, Dec. 8, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,803

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950590

Int. Cl.<sup>3</sup> A22C 11/04

U.S. Cl. 17—35

2 Claims



1. A filling apparatus for filling tubular casings with pasty material, comprising a hollow filling tube provided with a discharge opening, a cover or lidlike closure member mounted in front of the discharge opening of the filling tube, means for moving the closure member between a first position in which it closes the filling tube discharge opening and a second open position in which it permits discharge of the material to be packaged, web means for connecting the closure member to the filling tube peripherally in a manner that the material to be packaged is radially deflected into the casing between the discharge end and the closure member, a shell tube surrounding the filling tube and having its forward edge formed as a knife edge, a snubber about the shell tube for snubbing a casing during filling, means for axially displacing the shell tube relative to the filling tube in the filling direction so that in arriving in its final position the shell tube knife edge cuts any material projecting radially beyond the filling tube and the shell tube constitutes a peripherally extending closure for the discharge openings of the filling tube, and means for closing the casing after the shell tube arrives in its final position.

1. A method of unrolling and piecing a lap for combing machines, lap drafters and the like, comprising the steps of: supporting the lap on a pair of rolls, at least one of said rolls being connected to a drive which can be selectively engaged and disengaged; disengaging said drive to said one roll to render said roll freely rotatable whereby a fiber layer of the lap can be easily unrolled therefrom; piecing the fiber layer of said lap to a fiber layer of another lap; and thereafter engaging said drive to said roll, whereby the lap is thus driven and the fiber layer is therefore unrolled from said lap without being drafted.

4,419,792

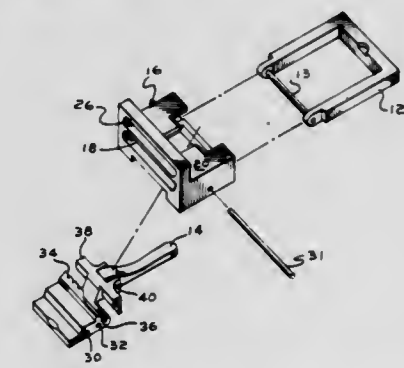
**REVERSIBLE BELT AND BUCKLE MECHANISM**  
Jerry L. Kohli, Feeding Hills, Mass., assignor to Buxton, Inc., Agawam, Mass.

Filed Dec. 18, 1981, Ser. No. 332,012

Int. Cl.<sup>3</sup> A44B 11/00

U.S. Cl. 24—170

8 Claims



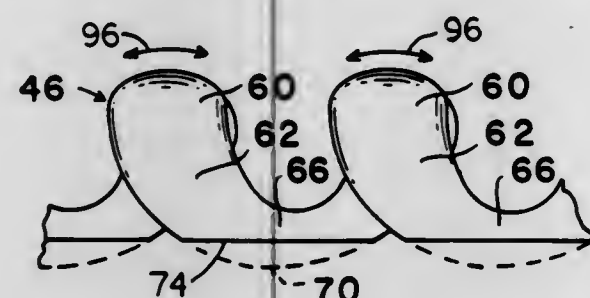
7. Reversible belt buckle for use with a separable belt comprising a belt receiving keeper, a discrete frame including a transverse pivot pin for hingedly coupling the frame to said keeper, and a latch lever pivotably mounted on said keeper, said lever being pivotable between a fully open position extending outwardly of said keeper and a closed position parallel to the undersurface of said keeper, said lever including a belt engaging rib extending from its upper surface and a downwardly facing channel for receiving the pivot pin of the frame and coupling the same to said keeper, said lever being pivotable about an axis and including a belthole engaging tongue pivotably carried by said lever whereby the lever is movable to engage simultaneously the underside of said belt by the belt engaging rib and to couple the frame to said keeper and to position said tongue in pivotable relation across said frame.



**4,419,793**  
**CONTINUOUS FILAMENT SLIDE FASTENER WITH CUTAWAY HEELS**  
 George B. Moertel, Conneautville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed Oct. 16, 1981, Ser. No. 311,818  
 Int. Cl.<sup>3</sup> A44B 19/12  
 U.S. Cl. 24—413

34 Claims

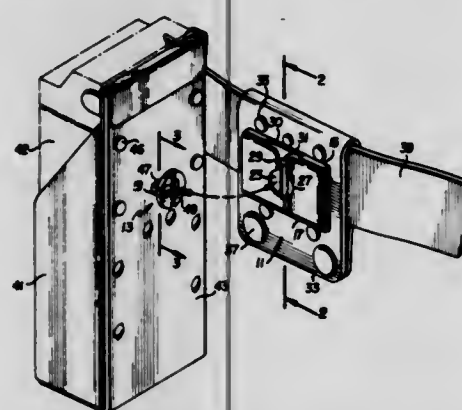


1. A stringer for a slide fastener comprising a support tape; a filamentary member mounted on the support tape and including a continuous filament formed into successive convolutions defining coupling elements wherein each coupling element has a head portion, a pair of leg portions extending from opposite sides of the head portion, and a heel portion connecting one of the leg portions to a corresponding leg portion of an adjacent coupling element; each coupling element being attached to said support tape; said filament in the leg portion having a substantially uniform cross-sectional area; and said filament in the heel portions having cross-sectional areas along the longitudinal length of said filament which are substantially reduced in size relative to the cross-sectional area of the leg portions by having a portion of the filament removed therefrom whereby flexibility of the stringer of the slide fastener is increased and the weight decreased.

**4,419,794**  
**PORTABLE FASTENING DEVICE**  
 Harold O. Horton, Jr., and William B. Thompson, both of Orlando, Fla., assignors to Repco Incorporated, Orlando, Fla.  
 Filed Oct. 5, 1981, Ser. No. 308,883  
 Int. Cl.<sup>3</sup> A44B 21/00

U.S. Cl. 24—667

4 Claims



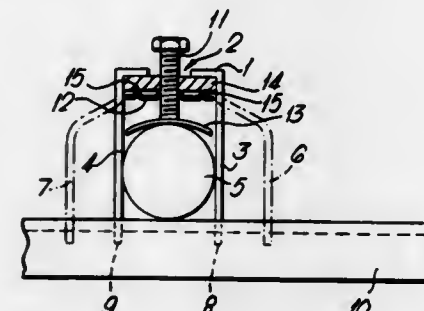
4. A device for removably and pivotally fastening two devices together comprising a female section including a keyhole; spring biasing means within said female section; a ridge supported by said spring biasing means; an open channel in said female section contiguous with the narrow dimension of said keyhole; means for mounting said female section to one of said devices; a male section comprising:

a button larger than said keyhole but having a width less than said open channel; a flat stud connecting said button to the other one of said two devices, the narrow dimension of said stud having a width less than the narrow dimension of said keyhole; an indentation in the outer face of said button having a geometrical configuration so as to mate with said ridge on said spring means; whereby said button and said stud may be positioned such that said stud passes through said narrow dimension of said keyhole with said spring means exerting a biasing force against the face of said button; said button and said stud being rotatable against the force of said spring means so as to engage and disengage said ridge and said indentation.

**4,419,795**  
**CLAMPS FOR CABLES, PIPES AND THE LIKE**  
 Robert C. Lyon, Wigan, England, assignor to BICC Limited, London, England  
 Filed Aug. 17, 1981, Ser. No. 293,108  
 Claims priority, application United Kingdom, Aug. 27, 1980, 8027683

U.S. Cl. 24—530

6 Claims



1. A clamp for securing at least one cable (as hereinbefore defined) to a support comprises a channel member having an apertured base and limbs shaped at their free ends for engagement with the support, and a sub-assembly comprising a screw, a saddle captive on the end of the screw remote from the screw head and positioned inside the channel member, a nut threaded on the shank of the screw between the screw head and the saddle, the aperture in the base of the channel being large enough to permit passage of the head of the screw but not so large as to permit passage of the nut and the nut comprising a slightly flexible, sheet-metal member having a threaded aperture and spaced from the aperture on at least one face of the nut, at least one upstanding bearing surface comprising a minor part of the surface area of said face, which can bear on the base of the channel.

**4,419,796**  
**METHOD OF MAKING SPIN STABILIZED DISCARDING SABOT PROJECTILE**  
 David E. Broden, Minnetonka, and Wilford E. Martwick, New Hope, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

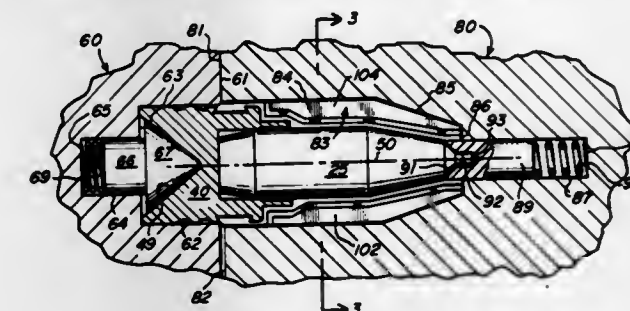
Filed Sep. 24, 1981, Ser. No. 305,078  
 Int. Cl.<sup>3</sup> B21K 21/06

U.S. Cl. 29—1.23

18 Claims

1. The method of producing a low dispersion discarding sabot projectile comprising the steps of:  
 (a) preassembling a subcalibre cylindrical projectile and a full calibre cylindrical pusher so that a tapered rear portion of said subcalibre projectile is set into a cup-like central forward facing recess in said pusher, said pusher comprising in part a circumferential groove positioned in approximate radial register with said tapered rear portion of said projectile;

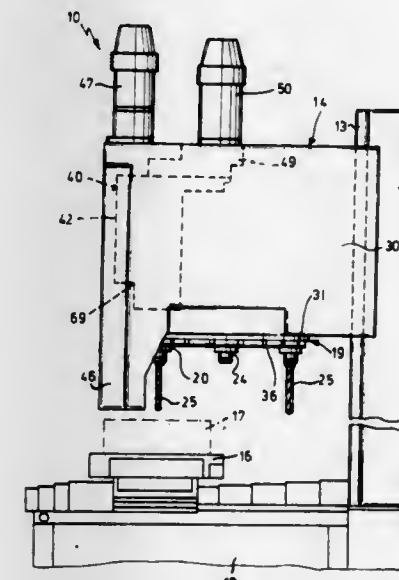
(b) placing said preassembled subcalibre projectile and pusher into a two-section injection molding machine with a first section of said molding machine including recessed means for receiving and positioning the rear portion of said pusher and with a second section of said molding machine having spring biased recessed means for receiving and positioning a pointed forward tip portion of said subcalibre projectile;  
 (c) positioning said two-section molding machine so that said first and second sections (i) are in abutting relationship, and (ii) define a discarding sabot cavity concentrically about said subcalibre projectile and a rotation ring cavity concentrically about said circumferential groove;



(d) injection of plastic material into said cavities which material, upon hardening, forms a discarding sabot and a rotation ring;  
 (e) removing, as by machining, surplus hardened plastic material from the external surfaces of said discarding sabot and said rotating ring, said machining being done with respect to a reference axis passing through said pointed forward tip portion of said subcalibre projectile and the center of said pusher; and  
 (f) installing a preformed nose piece on said pointed forward tip portion of said subcalibre projectile.

**4,419,797**  
**MACHINING CENTER**  
 K. Eugen Sigloch, Nachsommerweg 33, D-7000 Stuttgart-Freiberg, and Gerhard Stark, Beethovenstrasse 21, D-7311 Nottlingen, both of Fed. Rep. of Germany  
 Filed Nov. 13, 1980, Ser. No. 206,642  
 Claims priority, application Fed. Rep. of Germany, Nov. 13, 1979, 2945770  
 Int. Cl.<sup>3</sup> B23B 39/20; B23Q 3/157  
 U.S. Cl. 29—26 A

38 Claims

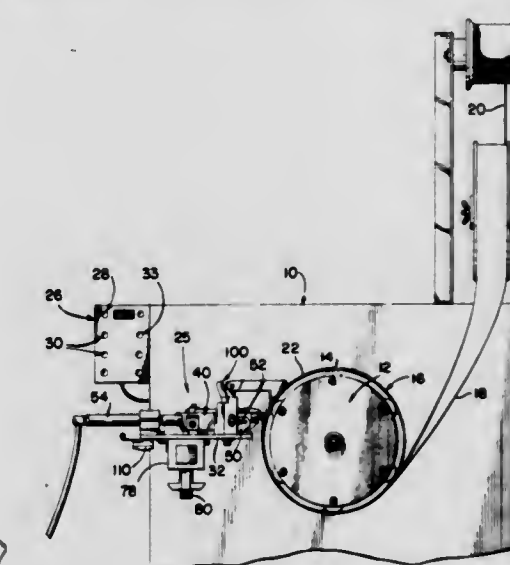


1. A machining center for carrying out at least one of a drilling and milling operation, the machining center including a machine frame, an outrigger attached to the machine frame, a tool spindle means for rotatably driving a tool means, a tool carrier means for carrying the tool means, a tool magazine means for accommodating at least one tool carrier means, and

means for mounting the tool spindle means to the outrigger so as to enable the tool spindle means to be displaced in an axial direction from an end position in alignment with a tool carrier means in the tool magazine means to a first position for enabling a coupling of the tool spindle means to the tool carrier means, and to at least one further position for machining a workpiece, and a magazine connecting means for supporting the tool carrier means during a coupling of the tool spindle means and for permitting an entrainment of the tool carrier means by the tool spindle means, characterized in that the mounting means includes a slide means arranged at the outrigger for enabling axial displacement of the tool spindle means, the tool spindle means extending through at least a zone of the slide means, means are provided for rotatably mounting the tool spindle means at the slide means, a guide means extends in parallel to an axis of rotation of the tool spindle means for guiding the slide means along a straight guide path, the guide means is arranged at a spacing from a portion of the machine frame to which the outrigger is attached, and includes at least one substantially planar slide track fixedly mounted on the outrigger, the tool magazine includes a gap for accommodating the tool carrier means to be supported by the magazine connecting means to be coupled with the tool spindle means and for enabling the zone of the slide means to pass through the tool magazine means, the slide means is arranged in a vicinity of a free end face of the outrigger, the free end face of the outrigger is disposed in a position facing away from the portion of the machine frame to which the outrigger is attached, and in that the zone of the slide means through which the tool spindle means extends faces the portion of the machine frame to which the outrigger is attached.

**4,419,798**  
**AUTOMATIC FLEXIBLE TUBE CUTTER**  
 Wayne K. Fairchild, 3620 W. Pendleton Ave., Santa Ana, Calif. 92704  
 Filed Mar. 20, 1981, Ser. No. 245,744  
 Int. Cl.<sup>3</sup> B23P 23/00; B26D 1/22  
 U.S. Cl. 29—33 T

3 Claims



1. An automatic-cutting apparatus for selectively cutting a given length of wire-reinforced flexible tubing, comprising: means for continuously forming a wire-reinforced flexible tubing; a base member adapted to be secured to a fixed structure adjacent said flexible tubing, as said tubing is being continuously formed; tube-cutting means operably mounted to said base member for selective cutting engagement with the annular wall of said tubing; wire-cutting means operably mounted to said base member and adapted to cut the reinforcing wire of said tubing at a selected point, whereby said selected given length of said



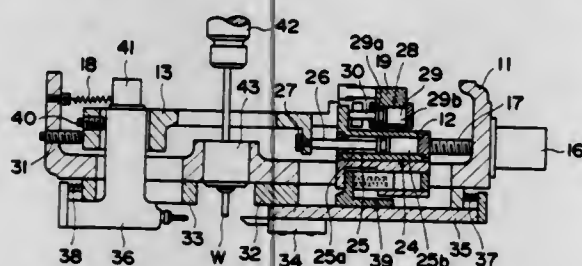
tubing is separated from the tubing being continuously formed;  
 means attached to said tube-cutting and said wire-cutting means for operating both of said means;  
 means for selectively controlling the predetermined length of tubing to be cut in a continuous manner;  
 a carriage member slidably and pivotally attached to said base member;

wherein said operating means comprises:

- a first actuating means pivotally mounted to said base member and connected to said carriage member to slidably engage said cutting means with the annular wall of said tubing for establishing an annular cut in said wall;
- a second actuating means mounted to said base member and adapted to pivotally move said carriage member, whereby said wire-cutting means engages and cuts said reinforcing wire of said tubing;
- cam means adapted to be engaged by said wire-cutting means to cause said wire-cutting means to cut said reinforcing wire;
- said tube-cutting means including a cutting blade mounted to said carriage; and
- said wire-cutting means comprising a pair of opposed wire-cutting members pivotally attached to each other, one of said wire-cutting members being affixed to said carriage, and the other wire-cutting member being positioned to freely engage said cam means, in order to close said opposed wire-cutting members as said carriage member is actuated by said second actuating means.

**4,419,799**  
**CUTTING TOOL DRIVING APPARATUS FOR A LATHE**  
 Yoshifumi Tuchiya, 6 of 1373, Baigo 6, Ohme-Shi, Tokyo, Japan  
 Filed Jan. 27, 1982, Ser. No. 343,381  
 Int. Cl.<sup>3</sup> B23B 21/00  
 U.S. Cl. 29—37 A

3 Claims



1. A radial cutting tool driving apparatus for a lathe, which comprises:

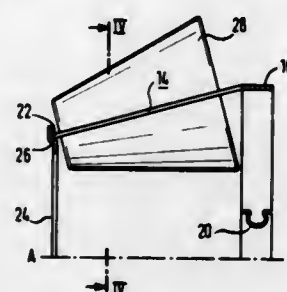
- first and second sliders disposed opposite to each other, and supported slidably on a frame, work being positioned between said first and second sliders;
- a servo motor and a ball screw and nut assembly adapted to drive said first slider;
- a first piston and cylinder assembly provided in said first slider, and having a piston secured at one end to said second slider;
- an arm supported rotatably on said frame;
- a second piston and cylinder assembly provided intermediate the ends of said arm, and including a piston having one end engaging said first slider and a cylinder mounted on said arm;
- a cam follower attached to one of said ends of said arm, and engaging said second slider; and
- spring means urging said second slider away from said first slider.

**4,419,800**  
**METHOD OF FORMING A CAGE FOR FRUSTO-CONICAL ROLLER BEARINGS**  
 Otto Bihler, and Reiner Augenstein, both of Halblech, Fed. Rep. of Germany, assignors to Otto Bihler Maschinenfabrik GmbH & Co. K.G., Halblech, Fed. Rep. of Germany  
 Filed Jan. 21, 1981, Ser. No. 227,137  
 Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002688

Int. Cl.<sup>3</sup> B21D 53/12

U.S. Cl. 29—148.4 C

15 Claims



1. Method of producing a cage for frusto-conical roller bearings comprising punching out windows from an elongated flat material first strip so that bars extending transversely of the elongated direction of the first strip remain between the windows, deforming the transversely extending bars, and bending the punched out strip to form a ring around the axis extending transversely of the elongated direction of the first strip and parallel to the flat surface of the first strip, wherein the improvement comprises punching out the flat material first strip so that a first bar extends along one elongated edge of the first strip with a number of elongated second bars extending transversely of the first bar and disposed in spaced relation in the elongated direction of the first strip and with the ends of the second bars spaced outwardly from the first bar being free so that the first bar and a pair of adjacent second bars form three sides of a window with the fourth side being open, deforming the second bars out of the plane of the first bar with the free ends of the second bars being offset relative to the plane of the first bar in the radial direction of the ring to be formed from the punched first strip whereby during the bending of the punched first strip and forming the first bar in the shape of a ring the free ends of the second bars are located on a circle having a diameter different from the diameter of the ring formed by the first bar, forming another end ring for connection to the free ends of the second bars, connecting the another end ring to the free ends of the second bars, and forming the another end ring from a flat material second strip by bending the second strip around an axis arranged to align with the bending axis of the first strip so that the flat surface of the second strip extends transversely of the bending axis of the second strip.

**4,419,801**  
**METHOD FOR MANUFACTURING A CAST IRON CYLINDER BLOCK**

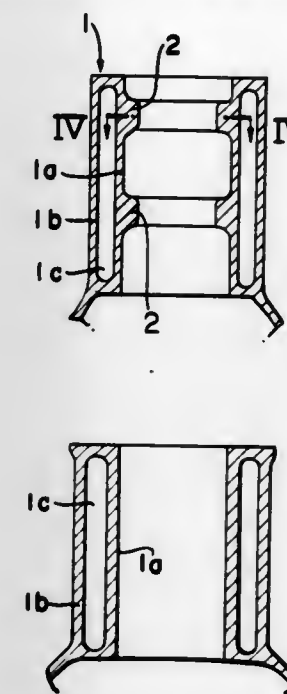
Hajime Yamashita, and Michio Takenaka, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan  
 Filed Jan. 19, 1981, Ser. No. 226,099  
 Claims priority, application Japan, Jan. 19, 1980, 55-4689  
 Int. Cl.<sup>3</sup> B23P 15/00, 13/02

U.S. Cl. 29—156.4 WL

4 Claims

1. Method for manufacturing a cast iron cylinder block for an internal combustion engine, in which piston slap noise can be decreased, said method comprising the steps of:  
 casting an iron cylinder block with a cylinder wall formed with at least one protuberance in a first area that will be subjected to a peak piston side thrust force during a descending stroke of the piston and without a protuberance in a second area that is not subjected to a peak piston side thrust force during a descending stroke of the piston so that the cylinder wall possesses in said first area a struc-

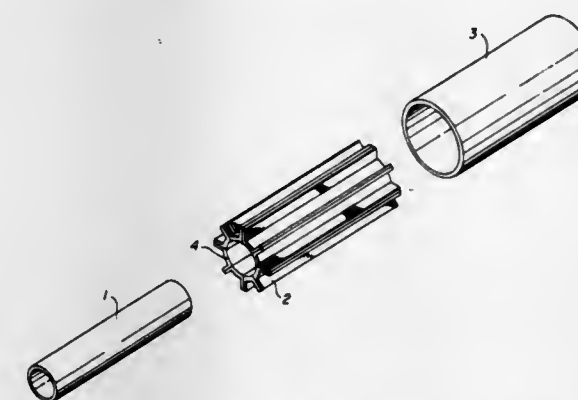
ture of graphite phase which is at least one of A and C types in accordance with ASTM standard, said A type having substantially uniformly distributed graphite flakes of medium size and said C type having in mixture substantially uniformly distributed graphite flakes of large and



small sizes, having more advanced growth of graphite in said first area than in said second area, and removing the protuberance to form a cylinder bore so that said first and second areas are provided with different graphite phases in the cast iron cylinder bore.

**4,419,802**  
**METHOD OF FORMING A HEAT EXCHANGER TUBE**  
 W. A. Riese, 23 - 13th St. SW., Massillon, Ohio 44646  
 Filed Sep. 11, 1980, Ser. No. 186,155  
 Int. Cl.<sup>3</sup> B23P 15/26  
 U.S. Cl. 29—157.3 A

3 Claims

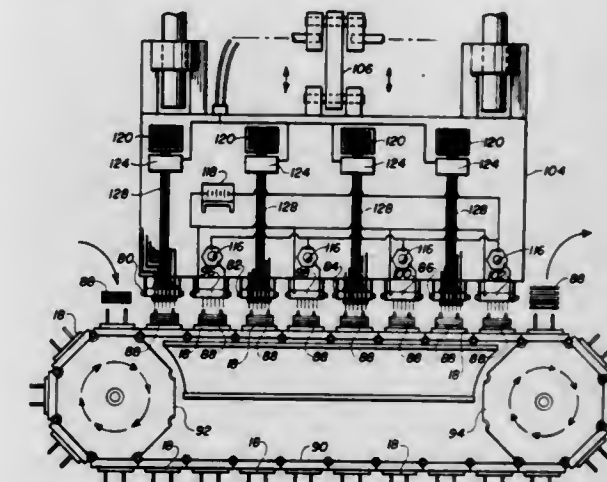


1. A method of joining inner and outer tubes with fin means therebetween thus forming a heat exchange tube comprising the steps of:

- sliding a first tube within a second tube,
- inserting fin means therebetween,
- expanding the first tube uniformly along its entire length radially for frictional engagement with the fin means which then causes the fin means ultimately to engage the second tube by expanding thereto, and not allowing the second tube to contract providing thereby a structure of uniform cross section along its entire length and assuring frictional contact of the tubes and fin means along the entire length wherein the first tube is expanded along its entire axial length by inserting a roller type tube expander therein and expanding the first tube radially outwardly with the roller expander along the entire axial length of the first tube.

**4,419,803**  
**METHOD OF FORMING A TOOL ASSEMBLY**  
 Henry M. Thornton, and John S. Thornton, both of York, Pa., assignors to Ashcombe Products Company, Dover, Pa.  
 Division of Ser. No. 231,340, Feb. 4, 1981. This application Nov. 26, 1982, Ser. No. 444,671  
 Int. Cl.<sup>3</sup> B23P 11/00; B23B 35/00  
 U.S. Cl. 29—428

6 Claims



1. A method of drilling or cutting a predetermined pattern of holes or cuts in a product sheet of material comprising the steps of:

- (a) selecting from a diagram sheet of an entire pattern of holes to be drilled in said product sheet of material desired partial patterns of holes of said entire pattern of holes to be drilled therein,
- (b) digitizing said partial pattern of holes upon a tape for a numerically controlled drilling machine,
- (c) operating a numerically controlled drilling machine as controlled by said digitized tape to drill said partial pattern of holes of predetermined diameter in a rigid sheet of material to form a rigid support plate having said partial pattern of holes for supporting respectively therein powered tool heads,
- (d) successively forming additional complementary digitized partial patterns of holes in related and complementary tape records,
- (e) successively forming related and complementary partial patterns of holes in additional rigid support plates to provide a set of said plates collectively embracing all holes to be drilled in said rigid support plates,
- (f) mounting powered tool heads respectively in the holes in said set of rigid support plates to form gang tool assemblies, and
- (g) drilling using said set of gang tools said partial patterns of holes successively in one or a stack of limited number of product sheets of material to achieve the entire desired pattern of holes therein.

**4,419,804**  
**METHOD FOR MANUFACTURING A PISTON ROD UNIT**

Ludwig Axthammer, Hambach, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Hambach, Fed. Rep. of Germany  
 Filed May 29, 1981, Ser. No. 268,331  
 Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020749

Int. Cl.<sup>3</sup> B23P 15/00, 11/00

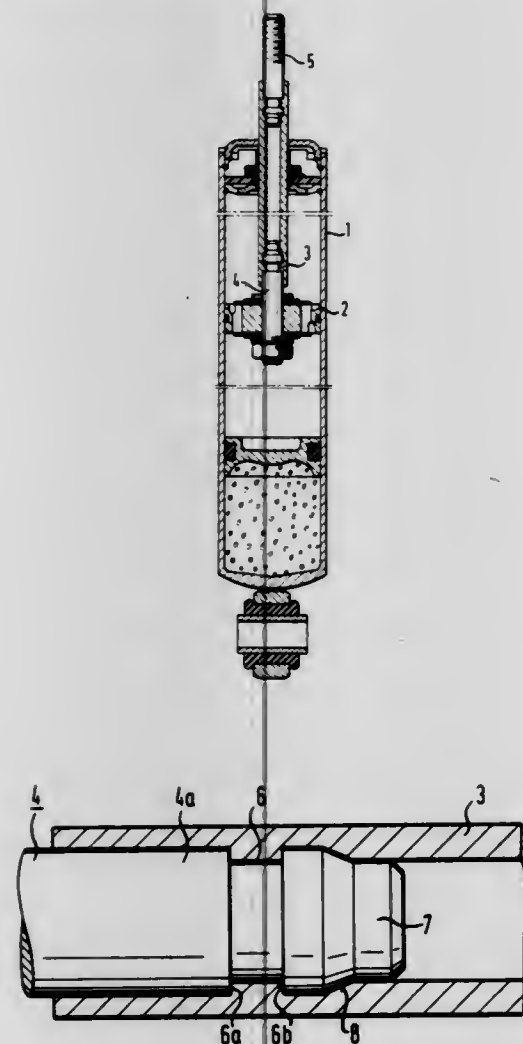
U.S. Cl. 29—434

29 Claims

1. A method of manufacturing a piston rod unit, including a metallic tube-shaped piston rod member having an initial inner diameter ( $d_i$ ) and an initial outer diameter ( $d_o$ ) and defining a cavity therein, and at least one terminal member (4) having a fastening pin (4a) within a respective end portion of said cavity, said method comprising the following steps:



- (a) providing a steel-made, tube-shaped piston rod member (3) with a constant initial inner diameter ( $d_i$ ) and constant initial outer diameter ( $d_o$ ) over the total axial length thereof;
- (b) providing a steel-made, terminal member (4) with the fastening pin (4a) to be introduced into said cavity, said fastening pin (4a) having
- (b1) an inner, substantially cylindrical end portion (7);
- (b2) an inner end face (7a) at the inner end of said inner end portion (7);
- (b3) an annular axially extending frusto-conically shaped expanding face (8) having a first end with a smaller diameter ( $d_s$ ) adjacent said inner end portion (7) and substantially corresponding to said initial inner diameter ( $d_i$ ) of said tube-shaped piston rod member (3), and a second end with a larger diameter ( $d_l$ ) adjacent the axial end of said expanding face (8) remote from said inner end face (7a), said larger diameter ( $d_l$ ) being larger than said initial inner diameter ( $d_i$ ) of said tube-shaped piston rod member;



- (b4) at least one shoulder face (6b) directed away from said inner end face (7a) and being located on the side of said expanding face (8) which is remote from said inner end face (7a);
- (c) introducing said inner end portion (7) into said cavity;
- (d) urging said fastening pin (4a) into said cavity so as to expand said tube-shaped piston rod member (3) along an axial end portion (3a) thereof by said expanding face (8), the outer diameter of said tube-shaped piston rod member (3) being expanded to an expanded diameter ( $d_{ex}$ ) along said end portion (3a), said expanded diameter ( $d_{ex}$ ) being larger than the initial outer diameter ( $d_o$ ) of said tube-shaped piston rod member and the expanded inner diameter of said piston rod member corresponding to both the larger diameter second end and the annular axially extending frusto-conically shaped expanding face of said expanding face;
- (e) radially compressing said expanded end portion (3a) of said tube-shaped piston rod member (3) by cold shaping so

as to reduce said expanded diameter ( $d_{ex}$ ) substantially to said constant initial outer diameter ( $d_o$ ) and to obtain axial engagement of said steel of said tubular piston rod member (3) with said shoulder face (6b).

#### 4,419,805 METHOD FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

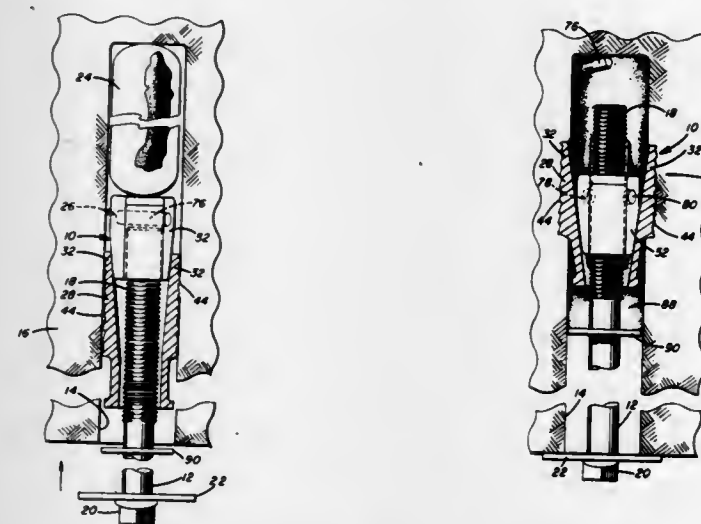
Frank Calandra, Jr., Johnstown, Pa., assignor to Jennmar Corporation, Cresson, Pa.

Filed Nov. 21, 1980, Ser. No. 209,134

Int. Cl.<sup>3</sup> B23P 25/00

U.S. Cl. 29—458

8 Claims



1. A method of anchoring a bolt in a bore hole comprising the steps of:

threadedly engaging a camming plug to the end of the bolt for axial movement thereon,

positioning an expandable shell having a plurality of longitudinally extending fingers in surrounding relation with the camming plug on the bolt,

preventing axial movement of the camming plug on the bolt by a stop means associated with the bolt upon rotation of the bolt in a preselected rotational direction,

preventing relative rotation between the bolt and the camming plug upon application of a predetermined torque by rotation of said bolt in the same preselected rotational direction so that the camming plug and the bolt rotate as a single unit and preventing said camming plug from rotating relative to said bolt and expanding said expandable shell,

displacing the stop means by the bolt as the bolt continues to rotate in said preselected rotational direction when a torque in excess of said predetermined torque is applied to the bolt; and

thereafter moving the camming plug on the bolt by rotation of said bolt in the same predetermined direction upon displacement of the stop means to expand the fingers of said expandable shell to anchor said expandable shell and said bolt connected thereto in the bore hole and applying a tension to said bolt.

#### 4,419,806 TOOL CHANGING DEVICE ON MACHINE TOOLS, PARTICULARLY ON HORIZONTAL BORING AND MILLING MACHINES

Karl-Josef Esser, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Scharmann GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

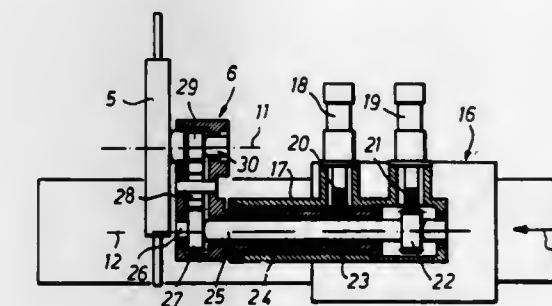
Filed Dec. 10, 1980, Ser. No. 214,632

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950577

Int. Cl.<sup>3</sup> B23Q 3/157

U.S. Cl. 29—568

7 Claims



1. A tool changing device for use with machine tools such as horizontal boring and milling machines having a headstock and drilling spindle, wherein the device exchanges tools between a tool supply and the drilling spindle, the device comprising in combination:

a base;

a carriage mounted on the base for reciprocation in the axial direction of the head stock and drilling spindle;

a pivot arm having a hollow mounting sleeve and a lateral portion, the hollow mounting sleeve being secured to said carriage for rotation only with respect thereto and having gear teeth therearound;

a first hydraulic cylinder mounted on the carriage and having a first toothed rack always only meshed with the gear teeth on the hollow mounting sleeve for rotating the pivot arm;

a shaft extending through the hollow mounting sleeve and having gear teeth at both ends thereof, the shaft being secured in the hollow mounting sleeve for rotation only with respect thereto;

a second hydraulic cylinder mounted on the carriage and having a second toothed rack always only meshed with the gear teeth on one end of the shaft for rotating the shaft;

a pinion journaled in the lateral portion of the pivot arm and meshing with the gear teeth at the other end of the shaft;

a gear journaled on the lateral portion of the pivot arm and meshed with the pinion, the gear having a mounting shaft projecting from the lateral portion of the pivot arm;

a tool changing arm having two ends with tool grasping members thereon, the tool changing arm being mounted midway its ends on the mounting shaft for rotation by the mounting shaft in a direction opposite that of the pivot arm as the pivot arm rotates; whereby the device inserts and withdraws tools as the carriage reciprocates and the tool changing arm rotates in the opposite direction of the pivot arm when being positioned to align the grasping members with the drilling spindle and tool supply.

4,419,807  
TOOL CHANGE DEVICE  
Georges Moulin, 17bis rue de Terrenoire, 42100 Saint-Etienne, France

Filed Mar. 2, 1981, Ser. No. 239,536

Claims priority, application France, Mar. 4, 1980, 80 05680; May 23, 1980, 80 12000

Int. Cl.<sup>3</sup> B23Q 3/157

U.S. Cl. 29—568

6 Claims

1. Tool-changing device adaptable to tool machines, comprising a storage magazine for tools mounted on independent

supports and capable of rotating so as to present the selected tool to a gripping means which can disengage the selected tool from its storage position and engage it into the spindle of the machine, characterized in that it comprises:

a base (2);

a cylindrical sleeve (3), having a longitudinal axis of symmetry, supported on said base for non-rotating rectilinear motion in a direction parallel to said axis;

a rotary barrel (6) mounted on and about said sleeve for concentric rotation about said axis;

cheeks (17 and 18) extending outwardly from the opposite ends of said rotary barrel;

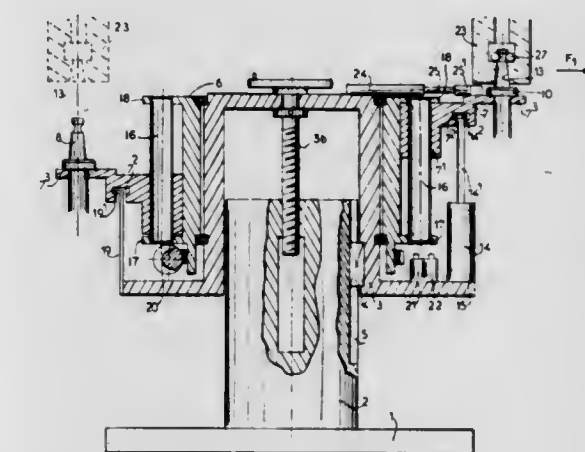
a series of guide pins (16) positioned circumferentially about said axis, with their axes parallel to said axis, and extending between said cheeks;

a corresponding series of annular sectors (7) mounted individually for motion along said pins parallel to said axis and parallel to said rectilinear motion;

each annular sector having means (9) to hold a tool;

each of said annular sectors having a circular tee-shaped groove (7<sup>2</sup>) therein, concentric about said axis;

a cylindrical safety ring (19), concentric about said axis and fixed to said cylindrical sleeve by a support (15), said



safety ring having a circular flange (19<sup>1</sup>), said safety ring and flange being of such dimension as to be meshable with the tee-shaped groove of an annular sector to thereby hold said annular sector captive against movement parallel to said axis but permit rotational motion about said axis;

said safety ring having a gap in its periphery of extent sufficient to release a one of said annular sectors from captive relationship between the tee-shaped slot in said one of said annular sectors and said safety ring and flange, when said barrel is rotated to bring said one of said annular sectors into alignment with said gap;

a jack (14) mounted on said support (15) and having an actuator (14<sup>2</sup>), said jack being located to have its actuator mesh with the tee-shaped slot of a one of said annular sectors while said one of said annular sectors is rotatably positioned at said gap in the safety ring and therefore not captive against movement parallel to said axis;

whereby said jack may move said one of said annular sectors parallel to said axis into a position out of longitudinal alignment with the other sectors;

whereby the tool held by said one of said annular sectors is positioned in space at a unique location, remote from positions in which tools are stored in other annular sectors.



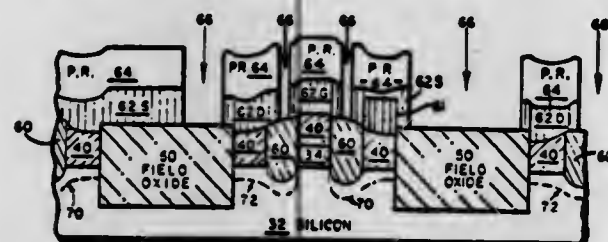
4,419,808

**METHOD OF PRODUCING REDUNDANT ROM CELLS**  
Matthias L. Tam, Monterey Park, and Frank Z. Custode, Norco, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 216,578, Dec. 15, 1980. This application  
Sep. 23, 1982, Ser. No. 421,757  
Int. Cl.<sup>3</sup> H01L 21/225, 21/265

U.S. Cl. 29—571

1 Claim



1. A method for producing an electrically programmable very large scale integrated circuit having at least one redundant read only memory cell comprising the steps of:

- forming a gate oxide;
- growing field oxide around active regions of a substrate including the region of gate oxide;
- forming the gate, source and drain conductors of doped polysilicon;
- forming source and drain regions on opposite sides of the gate;
- forming a layer of undoped polysilicon on the doped polysilicon drain; and
- forming contacts to the gate, source and drain whereby the layer of undoped polysilicon on the drain comprises a resistor connected in series with the drain.

4,419,809

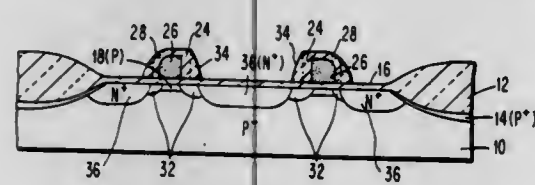
**FABRICATION PROCESS OF SUB-MICROMETER CHANNEL LENGTH MOSFETS**

Jacob Riseman, and Paul J. Tsang, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,893  
Int. Cl.<sup>3</sup> H01L 21/265

U.S. Cl. 29—571

26 Claims



1. Method of forming short channel length field effect transistors comprising:

- forming a first polycrystalline silicon layer on a silicon dioxide coating on the surface of a monocrystalline silicon substrate of one conductivity type;
- forming a silicon nitride layer over said first layer;
- removing portions of said insulator layer and said first polycrystalline silicon layer down to said silicon dioxide coating to produce openings having substantially vertical sidewalls on the remaining said insulator layer and polycrystalline silicon layer;
- thermally oxidizing the exposed said sidewalls of said first polycrystalline silicon layer to produce a silicon dioxide layer thereon;
- depositing a conductive layer over the various substantially vertical and substantially horizontal surfaces;
- anisotropically etching said conductive line layer to substantially remove all of said second layer from the horizontal surfaces while leaving said conductive layer on said vertical surfaces;

oxidizing to form a silicon dioxide layer upon the remaining said conductive layer;

removing the remaining said silicon nitride layer and said first polycrystalline silicon layer to define the gate regions of said field effect transistors by said remaining conductive layer and form the gate electrodes in the said conductive layer;

ion implanting a conductivity imparting impurity of an opposite conductivity type to said one type into said silicon substrate to form the source/drain regions using the said remaining said silicon dioxide layer over said second layer as the mask of the channel of the field effect transistor; and electrically ohmic contacting said source/drain regions and said gate electrodes.

4,419,810

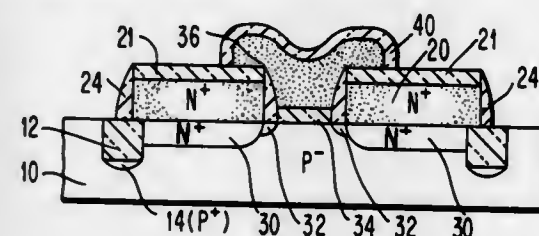
**SELF-ALIGNED FIELD EFFECT TRANSISTOR PROCESS**

Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,892  
Int. Cl.<sup>3</sup> H01L 21/265

U.S. Cl. 29—571

20 Claims



1. A method of forming self-aligned field effect transistors comprising:

- forming a heavily doped conductive layer of one conductivity type upon a monocrystalline silicon substrate of the opposite conductivity type to said one type;
- forming an insulator layer upon the surface of said conductive layer;
- forming openings with substantially vertical sidewalls through the said conductive layer to said silicon substrate in at least the locations of the planned gates of said field effect transistors;
- depositing a uniform thickness conformal insulating layer on said insulator layer over said conductive layer and the exposed said substrate and preferentially removing said insulating layer from the horizontal surfaces and leaving a sidewall insulating layer upon said substantially vertical sidewalls;
- wherein the said uniform thickness conformal layer is so chosen to form the desired channel length of said field effect transistors;
- heating the structure to form the heavily doped portions of the sources/drains of said field effect transistors of said one conductivity type by outdiffusion from said conductive layer;
- oxidizing the exposed said substrate to form the gate insulator of said field effect transistors;
- forming the gate electrode for each of said field effect transistors over said gate insulator; and
- forming electrical contacts to said conductive layer which are in electrical ohmic contact with said sources/drains through said insulator layer and electrical contacts to said gate electrodes.

4,419,811

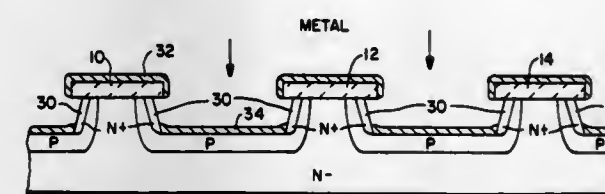
**METHOD OF FABRICATING MESA MOSFET USING OVERHANG MASK**

Edward J. Rice, Los Gatos, Calif., assignor to Acrian, Inc., Los Gatos, Calif.

Filed Apr. 26, 1982, Ser. No. 371,599  
Int. Cl.<sup>3</sup> H01L 21/22

U.S. Cl. 29—571

4 Claims



1. A method of fabricating a field effect transistor in a body of semiconductor material of first conductivity type comprising the steps of

- (a) forming a plurality of spaced layers of insulating material on a major surface of said body constituting a common drain region;
- (b) forming regions of opposite conductivity type in said major surface by introducing dopants into exposed portions of said major surface of said semiconductor body;
- (c) removing a portion of said region of opposite conductivity by chemical etching thereby forming mesa structures with said spaced layers of insulating material overhanging said mesas;
- (d) diffusing a dopant of said first conductivity type into the etched surface of said regions of opposite conductivity type;
- (e) applying a preferential etchant to said etched surface thereby removing said dopant of said first conductivity type except in the side walls of said mesas to form source regions; and
- (f) forming conductive metal layers on said plurality of spaced layers to form gate electrodes and conductive layers on said etched surfaces to form source electrodes, said spaced layers overhanging said mesas interrupting said conductive metal layers on said spaced layers from said conductive layers on said etched surface.

4,419,812

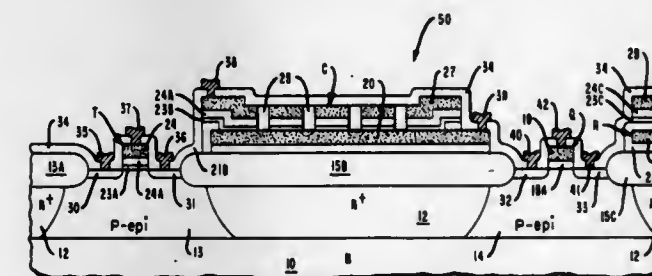
**METHOD OF FABRICATING AN INTEGRATED CIRCUIT VOLTAGE MULTIPLIER CONTAINING A PARALLEL PLATE CAPACITOR**

James A. Topich, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 23, 1982, Ser. No. 410,674  
Int. Cl.<sup>3</sup> H01L 21/98

U.S. Cl. 29—571

14 Claims



1. A process for forming a parallel conductive plate capacitor on a semiconductive substrate comprising:

- forming a first plate over said substrate;
- forming a dielectric layer over said first plate;
- forming a second plate having a plurality of windows over said dielectric;
- forming windows in said dielectric layer in a corresponding relationship with the windows in said second plate thereby forming a structure in which portions of the first

plate which are in correspondence with said windows in the dielectric layer are exposed; and  
subjecting the structure to a doping step to dope the entire first plate.

8. A process for forming a conductive polysilicon parallel plate capacitor and a polysilicon gate enhancement mode transistor for a voltage multiplier on a semiconductive substrate of a first conductivity type having an active region of a second conductivity type and a field isolation oxide region, said process comprising:

- forming a gate oxide layer over said active region;
- doping said active region to adjust the threshold voltage;
- forming a first polysilicon layer over said gate oxide;
- patterning said first polysilicon layer into a transistor gate electrode corresponding to said active region and a first plate of the capacitor corresponding to said field oxide region;
- forming an isolation oxide layer over said structure;
- selectively removing the isolation oxide over a central portion of the first polysilicon capacitor plate;
- forming a dielectric layer over the structure;
- forming a second polysilicon layer over said dielectric layer;
- patterning said second polysilicon into the second capacitor plate having a plurality of holes therein;
- patterning said dielectric layer into the capacitor insulator having a plurality of holes in correspondence with the holes in said second polysilicon capacitor plate;
- removing said isolation oxide to expose said gate electrode and said active region; and
- thermally diffusing or ion implanting active impurities of the first conductivity type to dope said first and second polysilicon capacitor plates and said gate electrode and form a source and a drain in self-aligned relationship with said gate electrode.

4,419,813

**METHOD FOR FABRICATING SEMICONDUCTOR DEVICE**

Hiroshi Iwai, Takaidonishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

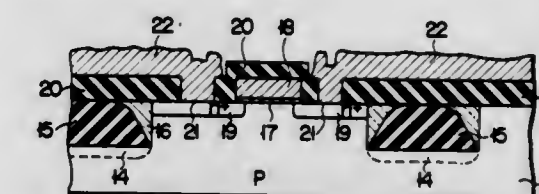
Filed Nov. 27, 1981, Ser. No. 325,375

Claims priority, application Japan, Nov. 29, 1980, 55-168584; Nov. 29, 1980, 55-168585

Int. Cl.<sup>3</sup> H01L 21/225

U.S. Cl. 29—576 W

26 Claims



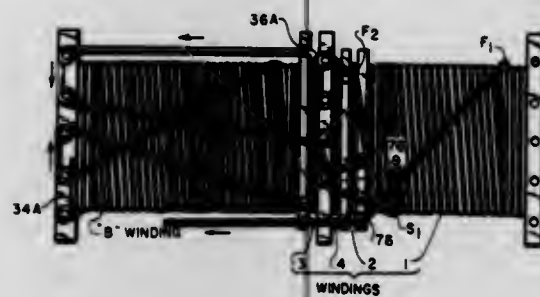
1. A method of providing a deep element isolation region in a semiconductor device having a semiconductor substrate during manufacture of the device, comprising the steps of:

- (a) forming a pattern of a masking material on the semiconductor substrate, and forming a groove in said semiconductor substrate by using the patterned masking material as a mask;
- (b1) forming a first insulating film in said groove in such a degree as to leave V-shaped gaps on both sides of said first insulating film, each said gap being surrounded between a side wall of the groove and said first insulating film;
- (b2) removing said masking material together with said first insulating film formed thereon to leave said first insulating film only in said groove;
- (c) forming a second insulating film on the surface of said semiconductor substrate including said groove; and
- (d) forming an isolation region substantially in said groove by removing a surface layer of said second insulating film.



4,419,814  
**METHOD OF MAKING A BOBBIN CONSTRUCTION FOR AUTOTRANSFORMER BALLAST**  
 Simon Hasserjian, Willowdale, Canada, assignor to General Signal Corporation, Stamford, Conn.  
 Filed Oct. 15, 1981, Ser. No. 311,568  
 Int. Cl.<sup>3</sup> H01F 47/06

U.S. Cl. 29—605



1. A method of fabricating an autotransformer ballast comprising the steps of:

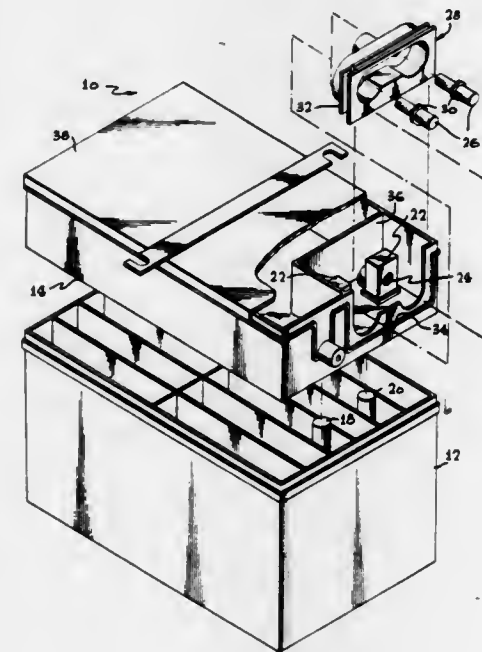
- (1) forming a single bobbin for accommodating a main primary winding and a main secondary winding, each having a large number of turns, and additional filament windings, each having a number of turns much smaller than the turns for the main winding;
- (2) said bobbin being defined by a tube adapted to accommodate a core, said bobbin being divided into sections along its longitudinal axis for receiving the respective windings;
- (3) further comprising the step of forming individual transverse dividers having a larger cross sectional area than said tube, thereby providing discrete bounded sections for the respective windings;
- (4) forming terminal pins upstanding from certain ones of said dividers so as to enable electrical connections from said windings while permitting continuously forming the windings, said terminal pins being formed in two aligned groups spaced along individual dividers;
- (5) and, in which the windings, which are designated the main secondary winding, filament windings 3, 4, and 2, and main primary winding are formed and spaced in order along the longitudinal axis of said bobbin, being continuously formed with respect to the terminal pins, which are designated the first pin through fifth pin for the first group in front-to-back order, and sixth pin to ninth pin for the second group in reverse order; in accordance with the following.

starting at the first terminal pin in the first group of pins, winding the main secondary or B winding, continuing by wrapping around the second pin of the first group, thence around the third pin, thence around a first support post; thereafter winding filament winding three, thence proceeding around the fifth terminal pin, thence the fourth pin, thereafter the eighth pin of the second group of pins; from the eighth pin, winding filament winding four, continuing around the seventh pin, thence the sixth pin, and around a second support post; thence, winding the filament winding two, thence proceeding around a third support and then the ninth pin; thence winding the first main winding, continuing around a fourth support post to terminate at the point of beginning;

thereafter, cutting the wire between the second pin and the third pin, between the fourth pin and the fifth pin, whereby the desired electrical configuration is obtained.

4,419,815  
**METHOD OF MAKING AN AIRCRAFT BATTERY**  
 David L. Rorer, and Jasper E. Hardin, both of Redlands, Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.  
 Division of Ser. No. 236,670, Feb. 23, 1980, Pat. No. 4,337,301.  
 This application Dec. 21, 1981, Ser. No. 333,041  
 Int. Cl.<sup>3</sup> H01M 2/06

1 Claim U.S. Cl. 29—623.2



1. A method of making an aircraft battery comprising the steps of:

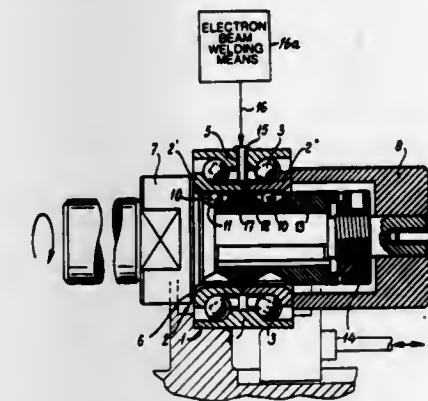
- installing and interconnecting battery plates within a casing;
- attaching a pair of connector posts to the plates so that the posts project above the top surface of the casing;
- providing a cover having a pair of lugs molded therein, each lug including an aperture extending vertically therethrough and a threaded nut cast within the lug so that its axis is horizontally disposed, the cover also including a slot in the wall of the cover, the slot having three sides and an opening at the top edge of the cover;
- fastening the cover to the top of the casing so that the posts extend through the apertures in the lugs;
- affixing the posts to the lugs;
- sealing the cover to the casing;
- providing a receptacle having a groove along its outer edge and two apertures extending horizontally therethrough;
- sliding the receptacle into the slot in the wall of the cover so that the receptacle groove engages the sides of the slot;
- providing a pair of terminal pins each having a threaded end and having a surface thereon adapted to receive a wrench for rotating it about its axis;
- inserting the threaded ends of the pins through the apertures in the receptacle;
- threading the threaded ends of the pins into the nuts cast within the lugs; and
- tightening the pins by means of a wrench bearing on the surface of the pin adapted to receive the wrench.

4,419,816  
**DEVICE FOR PRODUCING AN OBJECT CONSISTING OF AT LEAST TWO PARTS MOVABLE RELATIVE TO ONE ANOTHER ONE OF WHICH IS SUBSTANTIALLY ENCLOSED WITHIN THE OTHER**  
 Hendrikus J. Kapaan, Nieuwegein, and Martin B. Verburgh, Amersfoort, both of Netherlands, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands  
 Division of Ser. No. 98,535, Nov. 29, 1979, Pat. No. 4,330,911.  
 This application Mar. 1, 1982, Ser. No. 353,069  
 Claims priority, application Netherlands, Nov. 27, 1978, 7811624

Int. Cl.<sup>3</sup> B21D 53/10

U.S. Cl. 29—724

3 Claims



1. A device for assembling a bearing having an outer race ring, at least a pair of separate inner side by side race rings defining therebetween a parting line, a plurality of rolling elements in the annular space between the inner and outer race rings and a radially extending opening in the outer race ring aligned with the parting line of the inner rings comprising means for supporting the bearing elements to rotate the inner rings and maintain the outer rings stationary including a rotatable spindle having a guide or centering means engageable in the bore of the inner rings and a circumferential radial extending shoulder adapted to engage the axial end face of one said inner race rings, a cup member engageable over the free end of the spindle and engageable with the outer axial end face of the other inner race ring and means for adjusting the cup member axially thereby to clamp the inner race rings between the shoulder of the spindle and the cup member and electron beam welding means positioned to direct an electron beam through the opening in the outer race ring whereby upon rotation of said spindle and said inner race rings, the inner race rings are joined by welding at said parting line.

4,419,817  
**ELECTRICAL HARNESS FABRICATION APPARATUS**  
 Jack F. Funcik, Downers Grove, and Clarence Kolanowski, LaGrange, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Oct. 13, 1981, Ser. No. 310,479

Int. Cl.<sup>3</sup> B23P 19/00

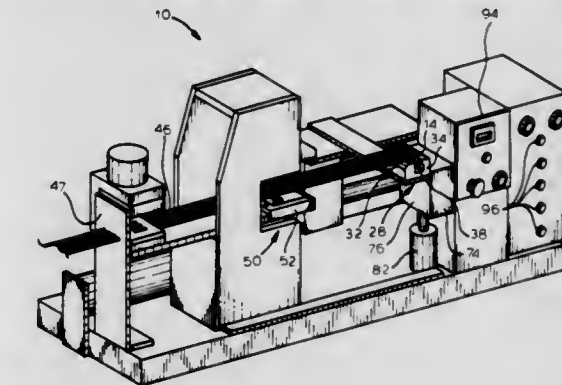
U.S. Cl. 29—749

2 Claims

1. In a machine for making an electrical harness, said harness comprising at least one connector with insulation displacement type contacts loaded therein, each contact connected to an insulation clad wire, each wire being of the same length, said machine including:

- a first station whereat a connector is initially positioned;
- a second station remote from said first station;
- holding means mounted at said second station for selectively gripping said wires;
- insertion means mounted at the second station for simultaneously displacing each wire into its corresponding contact;
- a connector carrier for mounting the connector thereon in a

given disposition removable between said first station and said second station in alignment with said wires; holding means mounted at said second station for selectively gripping said wires; wire cutting means mounted at the second station for cutting the wires to the same length; wire pulling means for imparting a force upon said cut lengths of wire for pulling said wire lengths from the second station and stripping the cut insulation segment from each end thereof; control means for sequentially actuating said insertion means, holding means, wire cutting means, connector carrier and wire pulling means in a given order, said control means moving said connector carrier from said first station to said second station, actuating said insertion means so that said wires are displaced in their corresponding contacts, releasing said wire holding means, moving said connector carrier back to said first station drawing



wire therewith, actuating said wire holding means, actuating the wire cutting means and the wire pulling means to form a completed electrical harness.  
 the improvement in said wire pulling means comprising:  
 a reciprocally mounted stripping block having a limiting surface defining the furthest limit of the first station away from said second station, said stripping block being movable in a path of travel generally transverse to the path of travel of the path of the connector carrier between a first position in the path of travel of the connector carrier whereby the connector carrier would abut said limiting surface when at the first station and a second position out of the path of travel of the connector carrier whereby said connector carrier would be able to travel past said first station in a direction away from the second station; and said control means moving the stripping block to its second position to allow said connector carrier to travel past said first station and exert a longitudinal force against said wires.

4,419,818  
**METHOD FOR MANUFACTURING SUBSTRATE WITH SELECTIVELY TRIMMABLE RESISTORS BETWEEN SIGNAL LEADS AND GROUND STRUCTURE**  
 Dmitry G. Grabbe, Lisbon Falls, Me., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1981, Ser. No. 314,921

Int. Cl.<sup>3</sup> H05K 3/30

U.S. Cl. 29—832

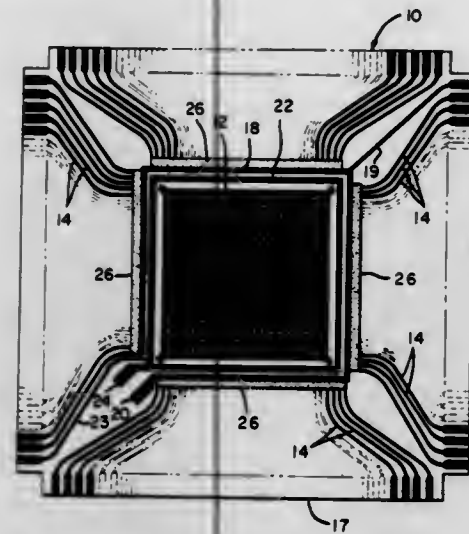
3 Claims

1. A method of manufacturing a semiconductor chip carrier comprising the steps of:

- (a) providing a dielectric substrate;
- (b) bonding signal leads and at least one ground bus on said substrate;
- (c) bonding resistive material on said substrate connected between said signal leads and said ground bus;
- (d) selectively removing said resistive material to form discrete paths of desired resistance between at least some of said signal leads and said ground bus,



- (e) placing a semiconductor chip on said substrate adjacent said ground bus; and

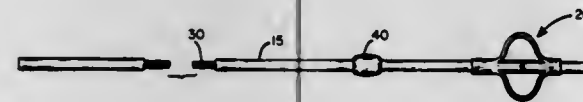


- (f) connecting at least some of said signal leads to said semiconductor chip by means of an elevated conductor passing over said resistive material and said ground bus.

**4,419,819**  
**METHOD OF MAKING BIOMEDICAL LEAD WITH LOBED LEAD ANCHOR**  
Eugene A. Dickhudt, and Roger A. Paulson, both of New Brighton, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.  
Filed Jan. 29, 1982, Ser. No. 344,123  
Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—857

5 Claims



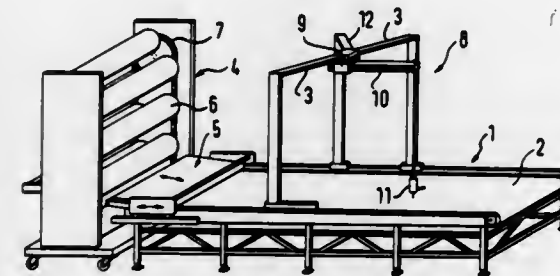
1. A method of making a body implantable lead of the type having an exposed electrode attached to a lead body comprising a conductor connected to said electrode and an insulating casing enclosing said conductor, and a lead anchor having lobes attached to said lead casing, comprising the steps of:  
providing a tube of pliable material substantially inert to body fluids, said tube being longer than the length of lobes desired and shorter than said lead body, having an inside diameter substantially equal to the outside diameter of the lead casing at the position it is desired to locate said lead anchor and having a plurality of slits in said tube in a direction substantially parallel to the axis of the tube, each slit extending from a point distal from the proximal end of the tube to a point proximal from the distal end of the tube and having a slit length equal to the lobe circumference desired;  
slipping said tube over said lead casing and positioning it at the location at which the lead anchor is desired;  
compressing the tube in a direction parallel to its axis to expand the slit portion of the tube into lobes; and while the tubing is in said compressed condition,  
securing said tubing to said lead casing at at least one point proximal to said slits and at least one point distal to said slits.

**4,419,820**  
**MATERIAL CUTTING MACHINE**  
Günter O. Stumpf, Ostendstrasse 13, 7432 Urach 1, Fed. Rep. of Germany  
Filed Mar. 4, 1982, Ser. No. 354,777  
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 8108075[U]

U.S. Cl. 30—124

Int. Cl.<sup>3</sup> B23K 15/00

8 Claims



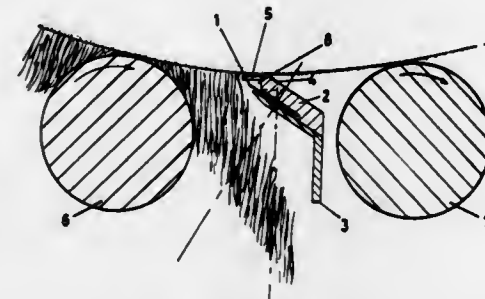
1. A cutting machine for single or multiple layer webs which are deposited on a laying table, said machine comprising:  
(a) a frame, said frame mounted for linear movement along said laying table, said frame having at least two vertical arms and a horizontal upper arm joining said vertical arms;  
(b) a rotatable element mounted on said horizontal arm for rotation about a vertical axis;  
(c) a linear guide means mounted for reciprocal movement in said rotatable element, said guide means pivotable in a horizontal plane to all sides of said table;  
(d) a cutting means for rotation at one end of said guide means,  
whereby said cutting means may be rotated, reciprocated along an axis defined by said guide means, pivoted in a horizontal plane, and linearly displaced to reach any point in a horizontal plane defined by said table.

**4,419,821**  
**SHEARING UNIT**  
Colin C. Anderson, 6 Montrose Pl., Beaumont, Adelaide, Australia  
PCT No. PCT/AU80/00110, § 371 Date Aug. 18, 1981, § 102(e) Date Aug. 18, 1981, PCT Pub. No. WO81/01678, PCT Pub. Date Jun. 25, 1981  
PCT Filed Dec. 18, 1980, Ser. No. 293,637  
Claims priority, application Australia, Dec. 18, 1979, PE1756

U.S. Cl. 30—276

Int. Cl.<sup>3</sup> B26B 19/24

7 Claims



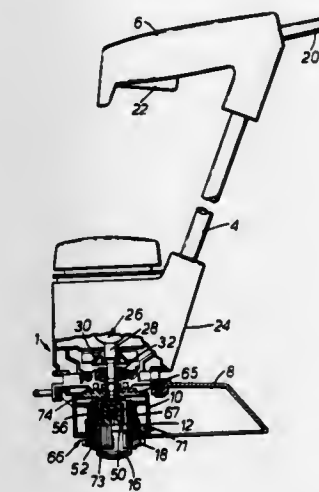
1. A shearing unit for shearing wool from a pelt or skin of a sheep, said unit comprising a head having an endless cutting blade, means to drive said endless cutting blade, and a comb to space said blade from the pelt or skin, characterised in that said comb essentially provides no support or restraint on the fibres of the wool and said endless cutting blade is provided with a serrated cutting edge, the serrations being of a size corresponding to that produced by a grinding stone selected within the range of 30 to 120 grit, whereby at high cutting speeds said serrated edge cuts the wool by the serrations impacting on the unsupported and unrestrained fibres of the wool.

**4,419,822**  
**BUMP-FEED TRIMMER**  
David Harris, Wolsingham, England, assignor to Black & Decker Inc., Newark, Del.  
Filed Jan. 12, 1982, Ser. No. 338,838  
Claims priority, application United Kingdom, Jan. 14, 1981, 8101099

U.S. Cl. 30—276

Int. Cl.<sup>3</sup> B26D 1/12

17 Claims



16. A cutting element holder, for use in a bump-feed string trimmer or the like, comprising:  
a cylindrical sleeve defining a central axis and having an outwardly extending flange at each end thereof to define an annular compartment;  
a coil of flexible cutting element wound in said annular compartment;  
a dome-like protrusion extending axially and centrally from one of the flanges on the opposite side thereof to said sleeve and having a cylindrical side wall coaxial with said sleeve;  
said cylindrical side wall having an outside diameter smaller than the internal diameter of said cylindrical sleeve;  
said one flange having a plurality of inwardly extending radial arms with the inner ends of said arm connected to said side wall, said arms defining recesses therebetween with said recesses extending into said one flange radially outwardly of said side wall; and  
said side wall having a plurality of window-like slots therein formed completely through said side wall from the inside to the outside thereof, said slots communicating with said recesses and extending completely through said side wall axially from said recesses;  
whereby in use said cutting element holder is slidably and releasably mounted on a sleeve-like escapement member of a bump-feed string trimmer in which the escapement member has externally threaded axial fingers adapted to slidably engage through said recesses into said slots with externally threaded portions of said fingers disposed radially outwardly of said side wall for engagement by a locking nut encircling the outside of said side wall.

**4,419,823**  
**PROGRAMMABLE BRAKING DEVICE**  
Gustav Thorban, Satteldorf, Fed. Rep. of Germany, assignor to Marabuwerke Erwin Martz GmbH & Co., Fed. Rep. of Germany  
Filed May 19, 1982, Ser. No. 379,780  
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124540

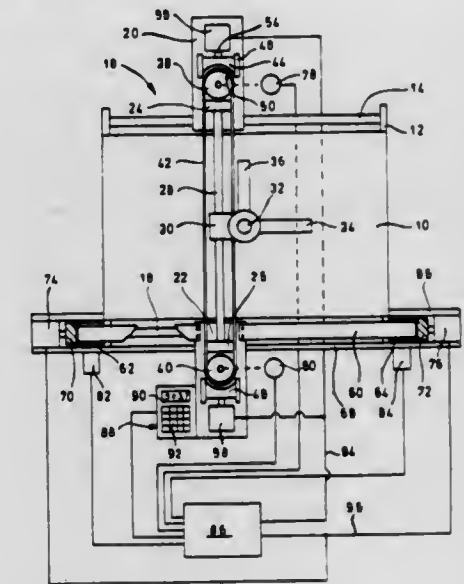
U.S. Cl. 33—1 M

Int. Cl.<sup>3</sup> B43L 13/02

17 Claims

1. A programmable braking device for a guide block that serves to move the drafting head of a drafting machine, which comprises:

- (a) at least one sensor that senses the actual coordinate position of the guide block,  
(b) an input unit for inputting the desired coordinate position of the guide block,  
(c) a computing circuit to which the output signals emitted by the sensor of (a) and the input unit of (b) are applied and which provides an output signal if the actual position of the guide block is identical with the desired position of the guide block,



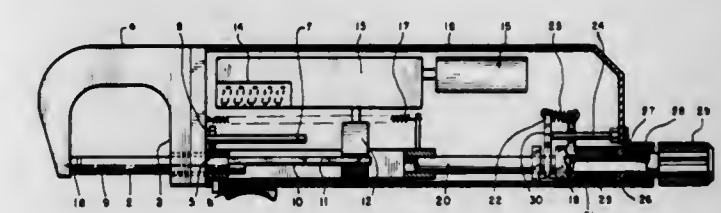
- (d) a servo-braking device interconnected with said guide block which servo-braking device is activated by the output signal emitted by said computing circuit to thereby lock the guide block against further movement,  
(e) draw means that move around pulleys,  
(f) said draw means that move around pulleys being connected to said guide block, and  
(g) said servo-braking device being positioned close enough to said draw means that move around pulleys so that there is engagement thereof when the guide block is to be locked against further movement.

**4,419,824**  
**DIGITAL ELECTRICAL LENGTH MEASURING INSTRUMENT**  
Johann Oberhans, Buchstorf, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany  
Filed Jul. 30, 1982, Ser. No. 403,800  
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131673

U.S. Cl. 33—143 L

Int. Cl.<sup>3</sup> G01B 3/18

14 Claims



1. In a digital, electronic length measuring instrument of the type comprising a bow, an anvil mounted to the bow, a measuring bolt continuously and directly slidable with respect to the anvil in a longitudinal direction, and a transducer which comprises means for sensing the longitudinal position of the bolt, the improvement comprising:  
a locking coupler having locked and unlocked orientations; means for connecting the locking coupler with the bolt such that the bolt is rigidly clamped in position with respect to the locking coupler in the longitudinal direction when the lock-



ing coupler is locked, and the bolt is freely slidable with respect to the locking coupler when the locking coupler is unlocked; and means for rigidly securing the locking coupler in place with respect to the anvil and for applying a predetermined measuring force on the locking coupler in the direction of the anvil; said locking coupler, connecting means, and securing means cooperating to lock the bolt securely in place with respect to the anvil and to apply a substantially constant measuring force to the bolt to bias the bolt against an object being measured between the anvil and the bolt.

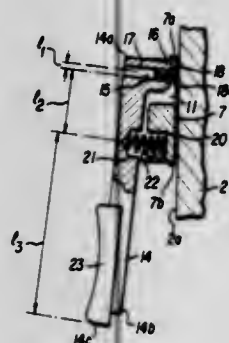
4,419,825

## HEIGHT GAUGE

Shigeo Miyamoto, Utsunomiya, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan  
Continuation of Ser. No. 170,041, Jul. 18, 1980, abandoned. This application Mar. 31, 1982, Ser. No. 363,808  
Claims priority, application Japan, Jul. 23, 1979, 54-101648  
Int. Cl.<sup>3</sup> G01B 5/02

U.S. Cl. 33—169 R

2 Claims



1. A height gauge comprising:
  - A. a vertical main beam having an end face; and
  - B. a slider having an upper edge portion, slidably mounted on the main beam, said slider carrying a scribe and a feed screw; and
  - C. a clamp body slidably mounted on the main beam and attached to the slider by means of the feed screw; said clamp body comprising:
    - (1) a clamp lever pivotally mounted on the clamp body; said clamp lever having a beam-contacting end and a finger-contacting end, wherein the beam-contacting end has a rotatable eccentric cam which engages the adjacent face of the main beam and by being rotated adjusts the force between the clamp lever and main beam; and
    - (2) said clamp lever having a finger grip, wherein said finger grip is extended up to the upper side portion of said slider; and
    - (3) said clamp lever pivoting about an axis parallel to the end face of the main beam, about a spring pin, wherein the axis is in close proximity to the eccentric cam; and
    - (4) the beam-contacting end of said clamp lever being urged toward the beam by a spring held under compression between the clamp lever and clamp body; wherein the distance from the center of said compression spring to the finger-contacting end of said clamp lever is greater than the distance from the contact point of said eccentric cam and said spring pin pivot point.

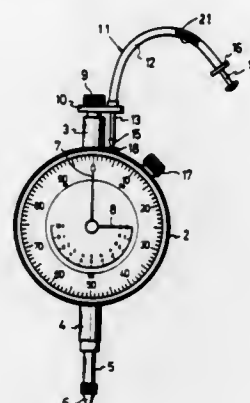
4,419,826

## DIAL GAUGE WITH RELEASING MEANS

Yoshiro Kanda, Batohmachi, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan  
Filed Oct. 13, 1981, Ser. No. 310,679  
Claims priority, application Japan, Oct. 23, 1980, 55-151519  
Int. Cl.<sup>3</sup> G01B 3/22

U.S. Cl. 33—172 R

10 Claims



1. In a dial indicator having release means, comprising an inner frame means, a spindle extending through said inner frame means and having opposite end portions projecting from opposite sides of said inner frame means, a contact point on one end portion of said spindle and adapted to contact a workpiece, a pointer coupled to said spindle for indicating the position of said contact point and an outer frame means mounted on said inner frame means, the improvement comprising wherein a connecting plate is detachably mounted on the other end portion of said spindle by means of a set screw, a release comprises an elongated tube and a wire means slidably movable longitudinally within and with respect to said tube, said tube being affixed to said connecting plate and said wire means abutting against the outer peripheral portion of said inner frame means, and said inner frame means comprises a cylindrical inner frame and said outer frame means is a bezel releasably fixedly mounted on said inner frame by means of a clamp screw.

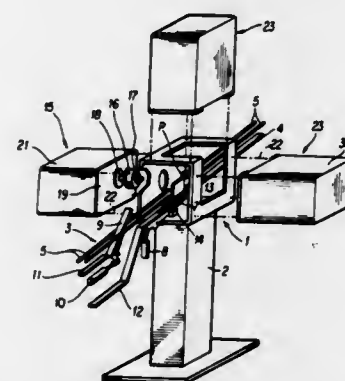
4,419,827

## MODULAR DEVICE FOR AUTOMATIC DIMENSIONAL GAUGING OF ROTATION PARTS

Roland Gluza, Bazainville, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France  
Filed Oct. 29, 1981, Ser. No. 316,280  
Claims priority, application France, Nov. 6, 1980, 80 23746  
Int. Cl.<sup>3</sup> G01B 7/12

U.S. Cl. 33—174 L

6 Claims

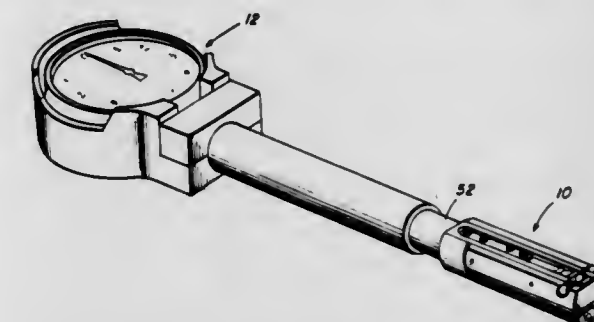


1. A fixture for the automatic gauging of parts having the shape of a solid of revolution, said fixture comprising:
  - a hollow chassis having perforated sides that include a plurality of tooled reference surfaces;
  - a support module including a base fixed to one of said reference surfaces;
  - a spindle supported in said support module for rotational and

translational movement, one end of said spindle extending into said chassis;  
a mandrel for grasping and carrying said parts, fixed to said spindle;  
at least one gauge module, each said at least one gauge module fixed to one of said reference surfaces;  
a feeler assembly movably mounted in each said at least one gauge module for movement between an inactive position and an active position wherein said feeler assembly is positioned adjacent a part held by said mandrel; and  
a chute passing through said chassis for bringing said parts to said mandrel, the position, height and width of said chute being adjustable for adaptation to various types of said parts.

responding to the extent of displacement of said member, said head comprising

- (a) a body;
- (b) connecting means for operatively connecting said body to said gauge;
- (c) a transfer rod mounted for limited longitudinal movement in said body and drivingly connected at one end to said member;
- (d) a bore-engaging sensing member movably mounted to the distal end of said body and drivingly connected to the other end of said rod;



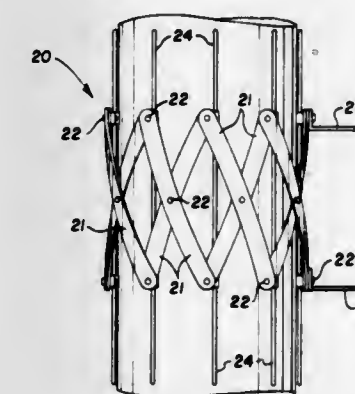
4,419,828

## APPARATUS FOR ESTABLISHING THE JUNCTION CONTOUR FOR INTERSECTING PIPES

David L. Farris, Rte. 1, Box 43D, Leesburg, Tex. 75451  
Filed May 19, 1981, Ser. No. 265,176  
Int. Cl.<sup>3</sup> G01B 5/20

U.S. Cl. 33—175

4 Claims



1. Apparatus for establishing, for a main and a lateral to be joined in intersecting relation, the contour of a mating junction; said apparatus comprising
  - an adjustable simulator having circumferentially spaced, axially-slidable rods for defining the outer diameter of said lateral; said simulator comprising an endless pantograph mechanism formed to a tubular configuration;
  - said rods being disposed on the inner wall of said pantograph mechanism to be placed, pursuant to adjustment of said mechanism, in contiguous relation with the surface of an encircled lateral to define said outer diameter of said lateral;
  - said pantograph mechanism having circumferentially spaced pairs of axially aligned pivot joints; pivoted bracket means mounted at each of said pivot joints; one of said rods being mounted in each pair of brackets corresponding to each of said circumferentially spaced pairs of pivot joints, whereby said pantograph mechanism supports said rods in circumferentially spaced parallel relation to its longitudinal axis; said rods defining the inner cylindrical surface of said simulator;
  - means for guiding said simulator adjacent to said main with its longitudinal axis aligned along the projected axis of said lateral;
  - and said rods being movable into engagement with the surface of said main to establish said contour.

4,419,829

## HEAD FOR BORE GAUGE

Mark H. Miller, Johnston, R.I., assignor to Federal Products Corporation, Providence, R.I.  
Filed Jul. 31, 1981, Ser. No. 288,985  
Int. Cl.<sup>3</sup> G01B 5/08, 7/12

U.S. Cl. 33—178 R

26 Claims

1. A head for a bore gauge having a movable member therein adapted to produce an indication of measurement cor-

- (e) an adjustable bore-engaging element mounted to the distal end of said body on the opposite side of said head in diametrical alignment with said sensing member;
- (f) manually actuated rack and pinion means operatively associated with said element for extending and retracting said element diametrically to and away from said body;
- (g) centralizing means connected to said body for engaging the walls of said bore and positioning said sensing member and said element along the diameter of said bore; and
- (h) locking means mounted to said body and engageable with said element for locking said element at a selected position.

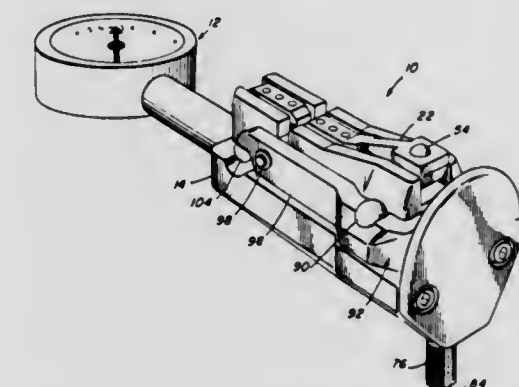
4,419,830

## BORE GAUGE HEAD ASSEMBLY

Mark H. Miller, Johnston, R.I., assignor to Federal Products Corporation, Providence, R.I.  
Continuation-in-part of Ser. No. 288,985, Jul. 31, 1981. This application Mar. 11, 1982, Ser. No. 356,947  
Int. Cl.<sup>3</sup> G01B 5/12

U.S. Cl. 33—178 R

9 Claims



1. A head for a bore gauge having a movable member therein adapted to produce an indication of measurement corresponding to the extent of displacement of said member, said head comprising:

- (a) a body;
- (b) connecting means for operatively connecting said body to said gauge;
- (c) a transfer rod mounted for limited longitudinal movement in said body and drivingly connected at one end to said member;
- (d) a bore-engaging sensing member movably mounted to the distal end of said body and drivingly connected to the other end of said rod;



- (e) an adjustable bore-engaging element mounted to the distal end of said body on the opposite side of said head in diametrical alignment with said sensing member;
- (f) said body being formed with a tapped hole coaxial with said alignment and a threaded stem disposed in said hole, said element mounted on the outer end thereof whereby rotation of said stem will selectively extend or retract said element diametrically to and away from said body and said sensing member;
- (g) a measurement scale located lengthwise along said stem for visually indicating the extension of said stem from said hole;
- (h) centralizing means connected to said body for engaging the walls of said bore and positioning said sensing member and said element along the diameter of said bore;
- (i) a locking nut mounted to said stem and engageable with said body for locking said stem at a selected position;
- (j) said other end of said transfer rod being formed with a diagonally extending V groove, said sensing member being resiliently and pivotally mounted to said body and including a spherical portion seated in said groove whereby any pivotal movement of said sensing member is converted to a linear movement of said rod; and
- (k) a support member mounted to said body transversely of said rod and engaging said rod along one side thereof adjacent said other end and opposite said groove to provide sliding support for said rod.

4,419,831

# METHOD AND APPARATUS FOR REPRODUCIBLY ASSOCIATING TWO MECHANICAL ELEMENTS WHICH ARE MOVABLE RELATIVE TO EACH OTHER

Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

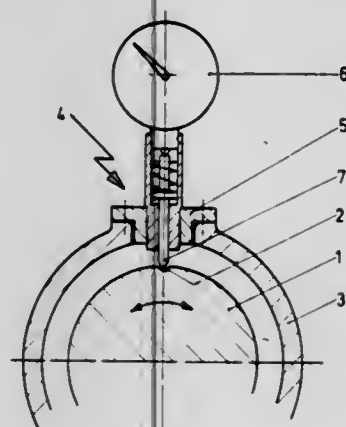
Filed Jun. 6, 1979, Ser. No. 45,880

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825581

Int. Cl.<sup>3</sup> G01B 5/00

U.S. Cl. 33-181 R

4 Claims



1. An apparatus for reproducibly establishing a mechanical zero position for two relatively movable parts of an industrial robot, comprising:

- a tubular receiving part;
- a shaft part rotatably mounted in said tubular receiving part and having a circumferential surface and one radial position with a single notch at a lower radial position having a relatively small circumferential extent with respect to said circumferential surface; and
- a dial gauge fixed to said tubular receiving part over said circumferential surface of said shaft part, said dial gauge having a movable dial and a sensing needle operatively connected to said movable dial for moving said dial with movement of said needle, said needle engaged with said circumferential surface and positioned to engage in said notch with each full rotation of said shaft part so that said dial remains motionless as said shaft part rotates with said

- needle engaged on said circumferential surface and moves only when said needle engages said notch;
- whereby movement of said dial indicates the mechanical zero position between said tubular part and said shaft part.

4,419,832

# AIRCRAFT ATTITUDE DISPLAY INSTRUMENT

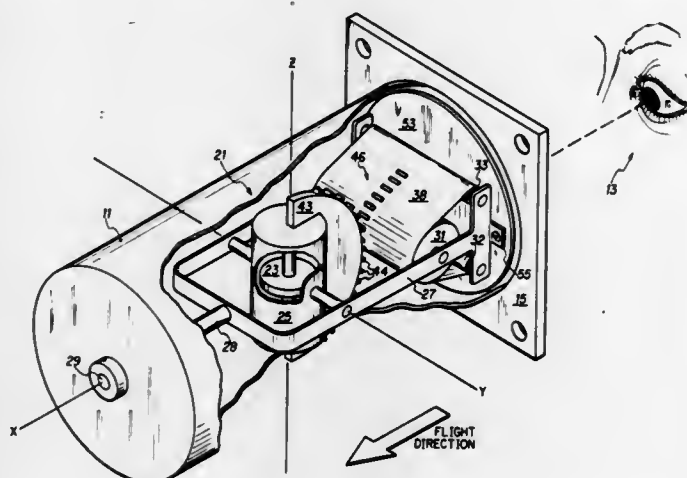
Donald F. Schmidt, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 8, 1982, Ser. No. 346,452

Int. Cl.<sup>3</sup> G01C 19/00

U.S. Cl. 33-329

11 Claims



1. An attitude indicator instrument for aircraft comprising: gyroscopic first means having a spin axis which is capable of angular movement, relative to said aircraft, about a further axis;
- second means comprising a strip of material suitable for bearing visible markings, said strip containing perforations and being formed into a closed loop;
- third means for supporting, and allowing movement of, said second means, said third means defining a path around which said second means may travel;
- fourth means for engaging said perforations, and
- fifth means for coupling said fourth means with said first means such that angular movement of the spin axis relative to the aircraft causes movement of said fourth means which in turn drives the second means around its path in a direction opposite to the angular movement of the spin axis.

4,419,833

# COMPOSITE LEVEL CONSTRUCTION

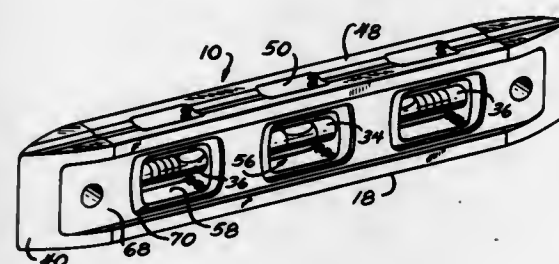
Randall J. Wright, 9150 W. Hawthorne, Milwaukee, Wis. 53226

Filed Jan. 24, 1983, Ser. No. 460,160

Int. Cl.<sup>3</sup> G01C 9/32

U.S. Cl. 33-379

10 Claims



8. An instrument for determining level or pitch relationships comprising:

- (a) a level or pitch vial;
- (b) a metal frame having a first planar working surface and an upstanding web, the web including means for position-

- ing and for retaining the vial in a predetermined angular relationship with respect to the first planar working surface;
- (c) a plastic element having a second planar working surface; and
- (d) means for automatically aligning the plastic element and the plastic second planar working surface in a predetermined angular relationship with respect to the vial, wherein the means for aligning the plastic second working surface in the predetermined second angular relationship to the vial includes means for aligning said plastic second working surface in a predetermined third angular relationship with respect to the first working surface, the first and third predetermined angles defining the second predetermined angular relationship and wherein the means for aligning the plastic second working surface in third predetermined angular relationship includes level instrument end caps secured to the ends of the frame in predetermined relationship with respect to the first working surface, means positioning the plastic second working surface in predetermined relationship with respect to the end caps.

4,419,835

# HAIR DRYER

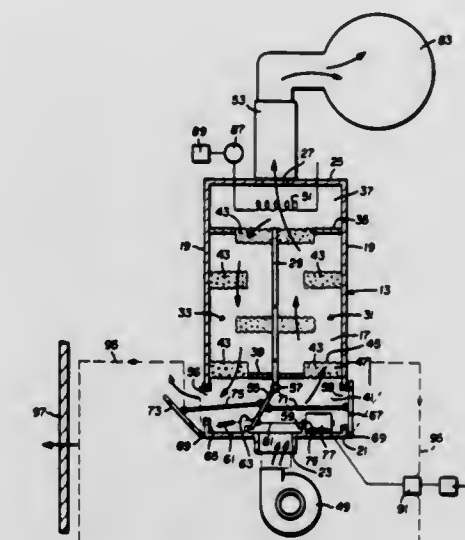
Don R. Strain, Clarkston, Mich., assignor to H.D. Research Company, West Bloomfield, Mich.

Filed Apr. 30, 1981, Ser. No. 259,121

Int. Cl.<sup>3</sup> F26B 21/08

U.S. Cl. 34-80

7 Claims



1. A dryer comprising:
- an enclosed housing including an air inlet and an air outlet; opposed first and second flow desiccant bed ducts on each side of said inlet and outlet;
- an inlet plenum located between said inlet and said opposed flow ducts and an outlet plenum located between said outlet and said opposed flow ducts;
- said inlet and outlet plenums communicating through said flow ducts;
- a valve door pivotally supported within said housing having one end extending across said inlet to direct air received from said inlet into one of said flow ducts in a first pivotable position and into said opposite flow duct in a second pivotable position;
- door actuating means intermittently pivoting said valve door between said first and second positions to alternately and intermittently direct air into one of said first and second flow ducts;
- blower means directing air into said inlet;
- said flow ducts each comprising perforated baffle assemblies of loosely packed desiccant material having a low pressure drop across each baffle assembly;
- a heater means, positioned within said outlet plenum in the air path therein, adapted for heating the dehydrated air passing through said outlet plenum rendering said dry air more hygroscopic for increased drying of the air passing through said outlet and the air returning through the other of said flow ducts for rapid regeneration of said baffle assemblies;
- valve means in said inlet plenum;
- said valve means alternately directing air received from one of said flow ducts out of said housing;
- said blower means directing air into said inlet;
- said valve door and door actuating means alternately and intermittently directing said air into one of said flow ducts, into said outlet plenum, and a large portion of said air out of said outlet;
- said outlet being a restricted opening and creating a back pressure in said outlet plenum directing a portion of air received from said opposed flow duct into the opposite flow duct; and
- said valve means directing said portion of air received from said opposed flow duct out of said housing.

4,419,834

# TREATING FLUIDIZED MATERIAL

John F. Scott, Orelan, Pa., assignor to Proctor &amp; Schwartz, Horsham, Pa.

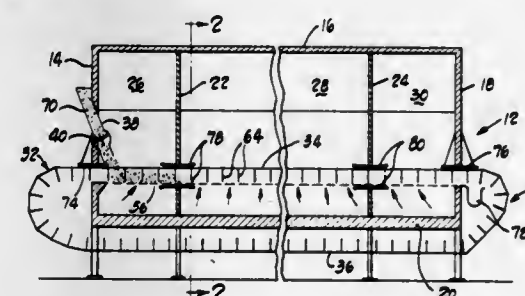
Continuation of Ser. No. 177,190, Aug. 11, 1980, abandoned.

This application Feb. 8, 1982, Ser. No. 346,923

Int. Cl.<sup>3</sup> F26B 17/04

U.S. Cl. 34-57 A

5 Claims

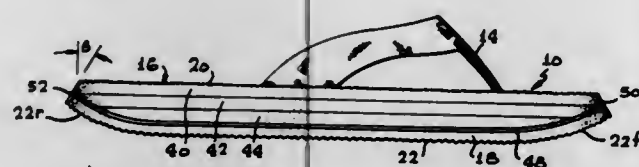


1. A fluid bed apparatus for controlled residence treating of particulate material comprising
- means defining an enclosed treating chamber;
- a foraminous support extending longitudinally within said chamber for supporting a bed of material within the chamber, said support having an exit end;
- gas supply means beneath said foraminous support; means for supplying gas to said gas supply means under sufficient pressure to levitate the material in said bed and to form a fluidized bed;
- a series of spaced-apart flight means substantially coextensive with the fluidized bed movable longitudinally above said foraminous support past the exit end of said support, the lower edges of said flight means being substantially contiguous with the foraminous support and the upper edges of the flight means being no lower than the bed upper surface, thereby moving the entire bed of said material confined by the flight means longitudinally and uniformly along said support to control the residence time of the particulate material in said chamber, said flight means being independent of the support.



**4,419,836**  
**FOOTWEAR IN THE FORM OF A SANDAL**  
 James K. Wong, 46-194 Nona Loop, Kaneohe, Hi. 96744  
 Continuation of Ser. No. 916,463, Jun. 19, 1978, Pat. No. 4,226,031. This application Jan. 25, 1980, Ser. No. 115,552  
 Int. Cl.<sup>3</sup> A43B 3/12  
 U.S. Cl. 36—11.5

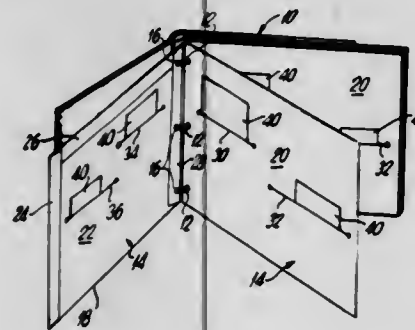
3 Claims



1. A sandal comprising:  
 a sandal base;  
 strap means for holding a foot on the base;  
 said base having a lower surface that slopes upwardly forwardly at the forward portion thereof in a convex curve so that the slope angle gradually increases at progressively more forward locations;  
 said base lower surface sloping upwardly-rearwardly at the rearward portion thereof in a convex curve so that the slope angle gradually increases at progressively more rearward locations, whereby to avoid splashing onto the sandal when walking at the seashore or other wear areas.

**4,419,837**  
**APPARATUS FOR DISPLAYING ADVERTISING MATERIAL**  
 David M. Meeker, Saratoga, Calif., assignor to Champion International Corporation, Stamford, Conn.  
 Continuation of Ser. No. 808,603, Jun. 21, 1977, abandoned.  
 This application Jun. 24, 1981, Ser. No. 276,877  
 Int. Cl.<sup>3</sup> B65D 27/08  
 U.S. Cl. 40—359

1 Claim

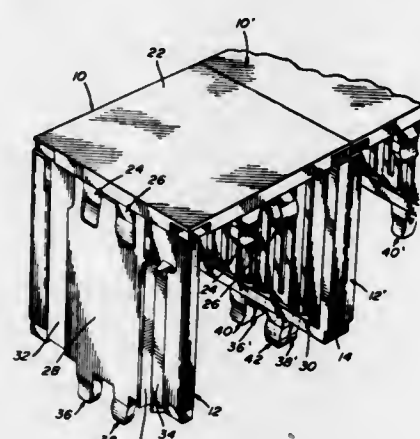


1. A display carrier for display of a plurality of differently sized sample envelopes in a loose leaf binder, said display carrier being generally rectangular in configuration and consisting of a sheet folded along a medial line thereof to form an envelope engaging first edge and defining a front panel and a back panel, said front panel being of greater area than said back panel and including flaps extending along the three remaining free edges, each flap being folded along its associated edge and bonded to the back panel, said front panel and back panel each having a plurality of differently sized elongated slots formed therein, each said slot in the front panel and back panel being disposed parallel to said envelope engaging first edge of the display carrier, with each of the slots in the front panel and back panel being spaced at different lengths from said envelope engaging first edge, out of alignment with other slots in its respective panel and with the ends of each said differently sized slot terminating in annular openings whereby the differently sized envelopes to be displayed each may be inserted into one of said slots to engage said envelope engaging first edge and thereby be maintained in position for display purposes, the spacing of said slots from said envelope engaging first edge being such as to permit each slot to receive more than half of

its respective sample envelope, said display carrier further including aligned, spaced apertures extending through the front panel, back panel, and a flap portion, along one edge disposed perpendicular to said envelope engaging first edge to enable said display carrier to be releasably retained in a loose-leaf binder.

**4,419,838**  
**DIAGRAM BOARD ELEMENT**  
 Frank Taylor, St. Eustache, and Klemens Maurer, Candiac, both of Canada, assignors to Monitronik Ltee, Quebec, Canada  
 Filed Jun. 18, 1982, Ser. No. 390,057  
 Int. Cl.<sup>3</sup> G09F 7/00  
 U.S. Cl. 40—605

9 Claims



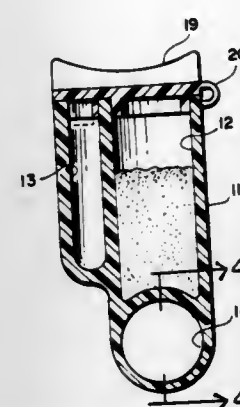
1. An element adapted for connection to components of a diagram board assembly comprising: a rectangular body including at least one pair of depending transversally spaced legs projecting beyond one sidewall of said body and being integral therewith, each leg having an inner face and an outer face and opposite side faces, said outer face including a curved portion; said legs of each pair being substantially in-line so that said all side faces thereof are intersected by an imaginary straight line substantially parallel to said cooperating sidewall; the curved portion of the outer face of one leg of a pair being concave while the curved portion of the outer face of the other leg being convex; and said legs being made of elastic material and mounted to said body so that said legs are flexible in a first direction, which is in a plane perpendicular to the sidewall, and are flexible in a second direction, which is in a longitudinal plane including said pair of legs and imaginary straight line to enable engagement with another component of said assembly.

**4,419,839**  
**CHARGE CONTAINER FOR FIREARMS**  
 Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176  
 Filed Mar. 19, 1982, Ser. No. 359,746  
 Int. Cl.<sup>3</sup> F42B 39/04; F41C 27/00  
 U.S. Cl. 42—90

2 Claims

1. In a charge container for use with muzzle loading firearms, said container having a body, said body having chamber means for containing at least one charge component, said chamber means being open at only one side, all other sides of said chamber means being closed, closure means for closing said open side of said chamber means, cap holding means mounted on said closure means for holding a percussion cap, the combination with said body, said chamber means, said closure means and said cap holding means, of projectile holding means, said projectile holding means being mounted on said body and against a closed side of said chamber means, said projectile holding means being substantially of a tubular con-

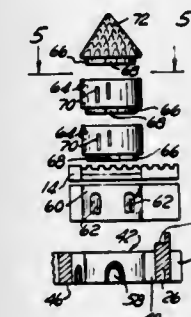
figuration, for holding a projectile therein, and being open at both ends to allow a bullet starter or ramrod to operate



through said projectile holding means for rapid transferral of a projectile to the bore of the firearm.

**4,419,840**  
**MODULAR MODEL STRUCTURE**  
 Benjamin D. Pope, 831 Jewell, Ferndale, Mich. 48220  
 Filed Aug. 20, 1981, Ser. No. 294,512  
 Int. Cl.<sup>3</sup> A63H 33/06  
 U.S. Cl. 46—19

16 Claims



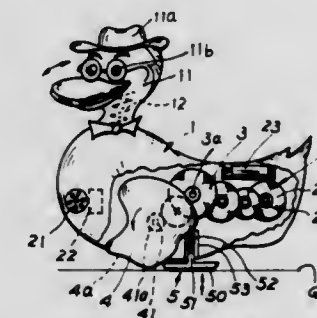
1. A modular model building structure comprising an integrally-formed base module having a plurality of walls connecting together a plurality of open cylindrical base sections, each open cylindrical base section having an inner surface of predetermined inner diameter and an outer surface of predetermined outer diameter, and at least one modular unit, said modular unit having spaced-apart projecting features formed integrally with its exterior surface, said projecting features engaging spaced apart notches on said walls to prevent said modular unit from accidental rotation said modular unit also having a solid cylindrical reduced diameter projection of said predetermined inner diameter size at the bottom edge of said modular unit for inserting said modular unit within the top of one of said open cylindrical base sections, wherein each of said modular units inserted into one of said open cylindrical base sections is removably locked in a predetermined position in relation to said one of said open cylindrical base sections by a transverse notch in said reduced diameter projection being engaged with a transverse rectangular ridge protruding at a right angle from said inner surface towards the center of said one of said open cylindrical base sections.

**4,419,841**  
**ALTERNATELY SWINGING AND TWISTING TOY**  
 Chan-Shiung Huang, 10-4 Fl., No. 62 Chang Chun Rd., Taipei, Taiwan  
 Filed Sep. 7, 1982, Ser. No. 414,617  
 Int. Cl.<sup>3</sup> A63H 13/02  
 U.S. Cl. 46—105

5 Claims

1. An alternately swinging and twisting toy comprising:  
 a main body formed with a pair of side-arm portions respectively mounted on both sides thereof;  
 a power driving means disposed in said main body;

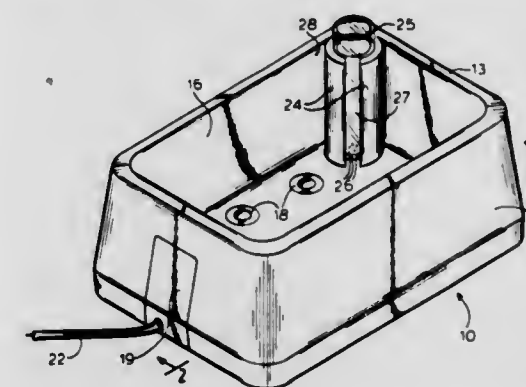
a power transmitting means transferring the output driving force from said power driving means;  
 a pair of moving cams receiving the output driving force through said power transmitting means; and  
 a pair of resilient feet formed on both sides of the bottom portion of said main body, the improvement which comprises:  
 said pair of moving cams are synchronously driven by said power driving means to alternately, directly engage a supporting surface to cause a swinging motion of said toy,



said moving cams are further, respectively, made to have irregular corrugations along their perimeters and said corrugations on one cam do not superimpose on the corrugations of the other; and said pair of resilient feet, each comprising a foot portion, a supporting leg portion connected on said foot portion, a helical spring backing on said leg portion, and a jacket pipe jacketing said spring and leg and is formed on said main body, whereby said resilient feet auxiliarily increasing the swinging motion of said toy as said toy moves across said supporting surface.

**4,419,842**  
**HYDROPONIC PLANTER**  
 Michael Palolan, 7 East Ct., Babylon Village, N.Y. 11702  
 Filed Feb. 8, 1982, Ser. No. 346,416  
 Int. Cl.<sup>3</sup> A01G 31/00  
 U.S. Cl. 47—62

12 Claims



1. A hydroponic device, comprising:  
 a hollow, integrally-formed, one-piece housing having a partition wall separating a substantially closed pressurizable lower chamber which serves to receive a liquid nutrient supply and an upper chamber having a top open end which serves to receive an inert filler material and the desired vegetation, said housing comprising a generally horizontally-disposed lower chamber base wall, an upstanding outer sidewall joined at its lower end to the periphery of said lower chamber base wall, a generally horizontally-disposed upper chamber base wall spaced above said lower chamber base wall which serves as said partition wall, an upstanding inner sidewall joined at its lower end to the periphery of said upper chamber base wall and a generally horizontally-disposed top wall joined to the upper ends of said outer and inner sidewalls, said outer sidewall having a recessed section formed therein



defined in part by a generally horizontally-disposed, inwardly-extending ledge;  
 at least one nutrient supply pipe coupled to said partition wall and extending downwardly into said lower chamber, said supply pipe having a bore extending therethrough to establish fluid communication between said upper chamber and said lower chamber;  
 inlet means in said housing ledge for introducing air under pressure into said lower chamber;  
 an electrically-powered air pump mounted in said recessed section of said housing so that its exposed external surface is substantially flush with the exposed outer surface of said outer sidewall, said air pump being coupled to said inlet means for pumping air into said lower chamber via said inlet means;  
 drainage means mounted in housing for draining liquid from said lower chamber; and  
 vent means for releasing a pressure build-up within said lower chamber.

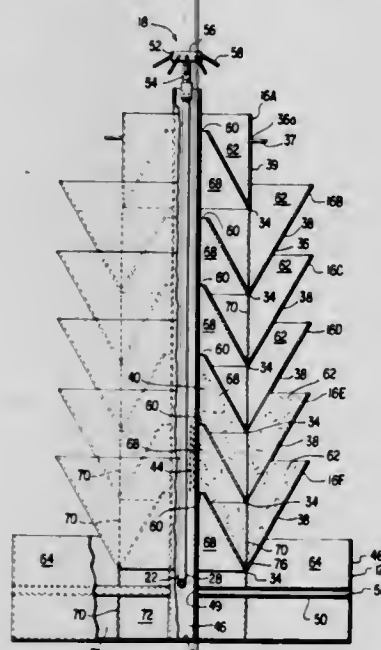
4,419,843

**SELF-IRRIGATING, MULTI-TIER VERTICAL PLANTER**  
 Hugh A. Johnson, Sr., P.O. Box 125, Lakeview, Mich. 48850  
 Continuation-in-part of Ser. No. 245,716, Mar. 20, 1981. This application Jun. 18, 1982, Ser. No. 389,966

Int. Cl.<sup>3</sup> A01G 25/00

U.S. Cl. 47—82

16 Claims



1. A self-irrigating planter comprising:
  - (a) a pan-shaped base member;
  - (b) an upstanding tubular post member open at its lower end and vertically secured to the base, said post member being permeable to air and water;
  - (c) a plurality of trays in a vertical stack coaxial with said post member, each of said trays containing a medium, to at least a level which fills a lower tray to at least the bottom of a next higher tray, for growing plants and having an outer conical wall and an intersecting oppositely-directed inner conical wall and terminating in a circular portion concentric to said post wherein said medium permits the flow of air and moisture therethrough and said tray permits air and moisture to flow between said post member and the exterior of said planter;
  - (d) each of said trays having an aperture in said bottom to allow liquid to seep into a lower tray or said base member;
  - (e) a second aperture located in an outer wall portion of each tray to provide an outlet for excess liquid to seep to a lower adjacent tray; and
  - (f) a liquid distribution means located above said post member.

4,419,844

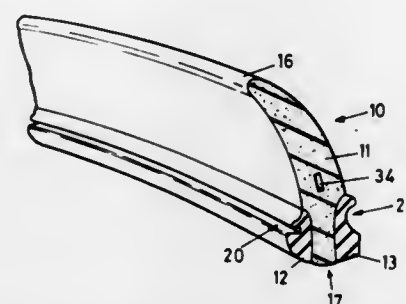
**WEATHERSTRIP**

Rudolf P. Kreisfeld, Edwardstown, Australia, assignor to Bridgestone Australia Pty. Ltd., Edwardstown, Australia  
 Filed Nov. 12, 1982, Ser. No. 440,844

Claims priority, application Australia, Nov. 12, 1981, PF1536  
 Int. Cl.<sup>3</sup> E06B 7/16

U.S. Cl. 49—475

5 Claims



1. A weatherstrip useful for excluding drafts around a door opening of a motor vehicle, having a sponge portion and two dense portions, all of ethylene propylene diene monomer, the weatherstrip having a constant cross-sectional shape which includes a free sealing end, and a captive end having a pair of oppositely facing retaining recesses for securing of the weatherstrip to a supporting structure, the sponge portion extending between said ends but being of reduced thickness at its captive end, the reduced thickness captive end being flanked on each side by the dense portions, said dense portions comprising outer surfaces defining the retaining recesses.

4,419,845

**METHOD OF AND APPARATUS FOR FINISH-GRINDING A CAMSHAFT**

Heinz Voigt, and Martin Wolters, both of Wuppertal, Fed. Rep. of Germany, assignors to Ernst Thielenhaus KG, Wuppertal, Fed. Rep. of Germany

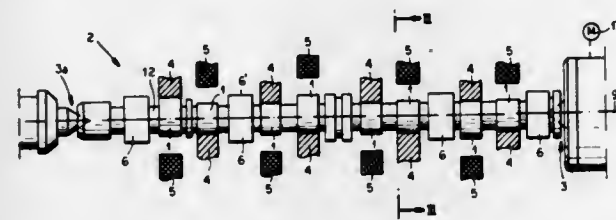
Filed Mar. 23, 1981, Ser. No. 246,704

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 3011454; Mar. 25, 1980, 3011455

Int. Cl.<sup>3</sup> B24B 5/04

U.S. Cl. 51—42

2 Claims



1. A method of finish-grinding a rough-ground camshaft having a shaft extending along and defining an axis and carrying a plurality of axially spaced cams each having a cam surface, said method employing for each cam a respective coarse prefinish tool and a respective fine finish tool, said method comprising the steps of:
  - rotating said camshaft about said axis;
  - urging against each cam surface the respective fine finish tool in one radial direction and with a predetermined pressure and the respective coarse prefinish tool with an equal but opposite pressure and in the opposite radial direction, said directions being generally coplanar through said axis and every other finish tool being to one side of said axis on said plane, whereby said tools alternate to either side of said axis in said plane; and
  - after a predetermined interval withdrawing said coarse prefinish tools radially from contact with said cam sur-

faces while continuing to rotate said camshaft with only said fine finish tools engaging the respective cam surfaces.

4,419,846

**APPARATUS FOR GRINDING OPTICAL LENSES**

Günter Schmitz, An der Reute 8, 7923 Königsbrunn, and Horst Reiche, Uhlandstr. 36, 7923 Königsbrunn/Zang, both of Fed. Rep. of Germany

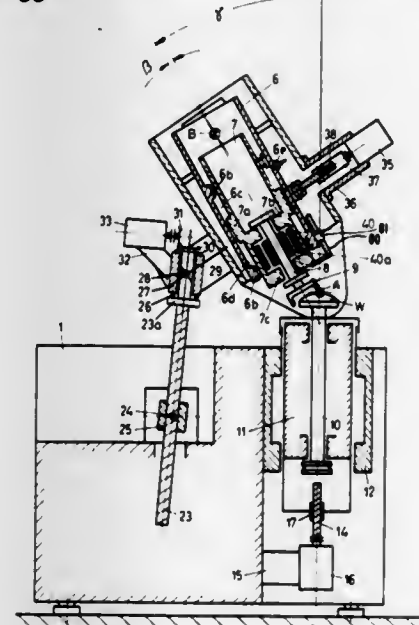
Filed Sep. 18, 1980, Ser. No. 188,372

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2937976

Int. Cl.<sup>3</sup> B24B 13/00

U.S. Cl. 51—55

16 Claims



1. Apparatus for producing convex and/or concave spherical surfaces in workpieces such as optical lenses, comprising a frame,
  - a workpiece spindle selectively mounted relative to the frame and having an end face to which is securable a workpiece to be machined to provide a spherical surface of selective radius and having a corresponding apex,
  - a tool spindle selectively mounted on the frame and carrying a machining tool of correspondingly selective effective diameter relative to the selective radius of the spherical surface of the workpiece for machining the workpiece,
  - the two spindles being disposed for corresponding rotation at a pre-selective angle to one another, and
  - angular positioning means including two mutually adjustable members for retaining the tool spindle in its corresponding angular position relative to the workpiece spindle in conformity with such pre-selective angle between the two spindles,
  - the first of said members being mounted for pivoting about a primary pivotal axis which is tangential to the apex of the spherical surface to be produced, and having a selective effective longitudinal dimension extending from the primary axis,
  - such first member being adjustably locatable at a pre-selected angle of inclination initially generally corresponding to such pre-selective angle between the two spindles in dependence upon the selective radius of the spherical surface to be machined,
  - the second of said members having the tool spindle directly mounted for rotation thereon and being mounted for pivoting about a secondary pivotal axis on the first member,
  - the pivotal axes of mounting of the two members extending substantially parallel to one another and being spaced apart by a distance corresponding substantially to the effective longitudinal dimension of the first member,
  - the second member which is pivotable about the secondary axis being locatable at an angular position with respect to a line joining the two axes, which angular position is

selected in dependence upon the effective diameter of the machining tool for final accurate angular alignment thereof with respect to the apex of the spherical surface to be produced, and

the first member being in the form of a swivel arm having a pivot mounting end at which such primary axis is located and a free end in opposed relation thereto, and the second member being mounted on the first member and being in the form of a rocker arm, and a spindle sleeve being provided in the rocker arm which receives the tool spindle and which is selectively axially displaceably mounted in the rocker arm for extending therebeyond for adjusting the location of the machining tool relative to the primary axis and apex of the spherical surface to be produced.

4,419,847

**DEVICE FOR SUPPORTING AND MOVING A TOOL WITHIN A TAPPING**

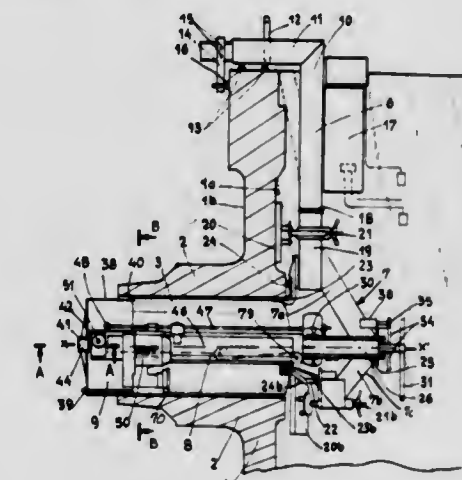
Jean-Benoit Duverne, Le Creusot, France, assignor to Framatome, Courbevoie, France

Filed Apr. 6, 1981, Ser. No. 251,456

Claims priority, application France, Apr. 15, 1980, 80 08430  
 Int. Cl.<sup>3</sup> B24B 5/06

U.S. Cl. 51—90

5 Claims



1. Device for supporting and moving a tool within a substantially horizontal tapping having a symmetry of revolution and traversing a wall so as to be flush with one side of said wall and project from the other side of said wall, said device comprising
  - (a) supporting and centering means in the form of a star, the arms of which extend radially with respect to the tapping;
  - (b) centering members carried by said arms for engagement within said tapping;
  - (c) means for fastening to the wall on the flush side of the tapping supported by the ends of said arms remote from said tapping;
  - (d) a cylindrical centering bell at the projecting end of said tapping and within the latter, said bell supporting a fluid-tight seal on its outer surface;
  - (e) end bearings carried by said supporting means and said centering bell, said end bearings having an axis common with the axis of said tapping;
  - (f) a tool holder bar connected at its ends to two stub shafts aligned along the axis of said tapping, each of said stub shafts being rotatable in one of said end bearings, said tool holder bar being off-set with respect to the axis of said tapping in a radial direction;
  - (g) means for rotating said tool holder bar about the axis of the tapping; and
  - (h) means carried by said tool holder bar for guiding and moving a tool in axial direction and in radial directions of the tapping.



4,419,848

**METHOD AND APPARATUS FOR ROTATING A STYLUS DURING LAPPING**

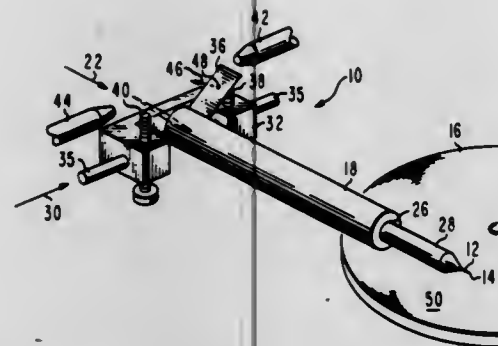
William A. Dischert, Jobstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 27, 1981, Ser. No. 297,054

Int. Cl.<sup>3</sup> B24B 9/16, 1/00

U.S. Cl. 51—229

12 Claims



1. An apparatus for rotating a stylus while a tip thereof is positioned adjacent a rotating scaife comprising: a stylus holder mounted on a trunnion and adapted to rotate about a first axis, means attached to said trunnion for pivoting said trunnion about a second axis transverse to said first axis, a vane attached to said holder and positioned adjacent said second axis in a manner such that a fluid directed against said vane causes said holder to rotate about said trunnion, and means for directing a stream of fluid against said vane said position of said vane and said directing means being such that the rotation of said holder is effected without generating a significant additional torque movement about said second axis.
9. A method of rotating a stylus while lapping a tip thereof comprising the steps of: attaching said stylus to one end of a stylus holder, said holder mounted on a trunnion and adapted to rotate about a first axis, pivoting said trunnion about a second axis transverse to said first axis, in order to position the tip of said stylus adjacent a surface of a rotating scaife, and directing a stream of fluid against a vane positioned adjacent said second axis and attached to said stylus holder in a manner such that said fluid causes said holder to rotate about said trunnion without generating a significant additional torque movement about said second axis.

4,419,849

**LENS PROCESSING METHOD AND APPARATUS**

Frank D. Sorrells, Knoxville, Tenn., assignor to Cole National Corporation, Cleveland, Ohio

Filed Feb. 11, 1981, Ser. No. 233,323

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B24B 1/00

U.S. Cl. 51—284 R

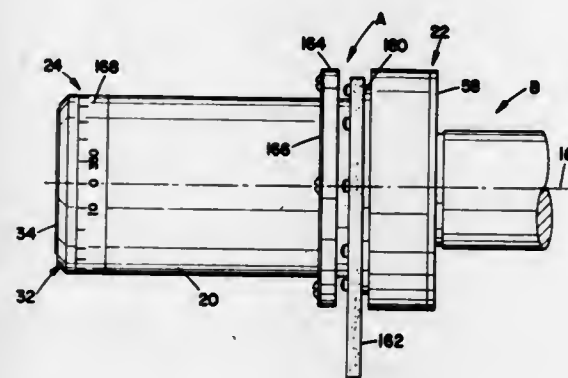
5 Claims

1. A method of generating an optical prescription into a lens blank which only requires a single mounting of said lens blank to an associated lens block, said method comprising the steps of: providing a lens blank having a frame center axis and a peripheral size substantially greater than the peripheral size of a finished optical lens to be formed from said lens blank; providing a reusable preformed lens block having a peripheral size which is not greater than the peripheral size of said finished optical lens, said lens block including means for mounting same to a chuck and having a longitudinal mounting axis; affixing said lens block to said lens blank so as to extend

outwardly from the face thereof which is opposite to the lens blank face which is to be processed and with said longitudinal mounting axis substantially aligned with said frame center axis;

installing a preselected lens block receiver in operative communication with a chuck coaxially disposed in mounted communication with a tailstock of lens generating apparatus, said lens block receiver including means for locating said lens block so that said lens blank may be placed in a predetermined position relative to said chuck;

placing said lens block in operative mounted communication with said lens block receiver such that a desired optical center axis of said lens blank is located substantially coaxial with the longitudinal axis of said tailstock to thereby



- accommodate a predetermined desired amount of lens blank decentration;
- generating the desired optical surface on said lens blank processed face and thereafter removing said lens block and lens blank from association with said chuck;
- performing subsequent operations for producing said finished optical lens while the same said lens block remains affixed to said lens blank for mounting said lens block and lens blank in subsequent processing apparatus;
- said step of performing subsequent operations being carried out without changing the physical characteristics of said lens block; and,
- deblocking said finished optical lens from said lens block for reuse of said lens block in processing other lens blanks.

4,419,850

**GRAVEL CURB**

William J. Butzen, Menomonee Falls, Wis., assignor to Metal Era, Inc., Waukesha, Wis.

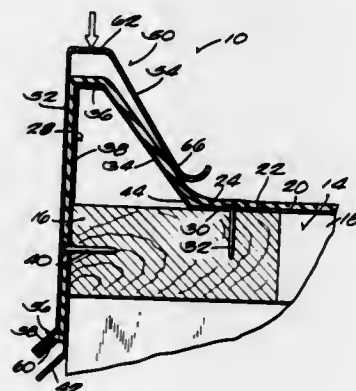
Continuation of Ser. No. 151,302, May 19, 1980. This

application Feb. 2, 1982, Ser. No. 345,047

Int. Cl.<sup>3</sup> E04D 3/40

U.S. Cl. 52—60

9 Claims



1. A roof edging mechanism for providing a dam at the edge of a roof and for securing the edge of a rubber membrane overlying the roof in place, the roof edging mechanism comprising

a dam means adapted to be secured to the edge of a roof, the dam means including an inclined portion having a lower edge engaging the roof and having an upper edge, and a vertical portion having an upper edge connected to the upper edge of the inclined portion, said vertical portion having a lower edge spaced from said lower edge of said inclined portion, and said dam being adapted to support a rubber membrane thereon, and

a fascia for covering at least a portion of said dam means and for clampingly engaging said rubber membrane where said lower edge of said inclined portion of said dam means engages the roof, said fascia including a vertical portion adapted to overlie said vertical portion of said dam means, said vertical portion having a lower edge including means adapted to engage the lower edge of said vertical dam portion, to releasably restrain said fascia against upward movement and said vertical portion of said fascia having an upper edge, and an inclined spring portion extending downwardly from said fascia vertical portion upper edge, said inclined spring portion including a lower edge adjacent said lower edge of said inclined portion of said dam means and said inclined spring portion of said fascia being resilient and being constructed such that said lower edge of said inclined spring portion clampingly engages said membrane where said lower edge of said inclined dam portion engages the roof, said fascia being adapted to be forced downwardly over said dam means to clamp said rubber membrane in place on said dam means, and said lower edge of said inclined spring portion being freely slideable on said rubber membrane as said spring means is forced downwardly over said dam means.

4,419,851

**STAIR STRUCTURE FOR STORAGE BINS**

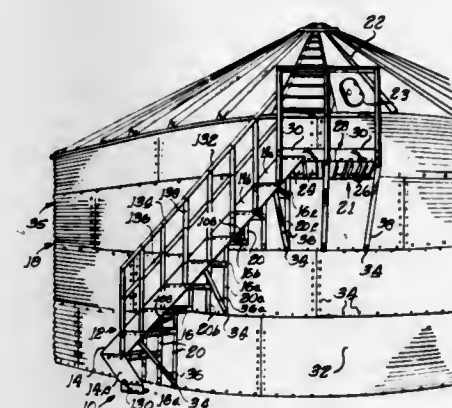
Joseph A. Kruger, Warsaw, Ind., assignor to Brock Manufacturing, Inc., Milford, Ind.

Filed Jul. 23, 1981, Ser. No. 286,163

Int. Cl.<sup>3</sup> E04F 11/00

U.S. Cl. 52—184

10 Claims



1. A stairway system for a wall having a horizontal curvature, the wall being comprised of adjacent overlying wall sections forming overlapping seams therebetween, said system comprising:

a first plurality of adjacent stringer sections adjustably joined to form a single stringer assembly spaced from and conforming substantially to the curvature of said wall;

a second plurality of tread members disposed between the wall and said stringer assembly, each of said members extending from the wall substantially along a radius of said curvature; and

attachment means to secure said tread members to the wall, the attachment means including an array of brackets, each of said brackets being secured to at least one of said tread members and attached to the wall by fastener means disposed in at least one of said overlapping means.

4,419,852

**DEVICE FOR PRESERVING CONNECTING BARS FOR CONCRETE STRUCTURAL MEMBERS**

Hans Dietrich, Bolligen, Switzerland, assignor to Losinger AG, Berne, Switzerland

PCT No. PCT/CH80/00121, § 371 Date May 28, 1981, § 102(e)

Date May 28, 1981, PCT Pub. No. WO81/01025, PCT Pub.

Date Apr. 16, 1981

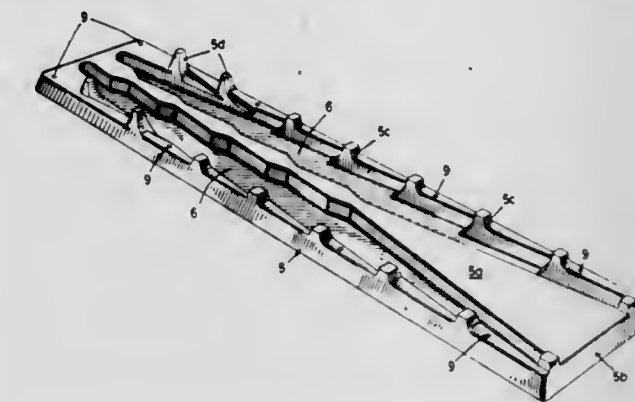
PCT Filed Oct. 2, 1980, Ser. No. 269,048

Claims priority, application European Pat. Off., Oct. 3, 1979, 79810113.5

Int. Cl.<sup>3</sup> E04C 1/00

U.S. Cl. 52—309.16

7 Claims



1. A reinforcement device adapted to be attached to a casing on which a steel-reinforced concrete structural member is to be made, said device comprising an elongate holding element made substantially of a thin-walled plastic mold, and reinforcing bars, the end portions of which, bent-off approximately at right angles, are in said element, said elongate holding element defining troughs open toward one side of the element and receiving said end portions therein and cast in an embedding material which is brittle in its solidified state, but does not adhere either to said reinforcing bars or to said element, said device being as a whole a rigid structural unit of permanent shape.

4,419,853

**METHOD FOR TREATING THE SURFACE OF A METAL TO IMPROVE THE ADHESION OF A CEMENTITIOUS JOINT COMPOUND THERETO**

Friedrich Failmezer, Schaumburg, and Geronimo E. Lat, Skokie, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Sep. 24, 1981, Ser. No. 305,071

Int. Cl.<sup>3</sup> C23F 11/00

U.S. Cl. 52—741

13 Claims

1. A method for forming a building structure including a metal structure such as a cornerbead, which comprises forming said metal structure, applying an emulsion comprising a forming lubricant and an aziridine to said metal structure, mounting said metal structure, applying a joint compound to cover said metal structure, and permitting said joint compound to dry.

4,419,854

**AUTOMATIC CONTINUOUS VACUUM PACKAGING METHOD AND APPARATUS**

Shingo Okada, Tokyo; Yuji Sawa, and Kunio Adachi, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,807

Claims priority, application Japan, Aug. 6, 1979, 54-99457

Int. Cl.<sup>3</sup> B65B 31/02, 9/02

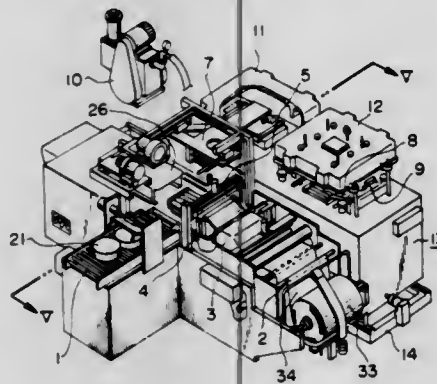
U.S. Cl. 53—434

19 Claims

3. A vacuum packaging method for solid objects comprising the steps of: supplying roll means with an object to be packaged;



transporting said object along said roll means to a vicinity of a receiver;  
 effecting relative movement between said receiver and said roll means so that said object is supported solely by said receiver;  
 drawing the end of a tubular film over an opening core with film drawing means;  
 surrounding said object together with said receiver;  
 sealing said end of said film with sealing electrodes;  
 cutting said tubular film into a predetermined length;  
 moving suction means into a position above said receiver and applying suction to said film at upper end portions of both the open and sealed ends thereof;  
 moving said receiver in cooperation with piston means in a manner such that said object is pushed toward said sealed end of said film;  
 moving said piston means when said receiver has reached a position separated from the open film end so that said object is positioned between said open and sealed film ends and positioned on receiving roll means through said film;  
 lifting said receiving roll means and said suction means to an upper level to thereby lift said object;



transferring said object with said film to a vacuum chamber of a first vacuum packaging means together with said suction means;  
 releasing said object in said vacuum chamber;  
 tensioning both peripheries of said open end of said film opened in the rectangular form so as to prevent the formation of creases during sealing and simultaneously releasing the vacuum condition of said suction means and returning said transferring means to an original position thereof;  
 lowering said vacuum chamber cover to seal said vacuum chamber;  
 evacuating said vacuum chamber;  
 moving said first vacuum packaging means laterally while simultaneously moving a second vacuum packaging means to a predetermined position;  
 returning said film tensioning means to an original position thereof;  
 contacting sealing electrodes to thereby seal the open end of said film while simultaneously releasing the vacuum condition in said vacuum chamber; and  
 opening said vacuum chamber cover while simultaneously moving said first vacuum packaging means laterally to an original position thereof.

4,419,855

**LOW DRAG STATIC SEAMER**

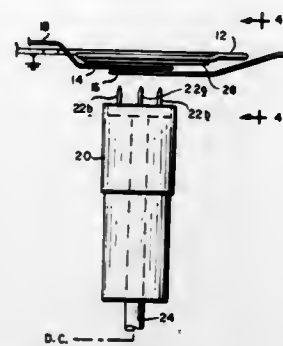
Frank G. Shanklin, Hemlock Park Dr., Groton, Mass. 01450  
 Continuation-in-part of Ser. No. 209,396, Nov. 24, 1980. This application May 20, 1981, Ser. No. 266,080  
 Int. Cl.<sup>3</sup> B65B 9/06, 51/26

U.S. Cl. 53—450

27 Claims

1. Apparatus for statically adhering overlapping portions of sheet film comprising a grounded support having a planar surface across which the overlapping portions of the film are tracked, means associated with the support for generating an electrostatic field through which the overlapping portions of

the film pass as they are tracked across said planar surface so as to charge the overlapping portions oppositely and means for



reducing the surface contact of the overlapping portions of the film with the planar surface.

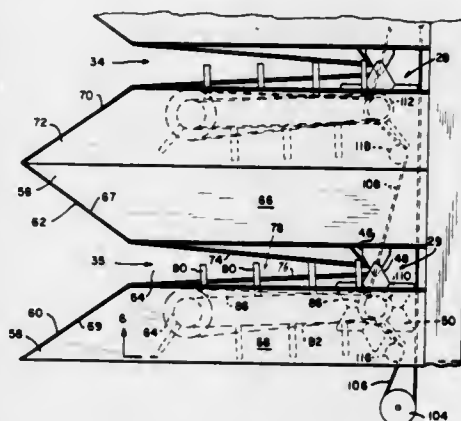
4,419,856

**SEED HARVESTING APPARATUS**

Clyde L. Taylor, 4146 W. Mineral King, Visalia, Calif. 93277  
 Continuation of Ser. No. 214,562, Dec. 8, 1980, abandoned, which is a continuation of Ser. No. 85,391, Oct. 16, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 325,060  
 Int. Cl.<sup>3</sup> A01D 91/04

U.S. Cl. 56—1

2 Claims



1. In a method for harvesting sesame stalks standing in rows in a field and having pods thereon carrying sesame seeds therein and in which the pods are of a type which have a tendency to shatter and release their seeds when they are moved or jarred by the use of a sesame seed harvester having a relatively narrow generally V-shaped opening lying in a horizontal plane for receiving sesame seed stalks as the harvester is advanced in the field, simultaneously guiding and supporting the stalks in the relatively narrow V-shaped opening in generally upright positions as they advance in the V-shaped opening by the use of closely spaced stabilizer fingers which extend substantially transversely across the V-shaped opening and lie in a horizontal plane which is in proximity to the horizontal plane of the V-shaped opening and travel at a speed which is approximately equal to the speed of movement of the harvester in the field so that the stabilizer fingers maintain registry with the stalks to minimize any jarring action to the stalks, collecting seeds on both sides of the generally V-shaped opening which accidentally fall from the pods during the time that the stalks are traveling in the V-shaped opening, severing the stalks in a horizontal plane in close proximity to the plane of the V-shaped opening while in the generally V-shaped opening with a minimum of vibration being imparted to the stalks, by solely utilizing high speed rotary-type cutoff means and having the fingers engaging the stalks prior to, during and after the stalks are cut off by the rotary-type cutoff means to thereby positively impell the stalks into the rotary-type cutoff means, collecting the stalks after they are severed

by the rotary-type cutoff means and separating the seeds from the pods carried by the severed stalks.

4,419,857

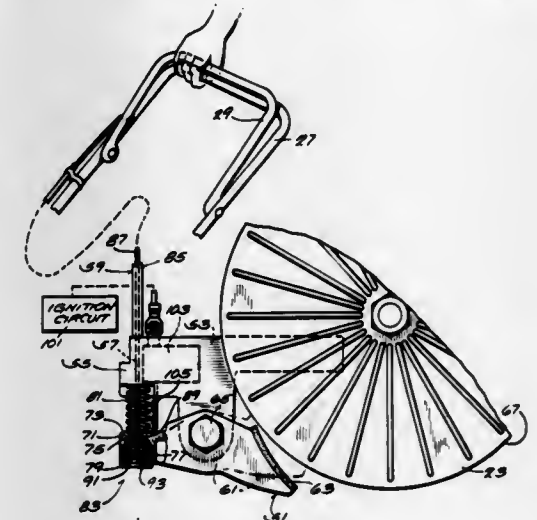
**LAWN MOWER WITH COMBINED ENGINE BRAKE AND IGNITION CONTROL**

LaVerne D. Smith, Wataga, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 7, 1981, Ser. No. 291,013  
 Int. Cl.<sup>3</sup> A01D 69/10; F16D 23/00

U.S. Cl. 56—11.3

8 Claims



1. A rotary lawn mower comprising a housing supported for rotation along the ground, an engine mounted on said housing and including a rotatably mounted crankshaft, a cutter blade located in said housing and fixed to said crankshaft, a braking surface located on said crankshaft and having common rotation therewith, a brake arm supported for movement relative to said engine between a braking position and a non-braking position, said brake arm having therein an aperture and having thereon a brake surface which is engageable with said braking surface when said brake arm is in said braking position, means biasing said brake arm toward said braking position, and means connected to said brake arm for moving said brake arm into said non-braking position against the action of the said brake arm biasing means and including an actuating linkage having a lost motion connection with said brake arm, said actuating linkage comprising a flexible cable including an outer end portion having an end, which outer end portion passes through said aperture, and said actuating linkage further including means preventing withdrawal of said outer end portion of said cable through said aperture, said withdrawal preventing means and said lost motion connection comprising a spring having a first end connected to said end of said cable outer end portion, surrounding said outer end portion of said cable and having a second end bearing against said brake arm.

4,419,858

**THREAD SPLICING DEVICE**

Joachim Rohner; Heinz Zumfeld; Reinhard Mauries, all of Monchen-Gladbach, and Hans-Jürgen Preuhs, Willich, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 27, 1981, Ser. No. 315,411

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040662

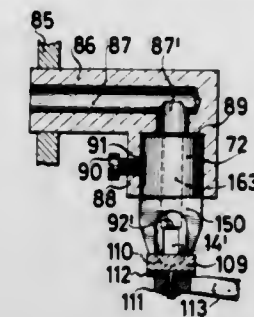
Int. Cl.<sup>3</sup> B65H 69/06; D02J 1/08

U.S. Cl. 57—22

30 Claims

1. Thread splicing device, comprising a stationary base body having a first compressed-air canal formed therein, a splicing head being interchangeably connected to said base body, said splicing head having a second compressed-air canal formed therein being in communication with said first compressed-air canal formed in said base body and said splicing head having a splicing chamber formed therein being in communication with

said second compressed-air canal formed in said splicing head, said splicing chamber including a selectively coverable longitudinal slot for inserting and joining threads, said slot having a flat slot bottom and a substantially prismatic cross section being modified in accordance with specifications of the threads



to be spliced, and said splicing head having an air discharge nozzle formed therein at an end of said second compressed-air canal in vicinity of said splicing chamber, said air discharge nozzle having at least one of a smaller open cross section and a different cross-sectional shape than said second compressed-air canal.

4,419,859

**SPLICING APPARATUS FOR SPUN YARNS**

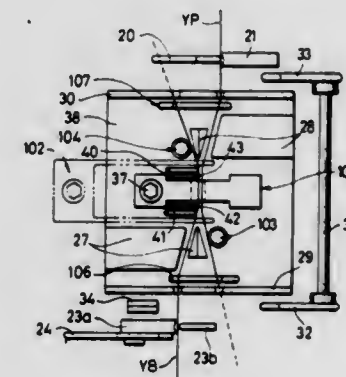
Hiroshi Mima, Joyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 19, 1982, Ser. No. 359,947

Claims priority, application Japan, Mar. 24, 1981, 56-43662  
 Int. Cl.<sup>3</sup> D01H 15/00

U.S. Cl. 57—22

8 Claims



1. A splicing apparatus for spun yarns where a yarn end on the package side and a yarn end on the bobbin side are introduced and lapped in a splicing hole formed on a splicing member and a compressed fluid is jetted on the lapped portion of the yarn ends to effect splicing, said splicing apparatus being characterized in that two control members of which positions are adjustable are arranged making a right angle with the axial line of the splicing hole on both the sides of the splicing member so that the lapped portion is put between the two control members and a part of openings of the splicing hole is covered by the control members.



# 4,419,860 SPlicing HEAD

Rolf Becker, Monchen-Gladbach; Josef Bertrams; Franz Gratsch, both of Wegberg; Gregor Kathke, Viersen; Wolfgang Kiesewetter, Willich; Herbert Knors, Monchen-Gladbach; Jakob Leven, Wegberg; Erich Quack, Monchen-Gladbach; Klaus Rautenberg, Erkelenz; Joachim Rohner, Monchen-Gladbach; Klaus Rosen, Monchen-Gladbach; Günter Wilms, Monchen-Gladbach, and Heinz Zumfeld, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

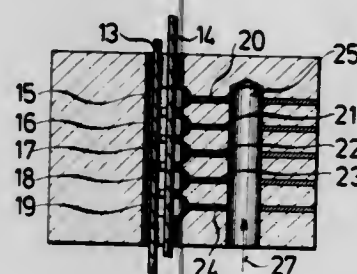
Filed Apr. 14, 1981, Ser. No. 368,114

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115234

Int. Cl.<sup>3</sup> D01H 15/00

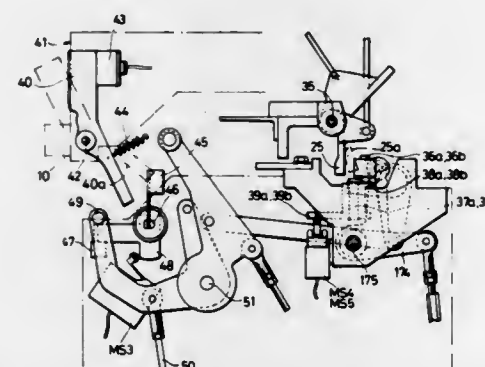
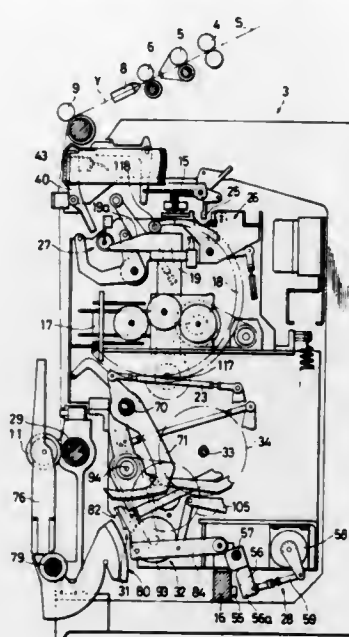
U.S. Cl. 57-22

5 Claims



1. Splicing device for producing a knot-free thread connection by splicing, comprising a splicing head having a longitudinal groove formed therein for the insertion of threads to be joined together, said splicing head having a plurality of cross grooves formed in said longitudinal groove and said splicing head having compressed air supply holes formed therein, at least two of said cross grooves having at least one compressed air supply hole terminating therein.

display plate of the spinning unit where natural yarn breakage occurs is detected, the knotting truck does not stop at the



position of said spinning unit but passes through said spinning unit.

# 4,419,862 HYDRAULIC MASTER CYLINDERS

Glyn P. R. Farr, Warwick, England, assignor to Lucas Industries Limited, Birmingham, England

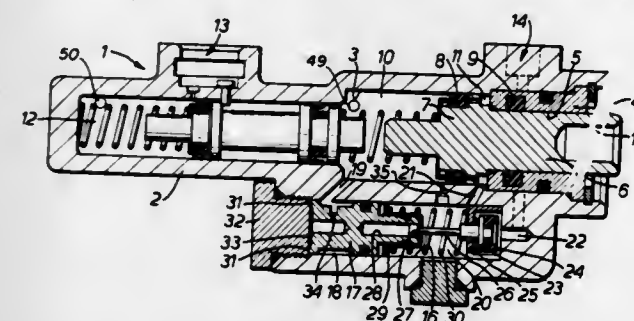
Filed Feb. 27, 1981, Ser. No. 238,755

Claims priority, application United Kingdom, Mar. 17, 1980, 8008948

Int. Cl.<sup>3</sup> B60T 11/20

U.S. Cl. 60-562

9 Claims



1. A hydraulic master cylinder comprising: a reservoir for hydraulic fluid; a body defining a primary bore and a secondary bore co-axial with and having a smaller cross-sectional area than the primary bore; a piston rod slidably and sealingly mounted in the secondary bore; a piston connected to the piston rod and slidingly and sealingly mounted in the primary bore, the piston dividing the primary bore into a primary chamber located on the side of the piston remote from the piston rod and a secondary annular chamber located between the piston rod and the wall of the primary bore; an outlet for

# 4,419,861 SPINNING APPARATUS PROVIDED WITH KNOTTING TRUCK

Michiaki Fujiwara, Kameoka, and Makoto Uramoto, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Oct. 16, 1981, Ser. No. 312,123

Claims priority, application Japan, Oct. 17, 1980, 55-145971

Int. Cl.<sup>3</sup> D01H 15/00, 13/16, 13/22

U.S. Cl. 57-261

9 Claims

1. A spinning apparatus provided with a knotting truck moving along many spinning units, said knotting truck comprising a knoter, a yarn breakage detecting mechanism detecting a yarn breakage indicating piece located on each spinning unit where yarn breakage due to slub occurs and a mechanism detecting a impediment signal display plate located on each spinning unit where natural yarn breakage occurs, wherein when slub yarn breakage indicating piece alone is detected, the knotting truck stops at the position of the spinning unit and performs a knotting operation and when the impediment signal

supplying fluid from the primary chamber to hydraulic apparatus; an expander chamber in fluid communication with both the primary chamber and the secondary chamber; a movable expander member located within the expander chamber and dividing the expander chamber into a primary portion which is in fluid communication with the primary chamber and a secondary portion which is in permanent fluid communication with the secondary chamber, the expander member being movable in response to a predetermined pressure differential between the primary and secondary chambers to expand the volume of the primary portion of the expander chamber to receive fluid from the primary chamber and to contract the volume of the secondary portion of the expander chamber and thereby supply fluid to the secondary chamber; means permitting fluid to flow from the reservoir into the secondary chamber until said predetermined pressure differential is reached; and means thereafter preventing fluid flow between the reservoir and the secondary chamber whereby, during brake application, after said predetermined pressure differential is attained said secondary chamber is pressurized and the effective cross-sectional area of said master cylinder is the cross-sectional area of the secondary bore.

# 4,419,863

## FUEL-AIR MIXING APPARATUS

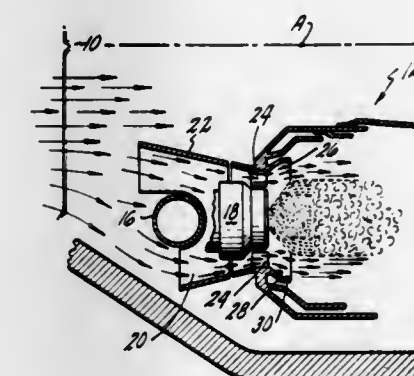
Herman G. Dvorak, Manchester; Robert D. Klapatch, Kensington; Sid Russell, Suffield, and Louis J. Spadaccini, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1981, Ser. No. 307,124

Int. Cl.<sup>3</sup> F02C 1/00

U.S. Cl. 60-748

4 Claims



3. In combustion apparatus of the gas turbine engine type including a combustion chamber having a plurality of circumferentially spaced fuel nozzles centered in a pattern about the axis of the combustion chamber, the improvement which comprises:

a plurality of air scoops corresponding in number to the number of fuel nozzles and of essentially truncated conical geometry each centered about a corresponding fuel nozzle wherein each of said scoops has an extended arcuate portion in the region nearest said combustion chamber axis for intercepting air flow approaching the chamber along the axis.

# 4,419,864

## AIR CONDITIONING SYSTEM AND METHOD

Alden I. McFarlan, 691 Dorian Rd., Westfield, N.J. 07090

Filed Sep. 14, 1981, Ser. No. 301,655

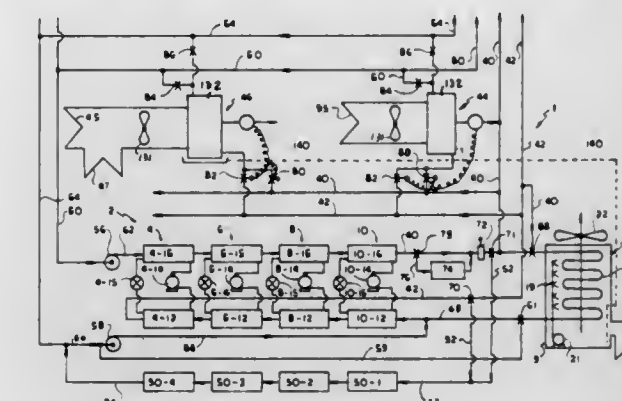
Int. Cl.<sup>3</sup> F25D 17/02

U.S. Cl. 62-98

20 Claims

1. In a method of air-conditioning a space, the steps of forming a stream of circulating air from a controlled volume of outside air and which may include a controlled volume of recirculated air from said space, passing said stream of circulating air through air-treating means and thereby cooling said stream of circulated air with a refrigeration system which has a fluid cooler in which heat is discharged from said system by

a heat-exchange relationship with a stream of exhaust air which is discharged from said space, the volume of said stream of exhaust air being variable with said volume of outside air, and controlling said volume of outside air in said stream of



circulating air passing through said air-treating means to that amount required to discharge heat through said fluid cooler at a sufficient rate to maintain the operating conditions within acceptable limits.

# 4,419,865

## OIL COOLING APPARATUS FOR REFRIGERATION SCREW COMPRESSOR

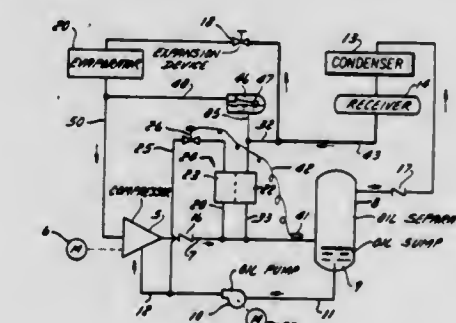
Paul G. Szymaszek, Milwaukee, Wis., assignor to Vilter Manufacturing Company, Milwaukee, Wis.

Filed Dec. 31, 1981, Ser. No. 336,501

Int. Cl.<sup>3</sup> F25B 31/00, 43/02

U.S. Cl. 62-193

4 Claims



1. Refrigeration apparatus comprising a screw compressor which is cooled and lubricated by the circulation of oil there-through and from which a mixture of compressed refrigerant and oil issues to an oil separator through a discharge duct, oil recirculating means comprising an oil pump having an inlet communicated with the oil separator and an outlet from which pressurized oil is conducted to the screw compressor, a receiver to which refrigerant flows from the oil separator through a condenser and in which liquid refrigerant is held for circulation through an evaporator, and delivery means comprising a refrigerant pump having a refrigerant inlet connected with said receiver and an outlet communicated with said discharge duct to deliver thereto a flow of liquid refrigerant that cools said mixture, said apparatus being characterized by:

- A hydraulic motor drivingly connected with said refrigerant pump and having an inlet for pressurized fluid and an outlet for exhaust fluid;
- oil duct means for delivering to said inlet of the hydraulic motor a portion of the pressurized oil issuing from the outlet of the oil pump, for energizing the hydraulic motor;
- other oil duct means communicating the exhaust outlet of the hydraulic motor with said discharge duct; and
- a housing which encloses both said refrigerant pump and said hydraulic motor.

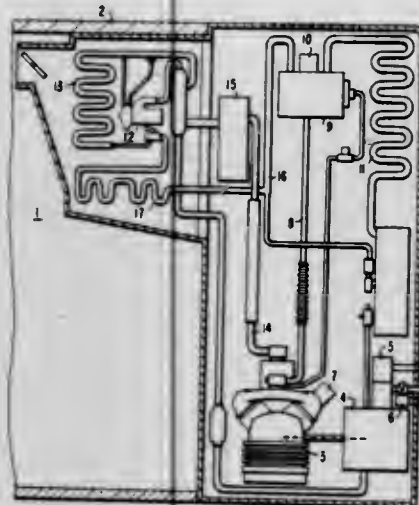


4,419,866

# TRANSPORT REFRIGERATION SYSTEM CONTROL

Leland L. Howland, Belle Plaine, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.  
 Filed Jun. 9, 1982, Ser. No. 386,550  
 Int. Cl.<sup>3</sup> F25B 1/00, 49/00; G05D 23/32  
 U.S. Cl. 62—228.4

15 Claims



1. In a transport refrigeration system of the type having the capabilities of at least heating and cooling operations, and dual compressor speed operation, and control means responsive to temperatures in the space served by the system for controlling the system in at least four modes of operation in accordance with temperatures in the served space differing from a setpoint temperature range, and in accordance with served space temperature being in first and second temperature bands first above the next above, respectively, the setpoint temperature range, and in accordance with served space temperatures being in third and fourth temperature bands first below and next below, respectively, the setpoint temperature range, the improvement comprising:

said control means includes means for operating the system in either a continuous cycle with said compressor running continuously and, alternatively, in an automatic start-stop cycle in which said compressor is stopped when the served space temperature is in said third temperature band;

said control means further including speed change delay means operative in said continuous cycle operation to delay for a predetermined time an increase in compressor speed from low to high upon a departure in served space temperatures from either the third to the fourth band, or from the first to the second band, coupled with an uninterrupted call by said control means for said high speed, and operative in a start-stop cycle, with said compressor stopped when the served space temperature is in said third temperature band, to effect any start of said compressor, occasioned by a departure of served space temperature from said third band, at said low speed.

4,419,867

# DEVICE FOR REGULATING A JOULE-THOMSON EFFECT REFRIGERATOR

Rene D. M. Albagnac, Paris, and Didier Jean-Pierre Silly, Nanterre, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Jul. 2, 1982, Ser. No. 394,772

Claims priority, application France, Jul. 7, 1981, 81 13346  
 Int. Cl.<sup>3</sup> F25B 19/00

U.S. Cl. 62—514 JT

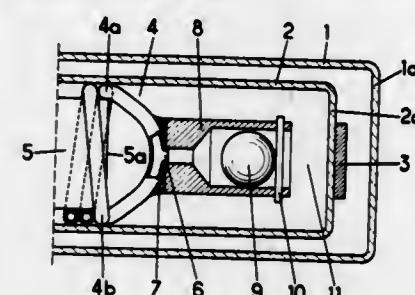
8 Claims

1. A miniaturized device for regulating a Joule-Thomson effect refrigerator comprising:

a housing;  
 inlet duct means in said housing for carrying a refrigerating fluid under pressure;  
 choke means connected to and communicating with said

inlet duct means, said choke means including a tubular member and an inner body in said tubular member and defining a refrigerating fluid passage therebetween, said tubular member being of a material having a different coefficient of expansion than the material of said inner body;

said housing defining an expansion and refrigeration chamber into which said choke opens, said chamber connecting with a passage formed by said housing and said inlet duct means for providing heat exchange from said expanded fluid in said chamber to said refrigerating fluid under pressure in said duct means;



said choke means being regulated to provide a decreasing flow of said refrigerating fluid as the refrigeration temperature drops to an operational temperature in accordance with the differences in said coefficients of expansion of said tubular member and said inner body, and wherein said inner body is designed to act as a shut-off means by expanding radially to occupy said refrigerating fluid passage in the tubular member at said operational refrigeration temperature except for a minimum flow passage defined between said member and said inner body which then enables a minimum flow of the expanded refrigerating fluid.

4,419,868

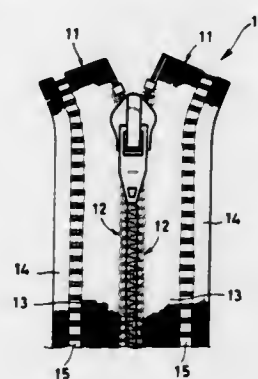
# WARP-KNIT STRINGER TAPE FOR SLIDE FASTENER

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan  
 Filed Sep. 15, 1981, Ser. No. 302,608  
 Claims priority, application Japan, Sep. 10, 1980, 55-132995[U]; Dec. 9, 1980, 55-176402[U]

Int. Cl.<sup>3</sup> D04B 21/00

U.S. Cl. 66—195

12 Claims



1. A warp-knit stringer tape for a slide fastener having a pair of rows of coupling elements, comprising:

(a) a first web for supporting along one longitudinal edge thereof one coupling element row of the slide fastener, said first web having a plurality of longitudinal wales of chain stitches;  
 (b) a second web spaced transversely from said first web with a wale-free region therebetween which is remote from said one longitudinal edge of said first web; and

(c) a connector thread interconnecting said first and second webs across said wale-free region;  
 (d) a group (hereinafter called first group) of adjacent ones of said wales of said second web which extend along said wale-free region being disposed closely to one another.

4,419,869

# APPARATUS FOR TREATING A CLOTH WITH THE USE OF LOW-TEMPERATURE PLASMA

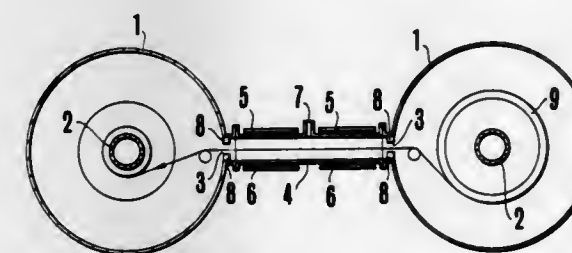
Yoshikazu Sando, Wakayama; Tokuju Goto, Nara; Itsuo Tanaka, Osaka; Hiroshi Ishidoshiro, and Matsuo Minakata, both of Wakayama, all of Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Jan. 18, 1983, Ser. No. 458,986

Claims priority, application Japan, Jan. 26, 1982, 57-10441  
 Int. Cl.<sup>3</sup> D06B 3/10

U.S. Cl. 68—5 D

2 Claims



1. An apparatus for treating a cloth with use of low-temperature plasma, comprising a pair of closed cloth taking-up cases provided respectively with a slit-type cloth taking-in and out opening and a cloth taking-up shaft, a cloth passage tube composed of a material permeable to high frequency electric wave, connecting between the two cloth taking-up cases for transporting the cloth therethrough, at least one pair of electrode plates provided at the outer circumference of the cloth passage tube for receiving high frequency electric wave produced by an oscillator, a gas supply pipe connected to the cloth passage tube, and a gas evacuating pipe provided in the vicinity of the cloth taking-in and out opening.

4,419,870

# VALVELESS LIQUID PUMPING AGITATOR FOR AUTOMATIC WASHERS

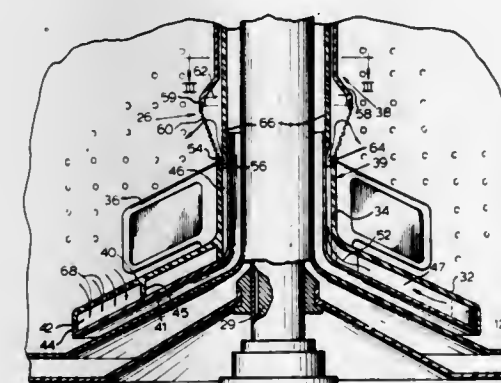
Robert A. Brenner, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 19, 1981, Ser. No. 294,137

Int. Cl.<sup>3</sup> D06F 17/10

U.S. Cl. 68—18 FA

9 Claims



8. In an automatic washer of the type having an oscillatory agitator, the improvement of:  
 pumping means comprising channel means forming a lower horizontal circulatory path and a vertical path through said agitator through which liquid is to be pumped;

venturi means between said circulatory path and said vertical path; and  
 a radial wall means in said lower circulatory path for diverting said liquid generally upwardly through said vertical path.

4,419,871

# FULLING MACHINE FOR TEXTILE MATERIAL IN CONTINUOUS ROPE FORM OR IN HOSE FORM

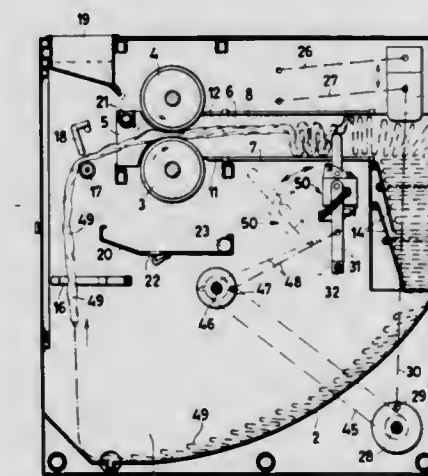
Placido Zonco, and Maurizio Zonco, both of Pray Biellese, Italy, assignors to Zonco Federico & Figlio di Federico, Pietro e Placido Zonco S.n.c., Pray Biellese, Italy

Filed Dec. 1, 1981, Ser. No. 326,369

Claims priority, application Italy, Dec. 15, 1980, 26656 A/80  
 Int. Cl.<sup>3</sup> D06B 3/24

U.S. Cl. 68—22 R

6 Claims



1. In a fulling and washing machine for textile materials in continuous rope or hose form, including a tub having side walls and an at least partially sloping bottom wall, at least one pair of superimposed presser and dragger rollers rotatably mounted above said bottom wall, means to drive each pair of rollers rotatably about their own axes at the same surface speed, said rollers being adapted to receive and cooperatively drive between the rollers of each pair continuous endless bands of fabrics in continuous rope or hose form, the presser roller being held pressed against the dragger roller, a fulling channel downstream of said rollers having an entrance opening, a further channel between each pair of rollers and the entrance opening of the fulling channel, a reciprocating pusher operatively associated with and in said fulling channel to cause the fabric to be fed forward therethrough, drive means to reciprocate said pusher, a basin containing a fulling liquor to be applied to the fabric positioned upstream of said rollers, and a partitioning and guiding frame positioned upstream of said rollers to keep the fabric endless bands spaced apart from each other, the improvement comprising said further channel is an introductory channel into which the fabric is passed from said rollers, a second pusher mounted on said tub so that it is movable in said introductory channel to engage and feed forward said fabric coming from said rollers towards said entrance opening of the fulling channel, means to reciprocate said second pusher synchronously with the reciprocation of the pusher operating in the fulling channel so that it is positioned near the exit end of said introductory channel when the pusher in the fulling channel is in a position wherein it is at least substantially withdrawn from the fulling channel to establish a free communication for said fabric between the introductory channel and the fulling channel.



4,419,872

**LOCKING DEVICE FOR SKIERS USE**

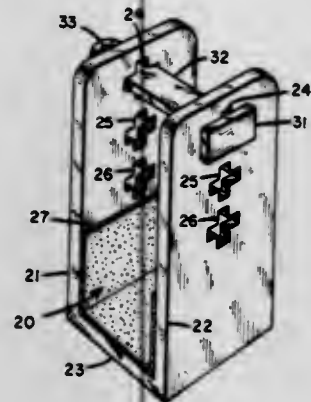
John W. Plifka, 5412 - 26th Ave. South, Minneapolis, Minn. 55417

Filed Jul. 17, 1981, Ser. No. 284,354

Int. Cl.<sup>3</sup> E05B 63/06, 65/00, 73/00; A45C 13/18; E21B 19/14; B24B 5/02

U.S. Cl. 70—18

4 Claims



1. A ski lock comprising, in combination: a U-shaped bracket having two generally parallel legs joined and spaced at first ends by a base strap, the free ends of said legs having pairs of aligned cruciform apertures at different spacings from said base strap; and a removable cross bolt having a generally flat body exhibiting a rectangular cross-section dimensioned to be received in said cruciform apertures in one of two mutually orthogonal orientations and a head to prevent passages of said bolt entirely through said apertures, the location of said pairs of apertures being such that the spacing between said bolt and said base strap corresponds to at least two different widths for different types of skis and skis with poles.

4,419,873

**SECURITY PADLOCK WITH OPTIONAL SUSPENSION CHAIN**

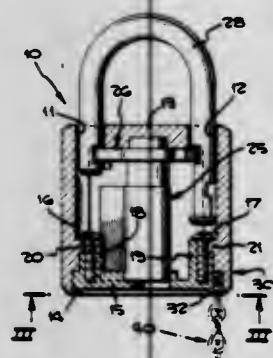
Riley M. Sopko, Palos Verdes Estates, Calif., assignor to Phillip L. Alfred, Flintridge, Calif.

Filed Jun. 29, 1981, Ser. No. 278,623

Int. Cl.<sup>3</sup> E05B 67/02, 67/22

U.S. Cl. 70—38 A

6 Claims



1. In a padlock having a body in which a removable lock cylinder is retained by a removable cylinder guard plate and which has means for fastening the guard plate to the body to retain the cylinder therein, the improvement comprising the provision of:

retainer means for optionally retaining a lock suspension chain to said padlock body wherein said retainer means is operable to retain said chain to said body by the assembly of said guard plate to said padlock body with a portion of said chain trapped between said guard plate and said padlock body.

4,419,874

**FASTENER DEVICE**

Attilio Brentini, c/o Lansa SA, 5, Ch. de la Gottrause, 1023 Crissier, Vaud, Switzerland

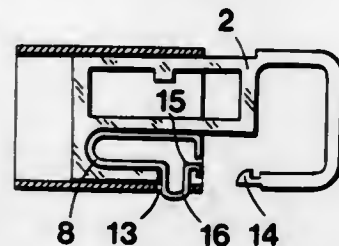
Filed Jul. 29, 1980, Ser. No. 173,298

Claims priority, application Switzerland, Aug. 10, 1979, 7376/79

U.S. Cl. 70—459

Int. Cl.<sup>3</sup> A44B 15/00

3 Claims



1. A key fastening-device comprising a case (1) and at least one coupling-piece (2) a portion of which is adapted to slide into said case (1), and the outer part of which is arranged to form a key fastening-loop (3), the device further comprising a plane spring (8) arranged in said case (1) for cooperating with the coupling-piece (2) which is also plane, said spring (8) being in the same plane as the coupling-piece (2) and forming a loop (16) passing through an opening (13) of the case (1) to form an operating button (16), said spring (8) presenting in addition a notch (15) for cooperating with a hook (14) provided on the coupling-piece (2) in order to ensure the closed position thereof, so that the operating of the said button (16) ensures the release of the hook (14) from the notch (15) and said spring (8) limits the opening sliding movement of the coupling-piece (2).

4,419,875

**ARTICLE MANIPULATOR MECHANISM FOR ACCELERATED SHOT TREATING APPARATUS**

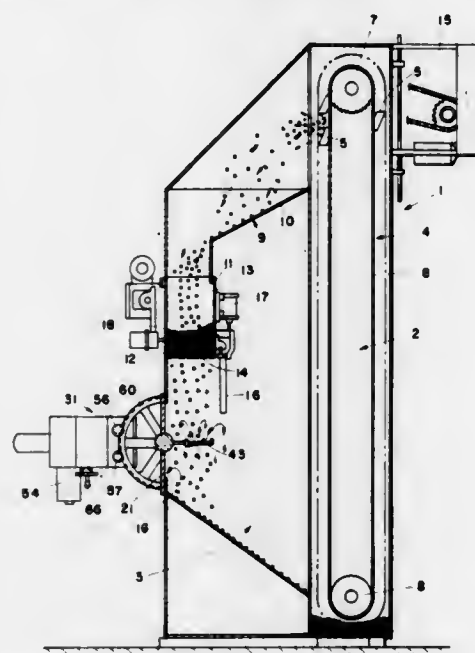
Bruce W. DeClark, Walker, and Joseph H. Weber, Grand Rapids, both of Mich., assignors to Progressive Blasting Systems, Inc., Grand Rapids, Mich.

Filed Sep. 10, 1981, Ser. No. 300,947

Int. Cl.<sup>3</sup> B24C 1/10

U.S. Cl. 72—53

16 Claims

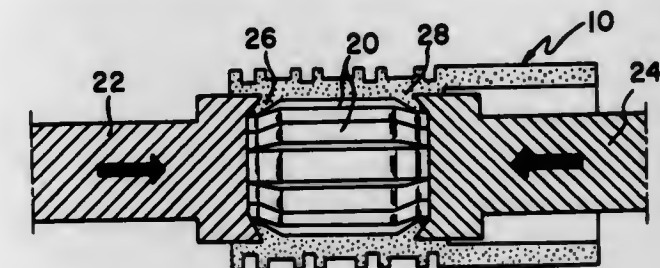


1. Mechanism for manipulating articles in the path of a stream of media created by vertical free-falling gravity accelerated media for treating such articles by said media impinging on the same corresponding predetermined portions of surfaces of said articles, said path being directed downwardly and

located within an enclosed housing having an opening closed by an enclosure panel means forming part thereof, comprising: a plurality of rotatably mounted fixture means projecting from said enclosure panel into said housing toward the said path of said accelerated media and each having article holder means at one end for holding an article to be treated in said path; said fixture means being mounted on said enclosure panel means, and said holder means extending inwardly thereof,

common driver means operatively connected to the other ends of each of said fixture means on the outer side of said enclosure panel means for rotating said fixture and holder means inside said housing, said driver means including a motor means operatively connected to each of said fixture means so as to rotate all of said fixtures and holder means in unison whereby predetermined surfaces of the articles held by said holder means are exposed in a uniform manner to said falling stream of media so that each article is subjected to the same peening intensity.

shoulders, the shoulders extending radially from a large diameter to a small diameter, the grooves defining a base diameter smaller than said large diameter and larger than said small diameter, said method comprising the steps of abutting a punch against at least one of said shoulders in order to deform said one shoulder, said punch abutting against said shoulder at a location between said large diameter and said base diameter, said one shoulder deformation causing the material of said one shoulder to extend radially inwardly inside said small diameter to substantially close said grooves adjacent said deformed one



4,419,876

**PRESSURE CONTROL APPARATUS FOR HYDROMECHANICAL DRAWING**

Jindrich Spacek; Vaclav Smrcek; Karel Voda, all of Brno; Jiri Kosek, Zdar n/Saz; Jan Hrdina, Zdar n/Saz, and Vaclav Penaz, Zdar n/Saz, all of Czechoslovakia, assignors to Tovarny strojirenske techniky, koncern, Prague, Czechoslovakia

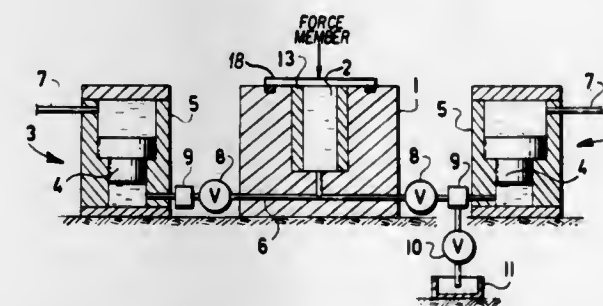
Filed Dec. 12, 1980, Ser. No. 215,915

Claims priority, application Czechoslovakia, Dec. 12, 1979, 8664-79

Int. Cl.<sup>3</sup> B21D 39/08

U.S. Cl. 72—57

5 Claims



1. In a hydromechanical drawing apparatus for the deep drawing of sheet metal in hydraulic presses having a pressure chamber in which the pressure chamber constitutes the drawing die, the improved device for the control of the pressure in the pressure chamber comprising a control system with a plurality of two-diameter piston transformers connected at the small diameter side to the pressure chamber and at the large diameter side to a fluid pressure supply line, wherein the said transformers' outputs are each valved to the pressure chamber, at least one of these outputs being closable independently of the others, and that furthermore the forming pressure chamber contains at least one interchangeable liner member to provide optional pressure chamber volumes, said transformers being selectively utilized dependent upon the liner selected.

4,419,877

**METHOD OF MANUFACTURING A CYLINDRICAL SLEEVE PROVIDED WITH INTERNAL GROOVES, AND TOOL FOR CARRYING OUT THIS METHOD**

Carmel Alfano, Saint Brice sous Foret, France, assignor to Societe Anonyme DBA, Paris, France

Division of Ser. No. 109,708, Jan. 4, 1980, abandoned. This application May 21, 1982, Ser. No. 380,856

Claims priority, application France, Jan. 16, 1979, 79 00949

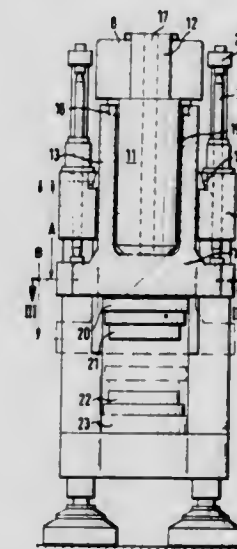
Int. Cl.<sup>3</sup> B21K 21/12

U.S. Cl. 72—325

2 Claims

1. A method for manufacturing a cylindrical sleeve provided with internal grooves extending axially between a pair of

1. An above-floor drop-forging press comprising a lower crosshead, an upper crosshead, a guide crosshead between the lower and upper crossheads, columns interconnecting said lower and upper crossheads, columns interconnecting said guide and upper crossheads, compression abutments disposed between respective mutually opposed surfaces of said lower and guide crossheads and said guide and upper crossheads, prestressing means to respectively prestress said columns and said abutments by compressing said abutments between the





crossheads so that said crossheads, abutments and columns form a prestressed press frame, a downwardly facing piston mounted on the upper crosshead, a vertically movable hydraulic cylinder enclosing said piston in operable engagement therewith, said cylinder having a lower end region adapted to carry an upper forging die, movable lower guide means operably arranged on said cylinder, lower end region for guiding the cylinder lower end region relative to said columns interconnecting said lower and guide crossheads, and upper guide means guiding said cylinder in the guide crosshead comprising a stationary guide in the guide crosshead in guiding engagement with said cylinder.

4,419,879

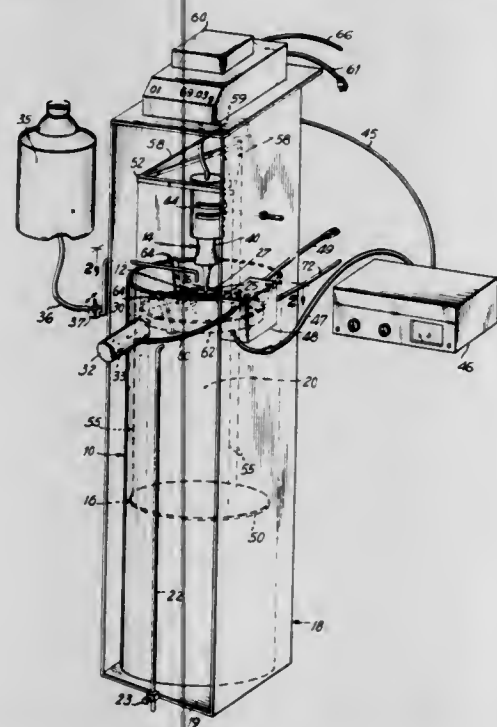
## PARTICLE MEASURING APPARATUS

Darrell C. Bush, Colleyville, and Ralph E. Jenkins, Irving, both of Tex., assignors to Core Laboratories, Inc., Dallas, Tex.  
Filed Oct. 16, 1981, Ser. No. 312,107

Int. Cl.<sup>3</sup> G01N 15/02, 15/04

U.S. Cl. 73—432 PS

19 Claims



1. Sedimentation-type particle size measuring apparatus for measuring the size of solid particles falling in a fluid of known viscosity, the apparatus comprising, in combination:  
a sedimentation container for the known-viscosity fluid;  
a cup-shaped particle dispenser initially containing a sample of solid particles and disposed above the fluid in the sedimentation container;  
swingable support means supporting the particle dispenser for swinging movement and selectively actuable for swinging said particle dispenser so that the latter discharges said solid particles immediately above the surface of the fluid in the sedimentation container, thereby rapidly transferring said solid particles from said dispenser to said sedimentation container;  
means including a particle receiving member supported in the fluid in the sedimentation container for detecting the landing thereon of solid particles transferred from said dispenser; and  
means responsive to the detection of the landing of said solid particles onto the particle receiving member for determining the size of the received particles.

4,419,880

## APPARATUS FOR CALIBRATING FLUID FLOW METERS UTILIZING DIGITAL TECHNIQUES

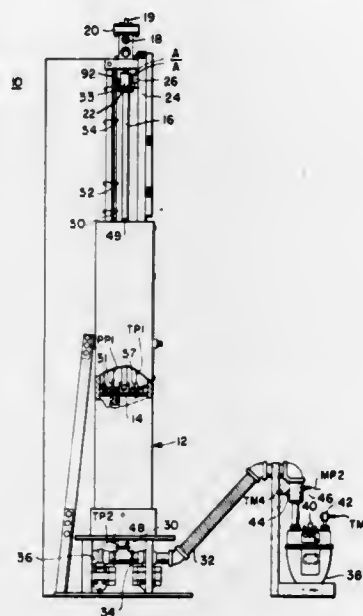
Peter J. Hanowich, McKees Rocks, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1980, Ser. No. 134,994

Int. Cl.<sup>3</sup> G01F 25/00

U.S. Cl. 73—3

65 Claims



1. Apparatus for calibrating a fluid flow meter under test, said apparatus comprising:

- (a) means for directing a known volume of fluid through the meter under test, said directing means comprising a housing having a start-test position fixedly disposed with respect thereto, and means for displacing the fluid between said housing and the meter under test said housing being coupled to the fluid flow meter under test to permit the fluid to be directed through the fluid meter by said displacing means;
- (b) first measuring means coupled to the fluid flow meter under test to provide a first indication of fluid flow as measured by the fluid meter;
- (c) second measuring means coupled to said directing means for providing a second, calibrated indication of the fluid drawn by said directing means through said meter; and
- (d) control means including means responsive to the movement of said displacement means with respect to said defined start-test position for enabling the accumulation of the first and second indications of the fluid flow, and means for terminating the accumulations of the first and second indications upon the occurrence of the accumulation by said first measuring means of a predetermined quantity of the first indication, whereby the known volume of fluid is defined with respect to said start-test position for each meter test and the accumulated value of the second indication provides a calibrated, precise manifestation of the fluid flow through the meter.

4,419,881

## HYDRODYNAMIC PRESSURIZING APPARATUS

Joseph A. Gentiluomo, Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 4, 1982, Ser. No. 374,830

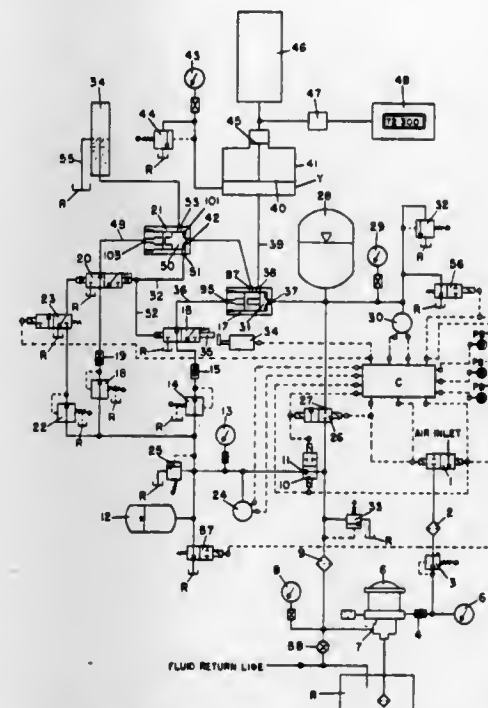
Int. Cl.<sup>3</sup> G01N 3/36; G01M 3/02

U.S. Cl. 73—37

10 Claims

1. A Hydrodynamic Pressurizing Apparatus comprising:
- (a) a loading valve having a cushion port, an inlet port, and a first and second exit port,
  - (b) an accumulator having a discharge port mounted directly to said inlet port of said loading valve;
  - (c) an intensifier having a low pressure port mounted di-

rectly to said first exit port of said loading valve; said intensifier having a high pressure outlet port;  
(d) an unloading valve having an inlet port mounted directly to said second exit port of said loading valve; said unloading valve having an exit port,



- (e) a pressure vessel having a bottom inlet and mounted directly to said high pressure outlet port of said intensifier;
- (f) and auxiliary fluid power and electric control equipment functionally associated with said loading valve, said accumulator, said intensifier, said unloading valve, and said pressure vessel, to provide proper system operation.

4,419,882

LEAKAGE DETECTION METHOD USING HELIUM  
Hiroshi Ishii; Kohji Seki, both of Tokyo; Hiroshi Morishita, Kawasaki, and Toshiaki Yamazaki, Tokyo, all of Japan, assignors to Nihonsanso Kabushiki Kaisha, Japan  
PCT No. PCT/JP81/00048, § 371 Date Nov. 10, 1981, § 102(e) Date Nov. 10, 1981, PCT Pub. No. WO81/02631, PCT Pub. Date Sep. 17, 1981

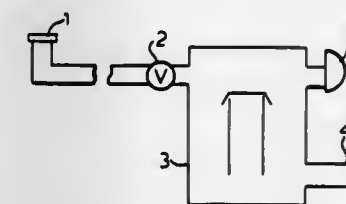
PCT Filed Mar. 6, 1981, Ser. No. 325,435

Claims priority, application Japan, Mar. 10, 1980, 55-29946

Int. Cl.<sup>3</sup> G01M 3/20

U.S. Cl. 73—40.7

10 Claims



1. A method of detecting a leakage in a system by the use of helium gas, comprising the steps of:  
supplying the helium gas to the system  
first drawing from the system sample gases at a low vacuum pressure which is created by a first vacuum pump, the sample gases including the supplied helium gas when the leakage exists in the system;  
throttling the flow of the drawn sample gases;  
increasing helium component in part of the throttled sample gases;  
detecting the increased helium component in the part of the sample gases; and  
exhausting the helium component increased sample gases so

that the detecting step is made with the helium component increased sample gases being placed at a high vacuum pressure of at least  $10^{-4}$  Torr which is created by means of a second vacuum pump.

4,419,883

## LEAK DETECTOR

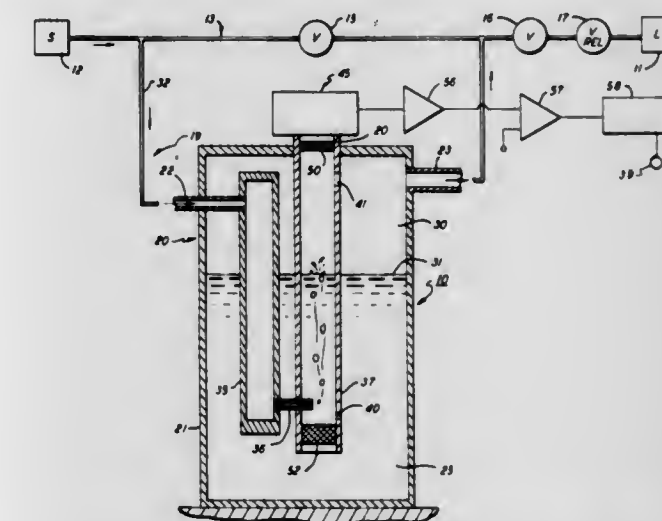
N. E. Gelston, II, 7 Orchard Rd., Skaneateles, N.Y. 13152

Filed Mar. 1, 1982, Ser. No. 353,609

Int. Cl.<sup>3</sup> G01M 3/10

U.S. Cl. 73—49.3

16 Claims



1. A method of detecting leaks in a hermetically sealed unit that includes the steps of:  
providing a source of gas at a predetermined test pressure that is above ambient pressure,  
connecting the source to the unit by means of a first flow circuit whereby the internal pressure of the unit is equal to the test pressure,  
rerouting gas from the source to the unit through a second flow circuit containing a bubble chamber whereby, in the event of a leak, a path of bubbles is established in a liquid, at least partially immersing a waveguide connected to a radar unit in said liquid,  
transmitting radar signals along the waveguide at the bubble path in said chamber,  
detecting changes in the transmitted signals produced by the movement of bubbles in the liquid that are returned along said waveguide, and  
producing an output signal in response to the detection of bubbles in the liquid.

4,419,884

## TEST HEAD FOR COMPRESSED GAS CYLINDERS

Carl A. Grencl, deceased, late of Yorba Linda, Calif., and by William C. Jordan, executor, Laguna Hills, Calif., assignors to La Nora J. Grencl, Yorba Linda, Calif.

Filed Jun. 14, 1982, Ser. No. 388,079

Int. Cl.<sup>3</sup> G01M 3/02

U.S. Cl. 73—49.8

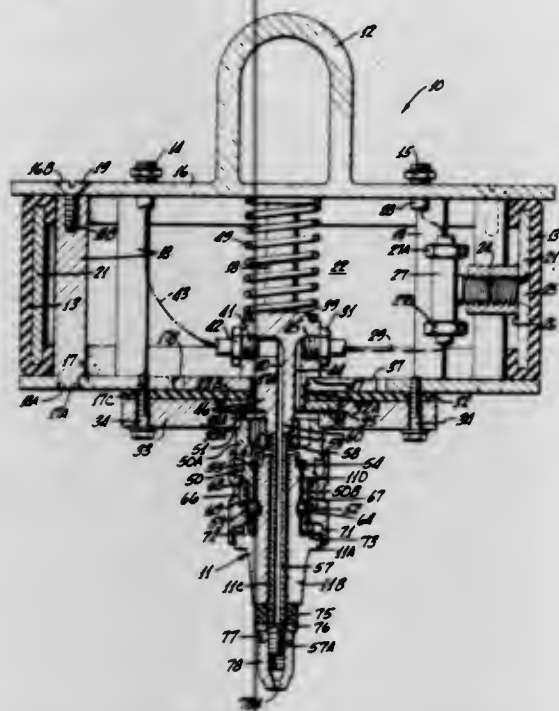
11 Claims

1. In a test head for sealing the threaded neck of a compressed gas cylinder or the like of the type comprising a rigid support member, a spud adapted for threaded engagement with said neck, said spud having an axial opening extending therethrough, means defining a chamber in said test head, said means comprising a movable diaphragm, the perimeter of which is connected to said support member, and a hollow, cylindrical coupling member rigidly connected to said support member, an elongate member extending through said axial opening in said spud, means for connecting one end of said elongate member to said diaphragm, an expansible grommet surrounding the other end of said elongate member, and a fitting fixedly attached to said other end of said elongate member, said grommet being positioned between said spud and said fitting whereby longitudinal motion of said elongate member



imparted by movement of said diaphragm causes said grommet to be compressed between said fitting and said spud, the improvement comprising quick-disconnect means for said speed comprising:

a coupling sleeve surrounding said coupling member and mounted for movement between first and second positions; and



means operatively associated with said coupling sleeve for locking said spud in a desired axial position relative to said elongate member in said first position of said coupling sleeve and for permitting slidable movement of said spud relative to said elongate member in said second position of said coupling sleeve whereby said spud may be detached from said test head upon movement of said coupling sleeve from said first to said second position.

4,419,885

# METHOD OF VERIFYING THE STRESS ROLLING OF A METALLIC RIM

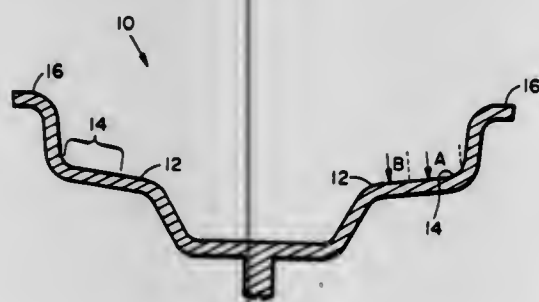
Roy C. Holmstrom, Lake Orion, and John V. Liggett, Plymouth, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 18, 1982, Ser. No. 379,397

Int. Cl.<sup>3</sup> G01N 3/40

U.S. Cl. 73-78

3 Claims



1. A method of verifying that a surface of a portion of a metallic rim has been stress rolled, said metallic rim including a reference surface that has not been stress rolled, said method comprising:

taking a first hardness reading of said surface;

taking a second hardness reading of said reference surface;

and

comparing said first hardness reading to said second hardness reading, said first hardness reading being significantly higher than said second hardness reading when said surface of said portion of said metallic rim has been stress

rolled and not significantly higher than said second hardness reading if said surface has not been stress rolled.

4,419,886

# RATE OF PENETRATION SENSOR FOR OIL DRILLING RIGS

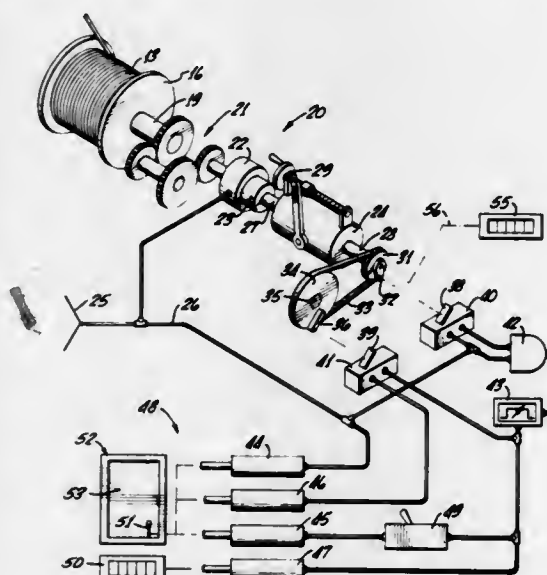
Leslie D. Peterson, Santa Ana, Calif., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 18, 1981, Ser. No. 332,243

Int. Cl.<sup>3</sup> E21B 45/00

U.S. Cl. 73-151.5

22 Claims



1. Apparatus for determining the amount of wire paid out from a drum comprising:

means for providing a first output having a fixed relationship to the rotation of said drum;

adjustable input-to-output-ratio drive means responsive to said first output for providing a second output having an adjustable relationship to the rotation of said drum, said drive means being adjustable to provide an average of the correct rate of wire paid out from said drum relative to rotary motion of said drum; and

means responsive to said second output for generating a third output approximately indicative of a given amount of wire paid out from said drum.

4,419,887

# DISTINGUISHING TRUE BASEMENT FROM DIKES AND SILLS ENCOUNTERED IN DRILLING OF A BOREHOLE THROUGH THE EARTH

Luke S. Gournay, Rockwall, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 13, 1982, Ser. No. 377,894

Int. Cl.<sup>3</sup> E21B 49/00

U.S. Cl. 73-152

5 Claims

1. In the drilling of a borehole in the earth, the method of determining whether a rock formation encountered by said drilling is true basement or a dense intrusion comprising:

traversing said borehole with a density logging tool in a depth interval extending above the point at which drilling encountered said rock formation;

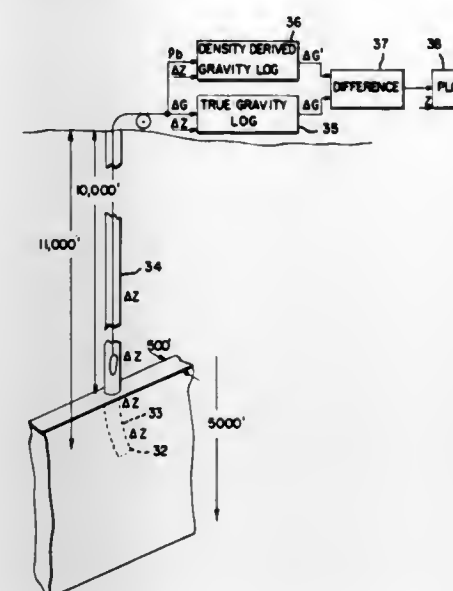
measuring the density of the formation surrounding the borehole as a function of depth over said depth interval; traversing said borehole with a gravimetric logging tool; measuring true gravity as a function of depth over said depth interval;

converting said density and said true gravity to a common measurement;

determining the difference between said density and said

true gravity in said common measurement over said depth interval; and

from the temperature compensating amplifier to indicate the relative humidity.



plotting a log of said difference on which true basement is distinguished from intrusive sills and dikes.

4,419,888

# HUMIDITY MEASURING METHOD

Kenzo Kitamura, Tokyo; Tetsuo Miura, Omiya; Satoshi Ookubo, Hasuda, and Hideyuki Nagata, Urawa, all of Japan, assignors to Kabushikikaisha Shibaura Denshi Selsakusho, Japan

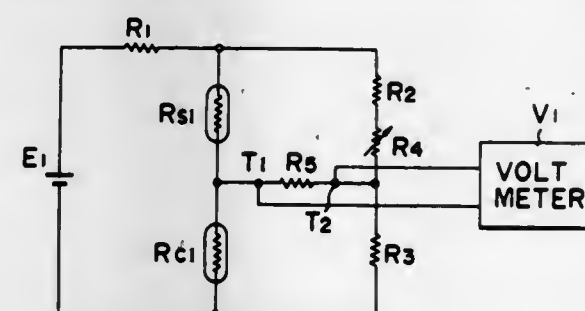
Filed May 9, 1980, Ser. No. 148,465

Claims priority, application Japan, Jun. 14, 1979, 54-74858; Jun. 14, 1979, 54-81092[U]; Jun. 14, 1979, 54-81093[U]

Int. Cl.<sup>3</sup> G01W 1/02, 25/18

U.S. Cl. 73-336.5

5 Claims



1. A hygrometer comprising:

a heat sensitive element having a temperature-resistance characteristic and held in a manner to be exposable to the open air;

a temperature compensating element having substantially the same temperature-resistance characteristic as the heat sensitive element and held in a completely dry state;

two resistors; the heat sensitive element, the temperature compensating element and two resistors forming a bridge circuit;

a power source for supplying a current to the heat sensitive element and the temperature compensating element to heat them up to a temperature above the open air temperature; and

a temperature compensating amplifier for amplifying an unbalanced output voltage from the bridge circuit, caused by a change in the resistance value of the heat sensitive element corresponding to the amount of water vapor contained in the open air, in such a manner that the amplification factor may vary with the open air temperature and the output corresponding to the relative humidity of the open air may have nothing to do with the open air temperature; and

voltage measuring means supplied with the output voltage

4,419,889

# MOISTURE SENSITIVE DEVICE

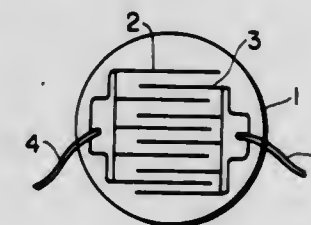
Katsutoshi Muto; Takao Sawada, and Yoshiharu Komine, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,374

Int. Cl.<sup>3</sup> G01W 1/00

U.S. Cl. 73-336.5

15 Claims



1. A moisture sensitive device comprising a moisture sensitive element including a material comprising  $M_{10}(PO_4)_6(OH)_2$ , wherein M is at least one member selected from the group consisting of Sr, Ca and Ba, at least two electrodes formed on said moisture sensitive element, with said electrodes being separated by said element, and to each of said electrodes is connected at least one electrical lead.

4,419,890

# BICYCLE ERGOMETER

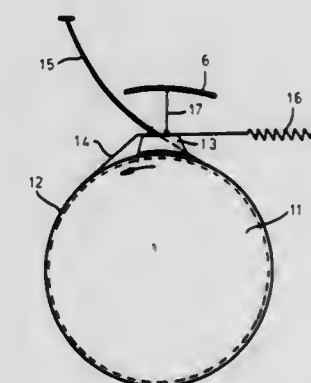
Esko Kotamäki, Turku, Finland, assignor to Tunturi Oy, Turku, Finland

Filed Mar. 16, 1981, Ser. No. 244,301

Int. Cl.<sup>3</sup> G01L 5/22

U.S. Cl. 73-379

1 Claim



1. A bicycle ergometer comprising:

a flywheel formed with a peripheral groove;

a brake band extending around the periphery of said flywheel;

a weight riding on the periphery of said flywheel and guided in said groove, said brake band being secured to said weight;

a tensioning element connected to said brake band for tightening same against said periphery of said flywheel;

a spring having an end connected to said weight and adapted to resist entrainment thereof with said flywheel; and

an indicator connected to said weight for displaying displacement thereof against the force of said spring.



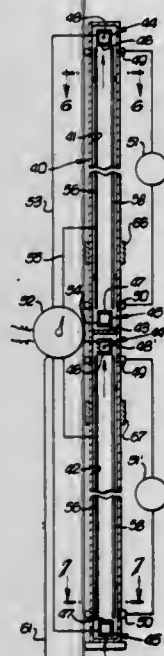
4,419,891

**SUPPORT GRAVITY MEASUREMENT INSTRUMENT**

Alva L. Browning, 1012 N. Lupine, Lompoc, Calif. 93436  
Continuation-in-part of Ser. No. 935,386, Oct. 13, 1978, abandoned, Ser. No. 757,754, Jan. 7, 1977, abandoned, Ser. No. 646,402, Jan. 2, 1976, abandoned, Ser. No. 510,559, Sep. 30, 1974, abandoned, Ser. No. 399,099, Sep. 20, 1973, abandoned, Ser. No. 404,294, Oct. 9, 1973, Pat. No. 3,965,755, and Ser. No. 41,845, Jun. 1, 1970, abandoned. This application Dec. 18, 1981, Ser. No. 332,252

Int. Cl.<sup>3</sup> G01V 7/14  
U.S. Cl. 73—382 G

51 Claims



1. A sensing mass field support gravity measurement instrument comprising an elongated measuring unit adapted to be mounted in substantial radial alignment with respect to the earth's center of gravity,

said unit comprising a tube having an elongated sealed chamber,

upper and lower support assemblies for said mass, one of said assemblies being mounted in the tube at the upper end of the chamber

and the other of said assemblies being mounted in the tube at the lower end of the chamber,

a single sensing mass adapted to serve both support assemblies, and means including said tube forming a free fall passageway between said assemblies for said sensing mass, each support assembly comprising a plurality of pairs of energizable support members for said sensing mass aligned on axes perpendicular with respect to each other, and means operably connected to each pair of support assemblies adapted to alternately energize and de-energize said support assemblies in opposite sequence,

apertures in the respective support assemblies on mutually facing sides spaced from each other by said free fall passageway,

a timer having a sequence of operation adapted to cyclically energize and de-energize said support assemblies in opposite sequence,

a sensing mass return pulse means connected to said timer having a cycle of operation in a sequence adapted to periodically return the sensing mass from one support assembly to the other support assembly,

and a clock device for measuring the time consumed in the free fall of the sensing mass from the upper support assembly to the lower support assembly,

said clock device comprising a start trigger for the upper support assembly responsive to the sensing mass upon emergence from the respective aperture and a stop trigger for the lower support assembly responsive to the sensing mass prior to entry into the lower support assembly.

4,419,892

**METHOD FOR DETERMINATION OF INTERNAL PIPELINE OR TUBING CORROSION**

Alvin D. Goolsby, Houston, Tex., and Ignatius A. M. Hesselman, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

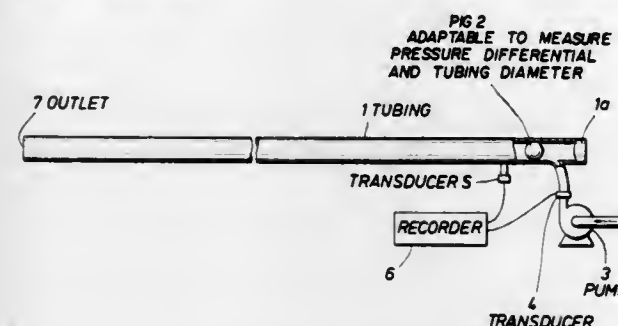
Filed Jul. 17, 1981, Ser. No. 284,280

Claims priority, application United Kingdom, Sep. 3, 1980, 8028446

Int. Cl.<sup>3</sup> G01M 19/00; G01N 33/00, 17/00

U.S. Cl. 73—432 R

4 Claims



1. A method for determining the variations with time of the internal condition of a pipeline or tubing, comprising propelling a pig, which is sealed against the pipeline or tubing wall, through the pipeline by means of a constant flowing driving fluid; continuously measuring and recording the pressure of the driving fluid during passage of the pig through the pipeline or tubing; deriving from the recorded pressure signals a plurality of quantities representative of the pressure variations in successive intervals of the pipeline or tubing, each interval having a predetermined length to cover the total length of the pipeline or tubing to be inspected; comparing the values of the quantities thus obtained with previously determined reference data of these quantities for the pipeline or tubing being inspected; and deriving from said comparison information as to the internal diameter variations of the pipeline or tubing being inspected.

4,419,893

**METHOD FOR DETERMINING SPECIFIC GRAVITY OF A LIQUID**

Lloyd A. Baillie, Homewood, and George A. Uhl, Crete, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

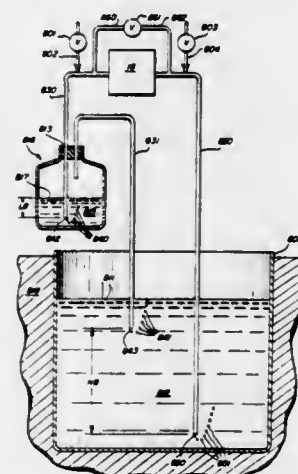
Division of Ser. No. 255,915, Apr. 20, 1981, abandoned, which is a division of Ser. No. 99,348, Dec. 3, 1979, Pat. No. 4,299,116.

This application Jul. 20, 1982, Ser. No. 399,942

Int. Cl.<sup>3</sup> G01N 9/26

U.S. Cl. 73—439

2 Claims



1. A process for measuring the average specific gravity of a first liquid within a tank by means of a photocell manometer having a first sensor and a second sensor, said process comprising:

introducing a first vapor purge stream into said second sensor which has an orifice thereof located below a surface of a reference liquid at a rate at least sufficient to keep said reference liquid from entering said orifice of said second sensor,

introducing a purge stream of said first vapor into a hollow column at a rate at least sufficient to maintain said column which is within said first liquid uniformly and completely filled with said first vapor, wherein said column has two ends consisting of a first end and a second end, wherein the first end is above a surface level defined by said reference liquid, and the second end terminates near a bottom of said tank, at a distance spaced from said bottom at least sufficient to permit said first vapor to exit from said second end,

introducing a second vapor purge stream into said first sensor which has an orifice thereof located below said surface level defined by said first liquid at a rate at least sufficient to keep said first liquid from entering said orifice of said first sensor, wherein said orifices of said first and second sensors are at the same height relative to one another, and

measuring a difference in pressure transmitted by said first sensor relative to a pressure transmitted by said second sensor; whereby a process for measuring the relative density of said first liquid as compared to said reference liquid can be achieved.

4,419,894

**DETECTION OF ANGULAR LOCATION OF UNBALANCE OF A ROTOR AND POSITIONING OF THE LOCATION TO A PREDETERMINED ANGULAR POSITION**

Sigeru Matumoto, Musashino, Japan, assignor to Kokusai Company, Ltd., Japan

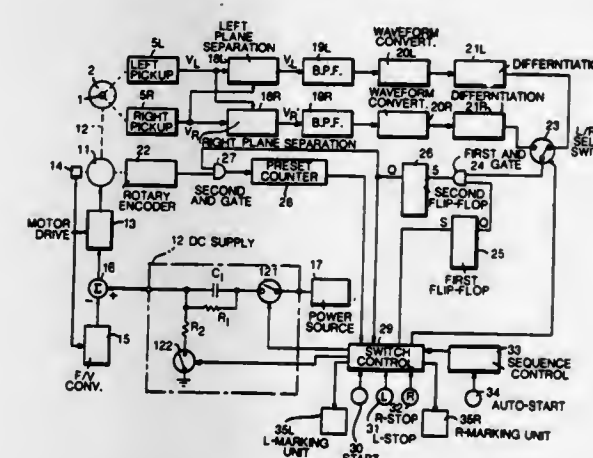
Filed Aug. 3, 1981, Ser. No. 289,434

Claims priority, application Japan, Aug. 2, 1980, 55-106598

Int. Cl.<sup>3</sup> G01M 1/22, 1/26

U.S. Cl. 73—462

16 Claims



1. A system for automatically detecting an angular location of unbalance of a rotor piece and simultaneously positioning the location to a predetermined stop angular position, which comprises:

two bearing means for rotatably supporting the axially opposite ends of the rotor piece to be tested;  
drive motor means having motor controlling means;  
means for transmitting rotation of said drive motor means to the test rotor piece supported by said bearing means;  
pickup means coupled with at least one of said bearing means for picking up once-per-revolution vibratory motion of said bearing means or forces on said bearing means due to dynamic unbalance of the test rotor piece as a vibration signal;  
pulse forming circuit means for forming phase indicating pulse signals from said vibration signal, said phase indicating pulse signals being presented at each of a plurality of

predetermined phase intervals of said vibration signal and indicating the unbalance location passing a reference angular position;

pulse generating means for generating angular pulse signals; each of said angular pulse signals indicating rotation of the test rotor piece over a predetermined unit angular extent; preset counter means in which a number of  $(2\pi + \alpha)/\alpha$  can be preset, where  $n$  is a predetermined rotation speed of the test rotor piece,  $\alpha$  being an angle between said predetermined stop angular position and said reference angular extent;

means for generating a motor speed reduction signal which is fed to said motor drive controlling means to reduce rotational speed of said drive motor means;

means coupled with said pulse forming circuit means and said motor speed reduction signal generating means and said pulse generating means for transmitting said angular pulse signals to said preset counter means after receiving one of said phase indicating pulse signals following said motor speed reduction signals; and

said preset counter means providing a signal to stop said drive motor means at a time when said angular pulse signals are counted up to the preset number, whereby said drive motor means is immediately stopped so that the unbalance location of the test rotor piece is positioned to said predetermined stop angular position.

4,419,895

**CANTILEVERED-BEAM, FIBER-OPTIC ANGULAR ACCELEROMETER**

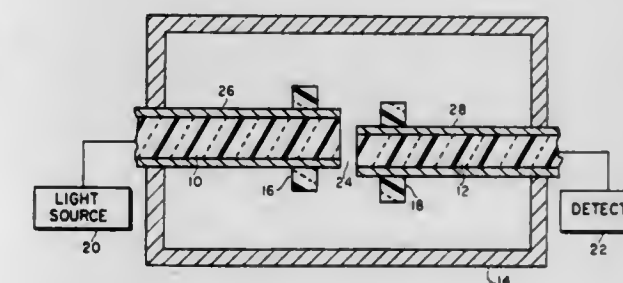
Harrison W. Fuller, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 25, 1982, Ser. No. 342,254

Int. Cl.<sup>3</sup> G01P 15/08

U.S. Cl. 73—517 A

8 Claims



1. An angular accelerometer, comprising:  
a first optical fiber arranged as a cantilevered-beam;  
a second optical fiber arranged as a cantilevered-beam spaced and offset from such first optical fiber such that optical coupling between said first and second optical fibers varies proportionately to angular accelerations about an axis perpendicular to the fiber axes and perpendicular to the direction of offset; and  
means for mass loading each of said first and second optical fibers with a mass loading member which is non-responsive to magnetic fields.

4,419,896

**FORCE OR VIBRATION INDICATING DEVICE UTILIZING MICROWAVE RESONANCE FERRIMIC GYRATORS**

Carl O. Olson, Jr., 8705 Little River Tpke., Annandale, Va. 22003

Filed Aug. 27, 1981, Ser. No. 296,852

Int. Cl.<sup>3</sup> G01N 29/00; G01L 1/00

U.S. Cl. 73—652

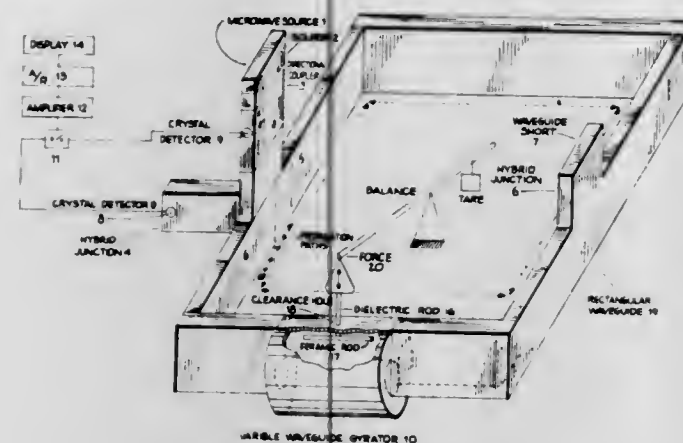
1 Claim

1. A device for measuring an applied weight, force or vibration comprising:

(a) a microwave energy source capable of transmitting energy,  
(b) a microwave bridge waveguide connection containing in



one arm a variable phase shift gyrator with a movable ferramic rod or slab, said movable ferramic rod or slab is connected by a free moving small dielectric rod to a means for receiving a weight, force or vibration source, the dielectric rod passes thru a small clearance hole in the side

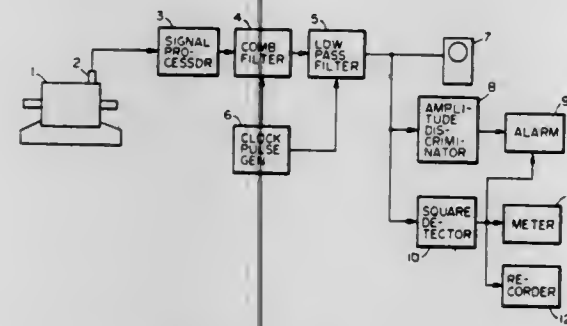


of the waveguide gyrator, whereby movement of the ferramic rod or slab in the gyrator produces an accompanying microwave phase change and bridge unbalance which is detected as a measure of the applied weight, force or vibration.

#### 4,419,897 APPARATUS FOR HARMONIC OSCILLATION ANALYSIS

Katsutoshi Matsuoaka, Chigasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan  
Filed May 6, 1980, Ser. No. 147,050  
Int. Cl.<sup>3</sup> G01H 1/00

U.S. Cl. 73-660



1. Apparatus for harmonic oscillation analysis comprising: a detector for taking up, as electrical oscillation, such mechanical oscillation generated during the operation of a rotary machine system;
- a comb filter for extracting from the detector's output signal having a composite periodic oscillation wave form only a fundamental wave component having a determined fundamental frequency ( $f_0$ ) and high harmonic wave component thereof;
- a clock pulse generator for generating clock pulse to drive said comb filter by the clock pulse having the fundamental frequency  $f_0$ ; and
- discriminating means for evaluating abnormality of said rotary machine system depending upon the particular signal components extracted by said comb filter.

#### 4,419,898 METHOD AND APPARATUS FOR DETERMINING THE MASS FLOW OF A FLUID

Klaus J. Zanker, Four Marks, near Alton, and Gerald Anderson, New Arlesford, both of England, assignors to Sarasota Automation Limited, Winchester, England

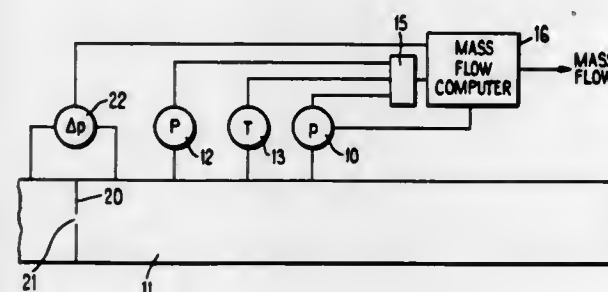
Filed Oct. 15, 1981, Ser. No. 311,523

Claims priority, application United Kingdom, Oct. 17, 1980, 8033540

Int. Cl.<sup>3</sup> G01F 1/86

U.S. Cl. 73-861.02

5 Claims



1. A method of determining the mass flow of a fluid comprising measuring, at each of a plurality of different regions in the fluid, a plurality of parameters comprising the pressure  $P$ , the temperature  $T$  and the density  $\rho$  of the fluid, determining the specific gravity  $G$  of the fluid from said parameters, and using the measured density together with a further parameter which varies with the volumetric flow to evaluate the mass flow of the fluid only if the so-determined values of  $G$  at said regions are within a given range of values.

#### 4,419,899 ELECTROMAGNETIC FLOW METER

Ichiro Wada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

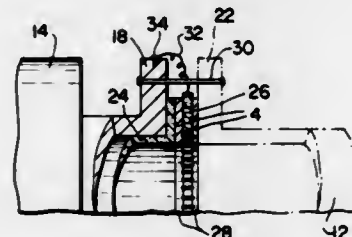
Filed Mar. 22, 1982, Ser. No. 360,420

Claims priority, application Japan, Apr. 30, 1981, 56-63510[U]

Int. Cl.<sup>3</sup> G01F 1/58

U.S. Cl. 73-861.12

17 Claims



1. An electromagnetic flow meter for measuring the flow of a liquid flowing through a pipe, comprising: an electromagnetic flow meter body having at least one connecting end for connecting the body to one end of the pipe; and a grounding device adapted to be fastened between the connecting end of said body and the end of the pipe, said grounding device comprising (a) an annular frame of an insulating material having an inner periphery defining a central opening and an outer periphery and (b) a grounding wire disposed on said annular frame at least at said inner periphery to be exposed to said central opening of said annular frame.

#### 4,419,900 MACHINE HEALTH MONITORING SYSTEM

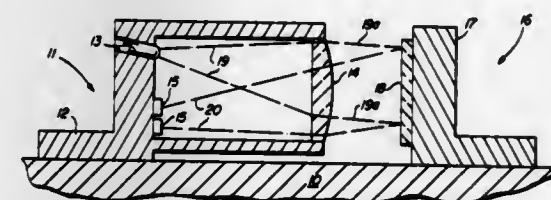
David R. Scott, Lancaster, Calif., and Thomas S. Rhoades, Colorado Springs, Colo., assignors to Machine Monitoring Research & Development Program, Ariz.

Division of Ser. No. 265,031, May 18, 1981, which is a continuation of Ser. No. 86,772, Oct. 22, 1979, Pat. No. 4,287,511. This application Nov. 13, 1981, Ser. No. 320,873

Int. Cl.<sup>3</sup> G01L 5/00

U.S. Cl. 73-862.06

1 Claim



1. A system for collecting and interpreting data reflecting the effect of at least a selected one of a plurality of forces acting on a machine tool for forming and/or bending metals, said system comprising, in combination:

- (a) at least one structural moment detector carried by said machine tool assembly for generating output signals in response to said plurality of forces acting on said machine tool assembly;
- (b) means for processing said output signals to modify the information content thereof, including rejecting components of said signals which reflect the effects of extraneous forces other than said selected one; and
- (c) means for manipulating said processed signals to provide secondary signals responsive to the condition of said machine tool assembly as a result of the application of said selected force.

#### 4,419,901 DEVICE FOR MEASURING THE AXIAL FORCE IN A SHAFT JOURNALLED BY ROLLER BEARINGS

Helmut Ruppert, Kassel, and Dietmar Frase, Dittelbrunn, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Essen and SKF Kugellagerfabriken GmbH, Schweinfurt, both of, Fed. Rep. of Germany

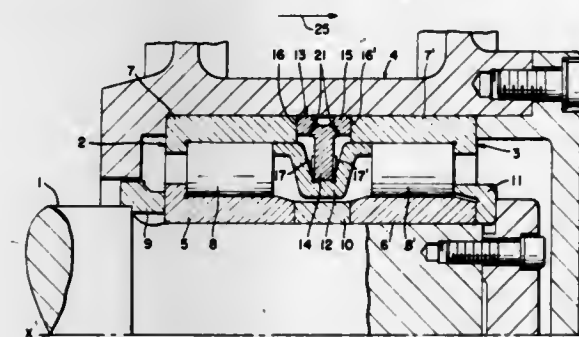
Filed Mar. 23, 1982, Ser. No. 361,526

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111434

Int. Cl.<sup>3</sup> G01L 5/12

U.S. Cl. 73-862.49

10 Claims



1. A device for measuring the axial force in a shaft which has a shaft shoulder and is journaled by means of two roller bearings arranged side by side in a housing having a bearing cover, with a first one of said roller bearings being located in the vicinity of said bearing cover, and a second one of said roller bearings being located remote from said bearing cover, said device further comprised in that: said second roller bearing has an inner ring which engages said shaft shoulder, and has an outer ring; an angle ring is arranged on said shaft in the vicinity of said bearing cover; said first roller bearing has a flangeless inner ring, and has an outer ring.

outer ring; each of said roller bearings being provided with a row of roller bodies respectively arranged between said outer and inner rings of the roller bearing with which it is associated, with the roller bodies of said row of roller bodies of said first roller bearing being supported on said inner ring of said first roller bearing in such a way that those end faces of said roller bodies of said last-mentioned row of roller bodies which face said bearing cover bear against said angle ring;

- a flanged ring, which transfers force and is movable in the direction of force when force is applied, is provided in such a way that those ends of said roller bodies of said rows of roller bodies which face one another are supported on said flanged ring; and
- a gauge ring is located between said flanged ring and those end faces of said rings of said roller bearings which are diametrically opposed to one another; said gauge ring having a first part which extends at substantially right angles to the axis of said shaft and is operatively connected to said flanged ring, said first part of said gauge ring being provided with means for effecting measurement of said axial force; said gauge ring also having a second part which is connected to said first part and is remote from said flanged ring, said second part of said gauge ring having pressure surfaces on two sides for effecting positive connection of said second part to said diametrically opposed end faces of said rings of said roller bearings.

#### 4,419,902 CONSTANT STRAIN LOAD CELL

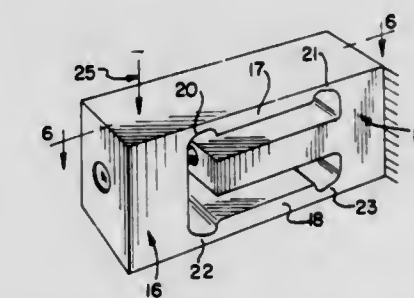
Hardev S. Somai, LaPorte, Ind., assignor to Maatschappij Van Berkel's Patent N.V., Leidschendam, Netherlands

Filed Oct. 2, 1981, Ser. No. 308,113

Int. Cl.<sup>3</sup> G01L 1/22

U.S. Cl. 73-862.65

7 Claims



1. In a constant strain load cell including a fixed end constraint, a movable end constraint, upper and lower flexures interconnecting the end constraints in parallelogram form, said end constraints being massive and of constant width therealong, said flexures being compliant and of constant width therealong, flexing areas at opposite ends of the flexures, and strain gages mounted at the flexing areas, the improvement being in the flexing areas which are of less thickness than the main body of the flexures and of uniform tapered thickness along their length from one end to the other end thereof such as to define constant stress areas along their entire length whereby bending of the areas will cause constant and equal tensile and compressive stresses along their length.

#### 4,419,903 METHOD AND APPARATUS FOR DETECTING INSUFFICIENT LIQUID LEVELS

Delbert D. Jackson, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 22, 1982, Ser. No. 350,697

Int. Cl.<sup>3</sup> G01N 35/08

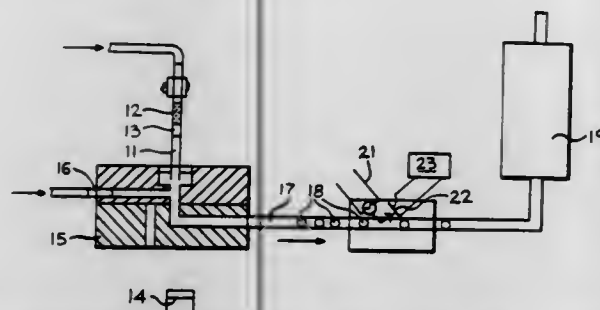
U.S. Cl. 73-864.01

4 Claims

1. In a liquid sampling apparatus including a probe for with-

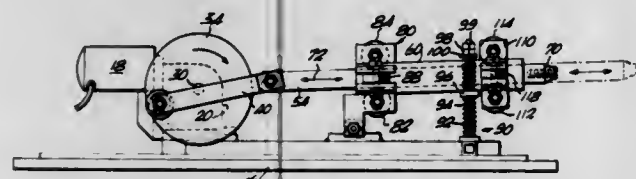


drawing a first liquid volume from a container, a conduit into which said liquid volume may be expelled, and a source of a second liquid volume connected to said conduit, said second liquid volume to be mixed with said first liquid volume thereby generating air bubbles if said liquid volumes are insufficient; a device for detecting said insufficient volumes comprising:



electromagnetic means, associated with said conduit, for detecting the presence of said air bubbles; and means, responsive to said detecting means, for counting said detected air bubbles.

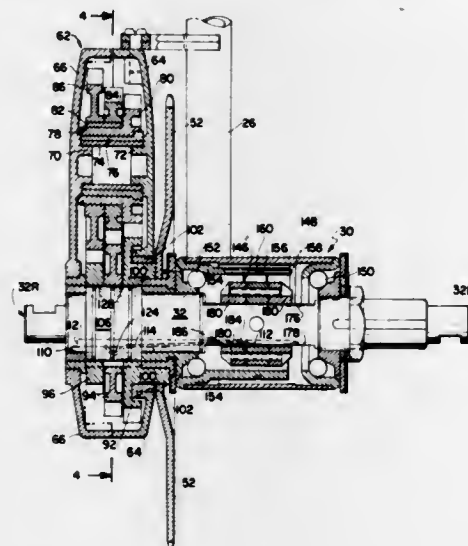
**4,419,904**  
**RECIPROCATING DEVICE**  
Randolph R. Albury, P.O. Box N 7512, Nassau, The Bahamas  
Continuation-in-part of Ser. No. 14,872, Feb. 26, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,179  
Int. Cl.<sup>3</sup> F16H 21/22  
U.S. Cl. 74-44 3 Claims



1. A reciprocating device comprising:  
an elongate slide member having a first end, a second end, and an intermediate portion between the ends, and said slide member having slide surfaces;  
a tubular member sized for telescopically receiving the intermediate portion;  
a housing including a base;  
said base including eccentric reciprocating means and means connecting the reciprocating means to the first end of the slide member for reciprocating movement,  
said first end comprising a laterally projecting bar perpendicular to the slide member and symmetrical therewith;  
a first vertically resilient mounting means comprising a vertically oriented spring support means, said spring support means having a lower end secured to the base and an upper end about which a washer and lock means are fitted, a spring means about said support means, said spring means being held under tension by said washer and lock means and having an intermediate region, and  
connector means movably attached to said intermediate region of the spring means and said tubular member, said connector means normally urging said tubular member to a first vertical position and yieldable vertically upon application of a vertical force on the second end of said slide member during generally horizontal reciprocation movement; and  
mounting means on the slide member second end for connection with a driven removable working end;  
said reciprocating means comprising,  
a drive means having a drive shaft,  
wheel means comprising a pair of wheels on a common axis opposed in confronting relation with the drive shaft intermediate the wheels,  
a drive motor having gear means on the drive shaft for rotating the wheel means, each wheel means including an

eccentric with a crank connecting each wheel to the bar of said slide member first end, to imparting eccentric reciprocating movement to the slide member.

**4,419,905**  
**BICYCLE TRANSMISSION**  
Fernand S. Lapeyre, 1224 Octavia St., New Orleans, La. 70115  
Continuation of Ser. No. 810,112, Jun. 27, 1977, Pat. No. 4,283,969. This application Sep. 22, 1980, Ser. No. 189,728  
The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> F16H 31/00; F16D 41/04  
U.S. Cl. 74-126 2 Claims

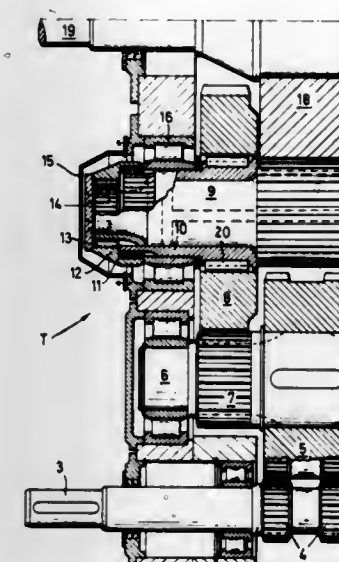


1. In a multi-speed transmission for bicycles,  
a drive shaft rotatably displaceable in a forward and in a reverse direction within a frame pedal hub in response to pedal displacement,  
collar means mounted on said drive shaft for rotation in conjunction therewith and permitted longitudinal displacement therealong intermediate a pair of spaced apart limiting positions, and  
means remote from said drive shaft engageable with said collar means and selectively responsive to a limited predetermined arc of reverse rotative displacement of said drive shaft at a pair of diametrically opposed angular positions thereof for displacing said collar means in a selected direction longitudinally along said shaft from either one of said limiting positions toward the other.

**4,419,906**  
**TORQUE DIVISION GEARING CONNECTION ASSEMBLY**  
Gerhard Briehl, Bocholt, Fed. Rep. of Germany, assignor to WGW Westdeutsche Getriebe- und Kupplungswerke GmbH, Fed. Rep. of Germany  
Filed Oct. 8, 1980, Ser. No. 195,004  
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941553  
Int. Cl.<sup>3</sup> F16H 35/00; F16D 1/12  
U.S. Cl. 74-413 52 Claims

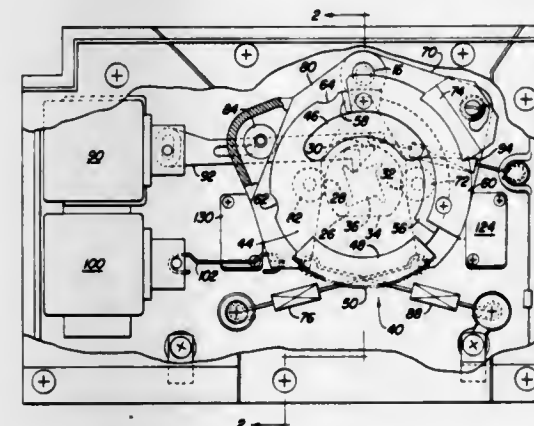
1. A torque division gearing assembly apparatus having an input to at least two torque branch gear trains for driving a common output shaft, at least one torque branch gear train including a gear for driving an intermediate shaft having a pinion formed thereon for driving connection with a corresponding gear wheel connected with said output shaft, wherein the drive connection between said gear and said intermediate shaft comprises a connection bush having two gear teeth rings of different diametral pitches, one said ring for receiving torque transmission from said gear and the other for transmitting torque to said intermediate shaft, and a bushing

element rotatable about and relative to said intermediate shaft and having at one end key means for driving connection with



said gear and at the other end gear teeth means for corresponding meshing with one of said connection bush gear rings.

**4,419,907**  
**MULTIPLE MODE CONTROL LEVER ASSEMBLY**  
Kenneth D. Baxter, Cedar Falls, Iowa; Gary R. Bluem, Wayzata; Dallas R. Humphrey, Golden Valley, both of Minn.; Carl E. Kittle, Cedar Falls, Iowa, and Douglas J. Kluge, Golden Valley, Minn., assignors to Deere & Company, Moline, Ill.  
Filed Dec. 23, 1981, Ser. No. 333,601  
Int. Cl.<sup>3</sup> G05G 5/06  
U.S. Cl. 74-531 16 Claims



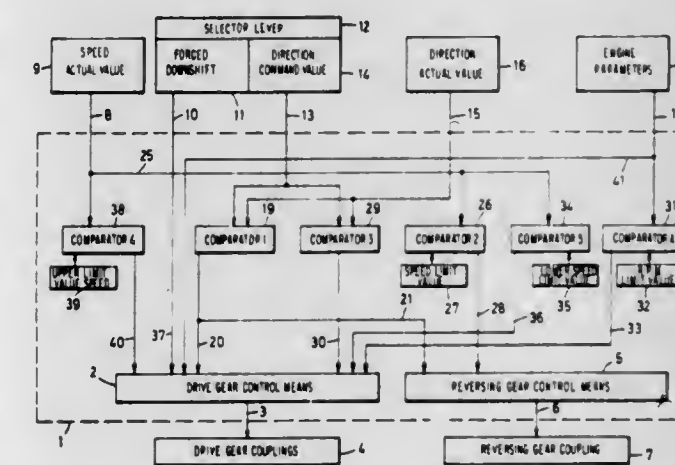
1. A multiple mode control lever assembly comprising:  
a housing;  
an operator-movable control lever;  
pivot means for rotatably coupling the control lever to the housing;  
a friction member for slidably engaging the control lever to resist rotation of the control lever relative to the housing, the friction member having a cam follower projecting therefrom;  
a resilient member biased to urge the control lever from a displaced position to a neutral position;  
an index cam mounted in the housing for rotation independent of the control lever and having cam surfaces engageable with the follower, the index cam being rotatable between a first position wherein a first cam surface faces the follower to permit the friction member to slidably engage the control lever and a second position wherein a second cam surface engages the follower to hold the friction member spaced apart from the control lever; and  
an index actuator mounted in the housing and including means for rotating the index cam among its positions.

**4,419,908**  
**MOLD AND METHOD OF MAKING SPOKED WHEELS AND PRODUCT OF SAME**  
Harold J. Reikowski, Southfield, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.  
Filed Oct. 26, 1981, Ser. No. 314,541  
Int. Cl.<sup>3</sup> B29D 3/02; B29G 7/00  
U.S. Cl. 74-552 11 Claims



1. A method of producing a spoked wheel from parallelly oriented fiber reinforced materials, comprising: providing a mold having a central support with an annular ring thereabout having a mold groove in its top surface adjacent its periphery, and at least two ramps connecting said groove with said central support, placing a segmental cover plate having a mold groove in its bottom surface over the mold groove in said annular ring and leaving an entrance channel between the ring and cover which communicates with the periphery of said ring and cover; placing a hub having parallel top and bottom flanges on said central support; wrapping binder impregnated parallel fibers into said entrance channel up said ramps, and between said flange of said hub until parallel fibers and binder build up in said mold grooves to said entrance channel; and forcing a wedge shaped member into said entrance channel to move the parallel fibers laterally to fill the mold grooves in the annular ring and its cover plate; and hardening the binder.  
2. The method of claim 1 including the step of: placing a binder wetted reinforcement pad in the portion of said groove in said annular ring that is beneath said entrance channel and opposite said ramps before pulling the binder impregnated parallel fibers through said entrance channel.  
3. An armature for a wheel made by the method of claim 2.

**4,419,909**  
**METHOD OF CONTROLLING A POWER TRANSMISSION DEVICE AND CONTROL SYSTEM FOR CARRYING OUT SAID METHOD**  
Hans-Jürgen Oppert, Sven A. L. Carlsson, and Hans G. Ericson, all of Eskilstuna, Sweden, assignors to Volvo BM AB, Eskilstuna, Sweden  
Filed Jun. 24, 1980, Ser. No. 162,675  
Claims priority, application Sweden, Jun. 28, 1979, 7905695  
Int. Cl.<sup>3</sup> B60K 41/06  
U.S. Cl. 74-856 5 Claims



1. In a method of controlling a power transmission device arranged between a driving engine and a drive axle and comprising a torque converter and a mechanical step gearbox, especially for vehicles such as wheeled loaders, comprising



controlling the gearbox both automatically in response to engine parameters such as rotational speed and torque, and in response to a directional signal from a manually actuated direction selector control, emitting a command value for the rotational direction of the drive axle, delaying the reversal of the working direction of the gearbox until the speed is less than a predetermined limiting speed value if the speed of the vehicle or the rotational speed of the drive axle exceeds said value, and reversing the direction of the gearbox when the directional command value signal is changed to indicate the opposite rotational direction to the prevailing rotational direction of the drive axle so that during the subsequent retardation it works against the prevailing drive axle direction; the improvement comprising maintaining during the entire retardation that gear in engagement which is in engagement at the beginning of the retardation, downshifting immediately to the next-to-the-highest gear if the highest gear is engaged when the directional command signal is changed, and when the retardation has been completed and the speed of the axle and vehicle is zero, engaging the next-to-the-lowest gear of the gearbox for the subsequent acceleration.

4,419,910

# SHIFT CONTROL MECHANISM IN AN AUTOMATIC TRANSMISSION FOR VEHICLES

Nobuaki Miki, Kariya, and Shoji Yokoyama, Anjo, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

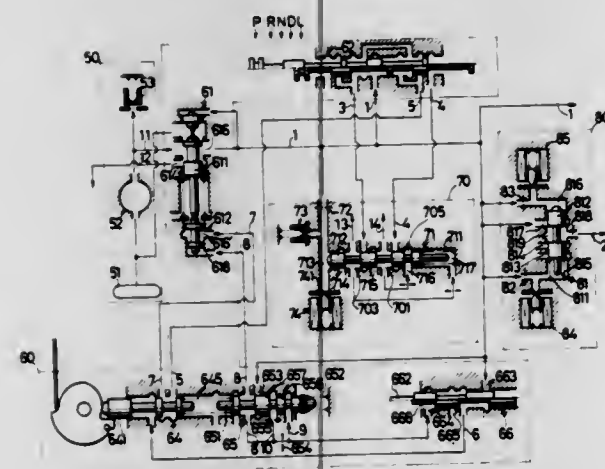
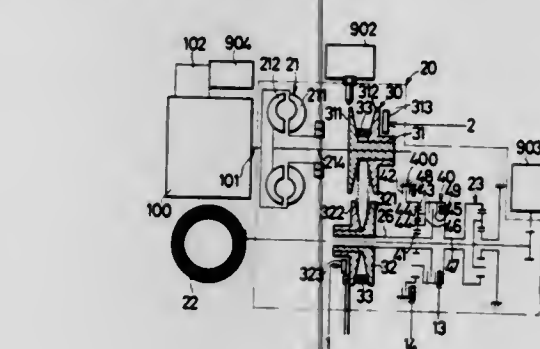
Filed Apr. 10, 1981, Ser. No. 252,863

Claims priority, application Japan, Apr. 15, 1980, 55-50073

Int. Cl.<sup>3</sup> B60K 41/04

U.S. Cl. 74—867

6 Claims



1. A shift control mechanism in an automatic transmission for vehicles, wherein a planetary gear transmission comprising a planetary gear set consisting of a sun gear, a ring gear, a planetary gear and a planetary carrier, one wet-type multi-plate clutch and one wet-type multi-plate brake is changed into forward and reverse drives by controlling hydraulic operation fluid supplied or discharged to hydraulic servo systems of the multi-plate clutch and the multi-plate brake, characterized in that said shift control mechanism comprises a shift control valve connecting the hydraulic servo systems with a hydraulic

pressure source or a drain port selectively, and a solenoid valve controlling operation of the shift control valve in response to an electric control circuit, said shift control valve having a first oil chamber supplied with hydraulic pressure from the hydraulic pressure source through a fixed orifice; a spool for receiving said hydraulic pressure positioned at one end of said shift control valve, and connected to the first oil chamber, and a spring positioned opposite said spool; a second oil chamber connecting the hydraulic servo system to operate at least a servo system with the hydraulic pressure source or the drain port and supplying or discharging hydraulic pressure to said hydraulic servo system; a third oil chamber connecting the hydraulic servo system to operate the multi-plate clutch with a hydraulic pressure source or the drain port and supplying or discharging hydraulic pressure to said servo system; a fourth oil chamber effecting feedback of hydraulic pressure fed by the second oil chamber to said spool; and a fifth oil chamber effecting feedback of hydraulic pressure fed by the third oil chamber to the spool, wherein a pressure receiving area of the spool connected to the first oil chamber is larger than a pressure receiving area in the fourth or fifth oil chamber and the solenoid valve urges the spool of the shift control valve by controlling hydraulic pressure in the first oil chamber.

4,419,911

# SOCKET DRIVE WRENCH AND PAWL AND RATCHET ASSEMBLY THEREFOR

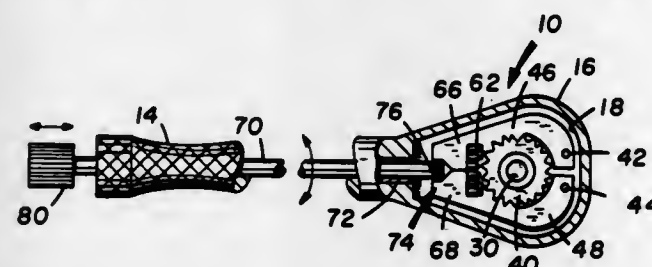
Steven A. Claudy, 7206 Bentwoods Rd., Hanover, Md. 21076

Filed May 19, 1981, Ser. No. 265,230

Int. Cl.<sup>3</sup> B25B 13/46

U.S. Cl. 81—62

25 Claims



1. A socket drive wrench for driving sockets comprising: a housing having a drive portion and a handle portion extending therefrom; socket mounting means rotatably carried on said drive portion of said housing, said socket mounting means adapted to accept and removably mount thereon said sockets; ratchet gear means connected to said socket mounting means and rotatable therewith; a pair of pawls pivotably disposed on said drive portion of said housing about and for selectively engaging said ratchet gear means, said pawls being positionable to permit clockwise and counterclockwise ratcheting, free-wheeling, and lockup of said ratchet gear means, each of said pawls having two ends, adjacent ends of said pawls being pivotably mounted to said housing, the other ends of said pawls being movable toward and away from each other, the teeth of each of said pawls engaging said ratchet gear means when said other ends of said pawls are moved toward each other, said teeth of each of said pawls disengaging said ratchet gear means when said other ends of said pawls are moved away from each other; spring biasing means for urging said other ends of said pair of pawls toward each other to engage said ratchet gear means therebetween; and pawl control means for positioning said pawls, said pawl control means for selectively contacting and positioning one of said pawls to permit clockwise rotation of said ratchet gear means and the other of said pawls to permit counterclockwise rotation, said pawl control means selectively engaging and positioning both of said pawls to permit free-wheeling of said ratchet gear means, said pawl

control means selectively engaging and positioning both of said pawls to engage said ratchet gear means to effect the lockup thereof, said pawl control means comprising a control arm having first, second, third, and fourth positions, said control arm in said first position contacting one of said pawls and positioning the same so as to be disengaged from said ratchet gear means, said control arm in said second position contacting the other of said pawls and positioning the same so as to be disengaged from said ratchet gear means, said control arm in said third position engaging both of said pawls and positioning them so as to be disengaged from said ratchet gear means, said control arm in said fourth position permitting both of said pawls to engage said ratchet gear means.

4,419,912

# VIBRATION THREADING LATHE FOR PRECISION SCREW CUTTING

Tatuo Sotome, Hiratsuka, and Fumio Yokoi, Isehara, both of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo and Yugen Kaisha Shindo Sessaku Kenkyusho, Kofu, both of Japan

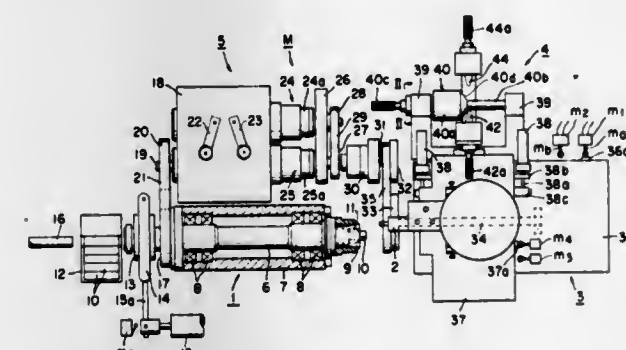
Filed Jun. 16, 1981, Ser. No. 274,356

Claims priority, application Japan, Jun. 24, 1980, 55-85494

Int. Cl.<sup>3</sup> B23B 5/24

U.S. Cl. 82—5

8 Claims



1. A vibration threading lathe for precision screw cutting, comprising: a main spindle having a hollow interior and a chuck at one end thereof; a blank feeding device for feeding blanks one-by-one through said hollow spindle from the other end and to said chuck to be held thereby at said one end of said main spindle; means for rotatably driving said main spindle; a travelling carriage assembly on said lathe adjacent said one end of said main spindle and having a saddle mounted thereon for movement in the axial direction of said main spindle, means connected with said saddle for moving said saddle toward said main spindle at a speed corresponding with the pitch of the screw threads being cut, a cross slide mounted on said travelling carriage for movement perpendicular to the direction of movement of said saddle, and carriage control means for controlling the movement of said saddle and said cross slide; a tool rest mounted on said cross slide and having a tiltable frame; a cutting tool mounted in said tiltable frame, said tiltable frame being adjustably mounted on said tool rest for adjustment of the position thereof relative to said tool rest for varying the position of the cutting tip of the cutting tool relative to a blank held in said chuck; and a vibrator mounted on said cross slide and coupled to said cutting tool for causing said cutting tool to vibrate during the screw cutting operation thereof.

1037 O.G.—20

4,419,913

# METHOD OF CUTTING PATTERNS IN WEB MATERIAL

Eduard Schlitt, Hamburg, and Günter Hell, Ellerau, both of Fed. Rep. of Germany, assignors to Aristo Graphic Systeme GmbH & Co., KG, Hamburg, Fed. Rep. of Germany

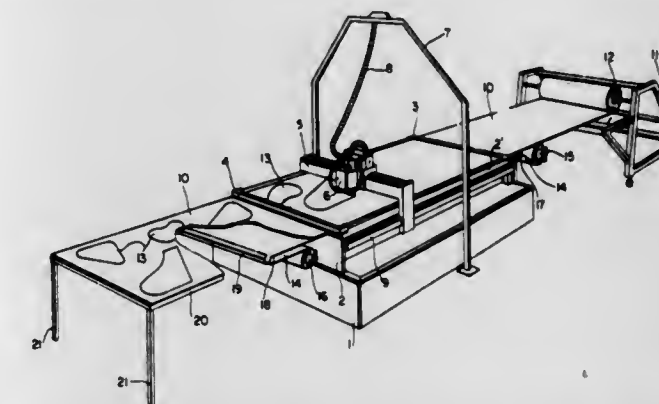
Filed Aug. 20, 1981, Ser. No. 294,686

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034621

Int. Cl.<sup>3</sup> B26D 7/20

U.S. Cl. 83—27

10 Claims



1. Method of cutting patterns in a web of pattern material comprising: A. longitudinally advancing a web of pattern material onto a cutting surface; B. simultaneously longitudinally advancing a web of rough surface material in parallel with the web of pattern material, such that the web of rough surface material abuts the underside of the pattern material while pulling a vacuum against the underside of the pattern material through the rough surface material, such that the pattern material adheres to the rough surface material during said cutting; C. cutting a pattern in that portion of pattern material within the confines of said cutting surface, such that burrs are formed on the underside of the pattern material and the burrs act as hooks to engage the rough surface material; D. releasing said vacuum and then simultaneously advancing the web of pattern material and the web of rough surface material away from the cutting surface as a consequence of said burr and rough surface engagement; and E. separating the web of rough surface material from the web of pattern material, such that the cut pattern may be removed.

4,419,914

# CANT PRODUCTION

Tony L. Evans, P.O. Box 415, Ozark, Mo. 65721

Filed Nov. 28, 1978, Ser. No. 965,386

Int. Cl.<sup>3</sup> B27B 5/34, 31/04

U.S. Cl. 83—407

13 Claims

1. A sawmill assembly comprising a pair of circular saws rotatable about a common horizontal axis and spaced from each other along said axis, said saws comprising a first set of saws; a second set of saws substantially identical to said first set of saws; a frame assembly mounting said first and second saws substantially in-line in a generally horizontal dimension generally transverse to said axes of said first and second saw set pairs; means for feeding an article to be cut to said first saw set, a main portion of the article passing through the space between said saws of said first saw set, and side portions of the article being separated from the main portion; means for feeding an article to be cut to said second saw set, a main portion of the article passing through the space between said saws of said second saw set, and side portions of the article being separated from the main portion; means for facilitating the rotation of the article 90° about an







4,419,920  
**APPARATUS FOR RECORDING AND REPRODUCING  
 MUSICAL PERFORMANCE**

Ichiro Ohe, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

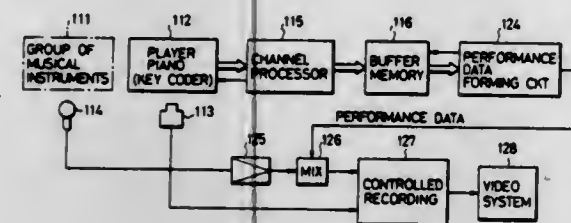
Filed Jul. 8, 1982, Ser. No. 396,360

Claims priority, application Japan, Jul. 16, 1981, 56-111429; Jul. 21, 1981, 56-114246; Jul. 23, 1981, 56-115560

Int. Cl.<sup>3</sup> G10F 1/00

U.S. Cl. 84-115

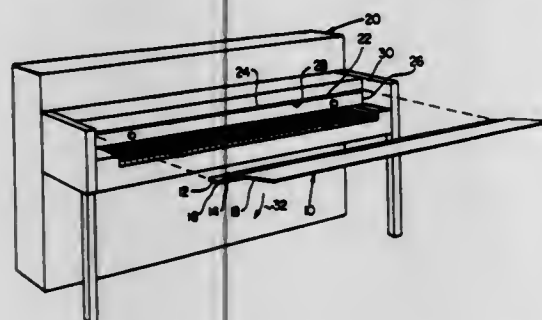
14 Claims



1. An apparatus for recording and reproducing a musical performance, comprising:
  - a recording section including a video system for recording in a composite form (a) an image signal obtained by photographing a scene of a performance of musical instruments, (b) a sound signal obtained by detecting a performance sound of said musical instruments, said sound signal substantially excluding the sound of a certain musical instrument, and (c) digital performance data indicative of the performance of said certain musical instrument; and
  - a reproducing section for separating the recorded image signal, sound signal and performance data relative to each other by a reproduction of the record obtained by said video system, and for reproducing an image from the separated image signal, and a sound from the separated sound signal, and for using said performance data to drive an automatically playing musical instrument corresponding to said certain musical instrument to make an automatic real performance based on said performance data.

4,419,921  
**PIANO KEYBOARD SHIELD**  
 Edward G. Simanski, 3005 Spruce Ave., Altoona, Pa. 16601  
 Filed Jun. 7, 1982, Ser. No. 385,509  
 Int. Cl.<sup>3</sup> G09B 15/06  
 U.S. Cl. 84-467

5 Claims



1. A unitary keyboard shield adapted to be attached to a piano of the type having a laterally extending gap, or slot, in a vertical section located at the rear of the keyboard, said shield, when attached to the piano, including a cover portion interrupting a player's line of vision to at least a portion of said keyboard, the improvement wherein said shield includes a rear section engageable within said slot for attaching the shield to the piano, said rear section being substantially planar, thinner than the slot, and inclined upwardly and rearwardly.

4,419,922  
**RECOIL CUSHIONING DEVICE, PARTICULARLY FOR  
 QUICK-FIRING WEAPONS**

Gildas Le Pierres, Boutigny-sur-Essonne, France, assignor to Vibrachoc, Saint Cloud, France

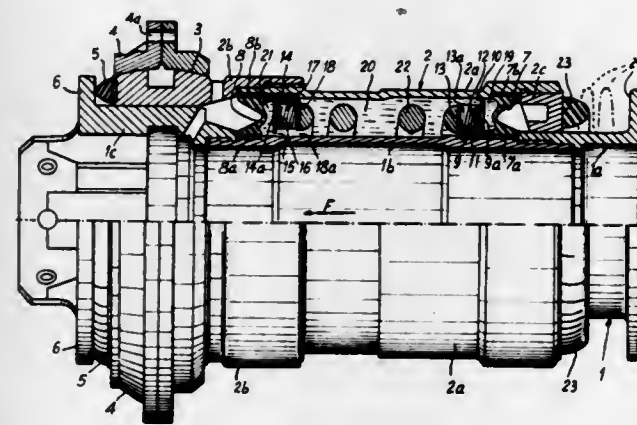
Filed Mar. 9, 1981, Ser. No. 241,615

Claims priority, application France, Mar. 12, 1980, 80 05490

Int. Cl.<sup>3</sup> F41F 19/14

U.S. Cl. 89-43 R

10 Claims



1. A recoil cushioning device, for quickfiring automatic weapons adapted to be operated at two different firing rates, located between a recoiling part of the weapon and a fixed part which guides the recoiling part, of the type exerting a cushioning force on the recoiling part during the recoil movement and exerting no substantial cushioning force during the return movement, wherein it comprises cushioning means for cushioning the recoiling part during any portion of the recoil travel, said cushioning means being associated with a first elastic recovery means having a first rigidity during the recoils of and being operative during the oscillation of said recoiling part corresponding to a first firing rate and second elastic recovery means which are only operated when the recoil amplitude exceeds a certain value and having an elasticity permitting them, in conjunction with said elastic recovery means, to secure a second higher rigidity during oscillation of said recoiling part corresponding to the recoils of a second higher firing rate

wherein the cushioning means comprises, between the fixed part and the recoiling part, a chamber sealed at its front and rear ends by sealing members permitting the chamber to retain its volume during the movements of said recoiling part, said chamber being subdivided into at least two areas, whereof one is reduced in complementary manner to the increase of the other area during recoil, so as to pass a cushioning fluid from one area to the other via constricting passages,

and wherein the chamber is subdivided by a first partition fixed to the recoiling part and a second partition fixed to the fixed part into three areas, namely a front area, an intermediate area and a rear area, filled with a cushioning fluid, the intermediate area being linked with the two other areas during the recoil movement which reduces the size of said intermediate area, by constricting passages whereas during the return movement which increases its size, said intermediate area can be connected with the other areas by wide passages.

4,419,923  
**TOGGLE ASSEMBLY FOR VEHICLES OR CARS**

Hiroshi Kasahara, Ueda, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Nagano, Japan

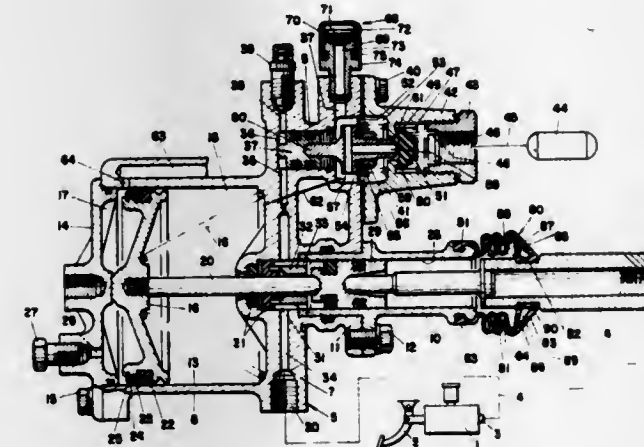
Filed Jul. 7, 1980, Ser. No. 166,379

Claims priority, application Japan, Jul. 17, 1979, 54-98442[U]; Jul. 31, 1979, 54-105816[U]; Jul. 31, 1979, 54-105817[U]; Aug. 30, 1979, 54-119309[U]

Int. Cl.<sup>3</sup> F15B 17/02

U.S. Cl. 91-460

4 Claims



1. A toggle assembly for vehicles or cars comprising a relay cylinder mounted on an end plate including a booster cylinder and an output cylinder, a control chamber arranged in coaxial relation to the relay cylinder, a control valve for controlling a gas by a hydraulic pressure of a master cylinder, said valve being arranged in operable association with the control chamber, and a booster piston disposed in the booster cylinder and in operable association with the controlled gas, wherein said end plate is provided with a shell for said booster cylinder as an integral piece, said booster piston dividing said booster cylinder into a front chamber between the piston and the end plate and a back chamber between the piston and the end of the booster cylinder opposite the end plate, said shell is integrally provided with a first compressed air passage having its one end being open in the back chamber of the booster cylinder for the booster piston and its other end passing through said end plate and being open at the end of a relay valve body, and a second compressed air passage is provided to extend from a casing for said control chamber, said second passage having its one end in communication with the other open end of said first passage and its other end in communication with said control chamber, and wherein a water- and dust-proof boot is interposed between the output push rod and the output cylinder body, said boot including a bellows section disposed for making a connection between first and second portions to which are fitted the output push rod and the output cylinder body, respectively, and a cover section provided to extend from said first portion such that the distal end thereof is brought in resiliently close contact with a crest portion of said bellows section to define an annular expansion chamber around the outer surface of said first portion, the respective end walls of said bellows and cover sections facing each other through said expansion chamber being provided therein with ventilation holes.

4,419,924  
**BRAKE ASSEMBLY FOR FLUID OPERATED PISTON  
 AND CYLINDER DEVICE**

Oskar Peter, Frauenstein 26, D 7481 Bingen, and Anton Stahr, Zellerhornstr. 22, D800 Munich, 900, both of Fed. Rep. of Germany

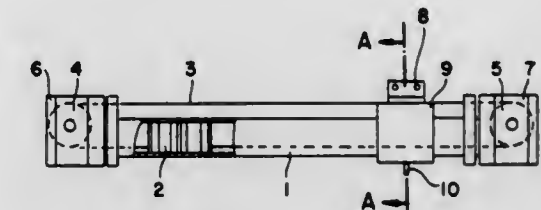
Filed Nov. 7, 1980, Ser. No. 204,835

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945133

Int. Cl.<sup>3</sup> F15B 15/26

U.S. Cl. 92-27

10 Claims

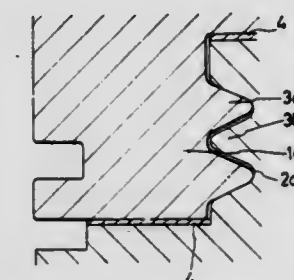


1. A brake assembly for a fluid operated piston and cylinder device of the type wherein drive means are connected to the piston to longitudinally move the piston relative to the cylinder, said piston having no piston rod, said device further having a force applying cross head movably disposed on the cylinder's outer wall surface and connected to said drive means for longitudinal movement with the piston, said assembly being integrated within the cross head and comprising at least one brake lining concentrically arranged about the cylinder for engagement with the outer wall surface of the cylinder and means for urging said brake lining into engagement with the cylinder's outer wall surface whereby to stop, lock and/or longitudinally position the piston with the cylinder.

4,419,925  
**ASSEMBLED PISTON FOR ENGINE**  
 Yoshihiko Tsuzuki, Nagoya; Kiyoshi Uchida, and Toshio Tanahashi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan  
 Continuation-in-part of Ser. No. 35,682, May 3, 1979, Pat. No. 4,343,229. This application Dec. 9, 1980, Ser. No. 214,504  
 Int. Cl.<sup>3</sup> F16J 1/00

U.S. Cl. 92-212

12 Claims



1. An assembled engine piston comprising 01401/ a metal body member having an axially extending annular recess at the top end thereof, said recess extending to a top surface of said body, a ceramic material head member on the top of said body, said head comprising an axially extending annular projection extending into said recess, radially extending interengaging means within said recess and on said projection and said body for securing said head to said body against relative axial movement in response to rotation of said head with respect to said body, said interengaging means comprising at least two rows of threads of conical section on said projection, and threads on said body, said rows of threads comprising an upper thread and a lower thread, said lower thread of said projection having an inclined lower surface engaged by a correspondingly inclined lower surface of a body thread, and said upper thread having a lower surface of a body thread, and said upper thread having a lower surface of a body thread.



an inclined upper surface engaged by a correspondingly inclined upper surface of a body thread, so that the threads of said body exert forces on the threads of said projection which tend to compress the portion of the projection between said upper and lower threads, and means to prevent relative rotation of said head and body.

4,419,926

### ESC ENERGY RECOVERY SYSTEM FOR FUEL-EFFICIENT AIRCRAFT

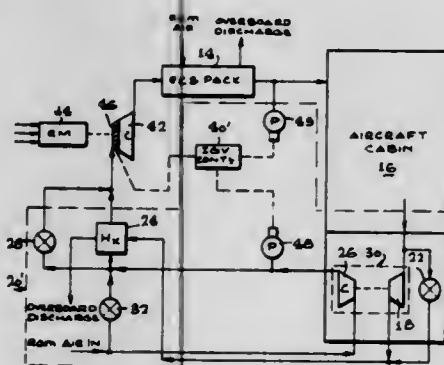
Michael J. Cronin, Sherman Oaks, and Gordon Seid, Los Angeles, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Sep. 2, 1980, Ser. No. 183,499

Int. Cl.<sup>3</sup> B64D 13/02

U.S. Cl. 98—1.5

12 Claims



1. An aircraft environmental control system for supplying a predetermined amount of conditioned air to an aircraft cabin, comprising:

- an electric motor;
- a cabin compressor arranged to be driven by said electric motor, said cabin compressor having an outlet adapted and arranged to supply heated and pressurized air to said cabin;
- a supercharging compressor connected in series between a source of fresh air and an inlet of said motor-driven cabin compressor;
- a free-running turbine mechanically coupled to said supercharging compressor to form a turbo-compressor arranged and adapted to be driven solely by discharge air emanating from said cabin, whereby the inlet of said motordriven cabin compressor may be provided with pressurized fresh air when said cabin is discharging pressurized air overboard.

4,419,927

### DECANTER FOR REDUCING OXIDATION AND EVAPORATION OF COFFEE

Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing Co., Inc., North Flippin, Ark.

Filed Feb. 11, 1981, Ser. No. 233,505

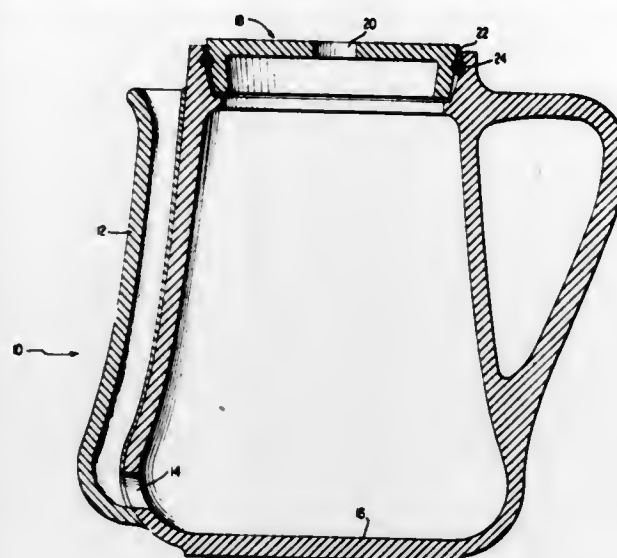
Int. Cl.<sup>3</sup> A23F 1/08

U.S. Cl. 99—275

9 Claims

1. A coffee decanter including a body portion having a bottom and sides which define a container for receiving coffee, the upper portion of said sides defining a mouth for ingress of coffee to within said container, a pour spout for egress of coffee from said container, and a top assembly removably received by said mouth for providing a cover contiguous to and across said mouth; said pour spout having a lower inlet opening through one side of said body portion to the interior of said container in adjacency to said bottom thereof and with the entire opening thereof below the lower quarter of the fill level thereof, extending to a height so that coffee will not overflow therefrom on filling of said container with coffee, and having a relatively small upper outlet opening; at least the upper portion of said container and said pour spout consisting of a material exhibiting poor thermal conductivity and in which the thermal gradient of such material in relation to the thickness and the

height thereof are interrelated to consequentially facilitate a temperature differential in an appreciable volume of coffee within the decanter such that the upper level of coffee there-



within is cooler than the lower level of coffee therewithin and the upper level of coffee in said pour spout is appreciably cooler than both the upper and lower level of coffee within the decanter.

4,419,928

### BUNDLING AND STACKING APPARATUS

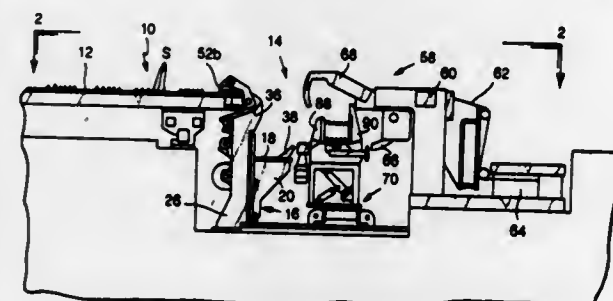
Kenneth L. Klusmier, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed May 17, 1982, Ser. No. 378,837

Int. Cl.<sup>3</sup> B65B 13/18

U.S. Cl. 100—7

13 Claims



1. A material handling apparatus having a first operational mode for bundling batches of a first type of elongated element with round cross-sectional profiles, and having a second operational mode for stacking batches of a second type of elongated element with shaped flat-sided cross-sectional profiles, said apparatus comprising:

- a conveyor means for laterally transporting batches of either of said types of elements in side-by-side relationship to a bundling and stacking station;
- a vertically adjustable elevator means at said station for receiving either of said types of elements;
- a first transfer means operable during said first operational mode to laterally direct the first type of elongated elements onto said elevator means;
- stationary members cooperating with operatively positioned movable members when said apparatus is in said first operational mode to laterally confine the first type of elements into a bundle on said elevator means as said elements are received from said conveyor means, said movable members being adjustable to inoperative positions to accommodate lateral removal of a bundle of said first type of elements from said elevator means and also to convert said apparatus from said first to said second operational mode; and
- second transfer means operable during the second operational mode of said apparatus for transferring layers of said second

type of element from said conveyor means onto said elevator means to form a stack thereon, said second transfer means being adjustable to an inoperative position removed from said conveyor means when converting said apparatus from said second to said first operational mode.

4. The apparatus of claim 1 further comprising tying means arranged on the side of said bundling and stacking station opposite to that occupied by said conveyor means, and carriage means for laterally transferring either bundles of said first type of elongated elements or stacks of said second type of elongated elements from said bundling and stacking station to said tying means, said tying means being operative to tie either said bundles on said stacks into integral units.

4,419,929

### PRESS DRIVE

Hans-Martin Dommer, Goppingen; Alfred Bareis, Uhlingen, and Ewald Bergmann, Rechberghausen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

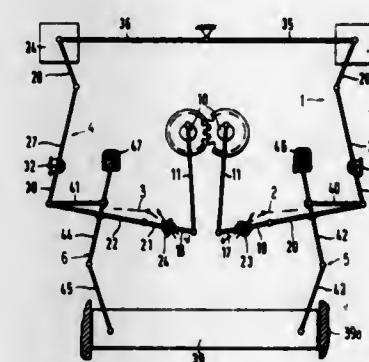
Filed Feb. 11, 1982, Ser. No. 348,015

Claims priority, application European Pat. Off., Feb. 11, 1981, 81100932

Int. Cl.<sup>3</sup> B30B 1/26

U.S. Cl. 100—257

15 Claims



1. A press drive for a high speed press, the press drive including a pair of oppositely driven eccentric shaft means, connecting means for connecting the eccentric shaft means with a slide means of the press, and mass balancing weight means corresponding to reciprocating masses of the press and acting in a direction opposite to the reciprocating masses, characterized in that the connecting means includes at least three pairs of toggle joint linkage means, each pair of toggle joint linkage means are symmetrically disposed with respect to the eccentric shaft means, a pair of connecting rod means each having a first end respectively connected to the eccentric shaft means, the first pair of toggle joint means are each nearly horizontally disposed and are respectively connected to a second end of the connecting rod means, means are provided for supporting each of the pair of first toggle joint linkage means at a frame of the press, the second pair of toggle joint linkage means is nearly vertically disposed and each is respectively connected to the first toggle joint linkage means and the mass balancing weight means, and the third pair of toggle joint linkage means is nearly vertically disposed and are respectively connected to the slide means, means are provided for respectively articulately connecting each of the third toggle joint linkage means with the first pair of toggle joint linkage means, and in that means are provided for supporting each of the third pair of toggle joint linkage means on the frame of the press in a direction of movement of the slide means.

4,419,930

### HAND LABELLING APPARATUS

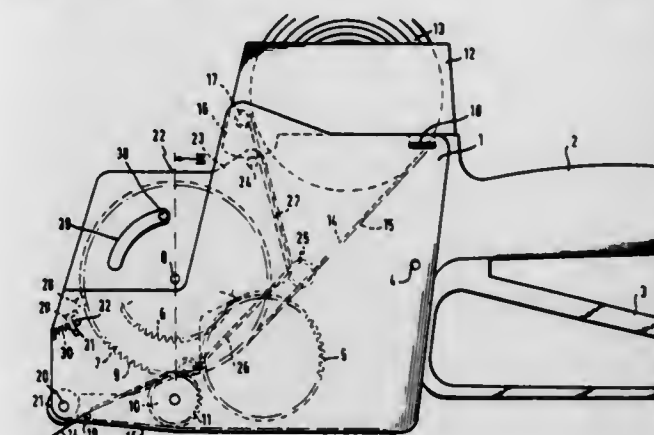
Günter Holland-Letz, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jul. 17, 1981, Ser. No. 284,205

Int. Cl.<sup>3</sup> B41T 1/22

U.S. Cl. 101—93.18

11 Claims



1. Hand labelling apparatus for imprinting and dispensing pressure-sensitive labels adhering to a carrier tape, comprising a housing having at its rear end a grip and an operating lever pivotal against said grip, a rotary printing mechanism adapted to rotate about an axis and to be operated by the operating lever via a gear connection, said rotary printing mechanism being disposed in the front region of the housing and driveable by the operating lever, and a feed means disposed in the housing and driveable by the operating lever for feeding the carrier tape from a supply roll to the printing mechanism and to a peel edge at which the pressure-sensitive labels detach from the carrier tape and move into a dispensing position beneath an applicator roll rotatably mounted at the front end of the lower side of the housing, wherein the rotary printing mechanism is disposed in a frame which is connected to the housing pivotally about a shaft disposed near the lower end of the end face of the housing, and wherein the frame can be locked in the housing, or pivoted to move the printing mechanism out of the housing, said pivoting movement causing disengagement of the gear connection between the rotary printing mechanism and the operating lever.

4,419,931

### RECIPROCABLE IMPRINTING APPARATUS

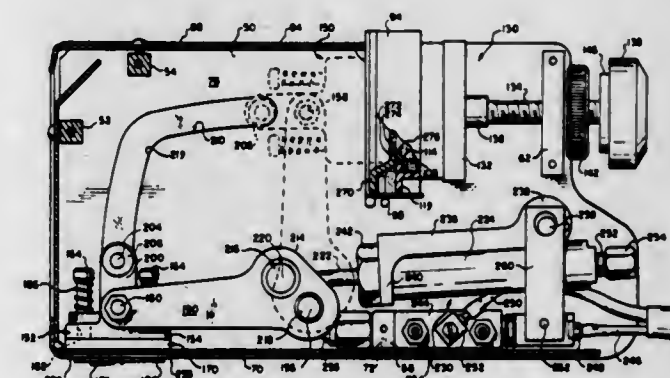
Burton L. Segal, Skokie, Ill., assignor to Kiwi Coders Corporation, Wheeling, Ill.

Filed Jul. 21, 1981, Ser. No. 285,444

Int. Cl.<sup>3</sup> B41K 1/42

U.S. Cl. 101—333

9 Claims



1. In an article imprinting apparatus which includes imprinting head means carrying type font means for applying an imprint to the surface of an object, inking cartridge means having an exposed inking surface adapted to be engaged by said type font means during a rest condition whereat a sealed



engagement is established between the imprinting head means and the inking cartridge means, drive means for translating said imprinting head means in an imprinting stroke and a return stroke between the rest condition and an imprinting position angularly disposed from said inking cartridge means through a path encompassing approximately ninety degrees of arc, and linkage means including a drive link pivotally mounted at one end to a stationary pivot point and at the opposite end to a movable pivot point, and a drive plunger for actuating said drive link, said imprinting head means being coupled to the movable pivot point whereby to effect the translation and guide means for controlling the rotation of said imprinting head means about the movable pivot point, said imprinting head means being rotated simultaneously with the translation thereof along said path, the improvement comprising said guide means comprising cam and follower means, said follower means being pivotally mounted to said imprinting head means at a location off set from the movable pivot point and movable therewith during translation of the imprinting head means, said imprinting head means being rotatable about the movable pivot point at a constant rotational acceleration relative to the drive link as said imprinting head means is translated along the length of said arc, the rate of change of rotational velocity of the imprinting head means per degree of rotation of the drive link being uniformly accelerated, the velocity of rotation of the imprinting head means being uniform at the locations proximate the ends of said path with the velocity of rotation increasing in accordance with the uniform rotational acceleration to the midpath of the strokes and decreasing under uniform deceleration to a location proximate the end of the path.

4,419,932

## SEPARATOR FOR INK FOUNTAIN

Bert Cappel, Muhlheim, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

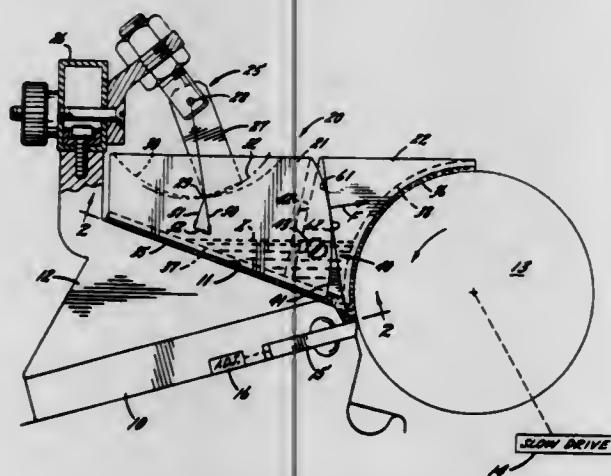
Filed Dec. 16, 1981, Ser. No. 331,214

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 8034726[U]

Int. Cl.<sup>3</sup> B41F 1/46

U.S. Cl. 101—363

6 Claims



1. For use in an ink fountain of the type having a trough with a flat sloping bottom wall terminating in an edge, a fountain roller rotatable about an axis and having a cylindrical surface extending closely parallel to said edge with means for driving the fountain roller so that ink is fed in the form of a thick film at the edge of the bottom wall, the combination comprising a movable partition for dividing the trough into adjacent feeding and non-feeding sections, said partition comprising a trough-engaging portion having a straight face and a separate roller-engaging portion having an arcuate face, the portions having adjacent edges, the portions being arranged in a vertical plane with their adjacent edges in overlapping relation to block escape of ink, the portions having resilient sealing strips secured to the faces thereof for sealing against the flat bottom

wall of the trough and the cylindrical surface of the roller respectively, the portions having force transmitting abutments for transmission of force perpendicular to said axis between them, one of said abutments being a curved surface so as to provide line contact between said abutments, the portions being pivoted together in the region of overlap by a pivot which extends parallel to the roller axis, means for clamping the trough-engaging portion downwardly and forwardly in the direction of the fountain roller, the pivot being loosely fitted to provide play in all directions in the plane of the partition so that, when the trough-engaging portion is seated on the sloping surface of the trough and clamped downwardly and forwardly in the direction of the fountain roller, the roller-engaging portion is free to undergo slight rocking and translational movement with respect to the trough-engaging portion for intimate seating of the arcuate edge thereof on the fountain roller notwithstanding variations in the transverse positioning of the roller axis vertically and horizontally with respect to the bottom walls of the trough.

4,419,933

## APPARATUS AND METHOD FOR SELECTIVELY ACTIVATING PLURAL ELECTRICAL LOADS AT PREDETERMINED RELATIVE TIMES

Ian J. Kirby, Warrington; Michael I. Mitchell, Chester, and Andrew Stratton, Farnborough, all of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 5,551, Jan. 22, 1979, Pat. No. 4,324,182.

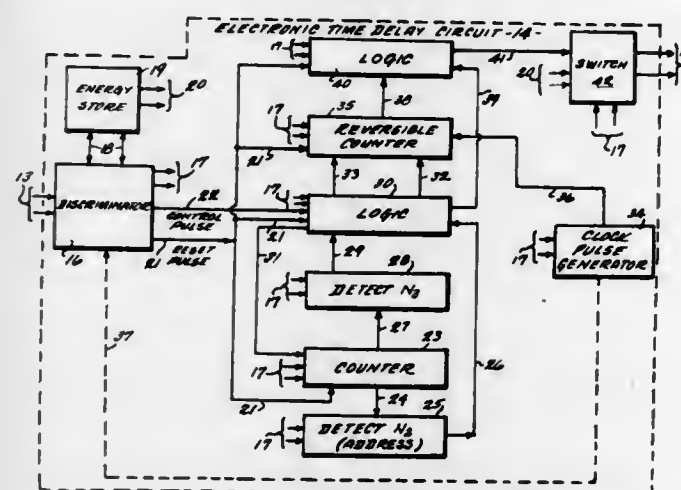
This application Oct. 1, 1981, Ser. No. 307,633

Claims priority, application United Kingdom, Feb. 2, 1978, 4057/78

Int. Cl.<sup>3</sup> F42C 11/00

U.S. Cl. 102—206

13 Claims



1. A system for energizing a series of electrical loads in predetermined timed sequence after a starting signal, which system comprises:

- a supply of electrical energy,
- means to generate a train of accurately timed control signals, and
- a time control switching circuit for each load for connecting said supply to the corresponding load at a desired time, each of said switching circuits comprising:
  - means to receive said train of control signals,
  - a preset signal selecting system having means to select a first and a second of said control signals and to generate first and second timing signals in response to said first and second control signals respectively,
  - means to generate a starting signal, and
  - timing means to measure the interval between said first and second timing signals by counting locally generated timing pulses and to generate an output signal whereby the corresponding load is connected to an energy supply at a time interval after the starting signal determined by the interval between the first and second timing signals.

4,419,934

## SAFETY APPARATUS FOR A SPINNING PROJECTILE FUZE

Robert Apotheloz, Greifensee, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

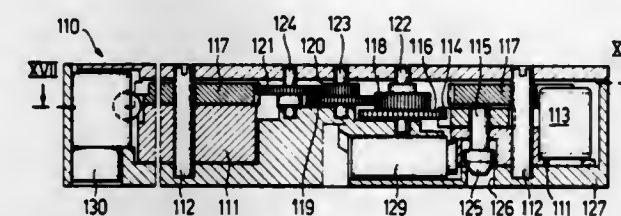
Filed Aug. 3, 1981, Ser. No. 289,294

Claims priority, application Switzerland, Aug. 28, 1980, 6485/80; Jun. 9, 1981, 3792/81

Int. Cl.<sup>3</sup> F42C 15/26

U.S. Cl. 102—233

11 Claims



1. A safety apparatus for use with a spinning projectile containing a reinforcement charge and a fuze, comprising:

- a rotor having a rotor axis;
- said rotor, upon firing of the projectile, being movable out of a blocking position into an armed position and the rotor axis being mounted externally of the spin axis of the projectile;
- a restraining mechanism cooperating with said rotor;
- said restraining mechanism releasing the rotor, after firing of the projectile and following a time delay, to enable said rotor to rotate into the armed position;
- a first safety element cooperating with said rotor;
- said first safety element responding to the firing acceleration and the spin of the projectile, in order to release the rotor for its rotation into the armed position;
- a second safety element cooperating with said rotor;
- said second safety element responding to the spin of the projectile in order to release the rotor for its rotation into the armed position;
- a housing accommodating said rotor, said restraining mechanism, said first and said second safety element and forming a structural unit placed intermediate the fuze and the reinforcement charge in the assembled state of the spinning projectile;
- housing means within which there are arranged said safety elements; and
- said housing means for said safety elements being mountable as a unit in said housing.

4,419,935

## EXPLOSIVE CHARGING APPARATUS FOR CHARGING EXPLOSIVE PELLETS TO A BORE IN A ROCK

Takao Shibukawa, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

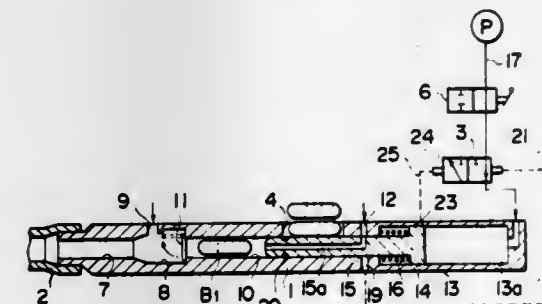
Filed Jan. 7, 1983, Ser. No. 456,507

Claims priority, application Japan, Jan. 9, 1982, 57-1626[U]

Int. Cl.<sup>3</sup> F42B 3/00

U.S. Cl. 102—313

7 Claims



1. An explosive charging apparatus comprising charging pipe means adapted to be inserted into a bore drilled in a rock,

body means connected to one end of said charging pipe means and having explosive guiding bore means extending axially in the body means so as to communicate at one end with said charging pipe means, said body means being formed with radially outwardly opening explosive supplying port means leading to an intermediate portion of said guiding bore means, cylinder means provided adjacent to the other end of said guiding bore means and having piston disposed in the cylinder means for reciprocating movement therein to and away from said guiding bore means, biasing means for urging said piston means away from the guiding bore means, rod means having one end connected with said piston means and the other end inserted into the guiding bore means so that said other end of the rod means is movable in response to a movement of said piston means between a retracted position wherein it is between the supplying port means and said other end of the guiding bore means and an advanced position wherein said other end of the rod means is advanced in the guiding bore means beyond said supplying port means whereby said supplying port means is opened to said guiding bore means when the rod means is in the retracted position to make it possible to supply an explosive to said guiding bore means but closed by said rod means when the rod means is in the advanced position, compressed air supply passage means formed in said body means and communicating with compressed air source means, air passage means formed in said rod means for connecting said compressed air supply passage means to said guiding bore means when said rod means is in the advanced position, valve means having a first position wherein said cylinder means is connected with the compressed air source means to move said piston means against said biasing means and a second position wherein said cylinder means is opened to atmosphere whereby the piston means is moved under said biasing means, said valve means being associated with first pilot means which is adapted to be connected with said compressed air supply passage means when said rod means is in the retracted position so as to shift said valve means from said second position to said first position and second pilot means which is adapted to be connected with said cylinder means to receive compressed air therefrom when said rod means is in the advanced position to shift the valve means from said first position to said second position.

4,419,936

## BALLISTIC PROJECTILE

Arthur D. Coates; William F. Donovan; John A. Rakaczky, all of Harford City, Md., and Wayman E. Scott, Knoxville, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

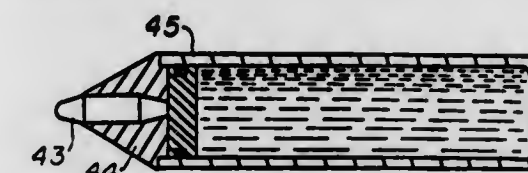
Division of Ser. No. 139,372, Apr. 11, 1980, Pat. No. 4,383,485.

This application Aug. 16, 1982, Ser. No. 408,317

Int. Cl.<sup>3</sup> F42B 11/24

U.S. Cl. 102—364

1 Claim



1. A hermetically sealed ballistic projectile comprising: a nose member having a rearwardly increasing diameter and a rearward region of decreased diameter, a rearward surface, and an axial countersunk-bore therethrough which includes; a kinetic energy penetrator axially disposed in said countersunk-bore and protruding from said nose member to form a leading point of impact of said projectile; a shell member a rearward inner surface and interior space, a forward most region having an inner surface of mating diameter with said nose member rearward region of de-



creased diameter and being in fixed but frangible contact with said nose member which includes an exterior steel case which is helically scored when it travels through a gun barrel and fragments in longitudinal strips upon impact;

- a piston member having a forward most surface proximate the rearward surface of said of said nose member, said piston member being in hermetically sealed engagement with the inner surface of the forward most region of said shell member; and
- a hypergolic fluid filling the interior space of said shell member between said rearward surface of said piston member and the rearward inner surface of said shell; whereby on impact of said projectile with a target said kinetic energy penetrator penetrates said target and said nose member moves rearwardly fracturing said shell along said indentations and forces said piston member rearwardly causing said hypergolic fluid to be spewed in a helical pattern in the immediate vicinity of the target.

4,419,937

### MAGNET SUPPORTING FRAME FOR A MAGNETICALLY LEVITATED VEHICLE

Guenter Steinmetz, Bruckmuehl; Ulf Steenbeck, Putzbrunn, and Dieter Reismayr, Oberhaching, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

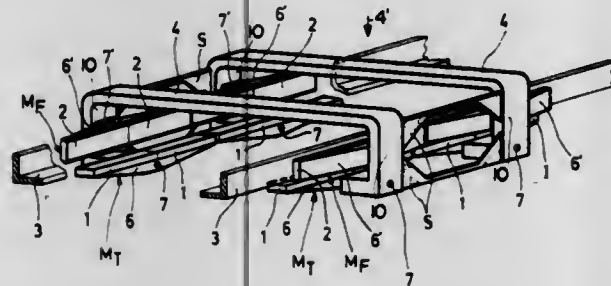
Filed Jul. 20, 1981, Ser. No. 284,701

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033448

Int. Cl.<sup>3</sup> B61B 13/08

U.S. Cl. 104—281

9 Claims



1. A magnet supporting frame for a magnetically levitated vehicle movable on a rail structure defining a longitudinal direction, comprising at least two bending crossbeams (4) so constructed and arranged that their resistance against a substantially vertically effective bending load is minimal, whereby said bending crossbeams are flexible by said bending loads, said bending beams extending across the longitudinal direction of the rail structure, a plurality of connecting brackets (5) stiff against shearing loads and extending in parallel to said longitudinal direction interconnecting said at least two bending crossbeams (4) for forming said frame, levitating magnet means (1), first see-saw support means (6') for said levitating magnet means (1) including first pivot means (7) for tiltably securing said levitating magnet means to said bending crossbeams, guide magnet means (2), second see-saw support means (6'') for said guide magnet means (2) including second pivot means (7') for tiltably securing said guide magnet means also to said bending crossbeams (4) so that each of said magnet means is tiltable in the direction of its respective magnetic force about an axis parallel to its pitch axis, whereby the magnet means are arranged in rows on both sides of a central plane extending vertically and centrally in said longitudinal direction, said rows extending symmetrically relative to said central plane.

4,419,938

### PLUG-ASSEMBLED SECTIONAL DISPLAY RACK

Albin Kaut, Blankensteinstrasse 26, D-7141 Steinheim/Murr, Fed. Rep. of Germany

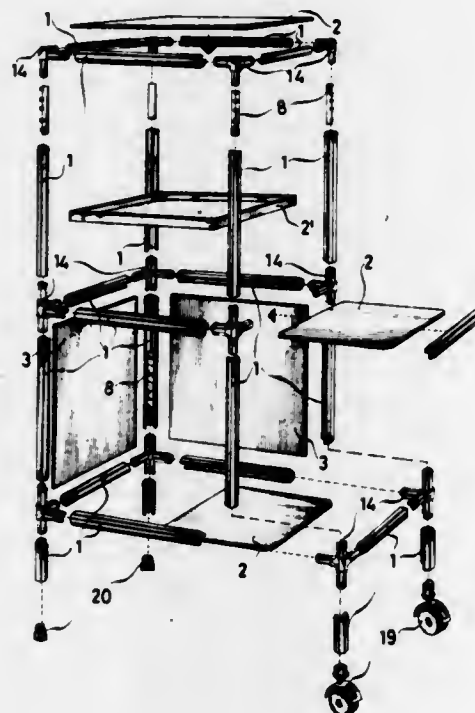
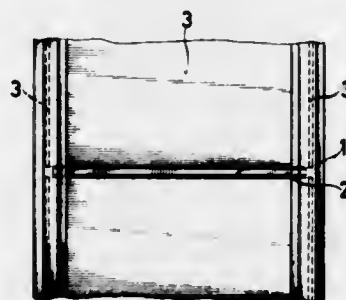
Filed Dec. 4, 1981, Ser. No. 327,479

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046139

Int. Cl.<sup>3</sup> A47B 3/00

U.S. Cl. 108—111

10 Claims



1. In a plug-assembled sectional rack suitable for display purposes and for use as a selling aid, store decoration, exhibition stand and the like, having hollow sections arranged vertically and horizontally to form, by means of corner junctions having plug connections, frames adapted to receive shelves for exhibiting items and/or vertical panels for multilaterally confining individual display cases within the rack, each of said hollow sections including a longitudinal recess defined by angular walls and a hollow longitudinal guide merging with the recess for accommodating said shelves and said vertical panels, the improvement comprising shelf supports having base portions provided with guide elements for insertion into said hollow longitudinal guides of the hollow sections whereby said shelf supports extend into said recesses, said base portions having upper faces serving as support surfaces for said shelves and having lateral faces for engaging said vertical panels, each said shelf support base portion being shaped such that there are slots between its lateral faces and the walls of said recesses for insertion of the vertical panels.

4,419,939

### CONCEALED SAFE

Tomas M. Reverte, Calle Pedraforca 6., Sant Cugat del Valles, (Barcelona), Spain

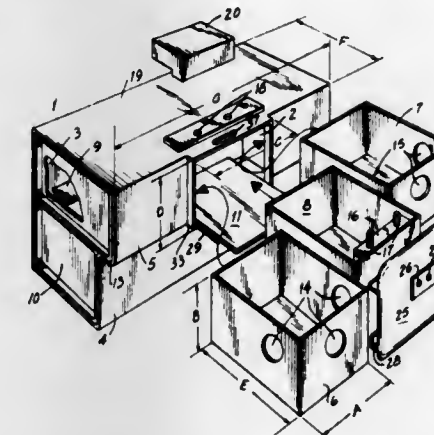
Filed Feb. 17, 1981, Ser. No. 235,145

Claims priority, application Spain, Dec. 6, 1980, 497,533

Int. Cl.<sup>3</sup> E05G 1/06; A47B 97/00

U.S. Cl. 109—54

35 Claims



1. A concealed safe, comprising a hollow body having a front wall, a rear wall and two opposite lateral walls and formed with an internal chamber horizontally extending between said lateral walls, said chamber including an upper compartment of substantially parallelepipedal shape and a lower compartment of substantially parallelepipedal shape, said front wall being formed with an access front opening; a first lateral removably-insertable drawer; a second lateral removably-insertable drawer; a central removably-insertable door-drawer, said drawers being adapted to be introduced into said upper compartment through said front opening in turn one after another such that the first lateral drawer is introduced through said opening and shifted in said upper compartment towards one of said lateral walls to free said front opening, then the second lateral drawer is introduced through said opening and shifted in said upper compartment to another of said lateral walls to free said opening and afterwards said central door-drawer is introduced into said upper compartment through said front opening so that all said drawers are fitted in said upper compartment in the insertable position, said drawers being adapted to be extracted from said upper compartment also in turn through said opening; a removable tray positioned between said upper compartment and said lower compartment for supporting said drawers during their introduction into said upper compartment through said opening, said tray being slidably displaced to and from said front opening; an attachable plug socket adapted to be positioned against said front opening to close the latter or to be moved from said front opening to release the latter; and locking means for locking said plug socket operated from the exterior of said body.

4,419,940

### BOILER INSTALLATION

Paul Cosar, Paris, and Raoul Teraube, Beauchamps, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Nov. 16, 1982, Ser. No. 442,143

Claims priority, application France, Nov. 25, 1981, 81 22023

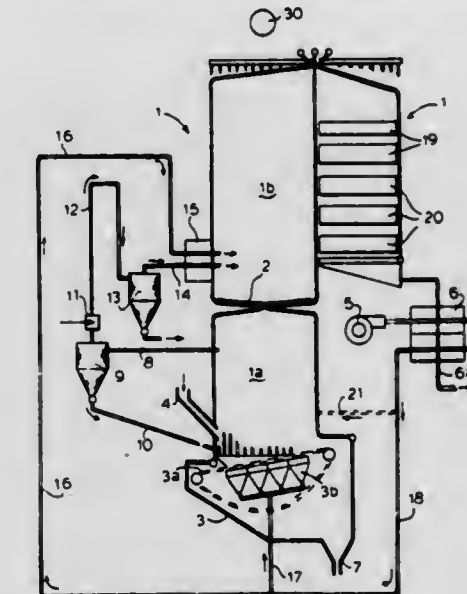
Int. Cl.<sup>3</sup> F23G 5/00

U.S. Cl. 110—229

11 Claims

1. A boiler installation comprising
- a hearth for burning and thereby gasifying a solid fuel, the hearth including
  - (1) a grid supporting a fluidized bed of the solid fuel spread thereover, and
  - (2) means for blowing primary combustion air through the grid from below;
- (b) a tubular boiler body superimposed on, and integral with, the hearth, the boiler body including

- a lower portion receiving the gasified fuel from the hearth,
- an upper portion,
- a common transverse wall dividing the tubular boiler body into the lower and upper portions, and
- a burner extending into the upper boiler body portion



- near the dividing transverse wall and receiving a supply of secondary combustion air;
- (c) conduit means connecting the lower boiler body portion to the burner for feeding the gasified fuel therefrom to the burner; and
- (d) dust removing and desulfurization means in the conduit means for removing dust and sulfur from the gasified fuel.

4,419,941

### SUPPLYING PULVERIZED COAL TO A COAL-FIRED FURNACE

Richard W. Santalla, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

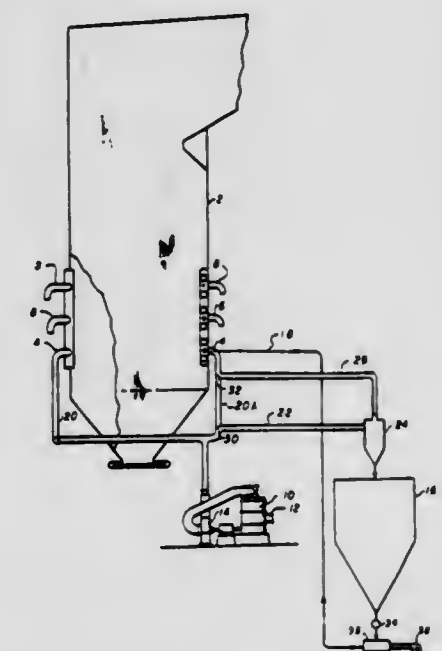
PCT No. PCT/US82/01193, § 371 Date Oct. 13, 1982, § 102(e) Date Oct. 13, 1982

PCT Filed Sep. 2, 1982, Ser. No. 437,428

Int. Cl.<sup>3</sup> F23K 1/00

U.S. Cl. 110—232

3 Claims



1. In a pulverized coal-fired steam generator having a direct-fired furnace, at least two burners for burning pulverized coal in the furnace, a load-carrying pulverizer for pulverizing the coal to be supplied to the furnace, and a plurality of conduits, one conduit per burner, interconnected between the burners



and the pulverizer, each conduit conveying a coal/air stream consisting essentially of a dilute phase pulverized coal and air mixture from the pulverizer to its associated burner, an apparatus comprising:

- a separator for separating pulverized coal from air;
- a diversion conduit interconnected between the separator and a first of the plurality of conduits interconnected between the burners and the pulverizer;
- valve means disposed at the interconnection of said diversion conduit with the first of the plurality of conduits for selectively diverting the coal/air stream flowing there-through into said diversion conduit;
- a return conduit interconnecting said separator with the first of the plurality of conduits at a location downstream of said valve means for venting the air removed from the coal/air stream in said stream in said separator to the furnace;
- a storage bin; and
- means for conveying the pulverized coal removed from the coal/air stream in said separator to the storage bin.

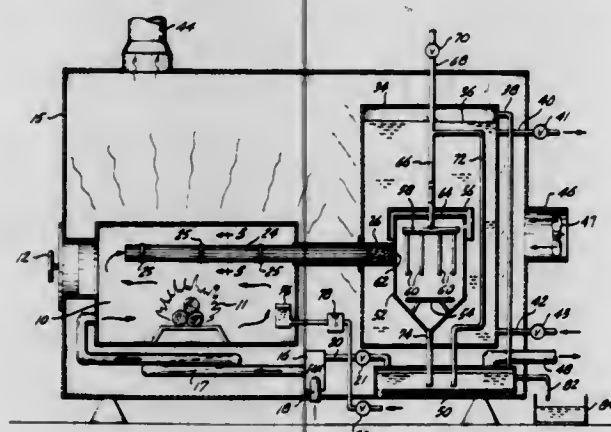
#### 4,419,942 STOVE

Charles A. Johnson, E. 160 Lucys Creek Rd., Belfair, Wash. 98528

Filed Jul. 26, 1982, Ser. No. 401,946  
Int. Cl.<sup>3</sup> F23B 7/00

U.S. Cl. 110—234

14 Claims



1. A stove for the combustion of wood, coal or other fuels comprising:

- a primary combustion zone having a fuel inlet, an air inlet and a combustion gas outlet;
- a secondary combustion zone comprising an elongated bundle of tubes extending at least a portion of their length into said primary combustion zone and adapted to conduct combustion gases from said primary combustion zone and continue the combustion thereof;
- a tertiary combustion and condensation zone communicating with said secondary combustion zone, said tertiary combustion and condensation zone being surrounded by a heat exchange medium to remove heat therefrom and condense water and other condensables while cooling said combustion gases;
- means to conduct combustion gases from said tertiary combustion and condensation zone through conduits in heat exchange contact with said heat exchange medium and then to the atmosphere after removal of heat therefrom; and
- means to conduct said water and other condensable from said tertiary combustion and condensation chamber into a collection vessel.

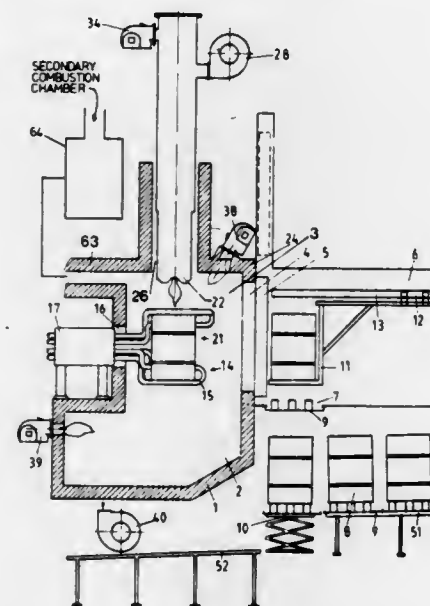
#### 4,419,943 INCINERATOR FOR CHEMICAL WASTE MATERIAL STORED IN BARRELS

Bent Faurholdt, Højvaenget 8, Helsingør DK-3000, Denmark  
PCT No. PCT/DK81/00095, § 371 Date Jun. 9, 1982, § 102(e)  
Date Jun. 9, 1982, PCT Pub. No. WO82/01581, PCT Pub. Date May 13, 1982

PCT Filed Oct. 28, 1981, Ser. No. 387,872  
Claims priority, application Denmark, Oct. 29, 1980, 4590/80  
Int. Cl.<sup>3</sup> F23G 7/00

U.S. Cl. 110—237

4 Claims



1. Incinerator for chemical waste material stored in barrels, comprising a primary combustion chamber with an outlet connected to a secondary combustion chamber, characterized in that said primary combustion chamber has a bottom section suitable for the combustion of solid waste material and a top section provided with a lateral port with a sluice closure and associated means for introducing a barrel through said port into said top section and withdrawing it therefrom, a barrel holder being provided in said top section in level with said lateral port, said barrel holder being adapted to receive and hold a barrel introduced through said port and being mounted for rotation about a horizontal axis for the purpose of turning a barrel held by it from upright to fully or partly inverted position and vice versa, burners and air injection means being provided for supplying flame heat and air both to the bottom section of the primary combustion chamber and to the interior of a barrel standing upright in the barrel holder.

#### 4,419,944 MULTIPLE STROKE LOOPER MECHANISM FOR STITCHING MACHINE

William E. Passons, 3782 Kings Road, Chattanooga, Tenn. 37416; Joseph L. Card, and Roy T. Card, both of P.O. Box 24, Hixson, Tenn. 37343

Filed Nov. 9, 1981, Ser. No. 319,213  
Int. Cl.<sup>3</sup> D05C 15/00

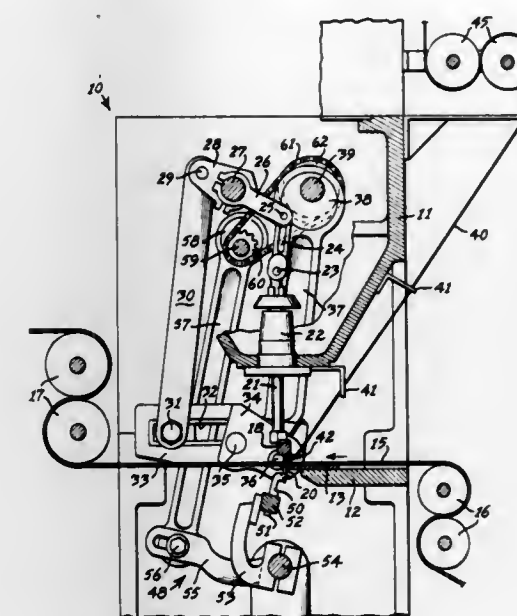
U.S. Cl. 112—79 R

13 Claims

1. In a machine forming stitches in a base fabric, including means supporting a base fabric for longitudinal movement in a fabric plane through the machine, a needle bar on one side of the fabric plane, at least one needle mounted on the needle bar and adapted to carry a yarn through the base fabric, needle drive means for reciprocally moving the needle bar toward and away from the fabric plane to move the needle in a needle path through the base fabric in a plurality of reciprocal needle strokes, each needle stroke constituting a stitch cycle, and means supplying yarn to the needle, a looper mechanism comprising:

- a looper hook for each needle on the opposite side of the fabric plane from its corresponding needle and pointing in

the direction opposite to the direction of the movement of the base fabric, and  
(b) looper drive means for reciprocally moving said looper hook across and proximate to the corresponding needle



path for periodic seizure of a loop of yarn carried by a corresponding needle in a plurality of reciprocal looper strokes, the number of said looper strokes being a multiple of each needle stroke in a stitch cycle.

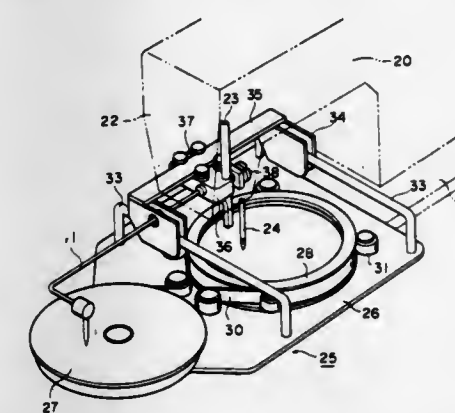
#### 4,419,945 EMBROIDERING APPARATUS FOR USE WITH SEWING MACHINES

Mitsuo Nishina, Nagano, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Filed Nov. 20, 1981, Ser. No. 323,453  
Int. Cl.<sup>3</sup> D05C 9/04

U.S. Cl. 112—103

17 Claims



1. An embroidering apparatus for use with a sewing machine having a needle provided at a predetermined position, comprising:

- a table movably supported in a plane including at least two intersecting directions on which an original pattern is to be placed,
- an embroidery frame associated with said needle of said sewing machine, means connecting said frame to said table for movement therewith in the direction corresponding to the movement of said table responsive thereto, and
- a tracing needle having the tip end thereof positioned at a fixed position and said tip end oriented to said original pattern on said table.

17. An embroidering apparatus for use with a sewing machine, comprising a pair of guide rails extending perpendicularly to each other, an embroidery frame movable back and forth and laterally along said guide rails, a table operatively connected to said embroidery frame and manually actuatable for timed movement with the embroidery frame, a tracing

needle oriented to said table on which an original pattern is to be placed, and means operatively connecting said tracing needle to said embroidery frame in fixed relationship therewith whereby movement of said tracing needle along said pattern correspondingly shifts said embroidery frame with respect to the needle of the sewing machine.

#### 4,419,946 FEEDING DEVICE FOR AN AUTOMATIC SEWING ARRANGEMENT

Jochen Fischer, Detmold, and Hans Scholl, Oerlinghausen-Lipperreie, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

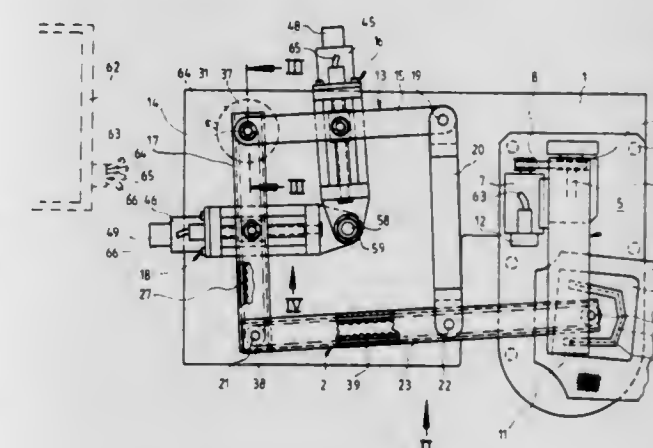
Filed Sep. 7, 1982, Ser. No. 415,596

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3136953

Int. Cl.<sup>3</sup> D05B 21/00, 27/00

U.S. Cl. 112—121.12

12 Claims



1. A sewing machine for producing a stitch contour in a workpiece according to a predetermined program, comprising: a stand; a sewing head including a drive motor and received by said stand, and having stitch forming means including a needle; workpiece receiving means movably arranged in a sewing plane with respect to said needle; at least one axis located at said stand in a perpendicular extension to said sewing plane, and link means extending in parallel to said plane, including: a first drive lever pivoted at one end at said axis; a second drive lever pivoted at one end at said axis; an intermediate lever jointly connected with one end to the free end of one of said levers; a drive-off lever jointly connected by link means to the free end of one of said drive levers and to the other end of said intermediate lever and receiving said workpiece receiving means; propelling means acting upon said drive levers; and programmable control means coordinately controlling said propelling means and said drive motor, said propelling means comprising: a first driving device including a first motor driving said first drive lever; and a second driving device including a second motor driving said second drive lever.

#### 4,419,947 ELECTRONIC SEWING MACHINE

Hachiro Makabe, Kanagawa; Muneaki Hagiwara, Koganei, and Haruhiko Tanaka, Mitaka, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,171

Claims priority, application Japan, Aug. 29, 1980, 55-118282  
Int. Cl.<sup>3</sup> D05B 3/02

U.S. Cl. 112—158 E

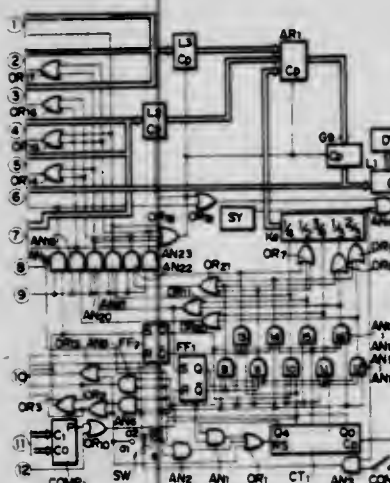
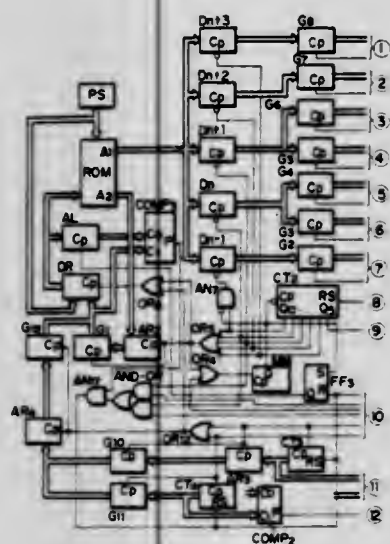
3 Claims

1. A sewing machine having a rotatable shaft means for



operating a stitch forming device and including feed dog means for feeding a fabric to be sewn and a needle for forming stitches in the fabric, the machine comprising:

- first electronic memory means (ROM) for storing stitch control data, said first memory means including at least the needle position control data for different positions;
- pattern selecting means for reading out from said first memory said stitch control data for a selected pattern;
- timing means (SY) operated synchronously with said shaft means to produce a timing signal for progressively reading out said stitch control data from said first memory;
- stitch mode changing switch means (SW) selectively operated to determine an elongation rate of a selected pattern to be elongated in a feeding direction;



- second memory means (Dn-1 to Dn+3) for temporarily storing designated stitch control data of said first memory means;
- counter means (CT1, CT2) for counting the ordinals of stitches of a selected pattern in relation to a timing signal of the timing means and in accordance with said pattern elongation rate determined by the stitch mode changing means, to thereby designate the pattern elongation rate and the stitch control data to be stored in said second memory means progressively during formation of the stitches of said pattern; and
- calculating means (AR1, Ke) operable with respect to an output of said counter means to make a calculation to produce different stitches between the stitches which are formed by the stitch control data stored in the second memory means.

4,419,948

## NEEDLE BAR LUBRICANT SEALING DEVICE

Wolf R. von Hagen, Hemmingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

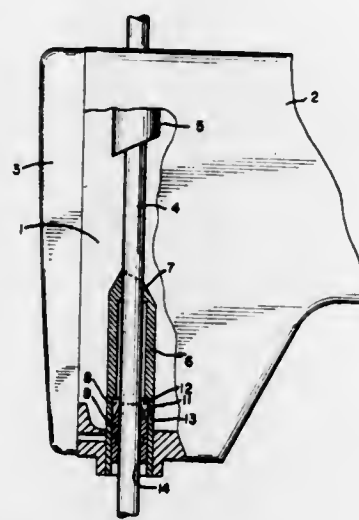
Filed May 10, 1982, Ser. No. 376,313

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 31195679

Int. Cl.<sup>3</sup> D05B 71/00

U.S. Cl. 112-256

7 Claims



- A sewing machine comprising:
  - a frame;
  - a bearing secured in the frame;
  - a lubricated needle bar endwise reciprocally mounted in said bearing for movement along a generally vertical linear path;
 means for removing excess lubricant from the peripheral surface of said needle bar, said means comprising first and second scraping edges arranged in surrounding engagement with said needle bar both of which are formed by an upper edge of a truncated conical surface which tapers downwardly and away from the straight line path of the needle bar, said first scraping edge being situated at one extremity of said bearing and the second scraping edge being situated intermediate the first scraping edge and the opposite extremity of said bearing, and a radial part formed in said bearing in communication with one of said scraping edges.

4,419,949

FABRIC ALIGNING METHOD AND APPARATUS  
Thomas P. Goodman, Palatine; Chieh-Kung Yin, Hawthorn Woods, and Robert L. Kosrow, Hoffman Estates, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed May 11, 1981, Ser. No. 262,271

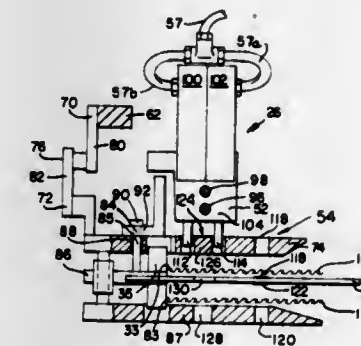
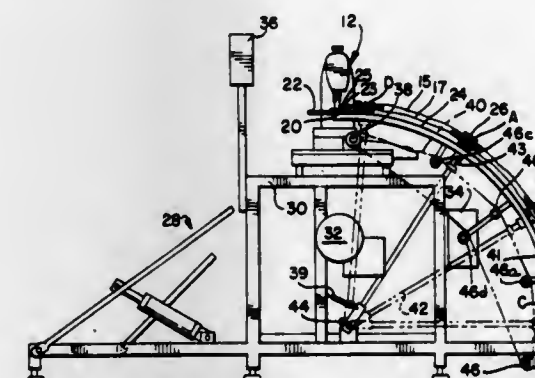
Int. Cl.<sup>3</sup> D05B 97/00, 35/10

U.S. Cl. 112-262.1

11 Claims

- A method for positioning in a predetermined location a series of edges of fabric panels comprising the steps of:
  - generating the analog value of a photocell array means through a multiplexer and A/D converter when no portion of the photocell array means, which includes of a series of individual sensor unit means that comprises energy transmitter means and receptor means, is covered whereby an uninterrupted energy value is determined and recorded;
  - positioning a portion of the fabric panels between the energy transmitter means and receptor means of the photocell array means, tensioning said fabric panels causing the photocell array to be moved along a length of said fabric panels;
  - re-establishing the analog value of said photocell array through said multiplexer and A/D converter means when the transmission of energy between the transmitter means

and receptor means of each sensor is interrupted by the presence of the fabric in combination with said uninterrupted energy value and recording that value; detecting the trailing fabric edge of the shorter fabric ply; causing a portion of said photocell array to run off said trailing fabric edge whereby terminating the interruption caused by the presence of said portion of fabric panel means with respect to some of said individual sensor means; clamping the fabric ply means;



reading the amount of energy received by each receptor of said individual sensor unit means, generating analog values thereof and recording same values; scanning said photocell array, generating analog values while comparing said values to said three previously recorded analog values and simultaneously reorientating said trailing fabric edge, after each reorientation generating and comparing the analog values and; securing said fabric panel means when a particular pattern of analog values is detected; and starting a work sewing cycle on said fabric panel means.

4,419,950

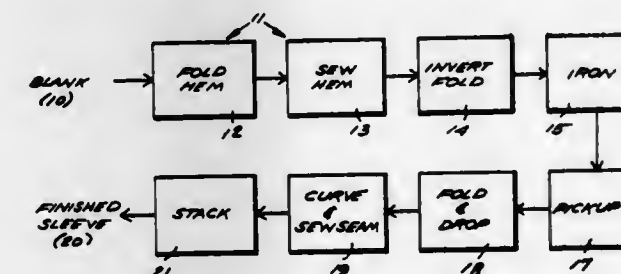
## HOT WIRE CUTTER FOR AUTOMATIC SLEEVE MAKING MACHINE

John H. Keeton, P.O. Box 296, Campbellsville, Ky. 42718  
Division of Ser. No. 319,671, Nov. 9, 1981, Pat. No. 4,404,946.  
This application Mar. 4, 1982, Ser. No. 354,797

Int. Cl.<sup>3</sup> D05B 65/00

U.S. Cl. 112-290

1 Claim



- A hot wire cutter assembly associated with an automatic

sewing machine stitching with synthetic thread, and comprising:

- a guide block mounted at the rear of said automatic sewing machine, and having a ramp portion formed therewith;
- an electric resistance heating coil mounted within a cut out formed in said guide block, and in operative association with said ramp; and
- said guide block and said coil positioned with respect to each other and said automatic sewing machine so that a piece of fabric being stitched by said automatic sewing machine after exiting said automatic sewing machine automatically passes over said ramp, and the synthetic thread providing said stitching is cut and a nub thereof is fused so that the ultimately remaining nub is of small size.

4,419,951

## FEEDER DEVICE FOR A SEWING MACHINE

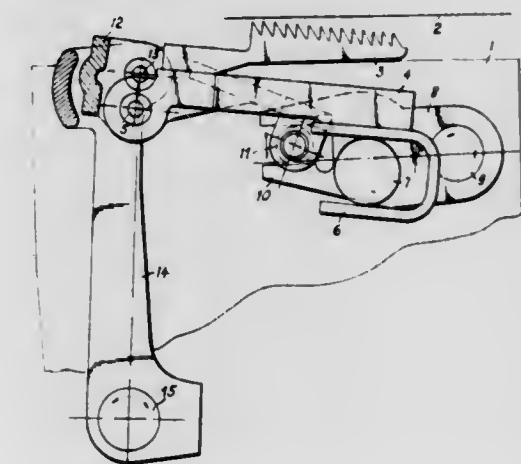
Urs Ruch, Berlingen, and Ernst Dreier, Steckborn, both of Switzerland, assignors to Fritz Gegauf Aktiengesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland  
Filed Nov. 18, 1980, Ser. No. 207,783

Claims priority, application Switzerland, Dec. 3, 1979, 10730/79

Int. Cl.<sup>3</sup> D05B 27/02

U.S. Cl. 112-323

3 Claims

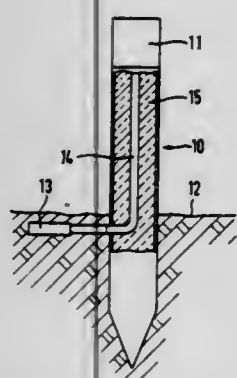


- A feeder device for a sewing machine having a stitch plate comprising:
  - a material feeder being operatively mounted below said stitch plate and being driven to selectively project through an opening in said stitch plate;
  - a lift rocker;
  - a follower pin operatively connected to said lift rocker;
  - a lift rocker shaft, said lift rocker being operatively connected to said lift rocker shaft;
  - a thrust rocker;
  - a thrust rocker shaft, said thrust rocker being operatively connected to said thrust rocker shaft;
  - an intermediate rocker, said intermediate rocker being operatively connected between said thrust rocker and said lift rocker;
  - a support;
  - a guide fork operatively connected to said support;
  - a support axis;
  - said follower pin being in engaging relationship with said guide fork and said support being connected to said material feeder and being operatively connected to said support axis, said support axis being mounted on said intermediate rocker at a distance nearly vertically below an axis connecting the intermediate rocker with the thrust rocker; wherein movement of said lift rocker imparts motion to said material feeder which is constrained to move in substantially horizontal and vertical directions to form an approximate rectangle in an effective area of movement due to the interconnection of the thrust rocker, the intermediate rocker, the lift rocker and the support to project said



material feeder through said opening in said stitch plate in a first vertical and a first horizontal direction and to retract said material feeder through said opening in said stitch plate in a retracted vertical direction and a retracted horizontal direction.

**4,419,952**  
**TEMPERATURE INDICATING DEVICE ON TRAFFIC SURFACES**  
 Wolfgang Weiler, Am Römerbrunnen 21, Frankfurt am Main, Fed. Rep. of Germany  
 Filed Feb. 9, 1981, Ser. No. 233,075  
 Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003408  
 Int. Cl.<sup>3</sup> G01K 11/16, 13/00  
 U.S. Cl. 116—216

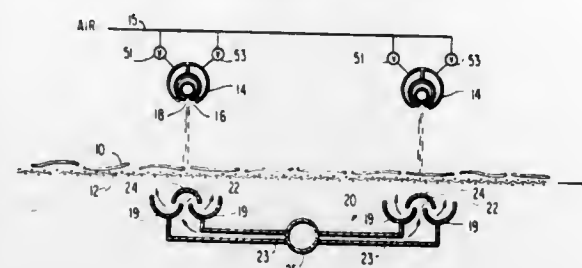


1. An apparatus for detecting and for optically indicating from afar only two different temperature conditions of an upper layer of a road surface, said apparatus comprising: metal thermally conductive temperature sensor means, adapted to be positioned within an upper layer of a road surface, for sensing the temperature thereof; a temperature indicator adapted to be positioned at a location above the road surface and at the edge of the road, said indicator including a liquid crystal agent having only a first optically perceivable condition substantially at a temperature above the freezing point of water and a second optically perceivable condition substantially at a temperature below the freezing point of water, said liquid crystal agent, depending on the temperature thereof, being changeable only between said first and second optically perceivable conditions; and a metal thermally conductive connecting means for thermally connecting said temperature sensor means and said liquid crystal agent, for thereby conveying the temperature sensed by said sensor means to said liquid crystal agent, and for thereby causing said liquid crystal agent to exhibit the respective said condition representative of said sensed temperature.

**4,419,953**  
**APPARATUS FOR APPLYING SEASONING**  
 David P. Fowler, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.  
 Filed Jun. 8, 1982, Ser. No. 386,350  
 Int. Cl.<sup>3</sup> B05C 19/00  
 U.S. Cl. 118—16

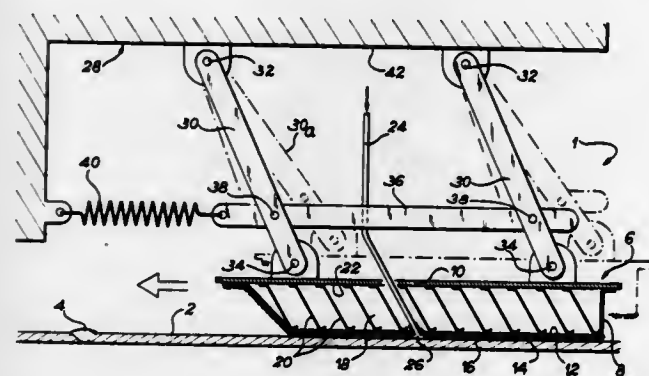
1. A seasoning distributor apparatus for controllably distributing seasoning falling onto a snack product comprising: opposite wall means defining a seasoning outlet therebetween and through which seasoning is discharged to fall onto the snack product; means for directing at least two streams of air along the respective opposite wall means toward the seasoning

outlet to meet the falling seasoning below the seasoning outlet and above the snack products, and



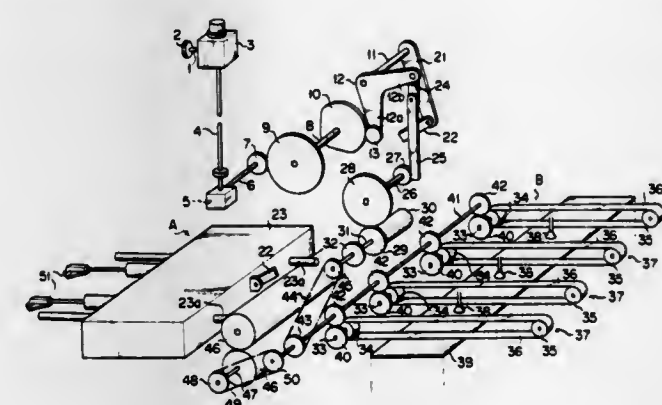
means for controlling the streams of air to control and modify the distribution of the seasoning falling from the seasoning outlet.

**4,419,954**  
**DEVICE FOR APPLYING A COATING TO A SURFACE SUBMERGED IN A LIQUID**  
 Raymond Galinou, Veigne, France, assignor to Commissariat a l'Energie Atomique and Centre National pour l'Exploitation des Oceans, both of Paris, France  
 Filed May 17, 1982, Ser. No. 378,788  
 Claims priority, application France, May 22, 1981, 81 10224  
 Int. Cl.<sup>3</sup> B05C 1/02  
 U.S. Cl. 118—207



1. A device for applying a coating to a surface submerged in a liquid comprising, at least one applicator moving along the surface to be painted and constituted by a pad having a support plate and a tight deformable envelope, the plate and the envelope having in each case an inner face and an outer face, the latter being in contact with the liquid in which the surface to be painted is submerged, the envelope being provided on its outer face with flexible fibres or bristles for rubbing on said surface, the support plate and deformable envelope defining a space within the pad, the latter being associated with a rigid support co-operating with means making it possible to exert a given pressure on the surface, wherein the space within the pad is tight to the liquid in which the surface to be painted is submerged and is equipped with elastic means making it possible to locally deform the envelope, and wherein the said means making it possible to exert a given pressure on the surface comprise a deformable system connecting the pad to the rigid support in order that the relative position of support and pad can vary, whilst the latter remains applied against the surface to be painted, the elastic means permitting the local deformation of the envelope of the pad comprising springs, whereof one end of each spring is fixed to the inner face of the plate, the other end thereof exerting a pressure on the inner face of the envelope.

**4,419,955**  
**SYNCHRONIZED DRIVE MECHANISM FOR A LOADER AND A DESTACKER OF A PRESS**  
 Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan  
 Filed Sep. 22, 1982, Ser. No. 421,337  
 Claims priority, application Japan, Oct. 12, 1981, 56-150016[U]; Oct. 12, 1981, 56-150017[U]  
 Int. Cl.<sup>3</sup> B05C 1/02  
 U.S. Cl. 118—227

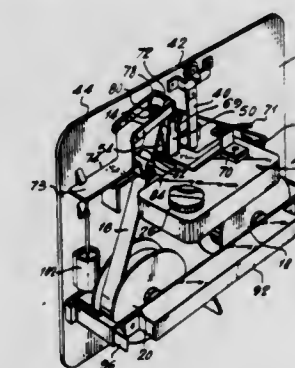


1. A synchronized drive mechanism for a loader and a destacker of a press including drive means, comprising: a first shaft connected to and rotated by said drive means; means for translating rotary motion of said first shaft into a linear reciprocating motion and a swing motion; first connecting means for connecting the swing motion side of said translating means with said loader; said loader being adapted to move reciprocally in synchronism with a press stroke for feeding a blank material into the press; means for converting the linear reciprocating motion of said translating means into an intermittent one way rotary motion; conveyor means of said destacker for conveying the blank material to said loader; and second connecting means for connecting the intermittent one way rotary motion of said converting means with said conveyor means whereby said conveyor means is rotated intermittently in one way in synchronism with the reciprocating motion of said loader for conveying the blank material to said loader.
5. A synchronized drive mechanism as recited in claim 1 further comprising a pair of roller means arranged between said destacker and said loader for coating oil onto the blank material passing therethrough and third connecting means for connecting the intermittent one way rotary motion of said converting means with one of said roller means whereby both said roller means are rotated intermittently in opposite directions from each other in synchronism with the reciprocating motion of said loader for feeding the blank material from said destacker to said loader.

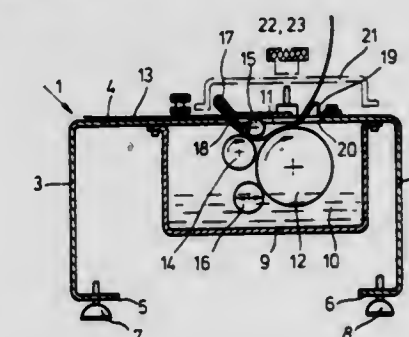
**4,419,956**  
**INKING MACHINES**  
 Jim Kwok-Fai, 20 Pennington St., 3rd Floor, Hong Kong, Hong Kong  
 Continuation-in-part of Ser. No. 246,691, Apr. 16, 1981, abandoned. This application May 14, 1982, Ser. No. 378,339  
 Int. Cl.<sup>3</sup> B05C 1/00  
 U.S. Cl. 118—235

1. A machine for inking typewriter ribbons and the like comprising: a support; an air-tight ink reservoir carried by said support; an ink inlet to said reservoir capable of being sealed tight once ink has been added; an inking roller carried by said support and having a cylindrical surface to which ink is delivered from said reservoir; means for moving a ribbon to be inked over said inking roller to transfer ink from said cylindrical surface onto said ribbon; an outlet from said reservoir immediately adjacent said cylindrical surface through which ink passes into contact with part of said cylindrical surface, the outlet being on the same side of said reservoir as the inlet so that ink cannot flow out of the outlet under gravity until said

drical surface to which ink is delivered from said reservoir; means for moving a ribbon to be inked over said inking roller to transfer ink from said cylindrical surface onto said ribbon; an outlet from said reservoir immediately adjacent said cylindrical surface through which ink passes into contact with part of said cylindrical surface, the outlet being on the same side of said reservoir as the inlet so that ink cannot flow out of the outlet under gravity until said



**4,419,957**  
**ADHESIVE COATING APPARATUS FOR COATING SHEET-LIKE MATERIALS**  
 Wolfgang Voges, Erlangen, Fed. Rep. of Germany, assignor to Claus Koenig KG, Erlangen, Fed. Rep. of Germany  
 Filed Nov. 12, 1980, Ser. No. 206,290  
 Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027564  
 Int. Cl.<sup>3</sup> B05C 1/02  
 U.S. Cl. 118—245



1. An apparatus for coating sheet-like material with adhesive comprising: a housing having a generally horizontal cover plate and a material inlet/outlet opening in said cover plate through which sheet material enters said housing uncoated and exits said housing after being coated with adhesive; an adhesive trough disposed within and sealingly connected to said housing, said trough being located below said cover plate and under said opening; and coating means disposed within said housing located substantially completely below said cover plate and over said trough, for drawing sheet material along said cover plate and downwardly into said housing through said opening, drawing adhesive from said trough and applying it to said



sheet material, and expelling coated sheet material from said housing upwardly through said opening, wherein adhesive dripping from said coating means will fall away from said opening into said trough, and said opening can be sealed when said coating apparatus is not in use by a substantially flat cover which extends over said opening and sealingly engages said cover plate to prevent the escape of vapors from said housing.

4,419,958

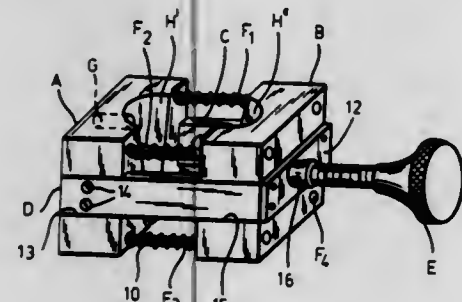
**NOZZLE FOR COATING OPTICAL FIBERS**

Giacomo Roba, Cogoletto, Italy, assignor to Cselet Centro Studi e Laboratori Telecomunicazioni S.p.A., Torino, Italy  
Filed Dec. 17, 1981, Ser. No. 331,920

Claims priority, application Italy, Dec. 19, 1980, 68946 A/80  
Int. Cl.<sup>3</sup> B05C 3/12, 11/02

U.S. Cl. 118—405

4 Claims



1. A nozzle for applying a protective resin coating to optical fibers, comprising a body essentially consisting of aluminum with a throughgoing passage which forms a frustoconical funnel terminating at its smaller end in a converging outlet port coaxial therewith, at least the wall surface of said outlet port being provided with an alumina layer unitary with said body and substantially free from open pores.

4,419,959

**MAGNETIC TONER RETAINER MEANS**

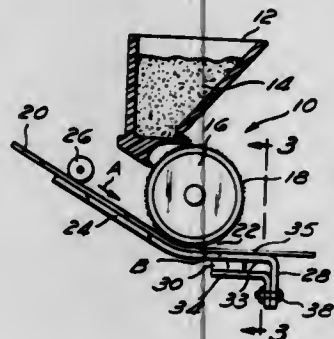
Virgil W. Westdale, Barrington, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,152

Int. Cl.<sup>3</sup> G03G 21/00

U.S. Cl. 118—657

6 Claims



1. A magnetic toner system, having a development zone, including:

a magnetic developer roller brush in said development zone;  
a hopper for dispensing magnetic toner to said roller brush;  
non-magnetic guide means supporting a master sheet for development adjacent the surface of said roller brush;  
means transporting said sheet through said development zone; and

magnet means in the development zone for restraining any toner on the bottom of said sheet from being carried out of said development zone as said sheet is transported there-through, said magnet means having a field strength that is

weaker than the field strength of said magnetic roller brush.

4,419,960

**DEVELOPING AGENT DENSITY CONTROLLING DEVICE**

Akio Okamura; Shuji Tanaka, and Tamotsu Sakamoto, all of Eibna, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

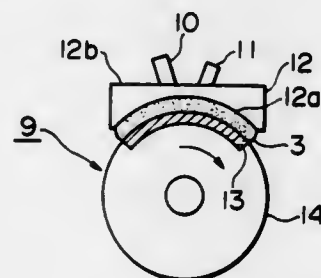
Filed Sep. 7, 1982, Ser. No. 415,621

Claims priority, application Japan, Sep. 8, 1981, 56-140253

Int. Cl.<sup>3</sup> B05C 11/00; G03G 15/00

U.S. Cl. 118—712

8 Claims



1. A developing agent toner density controlling device, comprising:  
means disposed in the flow path of a developing agent and including a permanent magnet for forming a magnetic brush of developing agent;

electrically conductive means confronting said permanent magnet for forming a toner image thereon by contacting said magnetic brush; and  
means for detecting the amount of toner in said image formed on a surface of said electrically conductive means, to control an amount of toner supplied to said developing agent.

4,419,961

**MILKING PARLOR CONSTRUCTION**

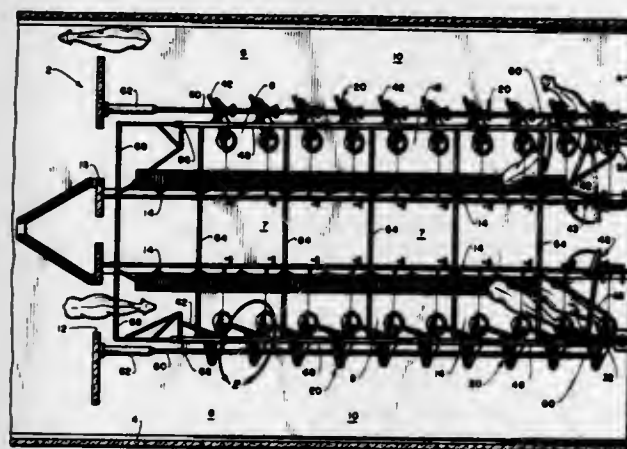
August Vandenberg; Ben W. Vandenberg, both of 17226 Roseton Ave., Artesia, Calif. 90701; Andrew W. Vandenberg, 15751 Ryon St., and Ben E. Haws, 8828 Laurel St., both of Bellflower, Calif. 90706

Filed Apr. 16, 1982, Ser. No. 369,030

Int. Cl.<sup>3</sup> A01K 1/12

U.S. Cl. 119—14.03

15 Claims



1. Milking parlor construction comprising the combination: a module comprising a hollow vertical upright member adapted for rigid securement in a base or the like; a feed bowl means secured to said hollow vertical upright member and defining a cattle feeding station; a gate member pivotally mounted on said hollow vertical upright member and being adapted to move between an open position and a closed position; a feed conveyor means superpositioned in stationary position to said hollow vertical upright member and adapted to

deliver feed to said hollow vertical upright member defining a driving means comprising buffer means for the wheel for storing feed passageway having communication to said feed bowl ing energy during the rotation of the or each wheel in one means; and means to move said gate member into a selected one of the open and closed positions.

4,419,962

**DOOR CONSTRUCTION FOR POULTRY CAGE**

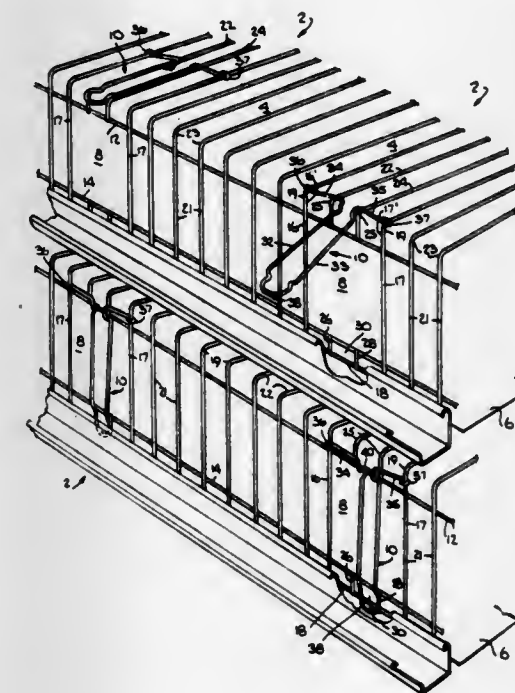
Anthony J. Siciliano, South Lyon, Mich., assignor to Diamond Automations, Inc., Farmington, Mich.

Filed Mar. 29, 1982, Ser. No. 362,602

Int. Cl.<sup>3</sup> A01K 31/10

U.S. Cl. 119—17

11 Claims



direction and by releasable guard means for blocking the rotation in the other direction.

4,419,964

**COMBUSTION PLANT**

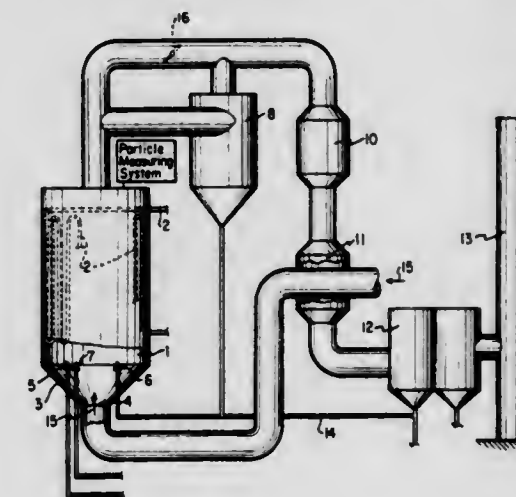
Torben Enkegaard, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Continuation of Ser. No. 88,526, Oct. 26, 1979, abandoned. This application Jun. 28, 1982, Ser. No. 392,456

Int. Cl.<sup>3</sup> F22B 1/00

U.S. Cl. 122—4 D

19 Claims



1. A cage door construction comprising:  
a cage front and a cage top, the cage front including left and right lateral wires and upper and lower transverse wires which intersect the upper and lower lateral wires to form a doorway;  
a pair of guide wires extending upwards from the upper transverse wire and bent over to form part of the cage top; and  
a flexible door for closing the doorway, the door including an elongated main part arranged in a first plane, a lower part bent out of the first plane to lie in a second plane which is substantially parallel to the first plane, and an upper part from which right and left arms extend laterally outwards, the elongated main part extending from the lower transverse wire to the upper transverse wire, the left and right arms each slidably engaged on the respective guide wire.

4,419,963

**FEEDING RAILING**

Weelink J. M. Willibrordus, No. 10, Brandersdijk, 7136 KV Zieuwent, Netherlands

Filed Mar. 31, 1982, Ser. No. 363,953

Claims priority, application Netherlands, Mar. 31, 1981, 8101597

Int. Cl.<sup>3</sup> A01K 5/00

U.S. Cl. 119—51 R

13 Claims

1. A feeding railing for animals comprising a frame, a plurality of vertical spikes fastened to said frame and adapted to extend pairwise behind the animal's head on both sides of the neck and being spaced apart by a distance which is larger than the width of the neck and smaller than the width of the withers of the animal and comprising at least one wheel supporting the frame so as to be movable along the ground, characterized in that the frame has connected with it a floor plate extending rearwardly over a given distance near the ground and by

1. Whirl chamber boiler plant which comprises at least one combustion chamber having boiler tubes therein, the bottom portion of said chamber sloping generally downwardly from the walls thereof toward generally centrally positioned combustion air inlet means, means for directing fuel and inert material to the bottom portion of said chamber so that the combustion takes place in a whirl which moves upwardly and centrally in said chamber and also downwardly along the walls of said chamber, said inlet means being dimensioned so as to avoid blockage thereof by the inert material, outlet means at the upper portion of said chamber for exit gases and particle products of combustion, means for selectively returning to said chamber at least a first predetermined portion of the inert material from the gases exiting said outlet means of said chamber, and means for returning to said chamber at least a second predetermined portion of the separated ash in a relatively cold condition.

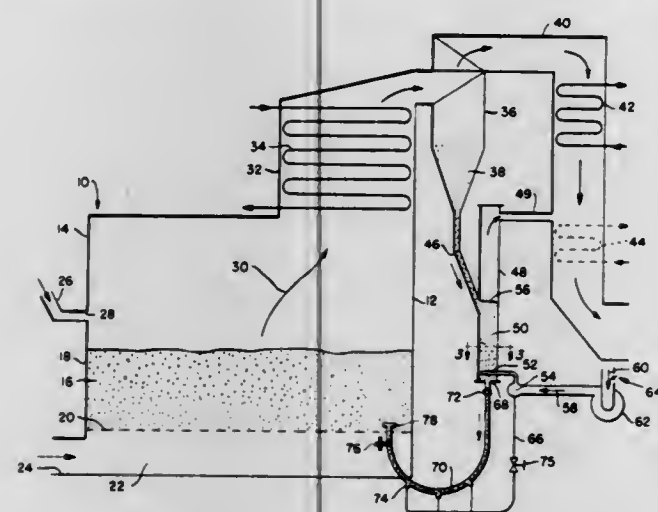


**4,419,965**  
**FLUIDIZED REINJECTION OF CARRYOVER IN A FLUIDIZED BED COMBUSTOR**  
 Juan A. Garcia-Mallol, Morristown, and Michael G. Alliston, Newark, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 16, 1981, Ser. No. 321,518  
 Int. Cl.<sup>3</sup> F22B 1/02

U.S. Cl. 122—4 D

10 Claims



1. A fluidized bed combustion system comprising:
  - (a) a combustion chamber;
  - (b) means in said combustion chamber for supporting a bed of particulate material including a fuel material;
  - (c) means for providing and introducing air to said bed, to fluidize said particulate material and to promote the combustion of said fuel material;
  - (d) means for introducing fuel to said bed of particulate material;
  - (e) separating means in communication with said combustion chamber for separating said combustion gases from said fine particles;
  - (f) means in communication with said separating means for receiving said fine particles from said separating means and for supporting a bed of said fine particles;
  - (g) a header and a set of horizontally-extending sparger pipes having spaced apart holes in their lower sides for introducing air to said fine particles to fluidize said fine particles; and
  - (h) means for passing said fine particles in a fluidized state from said bed of fine particles to said bed of particulate material.

**4,419,966**  
**FLUIDIZED BED COMBUSTION**

Francis J. Jenkins, and Michael J. Jenkins, both of Wolverhampton, England, assignors to EMS Technology Limited, Birmingham, England

Filed Feb. 23, 1982, Ser. No. 351,370

Claims priority, application United Kingdom, Feb. 27, 1981, 8106243

Int. Cl.<sup>3</sup> F22B 1/02

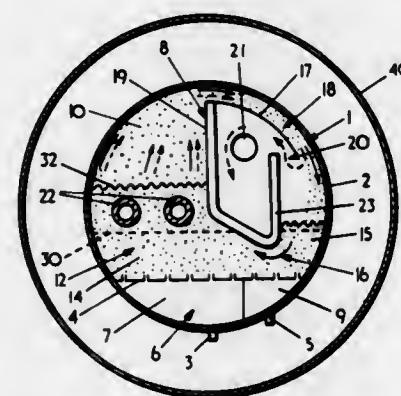
U.S. Cl. 122—4 D

10 Claims

1. A fluidized bed combustor including a horizontally elongate cylindrical body adapted to contain a fluidized bed of particulate material, a gas permeable support on which in use the bed is supported within the body, a plenum defined between the support and the base of the body, the plenum being divided into at least two parts, an exhaust outlet means at one end of the body, and a hollow elongate baffle extending within the body longitudinally thereof, the interior of the baffle communicating with the exhaust outlet means, a deflector located at a relatively upper part of the baffle and spaced from the defining wall of the body to provide passage means for the flow in use of gas and entrained bed particles from one side of the baffle to the other side thereof, an inlet means provided in

the baffle at said relatively upper part adjacent a trailing portion of the deflector, the baffle being disposed within the body such that in use at least a lower part thereof extends into the bed of particulate material thereby to define at least two regions therein corresponding to the at least two parts of the plenum and the upper part thereof extends into the freeboard above the bed.

5. A method of operating a fluidized bed combustor comprising the steps of establishing a bed of particulate material in at least two regions of a hollow elongate baffle at least a lower part of which extends into the bed and an upper part thereof extends into the freeboard above the bed, fluidizing the regions



of the bed at different rates, causing gases and entrained bed particles to pass in the freeboard from one region of the bed around the baffle through passage means defined between a deflector located at a relatively upper part of the baffle and the defining wall of the body to the other region thereof, the gases passing into the baffle through inlet means adjacent a trailing portion of the deflector, the gases exhausting through an exhaust outlet means located at one end of the body and communicating with the interior of the baffle, the entrained bed particles being deposited in the other region of the bed fluidized at a relatively lower rate, and causing circulation of bed material between the regions of the bed.

**4,419,967**  
**METHOD AND APPARATUS FOR UTILIZING ETHANOL OF ANY PURITY AS A FUEL IN 4-STROKE INTERNAL COMBUSTION ENGINES**

Alfredo C. Protacio, Project Sta. Barbara Sangley Point, Cavite City, Philippines; Ramon V. Navarro, Cavite City, Philippines; Eliseo M. Rio, Jr., Cavite City, Philippines; Antonio D. Alonte, Cavite City, Philippines, and Felix J. Pascual, Cavite City, Philippines, assignors to Alfredo C. Protacio, Cavite City, Philippines

Continuation of Ser. No. 153,696, Jun. 12, 1980, abandoned.

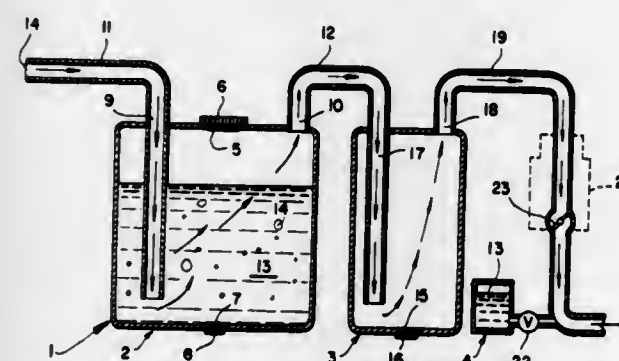
This application Sep. 30, 1982, Ser. No. 430,692

Claims priority, application Philippines, Jun. 14, 1979, 22666

Int. Cl.<sup>3</sup> F02B 75/12

U.S. Cl. 123—1 A

3 Claims



1. A method adapted to utilize non-anhydrous ethanol as a fuel in an internal combustion engine comprising the active steps of: aspirating air by means of vacuum pressure developed

by piston displacement of an engine on an intake stroke, bubbling said air into liquid ethanol contained in a vaporizing container, said vaporizing container including an air inlet pipe extending downward inside said vaporizing container to close to the bottom thereof, an air outlet pipe in the cover of said container, passing said bubbled air through said vaporizing container's air outlet pipe into a liquid condensate tank, said vaporizing container's outlet pipe extending downwardly inside said liquid condensate tank to close to the bottom thereof; said liquid condensate tank further including an air outlet pipe in the cover of said tank, thereby evaporating ethanol in said vaporizer container and said condensate tank and mixing said air and ethanol vapors in order to produce a homogeneous air-fuel flammable mixture, and introducing said flammable mixture into said engine's intake manifold free from moisture and ethanol droplets.

**4,419,968**  
**METHOD AND APPARATUS FOR REMOVING HYDROGEN SULFIDE FROM FUEL FOR AN INTERNAL COMBUSTION ENGINE**

Roy C. Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

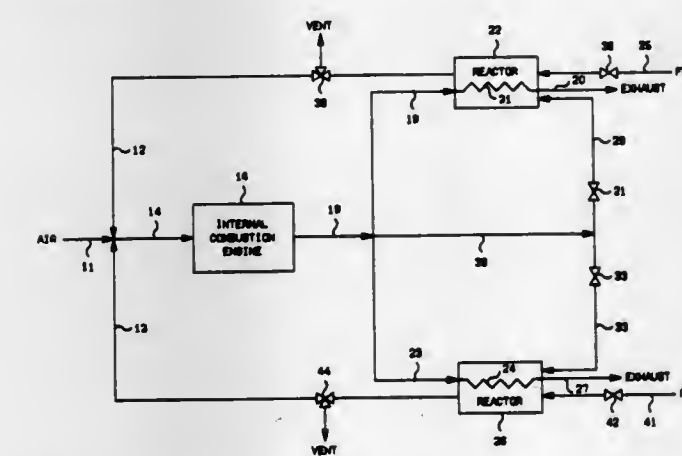
Division of Ser. No. 125,434, Feb. 28, 1980, Pat. No. 4,347,811.

This application Aug. 2, 1982, Ser. No. 403,977

Int. Cl.<sup>3</sup> F02B 43/08

U.S. Cl. 123—3

6 Claims



1. Apparatus comprising:
  - (a) an internal combustion engine;
  - (b) a first reactor;
  - (c) a second reactor, each of said first and second reactors containing an absorbing composition capable of removing hydrogen sulfide from fuel for said internal combustion engine and capable of being regenerated in the presence of oxygen;
  - (d) means for supplying a fuel for said internal combustion engine through said first reactor to said internal combustion engine, the fuel flowing through said first reactor contacting the absorbing composition contained in said first reactor;
  - (e) means for supplying a fuel for said internal combustion engine through said second reactor to said internal combustion engine, the fuel flowing through said second reactor contacting the absorbing composition contained in said second reactor;
  - (f) means for selectively supplying exhaust gases, which contain oxygen, from said internal combustion engine to said first and second reactors;
  - (g) means for manipulating the flow of fuel to said first and second reactors;
  - (h) means for manipulating the flow of said exhaust gases to said first and second reactors, the flow of fuel and the flow of said exhaust gases being manipulated in such a manner that if fuel is being supplied through said first reactor said exhaust gases are not supplied to said first reactor and said exhaust gases are supplied to said second reactor, and if fuel is being supplied to said second reactor said exhaust

gases are not supplied to said second reactor and said exhaust gases are supplied to said first reactor, wherein the absorbing composition in said first and second reactors removes hydrogen sulfide from the fuel, and said exhaust gases regenerate the absorbing composition in said first and second reactors.

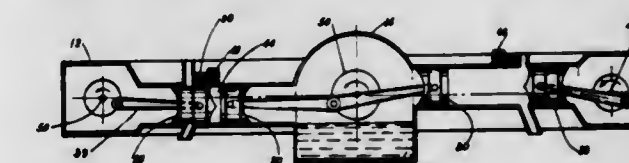
**4,419,969**  
**FLEXIBLE CYLINDER-HEAD INTERNAL COMBUSTION ENGINE WITH CYLINDER COMPRESSION ADJUSTABLE FOR USE WITH AVAILABLE FLUID FUELS**

Benjamin Bundrick, Jr., Rte. 3, Box 272, Slidell, La. 70458  
 Division of Ser. No. 62,581, Jul. 31, 1979, Pat. No. 4,312,306.  
 This application Oct. 13, 1981, Ser. No. 311,103

Int. Cl.<sup>3</sup> F02B 75/04, 75/36

U.S. Cl. 123—48 R

2 Claims



1. A flexible cylinder-head, piston type, internal combustion engine with spaced-apart cranks comprising:
  - (a) a pair of oppositely disposed cylinders, each having oppositely disposed ends, oppositely and equally offset from a line through the respective centers of said spaced apart cranks that are oppositely disposed from said cylinder ends;
  - (b) pistons respectively mounted in said cylinder ends;
  - (c) piston rods respectively connecting said pistons to the respectively nearest of said cranks;
  - (d) similar gears mounted on said cylinders and driven in rotation by said cranks, said gears being engaged for said cranks to rotate at same speed and in same direction in two cycle operation which pistons of each cylinder moving in opposed reciprocal action and alternate combustion; and
  - (e) mechanical means for manually disengaging and reengaging said gears, and changing the relative piston positions in said cylinders and thus cylinder compression between opposed pistons at closest proximity to an ignition compression of an available fluid fuel for the operation of said engine on said fuel.

**4,419,970**  
**CYLINDER BLOCK**

Terrence M. Shaw, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

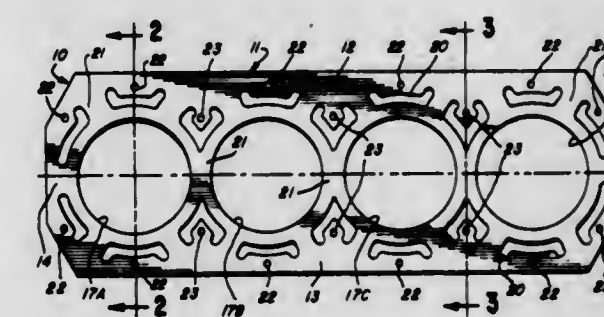
Continuation of Ser. No. 104,096, Dec. 17, 1979, abandoned.

This application Feb. 9, 1982, Ser. No. 347,188

Int. Cl.<sup>3</sup> F02F 1/36

U.S. Cl. 123—41.74

6 Claims



1. A cylinder block for an internal combustion engine comprising a cooling jacket portion having walls and a floor section; a plurality of cylinder tubes of generally uniform thickness integral with said cooling jacket floor section and ar-



ranged in relatively spaced relation and extending at least in part upwardly into said cooling jacket from said floor section and below said floor section, each of said cylinder tubes substantially axially supported only by said jacket floor section and substantially isolated from each other tube and said cylinder block, upper ends of said tubes being generally coplanar with top edges of said cooling jacket walls and defining a top surface of the block; a plurality of first and second bores disposed within said cylinder block parallel to said cylinder tubes and adjacent a perimeter of and in outwardly spaced relation therefrom so that said cylinder tubes are isolated from said bores via the cooling jacket extending to the top surface of the block in regions located between said bores and said cylinder tubes, with said cylinder tubes being substantially entirely surrounded by coolant above said floor section, said bores being internally threaded within said block to threadably engage a corresponding number of cylinder head bolts; said first bores being in closer proximity to said jacket walls than said second bores, the internal threading of said second bores commencing at a level which is a greater distance from the top surface of said block than the level of commencement of the internal threading in said first bores, such that relative variations in axial cylinder tube deflection with respect to radial tube position that result from axial cylinder tube compression are minimized without any cylinder tube support other than that provided by said integral jacket floor section.

4,419,971

## CYLINDER LINER FOR AN INTERNAL COMBUSTION ENGINE

Kiyoshi Nakamura; Katsutoshi Nishida, both of Yokohama; Toshihiko Ochiai, Yokosuka; Akio Ando, Kawasaki, and Syoji Okada, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 166,855, Jul. 8, 1980, abandoned. This application Nov. 23, 1982, Ser. No. 443,911

Claims priority, application Japan, Nov. 21, 1979, 54-149997

Int. Cl.<sup>3</sup> F01F 1/18

U.S. Cl. 123—193 C

1 Claim



1. A free standing cylinder liner for use in an internal combustion engine comprising:

a sintered homogeneous ceramic mass of molded material having a density higher than 95% of theoretical density value of the material, a flexural strength greater than 50 kg/cm<sup>2</sup> at 800° C. and a randomly directed, homogeneous structure, wherein said material comprises a powdered raw material selected from the group consisting of silicon nitride, aluminum nitride, silicon oxynitride and silicon aluminum oxynitride which has been sintered in a furnace free from application of pressure thereon, wherein said sintered ceramic mass at least comprises silicon nitride.

4,419,972  
AIR-FUEL INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori; Hitoshi Yoshida, both of Okazaki; Keichi Akutagawa, Nagoya; Akira Takata, and Tamotsu Fukuda, both of Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

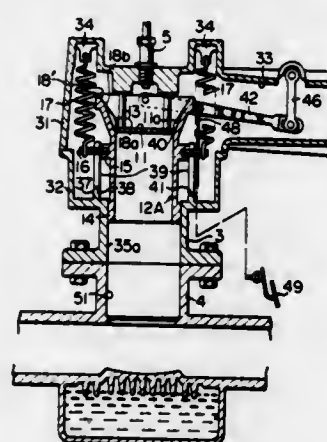
Filed Sep. 13, 1979, Ser. No. 75,683

Claims priority, application Japan, Sep. 19, 1978, 53-115527; Dec. 14, 1978, 53-155474; Dec. 14, 1978, 53-155475; Dec. 14, 1978, 53-155476; Dec. 14, 1978, 53-155477; Dec. 14, 1978, 53-155478; Dec. 14, 1978, 53-155480

Int. Cl.<sup>3</sup> F02D 9/12

U.S. Cl. 123—337

11 Claims



1. In an intake system for an internal combustion engine of the type comprising an intake pipe, fuel supply means for charging a fuel into said intake pipe so as to form an air-fuel mixture, an intake manifold for distributing the air-fuel mixture into cylinders of said engine, and a throttling system incorporated in said intake pipe between said fuel supply means and said intake manifold for controlling the flow rate of the air-fuel mixture to be delivered to said intake manifold, the improvement wherein said throttling system comprises:

a stationary valve body having a surface spaced downstream from said fuel supply means by a predetermined constant distance in opposed relationship therewith and on which the charged fuel impinges, said stationary body being substantially in the form of a disc,  
a plurality of rods suspending said stationary valve body from said intake pipe, and  
a movable tubular valve body having an outer wall surface, a part of which is slidably closely engaged with an inner wall surface of said intake pipe downstream of said stationary valve body, and an inner wall surface which cooperates with at least a portion of the peripheral edge of said stationary valve body to define a valve opening in said intake pipe between said inner wall surface of said movable valve body and said portion of said peripheral edge, said inner wall surface of said movable tubular valve body being formed with recess means which cooperates with only a portion of the peripheral edge of said stationary valve body to define said valve opening until the opening area of said valve opening reaches a predetermined value, the valve opening being defined between the entire peripheral edge of said stationary valve body and the entire periphery of said inner wall surface of said movable tubular valve body when the opening area of said valve opening exceeds said predetermined value,

said movable tubular valve body being movable relative to said stationary valve body in an axial direction of the former to vary the opening area of said valve opening, thereby controlling the air-fuel mixture charged into the cylinders of said engine.

4,419,973

## DEVICE FOR THE CONTROL OF THE TRAVELING SPEED OF A MOTOR VEHICLE

Harald Collonia, Königstein, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

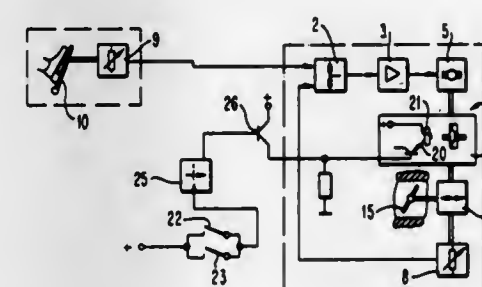
Division of Ser. No. 86,828, Oct. 22, 1979, Pat. No. 4,313,408, which is a division of Ser. No. 894,371, Apr. 7, 1978, abandoned. This application Aug. 4, 1981, Ser. No. 289,850

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2754826; Mar. 30, 1977, 2714113; Dec. 2, 1977, 2753702; Dec. 2, 1977, 2753703

Int. Cl.<sup>3</sup> F02D 11/10; F02B 17/00

U.S. Cl. 123—396

10 Claims



1. A device for the control of the traveling speed of a motor vehicle with a regulating unit actuatable by the vehicle driver, and means for transmission of the movement of the same to an element, which influences the air-fuel mixture, comprising  
a regulating unit,  
a first electrical position encoder being coupled with said regulating unit, said first position encoder having an output with an output signal,  
means for influencing the air-fuel mixture of the vehicle, an electrical adjusting device including a positioning actuator, the latter being operatively connected with said influencing means,  
a second electrical position encoder being coupled with said positioning actuator, said second electrical position encoder having an output with an output signal,  
means comprising an electrical controller including and for controlling said electrical adjusting device and having a desired value input connected with the output of said first electrical position encoder and applied with the output signal of said first electrical position encoder and having an actual value input connected with the output of said second electrical position encoder and applied with the output signal of said second electrical position encoder, means for generating a resetting signal, there being a vehicle element which is coupled to said generating means for producing said resetting signal, said generating means including a first switch coupled to said vehicle element for closing an electrical circuit upon actuation of said vehicle element, the closing of said electrical circuit producing said resetting signal and,  
said adjusting device including a coupling means operatively connected to said positioning actuator for operatively connecting and disconnecting said positioning actuator, respectively, in dependency on corresponding respective switching conditions of said coupling means,  
means for inoperatively switching said coupling means only for a short time upon actuation of said vehicle element of the motor vehicle via said resetting signal, said switching means including a multivibrator means activated by initiation of said resetting signal via said switch said switching means further including a first transistor having a base thereof coupled to an output terminal of said multivibrator means for inoperatively switching said coupling means upon activation of said multivibrator means by said switch via said resetting signal, resulting in the only said short time inoperative switching of said coupling means whenever said vehicle element is initially actuated with a reactivation of said coupling means automatically after said

short time expires after activation of said multivibrator means.

4,419,974

## METHOD OF AND APPARATUS FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Masaomi Nagase; Hironobu Ono, both of Toyota; Jiro Nakano, and Hideo Miyagi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

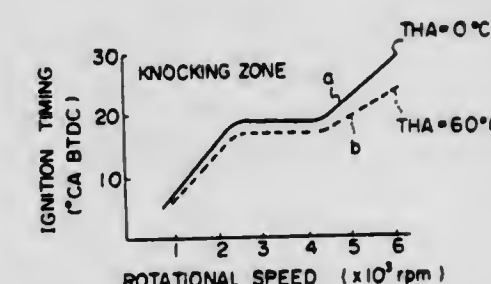
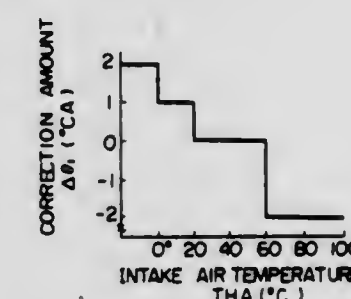
Filed Sep. 22, 1981, Ser. No. 304,558

Claims priority, application Japan, Sep. 27, 1980, 55-133680

Int. Cl.<sup>3</sup> F02P 5/04

U.S. Cl. 123—418

16 Claims

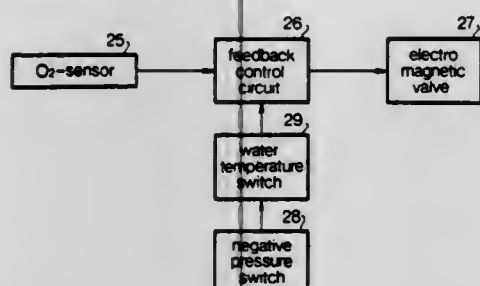


1. A method of controlling the ignition timing of an internal combustion engine having an intake manifold, said method comprising the steps of:

detecting one of the flow rate of air sucked into the engine and the pneumatic pressure in the intake manifold, and producing a first electrical signal related thereto;  
detecting the rotational speed of the engine and producing a second electrical signal related thereto;  
calculating, in response to said first and second electrical signals, a spark advance angle which represents an optimum ignition timing at the operating condition corresponding to the detected flow rate of air or the detected pneumatic pressure and to the detected rotational speed;  
detecting the temperature of air sucked into the engine to produce a third electrical signal which indicates the detected intake air temperature;  
correcting, in response to said second and third electrical signals, said calculated spark advance angle, said correcting step including the steps of increasing said calculated spark advance angle by a variable value when the detected intake air temperature is lower than a predetermined temperature, and decreasing said calculated spark advance angle by a variable value when the detected intake air temperature is higher than the predetermined temperature, said variable value changing depending upon the difference between the detected intake air temperature and the predetermined temperature and upon the detected rotational speed indicated by the second electrical signal; and  
controlling the timing of the sparks applied to the engine depending upon said spark advance angle.



## 8 Claims

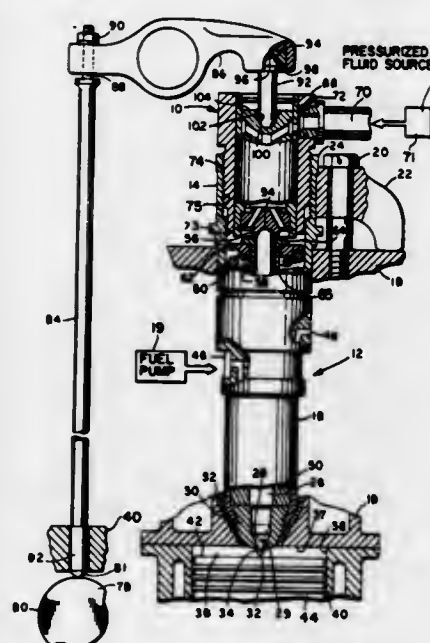


## 9 Claims

the regulator in response to the signal from the sensor unit

[illegible]

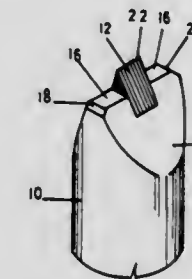
## 7 Claims



**1. A hydraulic device for selectively varying the force transmitting length of a member used in an internal combustion engine of the type having a train of members cyclically moved**

second force transmitting length for selectively effecting the motion of said train of members.

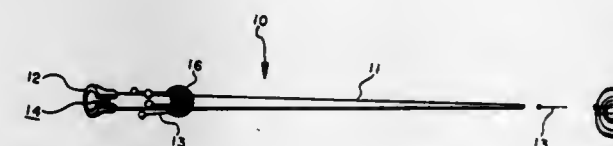
U.S. Cl. 125-11 R



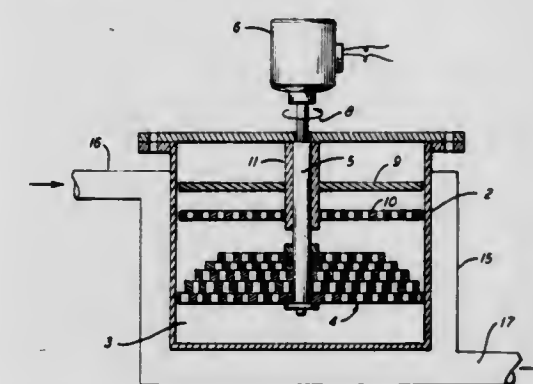
U.S. CI. 126-247

### 6 Claims

### 3 Claims



**1. A breath operated dart apparatus comprising:**  
**an elongate, open ended tube adapted at one end thereof to**  
**receive air expelled from the lungs and mouth of the user;**  
**elongate dart means adapted to be launched through and from**  
**the bore of the launching tube by the expelled air; and**  
**dart quiver means adapted for securement to the launching**  
**tube, wherein the quiver means comprises plastic foam**



1. A heating device comprising, in combination:
  - a. an enclosed container;
  - b. a drive shaft journaled into said container;
  - c. a set of at least four stacked perforate square flat plates centrally mounted onto said drive shaft near its lower end but offset one from another to expose the corners thereof, the flat surfaces of each being in face-to-face contact and rotating in a horizontal plane in a plane of rotation of said



- drive shaft and having at least 50 perforations per square inch;
- d. drive means for rapidly rotating said drive shaft;
- e. a liquid within said container covering said plates and adapted to be heated by being worked by the rotation of said plates; and
- f. heat exchange means for passing a heat transfer medium in indirect heat exchange with said liquid and recovering thermal energy therefrom.

4,419,981

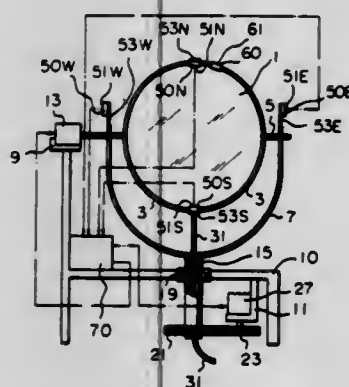
## SUN TRACKING APPARATUS

Kei Mori, 3-16-3-501, Kamino, Setagaya-ku, Tokyo, Japan  
Filed Jun. 29, 1982, Ser. No. 393,386

Claims priority, application Japan, Jul. 1, 1981, 56-103600  
Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—425

10 Claims



1. A sun tracking apparatus comprising a rotatable vertical shaft, a horizontal shaft which is rotatably supported by the vertical shaft and whose axis is orthogonal to the axis of the vertical shaft, a first pair of optical detectors which are supported by the vertical shaft at symmetrically opposed positions substantially on the axis of the horizontal shaft, said optical detectors having substantially vertical outer sunlight receiving surfaces which face outside in opposite directions to one another, a second pair of optical detectors which are supported by the horizontal shaft, so as to rotate therewith, at symmetrically opposed positions substantially on an axis perpendicular to the horizontal axis, said second pair of optical detectors having substantially parallel inner sunlight receiving surfaces facing each other, a first driving means connected to the vertical shaft for rotating the same in a predetermined direction in accordance with outputs of the first pair of optical detectors, and a second driving means connected to the horizontal shaft for rotating the horizontal shaft in a predetermined direction in accordance with outputs of the second pair of optical detectors, said first and second driving means being driven only when there are differences in outputs between the first pair of optical detectors and between the second pair of optical detectors, respectively.

4,419,982

## MAGNETIC EDGE SEAL FOR SOLAR COLLECTOR FILM

Robert E. Eckels, 2101 Youngfield, Golden, Colo. 80401  
Filed May 10, 1982, Ser. No. 376,297

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—426

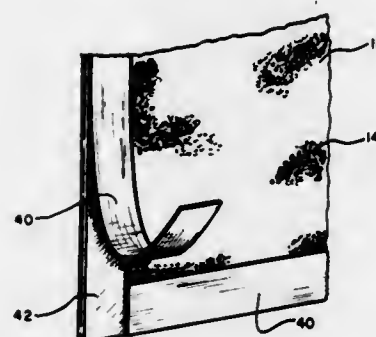
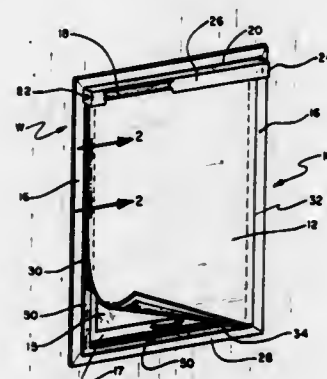
1 Claim

1. A magnetic edge seal for a flexible solar collector film material for forming a generally air-tight, heat insulating, reusable seal around the edges of a window opening in a surface of a building, the magnetic edge seal being provided to trap the air adjacent to said window opening to prevent it from entering the interior of said building while permitting solar energy to be converted to heat energy by said flexible film material so as to heat the air within said building, the magnetic edge seal comprising:

- (a) a flexible film sheet material sized to overlap the edges of

said window opening, said film material having a monolayer of transparent spheres adhered to the surface of said material facing said window opening;

- (b) said flexible film material being arranged to be stored in the retracted position by being wrapped around a rotatably mounted roller positioned adjacent to the upper edge of said window opening;
- (c) said rotatably mounted roller being positioned within an enclosed cover means positioned along the upper edge of said window opening whereby said edge is essentially sealed to prevent air flow;
- (d) said film material being arranged to be extended downwardly across the said window opening by unrolling from said rotatably mounted roller whereby the sheet material completely covers said window opening and overlaps the edges of said opening;



- (e) the edges of said sheet material having a continuous band of magnetically permeable particles adhered thereto; and
- (f) a continuous magnetic strip means applied along the edges of said window opening corresponding to the overlapping edges of said sheet material containing said magnetically permeable particles, said magnetically permeable particles being attracted to said magnetic strip means whereby an effective air-tight seal is provided around the outer edges of said film material whereby the air adjacent to the window opening is essentially enclosed and trapped to prevent movement to the interior of said building while allowing the solar energy collected on the surface of said flexible material to be converted to heat energy and conducted to the interior of said building.

4,419,983

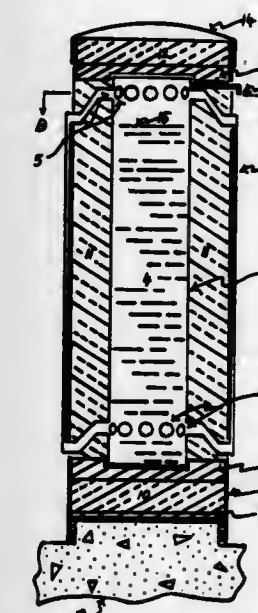
## DEVICE FOR PASSIVE SOLAR HEATING AND STORAGE OF A LIQUID

Beecher J. Holland, 600 Morison Ave., Kingsport, Tenn. 37660

Continuation-in-part of Ser. No. 73,099, Sep. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 34,295, Apr. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 851,053, Nov. 14, 1977, abandoned. This application Sep. 28, 1981, Ser. No. 305,972  
Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—434

1 Claim



1. A passively operating solar collector comprising: an insulating support base, a vertically disposed reservoir tank mounted on said base, a plurality of essentially straight tubular conduits arranged longitudinally on the circumference of a cylinder surrounding said reservoir, the longitudinal axis of said cylinder laying essentially in a vertical north-south plane, a plurality of lower tubes, each tube being in fluid communication with the lower end of said reservoir tank and the lower end of one of said conduits wherein the point of communication of each of said lower tubes with said conduit is lower than the corresponding point of communication with said reservoir tank, a plurality of upper tubes, each tube being in fluid communication with the upper end of said reservoir tank and the upper end of one of said conduits, wherein the working fluid level in the reservoir in normal operation stands below the point of communication of each of said upper tubes with the upper end of said reservoir tank, and wherein the point of communication of each of said upper tubes with said conduit is lower than the corresponding point of communication with said reservoir tank.

4,419,984

## RADIANT ENERGY COLLECTOR

William R. McIntire, Downers Grove, Ill., assignor to University Patents, Inc., Norwalk, Conn.

Filed Feb. 14, 1980, Ser. No. 121,541

Int. Cl.<sup>3</sup> F24J 3/02

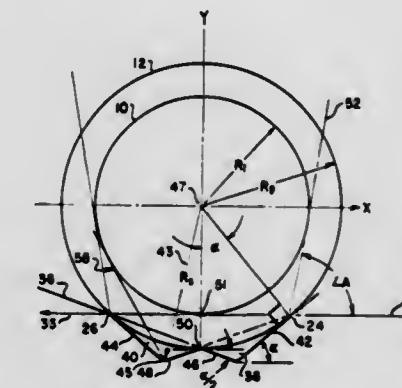
U.S. Cl. 126—439

5 Claims

1. A radiant energy concentration and collection device, comprising:

- an energy absorber having a dimension  $R_1$  from the center of said energy absorber to its lowermost extremity and a reflector spaced a distance  $R_2$  from the center of said energy absorber,
- said reflector adapted to redirect all radiant energy rays between first and second extremal rays onto said energy absorber, said first extremal ray being tangent to said energy absorber at a lower extremity, said second extremal ray being tangent to said energy absorber but oriented at an angle removed from said first extremal ray,
- said reflector including at least first and second adjacent

facets, each facet having opposed inner and outer arms joined at a nadir point and extending to an opening opposite said nadir point, said opening defined by the distance between the ends of said arms, each of said facet openings oriented towards said absorber, the ends of said inner arms of adjacent facets being joined at a distance  $R_2$  from the center of said energy absorber, the outer ends of said outer arms of said facet lying on an imaginary circle of said energy absorber,



said outer arms of each facet sloped to reflect said second extremal rays onto said lower extremity of said energy absorber and any rays falling between said first and second extremal rays onto either the opposing inner arm of one facet or the opposing outer arm of said other facet and thence to the absorber, said inner arms of each facet being sloped to reflect all rays, either falling directly thereon or falling thereon as a result of a reflection from an outer arm, onto said absorber, the slope of said inner arms being defined by an angle  $\alpha/2$  measured from said first extremal ray, where  $\alpha$  substantially equals  $\cos^{-1} R_1/R_2$ .

4,419,985

## APPARATUS FOR REVERSIBLY CLOSING A BODY PASSAGE

Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

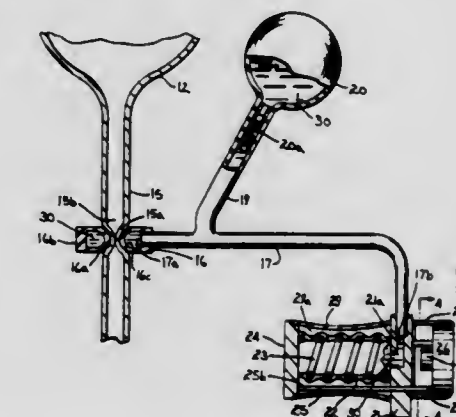
Continuation of Ser. No. 182,468, Aug. 28, 1980, abandoned.

This application Mar. 24, 1982, Ser. No. 361,466

Int. Cl.<sup>3</sup> A61F 1/00; A61B 17/00

U.S. Cl. 128—1 R

2 Claims



1. In an apparatus for implantation in a patient's body to control the flow of a body fluid through a body passage, wherein the apparatus has an inflatable means which can be inflated to close the body passage and deflated to open the body passage, and tubing connected at one end to the inflatable means to carry hydraulic fluid to and from the inflatable means, the improvement which comprises a push button actuated and expandable hydraulic fluid reservoir assembly also adapted to be implanted within the body which assembly includes:



- (a) a support coupled to the other end of said tubing, said support having a passage therethrough for conveying hydraulic fluid;
- (b) a rigid cap spaced from the support;
- (c) an elongated pumping chamber extending from the support to the cap and attached to the cap, said chamber communicating with said passage in the support to receive and transmit hydraulic fluids and containing a substantial amount of hydraulic fluid even in its unexpanded state;
- (d) a tension spring positioned within said pumping chamber and extending longitudinally between the support and the cap, said tension spring preventing the pumping chamber from being completely collapsed and emptied of hydraulic fluid in its unexpanded state;
- (e) a push rod connected at one end to said cap and having the other end extending through and past the support, said push rod being located outside of the pumping chamber; and
- (f) a push button mounted at the other end of the push rod; and

wherein said inflatable means, said tubing, said support passage and said pumping chamber form a closed system adapted to contain a pressurized fluid, so that when said push button is actuated said push rod will move said cap and thereby expand said pumping chamber from an initial volume containing a substantial amount of hydraulic fluid to a larger volume which will accommodate an added volume of hydraulic fluid from the inflatable means and cause said inflatable means to deflate due to the flow of hydraulic fluid through said tubing from said inflatable means to said pumping chamber.

4,419,986

## EMBRYO TRANSFER APPARATUS

Stanley P. Leibo, San Antonio, Tex., assignor to Rio Vista International, Inc., San Antonio, Tex.

Division of Ser. No. 251,969, Apr. 7, 1981, Pat. No. 4,380,997. This application Nov. 2, 1982, Ser. No. 438,596

Int. Cl.<sup>3</sup> A61B 19/00

U.S. Cl. 128-1 R

12 Claims



12. An apparatus for storing, thawing and transferring a frozen embryo to a recipient animal comprising:

- (a) a thin tubular plastic straw of the type typically used in artificial insemination procedures comprising a plug of porous material at the first end thereof and the heat seal closure at the second end thereof;
- (b) a volume of a cryoprotective agent comprising a solution of glycerol in PBS in a concentration of from about 1.0 M to about 2.0 M said volume containing the embryo to be transferred;
- (c) a volumetric amount of a diluent solution from about 6 to about 10 times as great as said volume of cryoprotective agent said diluent solution comprising sucrose in a PBS solution in concentrations of from about 0.5 M to about

- 1.0 M, the exact concentrations of said cryoprotective agent and diluent solution being adjusted so as to produce a substantially isosmolal condition upon mixture; and
- (d) an air bubble separating said volume of cryoprotective agent from said diluent solution.

4,419,987

## LASER ENDOSCOPE

Hisao Ogiu, Oume, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

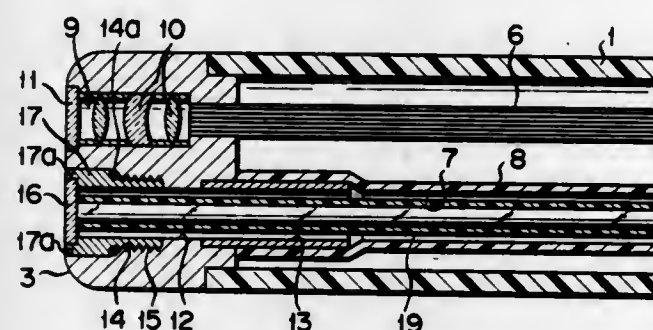
Filed Dec. 8, 1980, Ser. No. 214,095

Claims priority, application Japan, Dec. 21, 1979, 54-166433

Int. Cl.<sup>3</sup> A61B 1/00

U.S. Cl. 128-4

1 Claim



1. A laser endoscope comprising: an endoscope body having two ends; a distal end portion fixed to one end of the endoscope body, the distal end portion having internal screw threads formed therein; a control section fixed to the other end of the endoscope body; a channel extending through the distal end portion, endoscope body and control section and having a distal end; a holder which is detachably attached in the distal end portion, and, when attached in the distal end portion, covers the distal end of the channel in a liquid-tight state; and a glass cover which is so disposed in the holder so as to face the distal end of the channel when said holder is put to use by being attached to the distal end portion; said holder comprising a hollow cylindrical member having two ends, one end of which is fitted with the glass cover, and the other end of which is provided with external screw threads for engagement with the internal screw threads in the distal end portion; and said holder further comprising notches formed at the end thereof which is fitted with the glass cover to provide means for gripping the holder so that it can be rotated to disengage from the internal screw threads in the distal end portion.

4,419,988

## ELECTRONIC CIRCUIT FOR A DYNAMIC PRESSURE WAVE PNEUMATIC CONTROL SYSTEM

Thomas A. Mummert, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

Filed Aug. 3, 1981, Ser. No. 289,267

Int. Cl.<sup>3</sup> A61H 1/00

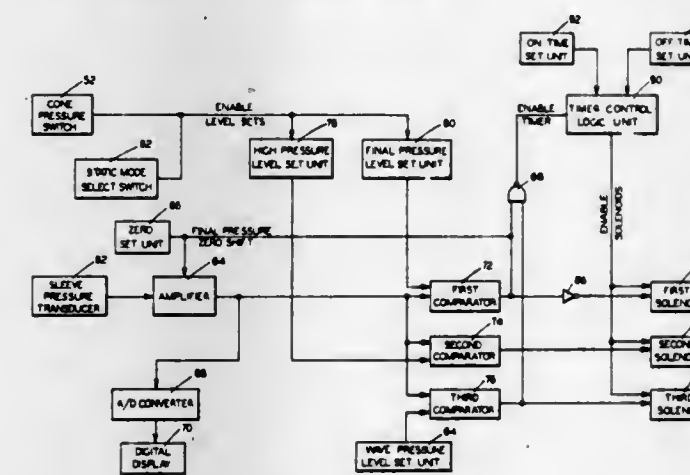
U.S. Cl. 128-24 R

29 Claims

1. In an apparatus intended for use in applying compressive pressure to a mammal extremity including a first inflatable chamber, a second inflatable chamber, and pneumatic control means responsive to control signals and pneumatically connected to the first and second chambers for inflating and deflating the chambers from a source of pressurized gas such that the chambers apply compressive pressure to the extremity, an electronic circuit for regulating a pneumatic control means comprising:

means responsive to the pressure within a first chamber for

generating an enabling signal when a first predetermined pressure level has been reached; means connected to said pressure responsive means and responsive to the absence of said enabling signal for generating a first control signal to the pneumatic control means to connect a source of pressurized gas to the first chamber, and responsive to the presence of said enabling signal for generating a second control signal to disconnect the first chamber from the source of pressurized gas and connect a second chamber to the source of pressurized gas; means for generating a reference signal representing a second predetermined pressure level;



means responsive to the pressure within the second chamber for generating a signal representative thereof; means responsive to said reference and second chamber pressure signals for generating a third control signal to vent the first chamber when the pressure in the second chamber equals or exceeds said second predetermined pressure level; means for generating a reference signal representing a third predetermined pressure level; and means responsive to said third pressure level reference signal and said second chamber pressure signal for generating a fourth control signal to disconnect the second chamber from the source of pressurized gas.

4,419,989

## TILTABLE RECLINING AND SEATING DEVICE

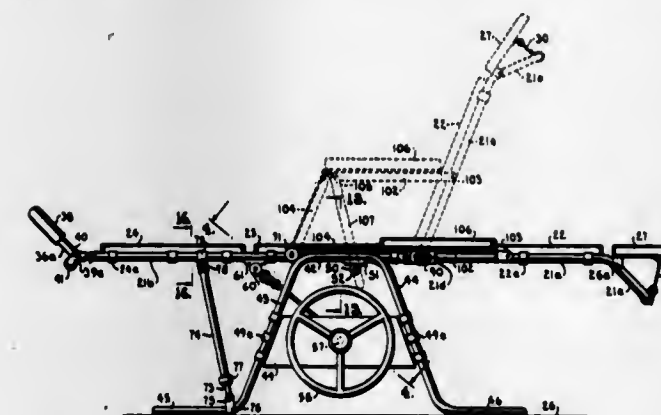
Ted E. Herbold, 1909 E. 28th Ave., North Kansas City, Mo. 64116

Filed Apr. 6, 1981, Ser. No. 251,184

Int. Cl.<sup>3</sup> A61F 5/00

U.S. Cl. 128-74

13 Claims



1. A therapy device comprising, in combination: a pair of parallel oriented A-frame base members adapted to rest on a ground or floor surface with the lower end of the legs of the A, a pair of first bearing collars, one fixed to each underside of the tops of the A-frames, a first transverse cylindrical shaft received in and carried by said first bearing collars, an elongate, rectangular, body-receiving frame having elon-

gate side members and shorter transverse head and foot end beam members, the said body-receiving frame configured at the ends thereof so as to provide a downwardly angled head end and an upwardly angled foot end, a pair of second bearing collars, one fixed to each underside of the elongate side members of the body-receiving frame intermediate the length thereof, said second collars engaging and carried by the first cylindrical shaft inboard of the first bearing collars whereby said frame is positioned inboard of the A-frame members, the frame pivotable with respect to the base members on its first shaft mounting, two opposed, substantially parallel plate members, one carried between each pair of A-frame legs and fixed thereto, a second transverse shaft rotatably received between said two plate members below said first shaft and extending through said plate members at the ends thereof, a turning wheel removably fixed to at least one end of the second shaft outside of the said plate members, a third transverse shaft mounted on said extending between the elongate frame side members and located between the first shaft and the foot end of the frame, the second shaft having opposed, reversed screw threads thereon intermediate the outboard ends thereof and inboard of the plate members, the said reversed threads spaced centrally apart from one another on the second shaft, an X frame made up of two centrally pivoted elongate arm members communicating between and connected at the ends of the members thereof to the said second and third shafts, the lower connection being by nuts pivotably mounted on the lower ends of the X frame members which are threadably engaging the said second shaft screw threads and the upper connection being by bushings pivotably mounted on the upper ends of the X frame members which are slidably engaging the third shaft, whereby rotation of the second shaft in one direction moves the nuts engaging the second shaft screw threads toward one another, thus lengthening the X frame along the longitudinal axis of the frame and elevating the foot end of the frame from normal horizontal upwardly, and rotation of the second shaft in the other direction moves the nuts engaging the threads away from one another, shortens said X frame along said axis, thus lowering the foot end of the frame toward normal horizontal, the upwardly angled foot end of the body receiving frame having a transverse beam member extending between and connecting the said elongate side members adjacent the ends of the straight portions thereof and the upwardly angled foot end, and a plurality of body carrying, transverse support members provided communicating between and carried by the elongate side members along the length thereof between the downwardly angled frame head end and upwardly angled foot end.

4,419,990

## APPARATUS FOR RELIEVING THE SPINAL COLUMN

Helmut Forster, Greppenstrasse 77, 8031 Alling, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 236,109

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007835

Int. Cl.<sup>3</sup> A61H 1/02

U.S. Cl. 128-75

23 Claims

1. A portable apparatus for relieving the spinal column, comprising a support element, a counter-support sized to bear against at least the top of a typical closed door or its door frame without passing through the slot therebetween, flexible means connecting the support element to the counter-support and sized to pass through said slot, and suspension means in the



form of a bracket of generally T-shaped configuration having a cross-piece extending generally parallel to the support element in a manner to engage and fully suspend a patient by his feet or by a head sling and having a foot portion solely pivot-



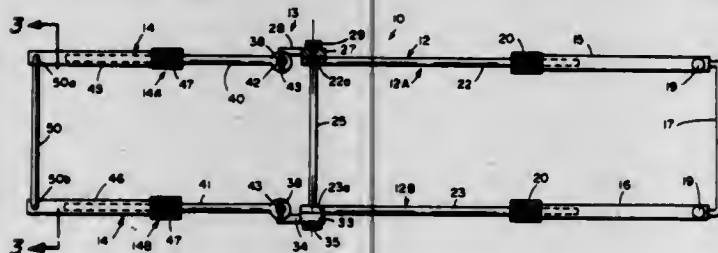
ally attached to said support element so as to afford a range of rotation of said bracket between a position substantially perpendicular to said support element and a downward position substantially parallel to said support element when in use mounted on said door through said slot.

#### 4,419,991 SPLINT

Roger Lee, 9533 Sunnyside Ave., Ben Lomond, Calif. 95005  
Filed Apr. 29, 1982, Ser. No. 372,918  
Int. Cl.<sup>3</sup> A61F 5/04

U.S. Cl. 128—88

7 Claims



1. A splint comprising first and second limb-support sections, and a plurality of transversely spaced articulated joints connecting said sections for pivotal adjustment in directions to move one section from a position of general longitudinal and planar alignment with the other section to a position wherein the plane of one section is inclined relative to the plane of the other section and said one section is slanted away from longitudinal alignment with said other section, said articulated joints comprising a plurality of transversely spaced arms connected for pivotal adjustment at one end to said one section and connected for pivotal movement at the other end to said other section, a pivot axis between each arm and said one section being at right angles to and spaced from a pivot axis between the same arm and said other section.

#### 4,419,992

#### OCCUSAL SPLINTS AND THE METHOD OF MANUFACTURING THE SAME

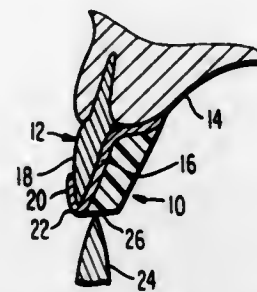
Peter M. Chorbajian, 10004 Carter Rd., Bethesda, Md. 20034  
Filed Feb. 12, 1981, Ser. No. 233,725  
Int. Cl.<sup>3</sup> A61F 5/36

U.S. Cl. 128—136

5 Claims

1. An occlusal splint sized and shaped to be worn on the upper arch of the mouth over the teeth, said occlusal splint being formed of two layers of resin, the upper layer molded to conform to the shape of the upper teeth and to be resiliently retained thereon, and a lower layer formed of a cold-cure resin built up on the upper layer, the lower surface of said lower layer shaped so that when the lower jaw is moved toward the upper arch with the condyls of the wearer in their retruded rest

position the upper surfaces of the lower teeth will engage said lower surface of the splint at the same time and said areas of



engagement of those teeth that are in engagement are all below the plane of the lowermost edges of said upper teeth.

#### 4,419,993

#### ANTI-FOGGING SURGICAL MASK

Neil E. Petersen, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.  
Filed Dec. 10, 1981, Ser. No. 329,603  
Int. Cl.<sup>3</sup> A62B 7/00

U.S. Cl. 128—201.15

14 Claims



1. An anti-fog surgical mask for covering at least the nose, mouth and a portion of the chin of the wearer, comprising:  
(a) a main body portion having an upper edge and a lower edge and comprising a filter portion between said upper edge and said lower edge, said filter portion comprising a filter means extending from about said upper edge to a location at about the chin of the wearer, said filter means divided into an upper region and a lower region, said upper region of said filter means being located at about said upper edge and providing between about 25 and 70 percent of the total area of said filter means, and said lower region of said filter means being adjacent to said upper region of said filter means and providing substantially the remainder of the total area of said filter means;

said filter means being further characterized in that said upper region and said lower region of said filter means are permeable substantially throughout, the average permeability of said upper region of said filter means is at least about 6 cubic feet of air per square foot per minute, and the average permeability of said lower region of said filter means is at least about 22.25 cubic feet of air per square foot per minute and is greater than the average permeability of said upper region of said filter means by at least about 2.25 cubic feet of air per square foot per minute, the permeabilities being measured in accordance with ASTM D 737-75 (Reapproved 1980) using a pressure differential of 0.5 inch of water across said filter means;

(b) means at said upper edge for providing an effective seal between said upper edge of said main body portion and the nose of the wearer; and

(c) means attached to said main body portion for securing said mask over the mouth and the nose of the wearer; said mask being substantially flexible and said upper region being oriented with respect to said lower region such that exhaled air

is directed away from the eyes of the wearer of said mask in order to reduce the possibility of fogging eyeglasses.

trodes with an electrical signal having a frequency band which is sufficient to define a speech pattern thereby establishing an

#### 4,419,994

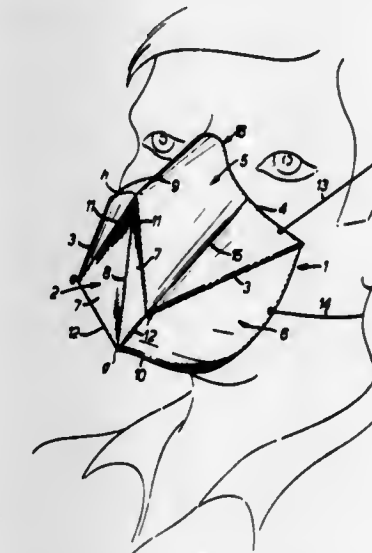
#### RESPIRATORS

Joseph R. Hilton, Guildford, England, assignor to Racal Safety Limited, Middlesex, England  
Continuation-in-part of Ser. No. 134,661, Mar. 27, 1980, abandoned. This application Jun. 22, 1981, Ser. No. 276,163  
Claims priority, application United Kingdom, Jul. 3, 1980, 8021880

Int. Cl.<sup>3</sup> A62B 7/00

U.S. Cl. 128—206.19

13 Claims



1. A generally cup-shaped filtering facepiece formed of flexible filtering material adapted to cover the nose and mouth of a user, said facepiece comprising

(a) convergent generally frusto-conical side wall means having at its larger end a peripheral free edge (4); and

(b) end wall means (2) closing the smaller end of said side wall portion, thereby to define a pocket (1) for receiving the nose and mouth of the user with said peripheral edge extending over the nose and under the chin of the user, said end wall means including

(1) a plurality of end wall panels (7) foldably connected with said side wall means by four first fold lines (11, 12) that are interconnected by four apices (e, f, g, h), respectively, said end wall panels being connected with each other by central fold line means (8) that extend between a pair of opposite apices (g, h), thereby to define between said four interconnected fold lines a quadrilateral region having two triangular panels

(2) said end wall panels being folded inwardly about said four interconnected fold lines to cause said quadrilateral region to extend reversely within said pocket at the closed end of the facepiece; and

(c) means (13, 14) for attaching said facepiece to the wearer's head.

#### 4,419,995

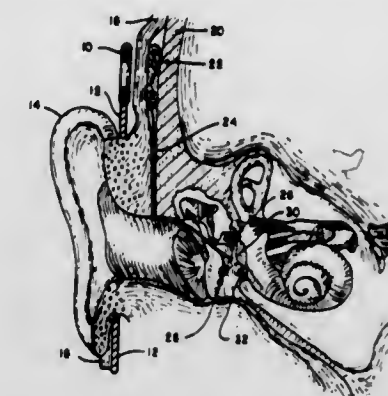
#### SINGLE CHANNEL AUDITORY STIMULATION SYSTEM

Ingeborg J. Hochmair, and Erwin S. Hochmair, both of A-1130 Wien Jaunerstrasse 27, Vienna, Austria  
Filed Sep. 18, 1981, Ser. No. 303,547  
Int. Cl.<sup>3</sup> A61N 1/18

U.S. Cl. 128—419 R

19 Claims

1. A method of chronic auditory stimulation of the cochlea for imparting speech patterns comprising the steps of placing an active electrode and a ground electrode outside of and near the base of a cochlea of a patient, and energizing said elec-



electric field between said active electrode and said ground electrode.

#### 4,419,996

#### CARDIAC PACER APPARATUS

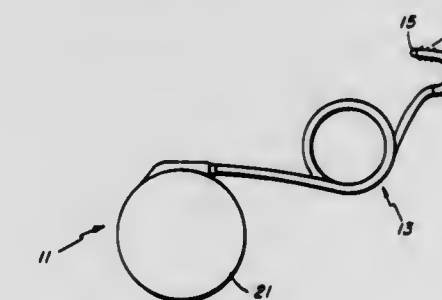
Peter P. Tarjan, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Mar. 12, 1981, Ser. No. 243,135

Int. Cl.<sup>3</sup> A61N 1/36

U.S. Cl. 128—419 PG

12 Claims



1. A system for cardiac treatment comprising:

an implantable pacer including circuit means having alternately a normal standby nontriggered demand pacing mode and a temporary triggered stimulation mode, said pacer being provided with a lead for electrically coupling said circuit means to the heart of a patient within whom the pacer is implanted, said circuit means including means for sensing electrical signals around the heart and means for providing electrical pulses suitable for stimulating the heart, said circuit means being operative in said standby mode to selectively provide inhibited stimulation of a patient's heart and operative in said triggered mode to provide nondelayed stimulation in substantial synchronism with sensed electrical trigger signals, said pacer including magnetically operable switch means for transferring said circuitry between said standby mode and said triggered mode; and

an external controller for selective temporary use in conjunction with said implantable pacer, said controller including means for generating a magnetic field suitable for operating said switch means and including also signal generating circuit means for applying, to a patient, pulsating electrical trigger signals which can be sensed by the implantable pacer circuitry when operating in said triggered mode,

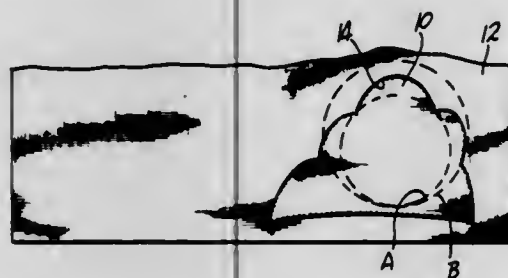
whereby said implantable pacer will normally operate independently in a standby mode but, upon application of said controller, will operate in a triggered mode which can be manipulated externally to treat arrhythmias.



**4,419,997**  
**METHOD OF FABRICATING TWO LAYER CUPS AND BRASSIERE**  
 Raymond Cole, Hillsdale; Raymond Kennedy, Montvale, and Lincoln McCluskey, Montville, all of N.J., assignors to International Playtex, Inc., Stamford, Conn.  
 Division of Ser. No. 280,402, Jul. 6, 1981, Pat. No. 4,375,445.  
 This application Feb. 17, 1983, Ser. No. 467,614  
 Int. Cl.<sup>3</sup> A41C 3/00

U.S. Cl. 128—489

4 Claims



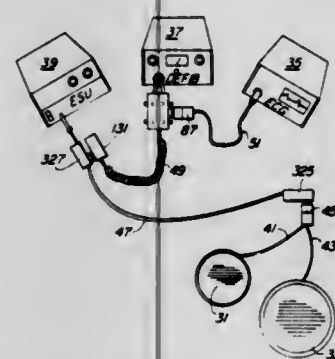
1. In a brassiere having a pair of breast cups, a support frame for each cup, and torso-encompassing portions for each support frame and shoulder straps, the improvement comprising: a first layer of material forming a substantial portion of each of said breast cups, and a portion of said support frame; a second layer of material forming said breast cups, said support frame and said torso-encompassing portion; said first layer being attached to said second layer at the periphery of the first layer; said first and second layers being non-stretchable at the crown of the cups, substantially non-stretchable longitudinally at the remainder of the cup and stretchable multidirectionally at the support frame.

**4,419,998**  
**PHYSIOLOGICAL ELECTRODE SYSTEMS**  
 Roger L. Heath, Evanston, Ill., assignor to R2 Corporation, Skokie, Ill.

Filed Aug. 8, 1980, Ser. No. 176,270  
 Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—639

45 Claims



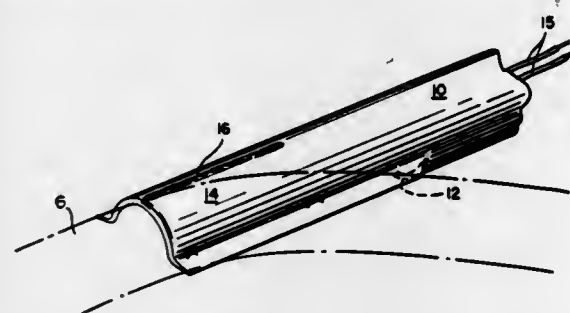
1. A physiological electrode system for use in conveying electrical signals to and from between the human body and certain electrical devices comprising: a first non-invasive electrode element to be attached to the skin of a patient; a second non-invasive electrode element to be attached to the skin of the patient, said first and second electrode elements capable of producing desired operation of each of a monitoring device, a stimulating device and a therapeutic device; interrelating means for selectively separately connecting said electrode elements to a monitoring device, a stimulating device or a therapeutic device to produce desired operation of each such device through said electrode elements, the monitoring device, the stimulating device and the therapeutic device being otherwise separate and

unrelated, said interrelating means providing for the simultaneous connection of said electrode elements to at least two of said devices; and protective means associated with said interrelating means for selectively permitting desired combinations of the monitoring device, the stimulating device and the therapeutic device to be simultaneously connected to the patient solely through said first and second electrode elements.

**4,419,999**  
**METHOD AND APPARATUS FOR MONITORING VASCULAR FLOW**  
 James W. May, Jr., Sandy Pond Rd., Lincoln, Mass. 01773; Frederick N. Lukash, 444 Lakeville Rd., Lake Success, N.Y. 11042, and Kenneth H. Cohn, 94 Francis St., Brookline, Mass. 02146  
 Continuation-in-part of Ser. No. 255,247, Apr. 17, 1981, abandoned. This application Dec. 7, 1981, Ser. No. 327,785  
 Int. Cl.<sup>3</sup> A61B 5/02

U.S. Cl. 128—691

5 Claims



1. In the measurement of blood flow at a selected site in tissue of an animal body by monitoring temperature with sensor means, the improvement comprising the steps of
  - A. providing electrical thermal sensor means having electrical leads extending therefrom,
  - B. providing an implantable housing element configured to conform with a portion of a blood vessel and carrying said sensor means on a surface thereof for disposition contiguous with a vessel adjacent to which said element is implanted,
  - C. surgically implanting said housing element within the animal body next to the wall of a vessel in which said blood flow is to be measured, for implanting said sensor means contiguous with tissue of the body and with said electrical leads extending transcutaneously therefrom,
  - D. monitoring temperature sensed by said implanted housing-carried sensor means by monitoring the electrical signal on said leads, for providing an indication of relative blood flow in said vessel, and
  - E. adapting said housing element with said sensor means for atraumatic removal from said body by transcutaneous withdrawal from said surgically-implanted location by pulling on said electrical leads.

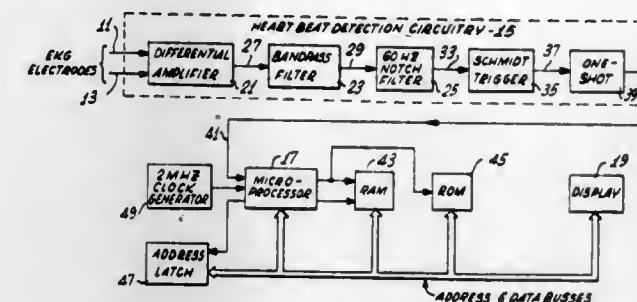
**4,420,000**  
**METHOD AND APPARATUS FOR MEASURING HEARTBEAT RATE**  
 Wilber H. Bailey, Leucadia, Calif., assignor to Camino Laboratories, Inc., San Diego, Calif.  
 Filed Sep. 28, 1981, Ser. No. 306,329  
 Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—706

24 Claims

1. A heart rate monitor comprising: detection means for measuring the time intervals between the successive beats of a heart and for producing a corresponding sequence of timing measurements; averaging means for averaging a prescribed set of the successive timing measurements, to produce a measurement average; and adjusting means for comparing each timing measurement in

the set with the measurement average and adjusting a particular measurement in the set in accordance with the comparisons, thereby producing an adjusted set of timing measurements;



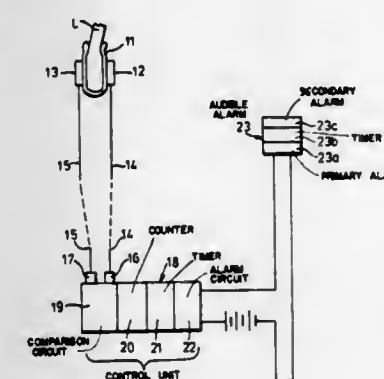
wherein the means for averaging further operates to average the adjusted set of timing measurements, to produce an estimate of heartbeat rate.

**4,420,001**  
**RESPIRATORY MEASURING DEVICES**  
 Keith M. T. Hearne, Flat C, 17, Pearson Ave., Hull, North Humberside, England (HU5 2SX)  
 Filed Jan. 17, 1980, Ser. No. 112,983  
 Claims priority, application United Kingdom, Jan. 19, 1979, 7902117

U.S. Cl. 128—724

Int. Cl.<sup>3</sup> A61B 5/08

7 Claims



1. A respiration rate measuring device for measuring the respiration rate of a person comprising, in combination,
  - (a) a temperature sensitive element intended to locate in a breathing duct or the air flow to and from a breathing duct of the person,
  - (b) means for locating said element in said breathing duct or in said air flow,
  - (c) control means for counting temperature changes sensed by said temperature sensitive element, and
  - (d) alarm means actuated by said control means when the rate of temperature change sensed by said temperature sensitive element rises above a predetermined value characterized in that
  - (e) said alarm means includes means effective on the person to whom the device is fitted, to make the person, when asleep, aware that the alarm means has actuated without being shocked from sleep.

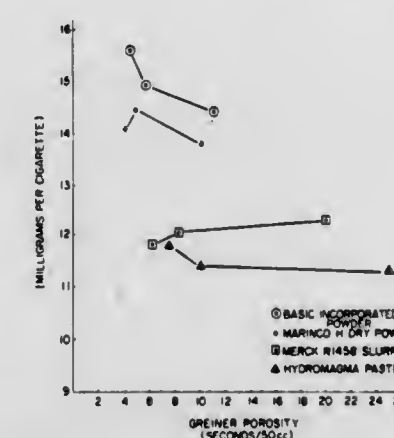
1037 O.G.—21

**4,420,002**  
**WRAPPER FOR SMOKING ARTICLES AND METHOD**  
 Warren K. Cline, Brevard, N.C., assignor to Olin Corp., Pisgah Forest, N.C.

Filed Apr. 7, 1982, Ser. No. 366,313  
 Int. Cl.<sup>3</sup> A24D 1/02, 3/16

U.S. Cl. 131—334

20 Claims

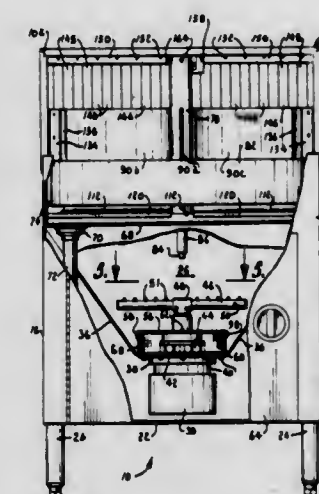


1. A wrapper for smoking articles such as cigarettes, cigars and the like comprising a cellulosic sheet containing a filler of fine grain magnesium hydroxide having an average particle size less than 10 micrometers and unreactive magnesium oxide.

**4,420,003**  
**GLASS WASHING MACHINE**  
 Quarterman Lee, Kansas City; Larry E. Watson, Parkville, and Glenn E. Montgomery, Lee's Summit, all of Mo., assignors to T.C.A., Inc., Richmond, Va.  
 Continuation-in-part of Ser. No. 148,739, May 12, 1980, abandoned. This application May 4, 1981, Ser. No. 259,970  
 Int. Cl.<sup>3</sup> B08B 3/02, 9/08

U.S. Cl. 134—80

23 Claims



1. Glassware washing apparatus comprising:
  - a housing presenting a loading zone for receiving dirty glassware, a washing zone for washing and rinsing the glassware, and an unloading zone for removal of clean glassware;
  - a rack mounted in said housing for rotation about a generally vertical axis, said rack being adapted to receive and support glassware thereon;
  - three partitions carried on said rack for rotation therewith and dividing said rack into three separate adjacent compartments, each of said compartments being successively positioned in the loading zone, the washing zone and the unloading zone upon rotational indexing of said rack;
  - means for washing the glassware disposed on said rack in the compartment positioned in said washing zone while said rack is stationary;
  - means operable subsequent to said washing means for rinsing



the glassware disposed on said rack in the compartment positioned in said washing zone while said rack is stationary; and  
an opening in said housing providing simultaneous access to both said loading and unloading zones for loading of dirty glassware into the loading zone and unloading of clean glassware from the unloading zone, thereby permitting each batch of dirty glassware to be loaded onto said rack in the loading zone, washed and rinsed in said washing zone following one rotational indexing of the rack, and unloaded from the rack in the unloading zone following another rotational indexing of the rack.

4,420,004

# APPARATUS FOR USE IN CLEANING OF SILK SCREEN PRINTING FRAMES

Sverre Jensen, Bruveien 9, Stavanger, Norway (N-4000)

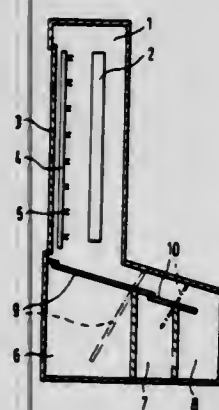
Filed Nov. 19, 1981, Ser. No. 322,976

Claims priority, application Norway, Nov. 27, 1980, 803583

Int. Cl.<sup>3</sup> B08B 3/02

U.S. Cl. 134—96

3 Claims



1. A silk screen printing frame cleaning apparatus comprising:

- a closeable chamber in which a silk screen printing frame is adapted to be held;
- a plurality of liquid applying means mounted in said chamber and movable with respect to said frame;
- a plurality of means for containing liquids to be applied by said liquid applying means to the frame;
- means for conveying the liquids from one of said containing means to an associated one of said plurality of applying means;
- means for returning applied liquid to the containing means from which said applied liquid was conveyed;
- said plurality of liquid containing means being disposed below said chamber and formed by walls of said apparatus in cooperation with a series of partitions of decreasing height, each of said liquid containing means having a substantially planar lid having an upper and lower end, each of said lids being pivotally attached intermediate said upper and lower ends and adjacent to an upper edge of one of said partitions, the lower end of each of said lids overlapping an adjacent lid, said closed lids forming a downwardly sloping surface whereby the liquids flow down said sloping surface and into a containing means whose associated lid is open.

4,420,005

# WATER POWERED DISHWASHER

Daniel Armstrong, 1842 Harbor Pl., Naples, Fla. 33942

Filed Nov. 1, 1982, Ser. No. 438,011

Int. Cl.<sup>3</sup> B08B 3/02

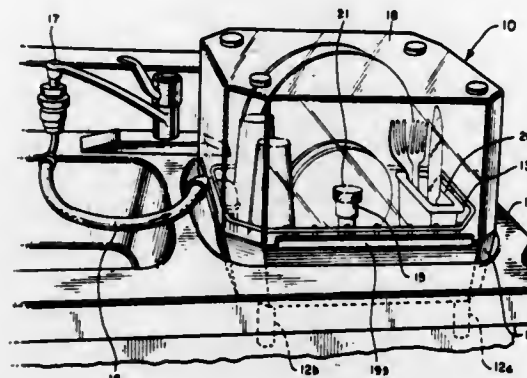
U.S. Cl. 134—100

6 Claims

- 1. A water powered dishwasher comprising
- a four-sided base;
- a four-sided dishrack lying within said base and removably supported by the upper rim of said base;

a water and liquid detergent mixing chamber located at the center of said dishwasher and mounted on said dishrack; a rigid pipe mounted on said dishrack, one end of said pipe being connected to a flexible hose leading to a water faucet and the other end of said pipe being connected to said mixing chamber;

a dispenser for storing and dispensing a quantity of liquid



detergent lying axially above and communicating with said mixing chamber;

- a rotatable spray arm mounted beneath said dishrack, said arm including a T-shaped central hub connected to and lying axially beneath said mixing chamber and a plurality of tubular arm segments extending from said hub; and
- a clear plastic dome-shaped cover whose lower edge rests upon flanges extending from the upper rim of said base.

4,420,006

# SPRAY CLEANING SYSTEM FOR FRYING APPARATUS

L. Frank Moore, and George M. Price, both of Shreveport, La.,

assignors to The Frymaster Corporation, Shreveport, La.

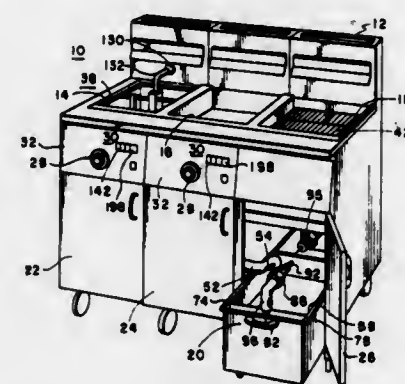
Division of Ser. No. 753,936, Dec. 23, 1976. This application

Oct. 20, 1978, Ser. No. 953,079

Int. Cl.<sup>3</sup> B08B 3/02, 9/08

U.S. Cl. 134—167 R

3 Claims



1. In a fry pot of the type having an interior side surface formed by the union of first, second, and third planar surfaces, the first planar surface having an edge which cooperates with the remaining interior side surfaces to define the mouth of the fry pot, the second planar surface projecting laterally from the first planar surface into the fry pot thereby defining a ledge, and the third planar surface being disposed intermediate the ledge and the floor of the fry pot, and wherein a fluid coupling member having a discharge port is mounted through the third planar surface beneath the ledge, the combination with the fry pot of a removable shower apparatus for insertion into the fry pot to discharge jets of cooking oil along the interior side surfaces, the shower apparatus comprising:

- a continuous tubular member having an inlet port for receiving a flow of cooking oil and having tubular side sections which are laterally displaced with respect to each other in conformance with the lateral displacement of the interior side surfaces of the fry pot, the tubular side sections being

substantially coextensive with the lateral peripheral dimensions of the corresponding fry pot interior side surfaces for permitting nesting engagement of the shower apparatus with the fry pot, each tubular side section having at least one outlet port for discharging a jet of cooking oil into the adjacent interior side surface of the fry pot;

a transverse tubular section interconnecting a pair of the tubular side sections in fluid communication; and,

a coupling member connected in fluid communication with the transverse tubular section, the coupling member including a rigid body portion and a conduit formed therein, the conduit including an inlet port formed at one end of the coupling member and a laterally projecting flange portion disposed intermediate the inlet port and the transverse tubular member, the inlet port and flange portion being arranged to permit registration of the fluid coupling member with the inlet port concurrently with engagement of the flange portion with the ledge as the shower apparatus inserted into the frypot.

4,420,007

# COMPONENT FRAMEWORK STRUCTURE FOR THE FRAME OF A FOLDABLE UMBRELLA

Tsun Z. Wu, No. 15, Lan 52, Ho-Ping West Rd., Section 3, Taipei, Taiwan

Filed Jan. 11, 1982, Ser. No. 338,267

Int. Cl.<sup>3</sup> A45B 19/00

U.S. Cl. 135—25 R

8 Claims



1. A component framework structure for the frame of a foldable umbrella comprising:

- an upper notch member;
  - an auxiliary stretcher made of at least one piece of flat plate material having a bend therein so that an upper portion of said auxiliary stretcher extends in a different plane from a lower portion thereof, said auxiliary stretcher being pivotally connected at a top end thereof to said notch member;
  - a tension rib pivotally connected at one end thereof to said auxiliary stretcher adjacent said bend;
  - a main rib pivotally connected at one end thereof to an opposite end of said tension rib; and
  - a main stretcher pivotally connected at a top end thereof to said main rib at a point on said main rib spaced from its ends, said main stretcher pivotally connected at an intermediate location thereon to a lower end of said auxiliary stretcher;
- the pivotal connection between said main stretcher and main rib, and between said main rib and said tension rib forming a head joint which, with said umbrella folded, lies next to said auxiliary stretcher upper portion.

4,420,008

# METHOD FOR TRANSPORTING VISCOUS CRUDE OILS

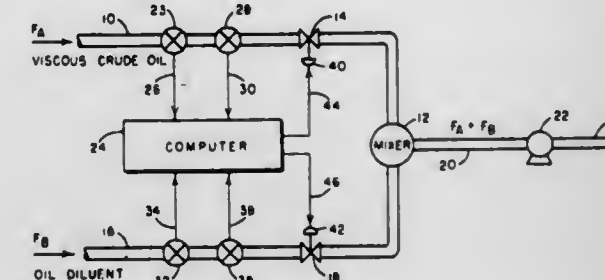
Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 29, 1982, Ser. No. 344,095

Int. Cl.<sup>3</sup> F17D 1/16, 1/17

U.S. Cl. 137—4

6 Claims



1. A method for transporting viscous crude oil in a pipeline, comprising:

- (a) providing a stream of viscous crude oil in a first conduit;
- (b) providing a stream of oil diluent having a relatively low viscosity in a second conduit;
- (c) mixing the stream of viscous crude oil with the stream of oil diluent to form a mixture thereof;
- (d) pumping said mixture through said pipeline at a desired viscosity and at a desired flow rate equal to the sum of the flow rate of the viscous crude oil and the oil diluent;
- (e) constantly measuring the viscosity and specific gravity of said viscous crude oil in said first conduit and producing signals representative of the viscosity and specific gravity of the viscous crude oil in said first conduit;
- (f) constantly measuring the viscosity and specific gravity of said oil diluent in said second conduit and producing signals representative of the viscosity and specific gravity of the oil diluent in said second conduit;
- (g) constantly providing a digital computer with said signals including signals representative of the desired viscosity of the mixture in the pipeline and the desired flow rate of the mixture in the pipeline;
- (h) constantly calculating in the computer, the flow rate of the viscous crude oil in said first conduit and the flow rate of the oil diluent in said second conduit in accordance with

$$\mu = \mu_A X_A + \mu_B X_B \quad (1)$$

$$X_A = \frac{\alpha V_A}{\alpha V_A + V_B} \quad (2)$$

$$X_B = 1 - X_A \quad (3)$$

$$\alpha = \frac{17.04 \Delta \rho^{0.5237} \rho_A^{3.2745} \rho_B^{1.6316}}{\ln \left( \frac{\mu_A}{\mu_B} \right)} \quad (4)$$

$$\Delta \rho = \rho_A - \rho_B \quad (5)$$

$$\frac{F_A}{F_B} = \frac{V_A}{V_B} \quad (6)$$

$$F = F_A + F_B \quad (7)$$

where

$\mu$  is the viscosity of the mixture,  
 $\mu_A$  is the viscosity of the viscous crude oil,  
 $\mu_B$  is the viscosity of the oil diluent,  
 $V_A$  is the volume fraction of viscous crude oil,  
 $V_B$  is the volume fraction of oil diluent,  
 $\rho_A$  is the specific gravity of the viscous crude oil,



$\rho_B$  is the specific gravity of the oil diluent,  
 $F_A$  is the flow rate of the viscous crude oil,  
 $F_B$  is the flow rate of the oil diluent, and  $F$  is the flow rate of the mixture;

- (i) constantly controlling the flow rate of the viscous crude oil in the first conduit to correspond to the resultant calculated flow rate determined by the computer during step (h); and
- (j) constantly controlling the flow rate of the oil diluent in the second conduit to correspond to the resultant calculated flow rate determined by the computer during step (h).

4,420,009

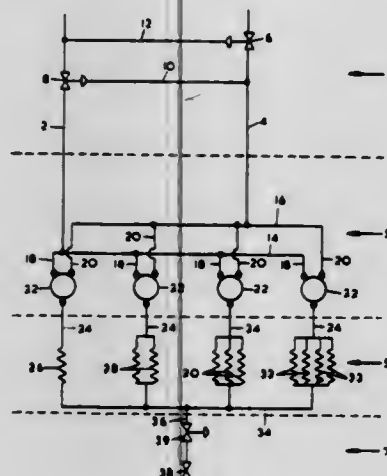
## APPARATUS FOR MIXING FLUIDS

Derek J. Sharp, and Robert C. Watts, both of Sutton, England, assignors to BOC Limited, London, England  
 Continuation of Ser. No. 137,099, Apr. 4, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,934  
 Claims priority, application United Kingdom, Apr. 6, 1979, 7912269

Int. Cl.<sup>3</sup> G05D 11/03; F15D 1/00

U.S. Cl. 137—98

12 Claims



7. Fluid mixing apparatus according to claim 5, in which the elongate flow restrictors are capillary tubes.

4,420,010

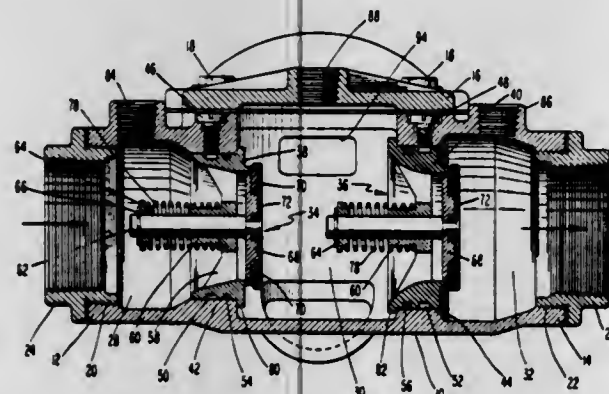
## IN-LINE BACK FLOW PREVENTER

Bernard B. Becker, Belmont; John K. Bowman, Brighton, and Cyril A. Randall, Belmont, all of Mass., assignors to Amtrol Inc., West Warwick, R.I.  
 Continuation of Ser. No. 890,964, Mar. 28, 1978, Pat. No. 4,232,704. This application Mar. 7, 1980, Ser. No. 128,240  
 The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> E03B 7/07

U.S. Cl. 137—116

2 Claims



1. Device for preventing the back flow of water from a point of use into a water supply line comprising a unitary casing

having an inlet, a central chamber, an outlet, a removal port and a drain vent opening, said inlet, said central chamber and said outlet being coaxially aligned, a relief valve in fluid communication with said central chamber and offset from said coaxial alignment of said inlet, said central chamber and said outlet, said removal port being located in the casing in direct communication with the central chamber, a cover for said removal port, a pair of check valves, one of said check valves being mounted between said inlet and said central chamber, the other of said check valves being mounted between said outlet and said central chamber, and said pair of check valves being coaxially aligned with said inlet, said central chamber and said outlet, whereby water passes essentially in a straight-through flow path through said device, and the back flow of water is prevented, means for removal of said pair of coaxially aligned check valves from said casing without removing said relief valve, and a flexible diaphragm formed integrally with a gasket located between said casing and said removable cover attached thereto, said gasket having an opening therethrough which allows removal of said check valves without disturbing said gasket or said flexible diaphragm, said relief valve being actuated by a pressure differential across said flexible diaphragm, one side of said diaphragm communicating with said central chamber and the drain vent opening and the other side of said diaphragm communicating with said inlet.

4,420,011

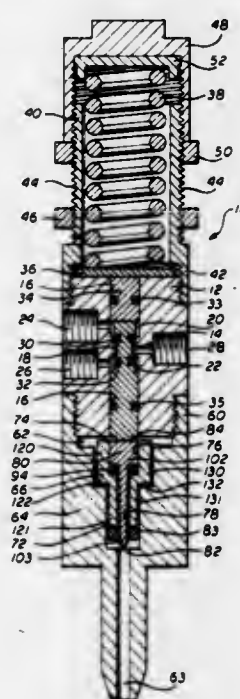
## DUAL PISTON SENSING MECHANISM

Harry Roger, 124 Banks Ave., Lafayette, La. 70506  
 Filed Dec. 8, 1981, Ser. No. 328,606

Int. Cl.<sup>3</sup> F16K 31/122

U.S. Cl. 137—269

2 Claims



1. A pilot valve comprising:
  - (a) a valve body, having:
    - (1) an elongated bore therein,
    - (2) a first fluid inlet port communicating with said bore,
    - (3) a second fluid inlet port communicating with said bore,
    - (4) an outlet port communicating with said bore, and
    - (5) a sensing port communicating with said bore;
  - (b) a valve element slidably engaged within said bore for regulating the flow of fluid through said pilot valve, said valve element being shiftable between
    - (1) a first position permitting communication between said first inlet port and said outlet port and precluding communication between said second inlet port and said outlet port; and
    - (2) a second position permitting communication between said second inlet port and said outlet port and precluding

communication between said first inlet port and said outlet port;

- (c) means for urging said valve element into its first position, the improvement comprising:

a piston means slidable within a piston chamber for shifting said valve element from its first position to its second position, said piston means being exposed to said sensing port so that sufficient fluid pressure applied to said sensing port will cause said piston means to engage said valve element to shift said element from its first position to its second position, against the action of said urging means, said piston means comprising:

- (a) a first piston slidable within said piston chamber, said first piston having a first and second sections, said first section being of larger diameter and concentrically aligned with said second section, and having a concentric bore therethrough, said concentric bore being of first and second sections, said sections being aligned with the first and second sections of said first piston, said first section of said concentric bore being of larger diameter than the second section of the concentric bore, and

- (b) a second piston slidably mounted within said first piston, said second piston having first and second sections, said first section of said second piston being of larger diameter than said second section and slidably in contact with the first section of said concentric bore of said first piston, the length said first section of said second piston being less than that of said first section of said concentric bore, and said second section of said second piston being slidably in contact with the second section of said concentric bore;

- (c) seal means annularly mounted around said second section of said second piston and having an outer diameter substantially the same as that of the second section of said first piston so as to hermetically seal said sensing port from the elongated bore, said seal means being capable of sliding movement within said piston chamber in response to the fluctuating fluid pressure within said sensing port and in response to movement by said first piston.

- (d) spacer means for positioning said second piston within said first piston, said spacer means being placed at the juncture of the first and second sections of said second piston, said spacer being of substantially the same thickness as the difference in lengths between the first section of said second piston and the first section of the concentric bore of said first piston, wherein said piston means defines first and second operating modes,

- (a) said first operating mode wherein said spacer is positioned between said first and second piston means so as to mount said second piston flush with the ends of said first piston whereby the effective surface area of the piston means is equal to that area defined by the diameter of said seal means,

- (b) said second operating mode wherein said spacer is removed from between said first and second pistons whereby the larger surface area of said first piston and said seal means will enable the fluctuating fluid pressure within said sensing port will induce said first piston and seal means into contact with said valve body at a relatively low level of pressure with respect to that level of pressure required to move said second piston upward into contact with said valve element in opposition to said means for urging said valve element into its first position and wherein the effective surface area of said piston means is reduced to that of the second end of said second piston,

the presence or absence of said spacer means determines the range within in which said piston means is enabled to shift said valve element from said first position to said second position.

4,420,012

## DEVICE FOR USE IN CONNECTION WITH TAPPING OFF FLUID FROM OR FILLING FLUID INTO A CONTAINER

Erik J. H. Aström, Tyresö, Sweden, assignor to Tekno-Detaljer Sture Carlsson AB, Vällingby, Sweden

PCT No. PCT/SE80/00054, § 371 Date Nov. 2, 1980, § 102(e)

Date Oct. 31, 1980, PCT Pub. No. WO80/01796, PCT Pub.

Date Sep. 4, 1980

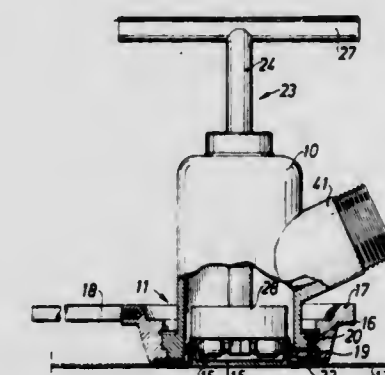
PCT Filed Feb. 28, 1980, Ser. No. 201,409

Claims priority, application Sweden, Mar. 2, 1979, 7901893

Int. Cl.<sup>3</sup> F16L 55/10

U.S. Cl. 137—319

5 Claims



1. A device for use in connection with tapping off fluid from or filling fluid into a container through an internally threaded tapping or filling hole provided in a wall of the container and adapted to be closed by means of an externally threaded generally cup-shaped plug having an outwardly open cavity in which an implement may be inserted for rotating the plug, said device comprising a bell-like housing which is adapted to be removably mounted with an open end thereof over said tapping or filling hole and which is provided with an opening through which fluid may be fed into or discharged from the housing, and a tool for manually operating the plug from a position outside the housing, said tool comprising a shaft which extends slidably and rotatably through a portion of the housing opposite to the open end of the housing, handle means provided at an outer end of said shaft, and plug holding means provided at an inner end of said shaft, said plug holding means comprising expansion means insertable into said cavity in the plug, a carrier for said expansion means, said carrier being mounted on the tool shaft, and actuating means for the expansion means, said actuating means being operative to expand the expansion means into frictional contact under pressure with the side wall of the cavity in the plug, characterized in that the carrier (28) for the expansion means (33) is mounted for limited movement on an inner end portion of the tool shaft (24), while the actuating means (39) for the expansion means (33) are rigidly connected to the tool shaft (24).

4,420,013

## REGULATOR GUARD

Alfonzo W. DiBlasio, Schenectady, N.Y., assignor to Cedious, Incorporated, Schenectady, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,663

Int. Cl.<sup>3</sup> B65D 25/00

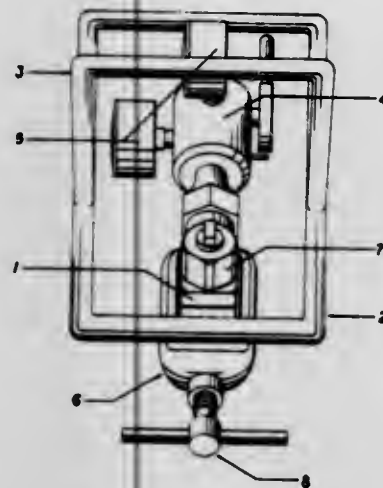
U.S. Cl. 137—382

4 Claims

1. A regulator guard for protecting a regulator and gauge assembly joined to a valve head of a gas cylinder, comprising: a mounting block member with front and rear surfaces having a conical protrusion on said front surface and a corresponding conical depression on said rear surface; said valve head having a surface with a conical depression therein abuttingly mating with said front surface of said mounting block member such that said conical depression on the valve head mating surface engages said conical protrusion on the mounting block member front surface;



means joined to said mounting block member forming a protective structure for said regulator and gauge assembly; a yoke securing said regulator and gauge assembly to said valve head, said yoke horizontally circumscribing said valve head and mounting block member abuttingly mated



therewith and tightenable thereagainst by an adjustable screw having a conical front end engaging said conical depression on said rear surface of said mounting block member, whereby said protective structure-forming means are securely positioned to protect said regulator and gauge assembly from impact damage.

4,420,014

## PRESSURE REGULATOR FOR A FLUID MOTOR

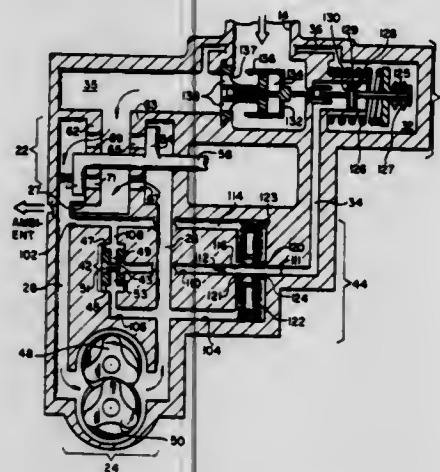
Robert R. Riggs, South Bend, and Paulmer D. Hunt, Mishawaka, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 142,205, Apr. 21, 1980, Pat. No. 4,352,299, which is a division of Ser. No. 952,029, Oct. 16, 1978, Pat. No. 4,249,453. This application Jun. 22, 1981, Ser. No. 276,142

Int. Cl.<sup>3</sup> G05D 7/01

U.S. Cl. 137-468

2 Claims



1. A pressure regulator comprising:  
a housing having a first chamber separated from a second chamber, said first chamber having an entrance port and an exhaust port, said entrance port being connected to a source of fluid under pressure, said exhaust port being connected to a supply conduit, said second chamber having a first port connected to said supply conduit for receiving a supply pressure signal and a second port connected to receive a variable reference pressure signal, said supply conduit having first and second branches connected to a mechanism, said variable reference pressure signal being a function of the pressure of the fluid supplied to said mechanism, said fluid communication to said first and second branches being controlled by an operator to operate said mechanism in opposite directions;  
wall means located in said second chamber for separating

said first port from said second port, said supply pressure signal and said variable reference pressure signal creating a pressure differential to move said wall;  
resilient means connected to said wall for opposing movement by said pressure differential;  
valve means connected to said wall for changing the flow characteristics from said first chamber into said supply conduit as a function of the movement of said wall means;  
temperature compensator means connected to said wall means for modifying the force of said resilient means to assure that the pressure differential required to move said wall means is substantially unaffected by changes in temperature; and  
pressure relief means connected to said second port to limit the variable reference pressure signal and thereby prevent the delivery of a predetermined fluid flow into said supply conduit that could damage said mechanism.

4,420,015

## INSTALLATION OF AN EXCESS PRESSURE VALVE IN A HERMETICALLY SEALED FLEXIBLE CONTAINER

Hans U. Blaser, Flurlingen, Switzerland, assignor to SIG-Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

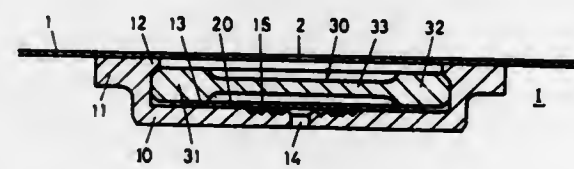
Filed Dec. 30, 1981, Ser. No. 335,770

Claims priority, application Switzerland, Jan. 7, 1981, 70/81

Int. Cl.<sup>3</sup> F16K 15/16

U.S. Cl. 137-852

11 Claims



1. In a safety valve for a hermetically sealed container, which valve includes a carrier plate having a lateral edge flange for fastening the carrier plate to the container and presenting a shallow recess having a base provided with an opening, a flexible diaphragm inserted in the recess and covering the opening, and a viscous sealing agent interposed between the base of the recess and the diaphragm, the improvement comprising a clamping member disposed in said recess and provided with pressing jaws positioned to clamp an edge region of said diaphragm against said base of said recess and a bar connecting said pressing jaws to form a unit therewith and having a lesser thickness than said pressing jaws.

4,420,016

## KINK-PREVENTING SPINE FOR AQUARIUM AIR HOSES

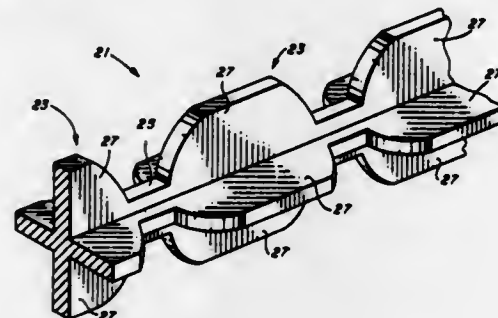
Ralph A. Nichols, Box 289, Lee Vining, Calif. 93541

Filed Jan. 7, 1982, Ser. No. 337,579

Int. Cl.<sup>3</sup> F16L 11/12

U.S. Cl. 138-103

9 Claims



1. A device for preventing kinks in air hoses for aquariums comprising:

a plurality of rib members each having a plurality of radially disposed ribs;  
means extending between adjacent ribs for attaching the center of each of said rib members to the center of an adjacent one of said rib members, said means for attaching being substantially flexible under bending stresses; and  
wherein  
said rib members and said attaching means are integrally formed from a flexible extruded plastic material.

4,420,017

## ENERGY CONDUIT SUPPORT

Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

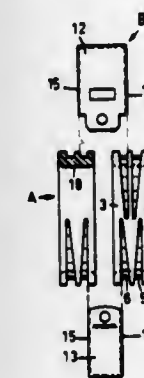
Filed May 4, 1981, Ser. No. 260,666

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040076

Int. Cl.<sup>3</sup> F16L 11/18

U.S. Cl. 138-120

13 Claims



1. In an energy conduit support between a movable consumer and a stationary connection comprising narrow tubular members with outwardly directed outer abutment stops and wide tubular members with inwardly directed abutment stops which engage behind each other, respectively, said members can be bent at an angle only in one direction with respect to one another, said members having top and bottom central regions and two arms therebetween, the narrow tubular members respectively having in a transverse central plane thereof a central outwardly directed abutment stop ring defining grooves, respectively, on both sides thereof towards the outer abutment stops and adapted for engagement of the inwardly directed abutment stops on the wide tubular members, the wide tubular members each being shortened in a longitudinal direction of the support on both sides, respectively, in the vicinity of a longitudinal cross-sectional half of the support by approximately the width of one of the grooves, respectively, and comprising two tubular member halves which can be placed over the narrow tubular members, said two tubular member halves constituting a wide tubular member half substantially above an axial neutral axis of the conduit support and a narrow tubular member half substantially below the neutral axis, the improvement wherein

the central outwardly directed abutment stop ring of each of the narrow tubular members has:  
parallel flanks in a vicinity of the wide tubular member halves, and  
diverging flanks which extend apart in a direction towards the neutral axis on both arms in the vicinity of the narrow tubular member halves,  
the outer abutment stops of each of the narrow tubular members have facing:  
converging flanks on both arms in the vicinity of the wide tubular member halves, said converging flanks taper towards the central outwardly directed abutment stop ring in a direction towards the neutral axis, and parallel flanks in the vicinity of the narrow tubular member halves.

4,420,018

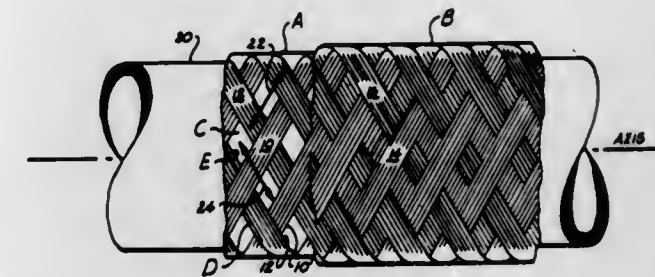
## POLYPHASE BRAID REINFORCED HOSE

Thomas C. Brown, Jr., 492 Hodges Dr., Orangeburg, S.C. 29115  
Filed Apr. 28, 1982, Ser. No. 372,612

Int. Cl.<sup>3</sup> F16L 11/00

U.S. Cl. 138-124

7 Claims



1. A tubular braid reinforced hose comprising:  
a tubular member;  
a plurality of courses of braided reinforcing wires covering said tubular member;  
each said course comprising at least two groups of reinforcing wires braided with one another;  
a first of said groups of wires having a helically wrapped orientation in a generally clockwise direction;  
a second of said groups of wires having an opposite helically wrapped orientation in a generally counter-clockwise direction;  
each said group including a plurality of reinforcing wires oriented generally side-by-side defining a generally single layered band having a width defined by outermost edge wires;  
adjacent windings of each of said groups of wires being spaced apart from one another defining crimp reducing braid spaces through which windings of the helically opposite group of wires cross to interlace over and under said adjacent windings of the other of said group of wires in a first braided structure;  
a first underlying course next adjacent said tubular member having first and second groups of wires covering no more than substantially one-half of the available strand space of said tubular member so that adjacent windings define crimp reducing braid spaces having a sufficient width to enable said windings of crossing over groups of wires to undergo less bending when interlaced with said spaced apart adjacent windings and thereby reduce the crimp of edge wires of said adjacent windings crossed thereover;  
said first and second groups of wires of said first underlying course interlaced over and under each other in braided structure defining distinct open unoccupied spaces between adjacent windings of said groups of wires, in which portions of the surface of said tube are substantially exposed;  
a number of overlying braided courses of said first and second groups of wires braided with one another in phase shifted relationship with respect to a next adjacent underlying course so that the wires of said overlying courses substantially occupy the open unoccupied spaces of said first underlying course so that the available wire space on said tubular member is substantially covered by said wires with reduced crimping of said edge wires at points of interlaced windings of said groups;  
said overlying course of groups of wires being applied at a point of lay downstream of corresponding edge wires of said next adjacent underlying course in said phase shifted relationship generally within said space; and  
said overlying course being braided with sufficient tension to enable wire windings of said groups of wires of said overlying courses to fit and interlock in said open unoccupied spaces of said next underlying course providing integral multi-course braided reinforcing fabric structure.



**4,420,019**  
**FLEXIBLE, NON-KINKABLE HOSE AND METHOD FOR MAKING THE SAME**

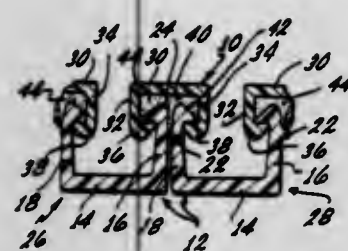
Joseph C. Dillon, 12317 Rochedale La., Los Angeles, Calif. 90049

Filed Apr. 5, 1982, Ser. No. 365,361

Int. Cl.<sup>3</sup> F16L 11/11

U.S. Cl. 138—129

14 Claims U.S. Cl. 140—147



**1. A flexible hose comprising:**

an elongated flexible channel member having a generally U-shaped cross section comprised of first and second walls integrally formed with a base, each of said first and second walls having an end distal from said base, said first wall including a rib projecting outwardly therefrom proximate to said end of said first wall and running the length of said first wall generally parallel to said base, said channel member being wound in a substantially helical configuration with said first and second walls being adjacent to one another in adjacent wraps, said rib being in contact with said second wall of an adjacently wound wrap at a location proximate to said end of said second wall; and an elongated cap member having a generally U-shaped cross section forming an inverted generally U-shaped cavity, said cap member being wound with said channel member, said ends of said first and second walls of said adjacent wraps being received in said inverted generally U-shaped cavity, said cap member and said ends of said first and second walls of said adjacent wraps being bound together in said U-shaped cavity by an initially flowable binding material, whereby said first and second walls of said adjacent wraps are separable and flexible below said rib.

**11. A flexible hose comprising:**

an elongated flexible channel member having a generally U-shaped cross section comprised of first and second walls integrally formed with a base, said channel member being substantially helically wound with a first wall of a first wrap of said channel member being adjacent to a second wall of an adjacent wrap of said channel member, said first and second walls extending radially outwardly from said base; and

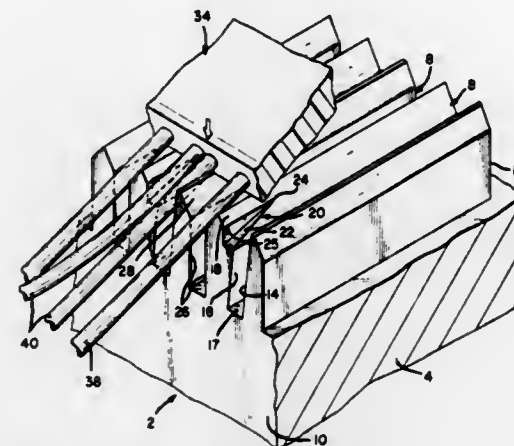
an elongated cap member having a generally U-shaped cross section forming an inverted generally U-shaped cavity, said cap member being wound around said channel member, the radially outermost portions of said first and second walls of adjacent wraps being received in said inverted generally U-shaped cavity, said cap member and said radially outermost portions being bound together into a solid body by an initially flowable solidified in situ binding material, adjacent surfaces of said first and second walls of adjacent wraps being free of said binding material radially inwardly from said cap and said radially outermost portion, said first and second walls radially inwardly from said radially outermost portion and said cap being separable and flexible without significant flexing of said cap member.

**4,420,020**  
**WIRE COMBING DEVICE**

James E. McGeary, and Walter C. Shatto, Jr., both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa. Continuation of Ser. No. 157,780, Jun. 9, 1980, abandoned. This application May 7, 1982, Ser. No. 376,071

Int. Cl.<sup>3</sup> B21F 1/02

12 Claims



**1. A combining device for transposing a pair of axially adjacent conductors into a modified axial relationship, comprising:** support block means having at least one profiled channel extending downwardly into a top surface thereof, said channel being defined by parallel sidewalls spaced apart to closely admit the diameter of one of said conductors, and said channel extending from a forward conductor receiving end of said support block means to a rearward conductor-nesting end;

one of said sidewalls having an upper longitudinal surface adapted to flare outwardly to said block means top surface;

said upper flared sidewall surface having a tapered profiled cut therein defined by a side and a bottom surface, said tapered cut extending from said forward conductor receiving end toward said rearward conductor nesting end with said profiled cut bottom surface extending into said upper sidewall portion a decreasing depth therealong.

**4,420,021**  
**METHOD AND APPARATUS FOR FILLING OF FLEXIBLE CONTAINERS**

Olaf Strand; Bjarne Omdal, both of Porsgrunn, and Jens Svendsen, Hosle, all of Norway, assignors to Norsk Hydro A/S, Oslo, Norway

Filed Oct. 5, 1981, Ser. No. 308,854

Claims priority, application Norway, Dec. 16, 1980, 803784

Int. Cl.<sup>3</sup> B65B 1/06

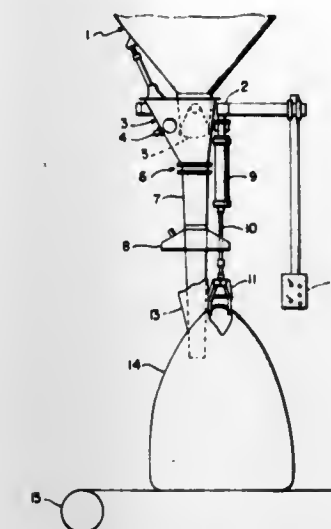
U.S. Cl. 141—10

9 Claims

**1. A method of filling bulk material into an inner bag of a flexible container of the type having plural lifting loops, said method comprising:**

hanging a first said lifting loop on a hook;  
 inserting a bulk material filling pipe into an opening in an upper portion of said inner bag;  
 hanging a second said lifting loop on said hook;  
 raising said hook to a filling position, and filling said inner bag with air, thereby causing said lifting loops to press said upper portion of said inner bag tightly against said filling pipe;  
 filling bulk material through said filling pipe into said inner bag, while supporting substantially the entire weight of the thus filled flexible container by said hook;  
 joining said first and second lifting loops together;

lowering said hook until said filled flexible container is not supported by said hook;



removing said hook from said joined lifting loops; and closing said opening in said inner bag.

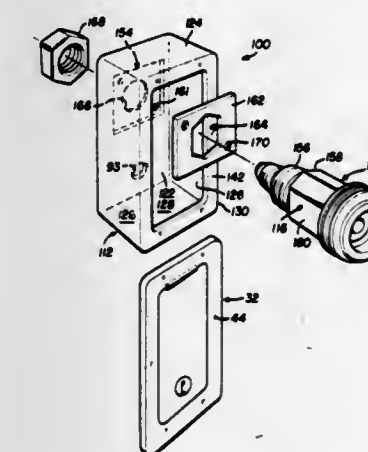
**4,420,022**  
**LIQUEFIED GAS FILLING DEVICE**  
 George H. Landry, 4669 Pardee, Dearborn Heights, Mich. 48125

Filed Apr. 6, 1981, Ser. No. 251,327

Int. Cl.<sup>3</sup> B65B 3/04

U.S. Cl. 141—18

2 Claims



**1. A filling device for a liquefied gas container comprising:** a box-shaped housing mountable on the exterior wall of a support structure, said housing having an interior wall and a receptacle located in said housing for receiving liquefied gas;

said receptacle having a unitary body including an inlet end and an outlet end, said inlet end of said receptacle having means for quick attach-detach coupling with a source of liquefied gas, said outlet end received through an aperture in said housing interior wall, and said outlet end connected to said liquefied gas container;

said receptacle having an inlet passage extending through said inlet end, an outlet passage extending through said outlet end, and an intermediate chamber located between said inlet and outlet passages, a check valve located in said intermediate chamber including a spring-biased poppet, and said poppet permitting one-way flow of liquefied gas from said inlet passage through said intermediate chamber to said outlet passage;

said receptacle outlet end including a threaded end portion which is connectable with said liquefied gas container, an enlarged threaded intermediate portion spaced from said threaded end portion, and a pair of flat surfaces on opposed sides of said threaded intermediate portion; said housing interior wall aperture and said receptacle inter-

mediate portion providing anti-rotation means for preventing rotation of said receptacle relative to said housing, said housing interior wall aperture including a pair of arcuate ends and a pair of opposed elongated parallel sides interconnecting said arcuate ends, said arcuate ends slidably clearing said receptacle threaded intermediate portion and said opposed parallel sides slidably engaging said receptacle intermediate flat surfaces, and means engaging said enlarged threaded intermediate portion for securing said receptacle against said housing interior wall with said receptacle intermediate flat surfaces engaging said wall aperture parallel sides thereby preventing rotation of said receptacle relative to said housing interior wall; and said anti-rotation means preventing loosening of the connection between said liquefied gas container and said threaded receptacle outlet end portion during the coupling or uncoupling between said receptacle inlet end and said source of liquefied gas.

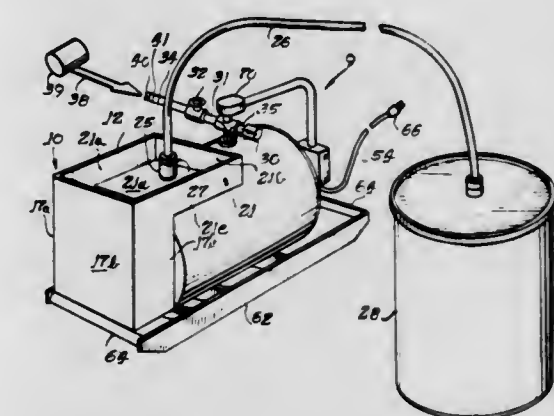
**4,420,023**  
**DEVICE FOR COLLECTING HEAVY OIL AND TRANSFERRING IT TO SUITABLE CONTAINER**  
 Raymond S. Cislak, 95 E. Craig Dr., Chicago Heights, Ill. 60411

Filed Mar. 14, 1980, Ser. No. 130,437

Int. Cl.<sup>3</sup> B65B 3/26

U.S. Cl. 141—198

9 Claims



**1. A transportable apparatus apparatus for collecting and for transferring heavy viscous liquids, said apparatus comprising:** collecting means to collect the viscous liquid; a pressure vessel for accumulating and for holding the viscous liquid until air pressure is applied thereto to force the liquid from said vessel; means for venting the pressure vessel to allow viscous liquids to flow therein, a movable carrier for movement from one location to another having said collecting means and said pressure vessel mounted thereon; one-way valve means allowing viscous liquids to flow from said collecting means into said pressurized vessel; level sensing means for sensing the level of liquid in said pressure vessel; air inlet valve means for connection to a supply of pressurized air and for admitting pressurized air into said pressure vessel; liquid outlet means for delivering from said vessel a flow of viscous liquid being moved by air pressure; said one-way valve preventing flow of the viscous liquid from said pressure vessel to said collecting means, and valve means controlled by the level sensing means to close said venting means and to admit pressurized air to flow into said pressure vessel to force viscous liquid in the pressure vessel outwardly through said liquid outlet means, said level sensing means closing said air inlet valve means when said liquid level in said pressure vessel falls below a predetermined level.

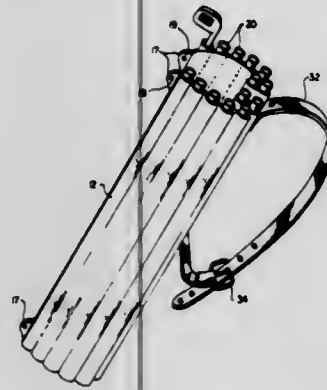


4,420,024

## GOLF CLUB BAG

Charles R. Clayton, 606 Coolidge St., Midvale, Utah 84047  
Continuation-in-part of Ser. No. 194,618, Oct. 6, 1980, Pat. No. 4,334,564. This application Oct. 5, 1981, Ser. No. 308,913  
The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.  
Int. Cl.<sup>3</sup> A63B 55/02

U.S. Cl. 206—315.4



1. A golf bag including:  
a plurality of generally elongate receptacles, each of a dimension sufficient to receive the handle of a golf club, means joining the receptacles together in a generally parallel arrangement and generally in a row, said joining means being flexible,  
handle means coupled to said receptacles or joining means to enable holding the receptacles,  
fastening means disposed on each of the two endmost receptacles in the row for fastening the two receptacles together to secure the receptacles in a folded configuration, an additional plurality of generally elongate receptacles, each of a dimension sufficient to receive the handle of a golf club,  
means joining the additional receptacles together in a generally parallel arrangement and generally in a row, and  
means connecting the additional receptacles to the first-mentioned receptacles in a generally back-to-back relationship.

4,420,025

## ANNULAR REINFORCING STRUCTURE OF RADIAL TIRES

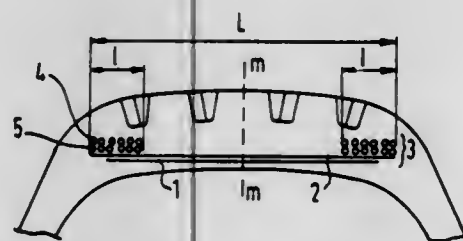
Giuliano Ghilardi, Sesto San Giovanni, and Luigi Maiocchi, Vernate fraz. Moncucco, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Oct. 1, 1980, Ser. No. 192,921

Claims priority, application Italy, Oct. 24, 1979, 26736 A/79  
Int. Cl.<sup>3</sup> B60C 9/20

U.S. Cl. 152—361 DM

6 Claims



1. A pneumatic tire for vehicle wheels, comprising a radial tire carcass having a crown zone, a tread-band disposed over the carcass in the crown zone, and an annular reinforcing structure disposed between the carcass and the tread-band, said annular reinforcing structure comprising at least two radially superimposed layers of metallic fabric which are substantially

as wide as the tread and comprising cords having an elongation at the breaking point of between 2.6% and 3.2%, said cords being parallel to each other in each layer and crossed with those cords of the adjacent layer, and symmetrically inclined with respect to the longitudinal direction of the tire at an angle of between 10° and 30°, and, in a radially external position with respect to said layers, a plurality of superimposed strips of adjacent coils of lang-lay type metallic cords having an elongation at the breaking point between 4% and 8%, disposed parallel to one another and with the equatorial plane of the tire, characterized by the fact that said plurality of superimposed strips comprise reinforcing rings only on lateral portions of said annular reinforcing structure, said reinforcing rings being constituted by at least two radially superimposed strips of said metallic cords, the outer edge of each ring being disposed substantially over the edges of said radially inner layers, the axial width of said rings being between 7% and 40% of the axial width of said annular reinforcing structure.

9 Claims

4,420,026

## MACHINE FOR AUTOMATICALLY FITTING TIRES TO RIMS

Pierre A. Goiseau, Verneuil sur Seine, France, assignor to Societe de Mecanique General - Goiseau Guittot, Les Mureaux, France

Filed Oct. 16, 1981, Ser. No. 311,956

Claims priority, application France, Oct. 27, 1980, 80 22959  
Int. Cl.<sup>3</sup> B60C 25/08

U.S. Cl. 157—1.24

19 Claims



1. A machine for automatically fitting tyres on rims, comprising a continuously driven endless conveyor (1), a first feed device (3) provided at the entrance of the conveyor for placing rims (A) one after the other flat on the carrier side (4) thereof, a second feed device (5) situated downstream of the first one for placing a tyre (B) of corresponding size aslant on each rim, a tyre-fitting head (6) situated downstream of the second feed device for fitting the tyres on the rims, and means (7) for discharging the tyred rims, said machine further comprising adjustment means (16) for automatically and continuously bringing the upper face of the rims (A) to a constant predetermined height with respect to the carrier side (4) of the conveyor (1), before they pass under the tyre-fitting head.

4,420,027

## TRANSPARENT ACCESS CURTAIN FOR COOLERS AND THE LIKE

Kenneth N. Gidge, Nashua, N.H., and Henry J. Richard, Lowell, Mass., assignors to BSL Corporation, Nashua, N.H.

Continuation of Ser. No. 287,303, Jul. 27, 1981. This application May 18, 1983, Ser. No. 494,499

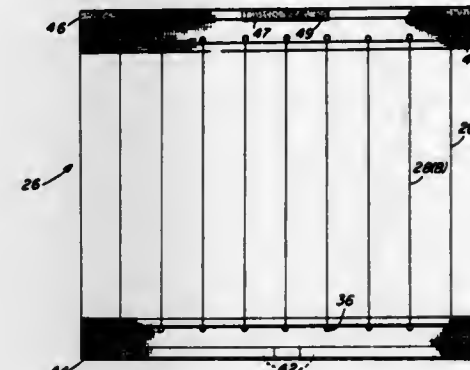
Int. Cl.<sup>3</sup> A47H 23/01

U.S. Cl. 160—328

12 Claims

1. An access curtain for use over the opening in an open display type refrigerator, or the like, comprising  
(a) a sheet of flexible, transparent material of generally rectangular outline,  
(b) a pair of strips of flexible, tear-resistant reinforcing material, one strip being joined to an upper portion of said sheet and the other strip being joined to a lower portion of said sheet,  
(c) means carried by at least a portion of the upper of said strips and/or by at least a portion of the refrigerator for connecting the upper of said strips to said refrigerator

proximate to the upper edge of said opening, said sheet together with said strips defining a curtain of a length sufficient to span said opening and overhang the lower edge of said opening,  
(d) said curtain being formed with a plurality of spaced parallel vertical slits disposed entirely within the outer edges of said curtain, said slits extending through said



- sheet and terminating at respective ends within said upper and lower strips,  
(e) said slits forming a plurality of substantially coplanar, parallel and integral strip sections arranged in substantially abutting edge to edge relation, and,  
(f) means carried by the curtain at the lower edge thereof for applying tension to said curtain.

4,420,028

## LUBRICATION SYSTEM FOR A DIE CASTING MACHINE

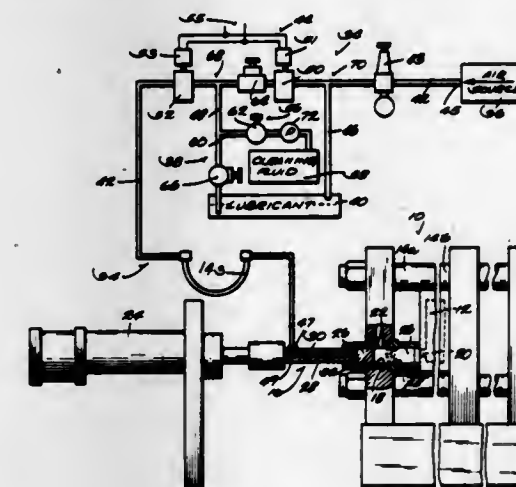
Edward M. Nelson, Greenfield, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 29, 1980, Ser. No. 201,982

Int. Cl.<sup>3</sup> B22D 17/20

U.S. Cl. 164—149

4 Claims



1. A die casting machine comprising a die member defining a cavity; a sleeve communicating with said die cavity; piston means operative for reciprocative movement within said sleeve and including a stem portion having a passage communicating with the interior of said sleeve; first means for introducing a stream of pressurized air into said sleeve through said stem portion passage and including an air conduit adapted to communicate with a source of pressurized air, and communicating with said stem portion; second means for introducing lubricant into said air conduit for delivery by the air stream into said sleeve through said stem portion passage, and including a lubricant conduit adapted to communicate with a source of lubricant and operatively connected with said air conduit; control means in said air conduit for selectively controlling air and lubricant flow to said stem portion passage; and third means for selectively blocking the conduction of the air stream by said air conduit and the conduction of the lubricant by said

lubricant conduit while introducing cleaning fluid into said lubricant conduit, into said air conduit, and into said stem portion passage, said third means including a cleaning fluid conduit adapted to communicate with a source of cleaning fluid, communicating with said air conduit and said lubricant conduit and including first valve means for selectively controlling cleaning fluid flow through said cleaning fluid conduit, second valve means in said lubricant conduit for selectively blocking said lubricant conduit, and third valve means in said air conduit for selectively blocking said air conduit.

4,420,029

## APPARATUS FOR BLOCKING ESCAPE OF HEAT IN HOT SLABS MANUFACTURED ON CONTINUOUS CASTING MACHINES

Kazuhide Kameyama, Kawachi-Nagano, and Takahiro Kiyofuji, Sakai, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 143,924, Apr. 23, 1980, abandoned.

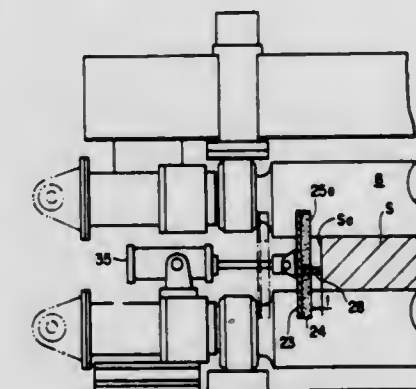
This application Aug. 9, 1982, Ser. No. 406,727

Claims priority, application Japan, Apr. 27, 1979, 54-55902; Jul. 10, 1979, 54-94112; Feb. 25, 1980, 55-21542

Int. Cl.<sup>3</sup> B22D 11/128

U.S. Cl. 164—448

3 Claims



1. An apparatus for blocking escape of heat in hot slabs manufactured on a continuous casting machine having a group of top and bottom withdrawal guide rolls positioned one after the other in the longitudinal direction of the cast slab, which apparatus comprises:

at least one heat containing cover on each side of the casting machine extending in the longitudinal direction of the cast slab and facing the side edges of the slab, said heat containing covers each comprising a heat containing plate and a heat-insulating material on the inside surface thereof, and said heat containing cover having a plurality of substantially semi-circular cut-out recesses in the upper and lower portions thereof for fitting around the lower and upper portions of the top and bottom withdrawal guide rolls and visor-like strip members on the upper and lower edges of said covers between adjacent recesses and projecting between adjacent withdrawal guide rolls in a direction parallel to the axes thereof;  
a contacting means on said heat containing cover extending toward the side edge of the slab for contacting the side edge of the slab for maintaining a predetermined clearance between the internal surface of the heat containing cover and the side edge of the slab;  
means for supporting the heat containing covers for reciprocal movement in the direction of the axes of the withdrawal guide rolls; and  
means connected to said heat containing covers for reciprocating said heat containing covers independently of each other for keeping said contacting means in contact with the side edge of the slab.



4,420,030

**CONTINUOUS LUBRICATION CASTING MOLDS**  
Michael J. Pryor, Woodbridge, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

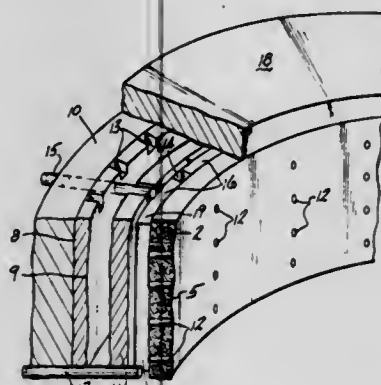
Continuation of Ser. No. 249,761, Apr. 1, 1981, Pat. No. 4,369,832, which is a division of Ser. No. 84,768, Oct. 15, 1979, Pat. No. 4,363,352. This application Jul. 23, 1982, Ser. No. 401,156

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> B22D 11/07

U.S. Cl. 164—472

9 Claims



1. A process for continuously casting molten metals or alloys comprising:

providing a continuous lubrication casting mold, said casting mold including a permeable casting mold section defining an inner casting surface and an outer lubricant receiving surface extending over substantially the entire length of said casting mold section, said casting mold section comprising a porous body having a continuous open pore fraction associated therewith for establishing a first set of passages for a lubricant;

providing a plurality of discrete feed holes extending between said inner and outer surfaces for establishing a second set of passages for said lubricant;

passing said molten metal or alloy through said casting mold section; and

continuously supplying said lubricant to said outer surface so that said lubricant passes through said first and second passages and transfers onto said inner casting surface along substantially the entire length thereof.

4,420,031

# METHOD OF CASTING METAL INCLUDING DISINTEGRATION OF MOLTEN METAL

Björn Frykendahl, Erik Dahlbergs Gata 59, 252 40 Helsingborg, Sweden, assignor to Sven Eketorp, Stora Benhamra; Hasse Fredriksson, Bisittargatan; Per Olof Strandell, Bockstigen and Björn Frykendahl, Helsingborg, all of, Sweden

Continuation of Ser. No. 127,896, Mar. 6, 1980, abandoned, which is a continuation of Ser. No. 907,963, May 22, 1978, abandoned. This application Feb. 18, 1982, Ser. No. 350,035

Claims priority, application Sweden, Jun. 8, 1977, 7706696

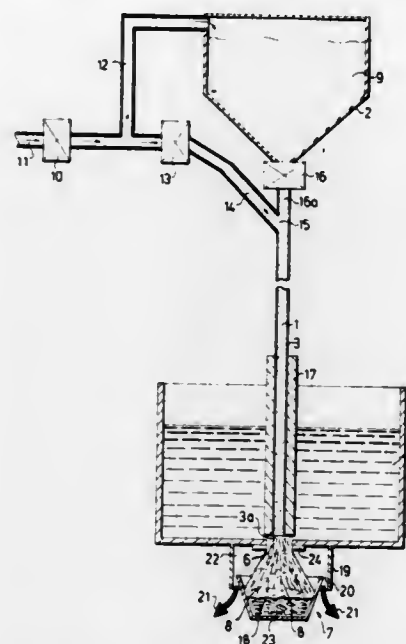
Int. Cl.<sup>3</sup> B22D 11/10, 23/00

U.S. Cl. 164—473

8 Claims

1. Method for casting molten metal into ingot bars, whereby the molten metal is first disintegrated into fragments by a gas containing a powdered material, after which the resultant mixture of fragmented molten metal and powder is collected, comprising the steps of: providing a container having an outlet in the bottom wall thereof and a lance-shaped tube disposed therein aligned with said outlet; disposing molten metal within said container such that said tube, at its mouth end, is at least partially surrounded by said molten metal; flowing said molten metal from said container through said outlet; pressurizing a supply means containing a powdered metallic material; mixing gas with said powdered metallic material; forcing the gas containing said powdered metallic material through and out

said mouth end of said tube, introducing a uniform mixture of the gas and powdered metallic material simultaneously in the center of the molten metal stream flowing from the container outlet, disintegrating the molten metal stream with said gas and powdered metallic material mixture, the quantity of powder mixed with the quantity of molten metal being in a predeter-



mined proportion such that a major portion of the mixture of the powder and molten metal upon disintegration by the gas stream and mixed with the powder, assumes a temperature of at least as much as the solidification temperature of the material mixture, and collecting the resultant semi-solidified mixture of fragmented molten metal mixed with metallic powder grains in a collector.

4,420,032

# METHOD OF CONTROLLING THE ENERGY MANAGEMENT OF AN ENERGY SYSTEM AND ENERGY SYSTEM BASED ON SAID METHOD

Christianus W. J. Van Koppen, Eindhoven; Onno Rademaker, Knegsel, and Adriaan J. De Ron, Veldhoven, all of Netherlands, assignors to Eurometaal N.V., Zaandam, Netherlands

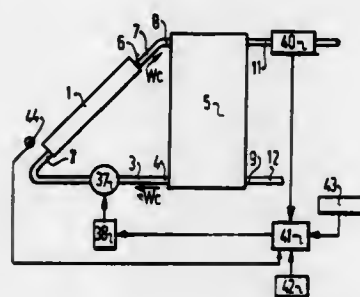
Filed Feb. 18, 1981, Ser. No. 235,755

Claims priority, application Netherlands, Feb. 19, 1980, 8001008

Int. Cl.<sup>3</sup> F28D 17/00

U.S. Cl. 165—1

4 Claims



1. The method of controlling a heat transfer system so as to yield high efficiency, comprising the steps of:

(a) providing a heat accumulating device having a heat capacity  $Q_0$ ;

(b) transferring heat by circulating a heat transfer fluid in a loop between an environmental heat transfer device and the heat accumulating device and effecting such circulation so that the temperature of fluid in the accumulating device is highly stratified;

(c) employing the highly stratified heat transfer fluid in the accumulating device to transfer heat at a consumer facility

by circulating the stratified heat transfer fluid between the consumer facility and the accumulating device and effecting such circulation so that stratification of the temperature of the heat transfer medium tends to be retained;

(d) determining the quantity of heat transferred in step (c) over a selected period of time; and

(e) controlling the circulation of step (b) such that the difference between the heat transferred in step (b) over a time period of duration equal to that of said selected period of time and the quantity of heat determined in step (d) is equal to  $n(Q_0)$  where  $n$  is 0 to 3.

4,420,033

# SYSTEM FOR AUTOMATICALLY CONTROLLING VEHICLE COMPARTMENT TEMPERATURE AND TRANSDUCER THEREFOR

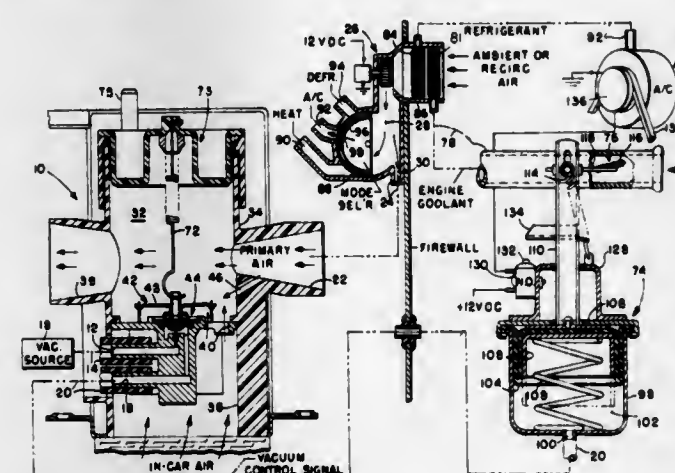
Rudolph J. Franz, Schaumburg, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 24, 1980, Ser. No. 190,290

Int. Cl.<sup>3</sup> F25B 29/00; B60H 3/00

U.S. Cl. 165—26

18 Claims



1. A system for controlling the temperature in a vehicle passenger compartment comprising:

(a) compressor means operable upon connection to an on-board source of power for providing a source of refrigerant;

(b) clutch means operable upon activation and de-activation to drivably connect and disconnect said compressor means with said source of power;

(c) cooler means disposed in heat-exchange relationship with said refrigerant and including means operable to provide heat exchange between said refrigerant and said compartment;

(d) heater means receiving an on-board source of heated fluid in heat exchange relationship therewith, said heater means being operable to provide heat exchange between said heated fluid and said compartment;

(e) heater valve means operable to control flow of heated engine coolant to said heater means;

(f) duct means having said heater means and said cooler means received therein and operable upon receiving a flow of forced air therethrough to direct substantially all of said flow over first one of said heater means and said cooler means and then over the other for providing tempered air;

(g) blower means operable to direct a flow of forced air to said duct means upstream of said heater means and said cooler means;

(h) plenum means receiving said tempered air from said duct means downstream of said heater means and said cooler means and operable to direct said tempered air to said compartment;

(i) sensing tap means operative to divert a minor portion of said duct flow upstream of said heater means and said cooler means;

(j) fluid flow powered transducer means operable upon

receiving flow from said sensing tap means to sense the temperature of the atmosphere in the vehicle passenger compartment and, upon connection to a source of fluid pressure, provide a modulated fluid pressure signal indicative of variations in the sensed temperature;

(k) fluid pressure responsive means including a movable actuator member operable in response to certain characteristics of said fluid pressure signal to modulated said coolant valve between no flow and maximum flow and including switch means operable to actuate and de-actuate said clutch means in response to predetermined amount of movement of said actuator member; and,

(l) selector means operative upon actuation by the vehicle operator to provide a desired temperature input to said transducer means wherein, upon the operator actuating said selector means, said transducer provides a variable fluid pressure signal such that said fluid pressure responsive means regulates said coolant valve and cycles said compressor for maintaining the passenger compartment at said desired temperature.

4,420,034

# HEAT-AUGMENTED HEAT EXCHANGER

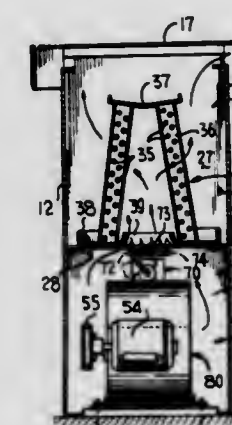
Gerry VanderVaart, Niagara Falls, Canada, assignor to Kool-Fire Limited, Niagara Falls, Canada

Division of Ser. No. 87,154, Oct. 22, 1979, Pat. No. 4,311,192, which is a continuation-in-part of Ser. No. 54,647, Jul. 3, 1979, Pat. No. 4,311,191. This application Apr. 30, 1981, Ser. No. 259,356

Int. Cl.<sup>3</sup> F25B 29/00

U.S. Cl. 165—29

4 Claims





coil to an outlet of said outdoor coil, and said open flame being directed upwardly and substantially entirely into said chamber.

4,420,035

**THERMAL CONTROL SYSTEM**

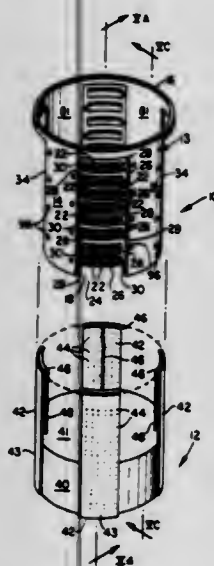
Dennis R. Hewitt, Laurel, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 15, 1982, Ser. No. 434,672

Int. Cl.<sup>3</sup> F28F 13/00

U.S. Cl. 165—32

6 Claims



1. A thermal control system, comprising: means (13) having a plurality of exposed surfaces (14) forming an open receptacle wherein adjacent ones of said exposed surfaces are spaced apart by intermediate separations (18) for radiating heat from said exposed surface; means (42) having channels (67) adjoining corresponding thermally conductive members (64) insertable within said intermediate separations (18) in spaced separation from said exposed surfaces (14) for distributing a stream of a material whose temperature is to be controlled; means (24) contiguous to said exposed surfaces and connectable to said thermally conductive members for transmitting thermal energy between said thermally conductive members and said exposed surfaces; and means (54, 56, 86, 90) responsive to the temperature of said material for regulating the effectiveness of said transmitting means inversely to the temperature of said material within said distributing means.

4,420,036

**ENERGY EFFICIENT HOUSING STRUCTURE**

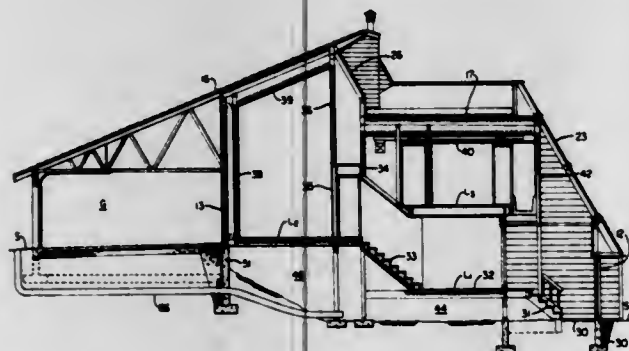
Lee B. Blaser, 8829 S. William Cody Dr., Evergreen, Colo. 80439

Filed Mar. 19, 1981, Ser. No. 245,585

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 165—45

20 Claims



1. In a building structure having a ground floor, exterior sidewalls and a roof forming an enclosure with room air spaces

therein, inner walls spaced inwardly of said exterior walls and roof to define an air circulating envelope therebetween, said envelope being in communication with a lower space beneath said ground floor level and which space is in heat transfer relation to the earth, the improvement comprising

a chase extending upwardly from open communication with said lower space into communication with said air circulating envelope at a point intermediately along the interior of said roof structure, said room air spaces flanking said chase, and vent means between said chase and said room air spaces, at least a portion of one of said exterior sidewalls and roof having a solar energy transmitting panel exposed to solar radiation and in heat transfer relation to said air circulating envelope, said roof including upper and lower roof sections, said clerestory disposed between said upper and lower roof sections exposing an interior portion of said building structure to solar radiation, and air circulating means communicating with said chase and operative to cause the circulation of air in a closed continuous path through said chase, said air circulating envelope and said lower space.

4,420,037

**DEVICE FOR COOLING AND CALIBRATING HELICAL THERMOPLASTIC TUBE RIBS**

Manfred Hawerkamp, Altenrather Strasse 37, 5210 Troisdorf, Fed. Rep. of Germany

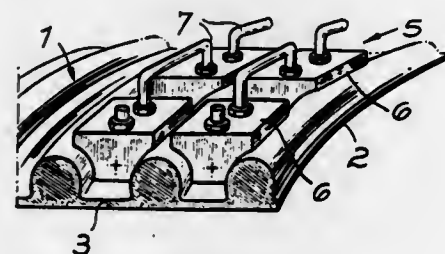
Filed Mar. 30, 1981, Ser. No. 249,156

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012295

Int. Cl.<sup>3</sup> F28F 7/00; A21C 3/00; A23G 1/00

U.S. Cl. 165—46

16 Claims



1. A device for at least one of cooling and calibrating a ribbed tubular wall of a thermoplastic material in a deformable state, the tubular wall having a circular surface and helically extending rib turns projecting from the circular surface at spaced intervals along the surface, comprising a cooling chain of a plurality of interconnected cooling cells mounted between at least two adjacent rib turns, a flexible coolant conduit interconnecting said cells, said cells having means for passing a coolant therethrough for cooling said adjacent rib turns, and said cells having wall portions contiguously engaging said adjacent rib turns.

4,420,038

**CLEANING SYSTEM FOR HEAT CONDUCTIVE CONDUITS OF A HEAT EXCHANGER**

Isao Okouchi; Sankichi Takahashi; Yasuteru Mukai; Katsumoto Otake; Takuya Sasaki, all of Hitachi, and Masahiko Miyai, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,068

Claims priority, application Japan, Jun. 30, 1980, 55-89702; Jun. 30, 1980, 55-89711

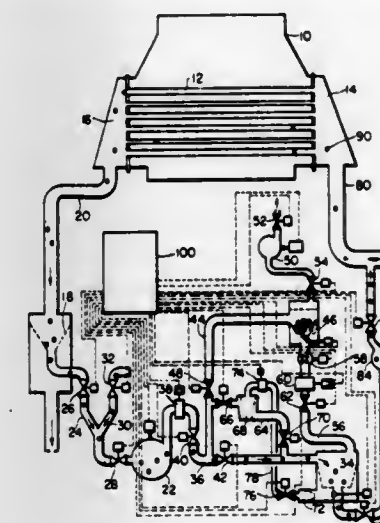
Int. Cl.<sup>3</sup> F28G 1/12

U.S. Cl. 165—95

5 Claims

1. A cleaning system for cleaning conduits by circulating resilient balls through the conduits to mechanically remove any incrustations formed on the inner surfaces of the conduits, the cleaning system comprising: circulating means having an inlet connected to one end of

the conduits and an outlet connected to another end of the conduits for circulating the balls through the conduits, detecting means for detecting defective balls from among circulating balls and for removing the defective balls out of the circulating means, said detecting means comprising a first counting means capable of selecting and counting the number of defective balls, means for supplying new balls into said circulating means



including a second counting means for counting the number of new balls supplied by said supplying means, third counting means for counting the number of balls circulating in the circulating means, and control means for controlling the number of balls circulating by adjusting the number of balls removed by said detecting means and the number of new balls supplied by said supplying means whereby the number of balls circulating is maintained at a predetermined level.

4,420,039

**CORRUGATED-SURFACE HEAT EXCHANGE ELEMENT**

Evgeny V. Dubrovsky, ulitsa Chaikovskogo, 18, kv. 203, Moscow, U.S.S.R.

PCT No. PCT/SU81/00005, § 371 Date Oct. 6, 1981, § 102(e) Date Oct. 6, 1981, PCT Pub. No. WO81/02340, PCT Pub. Date Aug. 20, 1981

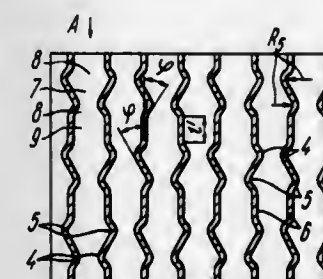
PCT Filed Jan. 15, 1981, Ser. No. 309,887

Claims priority, application U.S.S.R., Feb. 7, 1980, 2872538

Int. Cl.<sup>3</sup> F28F 3/02, 1/22

U.S. Cl. 165—152

3 Claims



1. A corrugated core structure for a heat exchanger, said core structure comprising: a plate having parallel rows of corrugations, the walls of the corrugations defining passages for streams of a heat-transfer agent to flow therethrough, pairs of opposed projections and recesses successively separated by smooth wall portions, the pairs of projections and recesses being arranged in opposition to one another so as to form divergent-convergent portions of the passages and having a length sufficient to intensify the heat transfer process; the smooth portions of the passages alternating with said divergent-convergent portions such that, in combination, they provide for successive throttling of the flow of the heat-transfer agent to intensify the heat transfer process, each said smooth portion of the passage having a length essentially below five

values of the hydraulic diameter of said smooth portion in the passage; the vertices of said corrugations being bent on a radius, the value of which is essentially below a difference between one fourth of the pitch of said corrugations and one-half the wall thickness thereof.

4,420,040

**BALL CATCHER**

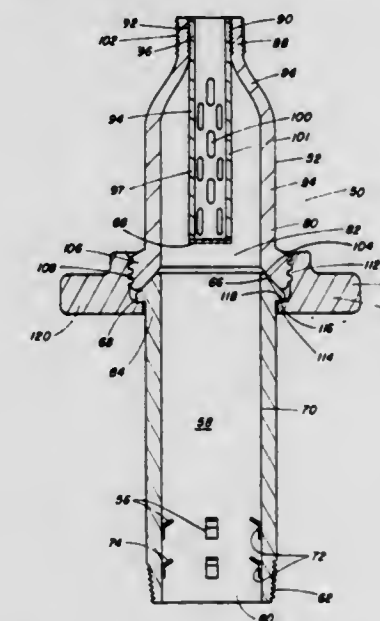
David P. Arbasak, and David L. Blake, both of Weston, W. Va., assignors to Halliburton Company, Duncan, Okla.

Filed May 7, 1982, Ser. No. 375,840

Int. Cl.<sup>3</sup> E21B 23/00, 33/068; B01D 35/28

U.S. Cl. 166—70

1 Claim



1. A ball catcher for use in well fluid flow back operations to catch balls used in the hydraulic fracturing of oil and gas wells, the ball catcher comprising:

a separable body housing means having an inlet and outlet thereto, the separable body housing means comprising:

first cylindrical portion means having a conical end surface means and annular shoulder means on one end thereof;

second cylindrical portion means including:

first cylindrical inlet portion means having an inlet and having, in turn, conical end surface means which mate with conical end surface means of the first cylindrical portion means and annular shoulder means thereon;

second cylindrical outlet portion means having the interior thereof formed having threads thereon; and frusto-conical swedge transition section means having one end secured to the first cylindrical inlet portion means and the other end secured to the second cylindrical outlet portion means; and

threaded nut means releasably securing the first cylindrical portion means to the second cylindrical portion means;

stinger means comprising elongated annular cylindrical member means having a closed end portion, the other end portion having the exterior thereof formed having threads thereon thereby releasably connecting the cylindrical member means to the outlet of the second cylindrical outlet portion means of the second cylindrical portion means of the separable body housing means and a plurality of elongated slot means through the wall of the elongated annular cylindrical member means; and resilient baffle means secured to the interior of the separable body housing means, the resilient baffle means comprising:

a plurality of resilient baffle means, each resilient baffle means having a first portion secured to the separable body housing means and a second lip portion extend-



ing into the interior of the separable body housing means whereby said balls in said well fluid flowing back through said ball catcher are caught and substantially retained in the interior of said ball catcher between the stinger means and the resilient baffle means.

4,420,041

**METHOD OF USING A VALVE IN GRAVEL PACKING**  
Dhirajlal C. Patel, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 232,710, Feb. 9, 1981, Pat. No. 4,378,842.  
This application Nov. 8, 1982, Ser. No. 439,862

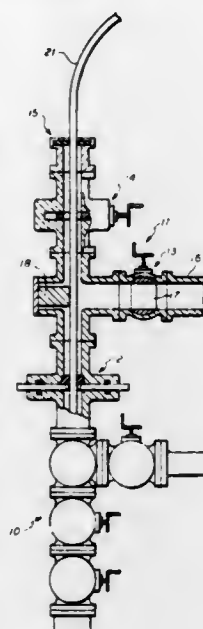
Int. Cl.<sup>3</sup> E21B 37/08

U.S. Cl. 166—278

6 Claims



severing the tubing with a tool inserted into the stack through the wing valve;  
dressing the upper end of the siphon tube with a tool introduced into the stack through the shut off valve;  
introducing through the stripper and shut off valve a pulling tube;  
sealingly securing the pulling tube to the siphon tube;



releasing the means supporting the siphon tube and the support-siphon tube annulus sealing means;  
and withdrawing the siphon tube through the shut off valve and stripper;  
all of the steps of the method being carried out while the well is under pressure control.

4,420,043

**VALVING APPARATUS FOR SELECTIVELY SEALING AN ANNULUS DEFINED BETWEEN A WORK STRING AND THE BORE OF AN ELEMENT OF A PRODUCTION STRING OF A SUBTERRANEAN WELL**

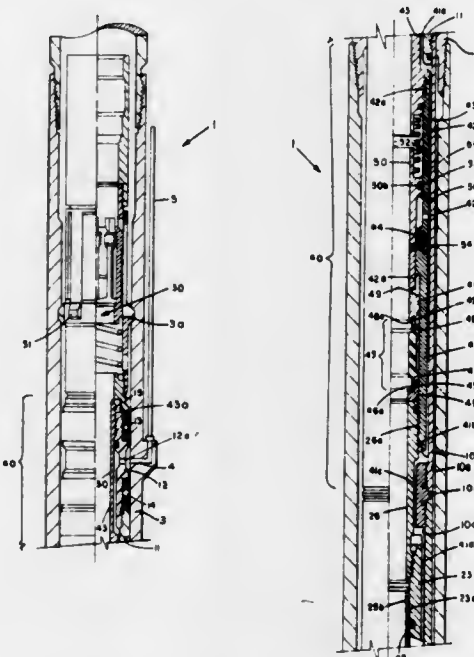
Robert T. Brooks, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jun. 25, 1981, Ser. No. 277,572

Int. Cl.<sup>3</sup> E21B 34/10

U.S. Cl. 166—319

16 Claims



1. A valve for an annulus defined between a tubular work string and a surrounding annular portion of an operative element of a production string of a subterranean well comprising: an annular valve body shiftably and sealably mountable in the

**METHOD FOR CUTTING AND REPLACING TUBING WITHOUT KILLING WELL**  
Karl N. Tunstall, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 5, 1982, Ser. No. 355,183

Int. Cl.<sup>3</sup> E21B 29/08

U.S. Cl. 166—297

3 Claims

1. The method of installing and removing a siphon tube from a well comprising:  
positioning on a wellhead a stack comprising a sealing and supporting section,  
a side mounted wing valve,  
a top mounted shut off valve, and  
a stripper;  
running a siphon tube through the stripper and shut off valve and into the well;  
supporting the siphon tube in the stack on the support section;  
sealing off the annulus between the stack and tubing below the wing valve;

bore of said annular portion for generally radial movements into and out of sealing engagement with the exterior of said tubular work string; resilient piston means urging said annular valve body into said sealing engagement; and means responsive to a control fluid pressure opposing said resilient means to permit said annular valve body to shift to its non-sealing position relative to said tubular work string upon the application of a predetermined control fluid pressure to said piston means.

4,420,044

**FLOW CONTROL SYSTEM**

William H. Pullin, Dallas, and Olen R. Long, Celina, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 19, 1982, Ser. No. 409,511

Int. Cl.<sup>3</sup> F21B 33/00

U.S. Cl. 166—322

2 Claims



1. A flow control system comprising; a mandrel having a flowway, a valve seat across said flowway, and means in said mandrel for receiving a retrievable valve in said means; a control valve comprising, a body, a pressure dome in said body, a piston slidable in said body and exposed to pressure within said dome on one side and to pressure exterior of the body on the other side, resilient seal means between said piston and body, said body and piston having cooperable means for alternately latching said piston in retracted position and permitting said piston to extend in response to external pressure conditions, a valve member carried by said piston and having a seal area cooperable with said valve seat to control flow through said flowway, said member having a fluid passageway communicating with the exterior of the valve member on opposite sides of the valve member seal area, a frangible disc sealing said fluid passageway, and cooperable split ring and shoulder means carried by said body and piston engaging when said valve means is extended to lock said valve member in extended position.

4,420,045

**DRILL PIPE TESTER AND SAFETY VALVE**

Michael E. McMahan, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 3, 1982, Ser. No. 373,949

Int. Cl.<sup>3</sup> E21B 34/12

U.S. Cl. 166—334

19 Claims

1. A pipe tester valve, comprising:  
a housing having a first end adapted to be connected to a string of pipe, having a flow passage therethrough having a first annular interior abutting surface and having a plurality of lug means located on the interior thereof below the first annular interior abutting surface;

a spherical valve member disposed in said flow passage of said housing;

lug means, attached to said housing, for engaging said spherical valve member and rotating said spherical valve member between open and closed positions wherein said flow passage is open and closed, respectively, as said spherical valve member is moved axially relative to said housing and said lug means; and

moving means for moving said spherical valve member axially relative to said housing between its said open and closed positions, said moving means including:

a lower valve member seat means having a downward facing surface supportably engaged by an upward facing surface of said housing when said spherical valve member is in its said closed position, so that downward forces exerted on said spherical valve member in its said closed position due to fluid pressure in said string of pipe above said spherical valve member are transmitted to said housing through said engagement of said downward facing surface and said upward facing surface;

an upper moving mandrel portion attached to said lower valve member seat means and a lower moving mandrel portion having an upper end adapted for engagement with a lower end of said upper moving mandrel portion and a plurality of lug means located on the exterior thereof slidably engaging the plurality of lug means on



the interior of said housing, so that when a weight of said string of pipe is set down on said housing said lower moving mandrel portion is moved upward relative to said housing and is engaged with said upper moving mandrel portion to move said upper moving mandrel portion upward relative to said housing thereby opening said spherical valve member;

sleeve spring means located between said housing and said lower moving mandrel portion, the sleeve spring means being located in said housing below the first annular interior abutting surface and above the plurality of lug means, the sleeve spring means being constructed so that when said weight of said pipe string is set down on said housing the sleeve spring means is caused to expand by the plurality of lug means on the exterior of the lower moving mandrel portion thereby allowing the lower moving mandrel portion to move upward relative to said housing thereby opening said spherical valve member, and when said pipe string is picked up the end surfaces of the plurality of lug means on the interior of said housing abut an end of said ring spring means causing said sleeve spring means to slidably move from the plurality of lug means on the exterior of the lower moving mandrel portion as the lower moving mandrel portion is moved to a lower position relative to said housing thereby closing said spherical valve member; and



latch means for latching said spherical valve member in its said closed position as said string of pipe and pipe tester valve are lowered into a well.

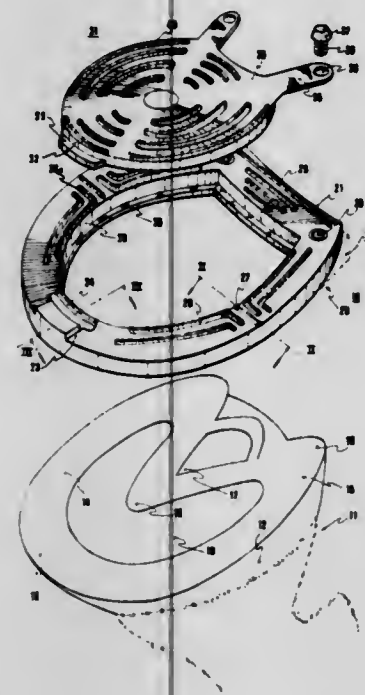
4,420,046

**PROTECTION DEVICES FOR HORSE SHOES**

Jean-Pierre R. Choplin, Jouarre, Seine Marne, France  
Filed Jul. 20, 1981, Ser. No. 284,797  
Int. Cl.<sup>3</sup> A01L 7/02, 5/00

U.S. Cl. 168—14

7 Claims



1. Wear appliance of thermoplastic elastomer, preferably polyurethane, for the protection of horse hooves, comprising on the one hand a wear appliance in the form of a strip of material conforming to the contour of the horny portion of the hoof, the rear ends of the strip being united in the area of buttresses of the hoof by a connecting strap so that the strip of material becomes continuous, of generally annular shape, on the other hand, a closure plate attachable in removable manner to the appliance for completely closing the free space located on the inside of the plane of the annulus, the appliance being characterized in that the ground bearing surface of the annular strip and the ground bearing surface of the closure plate are at the same level and that each comprises anti-skid relief sculptures, some longitudinal and some transverse, these sculptures being divided into four separate regions by interruptions, a forward portion on and near the toe, a rearward portion on and near the connecting strap, two lateral portions near the hoof side walls, the sculptures in each region extending principally over the major part of their length parallel or substantially parallel to the edges of the strip and of the closure plate.

4,420,047

**STOWABLE FIRE SUPPRESSION SYSTEM FOR AIRCRAFT CABINS AND THE LIKE**

Wilhelm A. Bruensicke, Santa Monica, Calif., assignor to Lockheed Corporation, Burbank, Calif.  
Filed Dec. 28, 1981, Ser. No. 335,238  
Int. Cl.<sup>3</sup> A62C 25/00

U.S. Cl. 169—53

6 Claims

1. A fire suppression system stowable within a passenger area of a pressurized cabin of an aircraft in flight comprising:  
a supply of water;  
a water outlet accessible from inside said passenger area;  
booster means for supplying said water to said outlet under pressure;  
a mobile fire suppression cart, said cart further comprising:  
a flexible water inlet hose;

means for effecting a fluid connection between said inlet hose and said water outlet;  
a source of foaming agent;  
means for pressurizing said foaming agent;  
a double conduit flexible outlet hose having one conduit in fluid communication with said source of foaming agent



and another conduit in fluid communication with said water inlet hose; and  
a mixing nozzle connected at one end of said flexible outlet hose for selectively mixing said water, said foaming agent and air to produce a heavy mist of plain water, a relatively dense foam, and a relatively light foam.

4,420,048

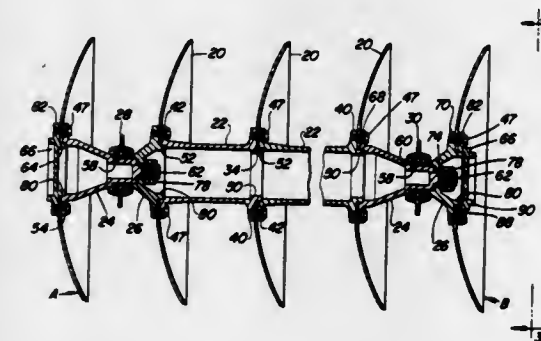
**DISK GANG ASSEMBLY**

Willard E. Peterson, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed Dec. 10, 1981, Ser. No. 329,546  
Int. Cl.<sup>3</sup> A01B 23/06

U.S. Cl. 172—568

5 Claims



1. A disk gang assembly, comprising a plurality of disks, a plurality of spacers coaxial with each other and with the disks and respectively interspaced and alternated among the disks to maintain the disks in axially spaced apart relationship, each spacer having opposite end radial flanges disposed so that the flange on one spacer abuts a disk from one side and a flange on the next adjacent spacer abuts the disk from the opposite side so as to sandwich each disk between adjacent flanges, said discs respectively having like-dimensioned central circular openings and at least one end of each spacer having an annular shoulder projecting axially beyond its flange and into and beyond the respective central opening, each shoulder being dimensioned to relatively closely fit the central disk opening into which it projects, the end of each spacer opposite to that having the annular shoulder being provided with an annular recess into which the adjacent shoulder projects, each recess and shoulder being so dimensioned as to provide a relatively close annular fit, the flanges and the disks having matching bolt holes on axes parallel to the disk and spacer axis, a plurality of threaded securing means cooperative among the bolt holes of adjacent flanges and the sandwiched disks for securing the disks and spacers together as an axially rigid unit, said spacers and disks being arranged in a series in which the last spacer in the series abuts the last disk in the series from only one side, a

coaxial spool arranged at the opposite side of that disk and having a radial flange abutting that side of the disk, said flange having bolt holes matching those of the disk and the last spacer flange, additional securing means cooperating via the flange and disk bolt holes to secure the spool and spacer together with said disk sandwiched therebetween, said spool having a reduced-diameter, coaxial cylindrical bearing portion axially beyond said disk, said bearing portion including an annular abutment means, a bearing carried on the bearing portion and abutting the abutment means, a second spool arranged coaxially with and axially beyond the first spool and having an annular recess carried by the first spool bearing portion and an abutment means abutting the bearing from the side axially opposite to the first-named abutment means, and means securing the two spools together.

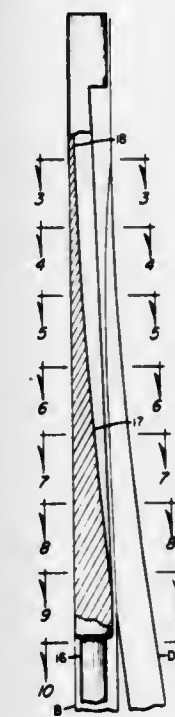
4,420,049

**DIRECTIONAL DRILLING METHOD AND APPARATUS**

Don R. Holbert, 6637 W. Hinsdale Ave., Littleton, Colo. 80123  
Continuation-in-part of Ser. No. 158,237, Jun. 10, 1980,  
abandoned. This application Jul. 8, 1982, Ser. No. 396,248  
Int. Cl.<sup>3</sup> E21B 7/08

U.S. Cl. 175—45

15 Claims



12. The method of directionally drilling a bore in a lateral, downwardly curved direction away from a substantially vertical main bore in a subsurface formation, comprising the steps of:

determining the deviation of the main bore from vertical;  
positioning a drill string in the main bore having a whipstock with a curved guide surface at the lower end of said drill string, said curved guide surface having a radius of curvature in a longitudinal direction corresponding to the radius of curvature of the lateral bore to be formed and having a concave face in a transverse direction;  
compensating for the helixing component of a drill bit advanced along said whipstock in forming said lateral bore;  
orienting said whipstock to compensate for lateral deviation of the main bore away from the desired azimuth of said lateral bore and said helixing component of a drill bit as it is advanced beyond said whipstock in forming said lateral bore, followed by  
advancing a drill bit along the curved guide surface to drill the lateral bore along the predetermined radius of curvature.

4,420,050

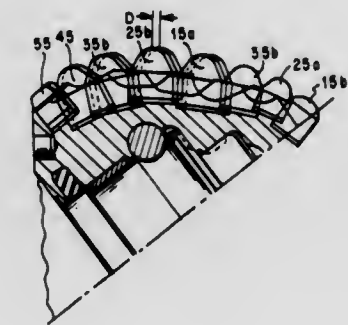
**OIL WELL DRILLING BIT**

Kenneth W. Jones, Kingwood, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Continuation of Ser. No. 62,260, Jul. 30, 1979, abandoned. This application May 18, 1981, Ser. No. 264,885  
Int. Cl.<sup>3</sup> E21B 10/16

U.S. Cl. 175—374

4 Claims



1. A roller cutter for a rotary drill bit of the type having a plurality of bearing journals and roller cutters at its lower end and used to drill well bores in relatively tough formations which tend to form annular ridges on the well bore bottom which hold the drill bit in a pattern of rotation about other than its geometric centerline, the roller cutter comprising:

a generally frustoconical cutter body having a recess in the base thereof adapted to receive a bearing journal, and a plurality of bores of generally circular shape in transverse section in the conical outer surface thereof; and  
a plurality of elongate cutting elements of a tungsten carbide material, one for each of said bores, each cutting element having a generally cylindrical base portion secured in the respective bore and a portion projecting outwardly from the roller cutter body, said projecting portion when viewed in section on a longitudinal central plane of the cutter body presenting opposing sides tapering to a generally blunt tip engageable with the bottom of the well bore, the cutting elements being arranged in a plurality of generally annular rows around the cutter body, a first row being adjacent the base of the roller cutter body and constituting a gage row, and a second row being between the gage row and the apex of the cutter body and constituting an intermediate row, the cutting elements of said intermediate row being spaced at generally equal intervals around the cutter body with the longitudinal centerlines of the base portions of the cutting elements of pairs of cutting elements in the intermediate row being spaced apart a predetermined offset distance in the direction of the longitudinal axis of the cutter body, with said offset distance being less than the radius of the base portion of a cutting element, and with the blunt tips of one cutting element of a pair of adjacent cutting elements being in overlapping relation with the blunt tip of the other cutting element of the pair, when the roller cutter is viewed in longitudinal central section, whereby, upon rotation of the drill bit, the cutting elements of the intermediate row engage the bottom of the well bore over a relatively wide annular area for reducing the thickness and thus the shear strength of any annular ridges forming on the well bore bottom and thus the capability of such ridges for holding the drill bit in an off-center rotation pattern.



4,420,051

## WEIGHING APPARATUS

Mitsuru Furuta, and Takeo Nakashimizu, both of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

PCT No. PCT/JP81/00017, § 371 Date Oct. 1, 1981, § 102(e) Date Oct. 1, 1981, PCT Pub. No. WO81/02204, PCT Pub. Date Aug. 6, 1981

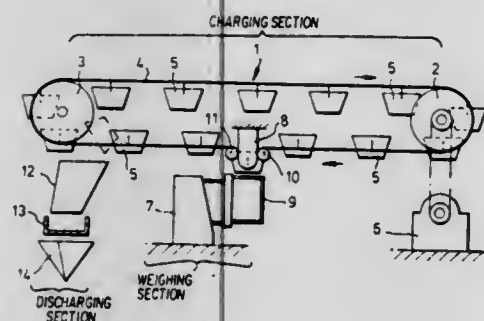
PCT Filed Jan. 26, 1981, Ser. No. 308,547

Claims priority, application Japan, Feb. 1, 1980, 55-11615

Int. Cl.<sup>3</sup> G01G 19/22, 13/00, 19/00; B65G 37/00

U.S. Cl. 177-25

8 Claims



1. A weighing apparatus comprising a plurality of transfer and weighing lines each consisting of a bucket conveyor having a plurality of buckets for transferring objects to be weighed, and a weighing unit for weighing the buckets with objects held therein, said apparatus being adapted to drive the bucket conveyors to successively weigh the object held in the buckets, store a predetermined number of measured weight values of the objects for each line, and compute a desired or predetermined number of combinations of the stored weight values to obtain a combination which provides a preset weight or a value nearest thereto.

4,420,052

## PATIENT WEIGHING SCALE

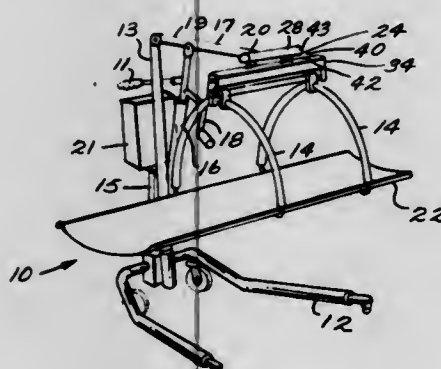
David C. Hale, Wheaton, Ill., assignor to Scale-Tronix, Inc., Wheaton, Ill.

Filed Aug. 27, 1980, Ser. No. 181,836

Int. Cl.<sup>3</sup> G01G 19/52, 19/14, 21/22

U.S. Cl. 177-132

11 Claims



1. A scale for weighing a patient in a longitudinally extending stretcher while mounted to a cantilever boom comprising:

- (1) a housing longitudinally extending in the horizontal plane;
- (2) means, mounted to said housing, for mounting said housing to said boom so as to be pivotable about a first longitudinal axis;
- (3) transducer means for measuring bending moments about a transverse horizontal axis, mounted in said housing, said transducer means having a second longitudinal axis and extending longitudinally in the horizontal plane;
- (4) means, pivotally mounted to opposite ends of said load cell, for mounting said stretcher to said load cell so as to be pivotable about a third longitudinal axis parallel to said first horizontal axis thereby assuring that the full weight of

the patient is directed vertically downward without effecting the orientation of said transducer means.

4,420,053

## FORK LIFT WEIGHING APPARATUS

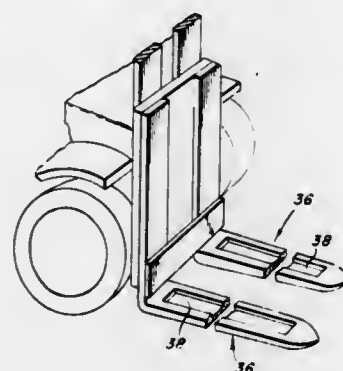
Frank J. Russo, Warren, Ohio, assignor to Litco International Inc., Vienna, Ohio

Filed Aug. 20, 1981, Ser. No. 294,781

Int. Cl.<sup>3</sup> G01G 19/08, 23/06

U.S. Cl. 177-139

3 Claims



1. A fork lift assembly having a plurality of load supporting tines, and each tine being provided with weighing means, the improvement comprising a tine having an elongated cavity therein, weighing means supported in said cavity, the over all height of said weighing means being only slightly greater than the depth of said cavity, said weighing means comprises a weigh bridge having an upper surface adapted to receive a load, a shock absorber secured to the bottom surface at each end thereof, and a load cell secured to each end thereof, and fastening means extending through openings in the bottom wall of the cavity for securing said weighing means therein.

4,420,054

## WEIGHING APPARATUS WITH OVERLOAD PROTECTION FOR OFF-CENTER LOADING

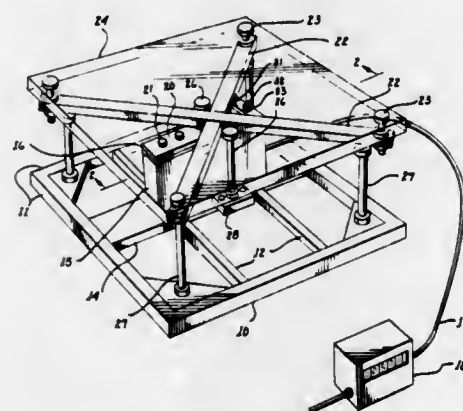
Richard F. Caris, Scottsdale, Ariz., assignor to Interface, Inc., Scottsdale, Ariz.

Filed Oct. 23, 1981, Ser. No. 314,166

Int. Cl.<sup>3</sup> G01G 23/02, 3/08

U.S. Cl. 177-154

1 Claim



1. A weighing instrument which comprises:

- (a) a planar frame for engaging a support surface, said frame having a central area for receiving a load cell thereon;
- (b) a load cell having a first end including a raised mounting surface and a second opposing end including raised load receiving surface, a portion of said mounting surface engaging the central area of said frame;
- (c) a first adjustable stop affixed to the central area of said frame proximate to the first end of said load cell;
- (d) a large area weighing platform having a load receiving upper surface;

- (e) a plurality of radially extending support arms coupled between the load receiving surface of said load cell and the outer peripheral region of the weighing platform;
- (f) a support member extending between two adjacent support arms and overlying a portion of the second end of said load cell;
- (g) a second adjustable stop affixed to the support member proximate to the second end of said load cell, said first and second stops residing within a plane orthogonal to the weighing platform;
- (h) a pair of overload protectors affixed to the central area of said frame and extending upwardly towards and being spaced from said weighing platform to limit downward movement thereof to a predetermined distance, said first pair residing within a plane which is orthogonal to the weighing platform and to the plane of said first and second stops, each stop and overload protector residing within adjacent quadrants about the load cell to thereby protect said cell from centrally located excess loading of the weighing platform; and
- (i) peripheral overload protectors affixed to said frame and extending upwardly towards and being vertically spaced from the peripheral portion of said weighing platform to thereby protect said cell from peripherally located excess loading of the weighing platform.

4,420,055

## APPARATUS FOR MEASURING WEIGHT AND FORCE

Hartmut Grutzediek, Dresdner Ring 1, 6203 Hochheim; Joachim Scheerer, AmFort Weisenau 38, 6500 Mainz 1; Erich Knothe, Hansenwinkel 4, 3406 Bovenden 1, and Franz-Josef Melcher, Rosenwinkel 18, 3414 Hardegsen 3, all of Fed. Rep. of Germany

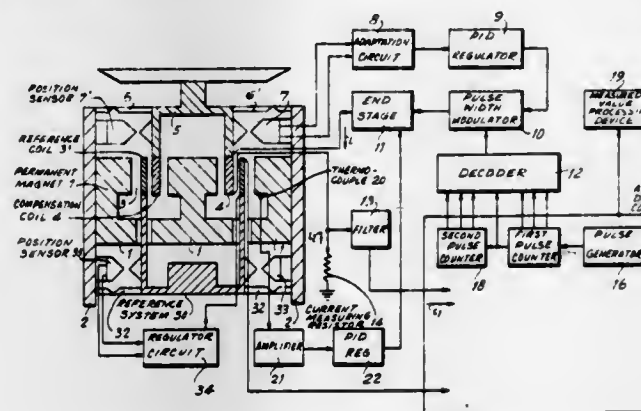
Continuation-in-part of Ser. No. 905,020, May 11, 1978, abandoned. This application Aug. 28, 1981, Ser. No. 297,349

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722093

Int. Cl.<sup>3</sup> G01G 7/00

U.S. Cl. 177-212

15 Claims



1. Apparatus for measuring weight and force, including a weighing and force-measuring system having a fixed part, a load reception part arranged for deflection on the fixed part, a device for providing a constant magnetic field in operative proximity with the load reception and fixed parts, a compensation coil arrangement in the constant magnetic field, and at least one position sensor for ascertaining load-dependent deflections of the load reception part from a predetermined position, said position sensor producing a sensor signal for regulating the current through the compensation coil arrangement so that the load reception part is returned to its predetermined position, said apparatus comprising

a regulator circuit electrically connected to said position sensor and receiving said sensor signal from said position sensor, said regulator circuit including an input electrically connected to said position sensor and an output electrically connected to said compensation coil arrangement, said regulator circuit regulating the current flowing through said compensation coil arrangement to return said load reception part to its predetermined position and to alternately impart

positive and negative values, determined by the loading, to the current flowing through said compensation coil arrangement, wherein said regulator circuit imparts the same maximum amplitude to the positive and the negative values of the current flowing through the compensation coil arrangement, after cessation of current variation due to a change of direction of said load reception part.

4,420,056

## POSTAGE SCALE

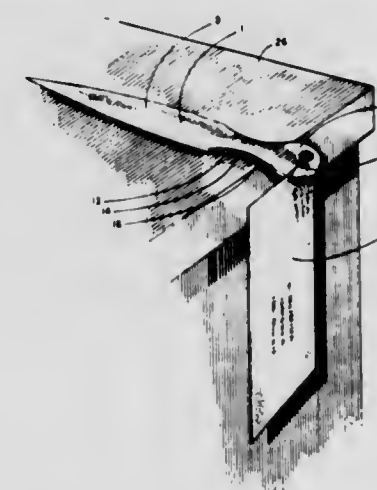
Lloyd Chapman, 1758 Fleetwood, Boulder City, Nev. 89005

Filed Feb. 22, 1982, Ser. No. 351,118

Int. Cl.<sup>3</sup> G01G 19/54

U.S. Cl. 177-245

1 Claim



1. A scale/letter opener device comprises an elongate, generally flat body member, a handle portion, a blade portion, grip means for holding a thin, flat article comprising a transverse slot extending from an edge of the handle portion to a central portion of the handle portion, and a bore through said handle portion at the termination of the slot, the slot intersecting the bore at approximately a centerline bisecting the device lengthwise, the slot having a mouth portion located at the edge of the device and a frictional gripping portion, said mouth portion having an opening substantially larger than the grip portion and serving as guide means for intersecting an article into the slot, and a plurality of transverse ribs extending substantially across the width of the body member on each side of the body member located at differing distances from the grip means along the body member, and wherein the ribs located closer to the grip means are greater in height than ribs located further from the grip means.

4,420,057

## AIR INDUCTION STRUCTURE FOR AN AUTOMOBILE AIR CLEANER

Kazuaki Omote, Fujisawa, and Masayoshi Hayashida, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 20, 1981, Ser. No. 294,808

Claims priority, application Japan, Oct. 31, 1980, 55-155897

Int. Cl.<sup>3</sup> B60K 13/02

U.S. Cl. 180-54 A

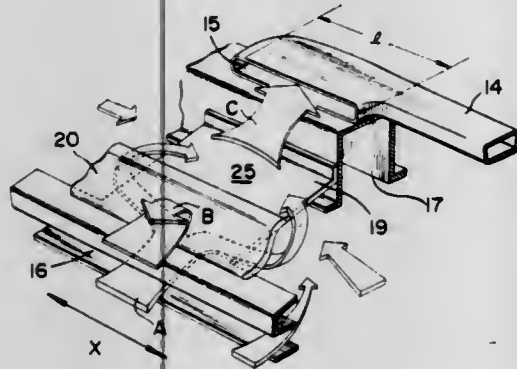
4 Claims

1. An air induction structure for an air cleaner on an automobile, the automobile being furnished with an engine compartment in its front body and a grille at its front end through which the engine compartment is open to the outside to introduce air thereto, the automobile being also furnished with a pivoted hood for covering the engine compartment from above, the hood being designed to form a gap between the top of the front of the automobile and the hood when the hood is



closed, to draw therethrough air into the engine compartment, the structure comprising:

- (a) an air intake duct located in the engine compartment, the air intake duct being connected at one end to the air cleaner and being open forward at its other end to conduct air to the air cleaner;
- (b) a first obstructing member extending across a first longitudinally and vertically extending straight path connecting part of the grille and the opening of the air intake duct to block the first path, the first obstructing member extending longitudinally from the upper end of the grille; and
- (c) a second obstructing member extending across a second



longitudinally and vertically extending straight path connecting part of the grille and the opening of the air intake duct to block the second path, the second obstructing member extending from the upper end of the grille to the hood when the hood is closed;

- (d) the first and second obstructing members defining an air passage in conjunction with the hood when the hood is closed, the air passage being open above both of the sides of the first obstructing member and leading to the opening of the air intake duct so that the air drawn into the engine compartment via the gap and the grille can enter the air passage via both of the openings thereof and be conducted to the opening of the air intake duct through the air passage.

4,420,058

## RADIATOR GUARD STRUCTURE FOR VEHICLES

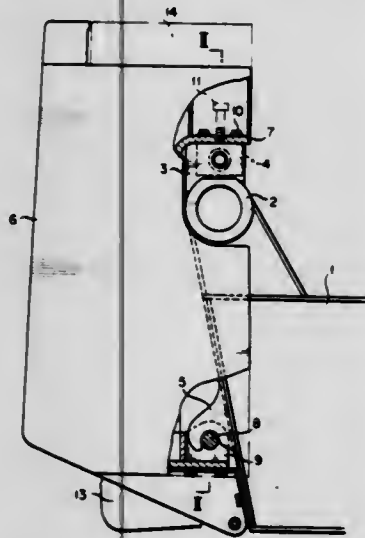
Yoshito Sato, Hirakata; Kazukiyo Chiba, and Minoru Matsumoto, both of Katano, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,083

Claims priority, application Japan, Jun. 25, 1980, 55-88141[U]  
Int. Cl.<sup>3</sup> B60K 11/04

U.S. Cl. 180-68 P

4 Claims



1. A radiator guard structure for a vehicle including an

implement and a pair of lift cylinders for the implement, comprising:

- a frame of the vehicle;
- a pair of lift cylinder supports each for supporting the respective lift cylinders and being fixedly mounted to said frame at an upper end portion thereof;
- a pair of hook means each being fixedly mounted to said frame;
- a radiator cover detachably mounted to said frame;
- a pair of engaging means each being fixedly mounted to said radiator cover at a lower end portion thereof, each said engaging means being adapted to engage with said respective hook means;
- a pair of mounting seat structures each being provided at an upper end portion of said radiator cover; and
- a pair of resilient mounting means each for mounting said respective mounting seat structures of said radiator cover to said respective lift cylinder supports.

4,420,059

## VEHICLE DRIVE SYSTEM

Kunihiko Suzuki, Sagami, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

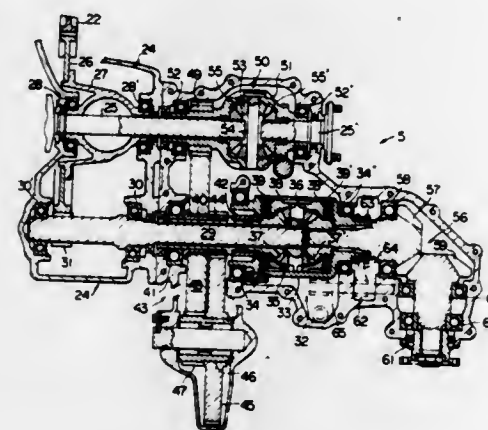
Filed Dec. 30, 1981, Ser. No. 335,679

Claims priority, application Japan, Jan. 9, 1981, 56-2526

Int. Cl.<sup>3</sup> B60K 17/04

U.S. Cl. 180-248

6 Claims



1. A vehicle drive system for a vehicle having at least two pairs of road wheels consisting of a pair of front road wheels and a pair of rear road wheels, comprising, in combination, a power unit having an output shaft having an axis of rotation in a lateral direction of the vehicle, a power transmission gear unit including transmission input and output shafts each having an axis of rotation in a lateral direction of the vehicle, and gears mounted on the transmission input and output shafts and arranged to be capable of selectively producing a plurality of gear ratios between the transmission input and output shafts, the output shaft of the power unit being operatively coupled to the transmission input shaft, said gears including a transmission output gear rotatable with the transmission output shaft; and a power distribution gear unit comprising (a) a power distribution shaft having an axis of rotation in a lateral direction of the vehicle, (b) a power distribution input gear having an axis of rotation aligned with the axis of rotation of the power distribution shaft, (c) an intermediate power transfer gear operatively intervening between the transmission output gear and the power distribution input gear and operative to transmit driving power therethrough from the transmission output shaft to the power distribution shaft, (d) a front-wheel and rear-wheel differential gear assembly arranged to be operative to split into two driving power components the driving power carried to the power distribution shaft, (e) a final reduction gear assembly operative to transmit therethrough one of said driving power components with reduction of speed at a predeter-

mined ratio, (f) a pair of drive shafts axially aligned with each other in a lateral direction of the vehicle and operatively connected to one of said pair of front road wheels and said pair of rear road wheels, (g) a wheel drive differential gear assembly mounted on said drive shafts, said final reduction gear assembly operatively intervening between said front-wheel and rear-wheel differential gear assembly and said wheel drive differential gear assembly, and (h) a right-angle power transfer gear assembly operative to transmit the other of said driving power components to the other of said pair of front road wheels and said pair of rear road wheels, said right-angle power transfer gear assembly including a driven gear having an axis of rotation in a fore-and-aft direction of the vehicle;

in which said final reduction gear assembly comprises an externally toothed ring gear coaxially rotatable on said power distribution shaft, a first reduction gear held in mesh with said ring gear and rotatable about an axis fixed with respect to and substantially parallel with said power distribution shaft, a second reduction gear coaxially rotatable with and smaller in diameter than said first reduction gear and an externally toothed idler gear held in engagement with said second reduction gear and in driving engagement with said wheel drive differential gear assembly.

4,420,060

## ENGINE MOUNT ARRANGEMENT

Toshihiko Kakimoto, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

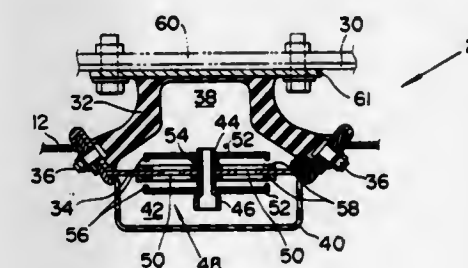
Filed Apr. 24, 1981, Ser. No. 257,177

Claims priority, application Japan, May 2, 1980, 55-58963

Int. Cl.<sup>3</sup> F16F 9/10; B60K 5/00

U.S. Cl. 180-300

11 Claims



1. In a vehicle: an engine; a transmission operatively connected to said engine; a chassis for supporting said engine and transmission; and a mounting arrangement comprising: supporting arms extending laterally from said engine; elastomeric insulators, one disposed at the end of each of said supporting arms for interconnecting said engine to said chassis, said insulators being adapted to undergo shear and permit said engine to roll about an axis which extends therethrough; and a mounting device disposed below said engine and interconnecting said engine and said chassis, said mounting device comprising: a partition connected to said chassis; a first flexible member mounted on a first side of said partition to define a first variable volume chamber, said first flexible member being connected to said engine; a second flexible member mounted on a second side of said partition to define a second variable volume chamber, said first and second chambers containing therein a working fluid; a flow restriction disposed through said partition for fluidly interconnecting said first and second fluid chambers; and a valve arrangement which closes to increase the flow resistance from said first to said second chamber and from said

second to said first chamber in response to a predetermined rate of fluid flow therebetween.

4,420,061

## PENTAGONAL SPEAKER ENCLOSURE WITH A DOWNWARD DIRECTED DYNAMIC DAMPING SYSTEM

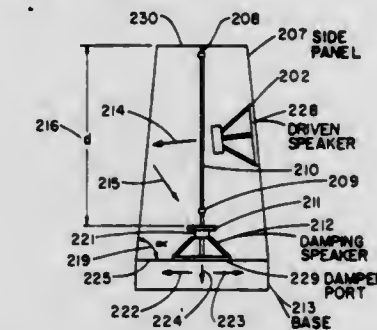
Michael Levy, 160-15 Powells Cove Blvd., Beechurst, N.Y. 11357

Filed Nov. 3, 1980, Ser. No. 203,349

Int. Cl.<sup>3</sup> H04R 7/24, 1/28

U.S. Cl. 181-166

9 Claims



9. A passive damper for subsonic waves comprising:

- (a) a downward facing passive speaker cone,
- (b) a weight attached to the speaker cone,
- (c) an elastic band attached at one end to the weight and extending upwards from the weight,
- (d) means for supporting the opposite end of the elastic band at a distance above the speaker cone to support the band which in turn supports the weight and speaker cone in a neutral position and exerts a restraining force on the motion of the speaker cone in the downward direction proportional to the displacement of the speaker cone from the neutral position to prevent the speaker cone from bottoming and thus avoid damaging the speaker cone, where the speaker cone is subject to subsonic waves.

4,420,062

## AUTOMOTIVE VEHICLE NOISE REDUCTION DEVICE

Masao Fukushima, Fuchu, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

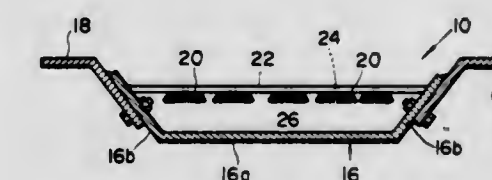
Filed Jun. 24, 1982, Ser. No. 391,931

Claims priority, application Japan, Jun. 26, 1981, 56-95559[U]

Int. Cl.<sup>3</sup> F01N 1/24

U.S. Cl. 181-204

6 Claims



1. A noise reduction device for an automotive vehicle having an engine and a vehicle body, said noise reduction device comprising:

- an under-cover structure fixedly disposed under said engine and including, a plate member securely connected to said vehicle body, a plurality of covering members which are spaced from each other and fixedly disposed between said plate member and said engine, and a sound absorbing material securely attached to each covering member and located opposite to said plate member.



# 4,420,063 ARRANGEMENT FOR REDUCING THE SUCTION AND/OR EXHAUST NOISES FOR RAPID SPEED COMBUSTION MACHINES

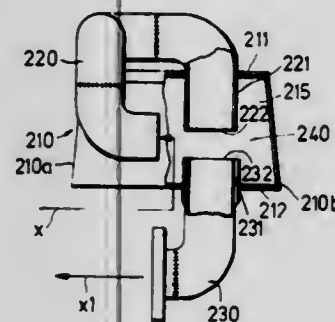
Volker Bohlmann, Hamburg, and Norbert Kanis, Hanover, both of Fed. Rep. of Germany, assignors to Sachs-Dolmar GmbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 81,333, Oct. 3, 1979, abandoned. This application May 3, 1982, Ser. No. 374,526

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1978, 7829489; Oct. 4, 1978, 7829599; Jul. 28, 1979, 2930668 Int. Cl.<sup>3</sup> F02M 35/12; F01N 1/00

U.S. Cl. 181—229

4 Claims



1. Apparatus for reducing the intake noise of high-speed internal combustion engines, such as for internal combustion engine-driven chain saws, lawn mowers and light motor cycles, comprising a closed, box-like casing, characterized in that the casing (210) encloses an inner space and is provided with an air intake connection (220) whose outlet end (221) extends through said casing into the inner space (215) of the casing (210) and a carburetor connection (230) whose inlet end (231) extends through the opposite side of said casing into the inner space (215) of the casing (210) and said inlet end (232) faces and is spaced from the outlet end (222) of the air intake connection located in the inner area (215) of the casing (210) accompanied by the formation of a gap therebetween (240) having a dimension in the axial direction of said air intake connection and carburetor connection within said housing corresponding to the range of 50 to 75% of the diameter of the connections (220,230) which have the same diameter.

# 4,420,064 MEANS FOR LUBRICATING RADIAL SHAFT SEALING RINGS IN GRINDING ROLLS

Ludger Lohnherr, Oelde-Sunninghausen, and Walter Holz, Beckum-Neubeckum, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

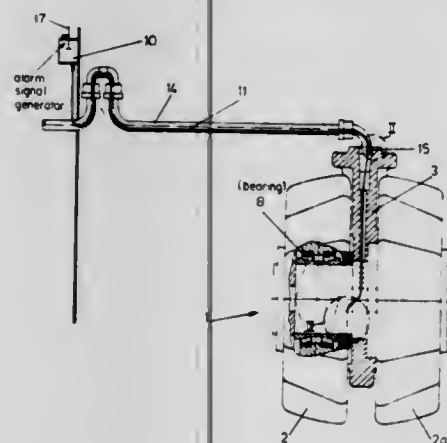
Filed Nov. 21, 1980, Ser. No. 209,010

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 7935481[U]

Int. Cl.<sup>3</sup> F16N 29/02; B02C 15/00

U.S. Cl. 184—1 C

6 Claims



1. In a grinding roll assembly having a roll carrier on which at least one grinding roll is journaled by bearings and on which

a pair of sealing rings is disposed and spaced from one another by a gap, the improvement comprising an air line in communication with said gap, an oil supply, and an oil conduit establishing communication via said air line between said oil supply and said gap.

4,420,065

# RAILWAY BRAKES

John P. Bayliss, Redditch, England, assignor to Lucas Industries Limited, Birmingham, England

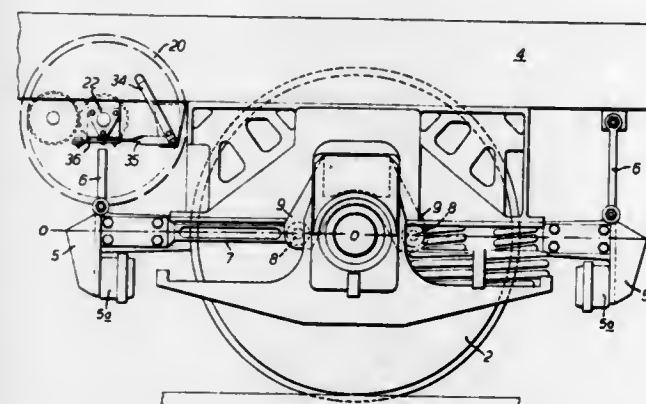
Filed Aug. 19, 1980, Ser. No. 179,534

Claims priority, application United Kingdom, Sep. 7, 1979, 7931225

Int. Cl.<sup>3</sup> B61H 13/38

U.S. Cl. 188—56

4 Claims



1. A tread brake for a railway vehicle including a frame and a wheel having an axis and mounted on the frame by a spring suspension, the brake comprising a braking element comprising an elongate rod of friction material, a power actuator carrying said braking element and operable to drive the rod longitudinally in a substantially radial direction relative to the wheel for applying an end face of said rod against the periphery of the wheel to brake rotation of the wheel, an arm mounting the actuator to said frame for movement relative thereto, said arm being connected to the actuator and directly to the frame by respective pivots both substantially parallel to the wheel axis, a member fixed with respect to the wheel axis, and a rigid link coupling the actuator to said member, said rigid link being immovably fixed to the actuator and being connected to said member by a pivot having an axis substantially parallel to the wheel axis, said rigid link being arranged to move the actuator in response to displacement of the wheel axis relative to the frame so that the actuator applies said end face of the rod against the wheel substantially radially of the wheel axis whatever the position of the wheel axis relative to the frame, said rigid link and said arm mounting said actuator and said rod on the same side of the wheel axis and in the same plane as the wheel.

4,420,066

# CAM LOCK SLACK ADJUSTER

Thomas M. Bogenschutz, Clayton, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Sep. 10, 1981, Ser. No. 300,829

Int. Cl.<sup>3</sup> F16D 65/34

U.S. Cl. 188—107

4 Claims

1. A combined brake actuator, slack adjuster, and lock for railway vehicle brakes comprising, cylindrical brake housing means containing a fluid operable piston and coaxial adjoining hand brake operable means operable to actuate a coaxial tubular push rod for governing application of brakes of a vehicle through slack adjuster means in response to either fluid pressure in a brake cylinder chamber or actuation of the hand brake operable means, wherein improved slack adjusting means is provided for adjustably connecting the piston to the push rod comprising:

(a) actuating rod means having an actuating rod, one end of

4,420,068

# COMBINATION CARRYING CASE AND DETACHABLE GARMENT CARRIER

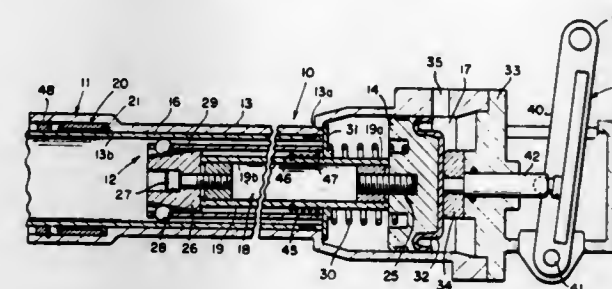
Edward L. Gerch, Chicago, Ill., assignor to Kingport, Ltd., Evanston, Ill.

Filed Dec. 7, 1981, Ser. No. 328,130

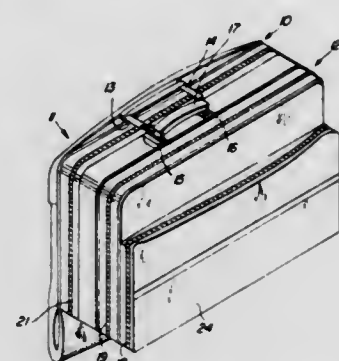
Int. Cl.<sup>3</sup> A45C 3/00

U.S. Cl. 190—102

6 Claims



operable to selectively operably connect the actuating rod means to the inner periphery of the push rod, and  
(c) adjusting means including a friction sleeve on a portion of the outer periphery of the push rod having, restricted free axial movement within the housing for causing axial adjustment of the push rod relative to the actuating rod for automatic slack adjustment for wear in the brakes.



1. In a carrying case of the type wherein flexible material is configured to define a plurality of generally rectangular polyhedral compartments having at least one of an opposed pair of spatially related sidewalls forming at least a portion of a common wall between adjacent compartments, and at least one panel forming a bottom, opposed end walls, and a top for each of said plurality of compartments, each compartment having an opening extending along the top and opposing sidewalls of same with closure means adjacent each opening, means on said case facilitating the carrying of same, and one of said compartments being a substantially hollow primary storage compartment, an improvement comprising:

a second compartment positioned adjacent said first compartment, said second compartment including file means mounted on said common wall between said first and second compartments for segregating any documents positioned in said case,

a third compartment positioned adjacent said first compartment and opposite said second compartment, said third compartment including a plurality of storage compartments mounted on said common wall between said first and third compartments for storing equipment, small documents and the like; and

umbrella storage means positioned in one of said second and third compartments for retention of a collapsible umbrella therein.

4,420,067

# FRICTION MEMBER OF RESIN MOLD TYPE

Yasunobu Yamamoto, Chiryu; Ryoichi Tomikawa, and Masami Ishii, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin Kako Kabushiki Kaisha, both of Kariya, Japan

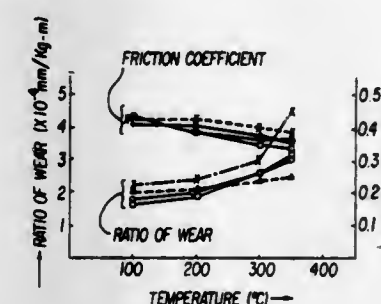
Continuation of Ser. No. 188,265, Sep. 17, 1980, abandoned. This application Apr. 8, 1983, Ser. No. 482,013

Claims priority, application Japan, Sep. 17, 1979, 54-119013

Int. Cl.<sup>3</sup> F16D 69/02

U.S. Cl. 188—251 A

6 Claims



1. An asbestos-free friction member of the resin mold type consisting essentially of:

10 to 70% by weight, based on the total composition, of brass fiber having a diameter of 0.05 to 0.5 mm and a length of 1 to 10 mm;

6 to 15% by weight, based on the total composition, of phenolic resin as binder agent;

20 to 80% by weight, based on the total composition, of an ingredient improving the frictional qualities selected from the group consisting of rubber dust, cashew dust, graphite, metal sulfide, metal oxide and metal powder; and

less than 30% by weight, based on the total composition, of a filler selected from the group consisting of calcium carbonate and silica.

4,420,069

# AUTOMATIC CLUTCH

Hideyuki Ishiwata, Kawasaki, and Kunihiko Ishino, Yokohama, both of Japan, assignors to Automobile Parts Manufacturing Company Limited, Japan

Filed Aug. 1, 1980, Ser. No. 174,607

Claims priority, application Japan, Aug. 24, 1979, 54-107820 Int. Cl.<sup>3</sup> F16D 11/00, 43/02

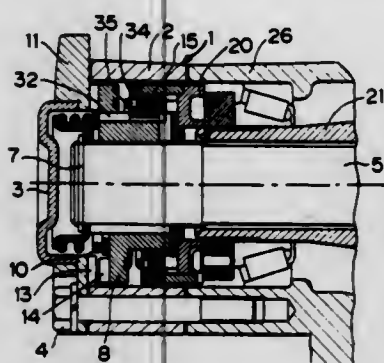
U.S. Cl. 192—35

1 Claim

1. An automatic clutch disposed between driven members comprising, on the driving side, a drive clutch movable only axially relative to the driving member and normally biased in a declutching direction, an outer cam located on the side of said drive clutch to which it is biased, said cam being adapted to move in the same way as said drive clutch, with a spring disposed between said outer cam and said drive clutch to bias them away from each other, a stationary inner cam adapted to be connected to or disconnected from said outer cam as said automatic clutch disengages or engages respectively, said inner cam having projections, a holdout ring having projections to be engaged with said projections of said inner cam and adapted to keep said outer and inner cams out of connection when the driving side stops, said holdout ring being fitted over said outer cam under such frictional conditions that, only when said ring



has engaged said inner cam, said ring can rotate relative to said outer cam, and, on the driven side, a driven clutch fixedly mounted on the driven member, said driven and drive clutches



having facing teeth which are engaged upon movement of said drive clutch against its normal bias to engage said automatic clutch.

4,420,070

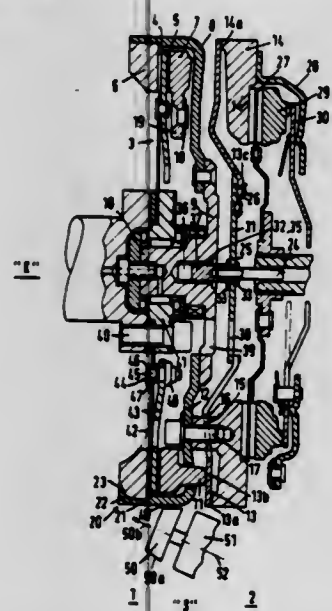
## FRICTION CLUTCH UNIT

Paul Maucher, Sasbach, and Oswald Friedman, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Buhl, Fed. Rep. of Germany  
Continuation of Ser. No. 143,559, Apr. 25, 1980, abandoned.

This application Mar. 2, 1982, Ser. No. 353,873  
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917138

Int. Cl.<sup>3</sup> F02N 5/04; F16D 21/06, 13/44  
U.S. Cl. 192—48.8

28 Claims



1. A friction clutch assembly, comprising a first shaft, such as the crankshaft of an internal combustion engine; a bearing system having a hub rotatable relative to said first shaft; a first clutch including a flywheel body rotatably supported by said bearing system and being operable to engage said flywheel body with and to disengage said flywheel body from said first shaft, said first clutch comprising first and second pressure plates forming part of said flywheel body, a first friction disc between said pressure plates and having first and second friction linings facing the respective pressure plates, means for non-rotatably connecting said friction disc to said first shaft, means for securing said first pressure plate to said bearing system, said second pressure plate being rotatable with and movable axially relative to said first pressure plate, means for urging said second pressure plate away from said friction disc, a first housing part having a radially inwardly extending portion secured to said hub, and a first diaphragm spring arranged to bias said second pressure plate against the respective friction lining; a second shaft, such as the transmission shaft of a motor vehicle; and a second clutch forming part of said flywheel body and operable to engage said flywheel body with or to

disengage said flywheel body from said second shaft, said second clutch comprising an axially fixed first pressure plate, axially extending arms connecting such first pressure plate to said portion of said first housing part, an axially movable second pressure plate, a second friction disc disposed between the pressure plates of said second clutch and secured to said second shaft, a second housing part secured to the first pressure plate of said second clutch, and a second diaphragm spring mounted in said second housing part, the following components of said first and second clutches being adjacent to each other, as considered in the axial direction of said first shaft: (a) the first pressure plate of said first clutch, (b) said first friction disc, (c) the second pressure plate of said first clutch, (d) said portion of said first housing part, (e) said first diaphragm spring, (f) the first pressure plate of said second clutch, (g) said second friction disc, (h) the second pressure plate of said second clutch and (i) said second diaphragm spring.

4,420,071

## SAFETY DEVICE FOR MACHINE HAVING FORCEFUL RECIPROICATION

Fumio Seki, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

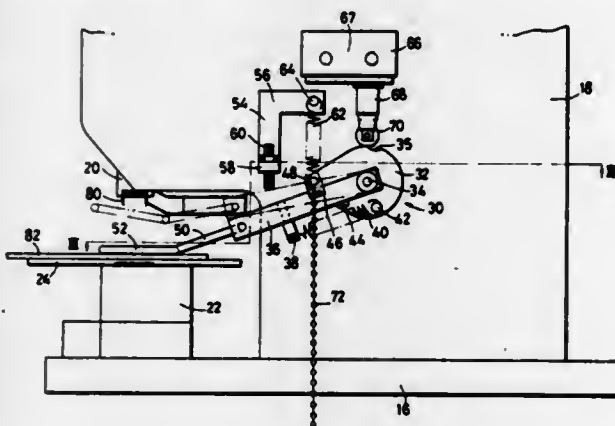
Filed Sep. 21, 1981, Ser. No. 303,929

Claims priority, application Japan, Sep. 19, 1980, 55-133440[U]

Int. Cl.<sup>3</sup> F16P 3/12

U.S. Cl. 192—134

12 Claims



1. A safety device for a forceful reciprocation machine having a frame, a stationary block fixed to the frame and a reciprocating member mounted on the frame, disposed above and in vertically opposed relation to the stationary block, and adapted for vertical reciprocation thereto, said safety device comprising, in combination:

- (a) a sensor pivotally mounted at its one end on the frame and having the other end thereof disposed between the stationary block and said reciprocating member for detecting an obstacle on the stationary block;
- (b) a plate cam pivotally mounted coaxially with said sensor and having a deflection formed on the peripheral surface thereof;
- (c) first means for confining with the stationary block the angular movement of said sensor to a first angular range;
- (d) second means for confining the relative angular movement of said sensor and said plate cam to a second angular range;
- (e) a first spring for urging said sensor in a first pivotal direction relative to said plate cam;
- (f) a second spring for urging said plate cam in a second pivotal direction;
- (g) a switch provided beside said plate cam and having a roller adapted for resilient and rolling engagement with the peripheral surface of said plate cam;
- (h) activating means for turning said plate cam in the first pivotal direction against the bias of said first and second springs; so that said cam plate and said sensor are turned

coextensively over said first angular range against the bias of said second spring until said sensor reaches the stationary block and thereafter said plate cam alone continues to be turned over said second angular range against the combined biases of said first spring and said second spring, whereupon said deflection is brought into engagement with said roller thereby activating the reciprocating member.

4,420,072

## SWITCHING AND CONTROL DEVICE

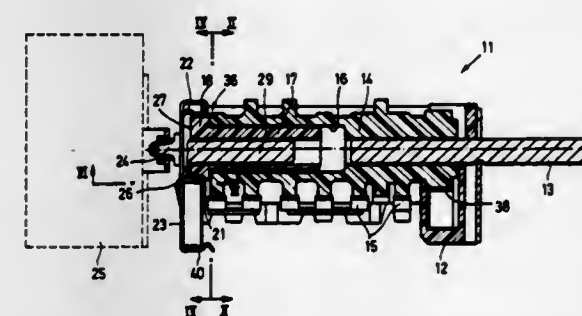
Karl Treffinger, Oberderdingen, and Günther Reimold, Eppingen, both of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,937

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016032

Int. Cl.<sup>3</sup> H01H 9/06; H01C 10/50; G05D 23/00  
U.S. Cl. 192—139

16 Claims



- 1. A switching and control apparatus, comprising: a stepping switch with a rotatable controller barrel; a regulator having a rotatable setting shaft drivable by the controller barrel; clutch means, including a regulator-side coupling member fixed for rotation together with the setting shaft, effective over a predetermined range of angular regulator settings, in which the controller barrel drives the setting shaft, and ineffective at angular settings beyond the predetermined range, during which the setting shaft is not driven by the controller barrel; and, means for restraining rotational movement of the regulator-side coupling member during movement of the controller barrel beyond the predetermined angular range.

4,420,073

## APPARATUS FOR TRANSFERRING ROD-SHAPED ARTICLES FROM A SOURCE OF SUPPLY INTO THE FLUTES OF A CONVEYOR

Nikolaus Häusler, Oststeinbek, and Klaus-Dieter Mallon, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,675

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007880; Dec. 8, 1980, 3046223

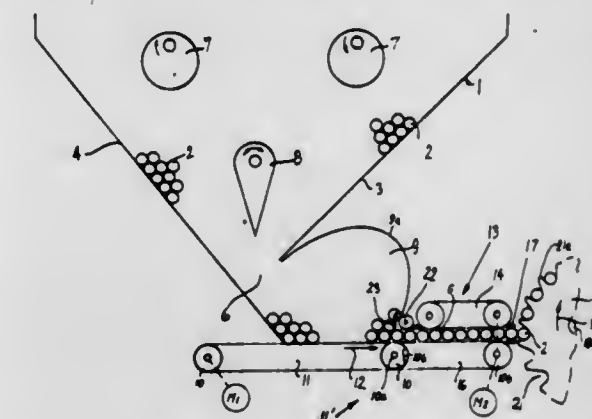
Int. Cl.<sup>3</sup> B65G 1/00

U.S. Cl. 198—347

22 Claims

1. Apparatus for manipulating rod-shaped articles which constitute or form part of smokers' products and have predetermined diameters, comprising a source of supply of substantially parallel articles, said source having outlet means arranged to discharge articles in such a way that the articles move sideways; a driven withdrawing conveyor having a plurality of article-receiving flutes arranged to move along a predetermined endless path and projections alternating with said flutes and tending to interfere with the admission of articles into said flutes at elevated speeds of said withdrawing conveyor; a transfer conveyor system for delivering articles from said outlet means into successive flutes of said withdrawing conveyor, said system comprising a receiving conveyor arranged to receive articles from said outlet means and to

move the articles sideways toward said path, a feeding unit interposed between said receiving conveyor and said path and including a pair of conveyors which define a gap having a width at most equal to said predetermined diameter so that the articles which are delivered by said receiving conveyor form in said gap a single layer successive articles of which are admitted into successive flutes in and substantially radially of said path, and means for driving said receiving conveyor at a speed at least matching the speed of said withdrawing conveyor and



for driving at least one of the conveyors in said feeding unit at a speed exceeding the speed of said withdrawing conveyor; and means defining a pileup zone for articles which have left said outlet means and are about to enter said gap, said pileup zone being located downstream of said outlet means as considered in the direction of travel of articles from said source toward said withdrawing conveyor and said receiving conveyor having first and second portions respectively located below said outlet means and said pileup zone.

4,420,074

## CONVEYORS

Eric R. Thomas, London, England, assignor to Molins Limited, London, England

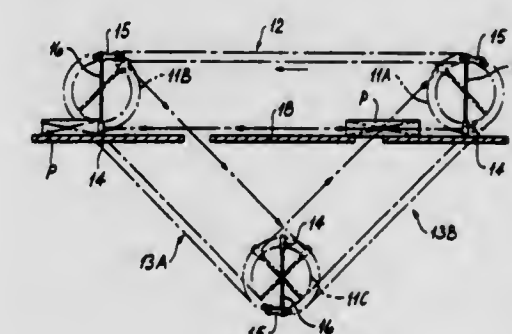
Filed Nov. 13, 1978, Ser. No. 960,148

Claims priority, application United Kingdom, Nov. 16, 1977, 47622/77

Int. Cl.<sup>3</sup> B65G 19/02

U.S. Cl. 198—128

14 Claims



1. A pusher conveyor comprising an endless flexible band, carried on at least two rotary members having parallel axes of rotation and with pushers fixedly secured to and projecting from said band at regular intervals, the free end of each of said pushers including a pusher surface, said band having a working run extending straight between two of said rotary members, characterized in that each pusher is so formed and secured to an associated portion of the band that while each portion is traveling along the working run each said pusher projects through and beyond a plane containing the axes of said two rotary members at the ends of the working run with said pusher surface located entirely on the side of said plane opposite said working run of said band and spaced from said plane, and so that when each said portion of the band commences to



move in an arcuate path around the rotary member at the downstream end of the working run said pusher surface reverses its movement to enter a complementary arcuate path.

4,420,075

# CONNECTING MEMBER FOR CHUTES OF CHAIN-AND-FLIGHT CONVEYORS

Wojciech Skolik; Jozef Wodecki; Zenon Gortat, all of Rybnik; Stanislaw Szyngiel, Leszczyn; Andrzej Bulenda, and Piotr Sopora, both of Rybnik, all of Poland, assignors to Rybnicka Fabryka Maszyn Ryfama Przedsiębiorstwo Państwowe, Rybnik, Poland

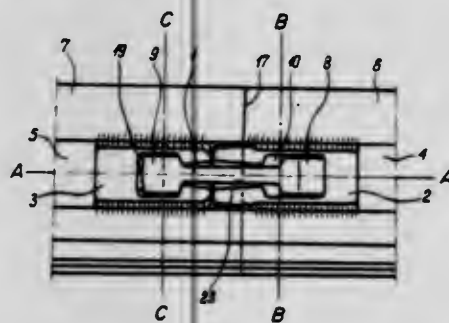
Filed Apr. 8, 1981, Ser. No. 252,510

Claims priority, application Poland, Apr. 10, 1980, 223399

Int. Cl.<sup>3</sup> B65G 19/28

U.S. Cl. 198—735

2 Claims



1. In combination, a connecting means for chutes of a mining chain and flight conveyor, comprising a locking yoke, mounted to the side wall of the end portion of one of the chutes to be connected together, and a catch yoke fixed to the side wall of the end portion of the second of the chutes to be connected and protruding towards the first chute and beyond the edge of said chute to which it is mounted, and a connecting link, said connecting link being shaped to provide on both ends respective flanged shoulders forming a catch end and a locking end, which connecting link is adapted to be placed in corresponding seats formed in said yokes, said catch yoke having a wall limiting the length of the seat for said catch end and which wall has a substantial inclination increasing the length of that seat towards its inside, said locking yoke having a wall limiting the length of the corresponding seat for said locking end and which wall has a small inclination slightly increasing the length of said seat towards its inside, part of the face portion of said catch end of the connecting link having an inclination of a selected size and convergence which corresponds to the inclination of the catch yoke wall limiting the length of the seat of the catch yoke, said locking end of the connecting link being provided with a through hole having a longitudinal axis which is parallel to the side wall of the conveyor chute, an elastic protective shaped link being mounted by a force fit in said locking end through hole, such that one end part of the elastic link is inserted in the hole while the other part, shaped in a form of hammer head, engages said wall limiting the length of locking yoke seat, the summary total outside length of said seats of the both yokes being smaller than the length of the shaped connecting member.

4,420,076

# MOISTURE RESISTANT, QUICK RELEASE PILL CONTAINER

Lois M. Beveridge, 303 Berts Dr., Lothian, Md. 20711, and Harry LaCoste, Kenilworth Towers, Bladensburg, Md. 20710

Filed Jun. 29, 1982, Ser. No. 393,326

Int. Cl.<sup>3</sup> A45C 11/00; B65D 83/04, 85/56, 59/02

U.S. Cl. 206—37

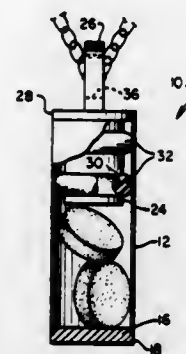
19 Claims

1. A nitroglycerin pill holding device for quick, emergency use to permit a user easy, ready access to the pills almost immediately when indications of a pending heart attack occur comprising:

a primary part comprising a cup-like container having an

open end with an inner circumference of a predetermined size;

a secondary part comprising an insert having an outer circumference of smaller size than said container inner circumference, and slidable relatively loosely into the open end of said cup-like container;



means mounted on said insert for filling the gap between the outer circumference of the insert and the inner circumference of the cup-like container with the dual function of securing the primary and secondary parts securely together and yet rendering them quickly and easily separable by a simple longitudinal pull and also as contaminant excluding structure for protecting pills held within the container.

4,420,077

# DISPLAY CARD WITH CONCAVE PANEL

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

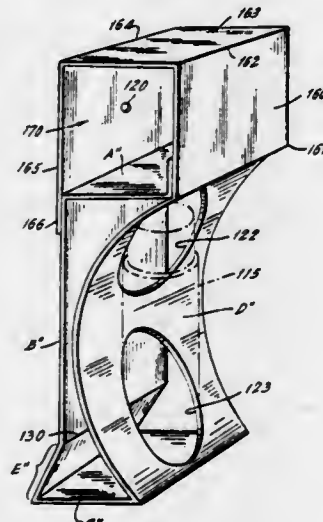
Continuation-in-part of Ser. No. 196,662, Oct. 14, 1980, Pat. No. 4,362,239. This application Oct. 9, 1981, Ser. No. 309,909

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B65D 5/50

U.S. Cl. 206—45.14

2 Claims



1. A display support for an article of merchandise, said support comprising:

(a) a back wall;

(b) a top horizontal wall;

(c) a bottom horizontal wall;

(d) a concave front wall extending between front ends of said horizontal walls, said concave front wall having at least one opening for supporting merchandise to be displayed on said support, and said concave front wall having a smooth curvature from the front end of said top horizontal wall to the front end of said bottom horizontal wall;

(e) a transverse score line disposed in said back wall, said transverse score line being closer and parallel to the plane of said bottom horizontal wall, said back wall bending at

said transverse score line to maintain the smooth curvature of said concave front wall, said transverse score line being spaced from said bottom horizontal wall a distance E which distance E is determined by the formula:

$$E = [(A + B + C) - D] / 2$$

wherein A and C are the lengths of said two horizontal walls; B is the length of said back wall; and D is the length of said concave front wall;

(f) a first panel extending upwardly from an upper edge of said concave front wall;

(g) an upper horizontal panel disposed above said top horizontal wall and extending rearwardly from a top edge of said first panel;

(h) a second panel extending downwardly from a rearward edge of said upper horizontal panel, said second panel overlapping and being adhered to said back wall, said first and second panels and said upper horizontal panel combining with said top wall to providing a substantially rectilinear reinforcing structure providing means for receiving material in addition to the merchandise displayed in said concave front wall.

4,420,078

# CARRYING CASE FOR A CARDIAC PACER

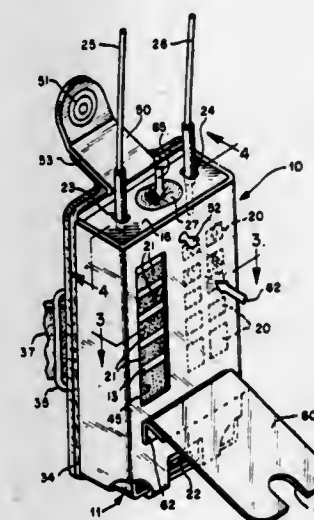
Kenneth W. Belt, Fort Atkinson, and John S. Mattson, Milton, both of Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Oct. 30, 1981, Ser. No. 316,780

Int. Cl.<sup>3</sup> B65D 85/38

U.S. Cl. 206—305

13 Claims



1. A carrying case for use in conjunction with a portable cardiac pacer having a housing of generally rectangular cross-section having top, bottom, front, rear, left and right side panels, the front and top panels of the housing each including at least one physician-actuable control, said carrying case comprising:

a body portion including bottom, front, rear, left and right side walls and a top rim portion forming an enclosure having an interior cross-section generally corresponding to that of the pacer housing for receiving the housing, the top panel of the housing extending generally to the plane of said rim portion when the pacer is seated in said enclosure;

means including a first flap panel extending from said rear panel to said front panel and over said physician-actuated top panel control, said first flap panel being hingedly mounted to said body portion whereby said flap panel can be hinged away from said rim portion to allow actuation of said top panel control and removal of said cardiac pacer from said enclosure;

means including a second flap panel extending over at least that portion of said front wall corresponding to said physician-actuated front panel control and substantially to said

rim portion, said second flap panel being hingedly mounted to said body portion whereby said panel can be hinged away from said front wall to allow actuation of said front panel control; and

user-actuable fastener means for fastening the free ends of said flap panels to each other and to said body portion whereby the cardiac pacer is retained in said enclosure and said physician-actuated controls are protected against inadvertent actuation by applied pressure from the exterior of the carrying case.

4,420,079

# CONTAINER FOR TAPE-LIKE MATERIAL

Lothar Glinorz, Frankenthal; Peter Dobler, Ludwigshafen; Klaus Schoettle, Heidelberg; Joachim Flohr, Viernheim, and Rolf Maerthesheimer, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

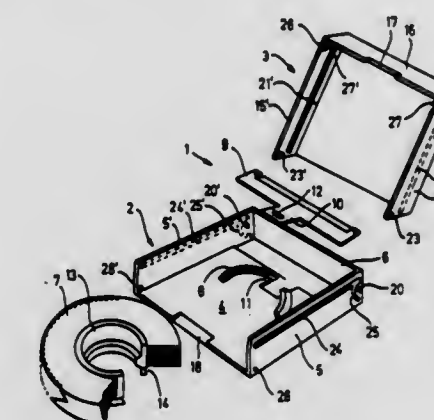
Filed Feb. 20, 1981, Ser. No. 236,501

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006864

Int. Cl.<sup>3</sup> B65D 85/67, 43/20, 5/64; G11B 23/02

U.S. Cl. 206—387

7 Claims



1. A container for web-like material, especially magnetic tape wound onto one or two rolls or stored in a cartridge, for operation on a drive mechanism, said container being designed to assume an open or closed condition such that said container, when in its open condition is open for access to said rolls or cartridge by said mechanism both at its front and at its top, and when in its closed condition, is closed all around for protection of the tape or cartridge,

said container having bottom and top parts and means pivotally connecting said bottom and top parts together,

said bottom part having bottom, side and rear walls and means for accommodating the rolls or cartridge, and said top part having at least a top wall with a front wall attached thereto, and

said connecting means having means, including pivots and a set of longitudinal guides on said two parts, respectively, for telescoping, in said open position said top part underneath said bottom part, thereby safeguarding said access at a minimum of space,

wherein the pivots are rotatable and slidable relatively to the guides and, said guides, with said container in telescoped condition, running parallel to said bottom and top walls, wherein said telescoping means include means for insuring parallelity between said two parts during the telescoping movement, and

wherein a second set of guides which run parallel to the first-mentioned set is provided on one of the two container parts, and guide pins for the second set are provided on the other part, arcuate sections of the second set of guides extending around the pivots, the radius of the arc corresponding to the distance between the pivots and the guide pins.



4,420,080

**RE-SEALABLE DISPENSER-CONTAINER**

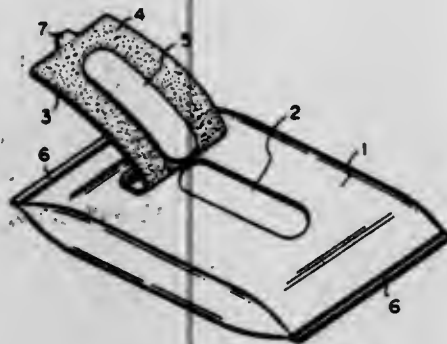
Kenji Nakamura, 3-7, Nishiwaji 6-chome, Higashiyodogawa-ku, Osaka, Japan

Division of Ser. No. 210,602, Nov. 26, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,554

Int. Cl.<sup>3</sup> B65D 81/24

U.S. Cl. 206—449

1 Claim



1. A re-sealable dispenser-container for containing sheet-like fiber material for make-up or toilet use, comprising a main body of container made of impervious material and having at least one opening for covering said opening attached to said main body by an adhesive layer formed on the surface of said flap which faces said opening, characterized by: further comprising a non-adhesive member for covering said opening, said member having a shape similar to and larger than said opening and being disposed on the opening inside of the main body before using the container, whereas after use, said member is drawn out through the opening and attached to said flap.

4,420,081

**STEP-WALL NESTABLE CUP**

Kenneth B. Dart, Okemos, Mich., assignor to Dart Container Corporation, Mason, Mich.

Filed Jun. 22, 1981, Ser. No. 276,016

Int. Cl.<sup>3</sup> B65D 21/02

U.S. Cl. 206—519

6 Claims



1. A step-wall nestable cup comprising: a base portion having an integrally formed sidewall extending upwardly therefrom to terminate at an upper peripheral edge so as to define a container, said sidewall including a first lower inner wall surface tapering upwardly to an outwardly extending inner offset step and a second upper inner wall surface tapering upwardly from said inner offset step, said sidewall including a first lower outer

wall surface tapering upwardly to an outwardly extending outer offset step and a second upper outer wall surface tapering upwardly from said outer offset step, said outer offset step being located below and spaced-apart from said inner offset step so as to define an annular thickened portion therebetween.

4,420,082

**TAB MOUNTED DISPENSER**

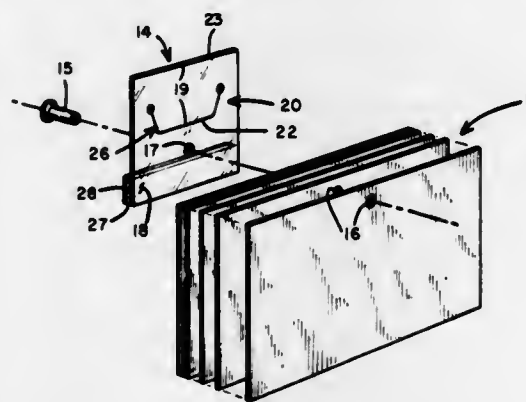
Jack Bernie, Edina, Minn., assignor to Process Displays Company, North Minneapolis, Minn.

Filed Sep. 3, 1982, Ser. No. 414,585

Int. Cl.<sup>3</sup> B65D 85/00; G09F 1/00

U.S. Cl. 206—526

4 Claims



1. A dispenser for presentation and taking of a plurality of sheets on a one-by-one basis comprising:

- (1) a plurality of sheets;
- (2) a hanger for supporting the plurality of sheets from a price channel having top and bottom flanges or against a vertical surface, the hanger (a) fabricated of flat flexible material, (b) having a channel section and an adhesive section, the channel section having a tab, the lower edge of the tab extending in a straight line parallel to the upper edge of the channel section and spaced from the upper edge of the channel section a distance greater than the vertical distance between the top and bottom flanges of the price channel, (c) the hanger having pressure sensitive adhesive on the rear surface of the adhesive section and having a release liner covering the adhesive;
- (3) a pivot linking the plurality of sheets and the hanger, the pivot being connected to the hanger at a point below the tab and being connected to the plurality of sheets at a point along a vertical line which line divides the plurality of sheets into two equal halves so that the hanger can be pivoted from a first position where the channel section is uppermost and the lower edge of the tab and the upper edge of the channel section can be engaged with the price channel to support the plurality of sheets, to a second position where the adhesive section is uppermost and the adhesive can attach the hanger to a vertical surface to support the plurality of sheets.

4,420,083

**PILL BOTTLES**

Michel M. Baustin, 1066 E. 81st St., Brooklyn, N.Y. 11236

Continuation of Ser. No. 243,885, Mar. 16, 1981, abandoned.

This application May 20, 1982, Ser. No. 380,420

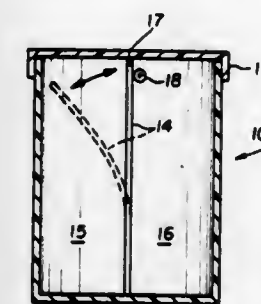
Int. Cl.<sup>3</sup> B65D 83/04, 85/42

U.S. Cl. 206—538

3 Claims

1. A pill bottle adapted to facilitate dispensing the proper daily dosage of pills from a total supply of pills in the bottle, said bottle comprising an open top container for holding a plurality of pills, removable closure means for closing the open top of said container, and flexible resilient means secured to the interior of said container adjacent the bottom thereof and extending substantially to the top of said container for dividing said container into two separate open ended pill compartments

both of which are accessible when said closure means is removed, said flexible resilient means having edges slightly spaced from the container so that said means can be flexed to close one of said compartments, the spacing of the edges of said resilient means from said container and the top thereof being such that a pill cannot pass from one pill compartment to the other when said closure means is in place, said flexible resilient means being adapted, when flexed, to close one of said com-



partments and, when released, to return to its initial position to give access to both pill compartments, the arrangement being such that a total supply of pills can be placed in the one of said pill compartments which is closed upon flexure of said flexible resilient means and a daily dosage of the pills placed into the other of said pill compartments from which they are dispensed for use while the other compartment is closed by said flexible resilient means.

4,420,084

**JEWELRY HOLDING DEVICE**

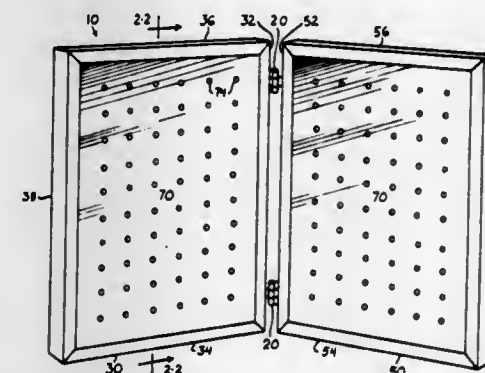
Elizabeth M. Whelan, 34631 Sequoia, McHenry, Ill. 60050

Filed May 17, 1982, Ser. No. 378,645

Int. Cl.<sup>3</sup> A47F 5/08; A47B 67/02; B65D 25/10, 5/52

U.S. Cl. 206—566

8 Claims



1. A device for holding jewelry comprising at least two frames, a jewelry holding means secured within said frames, and a securing means for attaching said frames together in an open display manner or a closed storage manner, said jewelry holding means being a rigid sheet, said frames being substantially thicker than said rigid sheet and said rigid sheet is secured within said frame at about the middle thereof to thereby permit said frames to protect a decorative portion of pierced earrings and a base portion of said pierced earrings or other jewelry.

4,420,085

**STAND UP ORGANIZER**

Earl D. Wilson, Ingleside, and Martin J. Holmes, Chicago, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Jan. 15, 1982, Ser. No. 339,537

Int. Cl.<sup>3</sup> B65D 69/00, 71/00

U.S. Cl. 206—571

5 Claims

1. An organizer for a medical procedure, comprising: a syringe having a hollow barrel;

an elongated cap releasably attached to a distal portion of the syringe;  
a tray having an upper wall, and a syringe recess in said upper wall shaped to frictionally engage and releasably secure a distal end of said cap with the syringe in an upright position, said syringe recess further comprising means defining a plurality of bosses therein, the said bosses frictionally engaging and releasably securing the distal end of said cap therewithin;  
an elongated groove defined in the upper wall of said tray for receiving the syringe in a lay-flat condition;  
an ampoule having a hollow body portion and a top which may be broken from the body;  
an additional, elongated groove defined in the upper wall of said tray for receiving the ampoule in a lay-flat condition; and



an ampoule recess defined in an end of said additional, elongated groove for receiving the body portion of the ampoule with the ampoule in an upright position;  
whereby, during a medical procedure, the ampoule top is broken from the ampoule to provide access to liquid contents in the ampoule body portion, the ampoule is placed upright in the ampoule recess, the syringe is placed in an upright position with the distal end of the cap inserted in the syringe recess between the bosses therein, the syringe is removed from the cap, the cap being retained by the bosses of the syringe recess, the syringe is manipulated to withdraw liquid contents from the ampoule hollow body, and, after use of the syringe in a medical procedure, the syringe is again placed in the cap, in an upright position.

4,420,086

**FILING HANGER**

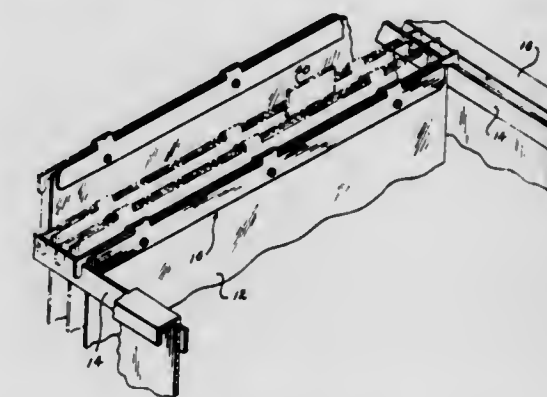
Peter G. Bards, Milwaukee, Wis., assignor to Bards Products, Inc., Milwaukee, Wis.

Filed Dec. 16, 1980, Ser. No. 217,173

Int. Cl.<sup>3</sup> A47B 63/00

U.S. Cl. 211—46

8 Claims



1. A filing hanger for supporting the upper edge of a vertically hanging sheet of material on a pair of spaced horizontal bars, said sheet having a plurality of perforations along the upper edge, said hanger comprising:



a first strap extending across the upper edge of the sheet along one side thereof;  
 a second strap extending across the upper edge of the sheet along the other side thereof, at least one of said first and second straps having a hook means at each end suitable for engaging one of the spaced bars; and  
 means mounted on one of the straps extending through the perforations in the sheet for coaction with means on the other of said straps for removably fastening said straps to each other and to the sheet, said fastening means including projections on one of said straps lockingly engaging holes on the other of said straps, each said projection including a circular base having an end section of reduced diameter terminating in an annular ridge, and wherein each said hole in said other strap is sized to lockingly engage said end section and ridge of a projection.

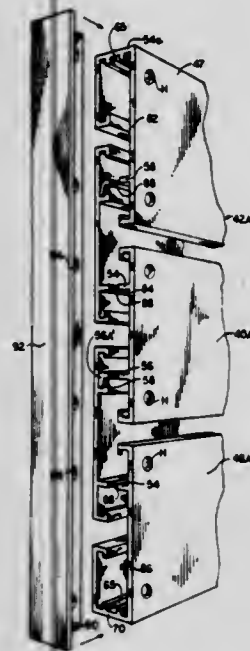
4,420,087

## ARTICLE DISPLAY DEVICES

Robert L. Johns, 927 Azalea La., Vero Beach, Fla. 32960  
 Continuation-in-part of Ser. No. 129,686, Mar. 12, 1980, Pat. No. 4,323,163, which is a continuation-in-part of Ser. No. 116,404, Jan. 29, 1980, abandoned. This application Jan. 2, 1981, Ser. No. 222,246  
 Int. Cl.<sup>3</sup> A47F 5/00

U.S. Cl. 211—189

20 Claims



1. A member for use in forming an article display unit which comprises:  
 a first rectangular web having a length substantially greater than its width,  
 a second rectangular web having a length substantially greater than its width,  
 said first and second webs being spaced apart parallel to each other with only a minor portion of the first web overlapping an equivalent portion of the second web,  
 a third web integral with said first and second webs and perpendicular thereto fixing said first and second webs in said spaced apart, parallel position,  
 an integral leg element extending laterally from said first web intermediate the longitudinal edges thereof in the direction of said second web,  
 an integral lug element extending laterally from said second web intermediate the longitudinal edges thereof in the direction of said first web and spaced apart from said leg element,  
 said leg element being structured to interlock with a portion of a lug element of another of said members.

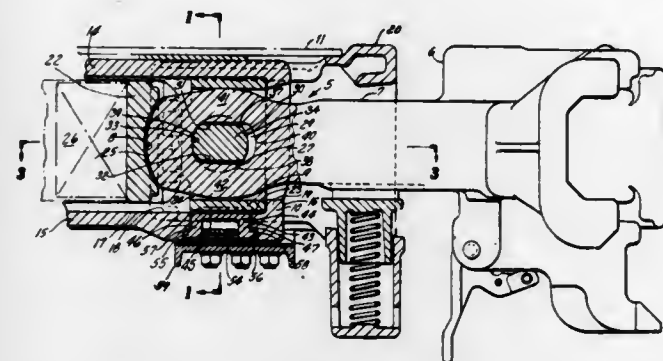
4,420,088

# ROTARY RAILROAD CAR COUPLER ASSEMBLY WITH A HORIZONTAL KEY/SLOT ARRANGEMENT

William J. Metzger, Willowick, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio  
 Filed Oct. 28, 1981, Ser. No. 315,926  
 Int. Cl.<sup>3</sup> B16G 7/10, 9/20

U.S. Cl. 213—50.5

14 Claims



1. A rotary railroad car coupler assembly which, when the coupler is horizontally disposed in a pull or buff position, comprises:

- a yoke having a cylindrical opening which extends longitudinally into the yoke from a front end of the yoke closest the head of an attached car coupler;
- a rotary connector mounted in the opening of the yoke for rotation about the rotational axis of the yoke, the connector having an opening which extends longitudinally through the connector and which communicates with a pair of horizontally aligned and oblong shaped slots which extend laterally from the opening in the connector, each slot defined by two pairs of oppositely disposed surfaces which are convexly curved outwardly from the center axis of the slot;
- means for restricting movement of the rotary connector longitudinally of the yoke;
- a car coupler having, a head which protrudes from the front end of the yoke for coupling engagement with another coupler, and a shank which is attached to the head and extends into the opening of the yoke and rotary connector, the shank having a butt end which extends through the opening in the rotary connector for seating engagement against a front follower which is spring loaded in the direction of the coupler head, the shank having a horizontally oblong slot extending therethrough adjacent the butt end thereof in horizontal alignment with the aligned slots in the rotary connector, the slot in the shank having a first pair of generally horizontally disposed surfaces which are connected at their opposing ends by a second pair of surfaces which are convexly curved outwardly from the center axis of the slot, the curvature of said connecting surfaces being complementary to adjacent similarly disposed and curved surfaces of the slots in the connector;
- means for keying the coupler to the rotary connector for unitary rotation, including a key extending horizontally through the aligned slots of the shank and rotary connector, the key having a horizontally oblong cross-sectional configuration which is smaller in area than that of the slots, the key having two pairs of oppositely disposed surfaces which are convexly curved outwardly from the center axis of the key and which are complementary to the curvature of the adjacent surfaces of the aligned slots of the rotary connector, the one pair of opposing curved surfaces being generally horizontally disposed and designed for rocking engagement with the similarly oriented first pair of surfaces of the slot in the shank to increase the vertical angling of the coupler, the key having a pair of opposing ends which are cylindrically shaped, as distinguished from prior art keys and cylindrical pins which have opposing ends that are flat or spherical.

11. A non-rotatable pin block insertable in the bottom opening of a rotary railroad car coupler yoke to retain a key in the yoke, comprising:

- a curved pin block surface designed to be in cylindrical relation with an inner surface of a cylindrical opening disposed in the yoke when the pin block is properly positioned in the bottom opening of the yoke;
- a non-circular pin block body including at least two pairs of parallel legs extending from the curved surface of the pin block, the first pair of legs having between their opposing ends a pair of aligned pinholes with identical rectangular cross-sections, the aligned pinholes being aligned with adjacent similarly shaped pinholes in the yoke when the pin block is properly positioned in the bottom opening of the yoke, the second pair of legs terminating at distal ends which have a pair of wings which extend laterally from the pin block into matingly configured recesses that extend laterally from the bottom opening of the yoke, when the pin block is properly positioned in the bottom opening of the yoke;
- a pin insertable in the aligned pinholes, the pin having a similar, but smaller cross-section than those of the pinholes, the pin coacting with the wings to limit axial movement of the pin block in the bottom opening of the yoke in a direction to and from the cylindrical opening in the yoke, whereby the curved surface of the pin block is maintained in substantial cylindrical alignment with the adjacent cylindrical surface of the yoke.

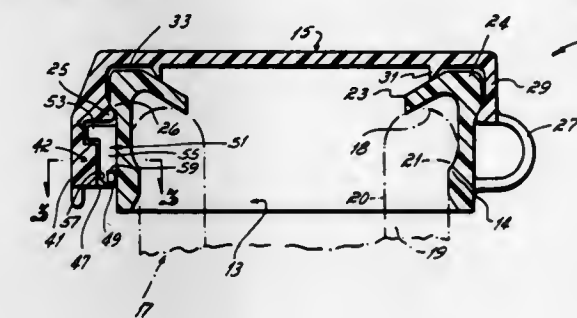
4,420,089

# CONTAINER CLOSURE HAVING CHILD-SAFETY MEANS

Charles B. Walker, 4316 Backmeyer Rd., and Walter L. Holt, Sr., 915 N. 16th St., both of Richmond, Ind. 47374  
 Filed Jul. 28, 1982, Ser. No. 402,430  
 Int. Cl.<sup>3</sup> B65D 55/02

U.S. Cl. 215—216

20 Claims



1. A safety closure for sealingly closing an access opening of a container, said safety closure comprising:

- a cap and a sleeve, said sleeve being adapted to be sealingly secured over said access opening of said container, said sleeve having an open mouth forming an access opening of said closure, said cap being hinged to said sleeve for removably engaging the mouth thereof;
- a flap disposed on one side of said cap and hinged thereto;
- a locking assembly for securing said cap over said sleeve mouth, said locking assembly comprising a female locking element and a male locking element, said female locking element including a pair of spaced edge sections forming a slot therebetween, said female locking element being disposed on one of said flap and sleeve, said male locking element including a ledge section and a projection extending perpendicularly relative to said ledge section, said projection and ledge section being disposed on the other of said flap and sleeve, said flap being movable to urge said spaced edge sections of said female locking element into engagement with said projection of said male locking element so as to dispose said projection in said slot therebetween with said edge sections of said female locking element abutting said ledge section of said male locking

element to prevent removal of said cap from said sleeve mouth without first releasing said locking assembly.

4,420,090

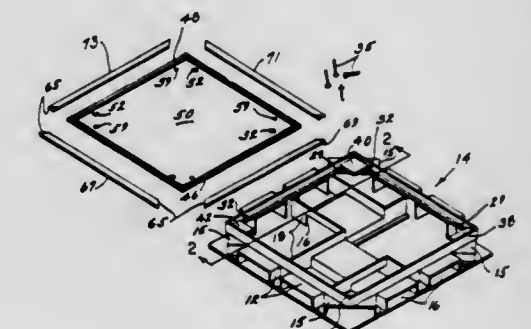
## JUNCTION BOX

Frank P. Thorpe, Streetsville, and Leslie O. Calhoun, Richmond Hill, both of Canada, assignors to CTS Corporation, Elkhart, Ind.

Filed May 22, 1980, Ser. No. 152,379  
 Claims priority, application Canada, May 16, 1980, 352079  
 Int. Cl.<sup>3</sup> H02G 3/12

U.S. Cl. 220—3.7

7 Claims



1. A junction box for encasement in concrete and comprising a substantially square box, an outer frame assembly consisting of a base portion and an inner frame assembly, said inner frame assembly being supported on said base portion, means forming a part of said outer frame assembly for abutting against a concrete surface, a plurality of weight carrying adjusting screws received through said base portion of said outer frame assembly to effect selective adjustment of said inner frame assembly relative to said abutting means and the concrete surface, a cover plate forming a part of said inner frame assembly, a header forming part of said inner frame assembly and circumscribed by said outer frame assembly and supported by said weight carrying adjusting screws, said header having a groove about the periphery thereof, and a trim comprising a central shank adapted to be force fitted within the groove of said header, and lateral means also forming a part of said trim and extending around the perimeters of said cover plate and outer frame assembly.

4,420,091

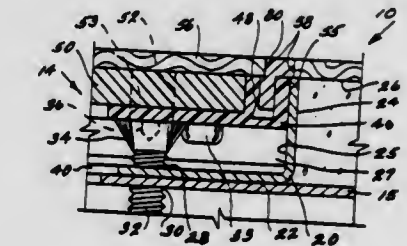
## JUNCTION BOX

Frank P. Thorpe, Streetsville, and Leslie O. Calhoun, Richmond Hill, both of Canada, assignors to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 152,379, May 22, 1980. This application Sep. 20, 1982, Ser. No. 419,778  
 Int. Cl.<sup>3</sup> H02G 3/12

U.S. Cl. 220—3.7

3 Claims



1. A junction box for encasement in concrete, comprising a box having duct receiving openings and dividers therein, an outer perimeter assembly including a base section, an outer wall surface of said outer perimeter assembly adapted to abut against a concrete wall and operatively secured to said base section, a plurality of weight carrying adjusting screws each



receivable in a respective threaded opening in said base section and disposed in the outer periphery at spaced locations of said base section, an inner cover assembly disposed within the area circumscribed by said outer perimeter assembly and including a header and a cover plate supported by the screws receivable in the base section and said screws selectively adjustable to effect adjustment of said inner cover assembly relative to said outer wall surface and the concrete wall, said header providing support for said cover plate and having a groove at the outer periphery thereof, and a stepped trim provided with a bottom section force fittable within said groove and a top section extending above the top of said inner cover assembly to position a floor covering therewith.

**4,420,092**  
**TAMPER-RESISTANT PHARMACEUTICAL VIAL AND CAP ASSEMBLY**

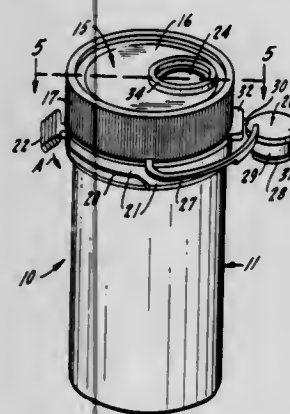
Sam D. Finkelstein, Canton, Ohio, assignor to MPL Inc., Chicago, Ill.

Filed Sep. 1, 1982, Ser. No. 413,623

Int. Cl.<sup>3</sup> B65D 51/18

U.S. Cl. 220—254

10 Claims



1. In a tamper-resistant pharmaceutical vial and cap assembly comprising an open-top vial for dispensation of a predetermined dosage of a pharmaceutical preparation and a molded cap of resilient material mounted on and covering the top of the vial, the cap having an integral skirt, encompassing the upper portion of the vial, the inner surface of the skirt and the outer surface of the upper portion of the vial comprising complementary mating interlock elements precluding manual removal of the cap from the vial, the cap further comprising a tear member defined by at least one weakened junction line such that removal of the tear member permits ready removal of the cap from the vial;

the improved construction permitting filling of the vial after the cap has been mounted on the vial but precluding post-filling contamination or tampering, comprising:  
a fill hole in the top of the cap affording access to the interior of the vial for filling the vial with the cap mounted on the vial;

and a stopper insertable in the fill hole to close and seal the fill hole after filling of the vial, the stopper having a configuration effectively precluding manual removal of the stopper from the fill hole after insertion therein.

**4,420,093**  
**MOLDED BUCKET AND LID HAVING HIGH STACK STRENGTH**

John W. Von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648  
Continuation-in-part of Ser. No. 319,933, Nov. 10, 1981, and Ser. No. 329,258, Dec. 10, 1981, Pat. No. 4,380,305. This application Mar. 9, 1982, Ser. No. 356,496

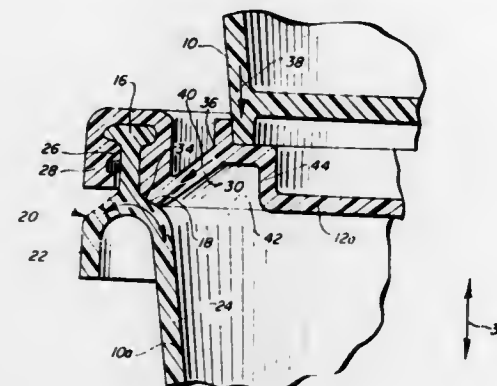
Int. Cl.<sup>3</sup> B65D 41/16, 41/18

U.S. Cl. 220—306

9 Claims

3. A molded bucket, which comprises:

a bucket lip defining an enlarged, annular projection at the mouth of said bucket;  
an inwardly positioned, annular self facing said mouth adjacent said lip;  
an outwardly positioned annular flange joined to said bucket adjacent said annular shelf, to provide extra hoop strength to the area of said annular shelf, which carries a lid attached to said lip, said lid defining in one piece a peripheral, annular recess receiving said annular projection in



locking relation, and an annular, straight wall which extends radially inwardly from the vicinity of said recess at an angle of essentially 20° to 60° from the axis of said bucket, said annular straight wall being positioned with its outer edge adjacent said annular recess and abutting said annular shelf, and its inner edge extending outwardly toward said mouth relative to the outer edge, whereby said bucket and lid exhibit high stacking strength, an annular, upstanding flange is provided on the outer side of said lid at the inner edge of said annular recess.

**4,420,094**  
**VENT CAP**

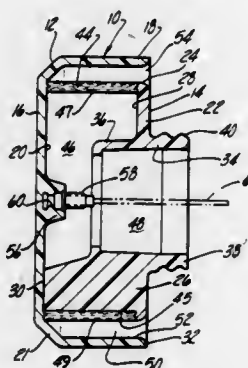
James P. Chapin, 1300 Arborview Blvd., Ann Arbor, Mich. 48103

Filed Jan. 21, 1982, Ser. No. 341,518

Int. Cl.<sup>3</sup> B65D 51/16

U.S. Cl. 220—37

15 Claims



1. A vent cap comprising:

a body having a top wall, a bottom wall and a closed side wall, said top, bottom and side walls defining an interior chamber,

a plurality of circumferentially spaced ribs extending and secured between the top and bottom walls,

a tubular member extending outwardly from the bottom wall, said tubular member having threads formed on its outwardly extending end and open at its other end to said chamber,

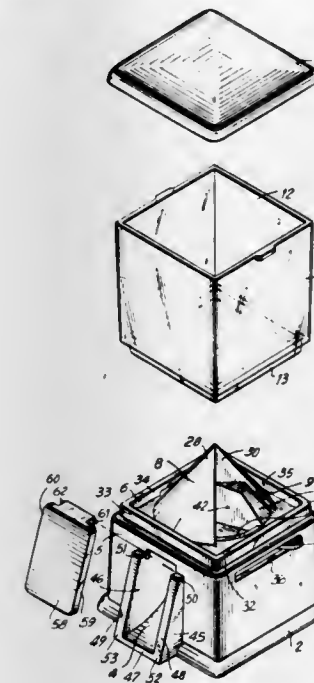
an annular filter entrapped between the top wall and bottom wall at a position spaced inwardly from said side wall so that one side of said filter is open to the interior chamber, said filter forming an annular subchamber between the air filter and the closed side wall, and

at least one opening formed through said bottom wall and open to said annular chamber.

**4,420,095**  
**MINIATURE GUM MACHINE**  
David Galoob, 90 Beachmont Dr., San Francisco, Calif. 94132  
Filed Nov. 23, 1981, Ser. No. 324,068  
Int. Cl.<sup>3</sup> B65G 59/00

U.S. Cl. 221—265

9 Claims



1. A miniature item machine, comprising

a base member having a bottom, a top spaced therefrom and a chute formed therein and extending from the top to the bottom thereof;

a base housing member fitted on said base member and having a top part spaced from the top of said base member, said top part having an opening formed therein partially extending over said chute and a dispenser housing of substantially conical configuration extending upward therefrom around part of said opening, said dispenser housing having an axis, a solid apex portion and a hollow base portion whereby said base portion next-adjacent the top of said base member is of substantially frusto-conical configuration;

a dispenser device rotatably mounted in the dispenser housing of said base housing member on the top of said base member and having an arm extending from said base housing member for selectively manually rotating said dispenser device;

a storage receptacle of substantially sleeve-like configuration having an open top and a spaced open bottom affixed to the top part of said base housing member for storing miniature items whereby a predetermined number of said items are selectively dispensed from said storage receptacle to said chute and thence out of said chute by manual rotation of said dispenser device; and

a cover removably mounted on the top of said storage receptacle for providing access to said receptacle.

**4,420,096**  
**CHILD-RESISTANT ACTUATOR COVER**  
Donald C. Kirk, Jr., Midlothian, Va., assignor to Ethyl Products Company, Richmond, Va.

Continuation-in-part of Ser. No. 826,276, Aug. 22, 1977, abandoned. This application Jun. 12, 1981, Ser. No. 273,003  
Int. Cl.<sup>3</sup> B65D 47/34

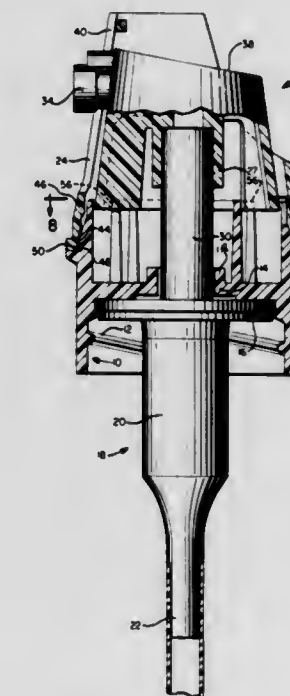
U.S. Cl. 222—44

14 Claims

1. An actuator assembly for a dispensing device comprising, in combination:

a. a cap body piece having

i. means for attachment to a container,  
ii. an exterior peripheral surface for engagement by the fingers of the user to enable said cap body piece to be manually screwed onto said container neck,  
iii. side walls connected by a flange having a hole therein for receipt of pump plunger means,  
iv. two arcuate protuberances projecting upwardly from said flange inside said side walls to define a first slot and a second slot, said first slot being larger than said second slot;  
b. a generally round, operable dispensing button and means mounting said button on said cap body piece for both rotation through 360 degrees and axial movement while



preventing tilting movement, said button having a downwardly extending skirt with a lower edge fitting closely within said sidewalls and having three tabs projecting radially inwardly from said skirt, two of said tabs being arranged close enough together to be received within said first slot and the remaining tab being arranged to be received in said second slot when said button is positioned in the dispensing mode permitting axial movement of said button;

c. a cover piece enclosing said button and adapted to expose a portion of the button for finger engagement; and,  
d. a guide on said button and said cover piece for preventing relative turning therebetween while enabling relative axial movement to be had.

**4,420,097**  
**PORTABLE LIQUID DISPENSER WITH CARRYING CASE**

Gregg A. Motsenbocker, 874 Felspar St., San Diego, Calif. 92109

Filed Jan. 15, 1981, Ser. No. 225,267

Int. Cl.<sup>3</sup> B65D 33/06, 33/36, 35/14

U.S. Cl. 222—131

17 Claims

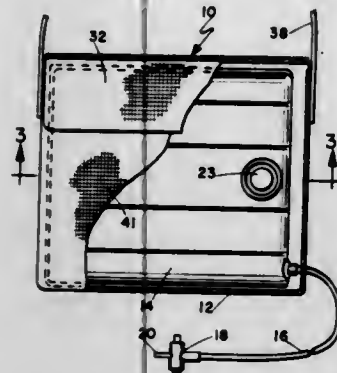
5. A liquid carrier and dispenser comprising:

a container for ingestible liquid comprising an envelope of flexible, collapsible, water impervious sheet material; means for admitting ingestible liquid into the interior of said liquid container;

a sealed second container wholly housed within said liquid container, said second container having a non-toxic temperature retaining material therein to provide direct surface contact and heat transfer between the liquid and said second container, said liquid container being collapsible



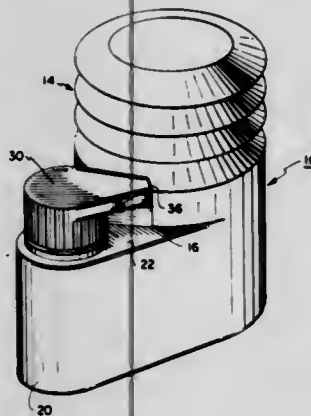
closely around said second container for convenience in storage, transporting, freezing and heating; and



dispensing means for controlled dispensing of the liquid at a point remote from the liquid container.

**4,420,098**  
**BELLOWS ACTUATED FOAM DISPENSER**  
Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425  
Filed Nov. 10, 1981, Ser. No. 319,946  
Int. Cl.<sup>3</sup> F04C 1/14; B65D 43/02  
U.S. Cl. 222—190

5 Claims



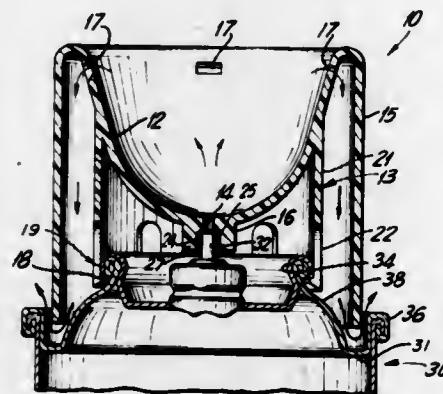
1. A foam dispenser comprising:
  - a hollow vertical cylinder having a top disposed horizontal first opening therein and a side disposed second opening therein which extends upward from the bottom of the cylinder to a position adjacent but below the first opening, said cylinder being otherwise sealed;
  - a hollow body integral with said cylinder, the interior of said body communicating via said second opening into the interior of the cylinder to form a common hollow chamber, said body extending outward from the cylinder and having a horizontal top, said top having a horizontal third opening therein, said body being otherwise sealed, said top having a raised elongated horizontal conduit extending between said second opening and said third opening to establish an air passage between said cylinder and said body when the chamber contains liquid to be dispensed and the level of the liquid in the chamber is coincident with said top;
  - first means including manually operable bellows secured and sealed to said first opening;
  - second means including a discharge orifice secured and sealed to said third opening;
  - a vertical dip tube open at both ends and disposed in said body, the top end of the tube being disposed adjacent said third opening, the bottom end of the tube being adjacent but spaced above the bottom of the body; and
  - third means disposed in said third opening above the liquid level, said third means being connected to the top end of the tube and coupled to the second means whereby when the bellows is compressed liquid forced upwardly out of the tube is mixed with air in the third means to produce

foam which is discharged through the orifice, ambient air being drawn through said orifice into the chamber to replace the liquid expelled when the compression force on said bellows is released.

**4,420,099**  
**CUP-SHAPED ACTUATOR FOR AEROSOL DISPENSER**  
Joseph C. Pizzurro, Scarsdale, and Virgil Naku, Hawthorne, both of N.Y., assignors to Precision Valve Corporation, Yonkers, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,122  
Int. Cl.<sup>3</sup> B67D 5/06; G01F 11/20  
U.S. Cl. 222—205

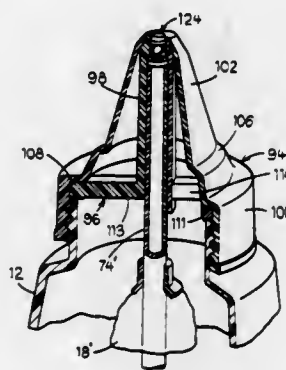
4 Claims



1. In an actuator for a pressurized aerosol dispenser which comprises a one-piece actuator body having a generally cylindrical outer wall, a cup-shaped portion having an upper edge defining a cup-shaped receptacle open at the top, the facing surfaces of said cylindrical outer wall and cup-shaped member defining an inner space, a discharge orifice near the bottom of the cup-shaped receptacle, a socket on the underside of the discharge orifice adapted to receive the hollow valve stem of a pressurized aerosol container, said socket having an opening communicating at one end with the discharge orifice of the actuator and at the other end with the hollow valve stem, the improvement comprising at least one vent aperture disposed in the surface defining the cup-shaped receptacle, which vent is disposed beneath the upper edge of the actuator and provides a passage from the cup-shaped receptacle to the inner space for propellant gas to escape from the product, said actuator being further adapted to vent the gas from the inner space.

**4,420,100**  
**DISPENSING APPARATUS**  
John J. Mueller, Woodbury, Minn., assignor to Containaire, Inc., Cleveland, Ohio  
Continuation of Ser. No. 956,096, Oct. 31, 1978, abandoned.  
This application Jan. 16, 1981, Ser. No. 225,718  
Int. Cl.<sup>3</sup> B65D 37/00  
U.S. Cl. 222—205

14 Claims



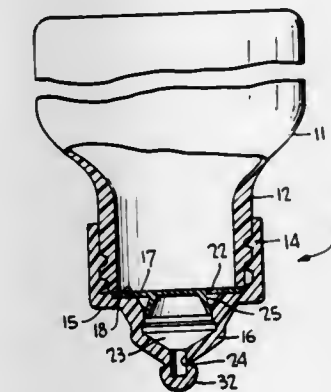
1. Dispensing apparatus for a flexible container, comprising: a closure having first and second openings, said closure

constructed to be secured at the first opening to a flexible container to cover an opening of the container, the second opening in the closure being a discharge passage through which contents of a container to which the closure is secured can be dispensed, an expansible bladder adapted to be received in the container and to receive fluid to displace dispensed contents, thereby dividing the interior of the container into a contents-containing portion exteriorly of the bladder and a contents-displacing portion within the bladder, check valve means to prevent flow through the second opening into the contents-containing portion of the dispenser while automatically allowing outflow from the contents-containing portion in response to greater fluid pressure inside the container than out, a conduit extending from within the closure to the bladder, providing a passage to the bladder with an inlet that receives flow through one of said first and second openings from the exterior of the closure and an associated container, and a check valve to allow flow through the conduit only into the bladder during use.

**4,420,101**  
**SQUEEZE BOTTLE WITH SELF-VENTING DISPENSING CLOSURE**

Richard K. O'Neill, Pomona, Calif., assignor to Diamond International Corp., New York, N.Y.  
Filed Nov. 18, 1981, Ser. No. 322,703  
Int. Cl.<sup>3</sup> B05B 11/04  
U.S. Cl. 222—212

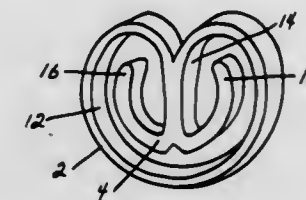
16 Claims



1. A self-venting dispensing closure for fluid-tight engagement with a squeeze bottle, comprising a cap containing a fluid opening, a disc on said cap containing a fluid bore which defines together with said fluid opening a single fluid passageway through the closure, said cap including an annular wall having a first portion defining a valve seat lying upstream of said fluid opening in the direction of product flow through said passageway, said disc having an annular valve thereon in engagement with said valve seat in a first position for closing said fluid passageway, at least a portion of said disc adjacent said valve being flexible to permit shifting of said valve along said annular wall into second and third positions respectively upstream and downstream of said valve seat in response to sub-atmospheric and super-atmospheric pressures within the bottle, first and second means on said annular wall respectively lying upstream and downstream of said valve seat to permit said fluid passageway to open respectively into bottle venting and dispensing positions corresponding to said second and third positions of said valve.

**4,420,102**  
**AUTOMATIC CONTOURING NAPKIN RING**  
Lloyd D. Clark, 15 Conrad St., San Francisco, Calif. 94131  
Filed May 15, 1981, Ser. No. 263,899  
Int. Cl.<sup>3</sup> A41H 33/00  
U.S. Cl. 223—34

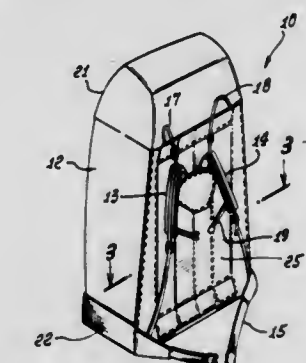
11 Claims



1. A napkin-shaping ring comprising an annular-shaped external portion, a cantilevered member extending from a part of an inside surface of said annular-shaped external portion toward the center of said annular-shaped external portion, a portion of said cantilevered member remote from said part of said inside surface of said annular-shaped external portion being wider than the rest of said cantilevered member, the internal height of said annular-shaped external portion, measured from said part of said inside surface thereof to the opposite inside surface thereof, approximating the internal width of said annular-shaped external portion, measured perpendicularly to said height measurement direction, such that when a cloth napkin is inserted, tip first, between the free end of said cantilevered member and said opposite inside surface of said annular-shaped external portion, and drawn about halfway into said ring, it will (a) be forced around between the inside surface of said annular-shaped external portion and said wider part of said cantilevered member to meet the opposite sides of the rest of said cantilevered member between said wider part thereof and said part of said inside surface of said annular-shaped external portion and (b) be forced to conform to the general shape defined by the internal structure of said napkin ring.

**4,420,103**  
**BACKPACK**  
Donald C. Douglass, Ventura, Calif., assignor to Wilderness Group Inc., Ventura, Calif.  
Filed Sep. 7, 1982, Ser. No. 415,473  
Int. Cl.<sup>3</sup> A45F 3/04  
U.S. Cl. 224—210

5 Claims

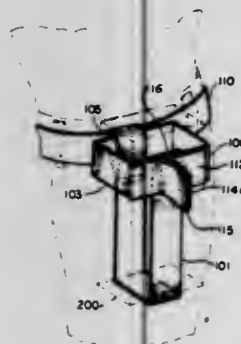


1. A backpack with integral frame, including in combination: a load carrying sack having a front face, a pair of shoulder straps and a waistband; and a support pad mounted on said front face; said pad comprising a foam sheet having a first height, a stiffener sheet having a second height less than said first height, and a protective sheet,



with said stiffener sheet, foam sheet and protective sheet attached to said front face by stitching, with a plurality of vertical rows of stitching defining vertically disposed panels, and a plurality of horizontal rows of stitching defining upper and lower sandwich structures of front face, foam sheet and protective sheet, and an intermediate sandwich structure of front face, stiffener sheet, foam sheet and protective sheet.

**4,420,104**  
**UNIVERSAL CARRYING CASE**  
Steven J. DiFenno, 6040 Lindbergh Blvd., Philadelphia, Pa. 19103  
Filed Nov. 25, 1981, Ser. No. 324,644  
Int. Cl.<sup>3</sup> A45F 5/00  
U.S. Cl. 224-250



14 Claims

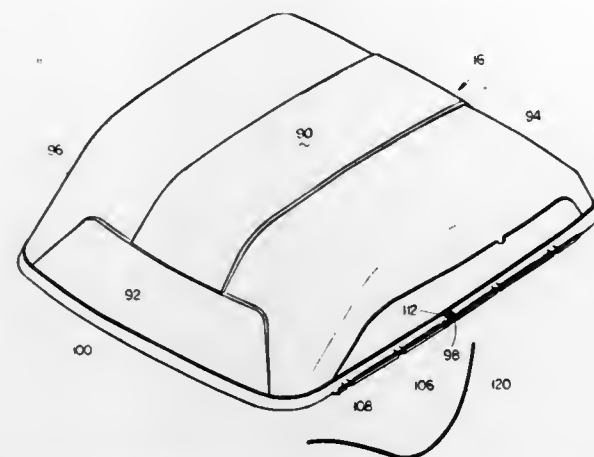
14. A method of making a carrying case comprising the steps of:

1. providing a tape like material having a fastening surface on one surface thereof;
2. providing a second tape like material having a complementary fastening surface thereon;
3. selecting a first length of said first tape like material and forming a loop at one end thereof;
4. securing a portion of said second, complementary material to the length of step 3 and the end opposite said loop and on the surface opposite said fastening surface;
5. selecting a second length of said first tape like material and securing a portion of said second, complementary material at one end thereof on the side opposite said first fastening surface;
6. inserting said second length through the loop of said first length.

**4,420,105**  
**FLEXIBLE HINGE AND CLOSURE MEMBER FOR A LUGGAGE CARRIER**  
John P. Nepper, 9826 Hartman, Omaha, Nebr. 68134  
Filed Sep. 30, 1982, Ser. No. 431,712  
Int. Cl. B60R 9/04

- U.S. Cl. 224-328
- 8 Claims
1. A storage container for travel comprising, a lower portion including a bottom, front and back walls, and opposite side walls, each of said walls having an upper end, an upper portion removably mounted on said lower portion and including a top, front and back walls, and opposite side walls, each of said walls having a lower end,

and an elongated flexible member detachably hingedly securing the lower end of at least one of the walls of said

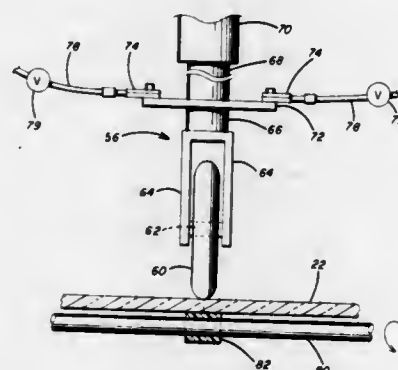


upper portion to the upper end of at least one of the walls of said lower portion.

**4,420,106**  
**METHOD OF AND APPARATUS FOR DAMAGE-FREE SCORING OF REFRACTORY MATERIAL**  
Charles J. Hyatt, Cheswick, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 3, 1981, Ser. No. 289,590  
Int. Cl.<sup>3</sup> C03B 33/02; B26D 3/08; B26F 3/00  
U.S. Cl. 225-2

13 Claims



1. A method of imposing a damage-free score in a piece of refractory material, comprising the steps of: biasing damage-free scoring means against the surface of said piece of refractory material with a biasing force sufficient to propagate a damage-free score therein but insufficient to initiate a damage-free score therein in the absence of an underlying surface defect; imparting vibrations to said scoring means to oscillate said scoring means while practicing said biasing step to create a surface defect in said refractory piece capable of generating a damage-free score therein; and moving said refractory piece and said scoring means relative to one another while practicing said biasing step to propagate said damage-free score within said piece of refractory material extending from the surface defect created by the imparting step.

**4,420,107**  
**LEAD FRAME ADVANCE SYSTEM**  
Michael Seyffert, Santa Cruz, and Alan F. d'Entremont, Sunol, both of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed Feb. 18, 1982, Ser. No. 349,954  
Int. Cl.<sup>3</sup> B65H 23/16, 25/02, 17/22  
U.S. Cl. 226-32

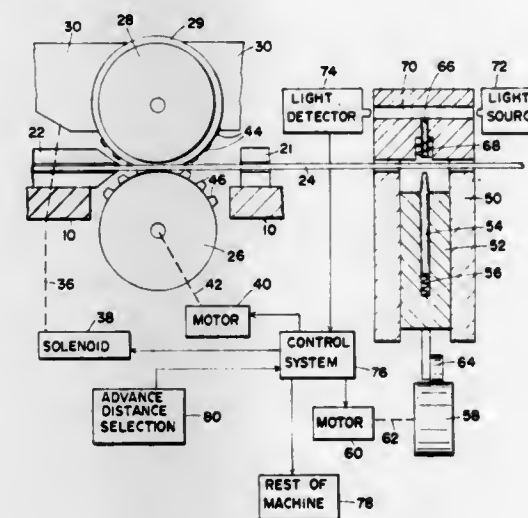
4 Claims

1. A lead frame incremental advance system for moving a

continuous strip of lead frame along its length by a predetermined adjustable distance comprising in combination:

roller means adapted to frictionally contact said lead frame comprising first and second pinch rollers on both sides of the lead frame, said first pinch roller connected to be driven by said motor means and having gear teeth thereon, said second pinch roller also having gear teeth thereon positioned to engage the gear teeth on the first roller so as to be driven by said first roller;

engagement means operable to move said roller means into contact with said lead frame;



motor means connected to said roller means so as to turn said roller means and advance said lead frame when said roller means is in contact with said lead frame; final alignment means adapted to cooperate with holes at known positions in said lead frame, after the lead frame is advanced by said roller means, so as to mechanically move the lead frame to the correct final position; and control means connected to said motor means, said final alignment means and said engagement means so as to first cause said engagement means to move said roller means, secondly cause said motor means to turn said roller means and advance the lead frame a predetermined distance, and finally operate the final alignment means.

**4,420,108**  
**APPARATUS FOR THE CONTROLLED FEEDING AND TAKING-OFF OF A THREAD INTO AND OUT OF A THREAD TREATMENT SECTION**  
Jürgen Kallmann, Kaarst, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

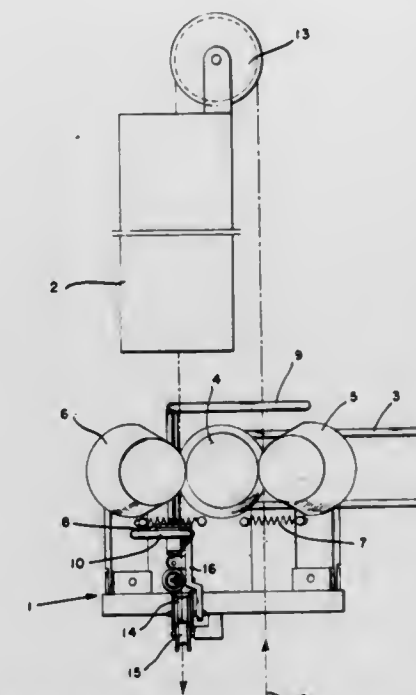
Filed May 22, 1981, Ser. No. 266,585  
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023068

Int. Cl.<sup>3</sup> B65H 51/08, 51/30  
U.S. Cl. 226-34

14 Claims

1. Apparatus for the controlled thread feeding into an incoming thread section and withdrawing of a thread from a thread outgoing section for passage into and out of a thread treatment section, said apparatus comprising: an externally drivable tapered surface drive roll and first and second tapered counter-pressure rolls bearing upon said tapered surface drive roll from opposite sides thereof defining with the latter a first gap or nip forming a feeding-in delivery means for said incoming thread section and a second gap or nip forming a take-off delivery means for said outgoing thread section, said thread travelling to said thread treatment section engaging between the drive roll and said first counter-pressure roll, said thread travelling away from said thread treatment section engaging

between said drive roll and said second counter-pressure roll, and first and second movable thread guide members for mov-



ing said thread along said tapered surface of said drive roll in response to variations in thread tension.

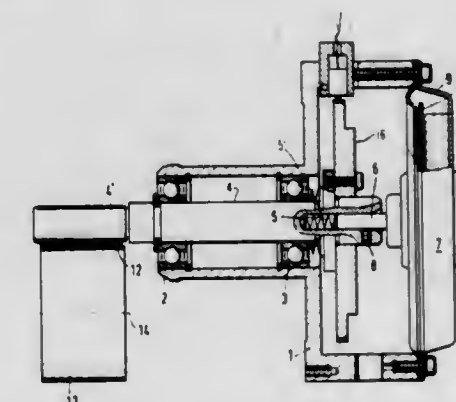
**4,420,109**  
**FLUTTER COMPENSATED MAGNETIC TAPE TRANSDUCING DRIVE APPARATUS**  
Heinrich Zahn, and Gerhard Falk, both of Rosdorf, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 274,718  
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025132

Int. Cl.<sup>3</sup> B65H 17/20

U.S. Cl. 226-181

2 Claims



1. Flutter compensated magnetic tape transducing drive apparatus comprising a drive system having a first mass rotating in a first direction, including a drive capstan (4') positioned to drive a tape (12) and means to drive the capstan, the tape having one side thereof in engagement with the circumference of the capstan; and a counter or pressure roller (13) positioned to engage the other side of the tape (12) and press the tape against the circumference of the drive capstan (4'), said counter or pressure roller being in frictional engagement with the tape, and rotating in a direction of rotation opposite to the first direction wherein the counter roller (13) has a mass which is matched to the mass of the drive system to form a counter-rotating mass to compensate for external rotary forces acting on the tape, and wherein the moment of inertia of the drive



system about the axis of rotation of the drive capstan (4') and the moment of inertia of the counter roller (13) about its axis of rotation are related by the equation:

$$\frac{J_1}{J_2} = \frac{r_1}{r_2}$$

wherein  $J_1$  is the moment of inertia of the drive system about the axis of rotation of the drive capstan (4');  $r_1$  is the radius of the drive capstan (4');  $J_2$  is the moment of inertia of the counter or pressure roller (13) about its axis of rotation (149); and  $r_2$  is the radius of the counter or pressure roller (13).

4,420,110

### NON-WETTING ARTICLES AND METHOD FOR SOLDERING OPERATIONS

Allan W. McCullough, Irving, and Richard A. Springer, Euless, both of Tex., assignors to Materials Technology Corporation, Dallas, Tex.

Filed Oct. 5, 1981, Ser. No. 308,282

Int. Cl.<sup>3</sup> B23K 3/00, 3/02

U.S. Cl. 228—54

12 Claims



1. A method for preventing the coating of a metal article with a filler metal such as solder or braze metal, which article when exposed to said filler metal in a molten condition of said filler metal is normally wetted with a coating of said filler metal, said method comprising the steps of applying a layer of a titanium compound selected from a group which includes titanium carbide, titanium nitride and titanium diboride to the surface of said article prior to exposing said article to said filler metal.

4,420,111

### CUP AND COVER COMBINATION

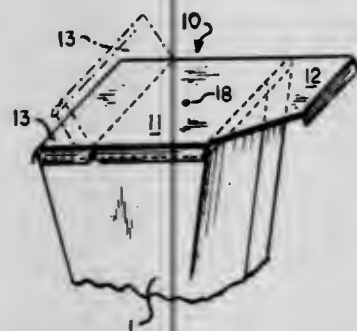
Erwin Hamant, 53-22 Roosevelt Ave., Woodside, N.Y. 11377

Filed Jul. 27, 1982, Ser. No. 402,224

Int. Cl.<sup>3</sup> B65D 41/26, 47/04

U.S. Cl. 229—7 SC

12 Claims



1. In combination: a drinking cup having walls forming a substantially rectangular open top mouth; and a cover for the cup comprising means for releasably retaining the cover on the mouth of the cup and for permitting sliding movement of the cover parallel to two parallel sides of the mouth and between first and second extreme positions, wherein the cover has means for completely closing the mouth of the cup when the cover is in the first position and opening means forming a pouring aperture at the mouth of the cup when the cover is in

the second position, said opening means extending beyond said cup walls when said cover is in said first position.

4,420,112

### PORTFOLIO CONSTRUCTION

Robert C. Cline, Washburn Terrace, Saugerties, N.Y. 12477

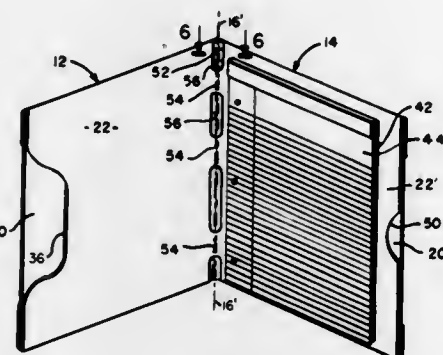
Continuation of Ser. No. 59,320, Jul. 20, 1979, abandoned. This

application May 6, 1981, Ser. No. 260,592

Int. Cl.<sup>3</sup> B65D 27/08

U.S. Cl. 229—72

10 Claims



1. A portfolio of one-piece pliant sheet construction, comprising front and back covers having spaced upper, lower and side edges, the covers being hinge-connected on a fold axis extending vertically between said upper and lower edges; each cover comprising an outer panel and a middle panel and an inner panel, the outer panels being connected to each other along the fold axis of hinge connection; the middle panel of each cover being a first extension of the associated outer panel vertically beyond one of said upper and lower edges thereof and folded along said one edge to lie in confronting outer-pocket-defining relation with the associated outer panel; the inner panel of each cover being a second and opposite extension of the associated outer panel vertically beyond the other of said upper and lower edges thereof and folded along said other edge to lie in confronting inner-pocket-defining relation with the associated middle panel; securing means fastening said inner and middle panels to each other essentially on an alignment adjacent and parallel to said one edge; and said side edges being unfastened to define pockets for the insertion of material between said outer, middle and inner panels.

4,420,113

### METHOD OF AND SYSTEM FOR CONTROLLING THE OPERATION OF A HEATER

Alain Lacroix, Lyons, France, assignor to Societe Lyonnaise des Applications Catalytiques, Rillieux-la-Pape, France

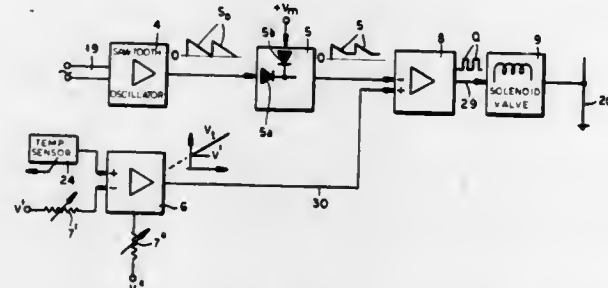
Filed May 28, 1982, Ser. No. 383,125

Claims priority, application France, May 29, 1981, 81 11018

Int. Cl.<sup>3</sup> G05D 23/00; H05B 1/02

U.S. Cl. 236—1 EB

11 Claims



1. A method of operating a heater, comprising the steps of: (a) continuously sensing the temperature of a location in the environment of the heater; (b) operating the heater at full power as long as said temperature lies beneath a lower limit of a predetermined range; (c) upon a rise of said temperature above said lower limit,

varying the mean power of said heater generally inversely with temperature changes within said range; (d) cutting off the heater upon said temperature exceeding a predetermined upper limit of said range; and (e) restarting the operation of said heater only upon said temperature dropping again beneath said lower limit.

4,420,114

### LIQUID HEATING SYSTEM

Gottfried Moser, Gladbach; Walter Nau, Cologne, and Ernst D. Neumann, Aachen, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

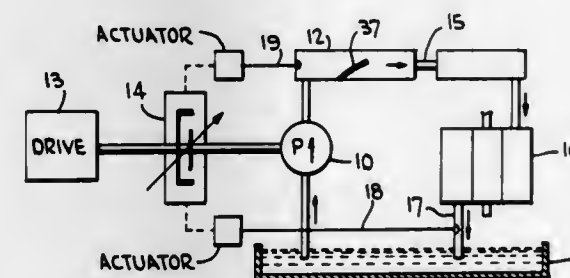
Filed Apr. 1, 1981, Ser. No. 249,936

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012760

Int. Cl.<sup>3</sup> F24C 9/00

U.S. Cl. 237—1 R

21 Claims



1. A liquid heating system, comprising a high-pressure hydraulic pump for suctioning the liquid from a liquid reservoir and delivering it thereto through a liquid conduit into which said pump is coupled, a variable speed internal combustion engine of a motor vehicle or an operating apparatus provided for driving said pump, a pressure-reducing element comprising a non-adjustable restrictor coupled into said conduit downstream of said pump for reducing the pressure and elevating the temperature of the liquid, said element having a fixed flow passage, a heat exchanger coupled into said conduit downstream of said element, and means for controlling the discharge rate of flow of said pump as a function of the calorific heat required to be generated by the system and/or of the temperature of the liquid, said control means including means for adjusting said pump for maintaining a predetermined discharge rate of flow thereof upstream of said pressure-reducing element even at low idling speeds of said engine, said adjusting means comprising a transmission assembly between said engine and said pump, said transmission assembly being inversely coupled to said engine so as to effect a decreasing transmission ratio as engine speed increases.

4,420,115

### AUTOMOTIVE AIR CONDITIONER

Katsuaki Matsushima, and Goro Uchida, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 24, 1981, Ser. No. 324,413

Claims priority, application Japan, Apr. 17, 1981, 56-55345[U]

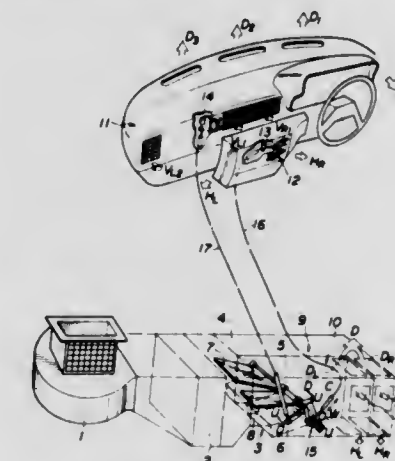
Int. Cl.<sup>3</sup> B60H 1/02

U.S. Cl. 237—12.3 A

2 Claims

1. An air mixing control type air conditioner comprising: a heater core within the air conditioner body having right and left air diffusing ports, an air passage divided by a partition plate into right and left side passages to the air diffusing ports of said heater core, a main air mixing damper at said one side passage for controlling the air temperature of said one side passage, a sub air mixing damper at said the other side passage for controlling the air temperature of said other side passage, a main temperature control lever at said main air mixing

damper for controlling the diffusing air temperature of said entire air conditioner, a sub temperature control lever at said sub air mixing damper for controlling the diffusing air temperature of said one side passage; and a link mechanism at said heater core, and said main and sub temperature control levers are coupled to said link mechanism, said link mechanism comprising: a main lever rotatably coupled to said main temperature control lever and also to a main shaft in such a manner that said main lever is rotatable around said main shaft, on which said one side damper is rotatably mounted in a range between a fully opened position and a fully closed position,



a coupling lever rotatably coupled to said sub temperature control lever and engaged with a sub mounting shaft in such a manner that said coupling lever is rotatable around said sub mounting shaft, a link connected to said coupling lever at one end and also connected to a pin at the other end, which pin is slidably inserted into a long hole at said main lever in such a manner that said pin is able to be fixed by pressing within the hole of said main lever at any position and is rotatably engaged with one end of a rod, and a hollow sub shaft connected to said sub air mixing damper and to which said main shaft is inserted in the hollow cavity thereof in such a manner that said sub shaft is rotatable coaxially with the axis of said main shaft and said sub lever is fixed to one end of said sub shaft.

4,420,116

### UNIT INJECTOR EMPLOYING HYDRAULICALLY CONTROLLED TIMING AND FUEL SHUT OFF

Timothy A. Warlick, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 31, 1981, Ser. No. 336,308

Int. Cl.<sup>3</sup> F02M 45/00, 53/04, 55/00

U.S. Cl. 239—95

17 Claims

1. A fluid injector, comprising (a) an injector body containing a central bore and an injection orifice communicating with said central bore; (b) an injector plunger mounted for periodic reciprocal movement within said central bore between an innermost position in which said injection orifice is closed and an outermost position in which an injection chamber is formed within said central bore between the inner end of said injector plunger and said injection orifice, said injector plunger including an inner plunger section and an outer plunger section mounted for independent reciprocal movement within said central bore to define a variable volume timing chamber between said plunger sections; (c) supply connecting means for providing a pathway for fluid under pressure to flow from a source into said injection chamber;







mechanism, wherein the improvement comprises a wire take-up means for winding up or unwinding the wires adapted for telescopically extending out or contracting the hanging mechanism, said wire take-up means being given a rotative force and consisting of three discs of which the outermost disc has a recess at its outer edge; a ratchet wheel provided in said wire take-up means; a sensor lever provided swingably above said wire take-up means and always pressed in the direction of said take-up means, said sensor lever being provided with pawls so arranged that they are engaged with the ratchet wheel when said sensor lever is swung toward said take-up means; a pulley rotatably mounted at an end of said sensor lever and adapted to receive the wires used for telescopically extending out or contracting said hanging mechanism; a limit switch designed to detect any swinging motion of said sensor lever in the direction away from said take-up means to cut off the rotative force; a slider provided slidably on a diametrical portion of the outermost disc of said take-up means, said slider having its one end projected into said take-up means while the other end terminates in a sector portion positioned in the recess of said take-up means; and an unwinding sensor lever provided swingably below said take-up means and always pressed in the direction of said take-up means, said unwinding sensor lever having provided on its underside a roll contacting an outer edge of said take-up means and also provided with a pawl so arranged that it is engaged with the ratchet wheel when said roll is fitted in the recess at the outer edge of said take-up means.

4,420,123

**FORCE RATE SENSOR ASSEMBLY**

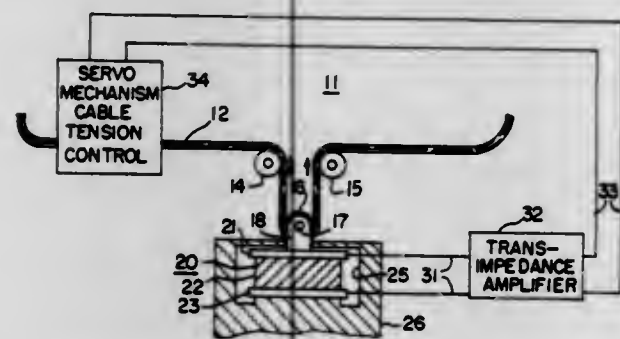
David S. Fox, and Donald G. Cawelti, both of Tucson, Ariz., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 19, 1981, Ser. No. 312,202

Int. Cl.<sup>3</sup> B65H 59/10

U.S. Cl. 242—147 R

1 Claim



1. A mechanism to control tension in a fiber optic cable during winding of the cable onto bobbins comprising: at least two idler pulleys and a tension sensing pulley through which the cable is carried, whereby tension is applied to the tension pulley by the cable; means connected to said tension pulley for measuring tension in said tension pulley comprising a plate of electrically non-conductive material carrying said tension pulley and which experiences a pull which is proportional to the tension in the cable, a piezoelectric transducer having crystal means bonded to upper and lower electrically conductive plates, said upper electrically conductive plate fixedly mounting said electrically non-conductive plate, a fixed frame of electrically non-conductive material bonded to said lower electrically conductive plate, and output leads connected to each of said electrically conductive plates for generating an electrical signal proportional to the force straining on said crystal means, plates and frame being configured to minimize the sensitivity of the crystal means to vibrations; means for enhancing said electrical signal comprising a transimpedance operational amplifier means with inverse feedback, the input to which comprises a current from said electrical signal and the output of which comprises a

voltage proportional to said input current, representing over time, the rate of change of the instantaneous applied force to the crystal means; and a servo mechanism cable tension control means for varying tension, within selected limits, on the cable being wound, said servo mechanism cable tension control being actuated by a signal comprised of the output signal of said means for enhancing.

4,420,124

**CARPET ROLLING MACHINE**

Harold B. Bardsley, Chorley; Brian J. Mosby, Blackpool; John M. Barlow, Chorley, and Brian Walton, Blackburn, all of England, assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

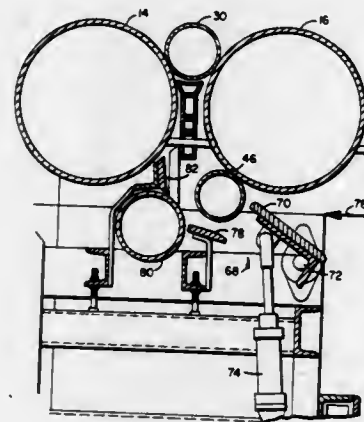
Filed Aug. 30, 1982, Ser. No. 412,600

Claims priority, application United Kingdom, Nov. 5, 1981, 8133357

Int. Cl.<sup>3</sup> B65H 17/12

U.S. Cl. 242—66

10 Claims



1. A carpet rolling machine comprising a pair of rotatably drivable roll supporting rollers disposed to define a supporting nip on which a roll of carpet can be formed, a lower deflector disposed between the rollers, means for mounting said lower deflector for movement into sliding contact with each of the rollers selectively, said lower deflector having an upwardly facing cam surface, an upper deflector selectively movable from a rest position to an operative position disposed above the lower deflector, said upper deflector having a downwardly facing cam surface, said cam surfaces of said upper and lower deflectors and the periphery of the adjacent rollers together defining a generally cylindrical space to which an end of a piece of carpet can be fed and constrained to follow a cylindrical path when said upper deflector is in said operative position, means for moving said lower deflector into contact with a selected first of the rollers, means for rotating said first roller in a direction such that the surface of said first roller in contact with the lower deflector moves downwardly, means rotating the second roller in a direction relative to said first roller such that the surface of said second roller adjacent to said first roller moves upwardly, and means for feeding and directing the end of said piece of carpet upwardly against the upwardly moving surface of said second roller to feed said carpet into said cylindrical space to form an incipient carpet roll.

4,420,125

**COLLAPSIBLE REEL**

Manuel Martinez, New Providence, and Ronald P. Zelins, Rockaway, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,280

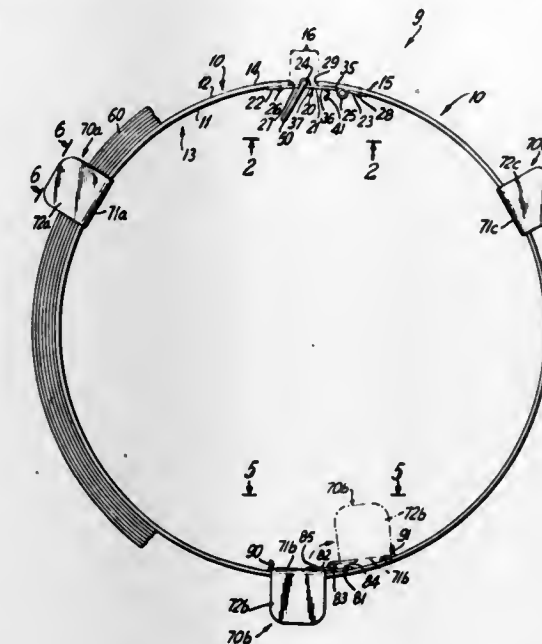
Int. Cl.<sup>3</sup> B65H 75/02, 75/24

U.S. Cl. 242—77

8 Claims

7. A reel according to claim 6 in which said fastening means

comprises hinge means connecting said base to the inside of said band, and in which said means for holding said unit com-



prises a resilient latch finger mounted on the inside of said band and adapted to make a detent engagement with said base.

4,420,126

**WEBBING LOCK DEVICE**

Takayuki Ando, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

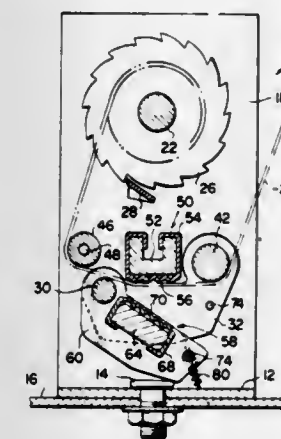
Filed Feb. 23, 1982, Ser. No. 351,369

Claims priority, application Japan, Mar. 3, 1981, 56-29245[U]

Int. Cl.<sup>3</sup> A62B 35/02; B65H 75/48, 59/16

U.S. Cl. 242—107.2

8 Claims



1. A webbing lock device provided in a webbing retractor capable of winding and unwinding a webbing, comprising: a stationary clamp member opposed and adjacent to one surface of the webbing; a movable clamp member opposed to the outer surface of the webbing and having freedom of movement towards and away from said stationary clamp member; a biasing means for biasing said movable clamp member away from said stationary clamp member; a roller on which the webbing is wound; a roller support member which rotatably supports said roller; a deformable member rotatably supported by said roller support member and connected with said roller, whereby said roller is supported by said roller support member through said deformable member, said deformable member designed to deform to displace said roller so as to abut said roller against a portion of said roller support member when tension of the webbing reaches a predetermined value; and a connecting member connecting said roller support member

with said movable clamp member, said connecting member being designed to break and release said roller support member from said movable support member when the tension of said webbing reaches a value higher than said predetermined value.

4,420,127

**PAWL ACTUATOR FOR DUAL REEL RETRACTOR**

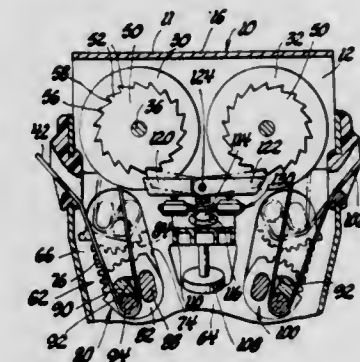
Joseph D. Kondziola, Troy, and Donald C. Sobleski, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1981, Ser. No. 299,406

Int. Cl.<sup>3</sup> A62B 35/02; B65H 75/48

U.S. Cl. 242—107.4 A

1 Claim



1. A dual reel seat belt retractor comprising:

a housing; first and second belt reels journaled on the housing for belt winding and unwinding rotation about parallel axes; first and second ratchet wheels carried respectively by the first and second reels and having circumferentially spaced ratchet teeth; first and second pawls mounted on the housing for movement between ratchet teeth engaging and disengaging positions respectively with the first and second ratchet wheels; a transfer link having a longitudinal axis, first and second abutment portions spaced each side of the longitudinal axis of the transfer link and engaging respectively with the first and second pawls, a central portion, and a mounting end having a pair of trunnion pins projecting laterally of the mounting end and an axial pin projecting axially of the mounting end; first and second mounting cradles carried by the housing and receiving the trunnion pins to restrain the transfer link against bodily movement along its axis but permit rolling movement of the transfer link about the axis and pivoting movement about the trunnion pins; an apertured mounting tab carried by the housing and interfitted with the axial pin of the transfer link to restrain the upward movement of the mounting end in the upward direction toward the reels; and an inertia sensor mounted on the housing and engaging the central portion of the transfer link whereby upon occurrence of predetermined inertia stimulus the transfer link is pivoted upwardly about the mounting end to simultaneously engage the first and second pawls with the ratchet teeth when the first and second ratchet wheels are in phase with one another and permitting the transfer link to roll simultaneous with pivoting movement to engage the first pawl with the first ratchet wheel irrespective of tip-on-tip locking engagement of the second pawl by the second ratchet wheel and then permit subsequent counter rolling movement of the transfer link by the inertia sensor to engage the second pawl with the second ratchet plate as permitted by slight unwinding rotation of the second reel to align the second ratchet wheel tooth for locking engagement by the second pawl.



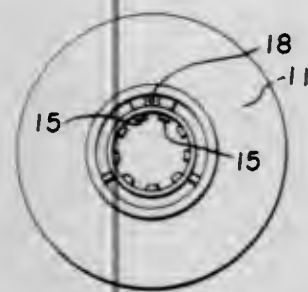
4,420,128

**MAGNETIC TAPE CASSETTE**

Masatoshi Okamura, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan  
Filed Nov. 20, 1981, Ser. No. 323,536

Claims priority, application Japan, Feb. 12, 1981, 56-19036[U]  
Int. Cl.<sup>3</sup> G03B 1/04; G11B 15/32  
U.S. Cl. 242—199

2 Claims



1. A magnetic tape cassette, comprising:  
a casing;

a tape feeding reel in said casing, said tape feeding reel including a first reel hub having first annular winding core including a first recessed portion for insertion of a first fitting element, said first winding core including a circumferentially spaced plurality of driving ribs mounted thereon, said tape feeding reel further including a first through hole in said first reel hub at a position corresponding to said first recessed portion;

a tape winding reel in said casing, said tape winding reel including a second reel hub having a second annular winding core including a second recessed portion for insertion of a second fitting element, said second winding core including a circumferentially spaced plurality of driving ribs mounted thereon, said tape winding reel further including a second through hole in said second reel hub at a position corresponding to said second recessed portion; and

a tape wound between said reels and clamped thereto at said recessed portions by said fitting elements, wherein one of said first and second through holes is mounted at a circumferential angular position corresponding to one of said driving ribs on a respective one of said first and second winding cores, and wherein the other of said first and second through holes is mounted at a circumferential angular position corresponding to a circumferential space between two of said driving ribs on a respective other of said first and second winding cores, whereby said tape feeding reel and said tape winding reel can be distinguished from one another.

4,420,129

**GUIDED MISSILE AND FUZE SYSTEM THEREFOR**

Günter Stetter, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm-Gesellschaft mit Beschränkter Haftung, Munich, Fed. Rep. of Germany  
Filed Mar. 25, 1976, Ser. No. 670,910

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514136

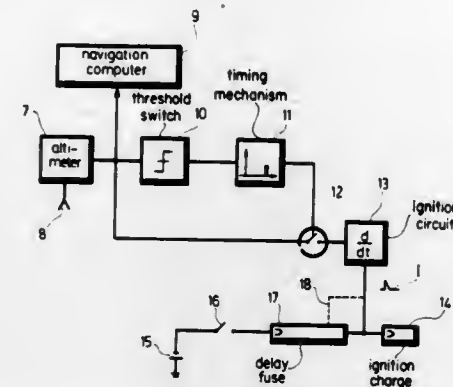
Int. Cl.<sup>3</sup> F41G 7/22

U.S. Cl. 244—3.15

6 Claims

1. For a guided missile having an impact fuze with a delay arrangement and an ignition charge and having an altitude measuring device as part of a trajectory control which measures the altitude and guides the missile toward a target from a first altitude through a lower transitional altitude and into a constant altitude as it approaches a target ship, an auxiliary fuze arrangement comprising a timing device, an enabling switch, an ignition circuit, said timing device being coupled to said altitude measuring device and responding to the missile reaching the transitional altitude and being coupled to the enabling switch for enabling the switch a predetermined time

after the transitional altitude is reached, said ignition circuit being connected to one of said delay arrangement and said ignition charge for initiating ignition of the ignition charge,



said enabling switch connecting the altitude measuring device to said ignition circuit when the enabling switch is enabled so that said ignition circuit responds to altitude measurements indicative of a target ship.

4,420,130

**FABRICATION PROCESS FOR AN ENVELOPE, IN PARTICULAR FOR SPACE BALLOONS, ENVELOPE THUS MADE, AND ITS APPLICATION TO THE AEROSPACE DOMAIN**

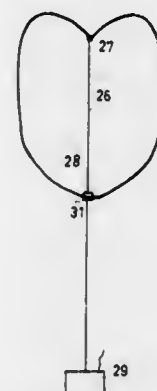
Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Dec. 22, 1980, Ser. No. 218,749

Claims priority, application France, Jan. 4, 1980, 80 00343  
Int. Cl.<sup>3</sup> B64B 1/40

U.S. Cl. 244—31

19 Claims



1. A stress controlled mechanism for a space balloon having a longitudinal axis, comprising:

- a. an axial tie means extending from the upper pole of a space balloon envelope, wherein said tie means passes through said space balloon envelope interior and through an aperture located in a slideable member fixedly attached to the lower pole of said space balloon envelope; and,
- b. an adjustable stopping member positionable at a pre-selected point along said axial tie means in said space balloon interior as a means for stopping said slideable member and permitting said space balloon to assume a pre-selected shape upon inflation of said balloon.

4,420,131

**MOORING DEVICES**

Martin J. Middleton, Ilminster, England, assignor to Westland Aircraft Limited, Yeovil, England

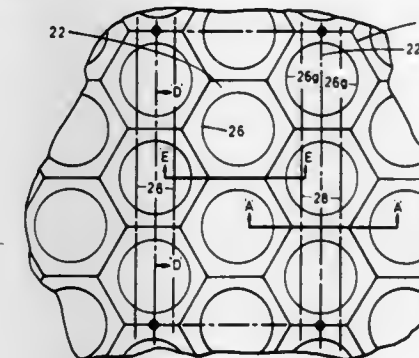
Filed Nov. 3, 1981, Ser. No. 317,785

Claims priority, application United Kingdom, Nov. 25, 1980, 8037807

Int. Cl.<sup>3</sup> B64F 1/12, 3/00

U.S. Cl. 244—115

12 Claims



1. A mooring device for attachment to a surface comprises a grid having an upper surface adapted for engagement by a harpoon carried by an aircraft such as a helicopter, wherein the grid comprises a plurality of substantially identical elements, said elements being rectangular in plan, disposed in parallel rows, and having a central region of the upper surface of each element formed with a plurality of apertures of a desired shape and an edge region of each element formed with a plurality of half apertures arranged so that when the elements are positioned in a juxtaposed relationship the half apertures of adjacent elements combine to form apertures corresponding to the shape of the central apertures, and retaining means adapted to retain said elements in juxtaposed relationship on the surface.

4,420,132

**SECURING DEVICE FOR HELICOPTERS AND THE LIKE**

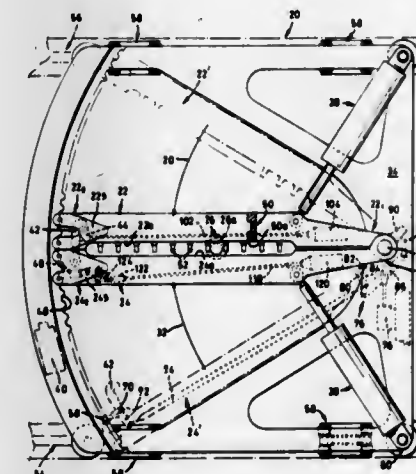
Gerald J. Martin, 49 Thorncliffe Park Dr., Apt. 908, Toronto, Ontario, Canada (M4H 1J6)

Filed Jun. 12, 1981, Ser. No. 273,153

Int. Cl.<sup>3</sup> B64F 1/22

U.S. Cl. 244—115

10 Claims



1. A device for securing helicopters and the like with respect to a support surface, the device comprising:  
a pair of arresting beams which have first and second ends and which are adapted to co-operate to trap therebetween a probe depending from a helicopter and the like;  
means pivotally supporting said beams adjacent their said first ends for movement about a common pivot axis between spaced apart positions in which the beams define therebetween a target area having the general shape of a sector of a circle for receiving a said probe, and positions in which the beams have moved inwardly into co-operat-

ing positions for trapping said probe, said pivotal supporting means being adapted to be mounted to said surface so that the helicopter and the like is secured with respect to said surface when the probe is trapped by said beams;  
fluid pressure operated actuating means coupled to said beams and operable to move the beams between said spaced apart positions and said co-operating positions, said actuating means being adapted to cause the beams to trap a said probe anywhere within said target area; and, means adapted to lock the beams both with respect to one another and angularly about said pivot axis after the beams have moved to their co-operating position and trapped a said probe.

4,420,133

**DEVICE FOR THE TRANSMISSION OF INFORMATION THROUGH THE RAILS BETWEEN A RAILWAY TRACK AND A GROUP OF VEHICLES RUNNING ALONG THIS TRACK**

Michel J. Dietrich, Le Plessis Belleville, France, assignor to Jeumont-Schneider, Puteaux, France

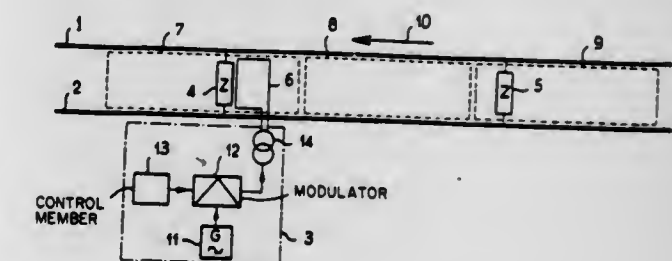
PCT No. PCT/FR79/00057, § 371 Date Mar. 17, 1980, § 102(e)  
Date Mar. 17, 1980, PCT Pub. No. WO80/00239, PCT Pub. Date Feb. 21, 1980

PCT Filed Jul. 2, 1979, Ser. No. 193,272

Claims priority, application France, Jul. 17, 1978, 78 21168  
Int. Cl.<sup>3</sup> B61L 3/00, 21/00

U.S. Cl. 246—167 R

12 Claims



1. A system for transmission of data along the rails of a railway track through a plurality of successive, contiguous zones, said data transmitted to a train passing along said track in a given direction of travel, said system comprising:

- (1) a plurality of resonance circuits, each connected across the rails of said zone, pairs of said resonance circuits defining said zones therebetween, and said zones being independent of a block system of said railway track,
- (2) an alternating current generator for each zone having a predetermined frequency outside frequency bands of said block system, said predetermined frequency producing a carrier frequency for the data to be transmitted,
- (3) for each given zone, said pairs of said resonance circuits defining the given zone tuned to the carrier frequency of said generator within said given zone,
- (4) means for modulating said carrier frequency for each zone corresponding to the data to be transmitted thereby providing a data signal for each zone,
- (5) a plurality of insulated conductive windings in the form of conductive loops, one of said windings within each zone and positioned between the rails of said tracks adjacent the downstream side of each zone with respect to the direction of train travel, for each given zone said one winding positioned immediately proximate one of said pairs of resonance circuits of said given zone and remote from the other of said pair of resonance circuits of said given zone,
- (6) means for coupling the winding within each zone to receive the data signal from the modulating means of each zone, and
- (7) a receiver mounted onboard said train at a position near the forward end of said train along the direction of travel



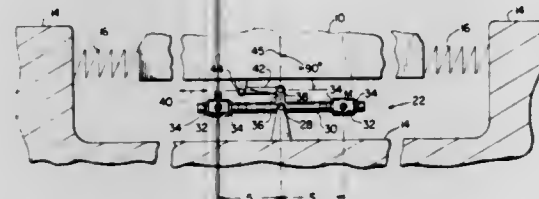
of said train, said receiver tuned to the respective carrier frequencies of each zone for receiving the data signals of each zone.

# **4,420,134** **VIBRATION ISOLATOR WITH CRANK DRIVEN INERTIA BAR**

William G. Flannelly, South Windsor, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.  
Filed Oct. 27, 1980, Ser. No. 201,186  
Int. Cl.<sup>3</sup> F16F 15/00

U.S. Cl. 248—559

11 Claims



1. A vibration isolator for use with two bodies movable relative to one another with elastic restraint along a given line of action, said isolator comprising an elongated inertia bar connected intermediate its ends to one of said bodies for pivotal movement relative to said one body about a first pivot axis, a crank arm fixed relative to said inertia bar and connected to the other of said two bodies at a point spaced from said first axis, said point at which said crank arm is connected to said other body being located approximately in a plane containing said first pivot axis and generally perpendicular to said line of action so that relative movement between said two bodies along said line of action causes rotation of said inertia bar about said first pivot axis, said inertia bar being arranged with its longitudinal axis at an angle to said plane, and said inertia bar having a center of gravity located substantially on said first pivot axis.

# **4,420,135** **SUPPORT PLATE**

Erich Munz, Weststrasse 1, 5204 Lohmar 1 - Geber, Fed. Rep. of Germany

Filed Dec. 4, 1980, Ser. No. 212,909  
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949295

U.S. Cl. 248—633

Int. Cl.<sup>3</sup> F16M 13/00

3 Claims



1. A vibration- and sound-absorbing support for mounting a machine on a base, the support comprising  
(a) a load distributing and shape-retaining metal carrier having a top side for supporting the machine and a bottom side facing the base, and  
(b) at least one pad of a vibration- and sound-absorbing material laminated to the bottom side of the metal carrier and disposed between the bottom side and the base, the pad comprising  
(1) circumferential webs and intersecting webs between the circumferential webs, the webs contacting the base and defining a plurality of separate open chambers facing the base, and  
(2) a plurality of protuberances in each one of the chambers, the protuberances projecting from the pad towards the base and having a height lower than that of the webs.

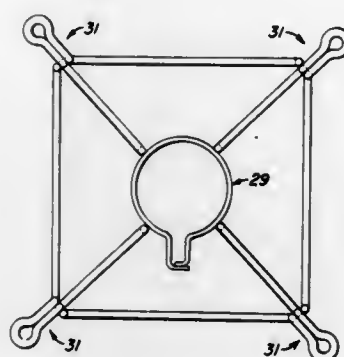
# **4,420,136** **MOUNTING ASSEMBLY**

Donald W. Lau, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 8, 1981, Ser. No. 271,485  
Int. Cl.<sup>3</sup> F16M 13/00

U.S. Cl. 248—674

2 Claims



1. In a mounting assembly for mounting a motor such as an electric fan motor to a support means, said mounting assembly including a clamp fixably mounted to and extending around said motor's housing, a plurality of first mount arms, each being generally linear and rod-like fixably mounted at one end to said clamp in generally equal spaced apart relationship completely around said clamp and each of said arms having a loop portion at the other end fixably mounted to said support means, wherein the improvement comprises a plurality of second arms each fixably mounted at its respective ends to adjacent first mounting arms in close proximity to said respective loop, said second members in combination having generally an endless extension and generally forming individually a base portion of a triangle in combination with adjacent first members.

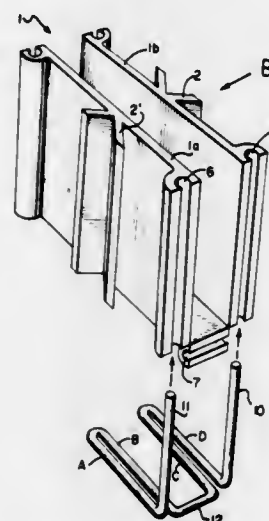
# **4,420,137** **ADJUSTABLE FOLDING, SPRINGBACK SHELF BRACKET**

Marshall J. Barrash, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 22, 1981, Ser. No. 314,039  
Int. Cl.<sup>3</sup> A47G 29/02

U.S. Cl. 248—240.4

17 Claims



1. A spring-biased shelf bracket which comprises:  
a back member;  
a shelf support member movable relative to said back member;  
hinge means for permitting movement of said shelf support member relative to said back member and for maintaining said members in spaced relation to each other;  
a mounting flange provided on at least said back member for mounting said bracket to a surface;

channel means provided at peripheral portions of said back member, shelf support member, and said hinge means; and spring means associated with said channel means for biasing said back member, shelf support member and hinge means into first positions relative to each other and for permitting movement of said members and hinge means into at least second positions.

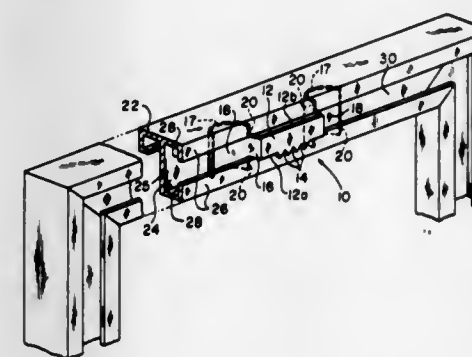
# **4,420,138** **SELF-LOCKING PICTURE FRAME CLIP**

David D. Sobel, 15415 N. 22nd St., Phoenix, Ariz. 85022

Filed Aug. 6, 1981, Ser. No. 290,618  
Int. Cl.<sup>3</sup> A47G 1/24

U.S. Cl. 248—496

10 Claims



1. A clip adapted for use in a picture frame that has a channel with a base, the clip comprising an elongate planar shelf whose longitudinal ends are bent to form a pair of opposed angularly depending legs, the distal end of each leg, in plan view, widening along an abrupt discontinuity of cross-section into a foot that is sized to fit into the channel, said discontinuity of cross-section thereby defining an edge to frictionally engage facing, inside surfaces of the channel, the vertical height of each foot being dimensioned with respect to the height of the channel so that when said planar shelf is depressed, said edge of each foot is released from engagement with the facing, inside surfaces of the picture frame channel to allow the clip to slide relative thereto along the base.

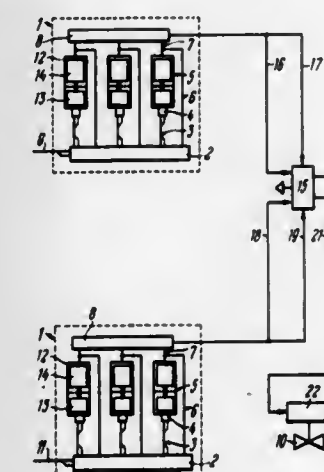
# **4,420,139** **DEVICE FOR REMOTE CONTROL AN ACTUATOR OF A SHUT-OFF MEMBER**

Valentin V. Belov, Klenovy bulvar, 8, kv. 47, and Vsevolod I. Verkevich, ulitsa Moldagulovoi, 18, korpus 2, kv. 254, both of Moscow, U.S.S.R.

Filed Aug. 20, 1980, Ser. No. 179,734  
Int. Cl.<sup>3</sup> F16K 31/122

U.S. Cl. 251—28

1 Claim



1. A device for remote control of the actuator of a shut-off member, said device connected by means of first and second

control channels, for respectively opening and closing said shut-off member, to a remote control system, comprising:  
an autonomous source of energy including a first unit and a second unit;  
each one of said units of said autonomous source of energy comprising  
at least two gas generators having an output and an igniter means;  
a pneumatic OR gate having an output and inputs connected to said outputs of said gas generators; and  
a selector having outputs connected to said igniter means of said gas generators, control inputs connected to said outputs of said gas generators, and an input of said selector of said first unit of said autonomous source of energy connected to said first control channel and an input of said selector of said second unit of said autonomous source of energy connected to said second control channel;  
said device further comprising:  
a distributor connected to said actuator of said shut-off member having first and second input channels and first and second control channels, said output of said OR gate of said first unit of said autonomous source of energy connected to said first input channel and to said first control channel of said distributor, and said output of said OR gate of said second unit of said autonomous source of energy connected to said second input channel and said second control channel of said distributor, wherein gases from the outputs of said OR gates of said first and second units effect operation of said distributor to selectively and alternately open and close said shut-off member.

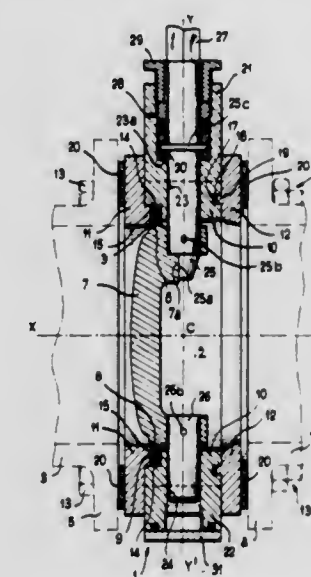
# **4,420,140** **BUTTERFLY VALVE AND A METHOD OF MANUFACTURE OF SAID VALVE**

Jean Gachot, 26 bis, avenue de Paris, 95230 Saisy Sous Montmorency, France

Filed Apr. 17, 1980, Ser. No. 140,999  
Claims priority, application France, May 4, 1979, 79 11275  
Int. Cl.<sup>3</sup> F16K 1/22; B23P 15/00

U.S. Cl. 25—152

8 Claims



1. A butterfly valve comprising a valve body traversed by a passageway which is adapted to be disposed between two end portions of a piping system, and a butterfly valve disk rotatably mounted within the valve body and displaced laterally with respect to the axis of rotation thereof which is disposed transversely to said passageway, an annular bearing surface at the periphery of said valve disk and adapted to bear on a valve seat within the passageway, the valve body comprising an annular member having two opposite chimneys which are directed transversely to said passageway and in which shaft means are mounted for rotational displacement of the valve disk, the annular member being mounted between first and second bearing rings which are radially thicker than the wall of the



annular member in regions apart from the chimneys, the valve seat being located in a recess in one annular end of the annular member and being disposed between one face of said recess and a flange projecting from said first bearing ring and fitting into said recess, sealing means disposed between the second bearing ring and the annular member, each of said bearing rings having an external radius which is larger than that of the annular member apart from the chimneys, mutual centering means coupling the annular bearing member and said second bearing ring, and means for centering said annular member and both bearing rings with respect to the piping system.

4,420,141

## VARIABLE RATE VALVE SPRING

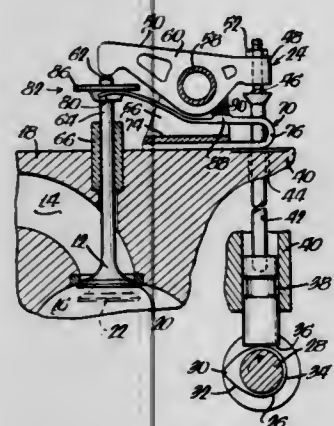
Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 26, 1981, Ser. No. 296,405

Int. Cl.<sup>3</sup> F16F 1/00

U.S. Cl. 251—337

24 Claims



1. In a valve train assembly (24) including a valve (12), a cam (26) engaging a cam follower (36), for moving said valve (12) through an intermediate position (K) between a seated position (J) and a maximum lift position (L), and spring means (70/93) for urging the valve (12) toward its seated position (J), the improvement comprising:

said spring means (70/93) having a first end (82/116), a second end (72/108), a preselected intermediate portion (88/97), a first effective length from said first end (80/116) to said intermediate portion (88/97) and a second effective length from said first end (80/116) to said second end (72/108), said spring having a first spring rate over said first effective length and a second spring rate over said second effective length, said second spring rate being of a lesser magnitude than said first spring rate; and stop means (90/92/98) for preloading said spring means (70/93) at said intermediate portion (88/97), only said first effective length being active in response to said valve moving between the seated position (J) and the intermediate lift position (K), said preload on said spring means (70/93) being overcome in response to said valve reaching the intermediate lift position (K), said second effective length being active in response to said valve moving between said intermediate position (K) and said maximum position (L).

4,420,142  
MACHINE COMPONENT OF OXIDE CERAMIC MATERIAL

Ulf Dworak, Baltmannsweiler; Hans Jud, Esslingen; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf, and Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

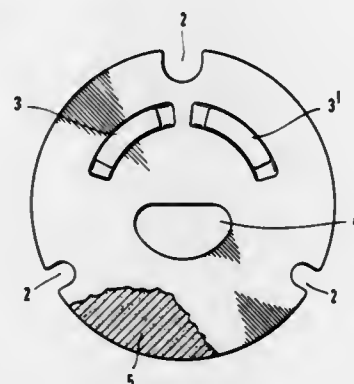
Filed Jul. 1, 1981, Ser. No. 279,246

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025596

Int. Cl.<sup>3</sup> F16K 11/00

U.S. Cl. 251—368

7 Claims



1. A machine component for sliding contact and sealing action with and structural support of another component comprising said machine component containing from about

- 3.0–25 weight percent of zirconium oxide, hafnium oxide or mixtures thereof which are present at room temperature, predominantly in the metastable, tetragonal modification, in the interior of the machine component and, in the monoclinic modification, at the surface of the machine component;
- a structural support section expressed as profile bearing ratio of 10 to 40%; and
- a center line average surface roughness  $R_a$  of less than 0.3  $\mu\text{m}$ .

4,420,143

## LINE STRING BLOCK ATTACHMENT

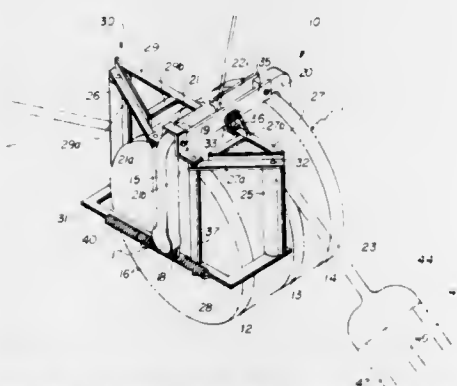
William J. Harris, Rte. 1, Box 245, Russell, N.Y. 13684

Filed Dec. 15, 1981, Ser. No. 330,895

Int. Cl.<sup>3</sup> H02G 1/02

U.S. Cl. 254—134.3 PA

9 Claims



1. An attachment for a stringing block or the like for guiding cable on a block sheave when preceeding or successive cable towers or poles are not linearly aligned comprising in combination:

means on said attachment affixed to a carriage of the stringing block for supporting said attachment, said attachment including first and second positions, said first position oriented to engage, guide and constrain the

cable and having manually activated locking means to maintain said first position, said second position oriented to be retracted from the cable, and biasing means to move said attachment from said first position to said second position upon release of said manual locking means whereafter the stringing block supports the cable solely,

a first cable engaging surface formed as an elongate roller rotatably mounted on a roller axle which forms a portion of said attachment, said roller rotates in a fixed radius arc from said first to said second position,

and a lower and upper support arm on said roller axle at extremities thereof, said support arms connected to a further axle for synchronous movement of said support arms, said further axle connected to an upper mounting bracket supported on said carriage and to a tang on a lower carriage portion, said biasing means connected to said lower support arm, said support arms connected to the stringing block whereby motion of said attachment from said first position to said second position causes rotation of said upper and lower support arms about an arc of a circle relative to the area of attachment to the stringing block as the center of curvature, and said roller and roller axle move in a peripheral path about said support arms defining and generating a cylinder.

4,420,144

## MANUAL HOISTING AND PULLING APPARATUS

Koji Nishimura, Rittcho, Japan, assignor to Vital Kogyo Kabushiki Kaisha, Osaka, Japan

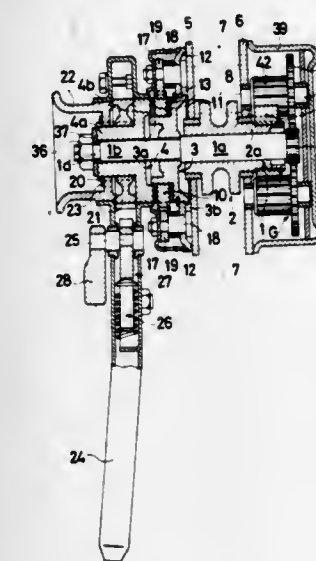
Filed Oct. 13, 1981, Ser. No. 310,839

Claims priority, application Japan, Oct. 21, 1980, 55-147956; Dec. 25, 1980, 55-188828

Int. Cl.<sup>3</sup> B66D 1/04

U.S. Cl. 254—345

6 Claims



1. In a hand hoist including a load sheave disposed between a pair of side plates and supported on a drive shaft, an operating lever associated with one end of the drive shaft to rotate said shaft, a drive member and a driven member provided between the operating lever and one of the side plates and screwed on a threaded portion of the drive shaft, a reverse rotation preventing assembly provided between the drive member and the driven member, and a train of transmission gears provided between the other end of the drive shaft and the load sheave including an axially movable pinion on said drive shaft removably engageable with intermediate gears, the improvement comprising a drive shaft holding member rotatably mounted on the driven member so that it is axially movable with the driven member and substantially non-rotatable irrespective of rotation of the driven member, and a stop member mounted on said one of the side plates and movable to selectively overlap opposite sides of said holding member to retain

the pinion on the other end of the drive shaft engaged with or disengaged from the intermediate gears.

4,420,145

## WALKING BEAM FURNACE FOR HEATING METALLURGIC MATERIALS WITH DIFFERENT INLET TEMPERATURES

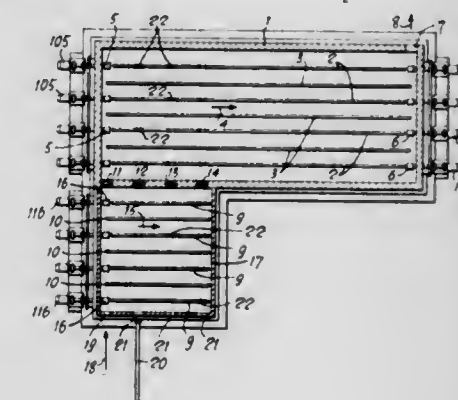
Iacopo Martini, Genoa, Italy, assignor to Italimpianti Società Italiana impianti, p.A., Genoa, Italy

Filed Mar. 1, 1982, Ser. No. 353,094

Claims priority, application Italy, Mar. 31, 1981, 12482 A/81 Int. Cl.<sup>3</sup> F27B 9/14

U.S. Cl. 266—90

9 Claims



1. A walking beam furnace for heating metallurgical materials such as billets, blooms, bars and the like, comprising:

- a plurality of successive side doors along said furnace;
- external conveyor means along at least one side of said furnace, said external conveyor means being located adjacent to said side doors;
- internal conveyor means within said furnace, said internal and external conveyor means advancing with corresponding speed and direction;
- introduction means for introducing materials into said furnace, said materials passing from said external conveyor means through any of said side doors to said internal conveyor means;
- discharge means for discharging materials from said furnace, said materials passing from said internal conveyor means through any of said side doors to said external conveyor means; and
- detection and control means for detecting temperature and cross-section of said materials and controlling introduction and discharge of said materials through said side doors of said furnace, said detection and control means thereby providing said materials, regardless of shape or initial temperature, with a substantially uniform temperature upon discharge from said furnace.

4,420,146

## APPARATUS FOR OPENING FOLDED, BOUND OR STITCHED MULTI-SHEET PRODUCTS, ESPECIALLY PRINTED PRODUCTS

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Dec. 8, 1980, Ser. No. 214,461

Claims priority, application Switzerland, Jan. 5, 1980, 304/80 Int. Cl.<sup>3</sup> B65H 5/30

U.S. Cl. 270—55

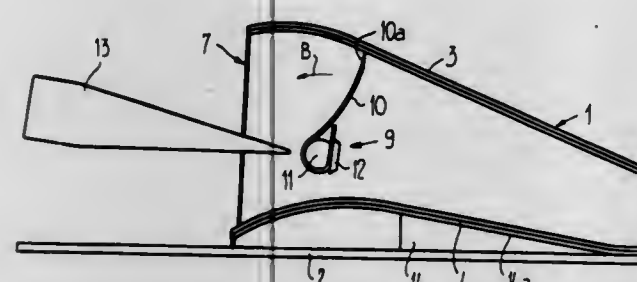
15 Claims

1. An apparatus for opening folded, bound or stitched multi-sheet products of a generally planar configuration, especially printed products, comprising:

a separation element capable of being introduced between the sheets of a respective product as a relative movement is effected between the product and the separation element, whereby an open side of the product is displaced past the separation element at a leading open side of such product;



means for accomplishing relative movement between the product and the separation element;  
said separation element comprising an essentially flat, rotatable opening element;  
means for rotating said rotatable opening element about an axis of rotation which is substantially parallel to a plane defined by the product to be opened;



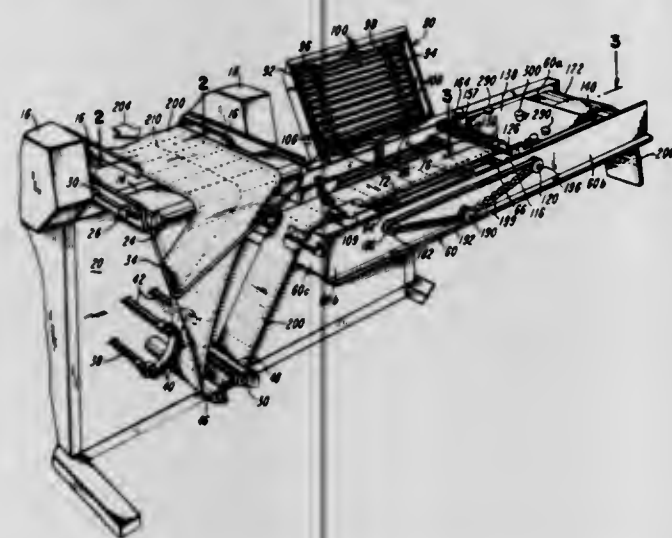
said rotatable opening element piercingly entering between the sheets of the product which practically completely bear upon one another; and  
said rotating means including means mounting said opening element in a position relative to the product such that said opening element, when subsequently rotated after it has piercingly entered the sheets of the product, separates the sheets located at one side of the opening element from the remaining sheets of the product.

4,420,147

**WEB FOLDING AND SEALING MACHINE**

William J. Knox, and Byron C. Hall, both of Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio  
Continuation-in-part of Ser. No. 329,756, Dec. 11, 1981. This application Jul. 9, 1982, Ser. No. 396,797  
Int. Cl.<sup>3</sup> B41L 43/12; B31B 23/00  
U.S. Cl. 270—37

4 Claims



1. Apparatus for sealing a continuously moving continuous folded web which carries solidified glue on selected areas of longitudinally extending regions thereof between the folded parts of the web comprising:

elongate support structure including first and second aligned sections along which the continuous folded web is movable;

a plurality of pairs of elongate heater strips, there being a plurality of laterally spaced-apart elongate lower heater strips and a plurality of laterally spaced-apart elongate upper heater strips in the first section of the support structure, each upper heater strip being directly above one of the lower heater strips along the length thereof, the pairs of heater strips being substantially parallel to each other and parallel to the longitudinal axis of the elongate support structure so as to be aligned with the longitudinally extending regions;

support means supporting the upper heater strips and mov-

able with respect to the lower heater strips for movement of the upper heater strips toward and away from the lower heater strips;

a pair of closely spaced parallel conterminous thermal conductor plates in the second section of the elongate support structure;

a first pressure roller positioned between the first section and the second section of the elongate support structure and extending transversely across the elongate support structure, a plurality of elastomeric pressure rings tightly encompassing the first pressure roller, there being one elastomeric pressure ring in alignment with each pair of the elongate heater strips, a second pressure roller parallel to the first pressure roller and closely spaced with respect thereto;

the folded web moving along the first section of the elongate support structure and between the upper heater strips and the lower heater strips for melting the glue which is between the folded parts of the folded web and which is between the pairs of spaced-apart elongate heater strips, the folded web then moving between the closely spaced pressure rollers as the elastomeric pressure rings of the first pressure roller and the second pressure roller apply pressure to the longitudinally extending regions of the folded parts of the web which have traveled between the pairs of heater strips and to the melted glue between the folded parts of the web, the folded web then moving between the thermal conductor plates for cooling the web and for solidifying the glue as the folded web travels between the thermal conductor plates, the support means being movable with respect to the lower heater strips to move the upper heater strips from the lower heater strips to provide access to the portions of the folded web which are positioned between the lower heater strips and the upper heater strips.

4,420,148

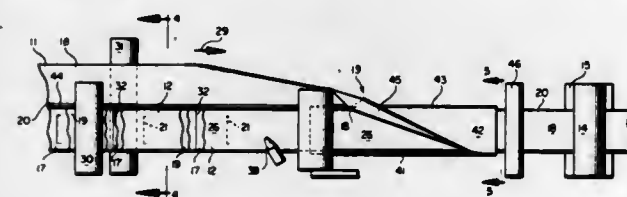
**METHOD AND APPARATUS FOR FOLDING A COVER STRIP OVER A MULTI-PLY INNER STRIP**

Clayton D. Meadows, Itasca, Ill., assignor to The Wessel Company, Inc., Elk Grove Village, Ill.

Filed Mar. 22, 1982, Ser. No. 360,449  
Int. Cl.<sup>3</sup> B41L 43/04

U.S. Cl. 270—41

9 Claims



1. In a booklet manufacturing process, a method for folding a cover strip having a transverse slit over a multi-ply inner strip, said method comprising the steps of:

providing one continuous strip of paper having first and second parts extending in adjacent relationship along a longitudinal folding line, with transverse slits at longitudinally spaced intervals on said first part;

said first part having a transverse dimension;

advancing said one continuous strip longitudinally in a downstream direction along a predetermined path having a downstream portion;

providing another continuous strip of paper having multiple plies longitudinally folded in nested relation along a line to define a spine for said other strip along the fold line for said plies, said other continuous strip having a transverse dimension corresponding substantially to the transverse dimension of said first part on said one strip;

advancing said other continuous strip longitudinally in a downstream direction along a predetermined path and above said first part on said one strip, said predetermined

path of the inner strip having a downstream portion corresponding to the downstream portion of the path of said cover strip;

providing a folding station at a predetermined location on said downstream path portion;

laying said other strip atop the first part of said one strip upstream of said folding station, whereby the first part of the one strip becomes a bottom cover under the second strip;

said one strip lying in a plane as said strip advances toward said folding station;

tensioning said one strip in the plane thereof, at said folding station, to avoid slack in said strip;

folding said second part of the tensioned one strip along said longitudinal folding line, out of the plane of the one strip and then over and atop said multi-ply second strip to provide a top cover over the second strip and a longitudinal edge at said folding line;

controlling the tension in said one strip during said folding step to avoid transverse tearing on said first part thereof from said transverse slit to said longitudinal folding line; supporting said first part of the one strip from below during said folding step;

urging said second part of the one strip downwardly toward said other strip as the strips move downstream during said folding step;

urging said longitudinal edge in a transverse direction toward said other strip during said folding step;

applying a longitudinally extending line of adhesive on said one strip adjacent said longitudinal folding line, prior to said laying step;

and adhering said spine to said one strip at said line of adhesive, after said applying step.

4,420,149

**AUTOMATIC ORIGINAL DOCUMENT FEEDER FOR ELECTROPHOTOGRAPHIC COPIER**

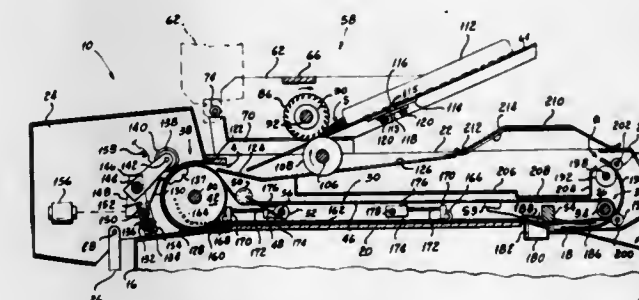
Max Schultes, Old Tappan, N.J., and Dietmar Eberlein, Wappingers Falls, N.Y., assignors to Savin Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 97,554, Nov. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 7,370, Jan. 29, 1979, abandoned. This application May 20, 1981, Ser. No. 265,393

Int. Cl.<sup>3</sup> B65H 1/04, 3/06

U.S. Cl. 271—10

5 Claims



1. Document transport apparatus for use with a copier having an imaging station, said apparatus including in combination means forming an inlet for receiving documents, means forming a generally horizontal guide surface facilitating manual introduction of documents into said inlet, a document support for receiving a stack of documents, said support having an end, means for automatically advancing documents from said end of the support, means mounting said support and said advancing means for constrained movement between first and second limit positions relative to said inlet-forming means and said guide surface while remaining continuously attached thereto, said support and said advancing means overlying said guide surface in said first limit position with said end adjacent said inlet and overlying said inlet in said second limit position to expose said guide surface and permit manual introduction of a

document into said inlet, said advancing means being operative in the first position to introduce documents from said support into said inlet, and means operable in each of said positions of said support and said advancing means for transporting a document introduced into said inlet to said imaging station.

4,420,150

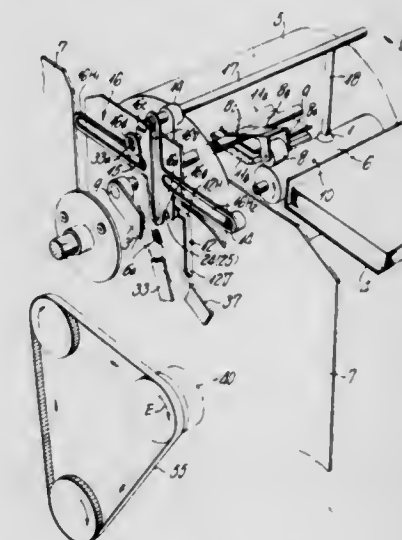
**APPARATUS AND METHOD FOR SEPARATING A SINGLE SHEET FROM A STACK AND CONVEYING IT**

Michio Umezawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan  
Filed Dec. 17, 1980, Ser. No. 217,553  
Claims priority, application Japan, Dec. 19, 1979, 54-166026; Dec. 25, 1979, 54-168746

Int. Cl.<sup>3</sup> B65H 3/08, 7/18

U.S. Cl. 271—11

19 Claims



1. An apparatus for separating sheets individually from a stack of sheets and conveying the separated sheets individually to a selected location comprising:

at least one suction device;

means associated with each said suction device for connecting it to a source of suction; and

drive means associated with each said suction device for moving it adjacent the uppermost sheet in said stack for attracting said uppermost sheet thereto by suction, thereafter tilting each said suction device to thereby separate any underlying sheets attracted thereto and then moving each said suction device towards said location to transport said uppermost sheet thereto, said drive means including adjusting means connected to each said suction device for adjusting the angle of tilt thereof according to characteristics of the sheet in said stack, said adjusting means including means for determining the thickness of a sheet from said stack and means associated with said thickness-determining means for adjusting said angle of tilt automatically as a function of thickness determined for the sheet.

10. An apparatus for separating sheets individually from a stack of sheets and conveying the separated sheets individually to a selected location, comprising:

at least one suction device;

means including a conduit connected with each said suction device for connecting it to a source of suction;

drive means connected to each said suction device for moving it adjacent the uppermost sheet in said stack for attracting it thereto by suction and thereafter moving each said suction device towards said location; and

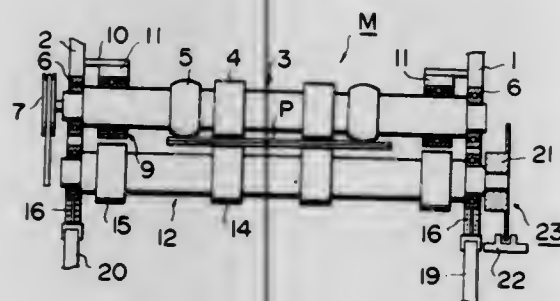
said conduit being formed with an opening leading to the ambient and located between each said suction device and the source of suction, and means provided over said opening for receiving another sheet comparable to the sheet to be attracted by each said suction device for covering said opening by said another sheet.



4,420,151  
OVERLAPPING FEED DETECTION DEVICE IN  
SHEET-PROCESSING MACHINE

Tetsuji Kobayashi, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan  
Filed Aug. 17, 1981, Ser. No. 293,261  
Int. Cl.<sup>3</sup> B65H 7/12  
U.S. Cl. 271-263

5 Claims



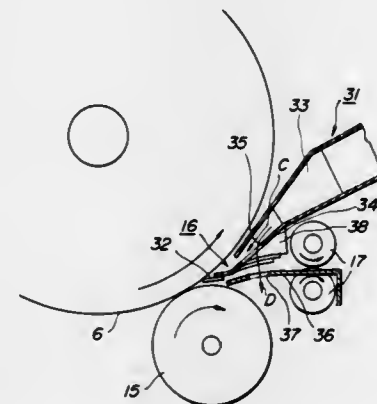
1. In an overlapping feed detection device for use in a machine for processing paper money, slips, checks, or like sheets, said detection device being of the type including propelling means driven by motive power means and operating to successively propel sheets to be processed, a driven rotatable structure rotatably supported to parallelly confront said propelling means and to be separable therefrom and approachable thereto, a gate gap being formed between said propelling means and said driven rotatable structure for passage therethrough normally of a single sheet at one time, said gap being widened when two or more sheets in overlapping state pass therethrough to force said driven rotatable structure to undergo a displacement away from said propelling means, and detecting means for detecting said displacement thereby to detect the overlapping feed of the sheets, the improvement comprising:

- a driving shaft formed integrally and coaxially with said propelling means;
- a driven shaft formed integrally and coaxially with said driven rotatable structure;
- bearings including inner races fixedly mounted on said driving shaft to rotate unitarily therewith and outer races;
- a holding mechanism including holding members normally holding said outer races against rotation;
- pressing rollers formed integrally with said driven shaft and said driven rotatable structure;
- elastic members urging said pressing rollers normally into pressing contact with said outer races;
- whereby said gate gap for passing only a single sheet is formed between said propelling means and said driven rotatable structure when said pressing rollers are in pressing contact with said outer races, and said pressing contact prevents said pressing rollers, said driven shaft and said driven rotatable structure from rotating;
- whereby, when two or more sheets in an overlapping state cause a widening of said gap and a displacement of said driven rotatable structure away from said propelling means, said pressing contact is released, thereby enabling rotation of said pressing rollers, said driven shaft and said driven rotatable structure; and
- rotation detecting means for detecting the rotation of said driven rotatable structure.

4,420,152  
APPARATUS FOR PEELING OR SEPARATING A  
RECORD PAPER FROM A PHOTOSENSITIVE DRUM OF  
AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Kiyoshi Miyashita, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan  
Continuation of Ser. No. 116,825, Jan. 30, 1980, abandoned. This application Aug. 10, 1981, Ser. No. 291,773  
Claims priority, application Japan, Feb. 2, 1979, 54-11135  
Int. Cl.<sup>3</sup> B65H 29/56  
U.S. Cl. 271-309

12 Claims



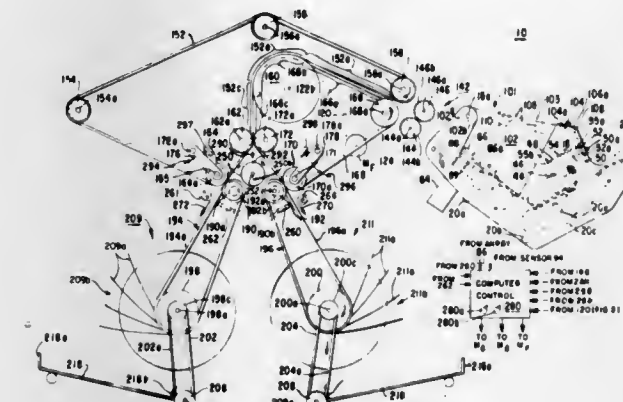
1. An apparatus for peeling a record paper having a toner image transferred thereon by means of a transferring member off a charge retentive member of an electrophotographic copying machine, comprising: a pair of pawls, each of said pawls employed to peel a respective side edge of the record paper from the charge retentive member; a duct for blowing an air stream in a space between the record paper and the charge retentive member; and first and second guide plates arranged substantially in parallel with each other for defining a passage through which the record paper peeled off the charge retentive member is fed in such a manner that the toner image retentive surface of the record paper is opposed to an inner surface of the first guide plate, at least one opening being formed in the first guide plate, through which opening an air stream is introduced into said passage so as to press the record paper against the second guide plate, a front edge of said first guide plate is recessed in a V-shaped manner in the paper feeding direction, and the record paper does not strike against the front edge of said first guide plate.

9. An apparatus for peeling a record paper having a toner image transferred thereon by means of a transferring member off a charge retentive member of an electrophotographic copying machine, comprising: a pair of pawls, each of said pawls employed to peel a respective side edge of the record paper from the charge retentive member; a duct for blowing an air stream in a space between the record paper and the charge retentive member; and first and second guide plates arranged substantially in parallel with each other for defining a passage through which the record paper peeled off the charge retentive member is fed in such a manner, that the toner image retentive surface of the record paper is opposed to an inner surface of the first guide plate, at least one opening being formed in the first guide plate, through which opening an air stream is introduced into said passage so as to press the record paper against the second guide plate, a front edge of said first guide plate is recessed in a convex manner in the paper feeding direction and is bent in a convex manner in a direction perpendicular to the paper feeding direction, whereby a curved front edge of the record paper does not strike against the front edge of said first guide plate.

4,420,153  
DOCUMENT HANDLING COUNTING AND EXAMINING  
DEVICE INCORPORATING HIGH SPEED ROTARY  
GATING MEANS

Theodore Winkler, Levittown, and Frank J. Reed, Philadelphia, both of Pa., assignors to Brandt, Inc., Bensalem, Pa.  
Filed Sep. 19, 1980, Ser. No. 188,906  
Int. Cl.<sup>3</sup> B65H 29/60  
U.S. Cl. 271-304

39 Claims



1. Means for selectively diverting sheets comprising: delivery means engaging the opposing major faces of sheets for delivering sheets in a single file along a substantially linear path in a spaced apart fashion towards a diverting location as each sheet leaves said delivery means; elongated revolvable means positioned in said linear path of movement of said sheets and revolvable about an axis lying in said path of movement; said delivery means including first and second moving guide means arranged adjacent one another for engaging opposing major faces of sheets along a portion of said linear path and extending abruptly away from one another at a point where the sheets leave the influence of said guide means, the portions of the first and second guide means extending away from each other serving as moving guides on opposite sides of said revolvable means; means for continuously rotating said revolvable means in a first direction at high speed for diverting sheets engaging the periphery of said revolvable means in a first direction away from said linear path and towards said first guide means and for continuously rotating said revolvable means in a second direction at high speed for diverting sheets engaging the periphery of said revolvable means in a second direction away from said linear path and towards said second guide means; first and second acceleration means forming a nip positioned adjacent said first and second moving guide means and downstream of said revolvable means, for abruptly accelerating a sheet as its leading edge enters the nip for delivery to a collection location associated with each acceleration means; the nips of said accelerating means each being arranged to selectively receive the leading edge of a sheet, while its trailing edge is still between the first and second moving guide means; said moving guide means being arranged relative to one another to exert a driving force upon sheets which gradually decreases over said portion of said linear path, enabling the acceleration means to accelerate a sheet whose leading edge has entered the nip of the acceleration means before the trailing portion of the sheet leaves said linear path portion, where it is engaged by said first and second moving guide means.

4,420,154  
WEIGHTLIFTING APPARATUS

John T. Ramsey, and William J. Ramsey, both of 3807 S. Webb Rd., Wichita, Kans. 67210  
Filed Nov. 12, 1980, Ser. No. 205,929  
Int. Cl.<sup>3</sup> A63B 21/06  
U.S. Cl. 272-118

5 Claims



1. A weightlifting apparatus for preventing injury to a weightlifter from a weightlifting bar including weights thereon in the event of physical collapse of the weightlifter comprising a framework having a base, a brace, a first pair of vertical support members generally being secured to one end of said brace and to said base, and a second pair of vertical support members generally securing to the other end of said brace and to said base, said vertical support members of said first pair being positioned in proximity to each other creating a first slot and each vertical support members of said first pair including a structure defining a plurality of first slot apertures, said vertical support members of said second pair being positioned in proximity to each other creating a second slot and each vertical support members of said second pair including a structure defining a plurality of second slot apertures, said first slot apertures in said first pair vertical support members and said second slot apertures in said second pair vertical support members being in registry, adjustment means is slidably and adjustably mounted within said first slot and within said second slot for supporting said weightlifting bar and adjusting the height of same with respect to the weightlifter, and fine adjustment means mounted on each of said adjustment means for additionally supporting said weightlifting bar and closely adjusting the height of said bar relative to the weightlifter, said weightlifting apparatus preventing injury to the weightlifter as said weightlifting bar rides within said first and second slots in that if the weightlifting bar and weights are dropped by the weightlifter the fine adjustment means and adjustment means will arrest the falling before injuring the weightlifter, each of said adjustment means comprises a generally rectangular body having a structure defining a plurality of adjustment apertures, at least two pin means for retaining said adjustment means in said first slot and in said second slot, by inserting one of said pin means through said first slot apertures of one first pair vertical support members, said adjustment apertures of one adjustment means, and through said first slot apertures of the other first pair vertical support members, in order stated, for retaining one of the adjustment means in said first slot, and by inserting the other of said pin means through said second slot apertures of one second pair vertical support members, through said adjustment apertures of another adjustment means, and through said second slot apertures of the other second pair vertical support members, in order stated, for retaining the other adjustment means within the second slot, said fine adjustment means comprising a bolt-like member threadably engaging each of said adjustment means; and a plate-like member positioned between each of said fine adjustment means and said adjustment means for stabilizing each of the combined fine adjustment means and adjustment means within the first slot and within the second slot.

4. A process comprising the steps of:  
(a) placing a bar height adjustment device within a first slot between a first pair of vertical support members and



within a second slot between a second pair of vertical support members so as to register apertures in the adjustment devices with the apertures in the vertical support members;

- (b) inserting a first pin through apertures in the support members and the adjustment devices so as to hold the devices in the slots;
- (c) attaching a bar height fine adjustment device to each adjustment device for closely adjusting the final height of a weightlifting bar relative to a user and for supporting a weightlifting bar and arresting the fall of a bar in the event a weightlifting bar is dropped by the user;
- (d) stabilizing each fine adjustment device and adjustment device within the slots by positioning a plate between each of the fine adjustment devices and the adjustment devices; and
- (e) threadably adjusting the fine adjustment device so as to vary the height of a weightlifting bar relative to a user.

4,420,155

**CONVERTIBLE BOWLING ALLEY**

Zena Sheinberg, and Alex Wortman, both of 526 Pauline Blvd., Ann Arbor, Mich. 48103

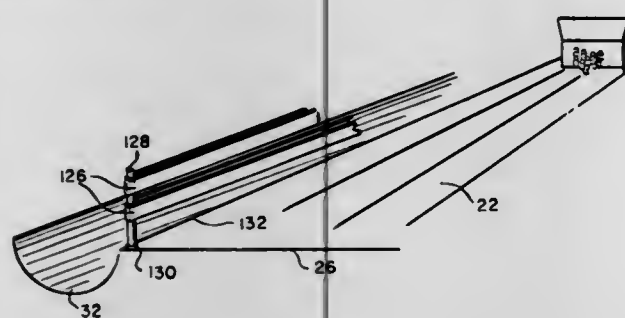
Division of Ser. No. 108,033, Dec. 26, 1979, Pat. No. 4,330,122.

This application Feb. 19, 1982, Ser. No. 350,323

Int. Cl.<sup>3</sup> A63D 5/00

U.S. Cl. 273—51

2 Claims



1. An improved bowling alley of the type comprising a bowling lane bed including an approach and a foul line at one end and a pin deck at the other end thereof and a pair of elongated gutters parallel to and abutting each side of said bowling lane bed, wherein the improvement comprises deflection means removably disposed longitudinally along both sides of said lane bed and outside of said gutters for deflecting a bowling ball rolled down said alley to thereby prevent said ball from falling into said gutters, said deflection means extending substantially along each side of said lane bed between said foul line and said pin deck, and upright pin support means removably disposable at its lower end in respective openings located in the corners formed by the said foul line and the contact lines of said lane bed and said gutter, and the corners formed at the distant end of said lane bed near said pin deck and at the contact line of said lane bed and said gutter, said deflection means being removably supported vertically above said lane bed by said upright pin support means whereby said bowling alley can serve as a conventional alley when said deflection means and said upright pin support means are removed and can serve as a carom bowling alley when said deflection means are supported in place.

4,420,156

**IRON-TYPE GOLF CLUBS**

Daniel N. Campau, Grand Rapids, Mich., assignor to Pepsico, Inc., Purchase, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,460

Int. Cl.<sup>3</sup> A63B 53/00

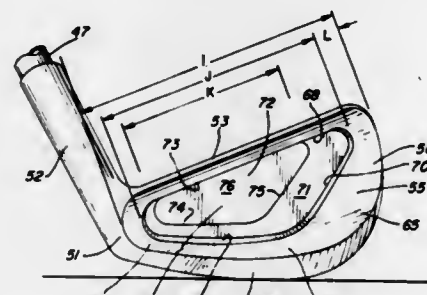
U.S. Cl. 273—77 A

18 Claims

1. A set of at least four iron-type golf clubs, each club of the

set having a shaft and a head connected to the shaft, each head having:

- a sole having a leading edge and a trailing edge;
- a toe,
- a heel,
- a flat striking face extending upwardly from the leading edge of the sole between the toe and the heel, the striking face extending at a different loft angle for each club of the set,
- a rear face extending upwardly from the trailing edge of the sole between the toe and the heel, and
- a cavity in the rear face, the cavity having a bottom wall which is spaced above the sole to provide a sole-weighting portion of the head between the sole and the cavity bottom wall and a side wall which is spaced from the toe to



provide a toe-weighting portion of the head between the toe and the cavity side wall, the thickness, width, and weight of the sole-weighting portion and the toe-weighting portion of each head being such that:

- (a) the center of gravity of each head is spaced progressively farther behind the striking face as the loft angle decreases;
- (b) the moment of inertia of each head with respect to an axis of rotation of the head which passes through the center of gravity progressively decreases as the loft angle decreases; and
- (c) the radius of gyration of each head with respect to said axis of rotation is greater than 1.26 inch whereby each club provides gear effect spin to a golf ball which is struck by the club at a point which is on the toe side or the heel side of the center of gravity of the club.

4,420,157

**APPARATUS FOR PLAYING A GAME**

Peter H. White, and Patricia M. White, both of Apartado 164, Estepona, Malaga, Spain

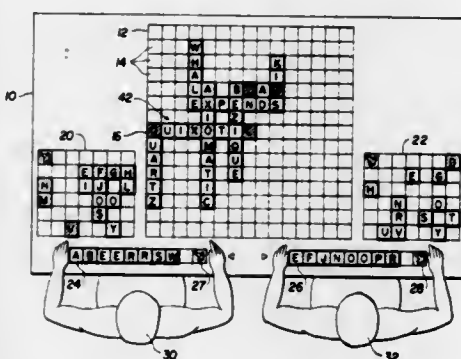
Filed Feb. 16, 1982, Ser. No. 349,363

Claims priority, application United Kingdom, Feb. 26, 1981, 8106156

Int. Cl.<sup>3</sup> A63F 3/00

U.S. Cl. 273—272

10 Claims



1. Apparatus for the playing of a game by only two participants, the apparatus comprising means that is planar when in use and that is marked with a single game area which defines a plurality of adjoining identically dimensioned spaces substantially all of which are plain and unmarked, said means further being marked to define one reserve area and one play area for use by each of the two participants, a plurality of playing pieces each of which is planar and is marked on both opposite

sides with a single letter of the alphabet or with a symbol denoting universal use, each playing piece being assigned a scoring value, and rules for playing a game with the apparatus which rules require the initial allotment of an equal set of lettered playing pieces and one universal playing piece to each of the two game participants for disposal in the respective reserve areas of said means, an initial secret selection by each participant of the same previously agreed number of not less than two and not more than ten of his/her allotted playing pieces for transfer from that reserve area to the respective play area, and the formation of conjoined words in crossword format in the adjoining spaces of the game area, such words yielding scores determined by the total letter values involved, the taking by the two participants of alternate turns using playing pieces selected from their respective play areas, and the subsequent restoral of the preselected number of playing pieces in their respective play areas at each turn by replenishment from the corresponding reserve areas, and wherein the rules also require all the playing pieces to remain fully visible to both participants once said initial secret selections thereby have been made in each game and the participants have signified that they are ready to continue that game.

4,420,158

**PORTABLE SPORTS FIELD GOAL ASSEMBLY**

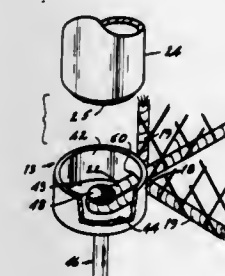
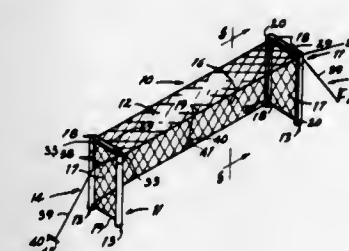
Lawrence E. Klock, Spokane, and Randall J. Browelett, Renton, both of Wash., assignors to Soccer Stuff, Inc., Seattle, Wash.

Filed Oct. 2, 1981, Ser. No. 307,801

Int. Cl.<sup>3</sup> A63B 63/00

U.S. Cl. 273—400

7 Claims



1. A portable field goal assembly, comprising:  
a pair of end frames, each including a pair elongated upright support members having bottom ends and interconnected by a cross member;  
an elongated goal net having longitudinal sides and transverse ends joined at corners and having a peripheral rope frame defining the ends, sides and corners;  
ground cups each having a peripheral wall defining an upwardly open recess for slidably receiving the bottom end of one elongated support member and having a horizontal bottom surface with a preformed aperture formed there-through within said recess;  
spike means received through the ground cup apertures for securing the ground cups and the attached frame members to the ground surface at spaced apart locations;  
guy means operatively connected to the end frames adapted to be secured to the ground surface, for holding the end frames in upright operative positions with the net stretched between the end frames; and  
means for operatively attaching the net to the end frame and to the spike means adjacent the net ends.

4,420,159

**PACKER VALVE ARRANGEMENT**

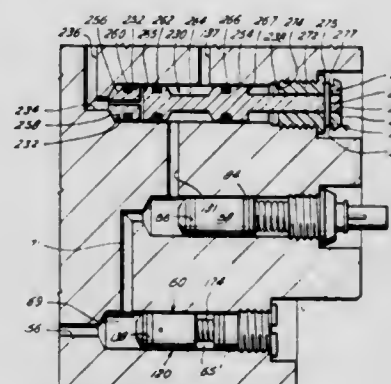
Edward T. Wood, Kingwood, Tex., assignor to Completion Tool Company, Houston, Tex.

Filed Aug. 13, 1982, Ser. No. 407,898

Int. Cl.<sup>3</sup> E02D 5/00; E21B 33/12

U.S. Cl. 277—34

13 Claims



1. In a tubular system having a hollow tubular mandrel;  
a packer attached to the mandrel at one end;  
a valve collar mounted on the other end of the mandrel, the other end of the packer being attached to the collar and the collar being in fluid communication with the packer by a passage and the collar also being in fluid communication with the interior and exterior of the mandrel;  
a valve system mounted on the mandrel, the valve system being in fluid communication with the packer and the interior and exterior of the mandrel, the valve system including at least one valve with at least one reciprocating member and a stop means for preventing reciprocation of the reciprocating member prior to the application of at least a predetermined pressure difference to the reciprocating member, the reciprocating member being located at one end of the passage when the stop means prevents reciprocation, the reciprocating member hving at least two seals thereon for preventing the flow of fluid from either side of the reciprocating member around the member to the passage;  
the improvement comprising:  
first means independent of the seals for permitting the flow of fluid from the interior of the mandrel to one side of one seal of the reciprocating member; and  
second means independent of the seals for permitting the flow of fluid from the exterior of the mandrel to oppositely facing surface of the other seal of the reciprocating member; and  
third means independent of the seals for equalizing the pressure on the other side of each of the seals to substantially that of the exterior of the mandrel.

4,420,160

**FACE SEAL SYSTEM**

Herman C. Laham, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 129,080, Mar. 10, 1980, abandoned.

This application May 28, 1982, Ser. No. 383,367

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277—40

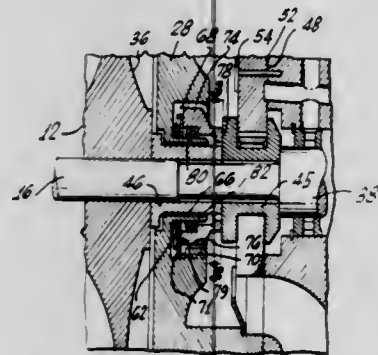
10 Claims

1. A seal system for a turbocharger for sealing passage of a rotatable shaft through a compressor backplate separating a turbocharger center housing and compressor housing from each other, comprising:  
means integral with the backplate defining an annular recess opening axially toward the center housing said recess having a radially extending annular base wall bounded at its radially inner extent by an axially extending annular flange concentrically about the shaft, said recess being further bounded by at least one integral and radially pro-



jecting anti-rotation lug spaced axially from said base wall of said recess;  
helical spring means receivable axially into said recess having a relatively low spring rate and a generally conical cross-section for compression substantially into a single plane;

a thrust washer having at least one slot formed therein for registry with said lug said thrust washer being receivable axially into said recess past said lug and then indexable with respect to said lug whereby said lug axially retains and limits axial travel of said thrust washer within said recess, said spring means exerting a force bearing axially against said thrust washer for urging said thrust washer in an axial direction toward said lug;  
a generally annular seal member having at least one slot



formed therein for registry with said lug, said seal member being receivable axially into said recess into bearing engagement with said thrust washer and including a seal face presented axially toward the center housing for sealing engagement with respect to the shaft;

passage means formed in said backplate bounding the radially outer extent of said recess for communicating the fluid pressure within the center housing to the axial side of said thrust washer opposite said seal member for assisting said spring means in urging said seal face into sealing engagement with respect to the shaft when said fluid pressure in the center housing exceeds the fluid pressure in the compressor; and

an annular resilient seal ring concentrically between said seal member and said flange for preventing passage of fluid therebetween.

4,420,161

### ROTOR STABILIZING LABYRINTH SEALS FOR STEAM TURBINES

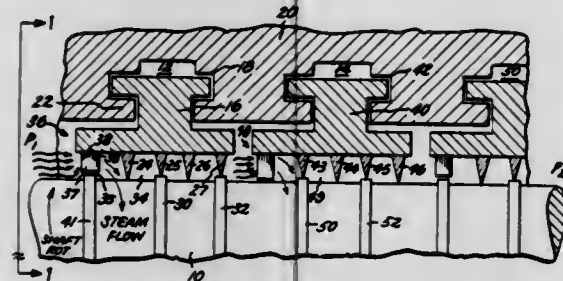
Edward H. Miller, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 10, 1982, Ser. No. 376,247

Int. Cl.<sup>3</sup> F16J 15/44, 15/40; F01D 5/20

U.S. Cl. 277-56

10 Claims



1. For use in a steam turbine having a central rotatable rotor, a labyrinth seal for minimizing leakage of the steam between a region of higher pressure and a region of lower pressure through which the rotor extends, such seal providing stabilization against rotational instabilities of the type caused by steam whirl and comprising, in combination:

a plurality of spaced-apart annular teeth affixed to a station-

ary portion of the turbine between said pressure regions and encircling the rotor substantially coaxially therewith to define chambers between the teeth, each tooth of said plurality of teeth extending radially inward to within close proximity of said rotor;

a row of circumferentially spaced-apart flow directing vanes affixed to the stationary portion of the turbine within said higher pressure region and encircling the rotor in proximity to said plurality of said annular teeth, each vane of said row having a portion of its planar surface being substantially radially aligned with respect to said rotor, and said planar surface of said vane being angularly inclined with respect to the axis of said rotor to direct steam passing therethrough into said chambers in a flow direction counter to the direction of rotor rotation; and

a raised annular land on the rotor surface opposite said row of vanes to produce an abrupt radially outward deflection of the steam flow passing axially near the surface of the rotor, the resultant outward flow being carried into the vicinity of said row of vanes so that substantially the entire flow of steam entering said chambers passes through said vane row and enters in a direction counter to the direction of rotor rotation.

4,420,162

### MECHANICAL SEAL AND METHOD OF FORMING A SLIDING SURFACE THEREOF

Tadamasa Yanai, Takahashi; Risaburo Sagehashi, Souja; Yoshio Kameyama, Souja, and Takao Shimomura, Souja, all of Japan, assignors to Eagle Industry Co., Ltd., Tokyo, Japan

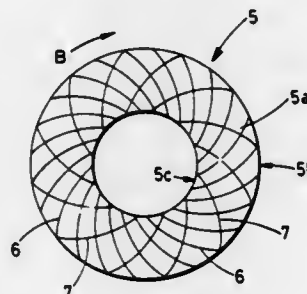
Filed Nov. 3, 1981, Ser. No. 317,814

Claims priority, application Japan, Nov. 4, 1980, 55-153840; Mar. 5, 1981, 56-30450

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277-96.1

18 Claims



1. A mechanical seal comprising a seat ring fixed to a housing, a seal ring fixed to a rotating shaft, said seal ring rotating with said rotating shaft, said seat ring and said seal ring being in sliding contact with each other to prevent the leakage of fluid, and a plurality of fine grooves formed on a sliding surface of one of said rings, some of said fine grooves being inclined forwardly for performing a lubricating action and the remainder being inclined rearwardly to perform a pumping action, said grooves being inclined forwardly and rearwardly with respect to the relative rotational direction of said seal ring, each of said fine grooves respectively having ends extending to the outer peripheral edge and the inner peripheral edge of said sliding surface, said forwardly inclined grooves and said rearwardly inclined grooves intersecting one another such that sealing fluid is passable from said forwardly inclined grooves to said rearwardly inclined grooves at said intersections such that sealing fluid enters said seal via said forwardly inclined grooves and exits said seal via said rearwardly inclined grooves, said rearwardly inclined grooves being greater in number than said forwardly inclined grooves such that the discharge capacity resulting from said pumping action of said rearwardly inclined grooves is greater than the intake capacity of said forwardly inclined grooves.

4,420,163

### MECHANICAL SEAL

Akira Takenaka, and Tatsuhiko Fukuoka, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

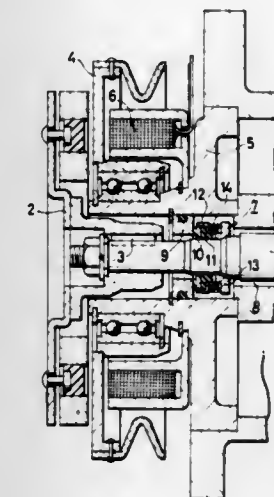
Continuation of Ser. No. 87,905, Oct. 24, 1979, abandoned. This application Mar. 11, 1982, Ser. No. 356,990

Claims priority, application Japan, Oct. 25, 1978, 53-131406

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277-96.1

13 Claims



1. In a mechanical seal for sealing a rotatable shaft with respect to a wall which is stationary relative to said rotatable shaft, said mechanical seal comprising an annular seating ring non-rotatably mounted on the wall and an annular follower ring mounted on the shaft for rotation therewith, said seating ring and said follower ring having opposed transverse annular seal faces, and including means for urging said seal faces into face-to-face sealing and rotatable sliding engagement with each other for sealing a pressurized fluid present in a first zone surrounding said follower ring from a second zone inside said seating ring, which second zone communicates with the ambient air, the improvement which comprises: the radially outer portion of said seal face of said follower ring is an annular, smooth, uninterrupted, land portion extending from the periphery of said seal face partway across the radial width of said seal face, said land portion being in sealing and rotatable sliding engagement with the portion of said seating ring that is opposed to said land portion, and the annular, radially inner portion of said seal face of said follower ring has a multitude of radially and circumferentially spaced-apart, discrete cavities therein distributed over the surface of said radially inner portion, said cavities being spaced also from both the radially inner and radially outer edges of said follower ring seal face, with the entire perimeter of each cavity being surrounded and thus closed by the follower ring seal face, said cavities being only in said radially inner portion, the depth of each said cavity being in the range of from 0.01 to 1.0 mm, the smallest dimension across the mouth of each said cavity, namely the width thereof, being in the range of from 0.1 to 1.0 mm, said radially inner portion extending up to about two-thirds of the distance from the radially inner edge to the radially outer edge of said seal face of said follower ring, so that fluid that leaks in a radially inward direction between said seal faces enters said cavities and is urged radially outwardly by centrifugal force generated by rotation of said follower ring relative to said seating ring.

4,420,164

### STAND FOR DIRT BIKES

Mark T. Mitchell, 8320 E. Indianola, Scottsdale, Ariz. 85251

Filed Jan. 15, 1982, Ser. No. 339,729

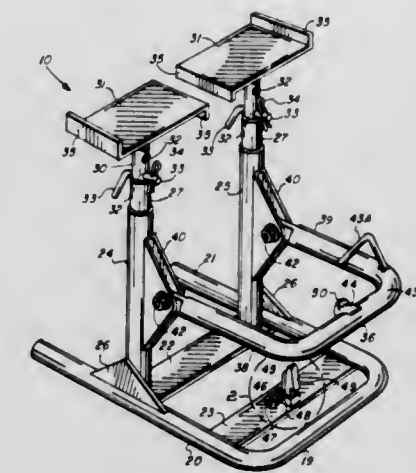
Int. Cl.<sup>3</sup> B62H 3/10

U.S. Cl. 280-293

10. A motorcycle stand comprising:  
a base,

10 Claims

at least one vertically arranged hollow column mounted on said base,  
said column having a collar mounted thereon in a telescopic arrangement for extending or reducing the combined length of said column and its associated collar,  
a lever arm pivotally mounted on said column, the movement of which in a predetermined manner simultaneously moves said collar relative to its associated column,  
a spring biased catch mounted on said base,



a clip mounted on said lever arm for engagement by said spring biased catch for holding the collar in a given position relative to said column when said lever arm is moved a predetermined distance in a given direction, and  
a surface on said catch, said catch responsive to the contact of an operator's foot against said surface for disengaging said clip to permit a reduction of the combined length of said column and the associated collar by the weight of the motorcycle on the stand.

4,420,165

### MULTI-TRAILER ASSEMBLY

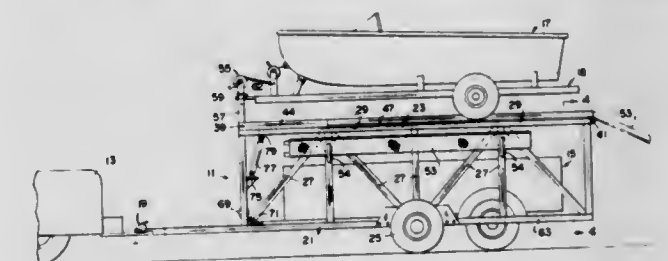
William K. Goodin, 8518 Macoma Drive, St. Petersburg, Fla. 33702

Filed Nov. 12, 1980, Ser. No. 205,921

Int. Cl.<sup>3</sup> B60P 3/08, 3/10

U.S. Cl. 280-414.1

6 Claims



1. A trailer for simultaneously transporting a first boat vehicle and a second wheeled vehicle with a third vehicle comprising:

a first base member having two longitudinal horizontal portions joined at one end with a transverse horizontal section;  
at least one trailer wheel independently attached to each longitudinal horizontal portion;  
a second base member disposed above the first base member and having two longitudinal horizontal portions connected by at least two transverse horizontal sections;  
a plurality of struts attached to and connecting the first and second base member;  
a U-shaped frame pivotally connected to the second base member, and two wheel guides attached to the U-shaped frame for supporting the first vehicle thereon;  
means for connecting the first base member to a pulling vehicle; and



means for coupling the second vehicle to be transported to the first base member whereby the weight of the second vehicle to be transported is self-supported and the trailer wheels support only the weight of the first vehicle to be transported and the trailer.

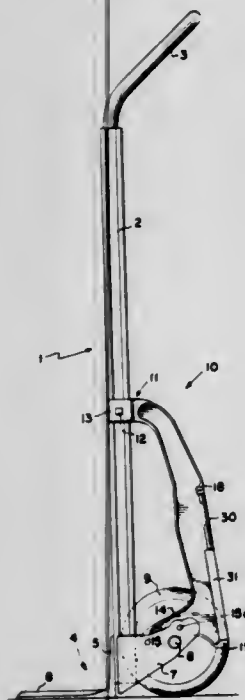
4,420,166

**STAIR CLIMBER FOR HAND TRUCKS**

Don C. Law, Bay City; Carl N. Mortenson, Midland; Paul Ripple, Prudenville, and Roger S. Eckhardt, Bay City, all of Mich., assignors to Magline, Inc., Pinconning, Mich.  
Filed Feb. 10, 1982, Ser. No. 347,529  
Int. Cl.<sup>3</sup> B62B 5/02

U.S. Cl. 280—5.24

19 Claims



1. In a hand truck and stair climber construction wherein a two-handed truck has a pair of wheels; a frame adapted in use to assume a generally vertical position supported by said wheels, the frame having a forwardly projecting nose part to receive a load thereon; and rearwardly projecting stair climbers are mounted on said frame, the stair climbers comprising a body member having a flat web terminating at one edge in a flange, said flange having a first portion overhanging both sides of said web and a second portion overhanging at least one side of said web, said flange portions being separated by a gap, and abutments carried by said body member at opposite ends of and extending beyond said flange.

4,420,167

**ASSEMBLY FOR STABILIZING A VEHICLE CHASSIS**

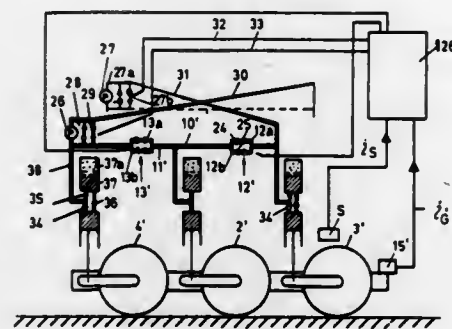
Nils Winblad, Varmlandsvägen 10C, S-691 32 Karlskoga, Sweden  
Continuation-in-part of Ser. No. 207,489, Nov. 17, 1980, abandoned, which is a continuation of Ser. No. 41,851, May 24, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 346,797  
Claims priority, application Sweden, Jun. 7, 1978, 7806643  
Int. Cl.<sup>3</sup> B60G 19/06

U.S. Cl. 280—6 H

20 Claims

11. A system for stabilizing a vehicle on uneven terrain, said vehicle having a chassis and at least three pairs of wheels, each wheel being independently mounted with respect to said chassis, said vehicle having a first and a second tilting axis, said vehicle also having a front and rear end and a first and second side,  
(a) first and second means for generating first and second signals, said first signal being generated in response to rotational motion around said first axis, and said second signals being generated in response to rotational motions around said second axis,

(b) fluid suspension means for each of said wheels mounted between said wheels and said chassis,  
(c) first and second bogie conduit means mounted on said first and second sides of said vehicle to interconnect the suspension systems mounted on said first and second sides of the vehicle, respectively, each of said bogie conduits being equipped with a valve means to provide bogie coaction between adjacent wheels when said valve means are activated,



(d) first and second diagonal conduit means interconnecting bogie conduit means diagonally across the vehicle, each of said diagonal conduit means having a pump means to transfer a fluid suspension medium from one bogie conduit means at one end of said vehicle to the other bogie conduit means at the opposite end of said vehicle, and  
(e) control means for selectively activating said pumps and said valve means in response to said first and said second signals as said vehicle traverses said uneven terrain.

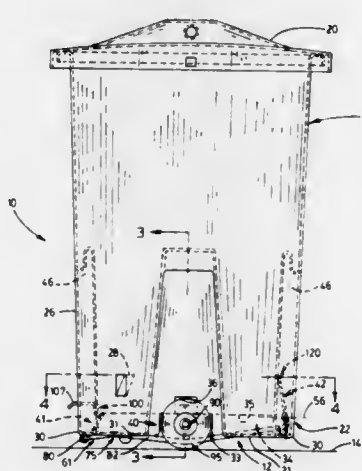
4,420,168

**DEVICE FOR HANDLING REFUSE OR THE LIKE MATERIAL**

Kenneth M. Dewing, Porterville, Calif., assignor to Terra Bella Industries, Terra Bella, Calif.  
Filed Jun. 10, 1982, Ser. No. 386,908  
Int. Cl.<sup>3</sup> B62B 1/00

U.S. Cl. 280—43.1

15 Claims



1. A device for handling refuse or the like material, the device comprising

- A. a container having a bottom surface defining a downwardly open recess therein and having a lowermost area,
- B. an arm extending across the surface and having opposite ends,
- C. means mounting one of the ends on said surface for pivotal movement of the arm before a predetermined upper position and a predetermined lower position,
- D. means mounted on the other of the ends selectively for latching the arm to the container when the arm is in the lower position for retention of the arm therein, and
- E. a wheel received in the recess and mounted on the arm for movement therewith between said positions, the wheel extending downwardly of the lowermost area when the arm is in the lower position for rolling support of the

container, and the wheel being disposed upwardly of such area in the recess when the arm is in the upper position.

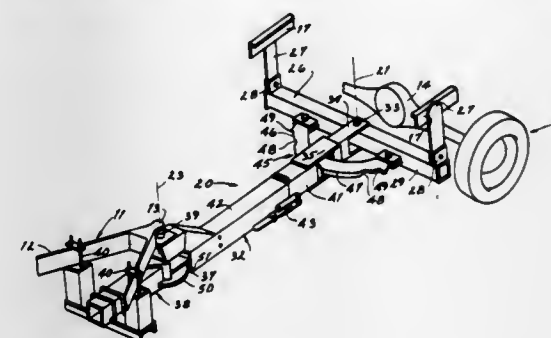
4,420,169

**TRAILER HITCH**

Wayne A. Taylor, P.O. Box 231, Fairfield, Mont. 59436  
Filed Apr. 30, 1982, Ser. No. 373,419  
Int. Cl.<sup>3</sup> B60D 1/14

U.S. Cl. 280—446 R

15 Claims



1. A trailer hitch for attaching a trailer vehicle to a towing vehicle having a rear axle, the hitch comprising:  
a hanger frame adapted to be mounted to the towing vehicle adjacent the rear axle thereof;  
drawbar means mounted at a forward end to the hanger frame for pivotal movement thereon about a primary axis, and extending to a rear end;  
bracket means on the drawbar means at the rear end thereof for free pivotal movement thereon about a secondary axis, mountable to the trailer vehicle;  
lockout means interconnecting the hanger frame, drawbar means, and bracket means, for alternately (a) positively locking the drawbar against pivotal motion about one axis while (b) simultaneously allowing pivotal motion about the other axis;  
wherein said lockout means includes:  
a first cam mounted to the hanger frame having a curved cam surface centered on the primary axis and stops positioned thereon at selected angular positions with respect to the primary axis;  
a second cam mounted to the bracket means having a second curved cam surface centered on the secondary axis and a stop positioned thereon at a prescribed angular position with respect to the secondary axis;  
lock pin means slidably mounted to the drawbar and having a forward end for slidably engaging the curved cam surface of the first cam and a rearward end for slidably engaging the curved cam surface of the second cam; and  
control means for normally urging the lock pin toward the second cam surface and the stop thereon;  
wherein the stop on the second cam and the rearward pin end releasably interlock at a prescribed angular relationship of the bracket means and drawbar means.

4,420,170

**CAMBER ADJUSTMENT TOOL AND METHOD FOR STRUT TYPE VEHICLE SUSPENSION**

Thomas J. Wysocki, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

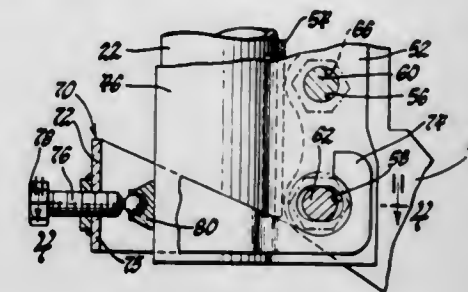
Filed Sep. 21, 1981, Ser. No. 304,321  
Int. Cl.<sup>3</sup> B62D 17/00

U.S. Cl. 280—661

3 Claims

1. A tool for adjustment of the camber setting of vehicle strut suspension of the class including a wheel support member and an upstanding hydraulic strut member interconnected by a vertically spaced pair of through-bolt and nut fastener assemblies, a first of such assemblies being received in an overlarge bolt hole means of one of the strut and wheel support members to permit adjustment of the wheel support member relative to the strut about the axis of the other fastener assembly to a selected camber setting of the wheel support member, said tool

comprising a U-shaped main member the legs of which are hooked at their ends and of generally equal length and spaced sufficiently apart to straddle the strut and be hooked over the ends of said first fastener assembly, and a set screw device threadably mounted in the web of the main member and in-



cluding an inner end adapted to bear against said one member, the set screw device being threadable to define and hold various camber settings of the wheel support member relative to the strut against forces tending to pull said web of the tool toward the strut.

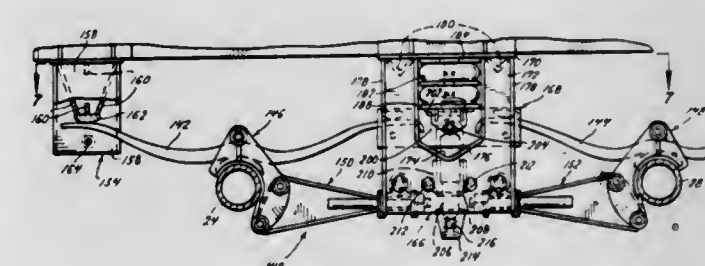
4,420,171

**HEAVY VEHICLE SUSPENSION ASSEMBLY WITH FREE FLOATING SPRINGS AND AXLE STABILIZING TORQUE ROD**

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804  
Division of Ser. No. 196,696, Oct. 14, 1980, Pat. No. 4,371,189.  
This application Aug. 6, 1982, Ser. No. 406,023  
Int. Cl.<sup>3</sup> B60G 11/02

U.S. Cl. 280—682

10 Claims



1. A vehicle suspension assembly for supporting a vehicle chassis on at least two vehicle axles comprising a first and second hanger depending downwardly from the chassis, an equalizer, a third hanger depending downwardly from the chassis at approximately the same position as the equalizer, a spring means mounting said equalizer to the third hanger approximately midway between said first and second hangers, said hangers and equalizer being generally aligned longitudinally of the chassis, said spring means permitting limited vertical deflection of the equalizer with respect to the chassis, a shock means extending between the equalizer and the third hanger to dampen the oscillation of the equalizer, a first leaf spring bearing downwardly on the first axle with an end bearing upwardly on the first hanger and an end bearing upwardly on the equalizer, a second leaf spring bearing downwardly on the second axle with an end bearing upwardly on the equalizer and an end bearing upwardly on the second hanger, means to maintain said leaf springs in a load bearing relationship to said axles and permit relative transverse movement therebetween, and means to maintain said equalizer aligned as it deflects vertically with respect to the chassis.



4,420,172

**RING JOINT FOR SEATBELT SYSTEM**

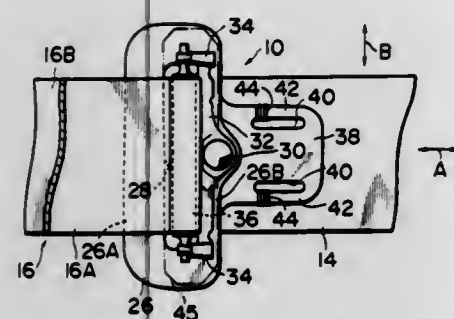
Ikuzo Kojima, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Nov. 30, 1981, Ser. No. 326,114

Claims priority, application Japan, Jun. 9, 1981, 56-84439[U]  
Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 280—802

16 Claims



1. A ring joint for connecting an inner webbing and an outer webbing to each other in a seatbelt system for protecting an occupant in a vehicular emergency, comprising:

- (a) a ring joint base secured to the forward end portion of the inner webbing and having inserted therethrough an intermediate portion of the outer webbing;
- (b) lock means for allowing said base to move relative to the inner webbing in a longitudinal direction of the inner webbing and for interlocking the outer webbing and the base due to said relative movement; and
- (c) guide means provided between the base and the inner webbing for allowing relative movement between the base and the inner webbing in the longitudinal direction of the inner webbing, but restricting relative movement between the base and the inner webbing in a widthwise direction of the inner webbing, whereby the inner webbing is prevented from being shifted in the widthwise direction thereof, thereby providing a reliably locked state of the inner webbing.

4,420,173

**AUTOMATIC SEATBELT SYSTEM**

Shigeru Moriya, Akio Yosida, both of Toyota; Yoshihiro Hayaishi, Kasugai; Tatsushi Kubota, Okazaki, and Mitsuaki Katsuno, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

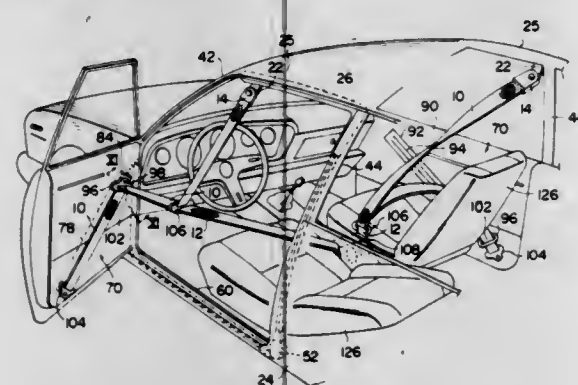
Filed Sep. 8, 1981, Ser. No. 300,104

Claims priority, application Japan, Sep. 24, 1980, 55-135707[U]

Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 280—804

21 Claims



1. An automatic seatbelt system, comprising:
- a first guide rail mounted along a roof side of a vehicle body for guiding a shoulder guide plate;
  - a second guide rail mounted on a vehicle door for guiding a lap guide plate;
  - an outer seatbelt having a first end secured to said shoulder

guide plate and a second end secured to a lower rear corner of said vehicle door;

an inner seatbelt having a first end slidably connected with an intermediate portion of said outer seatbelt and a second end secured on a takeup shaft of a retractor mounted on a center portion of a vehicle floor;

a ring plate mounted on said lap guide plate and slidably connected with the intermediate portion of said outer seatbelt between said first end of the inner seatbelt and said second end of the outer seatbelt;

a flexible transmitting means having a first end coupled with said shoulder guide plate and a second end coupled with said lap guide plate; and

a driving means for driving said flexible transmitting means along said first and second guide rails.

4,420,174

**IDENTIFICATION CARD BEARING LATENT IMAGE PERCEPTIBLE IN THE PRESENCE OF BACKGROUND LIGHT**

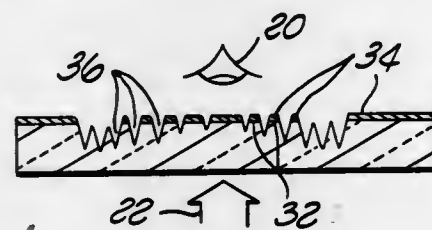
Barry C. Phelps, and John S. Hall, both of Sacramento, Calif., assignors to California Interface and Software Limited Partnership, Sacramento, Calif.

Filed Dec. 14, 1981, Ser. No. 330,349

Int. Cl.<sup>3</sup> B42D 15/00

U.S. Cl. 283—75

12 Claims



1. A latent image identification card for being viewed in the presence of background light comprising:

a translucent base having a surface with a plurality of depressions engraved therein for defining a plurality of non-engraved regions of varying dimensions between the engraved depressions; and

a substantially opaque layer covering only the non-engraved regions;

such that a negative image appears when the background light passing through the translucent base is less than a determinable value, and a latent, positive, image appears when the background light passing through the translucent base is greater than the determinable value.

4,420,175

**COLOR COPY RESISTANT DOCUMENT USING IRREGULAR OUTLINE LETTERS IN A MULTI-VOID BACKGROUND**

William H. Mowry, Jr., Ionia, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 22, 1980, Ser. No. 218,506

Int. Cl.<sup>3</sup> B42D 15/00

U.S. Cl. 283—93

4 Claims

1. A document for deterring a nefarious reproduction thereof upon a color copier comprising:

a substrate;

- a first tone invalidating image printed in a certain area on said substrate, said invalidating image including at least one outlined character, the outline of said character being at the inner and outer edges of said character, the outlining being a less than full tone image;

- a less than full tone colored background printed on the remaining areas of said substrate, said background including the space inside said inner outline edge of said charac-

4,420,177

**KNOTTERS**

James A. Munro, Aylesbury, England, and Marc G. Vansteelant, Zedelgem, Belgium, assignors to Sperry Corporation, New Holland, Pa.

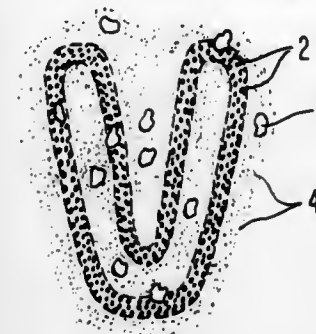
Filed Jun. 20, 1980, Ser. No. 161,632

Claims priority, application United Kingdom, Jun. 22, 1979, 7921878

Int. Cl.<sup>3</sup> B65H 69/04

U.S. Cl. 289—14

9 Claims



said at least one outlined character is substantially invisible to the human eye when viewed in conjunction with said second tone camouflage image and said background, but which said first one invalidating image formed of said at least one outlined character is readily apparent upon a reproduction of said document by said color copier.

4,420,176

**ELASTOMERIC JOINT FOR USE BETWEEN RIGID FITTINGS AND RIGID PIPE AND METHOD OF USE**

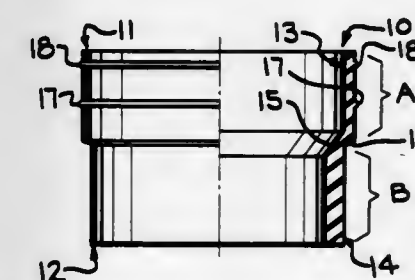
Kenneth R. Cornwall, 30064 Bentley, Livonia, Mich. 48154

Filed May 27, 1981, Ser. No. 267,636

Int. Cl.<sup>3</sup> F16L 5/00

U.S. Cl. 285—158

10 Claims



1. An elastomeric joint adapted for joining rigid pipe to a rigid fitting having a cylindrical opening and inner surface adapted for sealing engagement with an outside portion of the rigid pipe and the pipe fitting having an annular ring projecting from the inner surface for abutting with an end of the rigid pipe which comprises:

an integral tubular elastomeric joint with two spaced apart ends perpendicular to and around a longitudinal axis and having a larger diameter section and a smaller diameter section along the axis between the ends with inside and outside surfaces on each section defining walls and with spaced apart annular shoulders on the inside and outside surfaces of the joint intermediate the sections,

wherein the outside surface of the smaller section of the joint is cylindrical and adapted to be sealed with the inner surface of the rigid fitting with the end of the smaller section abutting on the annular ring of the rigid fitting and with the outside shoulder abutting on a lip of the opening of the rigid fitting, and

wherein the larger section of the joint has a cylindrical inside surface for sealing with an outside portion of the rigid pipe so that the pipe is separated by the joint from the rigid fitting and so that the larger section of the joint can be clamped to the pipe by a locking means, wherein the wall thickness of the larger section is such that, with the smaller section inserted in the rigid fitting opening prior to attachment to the pipe, the larger section can be flexed outward and over the outside surface of the fitting or inward inside the opening of the rigid fitting.

4,420,178

**REMOVABLE FIXING DEVICE**

Gerald M. Taylor, Harpenden, and Norman R. Emms, Welwyn Garden City, both of England, assignors to Item Products Limited, London, England

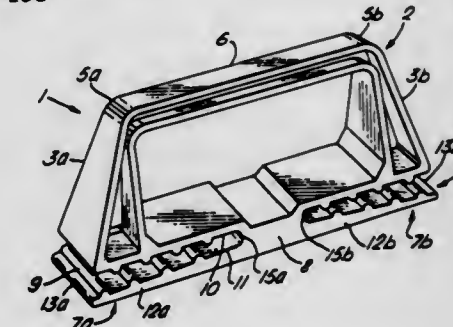
Filed Nov. 6, 1981, Ser. No. 318,864

Claims priority, application United Kingdom, Nov. 10, 1980, 8036056

Int. Cl.<sup>3</sup> B65D 71/00

U.S. Cl. 294—158

10 Claims



1. A removable carrying handle for use with an article having a slot, comprising:

a plurality of outwardly projecting clips, each clip comprising an upper interior surface and a lower interior surface and;

handle means to enable twisting of the clips; the device being so constructed that it may be fastened to the article by positioning the device with each said clip generally aligned with and between opposed slot edges and by then twisting the clip by means of the handle means so as to permit substantial portions of the upper and lower interior surfaces of each clip to receive and grip therein opposed slot-defining edge portions of the article.



4,420,179

**RAILWAY CAR WHEEL**

Hans-Martin Brauer, Möglingen, Fed. Rep. of Germany, assignor to Schwäbische Hüttenwerke Gesellschaft mit beschränkter Haftung, Aalen-Wasseraffingen, Fed. Rep. of Germany

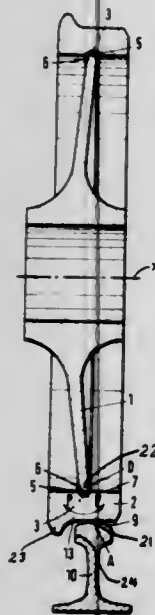
Continuation-in-part of Ser. No. 950,591, Oct. 12, 1978, Pat. No. 4,318,564. This application Aug. 7, 1981, Ser. No. 291,103  
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1977, 2746407

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B60B 3/04, 9/12, 17/00, 21/00

U.S. Cl. 295—15

5 Claims



1. A wheel used in a wheel set mounted on an axle for use with vehicles which ride on pairs of rails, the wheel comprising:

a wheel disc having an annular web portion and hub portion integral with the web portion, wherein the hub portion is centrally disposed in the wheel disc for concentric attachment of the wheel disc to the axle and wherein the web portion has an outer periphery which is curved about a line circumferential with respect to the disc, the web portion being concave and substantially thinner in cross-section than the hub portion;

a metal tire surrounding the wheel disc, the metal tire having a circular tread surface for engaging the rail, a circular interior surface for juxtaposition with the wheel disc, a first radial surface and a second radial surface, wherein the exterior surface joins the second radial surface to form a large diameter wheel flange and converges toward the first radial surface, and wherein the interior surface has portions of lesser diameter and greater diameter, one of which is curved to form a bearing surface which complements the curved bearing surface on web portion of the wheel disc and;

a bearing material on one of the bearing surfaces, whereby as the vehicle rolls along the rails and the wheel moves axially to engage and disengage the wheel flange with the rail, the tire oscillates with respect to the wheel disc about an axis extending normally with respect to the rail and hub.

4,420,180

**AUTOMOBILE FLOOR MAT WITH MOISTURE COLLECTING FEATURE**

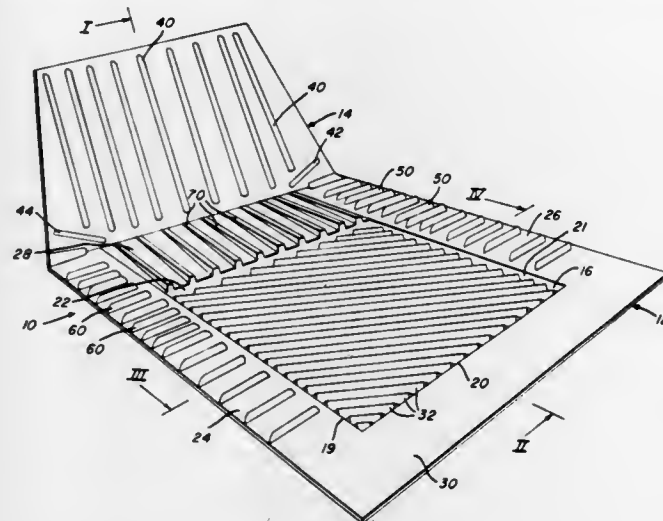
Andre' Dupont, Longueuil; Paul Laurent, Boucherville, and Bernard Beaujardin, Montreal, all of Canada, assignors to Creations 2000, Inc., Longueuil, Canada

Filed Feb. 11, 1982, Ser. No. 347,915

Int. Cl.<sup>3</sup> B60N 3/04

U.S. Cl. 296—1 F

5 Claims



1. An automobile floor mat comprising:

a main portion for lying flat on an automobile floor, said main portion comprising a centrally disposed, downwardly recessed area forming a pan for catching fluid, said pan having a floor and surrounding sides; a plurality of ridges rising vertically from said pan floor for holding clothing above said floor; and

an inclined forward portion extending in the longitudinal direction of said mat for lying on an inclined surface of said automobile, for example, the surface behind the pedals of the automobile; a plurality of ribs being formed on said inclined forward portion, said ribs extending along said pan,

wherein each of said ridges has a generally triangular upper portion with the apex of each ridge pointing upwardly and the base of each ridge being connected to said pan floor.

4,420,181

**BOAT-CANOPY FOR TRUCK BEDS**

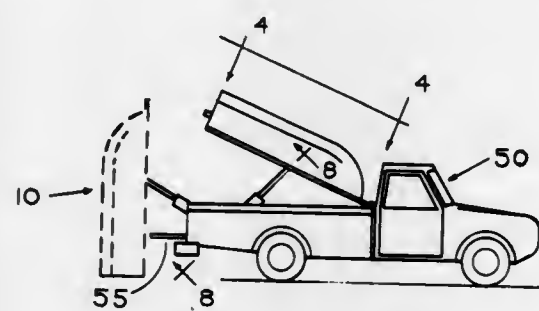
Wayne A. Hallburg, 1412 Sandhagen, Port Angeles, Wash. 98362

Filed Jun. 4, 1981, Ser. No. 270,645

Int. Cl.<sup>3</sup> B60P 7/02, 3/10; B63B 7/02

U.S. Cl. 296—157

7 Claims



1. A boat-canopy enclosure for the bed of a pickup truck and the like, which comprises:

a rectangular boat structure adapted to enclose a truck bed including a bottom portion of spaced twin hulls and a covering floor secured to the top edges thereof, a top portion having spaced upwardly extending sides longitudinally connected along the floor boundary, the sides and said floor being extended forwardly to merge together

into a square ended bow, and an upright panel enclosing the rear end of said floor and top portion of the structure, a deck strip connected to the upper edge of said sides and bow adapted to rest on and secured to the side walls of the truck bed,

an elongated L-shape member having a vertical flange connected to the side wall behind said truck cab such that the horizontal flange extends above the top of said wall to provide a space there between for receiving a portion of the bow deck strip when said structure rests on said truck walls,

a pair of extensible cylinders having one end pivotally connected to said top portion and the other to said truck bed, the cylinders being adapted to apply upward pressure on said structure, and

a latching device detachably mounted on the rear wall of said truck bed and upright panel for securing said structure on said bed.

4,420,182

**COLLAPSIBLE TRAILER**

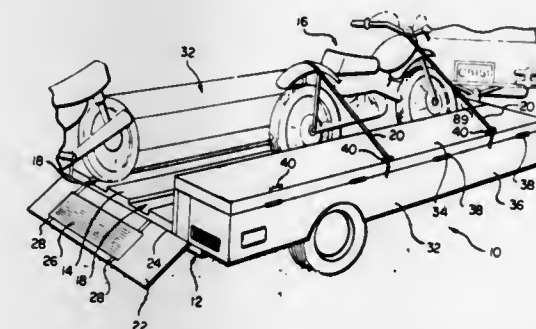
Edward S. Kaneshiro, 452 Harbor Ter., Bartlett, Ill. 60103

Filed Nov. 13, 1981, Ser. No. 321,127

Int. Cl.<sup>3</sup> B60P 3/32

U.S. Cl. 296—158

7 Claims



1. A camping trailer which is collapsible from an opened position to a collapsed storage position comprising:

a substantially rectangular trailer frame having a length and width;

a horizontal camper floor connected to the frame, the camper floor having two camper floor sides parallel to the length, and front and back sides parallel to the width;

two pairs of channels in the camper floor, each pair parallel to the other and parallel to the camper floor sides;

a substantially rectangular rigid top panel having two side edges and front and back edges, the two side edges parallel to the two sides of the camper floor, and the front and back edges parallel to the front and back sides of the camper floor;

a rigid front panel with a top edge pivotally affixed to the front edge of the top panel, the rigid front panel having bottom tracking means slidably received by one pair of the channels;

support means pivotally affixed to the back edge of the top panel and having a rigid back panel secured thereto, the support means also having a second bottom tracking means slidably received by the second pair of channels;

the rigid front panel is collapsible from an opened upright position to a collapsed horizontal storage position above the camper floor;

the support means and rigid back panel secured thereto are collapsible from an opened upright position to a collapsed substantially horizontal storage position above the camper floor;

the rigid top panel is collapsible from an opened horizontal position to a collapsed horizontal storage position above the collapsed rigid front and back panels;

the tracking means sliding within the two pairs of channels during the collapsing and opening of the top panel, and the top panel functioning as a ceiling or roof when the

trailer is in the opened position and functioning as a flat storage bed in the collapsed position whereby the top panel, rigid front panel and rigid back panel are stacked adjacent each other in the collapsed position.

4,420,183

**BODY LINER ASSEMBLY**

Robert C. Sherman, 32 Waterside La., Clinton, Conn. 06413

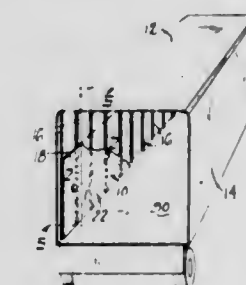
Continuation-in-part of Ser. No. 288,977, Jul. 31, 1981. This

application Jul. 2, 1982, Ser. No. 393,593

Int. Cl.<sup>3</sup> B62D 33/04

U.S. Cl. 296—181

13 Claims



1. In a cargo transport container body having an outer shell with vertical side walls and a plurality of spaced-apart vertical interior support posts, a body liner assembly comprising:

a plurality of liner sheet elements each having top, middle and bottom portions, and inner and outer surfaces with said inner surface being smooth to face the interior of the container body, each said liner element having a normally arcuate profile between said top and bottom portions,

first means for detachably clamping said bottom portion of said liner elements against said support posts, and

second means for detachably clamping said top portion of said liner elements against said support posts and for allowing vertical expansion and contraction of said liner elements, said arcuate profile of each liner element causing said top and bottom portions of said liner element to bias inwardly toward the interior of the container body against said first and second clamping means respectively and said middle portion to bias outwardly toward said support posts,

said plurality of liner elements being mounted in adjoining disposition to form a smooth continuous interior wall surface.

4,420,184

**PIVOTAL-SLIDING ROOF PANEL APPARATUS**

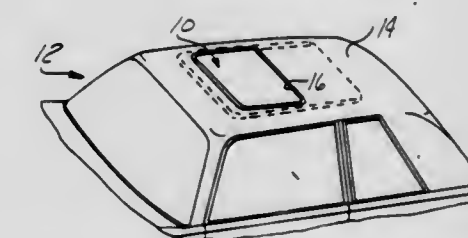
Milton C. Kaltz, Allen Park, Mich., assignor to American Sun-roof Corporation, Southgate, Mich.

Filed Dec. 4, 1981, Ser. No. 327,356

Int. Cl.<sup>3</sup> B60J 7/00

U.S. Cl. 296—221

10 Claims



1. A pivotal-sliding roof panel apparatus adapted to be mounted to the stationary roof structure of a vehicle having an opening in the roof thereof which is opened and closed by a movable roof panel, the apparatus comprising:

a housing adapted to be mounted to the stationary roof



structure of the vehicle, the housing having an aperture alignable with the opening in the roof of the vehicle;  
a roof panel movably mounted within the housing;  
drive means, mounted on the housing and operably connected to the movable roof panel, for causing selective movement of the movable roof panel;  
guide rails mounted on the housing and extending in the sliding direction of the movable roof panel;  
first and second lifter means, connected between the housing and opposed sides of the movable roof panel for raising and lowering the movable roof panel, the first and second lifter means each comprising:  
first and second pivotally connected links movable between collapsed and extended positions;  
guide means slidably disposed within the guide rails, the guide means connected to and moved by the drive means; a slider member slidably disposed within the guide means; the first link pivotally connected at a first end to an intermediate portion of the second link and at a second end to the slider member;  
the second link pivotally connected at a first end to the guide means and at a second end to the movable roof panel; and  
stop means for stopping the forward movement of the first link such that the lifter means moves to a partially-extended position from the collapsed position raising the roof panel to a closed position and, upon continued movement of the drive means, to a fully-extended position raising the roof panel to a partially-opened venting position.

4,420,185

#### DRIVE ARRANGEMENT FOR A MOTOR-VEHICLE TOP WITH OUTWARD-MOVING SLIDING COVER

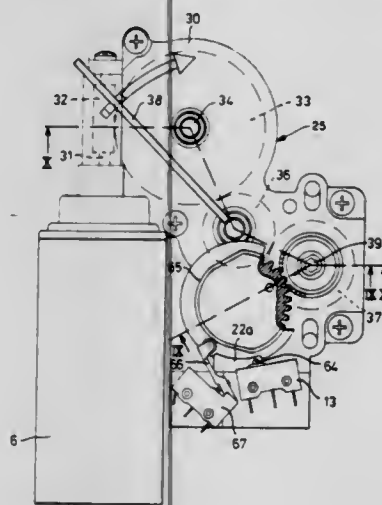
Horst Bienert, Gauting, and Hermann Pfisterer, Stockdorf, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,055

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030642

Int. Cl.<sup>3</sup> G05D 3/00; H02P 1/04, 3/00; B60J 7/02  
U.S. Cl. 296—223

11 Claims



1. A drive arrangement for a motor-vehicle top having an outwardly movable sliding cover driven by an electric motor through a transmission and at least one threaded cable engaging a pinion of the transmission, a manually-actuated switch and a limit switch with a contact arm being provided in a circuit of the electric motor, said contact arm cooperating with a cam of a trip gear to interrupt the current supply to the electric motor in a closed position of the sliding cover, and teeth of said trip gear forming with an indexing gear driven by the pinion shaft a step-by-step indexing transmission whose transmission ratio is determined so that the trip gear rotates by a maximum angle of 360° as the sliding cover moves from a fully retracted position to the closed position and an upwardly fully extended position; characterized in that the step-by-step

indexing transmission is provided with transmission elements for performing at least one of extending the length of an indexing step conducted near the closed position of the sliding cover and reducing the angular velocity of the trip gear during said indexing step.

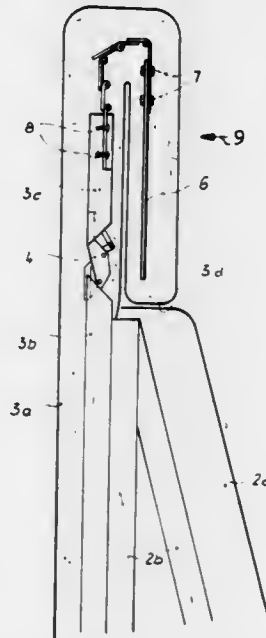
4,420,186

#### CONVERTIBLE LOW-BACK, HIGH-BACK UPHOLSTERED FURNITURE

Wilhelm Vogt, Bielefeld, Fed. Rep. of Germany, assignor to Hans Kaufeld GmbH & Co., Bielefeld, Fed. Rep. of Germany  
Continuation of Ser. No. 54,076, Jul. 2, 1979, abandoned. This application Jun. 8, 1981, Ser. No. 271,307  
Int. Cl.<sup>3</sup> A47C 3/00, 17/00

U.S. Cl. 297—284

7 Claims



1. An article of upholstered furniture adapted to be sat upon and comprising a substantially horizontal padded seat and a substantially vertical padded back rest attached thereto, a padded cushion attached to said padded back rest, said cushion comprising a first portion which overlies the rear surface of said back rest and has a generally vertically extending insert embedded therein, said padded cushion further comprising a second cushion portion having an elongated, unidirectionally flexible element embedded therein, hinge means connecting one end of said unidirectionally flexible element to one end of said insert at a position adjacent the uppermost edge of said back rest, said second cushion portion, said unidirectionally flexible element, and said hinge means being adapted to be manipulated into a first position wherein said second cushion portion overlies the forward padded surface of said back rest with a free edge of said second cushion portion being disposed closely adjacent to said padded seat whereby said article of furniture is adapted to be sat upon in a low-back furniture configuration, and being adapted to be manipulated into a second position wherein said second cushion portion is folded upon itself and extends upwardly from and vertically above said padded back rest with the said free edge of said second cushion portion resting upon the uppermost edge of said padded back rest to provide a padded head rest which is disposed immediately above said padded back rest whereby said article of furniture is adapted to be sat upon in a high-back furniture configuration, said embedded unidirectionally flexible element being constructed to exhibit flexibility in a single direction only relative to a predetermined limiting orientation which is defined by the said second position of said second cushion portion, whereby said unidirectionally flexible element is adapted to assume a plurality of different curvatures within said padded cushion as said second cushion portion is manipulated from said first position into said second position, or vice versa, relative to said padded back rest but said limiting orientation of said embedded unidirectionally flexible element inhibits rear-

ward displacement of said second cushion portion relative to said padded back rest when said second cushion portion is in its said second position.

4,420,187

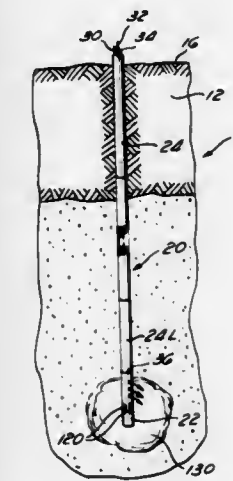
#### STATIONARY DRILL STRING ROTARY HYDRAULIC MINING TOOL AND METHOD OF HYDRAULIC MINING

Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660

Filed Apr. 13, 1981, Ser. No. 253,681  
Int. Cl.<sup>3</sup> E21C 45/00

U.S. Cl. 299—17

9 Claims



1. An improved method of hydraulically mining a subterranean mineral formation comprising the steps of:  
inserting a hydraulic mining tool apparatus into said formations from ground surface, said apparatus including a drill string and a mining tool mounted for independent axial rotation on one end of said drill string;  
axially rotating said mining tool while maintaining said drill string stationary within said formation to isolate frictional drag forces from said drill string;  
introducing a hydraulic mining fluid outward from said mining tool to dislodge minerals from said formation and form a resultant mineral slurry; and  
transporting said mineral slurry from said formation to said ground surface through the interior of said mining tool and drill string.

4,420,188

#### DOUBLE SHIELD TUNNEL BORING MACHINE

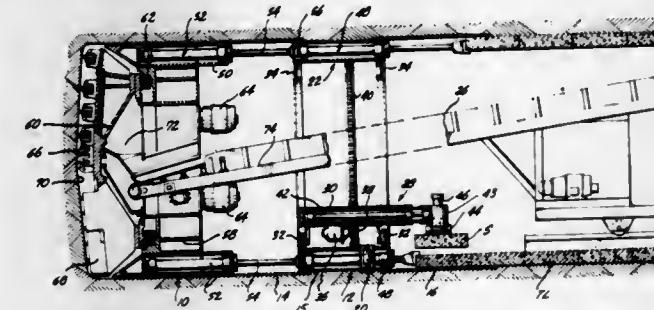
Richard J. Robbins, and David T. Cass, both of Seattle, Wash., assignors to The Robbins Company, Kent, Wash.

Continuation-in-part of Ser. No. 802,878, Jun. 2, 1977, abandoned, which is a continuation of Ser. No. 677,709, Apr. 16, 1976, abandoned, which is a continuation of Ser. No. 481,292, Jun. 20, 1974, abandoned. This application Nov. 27, 1981, Ser. No. 325,101

Int. Cl.<sup>3</sup> E21D 9/08

U.S. Cl. 299—31

19 Claims



1. A tunneling machine comprising:  
front and rear ground supporting tubular shields, each having

a ground contacting outer surface, with at least a substantial portion of the front shield always being positioned forwardly of said rear shield, and with at least a substantial portion of the rear shield always being positioned rearwardly of said front shield;  
radially expandable-contractable gripper means on said rear shield, operable for gripping the tunnel wall to in that manner anchor the rear shield against at least axial movement relative to the tunnel wall;  
said rear shield having a tail section comprising tubular wall means which extend axially rearwardly from said gripper means, and providing a space under cover of said tubular wall means within which a tunnel lining is constructed;  
thrust ram means comprising a first ring of axially extending linear hydraulic motors interconnected between the front and rear shields, adjacent the peripheries thereof, means for selectively delivering hydraulic fluid into said thrust ram means so that said thrust ram means are operable for shoving the front shield axially forwardly relative to the rear shield while the rear shield is anchored in position by the gripper means, and for turning said front shield in the tunnel relative to the rear shield to in this manner change the direction of advance of the tunneling machine;  
a second ring of axially extending linear hydraulic motors each having piston and cylinder portions, a first one of said portions being mounted on said rear shield and the second one of said portions being extendible rearwardly from said first portion and the rear shield to contact and push against a tunnel lining within the tail section space;  
power earth cutting means on said front shield, for cutting material from the tunnel face during forward movement of the front shield; and  
power conveyor means extending from said power earth cutter means rearwardly through said front and rear shield, for removing cuttings from the tunnel face.

4,420,189

#### APPARATUS FOR ATTACHING TO EARTH WORKING EQUIPMENT

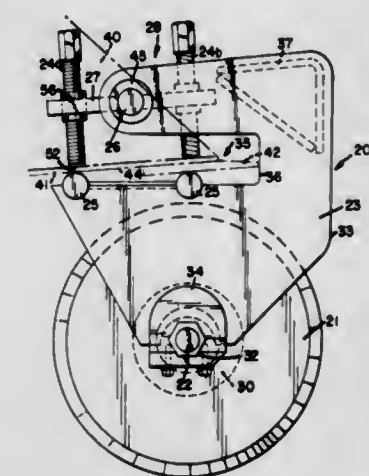
Dennis von Ruden, Owatonna, Minn., assignor to General Equipment Co., Owatonna, Minn.

Filed May 11, 1981, Ser. No. 262,454

Int. Cl.<sup>3</sup> E01C 23/09

U.S. Cl. 299—40

8 Claims



1. An apparatus for attachment to earth working equipment, comprising:  
(a) a tool;  
(b) means for supporting said tool; and  
(c) means for attaching said support means to a wall mounted on said earth working equipment, said (attaching) attachment means including means for contacting a first surface of said wall and a pair of counter-threaded screws for forcing a second surface of said wall to frictionally retain and clamp said support means in a stationary position relative thereto whereby a force tending to



loosen a first threaded screw of said pair simultaneously tightens a second counter-threaded screw of said pair thereby keeping said apparatus attached tightly to said wall.

4,420,190

## CAST VEHICLE WHEEL

Jakob Rohr, Schaffhausen, Switzerland, assignor to George Fischer Ltd., Switzerland

Filed Nov. 6, 1981, Ser. No. 318,941

Claims priority, application Switzerland, Nov. 13, 1980, 8420/80

Int. Cl.<sup>3</sup> B60B 3/06

U.S. Cl. 301-63 R

8 Claims



1. An improved cast vehicle wheel, particularly for use with tubeless tires, of the type having the unitarily formed combination of a rim portion, an axially offset pan and a flat annular flange, wherein the rim portion has a drop-center portion with conical surface portions extending outwardly from both sides thereof and with a shoulder formed between the drop-center portion and one of the conical portions, and wherein the pan interconnects the flat annular flange and the rim portion and includes means defining hand-holes therethrough, the improvement wherein

the shoulder is formed between the drop-center portion and the one conical portion on the same side as the axially offset pan and flange, intermediate portions of the pan between said hand-holes are shaped to merge into the rim portion, and an annular wall portion extends generally radially about the wheel axis and connects the shoulder with the drop-center portion and the intermediate portions of the pan, the wall portion undulating in directions substantially parallel to the wheel axis.

4,420,191

## SKID CONTROL SYSTEM

Tetsuro Arikawa, and Teruo Inoue, both of Yokosuka, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Apr. 3, 1981, Ser. No. 250,877

Claims priority, application Japan, Apr. 7, 1980, 55-45523; Jul. 26, 1980, 55-102678; Aug. 8, 1980, 55-109549

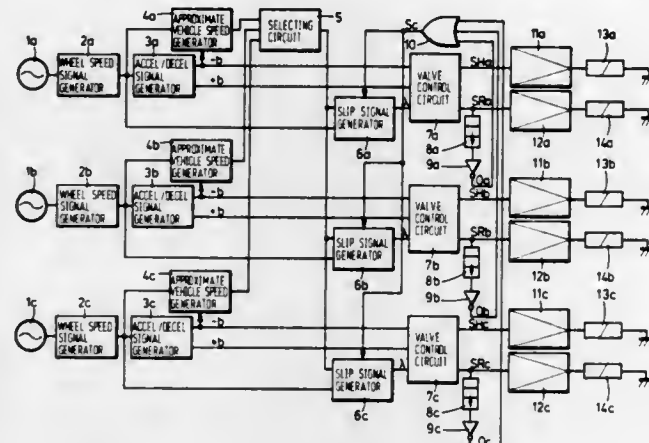
Int. Cl.<sup>3</sup> B60T 8/02

U.S. Cl. 303-103

14 Claims

1. In a skid control system for a vehicle having two or more wheels and the respective brakes for the wheels, including two or more skid control circuits, each of which comprises a wheel speed sensor for providing an output signal representative of the speed of said wheel or the mean speed of said wheels, an approximate vehicle speed generator for providing an output signal representative of the approximate speed of the vehicle on the basis of said output signal of the wheel speed sensor, a slip signal generator receiving said output signal of the wheel speed sensor, an acceleration/deceleration signal generator receiving said output signal of the wheel speed sensor, a valve control circuit receiving the outputs of said slip signal generator and acceleration/deceleration signal generator, and electromagnetic valve means receiving the output of said valve

control circuit, wherein the maximum of the outputs of said approximate vehicle speed generators of the skid control circuits is supplied to the respective slip signal generators, a predetermined amount is set in said respective slip signal generators, and a slip signal for relieving the brake to the wheel is generated from said slip signal generator, when the speed of the corresponding wheel becomes lower by more than said predetermined amount than said maximum of the output of the approximate vehicle speed generators, the improvement in which a second predetermined amount is set in said respective



slip signal generators, said slip signal generator generating a second slip signal, when the speed of the corresponding wheel becomes lower by more than said second predetermined amount than said maximum output of the approximate vehicle speed generators, and the larger of said first-mentioned predetermined amount and said second predetermined amount is selected in said slip signal generator of any one of said skid control circuits, until a skid signal or skid signals representative of the skid condition of the wheel or wheels is generated in the other of said skid control circuits.

4,420,192

## WALKING WHEEL

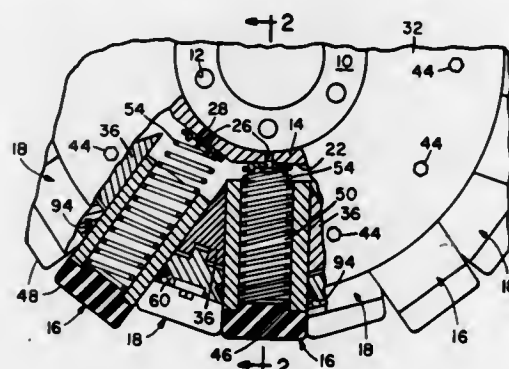
Leonard J. Holchuk, 2053 Lake St., Elmira, N.Y. 14901

Filed May 26, 1981, Ser. No. 266,755

Int. Cl.<sup>3</sup> B60B 15/18; B60C 7/00

U.S. Cl. 305-5

8 Claims



1. In a vehicle wheel of the type comprising a hub, means defining a plurality of chambers equally spaced around said hub, a foot disposed in each of said chambers and being capable of radial movement, means for restricting movement of each of said feet beyond a predetermined distance from said hub so that those portions of said feet remote from said hub tend to lie in a substantially circular arc, and at least one spring disposed between each foot and said hub, one end of each spring being disposed within said foot and forcing it outwardly, characterized in that

each of said chambers comprises two opposed planar side walls, the front and rear chamber walls comprising triangularly-shaped members, a planar surface of each triangularly-shaped member being contiguous with a wall of an adjacent foot, and in that said movement-restricting means comprises a locking slot in a side wall of each foot, said locking slot having an end wall, a plate bolted to said wheel and extending into said locking slot, and a locking member situated on the outer surface of each triangularly-shaped member, said plate being situated in a locking plate slot in the outer surface of said locking member.

4,420,193

## LINEAR BALL BEARING UNIT

Hiroshi Teramachi, 34-8, Higashi-Tamagawa 2-chome, Setagaya-ku, Tokyo, Japan (158)

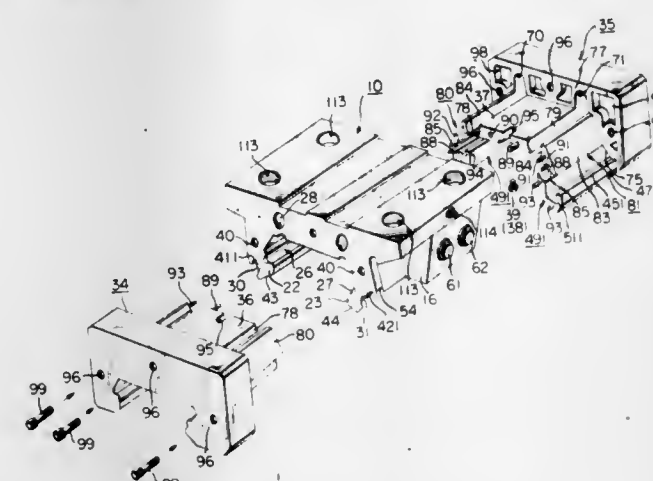
Filed Jul. 19, 1982, Ser. No. 399,917

Claims priority, application Japan, Aug. 11, 1981, 56-124821; Sep. 17, 1981, 56-137076[U]

Int. Cl.<sup>3</sup> F16C 29/06

U.S. Cl. 308-6 C

5 Claims



1. A linear ball bearing assembly comprising: (a) a linear ball bearing with opposite ends including a bearing block body and retaining covers attached to said opposite ends; (b) a race bar of generally X-shaped cross section with ribs, and a central recess of a generally trapezoidal cross section defined in said bearing block body, said central recess having an upper wall, also inclined walls with lower hook-shaped supporting parts, and right and left skirts formed on opposite sides of said central recess, four axial grooves for receiving loaded balls defined in said upper wall and said lower hook-shaped supporting parts of said inclined walls, the radius of curvature of said grooves being substantially the same as the radius of balls which are to be received, also, axial through-holes for receiving unloaded balls, defined in parallel to said grooves for receiving loaded balls, said axial holes being so disposed as to also define a junction between said holes and said grooves for receiving loaded balls; (c) grooves for receiving unloaded balls defined in the back side surfaces of said lower hook-shaped supporting parts, in parallel to said grooves for receiving loaded balls, also, a junction being defined between said grooves for receiving loaded balls and said grooves for receiving unloaded balls; (d) U-shaped grooves for inverting the direction of movement of balls defined in each of said retaining covers at positions corresponding to the junction between the grooves for receiving loaded balls and the holes for receiving unloaded balls and, between the grooves for re-

ceiving loaded balls and the grooves for receiving unloaded balls;

(e) each of said retaining side covers integrally including a horizontal member, right and left inclined members and right and left receiving members which extend on the respective sides of said U-shaped grooves for inverting the direction of movement of the balls;

(f) grooves providing a path for loaded balls of a radius of curvature substantially the same as the radius of any balls in said path and of a size capable of retaining any such balls defined between said horizontal member, right and left inclined members and right and left receiving members, along the axial direction of said members, said retaining covers being disposed in said bearing block body at the opposite ends thereof and fixed thereto with said horizontal members firmly fastened to the upper wall of said bearing block body, each of said right and left receiving members being formed in a substantially U-shaped cross section with an upper inverted L-shaped part with an upper edge, said upper edge being disposed opposite the groove for receiving unloaded balls and is provided with a guide groove;

(g) a multiplicity of balls filled in all said grooves and holes defined in said bearing block body and in said retaining covers, said race bar of generally X-shaped cross section being provided with grooves of a radius of curvature substantially the same as the radius of the balls which are to be inserted so as to receive loaded balls in the upper surfaces and in the lower inclined surfaces of the right and left ribs thereof.

4,420,194

## BALL SLIDEWAY

Kanji Asami, Hino, Japan, assignor to Hephaist Seiko Co., Saitama, Japan

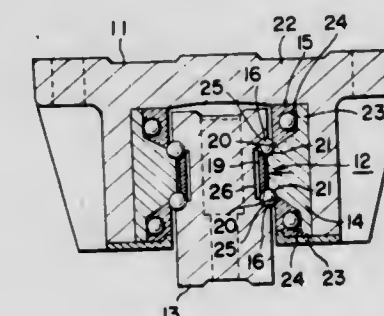
Filed Jul. 14, 1981, Ser. No. 283,348

Claims priority, application Japan, Jul. 21, 1980, 55-99713

Int. Cl.<sup>3</sup> F16C 29/06

U.S. Cl. 308-6 C

1 Claim



1. A ball slideway, comprising:

(a) a central guide member having a recess therein formed by sloping sides and a pair of first substantially parallel elongated ball grooves, each ball groove formed in a sloping side, and each ball groove being a first distance apart from the other groove; (b) a plurality of balls; (c) a bracket member pressed against and partially surrounding the guide member for linear movement with respect thereto, the bracket member including a portion thereof projecting toward the recess of the guide member, the projecting portion having a pair of second elongated ball grooves adjacent the first pair of ball grooves and substantially parallel thereto, the distance between each of the second ball grooves being less than the distance between each of the first ball grooves, and said first and second ball grooves being formed so that respective lines of force acting on the balls and passing through the middle of each of the first ball grooves and each of the corresponding second ball grooves intersect outside the guide member; and



(d) ball retainer means mounted between the guide and bracket members for defining a pair of independent, continuous ball circulating paths to retain the balls and permit them to circulate when the bracket member is moved linearly with respect to the guide member, and wherein the plane of one of the ball circulating paths is skew to the plane of the other ball circulating path.

4,420,195

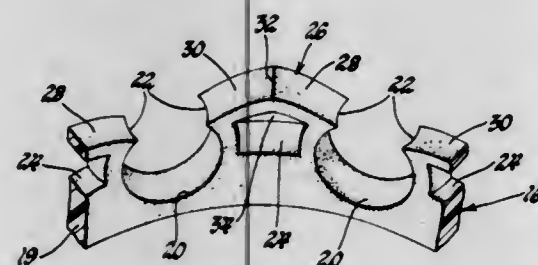
**BALL BEARING RETAINER**

Eugene W. Christen, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 18, 1981, Ser. No. 303,358

Int. Cl.<sup>3</sup> F16C 33/38

U.S. Cl. 308—201



1. A ball bearing retainer for the retention and guiding separation of bearing balls during bearing assembly, comprising, an annular body portion having a plurality of spherically concave ball retention pockets, each retention pocket opening axially outwardly of the body portion and including a pair of flexible retention lips, the retention lips disposed in a common radial plane of the body portion, each of said lips having a radially extending edge portion a ball separation and guidance projection spanning each pair of adjacent retention pockets to leave a closed radial opening therebetween, said radial opening being located between said projection and said body portion, each projection including a pair of sloped walls, each sloping from an integral apex located axially outwardly of the plane of the retention lips to the said radial edge portion of a respective retention lip of an adjacent ball pocket and being integral therewith, the walls providing separation and guidance of the bearing balls toward the retention pockets during bearing assembly, the radial opening between the body portion and each projection allowing the sloped walls to flex axially of the body portion with the retention lips about the apex as the bearing balls enter the ball retention pockets.

4,420,196

**ROTARY FILING DEVICE**

John M. Fuller, Hawke Hill, Fireball Hill, Sunningdale, Berkshire, England

Filed Jun. 12, 1981, Ser. No. 272,931

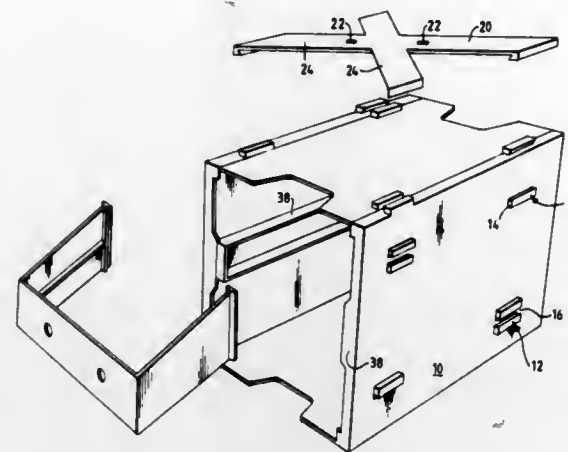
Int. Cl.<sup>3</sup> A47B 63/00, 81/06

U.S. Cl. 312—186

10 Claims

1. A rotary filing device comprising a frame carrying mounting strips each adapted to receive a container for an item or items to be stored, all of the strips being supported at each end

in a common elongate recess and the strips themselves being linked together to form an endless chain which is movable



1 Claim

within said recess by tilting successive strips to provide access to each container in turn.

4,420,197

**GUIDE MEANS FOR SLIDING DRAWERS**

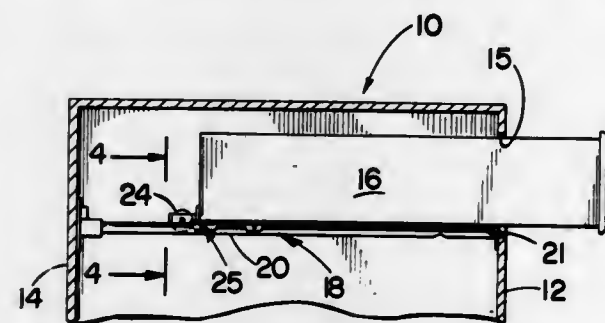
Sebastian E. Dreiling, 2040 Conejo La., Fullerton, Calif. 92633

Filed May 1, 1981, Ser. No. 259,412

Int. Cl.<sup>3</sup> A47B 88/00; F16C 21/00

U.S. Cl. 312—330 R

1 Claim



1. An improved guide means for sliding drawers, comprising: an elongated track defined by a channel having a pair of oppositely disposed longitudinal edge flanges and a longitudinal recess formed in the bottom of said channel, said recess being defined by a pair of spaced-apart longitudinal rib members projecting upwardly from said bottom of said channel; a carriage having a substantially rectangular frame structure having a transverse brace member, whereby said frame structure is secured to the bottom of said drawer and said brace member is secured to the rear of said drawer, said frame structure including oppositely disposed depending side walls; a roller mounted rearwardly of said carriage and said drawer, and adapted to be received in said recess of said track between said longitudinal rib members to provide lateral stability to the sliding drawer, said roller being supported in a rearwardly extended bracket integrally formed with said frame structure; stop means formed in said track and positioned to be engaged by said roller, said stop means comprising a raised ramp formed in said bottom of said track adjacent the forward end of said track; restraint means comprising a pair of inwardly projecting shoe members integrally formed below said frame structure so as to be positioned below said flanges of said track, whereby said flanges pass through said carriage without engaging said frame structure or shoe members, until said drawer is to be removed from said track and said roller engages said raised ramp; and

alignment means comprising at least one pair of guide-rib projections formed on each inner side of said depending side walls of said frame structure, whereby said oppositely disposed projections are arranged to engage the longitudinal edges of said respective flange members of said track.

4,420,198

**ELECTRICAL CONNECTION**

Willibald Zerlik, Birr, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

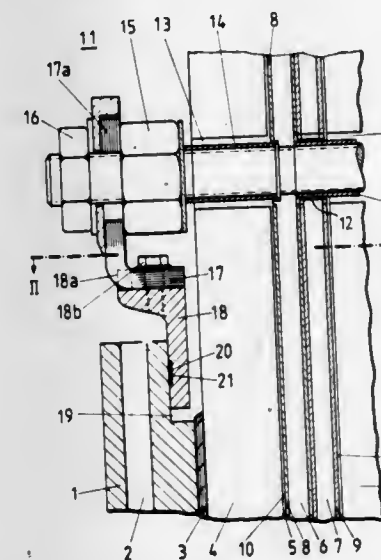
Filed Jun. 25, 1981, Ser. No. 277,239

Claims priority, application European Pat. Off., Jul. 4, 1980, 80200649.4

Int. Cl.<sup>3</sup> H01R 39/08, 39/24

U.S. Cl. 339—5 R

2 Claims



1. An electrical connection for a electrical machine having a gas cooled rotor comprising: a slip ring; a first and second contact rail; a rotor shaft mounted in an axial shaft borehole formed in said electrical machine; a slip ring bolt mounted in a radial shaft borehole formed in said electrical machine so as to have axial play and connected at a first end thereof to at least one of said first and second contact rails; and an electrical connecting link interconnecting a second end of said slip ring bolt to said slip ring wherein said electrical connecting link comprises a ring-shape contact carrier surrounding said rotor shaft and rigidly connected to said slip ring bolt; and a contact lamination tape disposed between said slip ring and said contact carrier wherein said slip ring has an axially extending annulus formed therein, said contact carrier axially extending into said annulus of said slip ring, and said contact carrier having an annular slot formed therein to receive said contact lamination tape in a substantially center section portion of the end portion on the contact carrier which extends into said annulus, and wherein the outer circumference of an end portion of said contact carrier contacts the circumference of said annulus formed in said slip ring, and the axial dimension of said contact lamination tape is less than the axial dimension of the depth of the extension of said contact carrier into said annulus.

4,420,199

**CABLE CONNECTOR**

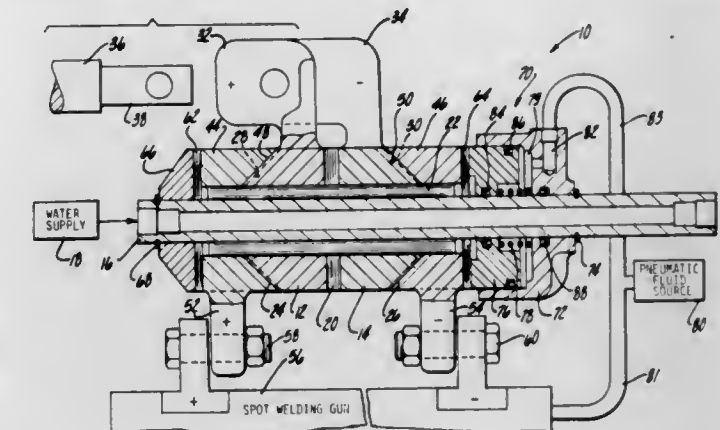
Arthur D. Vis, Warren, and Karl Sarafian, Lathrup Village, both of Mich., assignors to Craft Line Inc., Hazel Park, Mich.

Filed Oct. 30, 1981, Ser. No. 316,622

Int. Cl.<sup>3</sup> H01R 39/10

U.S. Cl. 339—8 R

12 Claims



1. In a rotary joint cable connector, the improvement comprising: at least two electrically conductive members having opposing contact surfaces normally held in wiping engagement with each other; and actuator means coupled to said members for selectively forcing the contact surfaces into highly pressurized locking engagement during application of current through the cable.

4,420,200

**SURGE-PROTECTED CABLE JOINT**

Horst Forberg, Wolfgang Radelow, Klaus-Peter Achtnig, and Manfred Müller, all of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

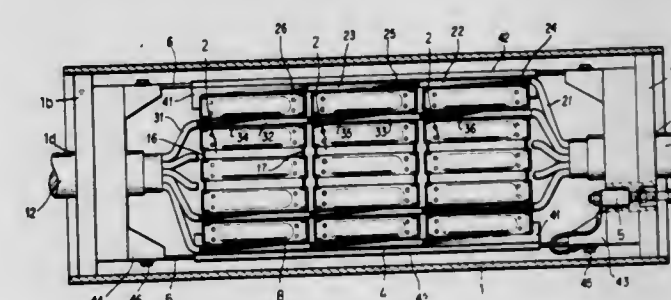
Filed Apr. 13, 1981, Ser. No. 253,725

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 8021913[U]

Int. Cl.<sup>3</sup> H01R 13/648

U.S. Cl. 339—13

2 Claims



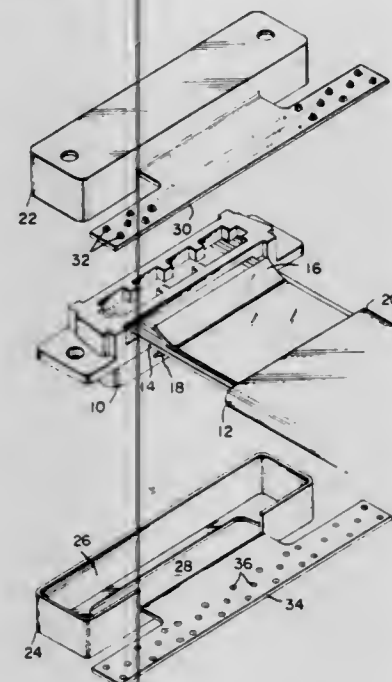
1. A surge-protected cable joint for telecommunication networks, comprising a joint casing closed at either end and having axial cable inlets, and terminal strips secured in the joint interior for the cable wires, characterized in that within the joint interior a plurality of rows of terminal strips (3) is provided on both sides of a central longitudinal plane so as to extend longitudinally in series, that each row of terminal strips (3) is secured within a receiving trough (2, 2a), and that pairs of the receiving troughs (2, 2a) are secured with their bottoms facing each other and to lateral connecting rails (4), said connecting rails (4) being mechanically and electrically coupled by means of support rails (6) to the two sealing end plates of the joint casing.



**4,420,201**  
**SHIELDING ASSEMBLY ENCLOSING AN ELECTRICAL CONNECTOR TERMINATING SHIELDED CABLE**  
 Brian D. Stephenson, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 9, 1981, Ser. No. 319,347  
 Int. Cl.<sup>3</sup> H01R 13/648  
 U.S. Cl. 339—14 R

7 Claims

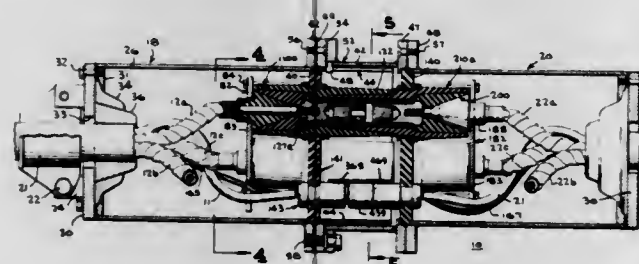


1. A shielding assembly for fully enclosing an electrical connector and terminating shielding layers of a fully shielded cable, said shielding assembly comprising:  
 a pair of seamless formed mating metal housing members together defining a full enclosure for an electrical connector;  
 one of said housing members defining an aperture providing access to a mating face of said electrical connector, each said housing member having an integral T-shaped extension with a plurality of flanged apertures formed in a cross bar portion thereof, said apertures being slightly offset with respect to each other in a superimposed condition, whereby crimping end portions of said cross bar upon itself causes said flanged apertures to penetrate a shielding layer from opposite sides forming a sandwich with flanges of one side engaging apertures of the other side and vice versa.

**4,420,202**  
**PLURAL PHASE CABLE COUPLERS**  
 Namik O. Atakkaan, Bluefield, W. Va., assignor to Pemco Corporation, Bluefield, W. Va.

Filed Sep. 10, 1981, Ser. No. 301,149  
 Int. Cl.<sup>3</sup> H01R 4/66  
 U.S. Cl. 339—14 R

6 Claims



1. A cable coupler assembly for interconnecting a first plurality of plural phase, high voltage cables with a second plurality of plural phase, high voltage cables, said coupler assembly comprising:

- (a) a first plurality of female terminals for attachment to corresponding of said first plurality of plural phase cables;
- (b) a second plurality of male terminals for attachment to corresponding of said second plurality of plural phase cables, said male terminals being adapted to matingly contact said female terminals;
- (c) a female housing including first means for mounting said first plurality of female terminals within said female housing in a spaced relationship with each other;
- (d) a male housing adapted to be coupled with said female housing and including second means for mounting said second plurality of male terminals within said male housing in a spaced relationship with each other and in a manner that each of said second plurality of terminals is aligned with a corresponding one of said first plurality of terminals when said male housing is coupled to said female housing;
- (e) said first and second mounting means comprised of respectively first and second support discs and first and second insulating members, said first and second support discs each including openings for respectively receiving said first and second plurality of female and male terminals, said first and second insulating members disposed respectively between each of said first and second plurality of terminals and their corresponding opening within said first and second support discs; and
- (f) means for disposing each of said first and second mounting means at substantially ground potential, each of said first and second mounting means comprised of a material whose resistivity is selected to be sufficiently low to establish a conductive path through its mounting means from one of said terminals to said ground disposing means if a fault producing current should be applied to said one terminal, said ground disposing means comprises first and second ground means disposed in electrical connection with said first and second support discs respectively, said first and second ground means each comprising a ground cable and a ground terminal element adapted to be matingly received by the other ground terminal, each of said ground terminals being directly connected to its supporting disc, whereby said connected support disc is established at substantially ground potential.

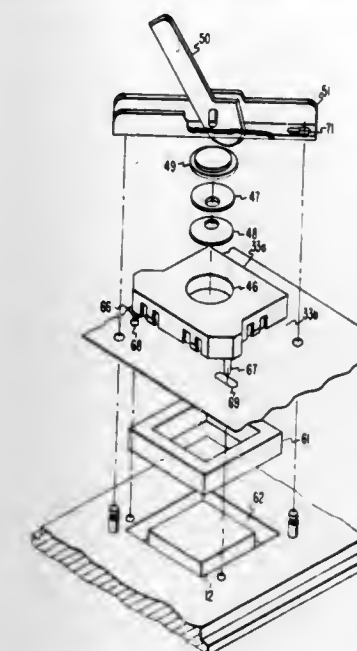
**4,420,203**  
**SEMICONDUCTOR MODULE CIRCUIT INTERCONNECTION SYSTEM**  
 Conrad J. Aug, Preston; Charles J. Guenther, and James B. Randolph, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,427  
 Int. Cl.<sup>3</sup> H01R 23/66  
 U.S. Cl. 339—17 CF

12 Claims

1. A circuit interconnection system for a semiconductor module carrier having a plurality of contact pads on a rigid planar surface, comprising:
- a planar flexible printed circuit wiring assembly having first and second surfaces;
  - a plurality of mating contact pads on said first surface adapted to make electrical contact with contact pads on a module carrier;
  - a plurality of raised solid contact bumps on each of said mating contact pads;
  - guide means on said flexible printed circuit wiring assembly for positioning a module carrier to place the plurality of contact pads on said module carrier in alignment with said mating contact pads of said flexible printed circuit wiring assembly;
  - an elastomeric backing element confronting said second surface of said flexible printed circuit wiring assembly in the region opposite said mating contact pads;
  - clamping means operable to compressively retain said flexible printed circuit wiring assembly between a module

carrier and said elastomeric backing element for maintaining compressive contact between module carrier contact

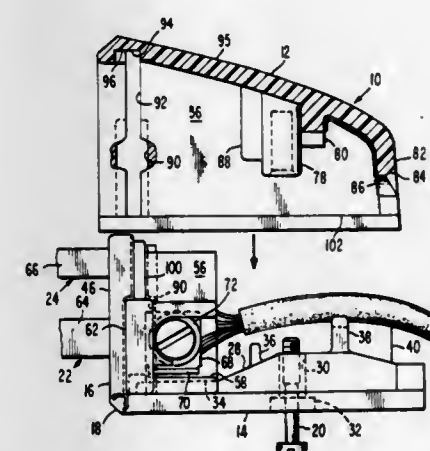


pads and said flexible printed circuit mating contact pads aligned therewith.

**4,420,204**  
**DEAD-FRONT ELECTRICAL WIRING DEVICE ATTACHABLE TO A POWER CORD**  
 Henry Leong, Kendall Park, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 95,734, Nov. 19, 1979, abandoned. This application Jul. 20, 1981, Ser. No. 285,209  
 Int. Cl.<sup>3</sup> H01R 13/512, 13/58  
 U.S. Cl. 339—63 R

6 Claims



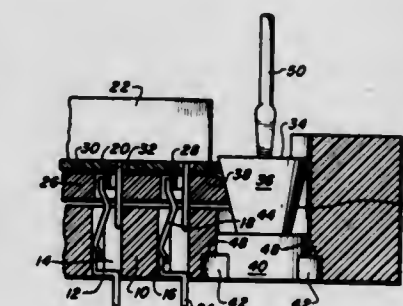
2. A dead-front electrical connecting device for attachment to a power cord of the plural conductor type, comprising:
- (a) a plurality of contact assemblies, each of which includes a contact element and a terminal adapted for connection of one of the conductors of a power cord;
  - (b) a two-piece housing that includes
    - (1) a first piece formed of two members connected by an integral hinge about which one of the members is swingable to a position in which it becomes a dead front upon which the contact assemblies are mounted, said one member, when in its dead front position, being substantially at a right angle to the other member with the terminals disposed within the angle defined between the members and having opposed side edges formed with locking tongues;
    - (2) a second piece formed wholly separately from the first piece and having an elongated channel shape so as to include a web and a pair of side flanges, the second piece having opposed grooves in the side flanges adapted to slidably receive and interengage with the

locking tongues responsive to movement of the second piece bodily toward the first piece, the locking tongues and the opposed grooves, when interengaged, providing a fixed relationship between said one member and said second piece, said first piece and said second piece cooperating to define an enclosure in which the terminals are confined; and  
 (3) fastener means connecting the pieces in the enclosure-defining relationship thereof.

**4,420,205**  
**LOW INSERTION FORCE ELECTRONIC COMPONENT SOCKET**  
 Michael Kirkman, Barrington, R.I., assignor to Augat Inc., Mansfield, Mass.

Filed Sep. 14, 1981, Ser. No. 301,989  
 Int. Cl.<sup>3</sup> H01R 13/629  
 U.S. Cl. 339—74 R

10 Claims



1. An electronic component socket comprising:  
 a base of electrically insulative material;  
 an array of spring terminals disposed in the base in a configuration corresponding to the terminal pin configuration of an electronic component to be mated with the socket;  
 a plate disposed for slideable movement on the base and having openings through which the spring terminal respectively pass;  
 a camming element moveable between first and second positions and cooperative with the plate;  
 the camming element being operative in its first position to urge the plate to an open position to cause lateral movement of the spring terminals such that the spring terminals will not engage the pins of an electrical component in the socket;  
 the camming element being operative in its second position to permit return of the plate to a closed position in which the spring terminals will be in electrical contact engagement with the pin of an electrical component in the socket; wherein  
 the scanning element comprises a plug having a head with a conical surface cooperative with an edge of the plate to cause lateral movement thereof upon axial movement of the plug.

**4,420,206**  
**ELECTRICAL CONNECTOR**  
 Gerald J. Martyniak, Indianapolis, Ind., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,941  
 Int. Cl.<sup>3</sup> H01R 9/07

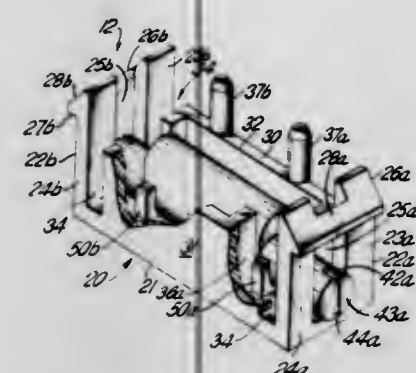
U.S. Cl. 339—75 M

17 Claims

1. A connector comprising a downwardly open housing adapted to be placed over vertically superposed carriers having registering conductive areas on the carriers' adjacent surfaces, said housing having longitudinally spaced downwardly extending portions with means at their lower ends for coupling said housing with the lower of said carriers, and pressure generating means comprising a longitudinally extending wedging body of non-circular cross section received between said portions in said housing, said body having a greater dimension



in one than in the other of its cross-sectional coordinates and having, moreover, rear and front contact faces on the opposite sides of said body separated by said greater dimension, said housing providing as a part thereof a web portion forming at the top of said housing at least a partial closure over the interior thereof, and said body being adjustable in said housing between first and second settings at which, with said such housing being over said carriers and coupled with the lower



one, said body is adapted to be, respectively, inoperable at said first setting to produce significant force on said carriers, and wedgingly positioned in said housing at said second setting between said web portion and carriers with said rear and front contact faces being simultaneously in a force coupled relation with, respectively, said web portion and said carriers so as to be productive by said rear face of a loading force on said web portion and by said front face of downward pressure on said carriers for pressing said registering areas together.

4,420,207

**SOCKET HAVING MEANS OF NO-LOAD ENGAGING WITH AND RELEASING FROM ELECTRONIC UNIT**  
Kinichi Nishikawa, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

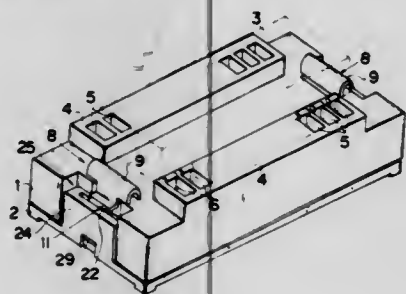
Filed May 14, 1981, Ser. No. 263,507

Claims priority, application Japan, May 28, 1980, 55-73558[U]

Int. Cl.<sup>3</sup> H01R 13/62

U.S. Cl. 339-75 M

5 Claims



1. A socket for an electronic unit having a plurality of wires depending therefrom, said socket comprising:

- a base plate having at least one row of vertical openings therein for receiving corresponding lead wires from the electronic unit;
- a connector plate having at least one row of contacts and on which said base plate is mountable with the openings aligned with said contacts and the contacts extending into said openings, said base plate and said connector plate being movable toward and away from each other between contact engagement and release positions of said contacts and the lead wires of the electronic unit on said base plate with the lead wires extending through said openings;
- a pair of resilient lock members, one at each of the opposite end portions of said base plate and having one portion normally resiliently urged away from said end portions of said base plate;
- a pair of retainers, one at each of the corresponding opposite end portions of said connector plate, and said one portion

of each resilient lock member having a retainer engaging means engageable with the corresponding retainer by the resilient urging of said one portion away from said end of said base plate when said base plate is at said engagement position; and

said lock members each having a finger operating portion projecting upwardly from the upper surface of said base plate and movable toward the corresponding ends of said base plate to release said retainer engaging means from said retainers;

said row of openings being located in said base plate for causing an electronic unit to be positioned between said finger operating portions with the electronic unit adjacent said finger operating portions when the electronic unit is mounted on the base plate with the depending lead wires extending into said openings, whereby when said finger operating portions of said lock members are moved toward each other to release the lock members from said retainers, the electronic unit is gripped between the fingers of the operator.

4,420,208

**PANEL MOUNTED CONNECTOR**

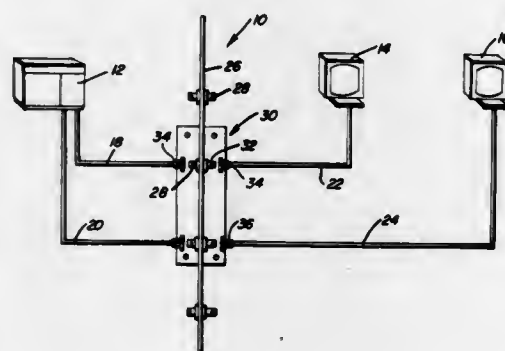
Gary W. Holland, and Robert H. Holland, both of P. O. Box 1761, Decatur, Ala. 35602

Filed Apr. 15, 1981, Ser. No. 254,398

Int. Cl.<sup>3</sup> H01R 13/44

U.S. Cl. 339-88 R

9 Claims



1. In combination with a cable connection assembly having a connection panel provided with opposed external surfaces and cable attachment means mounted on the panel for removably coupling a plurality of cables to each other, said cables extending from the opposed external surfaces of the panel, the improvement residing in said panel being a multi-layered board having an inner layer forming surfaces contrasting with the opposed external surfaces of the panel, and two outside layers on which the opposed external surfaces are formed, said opposed surfaces being engraved to visually expose portions of the contrasting surfaces of the inner layer through the outside layers forming identification indicia for the cables extending from the opposed surfaces of the panel.

4,420,209

**PLUG CONTACT**

Edmund Reis, and Arthur Wondra, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 239,053

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012239

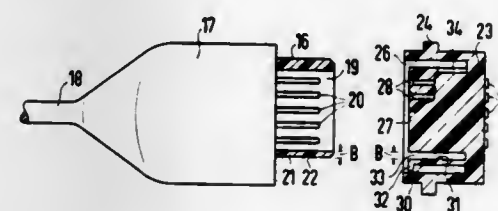
Int. Cl.<sup>3</sup> H01R 13/627

U.S. Cl. 339-91 R

9 Claims

1. A plug contact assembly having a female plug section and male plug section arranged for locking interconnection, comprising a free and resilient tongue supported at one end by and extending longitudinally from a plug head associated with said female plug section and spaced from an associated planar bottom surface of said plug head to define a longitudinally

directed slot, said tongue being formed with a detent hump directed towards said planar bottom surface in said slot, said female plug section having an exterior wall extending annularly spaced around said tongue and said plug head and forming an annular recess therewith, said annular recess being provided for receiving therein in interconnection a plug socket wall associated with said male plug section, said socket wall having a planar base wall, formed with an exterior recess in the outer surface thereof, for fitting into said slot, connector pin



means disposed in a cavity defined by said plug socket wall, contact hole means disposed in said plug head for respectively receiving insertion of said connector pin means upon interconnection of said male and female plug sections, wherein the height of said slot substantially corresponds to the thickness of said base wall such that said tongue is biased downwardly during insertion of said base wall in said slot as said detent hump rides along said base surface until said detent hump enters said exterior recess during interconnection of said female and male plug sections.

4,420,210

**HERMETIC THROUGH BULKHEAD ELECTRICAL CONNECTOR**

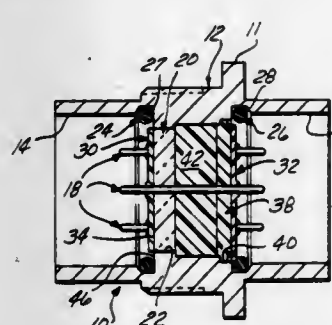
James J. Karol, Unadilla, and Thornton J. Young, Bainbridge, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 17, 1981, Ser. No. 303,294

Int. Cl.<sup>3</sup> H01R 13/52

U.S. Cl. 339-94 M

3 Claims



1. In combination with a hermetic through-bulkhead electrical connector comprising a generally cylindrical connector shell, at least one contact mounted within said shell, the improvement comprising a glass bead insert fused to said shell and said contact, and having an end face at a precisely predetermined axial location; a first interfacial seal bonded to said end face; a non-conductive, non-glass insert bonded to the interior of said connector shell and to said at least one contact at an axially spaced location from the opposite side of said glass bead insert, said connector shell being formed with an internal shoulder and said non-glass insert located against said shoulder, thereby defining a second precisely located end face remote from said fused glass bead insert; and a second interfacial seal bonded to said second end face, whereby two precisely located interfacial seals may provide effective interfacial sealing on either side of said connector.

4,420,211

**FLAT ELECTRICAL CABLE SPLICER**

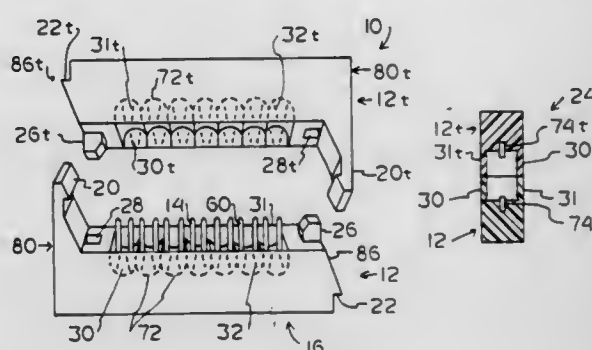
James A. Ledbetter, St. Charles, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Aug. 10, 1981, Ser. No. 291,797

Int. Cl.<sup>3</sup> H01R 9/08

U.S. Cl. 339-98

8 Claims



1. An apparatus for splicing one or more conductors of a flat cable to corresponding conductors in an adjacent overlying cable or cables comprising a housing formed of two housing members which are adapted to interengage with each other, each housing member having a generally rectangular surface contoured face formed of insulating material having a plurality of colinear grooves therein so as to conform to one side surface of said flat cable so that a short length of said flat cable can lie along and nest within said contoured surface, each of said housing members having facing grooves of substantially identical shape, means projecting upwardly from at least one end of each housing member which is adapted to interlock with the opposite end of the other housing member to interengage said housing members, said contoured faces of said housing members extending generally parallel to and facing each other when said housing members are interengaged, the grooves of the interengaged housing members being spaced apart a distance approximately equal to the thickness of the overlying cables which are to be spliced together so as to snugly hold said cables in said overlying position, and one or more upwardly extending generally U shaped piercing members formed of conductive material and having a lower end extending downward from the closed end of the U which extends into and tightly fits within a corresponding slot extending downwardly from the contoured face of one of the shell sections, the upward extending sides of said piercing means forming spaced apart prongs which are adapted to pierce through the insulation of said overlying cables and extend into a corresponding slot in the facing housing member of said interengaged housing members, the prongs of each piercing member being of such width and spacing that when the two shell sections are interengaged it selectively pierces the insulation of and tightly engages a pair of selected overlying conductors of the cables which are to be spliced together, and end seal means at the ends of the grooves for selectively being open to cables passing through and closed to protect cable ends terminating in the apparatus.

4,420,212

**POLARITY INDICATING BATTERY BOOSTER CABLE ASSEMBLY**

Bruce R. Wright, St. Louis, Mo., assignor to Associated Equipment Corporation, St. Louis, Mo.

Continuation of Ser. No. 186,455, Sep. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 158,681, Jun. 12, 1980. This application Sep. 30, 1982, Ser. No. 429,471

Int. Cl.<sup>3</sup> H01R 11/22

U.S. Cl. 339-113 L

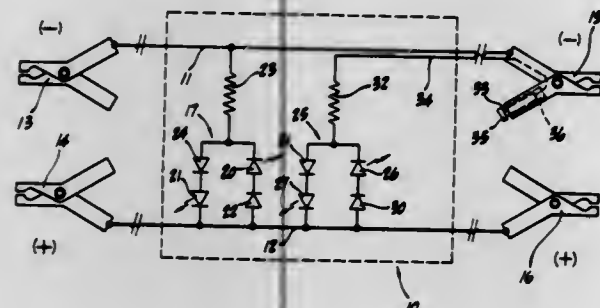
7 Claims

1. A polarity indicating battery booster cable assembly, comprising:

- (a) a pair of booster wires having first ends and second ends,



- (b) first battery attachment means connected to the first ends of the pair of booster wires,  
 (c) a first indicating means operatively connected to the first battery attachment means for indicating the polarity of connection of the first battery attachment means,  
 (d) a second battery attachment means connected to the second ends of the pair of booster wires, the pair of



booster wires providing continuous uninterrupted electrical connections between the first and second battery attachment means, and

- (e) a second indicating means operatively connected to one of the booster wires and including a test probe for determining the polarity for connection of the second battery attachment means.

**4,420,213**  
**SEALED BATTERY THREADED STUD TERMINATION**  
 Victor J. Julian, 2400 Belvue, Westchester, Ill. 60153, and Kenneth A. Julian, 409 Suffolk La., Oak Brook, Ill. 60521  
 Division of Ser. No. 149,349, May 13, 1980. This application Jun. 7, 1982, Ser. No. 386,421  
 Int. Cl.<sup>3</sup> H01R 13/52

U.S. Cl. 339—116 R

3 Claims



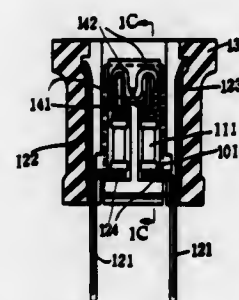
1. A termination assembly for connecting an electric cable to a terminal stud of a battery, comprising  
 a terminal plate having an aperture extending from the top to bottom thereof for receiving said stud,  
 means electrically and mechanically connecting said plate to said cable,  
 a plastic, insulating cover molded directly over the top and bottom surfaces of said terminal plate and having openings formed therein above and below said plate in alignment with said aperture for receiving said stud,  
 the portion of said cover disposed over the top of said plate including an integral, annular resilient sealing bead spaced from and surrounding said opening therein,  
 an annular metallic member positioned in said opening in the portion of said cover disposed over the top of said plate in abutting relationship with the top of said terminal plate, said metallic member having a central opening aligned with said openings and said aperture, and  
 said metallic member having a planar distal end surface spaced from said terminal plate by a distance which is greater than the distance of the distal end of said bead from said terminal plate.

**4,420,214**  
**ELECTRICAL PLUG AND SOCKET HAVING REPLACEABLE OVERCURRENT-PROTECTION DEVICE PROVIDED WITH SAFETY LATCH MEANS**  
 Jeng-Shyong Wu, No. 133 Tungshing Rd., Toufun, Maulit, Taiwan

Filed Feb. 14, 1980, Ser. No. 121,324  
 Int. Cl.<sup>3</sup> H01R 13/06

U.S. Cl. 339—147 P

7 Claims



1. In an electrical connection device constituting a plug and having an insulating body, a pair of electrical conductors entering said insulating body and terminating in respective connection terminals, a pair of connection electrodes for defining a pair of prongs extending from a forward end of said insulating body to be connected to a mating device and apertures in said forward end of said body through which said prongs extend for connection thereof to said mating device at said forward end of said insulating body, replaceable overcurrent-protection device means positioned within said insulating body and connecting each of said connection terminals to a corresponding one of said connection electrodes to complete an electric circuit, and at least one opening into said insulating body for fitting and removing the overcurrent-protection device means, the improvement comprising safety latch means including at least one latch member adapted to be inserted into said insulating body from said forward end thereof to hold the overcurrent-protection device means in position and to close each said opening for thereby preventing access to the overcurrent-protection device means, the direction in which the latch member is removed from said insulating body being thereby the same as the direction in which said connection device is connected to said mating device, whereby the removal of the latch member and the replacement of the overcurrent-protection device can be effected only if said connection device has been separated from said mating device, the overcurrent-protection device means defining an opening and the latch member being adapted to provide interengagement with the last-said opening to hold the overcurrent-protection device in position within said insulating body.

**4,420,215**  
**VARIABLE EFFECTIVE LENGTH CANTILEVER CONTACT AND CONNECTOR**  
 John N. Tengler, Chardon, Ohio, assignor to A P Products Incorporated, Mentor, Ohio

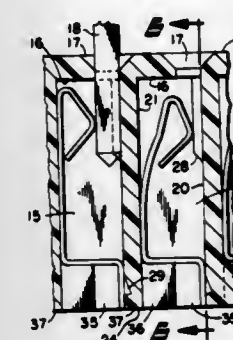
Filed Dec. 26, 1979, Ser. No. 107,352  
 Int. Cl.<sup>3</sup> H01R 13/50

U.S. Cl. 339—176 R

31 Claims

1. An electrical contact, comprising contacting means for electrically connecting with a member inserted to engagement therewith, and support means for supporting said contacting

means in position for such engagement, said support means including at least one cantilever-like portion having an effective

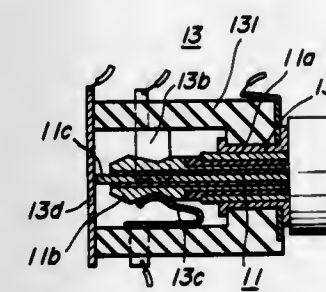


length that varies substantially continuously over at least a portion thereof during deformation thereof.

**4,420,216**  
**CONNECTING DEVICE**  
 Kazuyasu Motoyama; Toshihiro Nakao; Mitsuo Nasu, and Yoshio Tomizawa, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan  
 Filed Aug. 11, 1981, Ser. No. 292,039  
 Claims priority, application Japan, Aug. 13, 1980, 55-111530  
 Int. Cl.<sup>3</sup> H01R 13/06

U.S. Cl. 339—183

5 Claims



1. A connecting device comprising, a plug member arranged to be connected to an external load and including a conductive sleeve, a conductive tip extending out from within said conductive sleeve, a movable pin projecting from an end portion of the tip, and a jack member arranged to be mounted on a housing of an electrical apparatus and including a first contact segment for contacting with the conductive sleeve of the plug member, normally closed second and third switching contact segments arranged to separate from each other by action of the tip of the plug member wherein one of said second and said third contact segments electrically contacts the tip of the plug member, and a fourth contact segment for electrically contacting with the pin of the plug member to supply a source voltage from within the electrical apparatus to the external load through the pin of the plug member.

**4,420,217**  
**SWITCHABLE ON-AXIS OPTICAL BANDSTOP FILTER**  
 Reinhold Gerharz, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

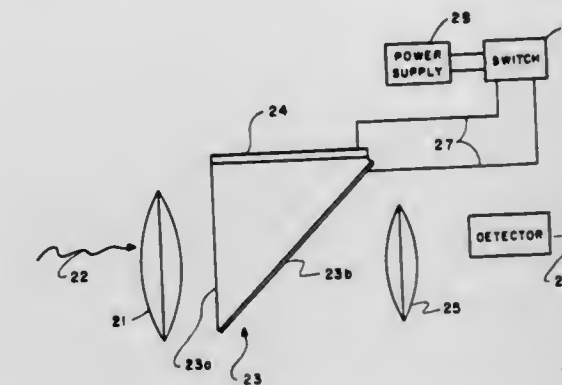
Filed Dec. 16, 1982, Ser. No. 450,322  
 Int. Cl.<sup>3</sup> G03H 1/04; G02B 5/32

U.S. Cl. 350—362

4 Claims

1. An optical bandstop filter capable of being erased and a new filter formed, including:  
 an erasable photosensitive medium;  
 means for directing coherent and noncoherent optical radiation through said medium;  
 means for retroreflecting said radiation into said medium

whereby the coherent radiation establishes standing waves in said medium; and

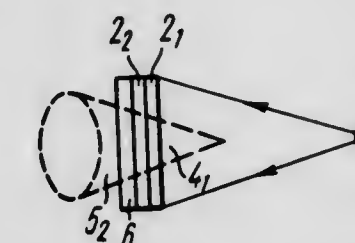


means for fixing said standing wave in said medium whereby an interference filter for said coherent radiation is formed.

**4,420,218**  
**METHOD OF OBJECT IMAGING**  
 Alexandr S. Rubanov; Leonid V. Tanin; Ljudmila V. Vasilieva; Anatoly N. Kalinin; Vyacheslav A. Bursky, and Felix V. Vidmant, all of Minsk, U.S.S.R., assignors to Institut Fiziki an Bssr, U.S.S.R.  
 Filed Feb. 23, 1981, Ser. No. 237,377  
 Claims priority, application U.S.S.R., Apr. 19, 1980, 2912365; May 26, 1980, 2922101  
 Int. Cl.<sup>3</sup> G03H 1/22

U.S. Cl. 350—3.85

42 Claims



1. A method of object imaging, comprising the following steps: recording of a holographic image of an object on a substrate; formation of a two-dimensional image of the same object on a separate substrate; mutual arrangement of said substrate having the holographic image thereon and said substrate having the two-dimensional image thereon for orientation of these images; and reconstruction of said images through illumination of said substrates by a light beam of varying intensity and of varying spatial coherence.

**4,420,219**  
**OPTICAL WAVEGUIDE CONNECTOR USING ASPHERIC LENSES**  
 Franz Muchel, Königsbrunn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heldenheim, Fed. Rep. of Germany  
 Filed Mar. 17, 1981, Ser. No. 244,755  
 Claims priority, application Fed. Rep. of Germany, Mar. 18, 1980, 3010347  
 Int. Cl.<sup>3</sup> G02B 7/26

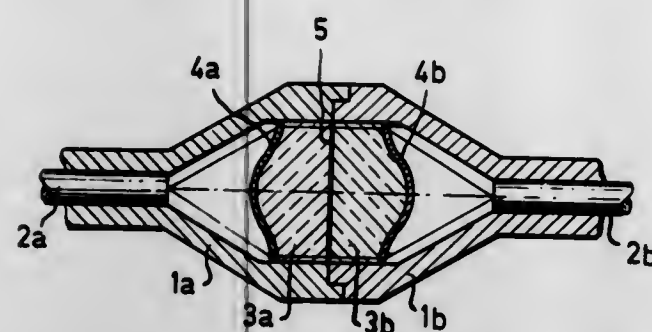
U.S. Cl. 350—96.18

13 Claims

1. A device for connecting first and second light guides to an external part comprising:  
 first and second light guide housing means for mounting said light guides corresponding to said first and second light guides, said light guides extending into said housing means; and  
 a converging aspheric plano-convex lens for each of said first and second light guide housing means, constructed and arranged to be disposed so that the focal point of said lens is disposed at the end surface of said light guides, said



plano-convex lens having an aspherically shaped surface and a planar surface, said aspherically shaped surface facing said light guides, said planar surface forming a



coupling side surface and being constructed and arranged to support an immersion fluid disposed between said planar coupling side surface and said external part.

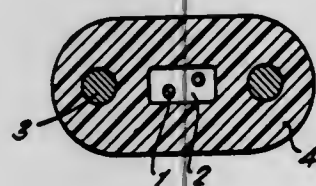
#### 4,420,220 OPTICAL GUIDES

Noel S. Dean; Kenneth L. Lawton; and Vincent A. Yates, all of Wigan, England, assignors to BICC Public Limited Company, London, England  
Continuation of Ser. No. 1,503, Jun. 25, 1979, abandoned, which is a continuation of Ser. No. 645,333, Dec. 30, 1975, abandoned. This application Nov. 4, 1980, Ser. No. 203,996  
The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> G02B 5/14

U.S. Cl. 350—96.23

14 Claims



1. An optical communication cable for transmission of light having a wavelength within the range 0.8 to 1.3 micrometers, which cable comprises an extruded elongate body of insulating material having extending throughout its length at least one bore which is defined by a substantially smooth continuous boundary wall, which is of substantially uniform transverse cross-section throughout the length of the bore; at least one non-twisted optical fibre which is housed loosely in and throughout the length of the bore and which is of a diameter substantially less than the diameter of the bore so that at any transverse cross-section of the cable throughout the whole of its length the at least one optical fibre is free to move in any direction within the bore of the extruded elongate body when the cable is flexed; and, embedded in the extruded elongate body throughout the whole of the length of the body and arranged on opposite sides of and substantially parallel to the bore, at least two separate elongate reinforcing members.

#### 4,420,221

PASSIVE ANIMATED, OR PATTERN CHANGING SIGN  
Lawrence N. Sparks, P.O. Box 134, San Marcos, Calif. 92069  
Filed Mar. 19, 1982, Ser. No. 359,919

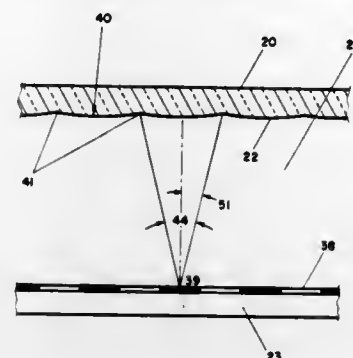
Int. Cl.<sup>3</sup> G02B 27/00; G03B 25/02; G09F 13/02, 13/16

U.S. Cl. 350—167

10 Claims

1. A lenticular lens array comprising a sheet of transparent

material having at least one side composed of a plurality of parallel, elongated, lenticular, and convex lens elements with

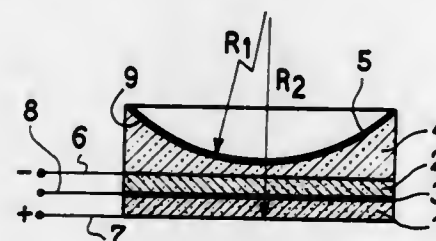


4,420,222  
MIRROR HAVING A VARIABLE FOCAL LENGTH  
Georges Bret, Verrieres le Buisson, and Guy Michelet, Paris, both of France, assignors to Quantel S.A., Orsay, France  
Continuation of Ser. No. 896,081, Apr. 13, 1978, abandoned.  
This application Apr. 10, 1981, Ser. No. 253,079

Int. Cl.<sup>3</sup> G02B 5/10

U.S. Cl. 350—295

19 Claims



1. A mirror having a reflecting surface, the entire area of which is intended to selectively focus an image reflected thereby in a continuously variable focal plane, the variation of which is obtained by a deformation of the structure of that mirror, the latter comprising a multilayer structure at least one component of the component layers of which is made from piezoelectric material the thickness of the entire multilayer structure being in the order of magnitude of one millimeter, and electrodes combined with said multilayer structure for applying voltage to said multilayer structure, said multilayer structure having an outer face, said reflecting surface being provided on said outer face, the mirror constructed in this way having outer faces at least one of which outer faces comprises at least one zone having a given curvature in the non-excited state of said multilayer structure, whereby said electrodes are connected to terminals adapted to be supplied with a selectively variable voltage the variation of which causes said image to be selectively focused in said focal plane.

#### 4,420,223

OPTICAL APPARATUS HAVING A MIRROR  
Yoshio Watanabe, and Nobuo Iijima, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Filed Nov. 27, 1981, Ser. No. 325,383  
Claims priority, application Japan, Nov. 28, 1980, 55-167511

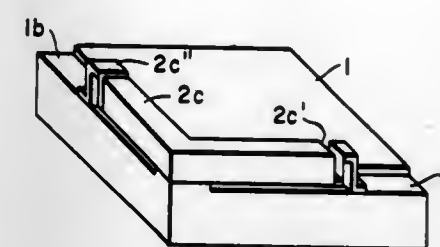
Int. Cl.<sup>3</sup> G02B 5/08

U.S. Cl. 350—310

15 Claims

1. An optical apparatus for a stage comprising:  
a supporting portion provided on said stage,  
a mirror which is fixed at a single portion thereof to said

supporting portion and having a free end portion not fixed to said stage, and



#### 4,420,224 LIQUID CRYSTAL DISPLAY CELL, PROCESS FOR ITS PRODUCTION AND CELL PLATE

Meinolph Kaufmann, Flisbach, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland  
PCT No. PCT/CH80/00034, § 371 Date Nov. 10, 1980, § 102(e)  
Date Nov. 10, 1980, PCT Pub. No. WO80/01959, PCT Pub. Date Sep. 18, 1980

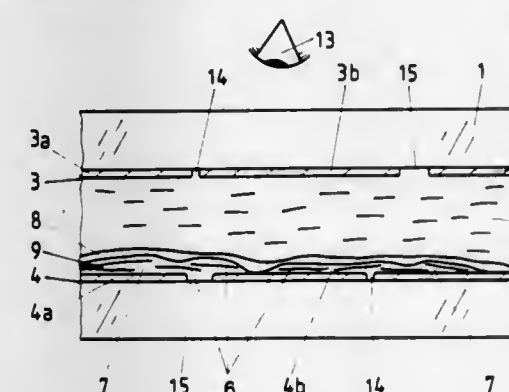
PCT Filed Mar. 6, 1980, Ser. No. 212,710

Claims priority, application Switzerland, Mar. 8, 1979, 2232/79

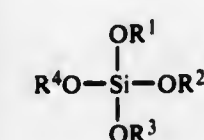
Int. Cl.<sup>3</sup> G02F 1/133; G02B 1/10; B05D 5/06; C08K 7/06

U.S. Cl. 350—338

9 Claims



1. A process for the manufacturing of a liquid crystal display cell, comprising:  
coating two cell plates on the interior surface with electrodes;  
coating at least partially onto the electrodes of the second cell plate with a mixture comprising flake-like aluminum particles and at least a fluid organic orthosilicate (at normal temperature) with the formula



wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are similar or different single value organic radicals, of which the corresponding hydroxyl compounds are volatile, whereby the mixture is hydrolyzed to form silicic acid prior to, during or after the coating;  
heating the second cell plate at temperatures from 300° C. to 550° C., and so annealing a reflective layer consisting of flake-like aluminum particles embedded in a practically homogeneous, transparent layered matrix mainly comprising SiO<sub>2</sub>; and  
assembling the two cell plates as a cell.

#### 4,420,225

#### LENS OF A HOMO- OR COPOLYMER OF A FLUORINE CONTAINING STYRENE POLYMER

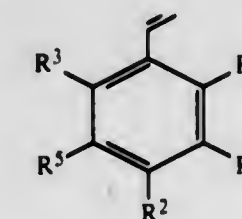
Bruno Bömer, Leverkusen; Carlhans Silling; Joachim König, both of Odenthal; Hans Hesse, Leverkusen; Carl Heynemann, Taufkirchen, and Raimund Weber, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Division of Ser. No. 179,621, Aug. 20, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,756  
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936131

Int. Cl.<sup>3</sup> B29D 11/00; G02B 3/00

U.S. Cl. 350—409

13 Claims

1. A lens comprising a homopolymer which contains, as a monomer unit, at least one styrene of the formula



in which

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> independently of one another denote hydrogen or partly or completely fluorinated alkyl or alkoxy and

R<sup>4</sup> and R<sup>5</sup> independently of one another represent hydrogen or fluorine,

the total number of fluorine atoms in the radicals R<sup>1</sup> to R<sup>5</sup> being at least 3 and the total number of carbon atoms in the radicals R<sup>1</sup> to R<sup>3</sup> being at most 8, said homopolymer having an n<sub>D</sub> value of between about 1.42 and about 1.55 and a v<sub>D</sub> value of between about 30 and about 50, and said homopolymer selected from the group consisting of ortho-, meta- and para-trifluoromethyl styrene.

#### 4,420,226

#### ZOOM LENS OF SHORT TOTAL LENGTH

Nozomu Kitagishi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

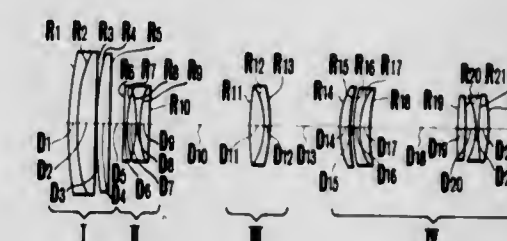
Filed Dec. 22, 1980, Ser. No. 218,940

Claims priority, application Japan, Dec. 28, 1979, 54-171342

Int. Cl.<sup>3</sup> G02B 7/04

U.S. Cl. 350—427

2 Claims



1. A zoom lens of short total length comprising:  
four component lens groups:  
the first lens group being of positive refractive power and movable along an optical axis to effect focusing;  
the second lens group being of negative refractive power and movable along the optical axis to effect zooming;  
the third lens group being of positive refractive power and movable along the optical axis together with said second lens group to maintain an image plane at a constant position during zooming;  
the fourth lens group being of positive refractive power and fixed; said fourth lens group including front and rear subgroups;  
said front subgroup consists of, in order from the object end, a first component of positive refractive power with a



convex surface of the strongest refractive power among said front subgroup disposed on the object end, a second component having a lens of negative refractive power with a convex surface disposed on the object end and a meniscus lens of positive refractive power and composed of two lenses cemented together;

said rear subgroup including a first component of positive refractive power and a cemented meniscus component with a concave surface disposed on the object side; and assuming that the focal length of the fourth lens group is,  $F_R$ , the composite focal length of the first component and the second component of the front subgroup is  $F_{I-II}$ , and the radius of curvature of the cemented surface of the meniscus lens of the front subgroup is  $rR_4$ , the following relations prevail:

$$0.65 < F_{I-II}/F_R < 0.71 \quad (1)$$

$$0.14 < rR_4 < 0.24 \quad (2)$$

4,420,227

### BRIDGE PAD ASSEMBLY FOR METAL SPECTACLE FRAMES

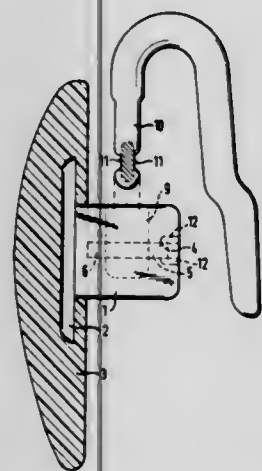
Herbert Speer, Dorfriesenstrasse 92, D-7130 Muehlacker-Enzberg, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,492

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044615

Int. Cl.<sup>3</sup> G02C 1/00, 5/12

U.S. Cl. 351-138



1. In a bridge pad assembly for a metal spectacle frame, comprising:
  - a bridge pad;
  - a bracket;
  - a bridge pad holder comprising a connector, which is resiliently locked to said bracket; and a baseplate carried by said connector at one end thereof and anchored in said pad,
- the improvement residing in that said connector has a cavity which is closed at one end by said baseplate and open at the other end, a crosspiece extending through said cavity and spaced from said baseplate, and a transverse bore, which intersects said cavity between said baseplate and said cross-piece and extends transversely to the latter,
- said bracket has a free end portion, which is fitted in said transverse bore and formed with lateral recesses on opposite sides, and
- a U-shaped spring clip is fitted in said cavity and closes the latter at said other end and straddles said crosspiece and resiliently interlocks with said lateral depressions.

### 4,420,228 METHOD AND APPARATUS FOR ANALYSIS OF CORNEAL SHAPE

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

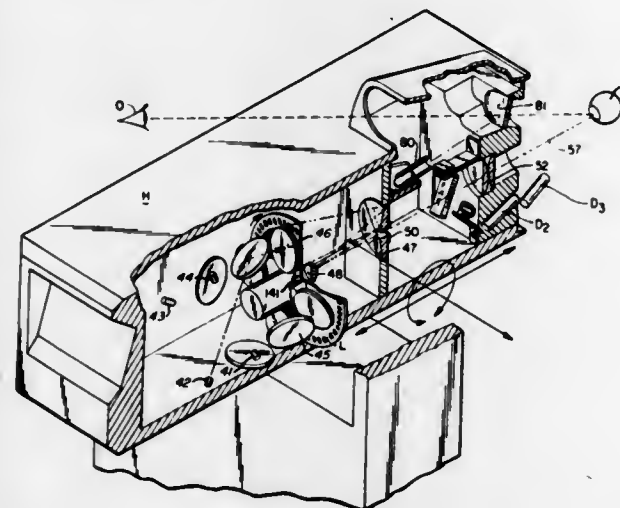
Continuation-in-part of Ser. No. 158,849, Jun. 12, 1980. This

application Jun. 27, 1980, Ser. No. 163,663

Int. Cl.<sup>3</sup> A61B 3/10

U.S. Cl. 351-212

5 Claims



1. A process for determining the shape of the cornea of the eye comprising: fixing the eye along a line of sight for measuring the eye at a first fixation; measuring the eye relative to said first fixation to determine sphere, cylinder and axis; fixing the eye at a second fixation; measuring the eye relative to said second fixation in sphere, cylinder and axis; fixing the eye at a third fixation; measuring the eye relative to said third fixation in sphere, cylinder and axis; determining from a combination of at least a portion of each said measurements of sphere, cylinder and axis at least one of the following parameters: central "k" readings in sphere, cylinder and axis; corneal shape factor; corneal decentrations; fits of corneal measurement to an overall elliptical corneal shape; vault height; cap size; "k" readings transposed to the corneal apex.

4,420,229

### OPHTHALMIC INSTRUMENTS

David L. Lewis, Harlow, England, assignor to Clement Clark International Ltd., England

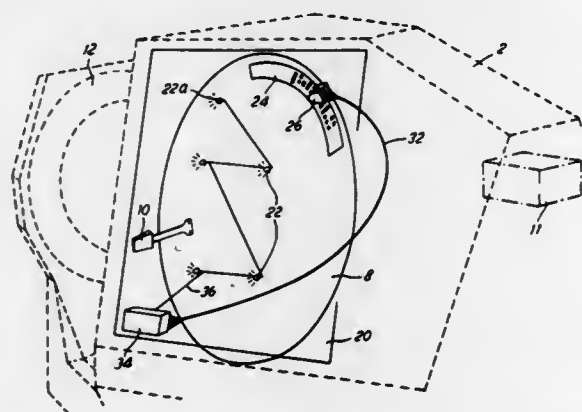
Filed Feb. 10, 1982, Ser. No. 347,564

Claims priority, application United Kingdom, Feb. 13, 1981, 8104534

Int. Cl.<sup>3</sup> A61B 3/02

U.S. Cl. 351-224

8 Claims



1. An ophthalmic instrument for displaying different patterns of light spots in a series of visual tests, the instrument comprising an apertured shutter arrangement at a first location having a series of different settings for determining the pattern of light spots to be displayed at a first location to a subject to be tested, said shutter arrangement comprising fixed and dis-

placeable shutter members and the selection of different light-spot patterns being effected by movement of the displaceable member relative to said fixed member, the instrument further comprising a screen at a second location for displaying each said pattern selected in a manner that is not visible to the subject observing the pattern displayed at said first location, a series of light-emitting elements being disposed in spaced positions over the area of the screen for producing said patterns on the screen, radiation transmitting and sensing means adjacent the apertured shutter arrangement for actuating said light-emitting elements, reflecting means in the path of radiation from said transmitting means for reflecting the radiation to the sensing means, said reflecting means and said radiation transmitting and sensing means being relatively displaceable with said movement of the displaceable shutter member and said reflecting means transmitting to said sensing means a different reflection characteristic for each displayed light-spot pattern associated with a respective setting of the shutter arrangement, actuation means for said light-emitting elements being connected to the radiation sensing means whereby the response of the sensing means to each reflective radiation characteristic actuates the light-emitting elements corresponding to the selected light-spot pattern to display the pattern on the screen at said second location.

4,420,230

### PRODUCTION OF THREE DIMENSIONAL MOTION PICTURES

Robert H. McElveen, 212 W. Jefferies St., Gaffney, S.C. 29340

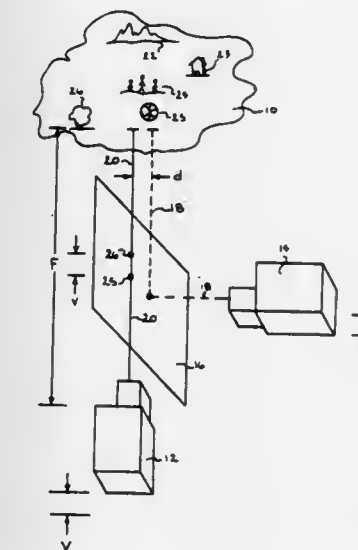
Continuation-in-part of Ser. No. 69,708, Aug. 27, 1979, Pat. No. 4,303,316. This application Oct. 26, 1981, Ser. No. 314,799

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> G03B 21/32

U.S. Cl. 352-43

13 Claims



1. An improved process for reproducing a visual scene which may be viewed in stereopsis by the unaided human eye comprising the steps of:
  - (a) recording a plurality of right and left views of a common visual scene from corresponding recording positions displaced from each other in a first direction at a distance of no more than about one inch and displaced from each other in a second direction generally perpendicular to said first direction at a distance of no more than about one inch, and
  - (b) continuously projecting, in alternation, a sequential group of one or more of said right recorded views and a sequential group of one or more of said left recorded views onto a receiving surface for viewing by the human eye, said duration of projection of said alternating groups being such that the visual duration of each group on said surface varies from a minimum to a maximum duration which is generally correspondingly proportional to the distance of the nearest non-moving object of special re-

gard in the scene from said recording positions, and wherein said duration is approximately equal to the visio-psychological alternation rate between right and left views of the human visual apparatus.

4,420,231

### MOTION PICTURE CAMERA

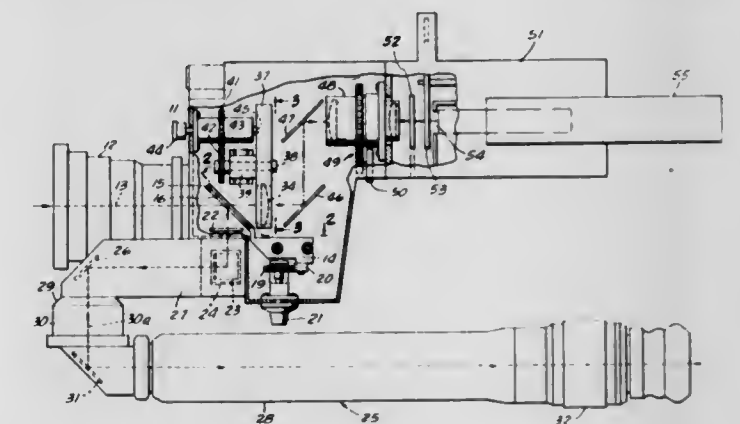
Robert E. Gottschalk, Los Angeles, Calif., assignor to Panavision, Incorporated, Tarzana, Calif.

Filed May 17, 1982, Ser. No. 378,854

Int. Cl.<sup>3</sup> G03B 3/00

U.S. Cl. 352-142

7 Claims



1. A motion picture camera device comprising, in combination: a housing, a prime 35 mm lens assembly mounted on said housing, a viewfinder eyepiece assembly pivotally mounted on said housing to turn about a horizontal axis, a 16 mm motion picture camera, means for transmitting light from the prime lens assembly to either the motion picture camera or to the viewfinder eyepiece assembly, or both, the light path to the motion picture camera including spaced fixed mirrors, the first being positioned at an angle to the axis of the prime lens assembly, to receive light therefrom, the second reflecting light from the first, and a relay lens in said light path.

4,420,232

### SELECTIVELY POSITIONABLE SLIDE TRAY POSITION SENSING ARRANGEMENT FOR SLIDE PROJECTOR APPARATUS

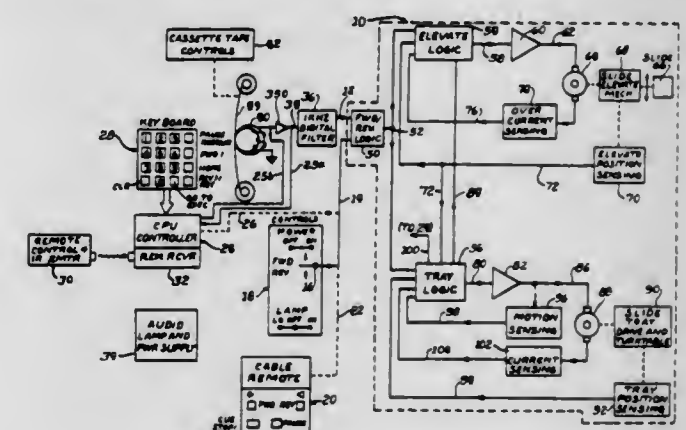
Nicholas Mischenko, Mount Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 31, 1981, Ser. No. 336,466

Int. Cl.<sup>3</sup> G03B 23/04

U.S. Cl. 353-25

16 Claims



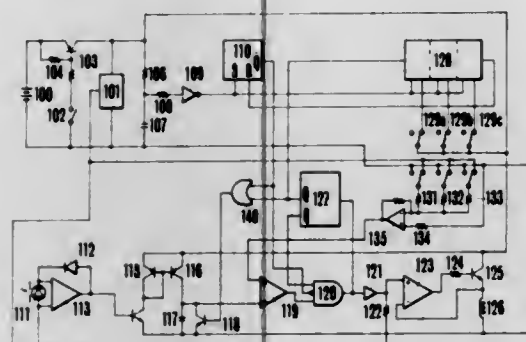
1. In a position sensing arrangement for sensing the position of a slide tray transport arrangement of a slide projector, the position sensing arrangement including a coded array arrangement arranged for movement in a manner directly correlated to movement of the slide tray transport arrangement, the coded array arrangement including two planar arrays of energy transmissive members arranged in respective predeter-







- for opening, and, after a predetermined time, closing said electromagnetically operated shutter;
- (c) means for setting a number of exposures;
- (d) a counter or counting each time said electromagnetically operated shutter means is closed after a an actuating signal and for producing a closing signal upon having counted the predetermined number set by the exposure number setting means;



- (e) a flip-flop circuit for holding said shutter drive circuit in an operative position from the time of the actuating signal to that at which said counter produces the predetermined signal; and
- (f) a timer circuit for preventing actuation of said shutter drive circuit from the initiation of a closing of said electromagnetically operated shutter to the termination of the closing thereof.

4,420,238

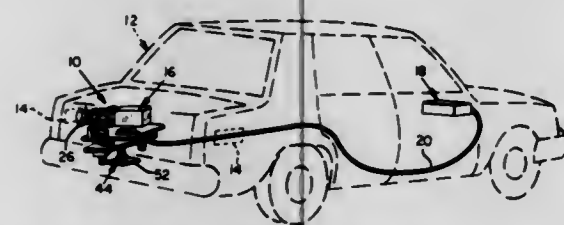
# **APPARATUS FOR ENABLING CONCEALING SURVEILLANCE BY USE OF A CAMERA IN A VEHICLE**

Larry L. Felix, 1250 N. Manzanita, Canby, Oreg. 97013  
Filed Apr. 19, 1982, Ser. No. 369,809

Int. Cl.<sup>3</sup> G03B 37/02, 29/00

U.S. Cl. 354—81

10 Claims



1. A camera-mount assembly for enabling a camera to be selectively panned and tilted comprising: support means for securely holding the camera; base means disposed adjacent said support means for positioning upon a surface; first pivot means mounted on said base means operable for selectively pivoting said support means, relative to said base means, about a substantially vertical, first pivot axis disposed to extend substantially adjacent the camera lens thereby to pan the camera; second pivot means interconnecting said base and support means operable for selectively pivoting said support means about a substantially horizontal, second pivot axis thereby to tilt the camera; transfer means pivotally connected to said support means for defining said second pivot axis and for transferring motion from said first pivot axis to said support means; said first pivot means including first power-driven means operable for imparting rotation, about said first pivot axis, to said transfer means and thereby to said support means; and said second pivot means including second power-driven means drivingly coupled to an elevator means operable for selectively elevating and lowering said support means

thereby to tilt said support means about said second pivot axis.

4,420,239

# **EXCHANGE MOUNT WITH DATA TRANSMITTING ELECTRICAL CONTACTS**

Haneishi Yasuyuki, and Shinsuke Komoto, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

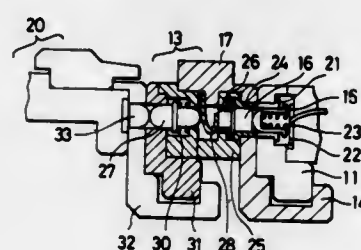
Filed Apr. 28, 1982, Ser. No. 372,776

Claims priority, application Japan, May 1, 1981, 56-63619[U]

Int. Cl.<sup>3</sup> G03B 17/00

U.S. Cl. 354—286

8 Claims



1. An exchange mount for a camera mount of a camera body comprising: a camera side mount member (14) capable of being mounted on said camera mount (11) of said camera body (10); a fixing ring (25); an "auto" and "manual" switching lever (17) connected to said fixing ring; a lens mount member (31) and a lens mount (32) on which a lens barrel (20) is mounted; a first electrical contact (16) located in said camera side mount member, said first electrical contact confronting and contacting a second electrical contact located in said camera mount when said camera side mount member is mounted on said camera mount, said second electrical contact being connected to a camera circuit; contact pin means (33, 27, 35) located in said lens mount; a switching contact (28) coupled to said switching lever, said switching contact electrically interconnecting said contact pin means and said first electrical contact when said switching lever is set to "auto" so that said contact pin means is electrically connected to said camera circuit.

4,420,240

# **TRIPARTITE CAMERA WITH RELEASABLE COUPLING BETWEEN EACH PART**

Makoto Katsuma, Kawasaki; Toyokazu Mizogui, Kiyose; Takashi Isobe; Akira Hiramatsu, both of Yokohama; Hiroyasu Murakami, Tokyo, and Toyoki Ishida, Ageo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 354,935

Claims priority, application Japan, Mar. 13, 1981, 56-36933

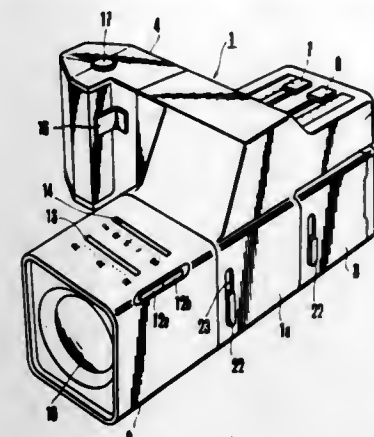
Int. Cl.<sup>3</sup> G03B 17/02

U.S. Cl. 354—288

3 Claims

1. A camera having at least three separable parts arranged in combination comprising: fitting means for fitting each of said parts to another part so as to have portions thereof overlap, said fitting means being arranged to fit each of said parts so that at least one side of each part is arranged to lie in a common plane with a side of another part; coupling means for coupling two successive parts with each other by respective coupling devices having common structures, said coupling means being operable between a locked state to retain said parts coupled together and an unlocked state to release the coupling engagement between said parts; and operating means for operating said coupling means to

bring said coupling means between said locked state and said unlocked state, said operating means being positioned re-



spectively at sides of said parts arranged to lie in a common plane with a side of another part.

4,420,241

# **MOUNTING ASSEMBLY FOR FILM-SQUEEZING ROLLERS**

Alfons Kastl, Munich; Klaus Lehnert, Unterhaching; Horst Köninger, and Güter Schirk, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

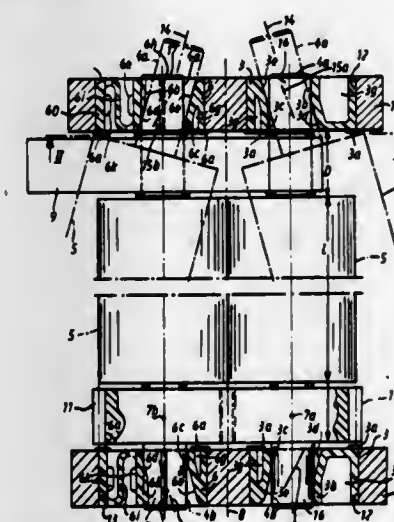
Filed Sep. 27, 1982, Ser. No. 424,997

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150225

Int. Cl.<sup>3</sup> G03D 9/02

U.S. Cl. 354—319

10 Claims



1. In a film-treatment device having: two spaced and generally parallel mounting plates each having a pair of plate holes, respective pairs of journals in the plate holes having respective journal holes centered on a pair of journal axes, the journal holes of one plate being coaxial with the journal holes of the other plate and the two journal axes being parallel, and rollers centered on respective roller axes and each having a pair of substantially cylindrical end trunnions centered on the respective roller axis and rotatably received in a respective one of the journal holes for rotation of the respective roller therein with its roller axis coaxial with the respective journal axis, the journals of one of the journal axes being constructed so the respective roller can move against spring force limitedly away from the other roller, the improvement wherein at least one journal of each journal axis is formed at the respective journal hole with: two semicylindrical journal surfaces spaced axially apart, centered on the respective journal axis, of the same radius of curvature as the respective trunnion, and diametrically oppositely concave toward each other, whereby the re-

spective trunnion rides on the respective journal surfaces with the respective roller axis lying on the respective rotation axis, and two generally semicylindrical skew surfaces spaced axially apart, centered on respective skew axes inclined to and intersecting the respective rotation axes, of at least the radius of curvature of the respective trunnion, and diametrically oppositely concave toward each other, each of the skew surfaces being axially level relative to the respective journal axis with a respective one of the respective journal surfaces, the skew axes being at such an angle and so positioned relative to the respective journal axes that the respective trunnions can be inserted into the respective journals in surface contact with the respective skew surfaces.

4,420,242

# **MAGNETIC BRUSH DEVELOPING AND CLEANING PROCESS**

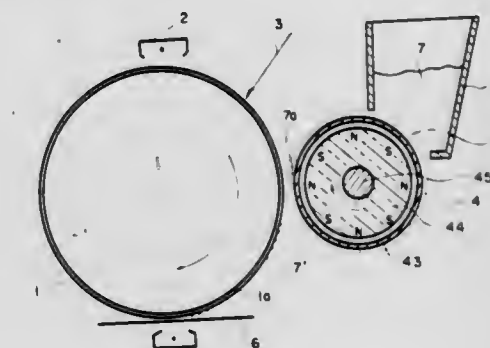
Keitaro Yamashita, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,205

Int. Cl.<sup>3</sup> G03G 15/09

U.S. Cl. 355—3 DD

5 Claims



1. A magnetic brush developing and cleaning process, comprising the steps of: providing a magnet roll which includes a rotatable, non-magnetic cylindrical shell and a rotatable permanent magnet disposed within said shell, said rotatable permanent magnet having a plurality of adjacent magnetic poles in proximity to said shell; forming a magnetic brush of a developer powder on said shell of said magnet roll; developing electrostatic latent images by rotating at least said permanent magnet and softly rubbing said magnetic brush against electrostatic latent images on an image bearing surface; transferring the developed images to a sheet; and cleaning said image bearing surface by rotating said sleeve and said permanent magnet in opposite directions, and strongly rubbing said magnetic brush against said surface.

4,420,243

# **HOLD-DOWN ARRANGEMENT FOR COPY SHEET PICK-OFF SYSTEM**

James M. Baker, Whitney Point, and David L. Vermaat, Port Crane, both of N.Y., assignors to Savin Corporation, Stamford, Conn.

Filed Jul. 9, 1982, Ser. No. 396,781

Int. Cl.<sup>3</sup> G03G 15/00

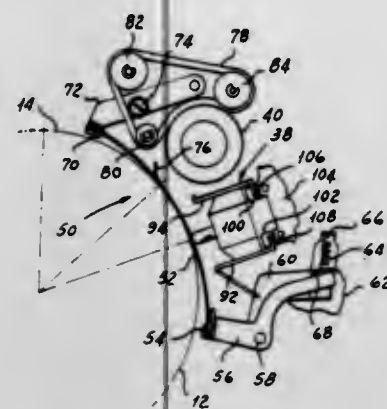
U.S. Cl. 355—3 TR

10 Claims

9. In an electrostatic copier having a drum from which a developed electrostatic image is to be transferred to a copy sheet at a transfer station, a copy sheet hold-down finger having an opening therein and means including an eccentric in said



opening for mounting said finger at said transfer station with the end thereof in spaced relationship to the surface of said



drum and manually operable means for rotating said eccentric to adjust the position of said finger end relative to said surface.

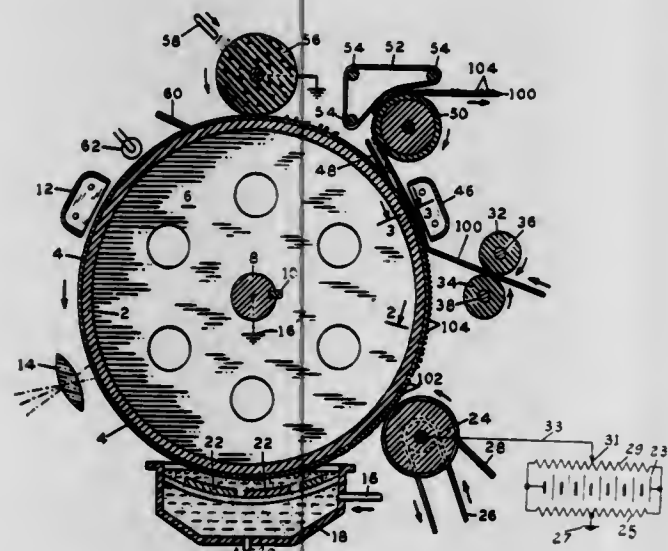
#### 4,420,244 APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES FOR GAP TRANSFER TO A CARRIER SHEET

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Division of Ser. No. 267,465, May 27, 1981. This application  
Oct. 12, 1982, Ser. No. 433,658  
Int. Cl.<sup>3</sup> G03G 15/10, 15/14

U.S. Cl. 355—3 TR

1 Claim



1. An electrophotographic apparatus including in combination a photoconductor; means for moving said photoconductor past a corona charging station for imparting a charge of a certain polarity to the surface of said photoconductor; an imaging station; a developing station, said developing station including means for applying a developing liquid to said photoconductor, which developing liquid comprises a dielectric carrier liquid, toner particles, and spacing particles having a dielectric constant higher than the dielectric constant of said carrier liquid; a metering station; and a transfer station in succession; said metering station comprising metering means, means for mounting said metering means adjacent to the surface of the photoconductor, means for impressing a bias on said metering means of the same polarity as the charge on said photoconductor; and means for spacing a carrier sheet to which the developed image is to be transferred from the surface of the photoconductor; said spacing means comprising said spacing particles and means for positioning said carrier sheet at said transfer station.

#### 4,420,245 ELECTROPHOTOGRAPHIC COPIER HAVING MOVABLE OPTICAL ELEMENTS FOR CHANGING THE MAGNIFICATION OF AN ORIGINAL DOCUMENT

Hisashi Katao, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

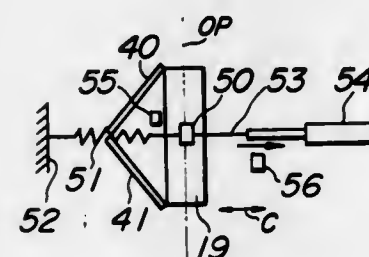
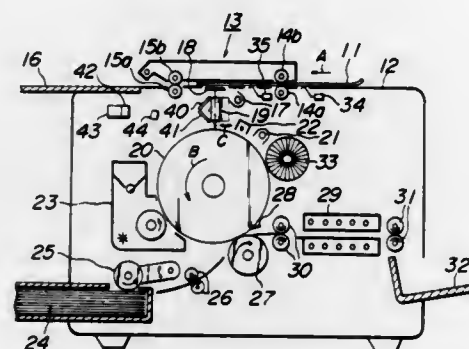
Filed May 27, 1982, Ser. No. 382,617

Claims priority, application Japan, May 30, 1981, 56-81850

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—11

7 Claims



1. An electrophotographic copier for forming a copy of a document comprising  
means for moving a document to be copied through an exposing position;  
means arranged at the exposing position for illuminating the moving document;  
a life-size image projecting optical system having a converging optical fiber array which forms a life-size image of the illuminated document and being arranged movably between first and second positions with respect to an optical axis;  
a modified-size image projecting optical system for forming a modified-size image of the illuminated document and having a plurality of optical elements at least one of which is secured to said converging optical fiber array, remaining optical elements being arranged fixedly;  
means for moving said converging optical fiber array together with said at least one optical element of the modified-size image projecting optical system;  
a photosensitive member arranged movably in synchronism with the movement of the document for receiving either one of said life-size image and modified-size image of the document to form a corresponding electrostatic latent image;  
and  
means for forming a duplicated copy with the aid of the latent image; whereby when said converging optical fiber array is in said first position, said life-size image is projected onto said photosensitive member, and when said converging optical fiber array is in said second position, said at least one optical element is in the optical axis to project the modified-size image of the document onto the photosensitive member.

#### 4,420,246 MULTIPLE REPRODUCTION APPARATUS

Mitsuhiro Nonaka, and Yuichi Kobayashi, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Japan

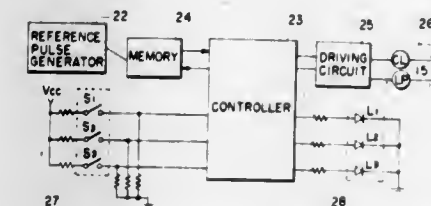
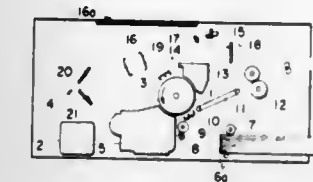
Filed Nov. 5, 1981, Ser. No. 318,424

Claims priority, application Japan, Nov. 6, 1980, 55-156228

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 R

7 Claims



1. Apparatus for making at least one copy from an original comprising:  
an original holder for holding thereon said original;  
image forming means having an image forming surface on which a copy image of said original is to be formed;  
an exposure system for exposing an image of said original onto said image forming surface;  
driving means for intermittently driving after a wait time period either one of said original holder or at least a part of said exposure system for image exposing motion relative to the other, in a reciprocating manner between a home position from where an image exposing motion is initiated and an advanced position from where a returning motion back to said home position is initiated;  
transferring means for transferring said copy image formed on said image forming surface to a transfer medium; and  
wait time period control means for controlling the length of a wait time period at said home position between completion of a returning motion and initiation of a next image exposing motion of said one of said original holder or at least a part of said exposure system in response to the size of said original or transfer medium.

#### 4,420,247 COMPUTER CONTROL MEANS FOR AN ELECTROSTATIC RECORDING APPARATUS

Koji Suzuki, Yokohama; Joji Nakahira, Tokyo; Koki Kuroda, Yokohama; Nao Nagashima, Tokyo, and Yoshiaki Takayanagi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 219,513

Claims priority, application Japan, Dec. 28, 1979, 54-171351; Jan. 31, 1980, 55-12926; Jan. 31, 1980, 55-12928

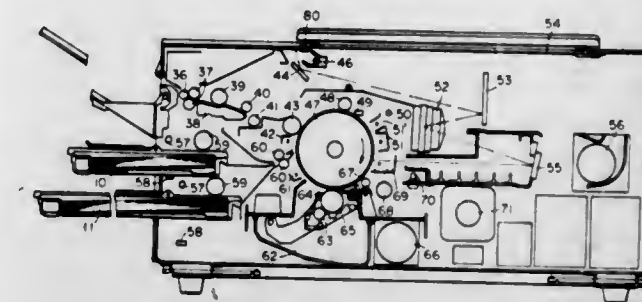
Int. Cl.<sup>3</sup> G03G 15/01

U.S. Cl. 355—14 C

11 Claims

9. A recording apparatus comprising:  
a plurality of processing means for forming an image on a recording medium;  
a first digital computer for controlling at least one of said processing means; and

a second digital computer for transferring data for image formation to said first digital computer wherein said first



digital computer is initialized by a signal from said second digital computer.

#### 4,420,248 VARIABLE MAGNIFICATION COPYING DEVICE

Ryota Ogawa, Kawagoe; Ikuo Negoro, Tokyo; Hisao Iwanade, Tsurugashima, and Yasunori Arai, Asaka, all of Japan, assignors to Asahi Kogyo Kogyo Kabushiki Kaisha, Tokyo, Japan

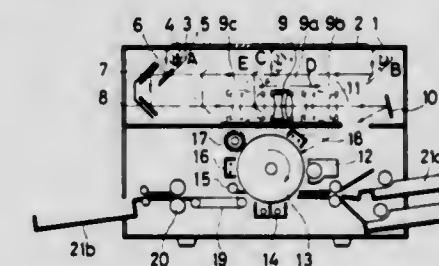
Filed Mar. 16, 1981, Ser. No. 244,476

Claims priority, application Japan, Mar. 25, 1980, 55-37841

Int. Cl.<sup>3</sup> G03B 27/52

U.S. Cl. 355—57

9 Claims



1. A variable magnification copying device having a copying optical system capable of enlarging and reducing the image of an original, comprising: full-speed mirror means for scanning a predetermined copying size document; a half-speed mirror following said full-speed mirror; a zoom lens system and means for moving said zoom lens system following said half-speed mirror wherein a region of movement of said zoom lens system for an enlargement copying operation is shared with a region of movement of said half-speed mirror for an equal magnification copying operation and a reduction copying operation.

#### 4,420,249 IMAGE REPROPORTIONING MACHINE

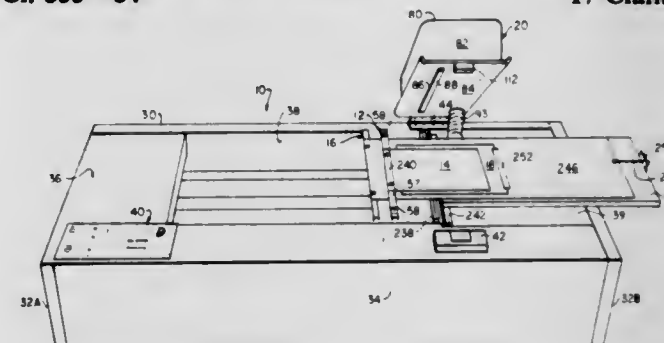
Dennis H. Trump, Nashua, N.H., assignor to Nashua Control Instruments, Inc., Nashua, N.H.

Filed May 7, 1982, Ser. No. 376,028

Int. Cl.<sup>3</sup> G03B 27/10

U.S. Cl. 355—84

17 Claims



1. An image reproportioning system for reproducing an



image from an image bearing sheet onto a photosensitive sheet so that the scale of one dimension of the reproduced image can be changed relative to its other dimension, said system comprising:

a first sheet supporting member for supporting one of said sheets;  
a second sheet supporting member for supporting the other of said sheets in substantial juxtaposition with said one sheet;  
means for defining a slit of light;  
means for moving said first and second sheet supporting members at a substantially constant speed in a first direction parallel to the direction of said one dimension and transverse to said slit of light so that said sheets pass through and are exposed by said slit of light;  
means for moving said first and second sheet supporting members relative to one another at a substantially constant relative speed as said sheets are exposed to said slit of light, said relative speed being a function of the percentage of change of said scale of said one dimension, said means for moving said first and second sheet supporting members relative to one another including

- means for spring biasing said first and second members so that said second member is biased to move relative to said first member in a direction parallel to said first direction;
- ramp means;
- means for adjusting the angle of inclination or declination of said ramp means in said first direction; and
- cam arm means (1) pivotally mounted to and adapted to move with said first sheet member, and (2) cooperative with said ramp means so as to move said second member relative to said first member at a constant linear speed against said bias means as said first and second members move at said substantially constant speed.

4,420,250

# ARRANGEMENT FOR MEASURING THE BATH LEVEL IN A CONTINUOUS CASTING APPARATUS

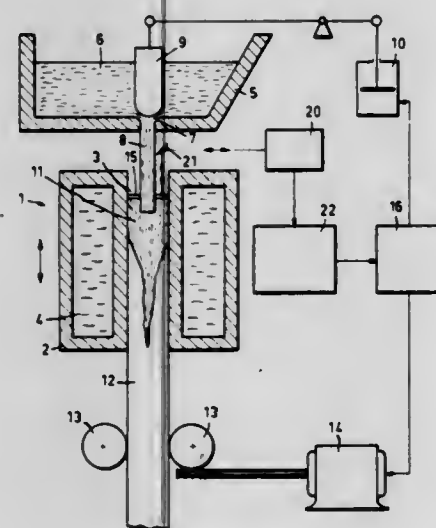
Günter Kompa, Schopfheim, Fed. Rep. of Germany, assignor to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,157

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 2931199

Int. Cl.<sup>3</sup> G01C 3/08; G01F 23/00

U.S. Cl. 356—5



1. A method for measuring the bath level in a cooled, tubular mould utilized in a continuous casting process where a melt of metal to be cast is discharged from a container therefor into the mould via an immersion tube vertically extending into a bore through the mould to thereby establish the bath, there being an annular space between the immersion tube and the wall of the bore, and where the melt is solidified by the cooled mould and continuously withdrawn therefrom as a solidified bar, said method comprising the steps of transmitting a series of light pulses from a transmission point in a first direction through an

elongated tube horizontally disposed above the mould to the side thereof having a right-angle bend therein to a common deflecting mirror disposed at the bend; deflecting the light pulses from the common deflecting mirror into said annular space between the immersion tube and mould bore in a direction parallel to the vertically extending immersion tube and onto the surface of the bath; reflecting pulses from said bath surface through said annular space back to said common deflecting mirror; deflecting the reflected pulses from said mirror through said tube in a direction opposite to said first direction to a receiving point; electrically measuring the time interval between the instant of transmission of each transmitted light pulse and the instant of receipt of the corresponding echo light pulse to determine said bath level.

4,420,251

# OPTICAL DEFORMATION SENSOR

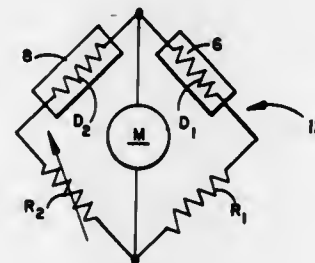
Kenneth A. James, Corona del Mar; William H. Quick, La Habra Heights; Rudolf R. August, Laguna Beach, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 146,929, May 5, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 334,998

Int. Cl.<sup>3</sup> G01B 11/16; G01L 1/24

U.S. Cl. 356—32

6 Claims



1 Claim

1. An optical sensor to provide an indication of a physical parameter, said optical sensor comprising:  
source means for providing a supply of incident light signals, first optical means to polarize said incident light signals, second optical means arranged so as to selectively transmit polarized light signals that are supplied thereto, at least one light transmitting optical fiber aligned at a first end thereof with each of said first and second optical means for receiving polarized incident light signals from said first optical means, light reflecting means aligned with the second end of said optical fiber to thereby reflect polarized light signals that are transmitted thereto via said optical fiber back through said optical fiber and to said second optical means, and optical detector means aligned to receive polarized output light signals that are selectively transmitted from said optical fiber through said second optical means, said detector means being responsive to the optical characteristics of the output light signals, said optical fiber undergoing a corresponding deformation in response to a physical parameter, whereby to alter the optical characteristics of the light signals being transmitted therethrough, the optical characteristics of the output light signals that are transmitted to said optical detector means through said second optical means relative to the optical characteristics of the incident light signals supplied to said optical fiber from said first optical means providing an indication of the physical parameter.

4,420,252

# LIGHT MEASURING DEVICE FOR CONTROLLING EXPOSURE

Kenji Nakauchi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

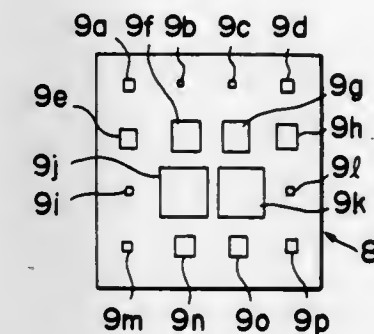
Filed Dec. 22, 1980, Ser. No. 218,561

Claims priority, application Japan, Dec. 21, 1979, 54-166690; Dec. 21, 1979, 54-166691

Int. Cl.<sup>3</sup> G01J 1/30

U.S. Cl. 356—225

11 Claims



1. A light measuring device for measuring the brightness of a subject matter, comprising a plurality of photodetectors arranged to measure the brightness of different respective parts of the subject matter, weighting means for weighting the output of said photodetectors to different respective degrees according to the position of the photodetectors, and summing means receiving the weighted outputs of said photodetectors to provide an exposure output.

4,420,253

# METHOD AND APPARATUS FOR DETECTING WEAR OR BREAKAGE OF TOOLS AND OTHER OBJECTS

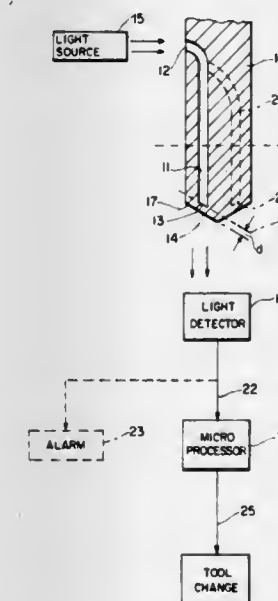
Timothy R. Pryor, Tecumseh, Canada, assignor to Diffraction Ltd., Windsor, Canada

Filed Nov. 20, 1981, Ser. No. 323,397

Int. Cl.<sup>3</sup> G01N 21/00; G02B 5/14; B23B 39/00

U.S. Cl. 356—237

14 Claims



1. A method of detecting wear or breakage of an object which comprises:  
providing an object having an elongate fiber optic imbedded in the object such that a first, light receiving end of said fiber optic is located at a first surface of the object and such that a second, light emitting end of said fiber optic is located within the body of said object and spaced from a further surface of the object such that the light emitting end of said fiber optic is covered by a portion of said object overlying said light emitting end of said fiber optic; directing light onto said light receiving end of said fiber optic whereby said light is transmitted along said fiber optic to the light emitting end thereof, said light being

such that the portion of the object overlying said light emitting end of said fiber optic is opaque thereto; and, detecting any light emitted from said light emitting end of said fiber optic whereby the detection of emitted light provides an indication that the portion of said object overlying said light emitting end of said fiber optic is not present.

4,420,254

# CUVET AND ASSOCIATED APPARATUS AND METHOD FOR USING SAME

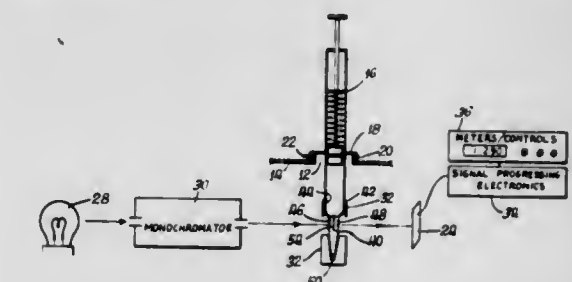
John R. Smeaton, P.O. Box 337, Wayne, Ill. 60184

Filed Feb. 19, 1980, Ser. No. 122,376

Int. Cl.<sup>3</sup> G01N 1/14

U.S. Cl. 356—246

13 Claims



1. The combination of:

a cuvet comprising a hollow body with first and second body portions, said first body portion having an opening and an associated coupling section for releasable connection thereof with a variable pressure device, and said second body portion having windows and a draw hole for receipt therethrough of a liquid to be drawn into the second body portion and in alignment with the windows; a variable pressure device, said variable pressure device having a hollow body, means for varying the pressure within said hollow body and means releasably coupling the hollow body with the cuvet opening;  
a spectrophotometer; a cuvet holder; an access panel having an opening for receipt of the variable pressure device; and a light shield, said variable pressure device extending through said opening, and said light shield substantially closing against light any gap between the variable pressure device and the sides of the opening.

4,420,255

# ADIABATIC BURNER FOR PREMIXED GASES

Mark A. DeWilde, Forest Hill, and Richard A. Beyer, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 16, 1981, Ser. No. 302,892

Int. Cl.<sup>3</sup> G01J 3/30; G01N 21/72

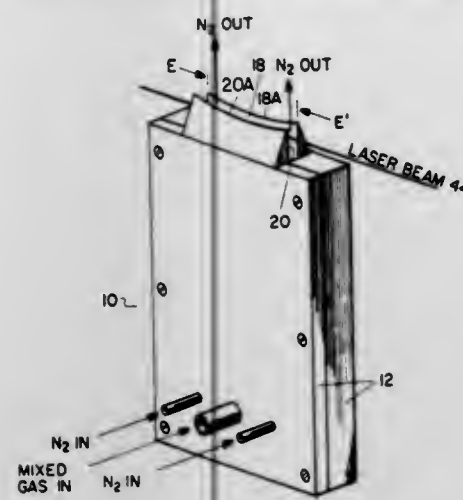
U.S. Cl. 356—315

5 Claims

1. A method for optically probing the precombustion and primary reaction zones of an essentially adiabatic flame of a combustible gas mixture, which comprises introducing a stream of said gas mixture into a burner channel having an outlet including a pair of essentially parallel and coextensive walls each terminating in a knife edge, passing said gases through said channel under relatively laminar flow conditions, flaming said gas mixture exiting said outlet, and passing an optical probe between said outlet walls with knife edges



through said precombustion or primary reaction zones of a flame of said combustible gas mixture, said knife edges provid-



ing a stable, essentially adiabatic flame where the combustible gas mixture exits said outlet.

4,420,256

## DUST MEASUREMENT

Gerdt Fladda, and Thorulf Pettersson, both of Täby, Sweden, assignors to Svenska Träforskningsinstitutet, Stockholm, Sweden

PCT No. PCT/SE80/00172, § 371 Date Feb. 12, 1981, § 102(e) Date Feb. 12, 1981, PCT Pub. No. WO80/02876, PCT Pub. Date Dec. 24, 1980

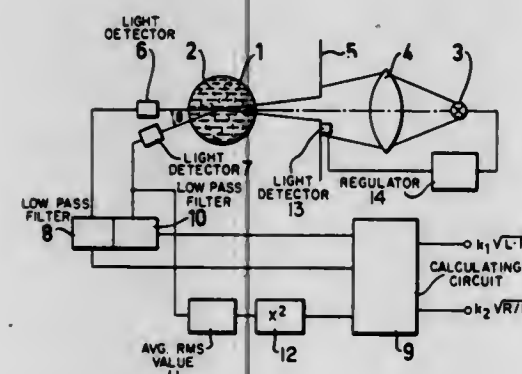
PCT Filed Jun. 13, 1980, Ser. No. 237,123

Claims priority, application Sweden, Jun. 15, 1979, 7905294

Int. Cl.<sup>3</sup> G01N 15/02

U.S. Cl. 356—336

10 Claims



1. Measuring apparatus for measuring the concentration of and/or average particle diameter of substantially spherical particles present in a flowing medium, comprising:

- a light source for illuminating the particles with a light beam having an axis in a direction different from the direction of flow of the medium;
- a first light detector, positioned along the axis of the light beam so as to receive light not scattered and not absorbed by the particles, for generating, responsive to the amount of light detected thereby, a first light detector signal having DC and AC components;
- a second light detector, positioned not along the axis of light beam so as to only receive light reflected by the particles, for generating, responsive to the amount of light detected thereby, a second light detector signal having DC and AC components;
- a first low pass filter, coupled to said second light detector, for filtering out the AC component of said second light detector signal and passing only the DC component thereof;
- RMS circuit means, coupled to one of said first and second light detectors, for generating a signal related to the aver-

age RMS value of the AC component of the light detector signal received therefrom;

squaring circuit means, coupled to the RMS circuit means, for generating a signal related to the square of the average RMS value of the AC component coupled to said RMS circuit means; and

a calculating circuit, coupled to said squaring circuit means and to said first low pass filter for (a) generating a first signal L representing a logarithmic function of the DC voltage component of the output voltage from the second detector proportional to the concentration of the particles and inversely proportional to the average radius of the particles, (b) generating a signal R representing a logarithmic function of said squared average RMS value proportional to both the average radius of the particles and to the concentration of the particles, (c) generating a first signal  $A = \sqrt{L \cdot R}$  proportional to the concentration and independent of the particle diameter when measuring the concentration, and (d) generating a second signal  $B = \sqrt{R/L}$  proportional to the diameter of the particles and independent of their concentration when measuring the average particle diameter.

4,420,257

## LASER LIGHT SCATTERING PHOTOMETER

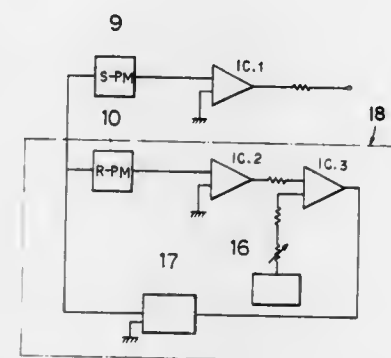
Mitsutoshi Fukuda; Nobuyuki Baba, and Kenji Arichika, all of Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Feb. 14, 1980, Ser. No. 121,314

Int. Cl.<sup>3</sup> G01N 21/00

U.S. Cl. 356—341

26 Claims



12. An apparatus for measuring the intensity of light scattered by a test fluid comprising: means for providing a light beam, measuring cell means having a chamber accommodating test fluid, said measuring cell means including a body of non-light reflecting material having a central chamber, an inlet pathway open to one side of the chamber, and an outlet pathway open to the other side of said chamber, said chamber and inlet and outlet pathways accommodating flowing test fluid, glass block means secured to opposite sides of the body, said chamber being aligned with the optical axis of the light beam whereby the light beam passes through the test fluid in said chamber as transmitted light and scattered light, means having an annular slit located adjacent the measuring cell means aligned to match the axis of the scattered light, first light detector means operable to monitor the intensity of scattered light passing through said annular slit, second light detector means operable to monitor the intensity of the transmitted light, and electronic circuit means connected to said first and second light detector means operable to use variations of the intensity of the transmitted light to compensate for fluctuations of the intensity of the scattered light, said circuit means having first means connected to the output of the second light detector means, reference voltage means connected to the first means, and power supply means connected to the output of the first means and the input of the first light detector means whereby variations of the scattered light are compensated by the varia-

tions of the transmitted light detected by the second light detector means.

4,420,258

## DUAL INPUT GYROSCOPE

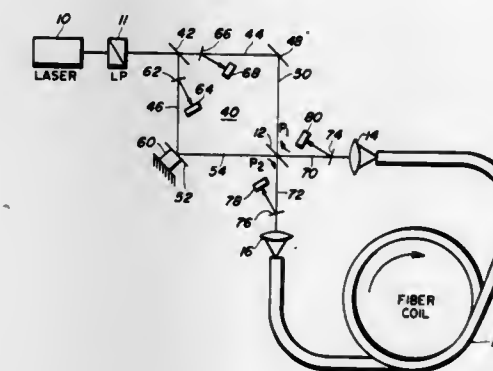
William K. Burns, and Scott C. Rashleigh, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1981, Ser. No. 314,298

Int. Cl.<sup>3</sup> G01C 19/64; G01B 9/02

U.S. Cl. 356—350

15 Claims



1. A Sagnac rotation measurement device designed to operate in a reciprocal mode for maximum sensitivity comprising: an interferometer including a 3 dB coupler with two input ports and two output ports and a light path circuit with a plurality of turns of optical path in or parallel to a given plane and with the ends of the circuit connected between said two output ports of said 3 dB coupler, means for applying different equal intensity light beams to each of said two input ports of said 3 dB coupler in appropriate phase relationship so that the light beams applied from each of said output ports into said light path circuit ends for counterpropagation therethrough have equal intensities; and means for extracting output light signals returning from said light path circuit having information regarding the rotation rate of said plane of said light path circuit from the input ports of said 3 dB coupler.

4,420,259

## DOUBLE COUPLED DUAL INPUT RATE SENSOR

Henry F. Taylor, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 23, 1981, Ser. No. 314,299

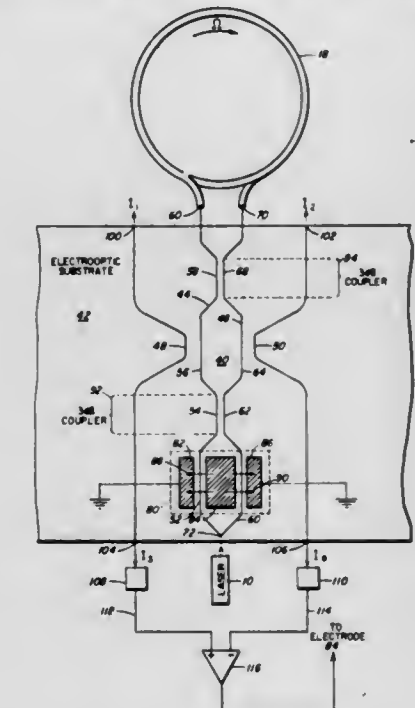
Int. Cl.<sup>3</sup> G01C 19/64; G01B 9/02

U.S. Cl. 356—350

8 Claims

1. A rotation measurement device comprising: a first optical path; a second optical path; means for directing equal intensity beams along said first and second optical paths, respectively; phase shifting means for generating a relative phase shift between the light beams propagating in said first and said second optical paths; a first 3 dB coupler disposed in said first and second optical paths for coupling the light beams propagating therein; a second 3 dB coupler disposed in said first and second optical paths following said first 3 dB coupler for coupling the light beams propagating therein; a light path circuit having a plurality of turns in or parallel to a given plane with one end thereof connected to said first optical path through said second 3 dB coupler and with the other end thereof connected to said second optical path through said second 3 dB coupler such that light beams will propagate in mutually opposite directions in said light path circuit; means disposed between said first and second 3 dB couplers for extracting a portion of the light signals propagating

back from said light path circuit through said first and second light paths; and means for comparing the intensities of said extracted light signals and generating a control voltage therefrom proportional to the difference in intensities thereof and applying this control voltage to control the phase shift gener-



ated by said phase shifting means in order to cause the difference in extracted intensities to go to zero; wherein this control voltage applied to said phase shifting means in order to force the difference in extracted intensities to go to zero is proportional to the rotation rate in said plane of said light circuit path.

4,420,260

## INTERFEROMETER TRANSMITTING THE USEFUL PHASE INFORMATION THROUGH OPTICAL FIBRES

Mario Martinelli, Suzzara, Italy, assignor to Cise - Centro Informazioni Studi Esperienze S.p.A., Milan, Italy

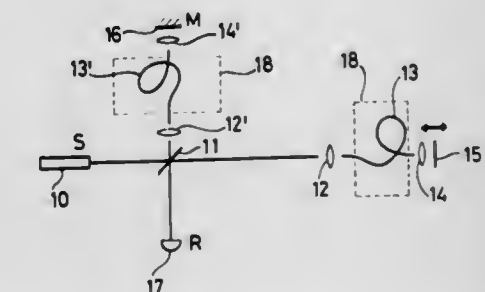
Filed May 4, 1982, Ser. No. 374,896

Claims priority, application Italy, May 6, 1981, 21529 A/81

Int. Cl.<sup>3</sup> G01B 9/02

U.S. Cl. 356—351

13 Claims



1. An optical-fibre interferometer with differential subtraction of the noise collected by the optical-fibre transmission line, characterized in that it comprises a laser-light emitter which sends a beam of polarized light to the input end of a single-mode optical fibre, at the output end whereof a first beam splitter is provided which directs the two resultant beams onto a reference mirror and onto a device which produces a reflection of the beam with modulation of the optical phase to be detected, respectively, the two reflected beams coming from the device and the reference mirror being fed back through said first splitter to said output end of the optical fibre to form a composite beam sent from said input end of the optical fibre to a detecting element.



4,420,261

**OPTICAL POSITION LOCATION APPARATUS**

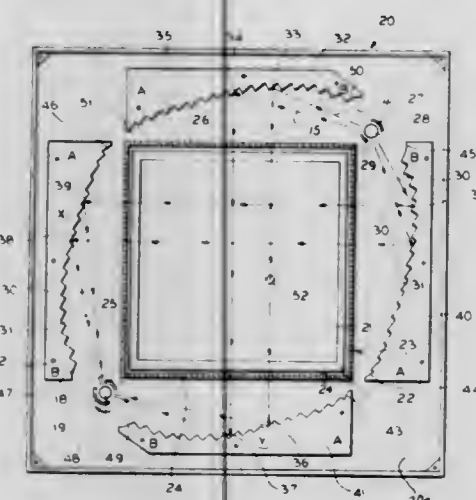
Gordon A. Barlow, Skokie; Timothy T. Tutt; Richard A. Karlin, both of Chicago, and John R. Krutsch, Glenview, all of Ill., assignors to Lowbar, Inc., Northbrook, Ill.

Filed Sep. 2, 1980, Ser. No. 183,357

Int. Cl.<sup>3</sup> G01B 11/14; G02B 27/17, 5/00

U.S. Cl. 356—375

25 Claims



1. An optical position location and size determining apparatus for locating the positions of one or more objects along one or more coordinate axes of a defined sensing area, as well as for determining other measurable parameters of said one or more objects such as the sizes thereof relative to said one or more coordinate axes, said apparatus comprising:

radiant energy emission means;  
radiant energy detection means;  
means for distributing said radiant energy emitted by said radiant energy emission means over a location region from a position proximate to a first side of said region;

one or more integrated collector means proximate to a second side of said location region, said integrated collector means cooperating with said distributor means to receive said radiant energy distributed by said distributor means and to transmit said radiant energy to said radiant energy detection means;

signal output means operably connected to said radiant energy detection means;

shield means, said shield means to prevent ambient or stray radiant energy not transmitted from said integrated collector means from impinging said radiant energy detection means;

scanner means;

said scanner means including optical element means, said optical element means operating to direct said radiant energy received from said integrated collector means to said radiant energy detection means;

said scanner means further including motor means, said motor means being operably connected to said optical element means whereby said optical element means is made to rotate with respect to said integrated collector means;

said scanner means further including apertured mask means, said apertured mask means having a dimensioned aperture therein;

said apertured mask means cooperating with said optical element means and located in optical alignment with said optical element means and said radiant energy detection means;

said shield means and said scanner means cooperating to restrict the radiant energy received by said radiant energy detection means to that portion of said distributed radiant energy received by the portion of said integrated collector means which is instantaneously in optical alignment with the combination of said rotating optical element means, said dimensioned aperture of said apertured mask means, and said radiant energy detection means, whereby the

radiant energy received by said integrated collector means may be sequentially and selectively monitored by said radiant energy detection means.

4,420,262

**APPARATUS FOR UTILIZING HAND-HELD POWER DRILL FOR SHAKING PAINT CONTAINERS AND THE LIKE**

John W. Sterrenberg, 8350 E. McKellips Rd. #146, Scottsdale, Ariz. 85257

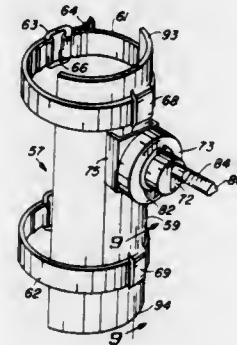
Continuation-in-part of Ser. No. 278,079, Jun. 29, 1981, abandoned, which is a division of Ser. No. 174,172, Jul. 31, 1980, Pat. No. 4,318,622. This application Jun. 14, 1982, Ser. No. 388,262

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> B01F 11/00

U.S. Cl. 366—110

17 Claims



1. An apparatus utilized in conjunction with a hand-held power drill for shaking a container of spray paint, the hand-held power drill including a rotatable chuck, the container of spray paint having a longitudinal axis and a cylindrical side wall, said apparatus comprising in combination:

a. a base member;

b. securing means for securing said base member to the cylindrical side wall of said spray paint container;

c. a first cylindrical driveshaft rotatably mounted to said base member for movement about a first axis of rotation extending substantially perpendicular to the longitudinal axis of said spray paint container, said first cylindrical driveshaft having a front face substantially perpendicular to said first axis of rotation at an end of said first cylindrical driveshaft furthest from said spray paint container;

d. a second generally cylindrical driveshaft extending outwardly from the front face of said first cylindrical driveshaft by a distance substantially commensurate with the length of the rotatable chuck of the hand-held power drill, said second generally cylindrical driveshaft having a diameter smaller than the diameter of said first cylindrical driveshaft, said second generally cylindrical driveshaft having a first end secured to said first cylindrical driveshaft and having a second end for being engaged by the rotatable chuck of the hand-held power drill, said second generally cylindrical driveshaft having a second axis of rotation extending substantially perpendicular to said front face of said first cylindrical driveshaft and substantially parallel to said first axis of rotation, said second axis of rotation being offset from said first axis of rotation for allowing a user to vibrate said base member and said spray paint container secured thereto by operating the hand-held power drill to rotate said second generally cylindrical driveshaft while holding said spray paint container loosely in one of the user's hands.

4,420,263

**ELECTRONIC WATCH WITH MEANS FOR DETECTING THE MOVEMENT OF A HAND THROUGH A REFERENCE POSITION**

Rene Besson, Neuchatel, and Alphonse Bron, Bassecourt, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

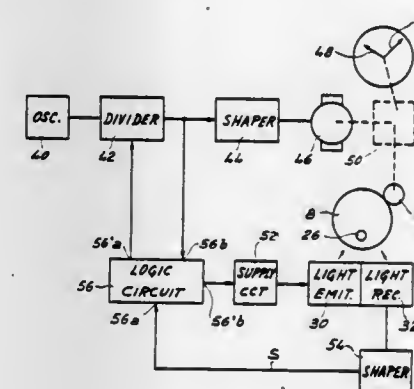
Filed Dec. 15, 1982, Ser. No. 450,140

Claims priority, application Switzerland, Dec. 23, 1981, 8243/81

Int. Cl.<sup>3</sup> G04C 3/00, 9/00; G04B 23/02

U.S. Cl. 368—80

7 Claims



1. An electronic watch comprising a frequency generator for supplying at least one periodic signal, stepping motor means controlled by said signal, at least one hand for displaying the time and performing p steps per revolution, a gear train for transmitting the movement of said motor means to said hand and means for detecting the movement of said hand through at least one reference position, comprising:

a movable detection member mounted pivotally about an axis and provided with a first optical device;

a movable drive member connected to said gear train and co-operating with said movable detection member in order successively to impart to said first optical device n separate angular positions per revolution of said movable detection member with  $P > n \geq 2$  and  $P = k \times n$ , k being an integer;

a second optical device which is fixed comprising at least means for emitting a light beam towards said movable detection member and light detecting means for receiving at least a part of said light beam only when said first optical means is in those of said n positions corresponding to said reference positions of said hand and for converting said light beam into an electrical signal; and

means for delivering a detection signal in response to said electrical signal.

4,420,264

**STRUCTURE FOR PREVENTING THE ROTATING OF A REGISTER RING OF A DIVER'S WATCH**

Toshio Murata, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1982, Ser. No. 416,562

Claims priority, application Japan, Sep. 18, 1981, 56-138533[U]; Jul. 9, 1982, 57-119588

Int. Cl.<sup>3</sup> G04B 19/20, 39/00; G05G 5/06; G09F 9/00

U.S. Cl. 368—223

7 Claims

1. A diver's watch comprising

a watch case;

an annular upright portion formed on said watch case and having a plurality of lock notches disposed at the peripheral portion thereof, each of said lock notches being in the form of an axially extending groove;

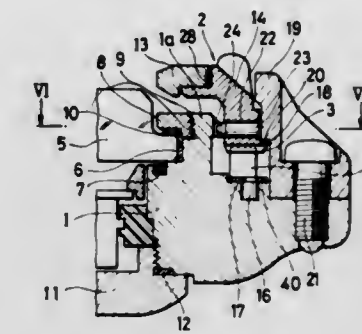
a register ring rotatably and axially, movably provided at the outside of said upright portion of said watch case and having a plurality of notches at the underside thereof, each of said notches being in the form of a radially extending groove;

at least three elastic click members secured to said watch case, one end of each of said click members engaging with

one of said notches and urging said register ring in the upward direction;

a holding ring disposed outside the register ring and secured to said watch case for holding said register ring;

a lock pin inwardly projected from said register ring and engaged with one of said lock notches; and



said lock notches and notches of said register ring corresponding with each other in the angular position of the register ring, wherein

said lock pin and lock notches are so arranged so that when said register ring is depressed against the elasticity of said click members, said lock pin disengages from the corresponding lock notch.

4,420,265

**INFRARED TEMPERATURE MONITORING APPARATUS HAVING MEANS FOR SKY RADIATION COMPENSATION**

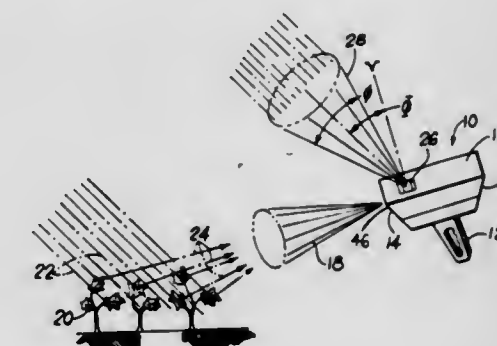
Charles E. Everest, 11662 Pincian Way, Santa Ana, Calif. 92705, and Graham K. Walker, 168 B Suffolk St. West, Guelph, Ontario, Canada (N1H 2J8)

Filed Jul. 31, 1981, Ser. No. 289,003

Int. Cl.<sup>3</sup> G01J 5/04, 5/06

U.S. Cl. 374—133

13 Claims



1. An improved apparatus for measuring the temperature of an object using a first detector in a portable instrument for detecting the infrared radiation emanating therefrom, the improvement comprising:

a second detector in said portable instrument for detecting secondary infrared radiation emanating from a source other than said object, said secondary radiation being reflected by said object into said first detector,

means for adjusting the relative output signals produced by said first and second detectors, respectively, for providing a correction signal for calibration of the reflection characteristics of said reflected secondary radiation of said object,

means for combining said relative output signals with a reference signal to produce a composite signal having said correction signal, which is indicative of the temperature of said object and compensates for the reflection by said object of said secondary radiation, and



means for displaying a temperature value corresponding to said composite signal.

4,420,266

# PIEZOELECTRIC PRINTER AND PIEZOELECTRIC MULTILAM ACTUATOR USED THEREIN

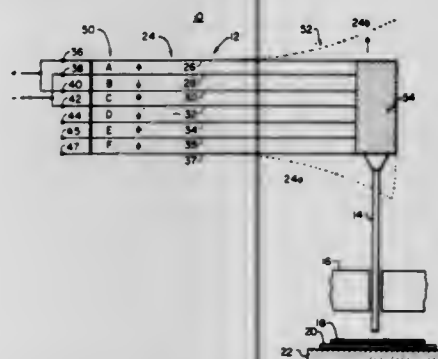
Henry H. Kolm, Wayland, and Eric A. Kolm, Brookline, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Division of Ser. No. 300,025, Sep. 8, 1981, Pat. No. 4,362,407. This application Aug. 23, 1982, Ser. No. 410,549

Int. Cl.<sup>3</sup> B41J 3/12

U.S. Cl. 400—124

7 Claims



1. A piezoelectric actuator comprising: a piezoelectric multilam including at least two piezoelectric members and having a mounting portion and an actuating portion; said actuating portion being movable in an actuating direction and a cocking direction; said multilam being tapered in its lateral dimension, being larger at the mounting portion and smaller at the actuating portion; a weight carried by said multilam for increasing the energy transfer of said multilam; means for applying a cocking voltage and an actuating voltage to said members which voltages are less than the rupture voltage in the poling direction and less than the depoling voltage in the depoling direction for cocking and actuating said multilam, the duration of said cocking voltage being approximately the period of the resonant frequency of said multilam.

4,420,267

# SERIAL PRINTER

Yasuhiko Iwane, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

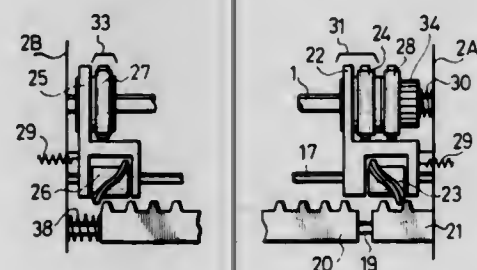
Filed Dec. 23, 1981, Ser. No. 333,770

Claims priority, application Japan, Dec. 25, 1980, 55-184676

Int. Cl.<sup>3</sup> B41J 1/50, 7/34

U.S. Cl. 400—149

13 Claims



1. A serial printer having a plurality of carriages carrying respective type wheels and each adapted to be shifted to desired positions along a line to be printed, comprising: (a) a first carriage adapted to be moved from a first reset position to various printing positions along a line to be printed, said first carriage rotatably carrying a first type wheel and rotatably carrying a first screw member having

a spiralling tooth formed over at least a portion of its circumference;

- (b) a second carriage adapted to be moved from a second reset position to various printing positions along a line to be printed, said second carriage rotatably carrying a second type wheel and rotatably carrying a second screw member having a spiralling tooth formed over at least one portion of its circumference;
- (c) means including a type wheel drive shaft for rotating said first and second type wheels;
- (d) means for rotatively driving said type wheel drive shaft;
- (e) means including a screw member drive shaft for rotating said first and second screw members;
- (f) means for rotatively driving said screw member drive shaft;
- (g) a hammer member having a striking surface having a length corresponding to the printing area of one line of printing;
- (h) means for driving said hammer member;
- (i) said hammer member being unable to strike said first type wheel when said first carriage takes said first reset position;
- (j) said hammer member being unable to strike said second type wheel when said second carriage takes said second reset position, said second reset position for said second carriage being located oppositely along the line to be printed from said first reset position for said first carriage; and
- (k) an elongated rack adapted to be moved between two positions each causing said rack to engage a respective one of said first and second screw members, and means for sliding said rack longitudinally between said two positions so that said screw members may selectively be made to engage with the teeth of said rack thereby to shift the associated carriage.

4,420,268

# PRINTING APPARATUS AND TAPE CLAMP THEREFOR

Yoshihiro Tsukamura, Kawasaki; Hidekuni Aizawa, Yokohama, and Keiichi Ohta, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

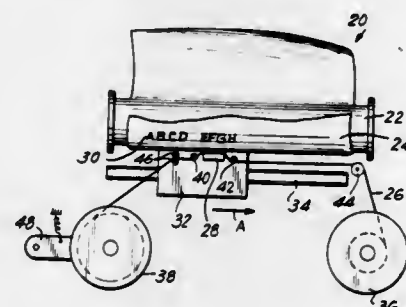
Filed Dec. 11, 1981, Ser. No. 329,701

Claims priority, application Japan, Dec. 11, 1980, 55-178143[U]

Int. Cl.<sup>3</sup> B41J 33/14

U.S. Cl. 400—233

7 Claims



1. Apparatus for producing visual information on recording paper in response to an information signal, comprising: platen means associated with said recording paper; recording head means adapted to move in a first direction relative to said paper during a recording operation for transferring a pigment from a tape positioned between said recording head means and said paper so as to record said visual information on said paper and adapted to move in a second direction relative to said paper during a return operation; carriage means adapted to move with said recording head means in said first and second directions; first tape clamp means for clamping said tape to said carriage means during movement of said recording head means in said second direction to withdraw an unused portion of

tape after said recording head means completes a recording operation with respect to said paper and including first lever means pivotally mounted to said carriage means, first restraining means secured to said carriage means, and first biasing means for biasing said first lever means toward said first restraining means to clamp said tape therebetween; and

second tape clamp means for clamping said tape to the apparatus during movement of said recording head means in said first direction to prevent movement of said tape during said recording operation and including second lever means pivotally mounted to said apparatus, second restraining means secured to said apparatus, and second biasing means for biasing said second lever means in said first direction toward said second restraining means to clamp said tape therebetween with a force which increases with an increasing force tending to pull the tape in the first direction.

4,420,269

# DEVICE FOR LIFTING THE PRINTING HEAD OFF THE PLATEN

Rolf Ackermann, Nuremberg; Friedrich Jung, Erlangen; Egon Mauer, Furth, and Hermann Rupertinger, Oberasbach, all of Fed. Rep. of Germany, assignors to Triumph-Adler A.G. fur Büro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

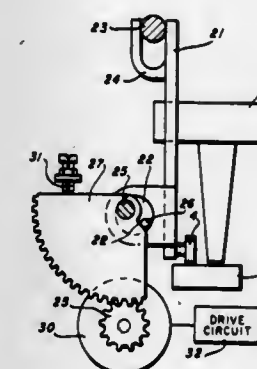
Filed Feb. 11, 1982, Ser. No. 348,090

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112079

Int. Cl.<sup>3</sup> B41J 11/20

U.S. Cl. 400—356

1 Claim



1. In a printer having a platen, a pair of frame supported guide rods extending parallel to said platen, and a carriage supporting a printing element, means mounting said carriage on said guide rods for movement along said platen and for movement transverse to said platen, one of said guide rods being eccentrically rotatably supported whereby rotation thereof will move said carriage away from engagement with said platen, means on said carriage normally engaging said platen to establish a normal distance between said printing element and said platen, a bidirectional stepper motor, drive circuitry for energizing said motor to effect movement of said carriage away from and back into engagement with said platen to facilitate paper movement between said printing element and said platen during the time said carriage is away from engagement with said platen, means driven by said motor for moving said carriage to a first position away from engagement with said platen and to a second position further away from engagement with said platen when said motor is energized in response to a line feed signal and to a paper insertion signal, respectively, said means driven by said motor for moving said carriage comprising,

a gear segment rotatably mounted on the rotational support of said eccentrically supported guide rod, a pinion gear on said motor for driving said gear segment, a drive surface on said gear segment, and an eccentric pin extending axially from the end of said eccentrically supported guide rod in the path of said drive surface to be driven thereby and to thereby rotate said eccentrically supported guide rod.

4,420,270

# VISUAL DISPLAY PRESENTATION BOX

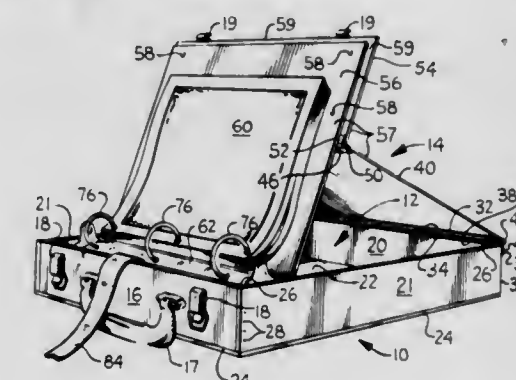
Henry S. Rossello, Mission Viejo, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 24, 1982, Ser. No. 423,294

Int. Cl.<sup>3</sup> A45C 3/02

U.S. Cl. 402—76

8 Claims



1. A portfolio for housing, carrying, and displaying visual presentation materials including: a rear wall portion; and a lid portion, said lid portion having: a forward lid section; an aft lid section; first hinge means attaching said aft lid section to said rear wall portion; second hinge means attaching said forward lid section to said aft lid section; a display plate attached to said forward lid section; means for attaching the visual presentation material to said display plate; and a bottom portion connected to said rear wall portion, said aft lid section having a closed position generally parallel to said bottom portion and an open position at a first predetermined angle to said bottom portion, said forward lid section having a closed position generally parallel to said bottom portion and an open position at a second predetermined angle to said bottom portion greater than said first predetermined angle, said display plate being attached to, and parallel to, said forward lid section and including: a first edge positioned to be supported on said bottom portion when said forward lid section with said attached display plate are in the open position, said display plate forming a third predetermined angle with said bottom portion.

4,420,271

# CENTERLINE-ATTACHED LOOSELEAF NOTEBOOK PAGE LIFTER

Ray F. Zablinski, P.O. Box 92, Roaring Springs, Tex. 79256

Continuation-in-part of Ser. No. 195,758, Oct. 10, 1980, Pat. No. 4,373,825. This application Sep. 14, 1982, Ser. No. 417,887

The portion of the term of this patent subsequent to Feb. 15,

2000, has been disclaimed.

Int. Cl.<sup>3</sup> B24F 13/00

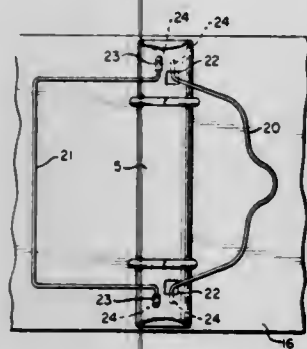
U.S. Cl. 402—80 L

10 Claims

1. A page lifting device for use with a looseleaf binder having front and back covers, binding rings and a ring base cover which comprises at least one pair of stiff wire loops rotatably



mounted on the top of the ring base cover by a hinge means at or contiguous with the centerline of said ring base cover, said loops being mounted perpendicular to and surrounding at least one of the binding rings and being of sufficient height to freely pass over the binding rings; whereby on closing the looseleaf binder the outermost parts of said loops encounter the inside surfaces of the looseleaf binder's front and back covers, forcing said loops toward the center of said binder and thus forcing the sides of said loops to encounter the bottom edges of any pages contained in said binder, thereby forcing said pages to rise on the binding rings away from the ring base cover toward the uppermost part of said binding rings preventing the pages from being caught between the binding rings and the inside surfaces



of the looseleaf binder's front and back covers; wherein the hinge means by which the stiff wire loops are attached to the top of the ring base cover comprises the ring base cover having at least two raised sections formed in the surface thereof, at least one end face of each raised section having a means for receiving the end of at least one of said pair of stiff wire loops, and each of said pair of stiff wire loops having their ends angled to lie parallel to the ring base cover; the raised sections in ring base cover and the means for receiving the end of at least one stiff wire loop being located and being of sufficient size to allow the angled ends of the stiff wire loops to be placed therein, rotatably attaching the stiff wire loops to the ring base cover.

4,420,272

# METHOD AND STRUCTURE FOR BEARING THE ECCENTRICITY OF A BUSHING BORE

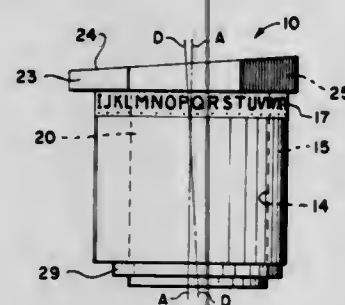
William E. Ingalls, Longmont, and Thomas W. O'Rourke, Boulder, both of Colo.

Filed Sep. 27, 1982, Ser. No. 423,894

Int. Cl.<sup>3</sup> F16D 1/00

U.S. Cl. 403—4

11 Claims



1. A bushing assembly having an infinitely variable eccentricity within a given range, the bushing assembly comprising: an outer body member having an outer body surface defined around a first axis, and an inner bore defined therethrough around a second axis eccentric to the first axis; and an inner sleeve member having an outer surface complementary in shape to the outer body member inner bore and defined around a third axis, and having an inner bore defined therethrough around a fourth axis eccentric to the third axis, the inner sleeve member being rotatably positioned within the bore of the outer body member, and at least one pair of

the outer body pair of axis and inner sleeve pair of axis being in a skewed relationship;

whereby the eccentricity of the inner sleeve member bore relative to the outer body member outer surface may be varied by rotating the inner sleeve member within the outer body member.

4,420,273

# COUPLING DEVICE FOR THE PLAY-FREE CONNECTION OF A PRECISION POTENTIOMETER WITH A MOVABLE MACHINE PART

Fritz Blessing, Ostfildern; Gabor Margitics, Esslingen, and Gerhard Brauer, Geltendorf, all of Fed. Rep. of Germany, assignors to Firma Novotechnik KG Offterdinger GmbH & Co., Ostfildern, Fed. Rep. of Germany

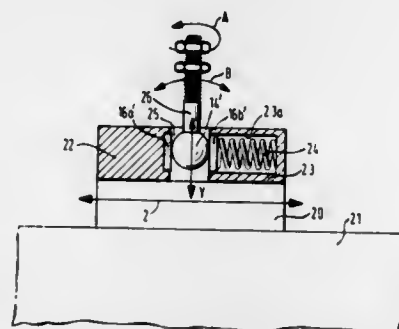
Filed Nov. 4, 1981, Ser. No. 318,111

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041639; Oct. 21, 1981, 3141655

Int. Cl.<sup>3</sup> F16D 1/00, 3/00

U.S. Cl. 403—24

9 Claims



1. A coupling device for coupling a movable member of a machine to a movable member of a potentiometer to convert sliding movement of the movable member into proportional movement of the potentiometer comprising:

- a ball-shaped glide adapted to be attached to one of said movable members;
- a planar abutment engaging said glide and adapted to be attached to said other movable member, and
- a biasing spring means for applying pressure, in a working direction, to said glide piece to maintain said glide piece and said planar abutment in intimate contact with one another, thereby forming a joint connection for the transmission of only translational movement.

4,420,274

# ELASTIC ARTICULATION, COUPLING OR THE LIKE

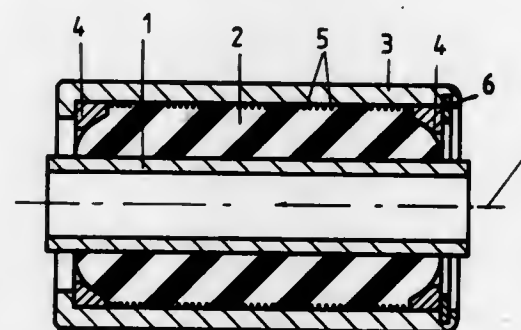
Bruno Hüsch, Bad Neuenahr-Ahrweiler, Fed. Rep. of Germany, assignor to Boge GmbH, Eitorf, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,724

Int. Cl.<sup>3</sup> F16B 1/00

U.S. Cl. 403—227

12 Claims



1. An elastic articulated coupling comprising a relatively rigid inner member having a longitudinal axis, a relatively rigid outer member having a generally cylindrical interior surrounding said inner member with substantial clearance, an elastomeric

4,420,276

# BEARING ASSEMBLY FOR A TETHERED BUOYANT PLATFORM

Roy G. Roberts, Harrow, England, assignor to The British Petroleum Company Limited, London, England

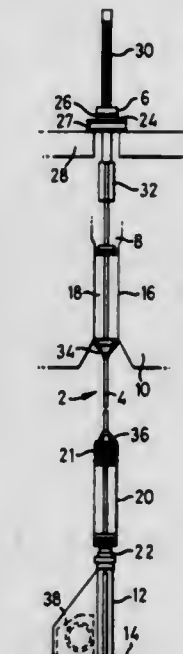
Filed Apr. 28, 1981, Ser. No. 258,533

Claims priority, application United Kingdom, Apr. 24, 1980, 80/13564

Int. Cl.<sup>3</sup> E02D 5/54; B63B 21/50

U.S. Cl. 405—224

8 Claims



1. A tether assembly for a tethered buoyant platform, suitable for installation in a shaft of a leg of the tethered buoyant platform, comprising a cable tether having a terminal at the end thereof for connecting to a corresponding member on the sea bed and having located at a position along its length (a) a bearing to contact the sides of the shaft to transmit lateral forces from the tether to the shaft of the tethered buoyant platform and (b) a bending guide, the bearing and the bending guide being provided by a member of generally cylindrical form adapted to be a sliding fit in the shaft of the leg and having an aperture extending lengthwise therethrough, the wall of the lower end of the aperture having a curved surface to control the bending radius of the tether.

4,420,277

# MINE ROOF DRILLER-BOLTER APPARATUS AND METHOD

George A. Hibbard, Ward D. Morrison, and Ralph C. Lumbr, all of Claremont, N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Sep. 18, 1981, Ser. No. 303,328

Int. Cl.<sup>3</sup> E21D 20/02

U.S. Cl. 405—260

41 Claims

29. A method of bolting the roof of an underground mine, comprising the steps of: stinging a housing against the roof of the underground mine, moving a peripheral end of a drill centralizer into communication with the roof, moving a drill rod with a drill bit attached to the end thereof, through a central bore of the drill centralizer and into the roof, retracting the drill rod such that the drill bit is at a position rearward of a passageway communicating with the central bore of the centralizer, without retracting the drill centralizer from communication with the roof, delivering a container of roof bolt anchoring media through the passageway and through the centralizer and into the drilled hole, retracting the drill centralizer and moving the housing such

4,420,275

# ALASKAN OFFSHORE DRILLING BASE

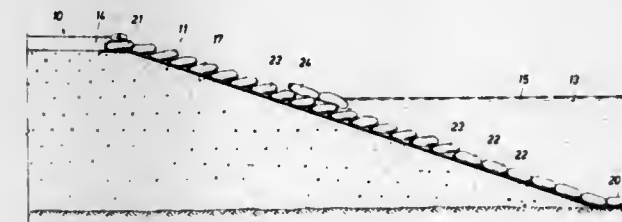
John R. Ruser, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 19, 1982, Ser. No. 369,715

Int. Cl.<sup>3</sup> E02B 17/00, 3/12

U.S. Cl. 405—217

1 Claim



1. An offshore man-made island of a size to drill oil or gas wells therefrom, said island, when taken in vertical cross section, being in the form of a truncated cone having a base at least four times as great as its height, at least the sloping outer surfaces of the island being made of sand and gravel of a size that is subject to erosion by wave action, said island comprising:

- a protective erosion-combating covering on the sloping sides of the island in the form of a porous flexible sheet through which water can pass in either direction with minimal disturbance to the sand and gravel forming the island;
- said covering extending from the bottom of the island on the ocean floor upwardly along the sides of the island to a level at least equal to that of maximum high tide, said covering comprising a plurality of lengths of flexible sheet material positioned on the sloping sides of the island and extending radially outwardly and downwardly from the top to the bottom of said island;
- anchoring means in the form of partially flexible bags of sand and gravel arranged in a pattern to cover the flexible island covering from the ocean floor to a level at least equal to that of maximum high tide;
- each of said bags having sides longer than the width of its bottom, said bags being arranged on their sides in rows on the slope of the island with the long dimension of the bags running up the side of the island; and
- the bags located between the high and low water levels on the island arranged in an imbricated manner with the downslope end of each bag overlapping and anchoring the upslope end of the adjacent bag lying downhill thereof by extending from 20 to 60 percent of the length of the bags over the adjacent downhill bags.



that the drill rod is moved out of alignment with the drilled hole as a roof bolt is moved substantially simultaneously into alignment with the drilled hole, said roof bolt having the bolt head in a sleeve and the end of the bolt opposite the bolt head loosely disposed through an aperture in a bolt plate, said bolt and plate provided in a bolt plate centralizer by moving the loosely disposed

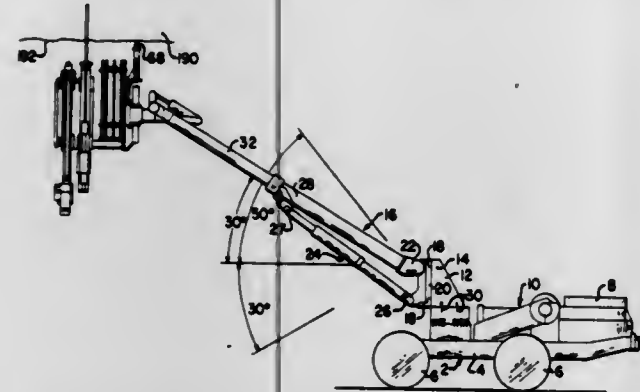


plate toward an opening in a generally planar bar of a bolt plate centralizer having wall segments extending outwardly and upwardly of the base, such that the plate passes over the wall segments adjacent the opening and impacts consecutively against the wall segments opposite the opening, driving the roof bolt into the drilled hole, and setting the anchoring media around the roof hole.

4,420,278

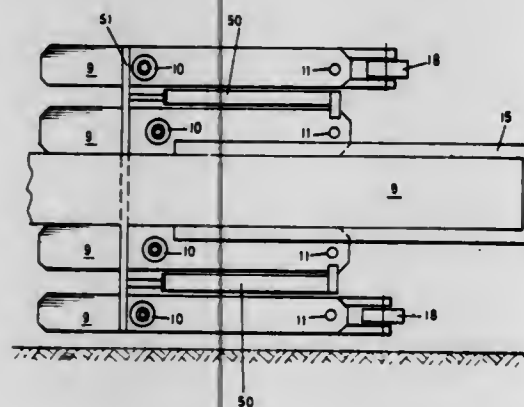
## HEADING SHIELD

Andrew J. Walker, Tewkesbury, England, and John C. Watt, Johannesburg, South Africa, assignors to Dowty (South Africa) (Proprietary) Limited, South Africa  
Filed Feb. 17, 1981, Ser. No. 234,745  
Claims priority, application South Africa, Feb. 29, 1980, 80/1171; Aug. 8, 1980, 80/4838

Int. Cl.<sup>3</sup> E21D 23/00; E21C 29/00

U.S. Cl. 405—301

12 Claims



1. A mobile mine conveying and support apparatus for protecting a separate continuous mining machine and collecting material mined by said machine, said apparatus comprising:

- (a) a first portable mine roof support means, said means having:
  - (i) at least two longitudinal roof beams generally parallel to one another to engage the mine roof,
  - (ii) at least two longitudinal base support means mounted below said roof support beams to engage the mine floor,
  - (iii) at least two hydraulic pistons mounted therebetween for intermittently urging said roof beams into engagement with a mine roof,
- (b) a second portable mine roof support means, said means having:
  - (i) at least two longitudinal roof beams generally parallel

- to one another to engage the mine roof adjacent the roof beams of said first support beams,
  - (ii) at least two longitudinal base support means mounted below said roof support means to engage the mine floor adjacent the longitudinal base support means of the first support means,
  - (iii) at least two hydraulic pistons for intermittently urging said roof beams into engagement with said roof when said roof is not supported by said first support means,
  - (c) the innermost longitudinal base support means of said first and second support means defining therebetween an operating space for a continuous mining machine;
  - (d) hydraulic advancing means for linking said first and second portable roof support means to advance each of said support means when its respective roof beams are withdrawn from engagement with said mine roof;
  - (e) conveyor means mounted between the inner most longitudinal base support means of said first and second mine roof support means for collecting and conveying material mined by said continuous mining machine;
- whereby said portable roof support means is advanced intermittently forward by said hydraulic advancing means to protect an operator of a separate continuous mining machine that is advanced forward in a continuous manner.

4,420,279

## PRESSURE IMPULSE DENSE PHASE CONVEYING APPARATUS AND METHOD

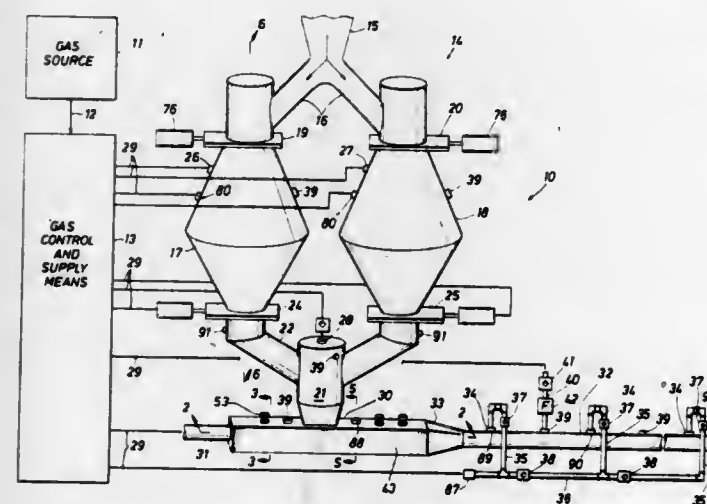
Othel D. Easley, Jr., Houston, Tex., assignor to Reactor Services International, Inc., Alvin, Tex.

Filed Feb. 22, 1982, Ser. No. 351,196

Int. Cl.<sup>3</sup> B65G 53/66

U.S. Cl. 406—14

24 Claims



1. A fluid material slug conveying apparatus comprising:
- (i) a source of motive fluid;
  - (ii) a motive fluid controlling and supplying means connected to the motive fluid source for supplying motive fluid at required pressures, quantities, positions and times;
  - (iii) a fluid material supply means for supplying a continuous source of fluid material to be conveyed by the motive fluid;
  - (iv) a slug forming and loading means for forming and loading slugs of fluid material comprising a slug forming and loading housing having a slug forming and loading motive fluid inlet at its upstream end, said slug forming and loading motive fluid inlet attached to and supplied by the motive fluid controlling and supplying means, the housing having a slug forming and loading venturi therein downstream of the slug forming and loading motive fluid inlet, the slug forming and loading venturi having a fluid material opening in the throat of the venturi, said fluid material opening being connected to and allowing open communication between the fluid material supply means and the throat section of the slug forming and loading venturi, a flutter valve comprising a piece of flexible material at-

- tached at one end to the inside of the housing, upstream of the fluid material opening, of a length and a width such that when extended downstream and pressed against the fluid material opening it essentially covers said fluid material opening;
- (v) a conveying tube having its upstream end attached to and in open communication with the downstream end of the slug forming and loading housing and having its downstream end in communication with and directed to the fluid material slug's destination.

4,420,280

## TOOL BLOCK

Manfred Gustafson, Fagersta, Sweden, assignor to Seco Tools Aktiebolag, Fagersta, Sweden

PCT No. PCT/SE81/00094, § 371 Date Aug. 11, 1981, § 102(e) Date Aug. 11, 1981, PCT Pub. No. WO81/03635, PCT Pub. Date Dec. 24, 1981

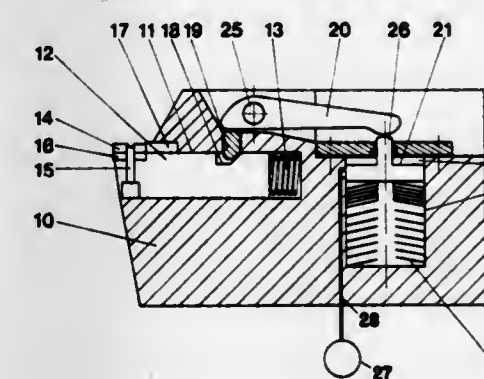
PCT Filed Mar. 27, 1981, Ser. No. 293,216

Claims priority, application Sweden, Apr. 3, 1980, 8002581

Int. Cl.<sup>3</sup> B26D 1/00

U.S. Cl. 407—109

10 Claims



1. In combination:
- a tool block having a stop surface,
  - a cutting insert holder movable on said tool block between clamping and non-clamping positions, said holder including means for mounting a cutting insert such that the insert is clamped against said stop surface when said tool holder is in said clamping position, and
  - holder moving means for moving said insert holder into said clamping position and comprising:
    - a lever having first and second portions and being rotatably mounted on said tool block intermediate said first and second portions,
    - holder-engaging means at said first portion of said lever for engaging said holder and moving said holder to said clamping position in response to rotation of said lever in a first direction,
    - biasing means arranged on said tool block for forcefully engaging said second portion of said lever to rotate said lever in said first direction so that said holder-engaging means moves said holder to said clamping position, and
    - retracting means for retracting said biasing means to enable said lever to be rotated in a second direction opposite said first direction such that said holder is movable to said non-clamping position.

4,420,281

## FAIL-SAFE MECHANISM

Robert E. Dehoff, Mt. Joy, Pa., assignor to AMP, Incorporated, Harrisburg, Pa.

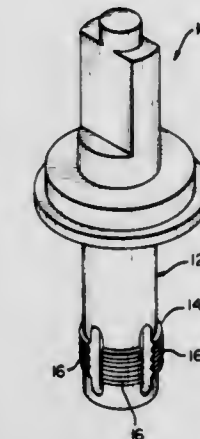
Filed Oct. 5, 1981, Ser. No. 308,766

Int. Cl.<sup>3</sup> F16B 35/02

U.S. Cl. 411—392

1 Claim

1. An improvement to a threaded member capable of preventing damage to the threaded member by excessive rotational forces being applied thereto when the member is being advanced in a complementary threaded female member, said



portion, said threaded segments and axial slots terminating above the free end, so that when the shank, under continual rotational force, becomes immobile, said segments are capable of recoverably collapsing inwardly whereupon the threads thereon become momentarily disengaged from the threads in the complementary member and the position of the shank relative to the complementary member shifts to permit the shank to be turned again whereupon the segments again recoverably collapse.

4,420,282

## METHOD FOR BINDING BOOKS

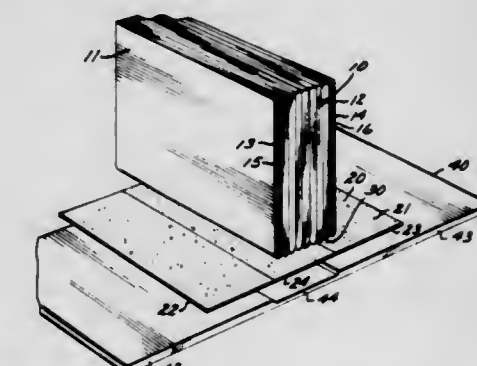
Herbert R. Axelrod, Deai, N.J., assignor to Permabek, Inc., Las Vegas, Nev.

Filed Apr. 30, 1980, Ser. No. 145,018

Int. Cl.<sup>3</sup> B42C 9/00, 19/04

U.S. Cl. 412—4

20 Claims



1. A method for binding books comprising the steps:
- assembling a plurality of pages into a stack having front and rear outer pages with one edge of the stack forming a spine and each page having height and width dimensions,
  - coating said spine with a flowable heat-activated glue, providing a reinforcing short cover having inside and outside surfaces, the short cover defining a central portion to overlie said spine and side portions to at least partially overlie said outer pages,
  - coating the inside surface of said central and side portions of said short cover with a heat-activatable glue,
  - pressing said glue-coated spine against said heat-activatable glue-coated central portion of said short cover and heating and activating the glue on said central portion for adhering said central portion to said spine,



folding said side portions of the short cover to at least partially overlaid said outer pages, pressing each side portion of the short cover against an adjacent outer page and applying heat thereto, thereby activating said glue on said side portions and adhering them to said outer pages respectively.

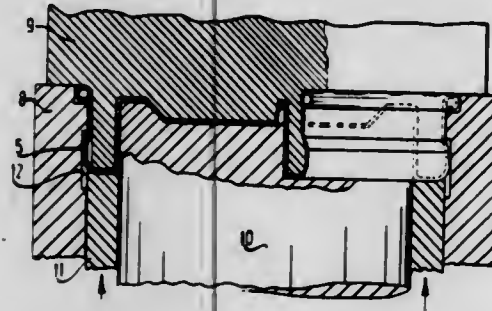
4,420,283

**METHOD OF FORMING AN OUTWARDLY INVERTED PERIPHERAL EDGE ON A PREFORMED METAL LID**  
Willem P. Post, Diepenveen, Netherlands, assignor to Thomassen & Drijver-Verblifa N.V., Deventer, Netherlands  
Filed Sep. 23, 1981, Ser. No. 304,646

Claims priority, application Netherlands, Sep. 29, 1980, 8005402

Int. Cl.<sup>3</sup> B21D 51/26

U.S. Cl. 413-8



1. The method of forming a metal lid to close, circular tolerances, which comprises the steps of:

- forming a metal lid having an outer annular wall portion which is concentric with an axis which is perpendicular to the general plane of the lid, having an inner annular wall portion spaced radially inwardly from and parallel to said outer wall portion, having a U-shaped portion joining said wall portions at one end thereof, and having a central disc-like portion bridging across the other end of said inner wall portion;
- closely confining the metal lid of step (a) within a die assembly to preserve the concentricity of said wall portions and their parallelism and to provide clearance spaces only in a region circumferentially surrounding a portion of said outer wall portion at its juncture with said U-shaped portion and in a region between said wall portions opposite said U-shaped portions and, while the metal lid is so confined;
- permanently deforming said U-shaped portion to close said clearance opposite thereto and to bulge and permanently deform said portion of the outer wall portion into said circumferentially surrounding clearance therefor; and then
- removing the so-deformed metal lid without further deformation to recover a finished metal lid having the circularity of the lid as formed in step (a).

4,420,284

**DEVICE FOR THE FEEDING OF MATERIAL BARS FOR PROCESSING MACHINES**

Hans Eisinger, Kopernikusstrasse 40, D-8900 Augsburg 21, Fed. Rep. of Germany, and Quido Kraus, Hirblingen, Fed. Rep. of Germany, assignors to Hans Eisinger, Augsburg, Fed. Rep. of Germany

Filed May 22, 1979, Ser. No. 41,381

Claims priority, application Fed. Rep. of Germany, May 24, 1978, 2822569

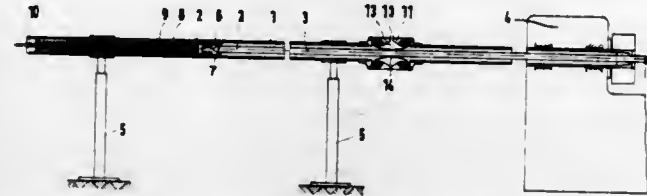
Int. Cl.<sup>3</sup> B22Q 5/22

U.S. Cl. 414-17

9 Claims

1. A device for feeding bars of material to processing machines, comprising a tube in which a bar of material can be axially advanced in the direction of the processing machine, a piston guided in the tube over a substantial length thereof for

applying axial pressure against the bar of material, a bellows, adapted to be loaded by a pressurizing medium, located behind the piston for applying pressure to the piston, the piston being hollow and the loading bellows being located within it when collapsed, pressure valve means for controlling the pressure of the pressurizing medium applied to the bellows for controlling



the feeding force of the piston acting on the bar material, a tubular diaphragm, loaded by the pressurizing medium, located in the tube and supported in a rotatable manner, whereby the bar of material can be centered, the inside diameter of the diaphragm which is not loaded by the pressurizing medium being equal to or greater than the inside diameter of the tube.

4,420,285

**APPARATUS FOR LOADING BULK MATERIALS FROM A STORAGE BIN INTO A TRUCK**

Georges Loyer, Viviers; Jean Bonnet, Carry-le-Rouet, and Roger Lazzarini, Marseille, all of France, assignors to La-Farge Conseils et Etudes, Paris, France

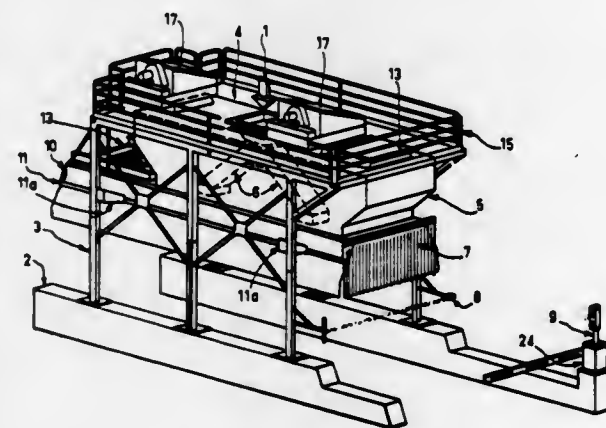
Filed Dec. 31, 1981, Ser. No. 336,303

Claims priority, application France, Jan. 5, 1981, 81 00056

Int. Cl.<sup>3</sup> B65G 67/06

U.S. Cl. 414-291

4 Claims



1. Apparatus for loading bulk materials from a storage unit into the body of a truck, said apparatus comprising a fluidtight ceiling supporting a hood, the lower part of said hood being higher than the maximum higher of trucks to be loaded, the width and length of said hood being at least that of bodies of trucks to be loaded, said hood accommodating a chute for discharging bulk materials into the truck body to be loaded, means connected to said hood for exhausting air from under said roof, flexible movable wall means downwardly extending from walls of said hood and cooperable with sides or edges of the truck body to be loaded, said flexible movable wall means defining an enclosure, at least three said movable walls means being horizontally displaceable toward corresponding lateral and transverse sides of the truck body to be loaded, said means for exhausting air being powerful enough to urge said movable wall means into substantially fluidtight contact at corners of said enclosure against sides or edges of the truck body to be loaded.

4,420,286

INVALID LIFT APPARATUS

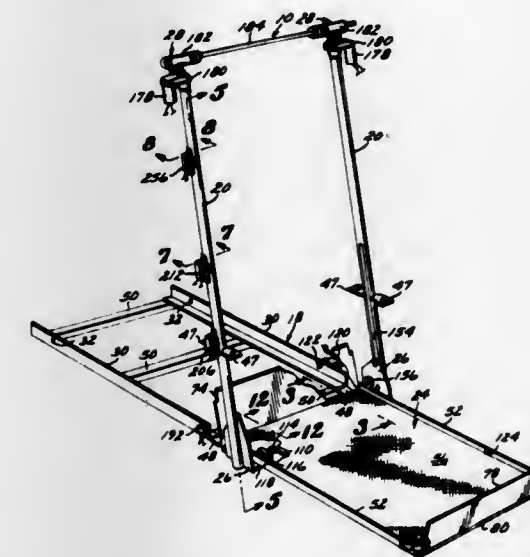
James M. Hanson, Garden Grove, and Robert Schlichting, Cerritos, both of Calif., assignors to Wide One Corporation, Anaheim, Calif.

Filed Mar. 27, 1981, Ser. No. 248,250

Int. Cl.<sup>3</sup> B60P 1/44

U.S. Cl. 414-539

11 Claims



1. Invalid lift apparatus in combination with a passenger vehicle having a loading floor, and a door opening adjoining said loading floor, said apparatus comprising:

- storage receptacle means located below said loading floor; a generally horizontally oriented platform receivable within and supported by said receptacle means in an inner position wherein said platform projects outwardly of said loading floor and defines a step located inwardly of said door opening for ambulatory persons to step up to and down from said loading floor, said platform being movable outwardly of said doorway, into an outer position and out of engagement with said receptacle means, for subsequent lowering into a lower position wherein a wheelchair can be rolled onto or off said platform, and wherein said platform defines a step extending outwardly of said door opening for ambulatory persons to step up to or down from said loading floor when there is no wheelchair on said platform;

a pair of elongated, generally vertically oriented fixed support means attached to said structure on opposite sides of said door opening, respectively, and extending upwardly above the top of said door opening;

a pair of movable support means carried by said fixed support means, respectively, for vertical movement relative to said fixed support means, and including a pair of support bracket means for engaging and supporting said platform in said outer position;

a pair of actuator means carried by the upper extremities of said pair of fixed support means and mechanically coupled to the upper extremities of said pair of movable support means, respectively, and each operative to develop a torque to effect said vertical movement of the associated one of said pair of movable support means for raising and lowering said platform between said lower position and an upper position level with said loading floor for transferring a wheelchair between said platform and said loading floor; and

coupling means including a shaft connected to said pair of actuator means, and operative to mechanically transmit said torque developed by each of said pair of actuator means to the other of said pair of actuator means to thereby equalize the vertical movements of said pair of movable support means, said shaft extending transversely above the top of said doorway.

4,420,287

GRIPPER FEED AND GRIPPER RESILIENCE

CYLINDERS ON FORGING MANIPULATORS  
Erwin Kost, Meerbusch, and Werner Foltz, Mettmann, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

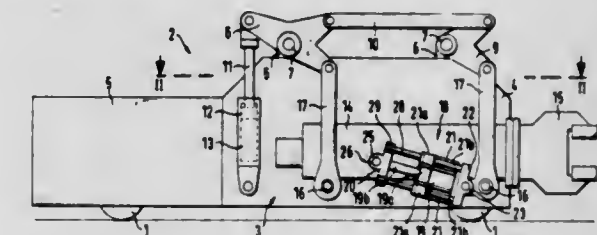
Filed May 5, 1981, Ser. No. 260,770

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019971

U.S. Cl. 414-729

Int. Cl.<sup>3</sup> B21J 13/10

6 Claims



1. In a forging manipulator including a manipulator truck, a gripper support, a front suspension link and a rear suspension link which pivotally support the gripper support for relative longitudinal movement on the truck, and hydraulic cylinder means mounted to act between the truck and the gripper support for providing cushioning for longitudinal relative movement of said gripper support with respect to said truck, the improvement wherein the hydraulic cylinder means comprises a double acting movable assembly of three parallel spaced cylinders to form said assembly with a separate and independent middle cylinder and two separate and independent outer cylinders, respective pistons slidable in said cylinders, and respective separate and independent piston rods connected to said pistons, means to interconnect the piston rods of said two outer cylinders, means to pivotally connect said interconnecting means to one of the truck and the gripper support, and means to connect the piston rod of said middle cylinder pivotally to the other of the truck and the gripper support, so that when said middle piston and cylinder are operated during forward motion of the manipulator into forging position to produce a relative stroke of the middle piston and piston rod with respect to said middle cylinder, said outer interconnected piston rods and pistons are hydraulically biased in their retracted position to prevent relative motion between them and said respective outer cylinders, and when said outer piston rods and pistons are operated to produce relative motion thereof with respect to their outer cylinders toward their fully extended position, said middle piston is hydraulically biased in its fully extended position.

4,420,288

**DEVICE FOR THE REDUCTION OF SECONDARY LOSSES IN A BLADED FLOW DUCT**

Hans Bischoff, Gröbenzell, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 275,037

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023466

Int. Cl.<sup>3</sup> F01D 9/00

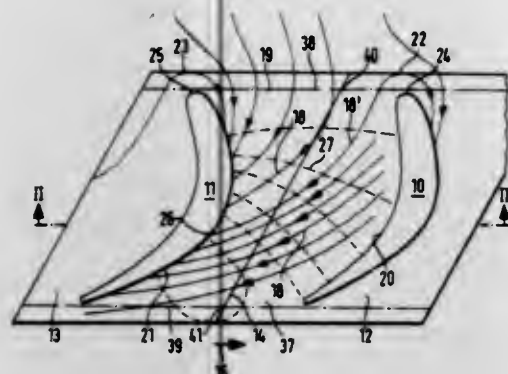
U.S. Cl. 416-244 A

5 Claims

1. An arrangement for the reduction of secondary flow losses in a bladed flow duct of a turbomachine having a plurality of turbine blades arranged circumferentially therearound along a circumferential direction, with each turbine blade being mounted upon a separate platform, and each turbine blade having opposite convex and concave sides, with the concave side defining a pressure side of the blade and the convex side defining a suction side of the blade, such that the convex suction side of each turbine blade faces a concave pressure side of an adjacent blade, and the concave pressure

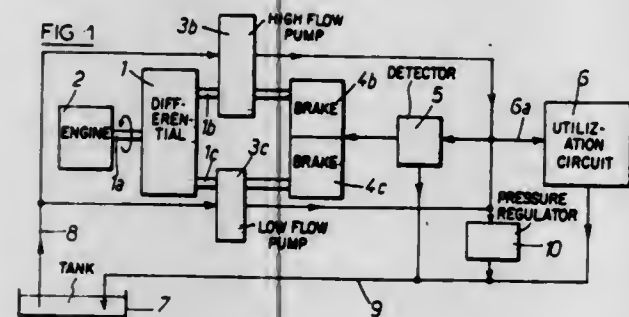


side of each turbine blade faces a convex suction of an adjacent blade, said bladed flow duct defining a duct wall having a boundary layer step between circumferentially adjacent blades, said boundary layer step being directed towards the concave pressure side of an adjacent turbine blade, said bound-



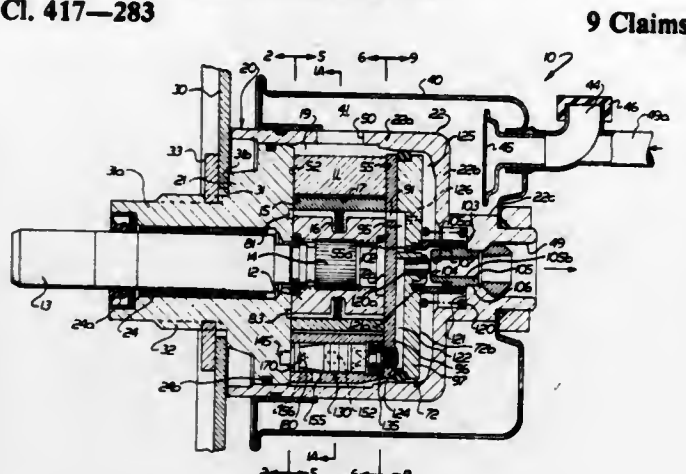
ary layer step extending obliquely, relative to said circumferential direction, in a direction along a approximately parallel with the suction side of the blade, and the boundary layer step in the longitudinal direction thereof having a convex shape and having a zero height at the beginning and at the end thereof.

**4,420,289**  
**SYSTEM FOR SUCCESSIVELY PRODUCING HYDRAULIC FLUID FLOWS AT STAGGERED VALUES**  
Jean-Max M. Silhouette, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France  
Filed Jun. 15, 1981, Ser. No. 273,686  
Claims priority, application France, Jun. 19, 1980, 80 13581  
Int. Cl.<sup>3</sup> F04B 49/00  
U.S. Cl. 417-216



1. A system for successively producing hydraulic fluid flows at staggered values, said system comprising:  
a single engine;  
a mechanical transmission having at least two output shafts and at least one epicycloidal differential, one said at least one differential having an intake axis coupled to said engine;  
a hydraulic fluid tank;  
at least two rotary pumps having staggered nominal flow values, each of said pumps having mechanical intakes coupled by mechanical links to one of said output shafts of said transmission, fluid intakes connected to said fluid tank and fluid outputs;  
brake means connected to each of said pumps;  
means for successively controlling each of said brake means, said means for controlling including pressure detector means for determining the pressure of fluid at the discharge side of said pumps, whereby each of said pumps is successively switched between stopping and running as a function of a threshold differential pressure; and  
fluid circuits connecting said pumps to said pressure detector means.

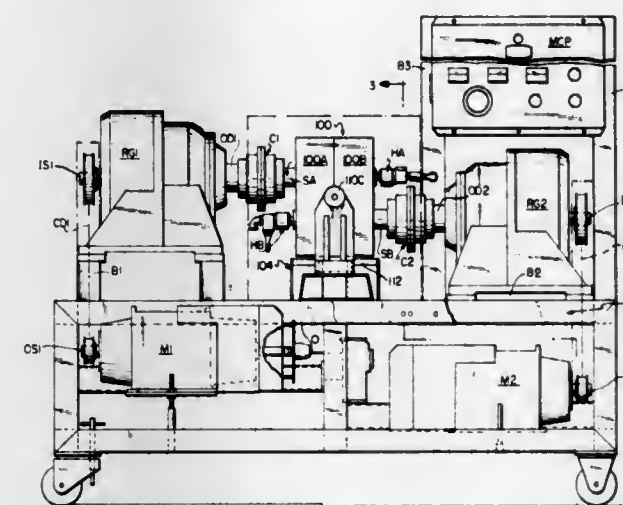
**4,420,290**  
**POWER STEERING PUMP**  
Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio  
Filed May 7, 1981, Ser. No. 261,645  
Int. Cl.<sup>3</sup> F04B 49/08  
U.S. Cl. 417-283



9 Claims  
1. A pump for supplying fluid to a system comprising a rotor member, a cam member encircling said rotor member, means for effecting relative rotation of said cam and rotor members about an axis, a plurality of vanes carried by one of said cam and rotor members, said vanes engaging the other of said members and defining pumping pockets which expand and contract on relative rotation of said members, a cheek plate extending radially of the rotational axis and disposed adjacent one side of said rotor member and said cam member, said cheek plate being movable along the rotational axis to communicate expanding and contracting pockets, means defining a cavity on one side of said cheek plate, a first fluid passage conducting fluid pressure into said cavity which fluid pressure biases said cheek plate into a position blocking communication between said expanding and contracting fluid pockets, a servo valve located in said cam member for venting the pressure in said cavity to thereby control the position of the cheek plate, said servo valve including a valve spool having opposite surfaces against which fluid pressures act to control the axial position of said cheek plate, means defining a variable control orifice having system pressure on a first side of said control orifice and pressure from the contracting pumping pockets on a second side of said control orifice, means for communicating the fluid pressures on said first and second sides of said variable control orifice to said opposite sides of said valve spool, and said means defining said variable control orifice including a member movable with said cheek plate to effect a reduction in the size of said orifice as said cheek plate moves away from said rotor and cam and an increase in the size of said orifice as said cheek plate moves towards said rotor and cam.

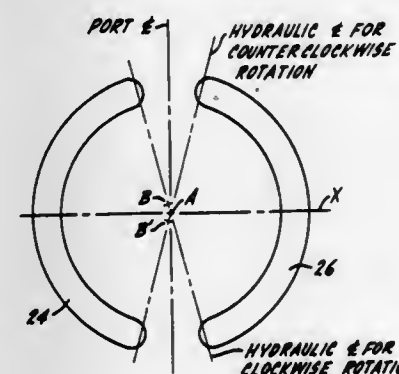
**4,420,291**  
**DYNAMIC COOLER APPARATUS FOR MOLTEN THERMOPLASTIC MATERIAL**  
Thomas W. Winstead, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.  
Filed Jan. 5, 1979, Ser. No. 1,178  
Int. Cl.<sup>3</sup> F04B 17/00, 35/04; F04C 2/16, 15/00  
U.S. Cl. 417-338  
22 Claims  
1. Means dynamically cooling and pumping molten thermoplastic material from an input source to an output device while isolating said input source from said output device, comprising: a housing of a substantial mass of heat conducting material;

a pumping cavity defined within said housing and having inlet and outlet ports communicating therewith from opposite sides thereof;  
first and second intermeshing pumping gears having a line of intersection mutually adjacent said inlet and outlet ports, each of said pumping gears having a plurality of teeth with troughs defined between adjacent said teeth;  
first and second rotary pump shafts extending through said housing and said pumping cavity and respectively mounting said first and second pumping gears for rotation therewith;



heat exchange fluid circulating means extending internally of said pumping gears and through said housing in a flow configuration substantially encompassing said pumping cavity; and  
first and second motor means driving said first and second pump shafts, respectively, independently of one another and in a load sharing manner to substantially preclude loading between said intermeshing pumping gears; said teeth having a cross-section which optimally minimizes the cross-sectional area of molten thermoplastic material in said troughs to maximize exposed surface area and cooling efficiency.

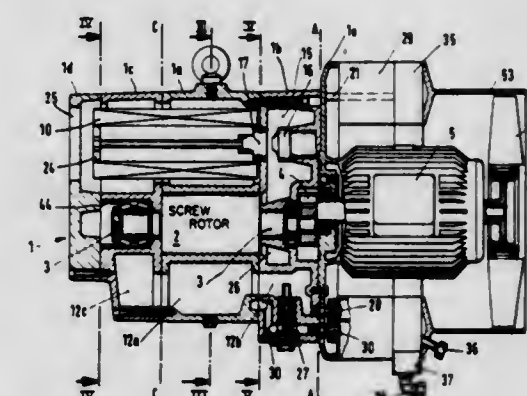
**4,420,292**  
**BI-DIRECTIONAL INTERNAL/EXTERNAL GEAR PUMP WITH ADVANCED PORTING**  
Timothy P. Lutz, South Bend, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.  
Filed Mar. 9, 1981, Ser. No. 241,894  
Int. Cl.<sup>3</sup> F04C 2/04  
U.S. Cl. 418-32



14 Claims  
1. Bi-directional fluid displacement apparatus comprising a housing including a body defining an annular groove concentric about a first axis, said body also defining inlet and outlet ports with a port centerline, said ports being symmetrical about a line perpendicular to said port centerline, said housing also including a cover received in said groove, said cover defining an annular chamber concentric about a second axis parallel to said first axis, said chamber being in fluid communication with

said inlet and outlet ports, a shaft journaled in said housing for rotation on said first axis, an internal/external gear set in said chamber, said internal gear being secured to said shaft for rotation therewith on said first axis, said external gear being rotatable on said second axis, said axes establishing the hydraulic centerline of said gear set, said cover having a first position wherein said hydraulic centerline is advanced relative to said port centerline by a predetermined angle of advance, said cover being rotatable to a second position wherein said hydraulic centerline is rotated substantially 180° minus twice said angle of advance, and means for securing said cover to said body in said first and second positions, said apparatus being constructed and arranged such that said hydraulic centerline intersects said inlet and outlet ports when said cover is in said first and second positions.

**4,420,293**  
**LIQUID COOLED COMPRESSOR WITH IMPROVED LIQUID SEPARATION**  
Rudolf Hofmann, Diedenbergen, Fed. Rep. of Germany, assignor to Isartaler Schraubenkompressoren GmbH, Geretsried, Fed. Rep. of Germany  
Filed Sep. 23, 1980, Ser. No. 189,815  
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1979, 2938557; Jun. 13, 1980, 3022277; Jun. 13, 1980, 3022249; Jun. 20, 1980, 3023092; Jul. 9, 1980, 3026000  
Int. Cl.<sup>3</sup> F04C 18/16, 29/02  
U.S. Cl. 418-47



10 Claims  
1. In a compact compressor apparatus comprising a screw compressor including screw rotors with liquid injection into the compression chamber for cooling and lubrication, having a liquid separator and a liquid collecting tank combined with the screw compressor in a housing that can be disassembled, and including air guide runs in sections parallel to the axes of rotation of the rotors, wherein a first section (8) runs from an air inlet opening (25) to the suction end of the compressor (26), and after a turn round of about 180°, is followed by a second section through the compressor, which after a turn round of about 180° is followed by a third section through the separator, which after a turn round of 180° is followed by a further section up to the connection of an outlet opening for compressed air, characterized in that  
the third section is formed as a pre-separation chamber that extends the length of the housing through the upper part of liquid collecting tank (12,41) and that after a turn round of 180° (12b) is followed by a main separation chamber (9) that extends in axial direction above the liquid collecting tank, in which main separation chamber a liquid separator (11) is provided, and an air exit opening (22) in the upper part of the main separation chamber (9).



4,420,294

# APPARATUS FOR THE CONTINUOUS EXTRUSION OF ELECTRICALLY CONDUCTIVE GRANULATED MATERIALS, PREFERABLY POWDER METALLURGY MATERIALS

Klaus Lichtinghagen, Kirchhain, Fed. Rep. of Germany, assignor to Glacier GmbH-DEVA Werke, Stadtallendorf, Fed. Rep. of Germany

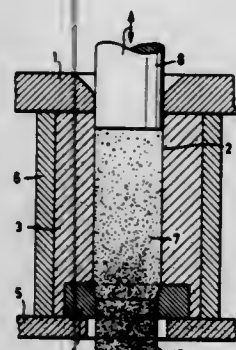
Division of Ser. No. 115,082, Jan. 24, 1980, Pat. No. 4,380,473. This application Nov. 20, 1981, Ser. No. 323,537

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1979, 2903510

Int. Cl.<sup>3</sup> B22F 3/18

U.S. Cl. 425—79

11 Claims



1. An apparatus for performing a process for the continuous extrusion of electrical conductive granulated material, preferably powder metallurgy material, comprising:

a die having a wall defining a passage duct for the travel of said material and wherein said wall comprises an electrically non-conductive material;

a nozzle disposed on said die;

a reciprocating punch movable into said duct for compressing and advancing said material in said duct and for extruding a string of said material through said nozzle on said die;

a power supply having electrical terminals; and means for connecting said punch and said nozzle to said terminals of said power supply, whereby said material in said duct is heated by a longitudinal flow of electric current therethrough as said material is being compressed and advanced.

4,420,295

# APPARATUS FOR MANUFACTURING CEMENTITIOUS REINFORCED PANELS

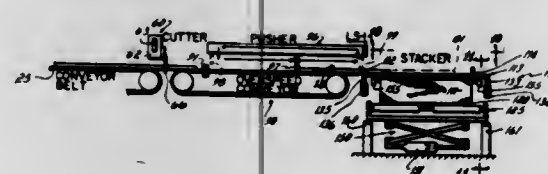
Theodore E. Clear, 903 Harrison Ave., and Paul E. Dinkel, 645 Hamilton-New London Rd., both of Hamilton, Ohio 45013

Division of Ser. No. 78,932, Sep. 26, 1979, Pat. No. 4,281,952, which is a division of Ser. No. 887,324, Mar. 16, 1978, Pat. No. 4,203,788. This application May 21, 1981, Ser. No. 265,898

Int. Cl.<sup>3</sup> B29C 17/14; B29D 3/02

U.S. Cl. 425—92

4 Claims



1. Apparatus for manufacturing cementitious panels of the type having a nailable cementitious aggregate core faced on each major side with a reinforcing element bathed in a slurry comprising hydraulic cement, said apparatus comprising:

a conveyor means for conveying a plurality of flat, abutting carrier sheets;

a slurry trough containing a slurry bath comprising hydraulic cement;

means for running a first reinforcing web through said

trough and for metering the amount of slurry adhering to said first web;

a drag bar means engaging an upper side of said first web for pushing said slurry through said first web, and said slurry web onto moving carrier sheets on said conveyor;

means for depositing a metered amount of a nailable aggregate cementitious core material onto said slurred web;

means for compacting said core material;

a second slurry trough containing a slurry bath comprising hydraulic cement;

means for running a second reinforcing web through said trough and for metering the amount of slurry adhering to said first web;

second drag bar means engaging an upper side of said second web for pushing said slurry through said second web, and said second slurred web onto said aggregate core material, said second web adhering thereto, and thereby forming an elongated uncured panel web;

means for transversely cutting separate panels from said uncured panel web between adjacent carrier sheets; and

means for stacking said separate panels for curing.

4,420,296

# CLOSURE ASSEMBLY

Michael P. Anderson, Park Orchards, Australia, assignor to Kovan Engineering Pty. Ltd., Australia

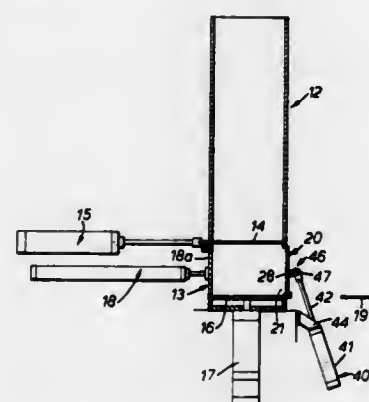
Filed Jun. 10, 1982, Ser. No. 386,918

Claims priority, application Australia, Feb. 19, 1982, PF2772

Int. Cl.<sup>3</sup> A01J 25/13, 25/15; B29C 1/00; E06B 5/00

U.S. Cl. 425—444

18 Claims



1. A closure assembly comprising:

structure defining an opening;

a closure member mounted to said structure for movement to and from a position in which it closes said opening;

co-operable locking means on said structure and closure member including a first element fixedly mounted to a shaft for rotation with the shaft, which is in turn rotatably supported on said closure member, and a second element defining a seat for said first element in a particular rotational position of the shaft, seated engagement between the elements at this position physically locking the closure member in its closed position; and

drive means coupled between the structure and said shaft, reversibly actuatable to execute a first motion in which it drives said closure member from an open condition to said closed condition and then a succeeding second motion in which it causes rotation of said shaft to effect seated engagement between said elements of the co-operable locking means.

4,420,297

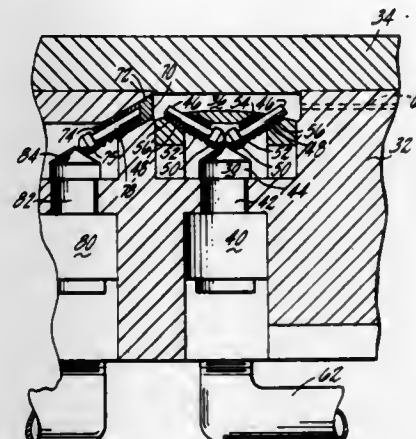
# RETRACTABLE APPARATUS FOR SHOE SOLE MOLDS

Francis O. Remon, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Apr. 27, 1981, Ser. No. 257,902

Int. Cl.<sup>3</sup> A23P 1/00

U.S. Cl. 425—577



1. A mold apparatus which defines a shoe sole mold cavity and a conduit for injecting material into said shoe sole mold cavity;

a reciprocably movable mechanism which forms impressions in the side wall and through the sole material injected in said mold cavity;

said reciprocably movable mechanism comprising a pressurizable piston and cylinder unit in rubbing contact with a pair of biased pins to effect proper motion therebetween, said pins being supported in channels directed towards said mold cavity;

said pins being biased by springs which are engaged between a shoulder in said channels, and a head on one end of each of said pins, said biasing being effective to force said pins to retract from said mold cavity upon depressurization of said cylinder unit.

4,420,298

# DEVICE FOR MAKING SPATZELS

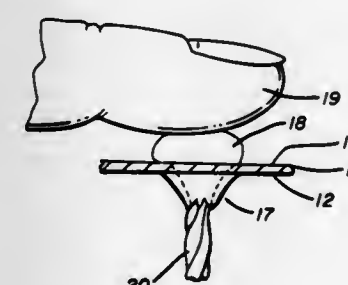
Ann Mandrick, 659 Perkins Dr., Warren, Ohio 44483

Filed Jul. 30, 1981, Ser. No. 288,298

Int. Cl.<sup>3</sup> A21C 3/04, 11/16

U.S. Cl. 425—463

2 Claims



1. A spatzel making device comprising a thin, flat metal body member having a plurality of spaced apertures punched therein of sufficient size for forming spatzel therethrough, depending tubular members formed on said body member from the metal displaced from said punched apertures and extending from the metal around said apertures, each tubular member defining a slightly tapered passageway terminated in irregular, angular, twisted configurations by said displaced metal, the edges of said tubular members having circumferentially irregular patterns arranged so that dough pushed therethrough will rotate about its axis and conform with the shaped angular configuration of the ends of the tubular members, a handle formed on said body member extending outwardly therefrom.

4,420,299

# CONTINUOUS OPERATION PRESS

Albert De Mets, Roeselaere, Belgium, assignor to De Mets N.V., Izegem, Belgium

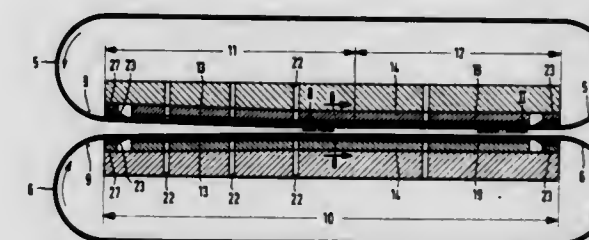
Filed Nov. 16, 1981, Ser. No. 321,564

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 8030533[U]; May 26, 1981, 8115711[U]

Int. Cl.<sup>3</sup> B30B 5/06

U.S. Cl. 425—101

65 Claims



1. A continuous operation press for at least one of producing and treating a board web, the press having a press area including a main press area and a calibration area disposed rearwardly of a main press area, as viewed in a conveying direction of the board web, upper and lower belts for defining upper and lower carrying runs between which the board web is carried, the upper and lower belts being adapted to continuously circulate at a constant speed, characterized in that upper and lower abutment means extending substantially perpendicular to a conveying direction of the board web are provided and extend over an entire width of the press area of the press, the upper and lower abutment means are respectively disposed in proximity to an underside of the upper and lower belts, a friction reducing means is arranged on the respective abutment means in at least one of the main press area and calibration area, each friction reducing means including a friction reducing surface cooperable with the underside of the upper and lower belts, the friction reducing means extends over an entire width and length of at least one of the main pressing area and the calibration area, and means for supplying a lubricant to the friction reducing means including lubricant supplying openings formed in each of the friction reducing means at a position spaced from lateral edges of the friction reducing means.

4,420,300

# CONTINUOUS ROTARY THERMO-FORMING SYSTEMS AND APPARATUS OF THE PRESSURE ASSIST, PLUG ASSIST AND MATCH MOLD TYPE

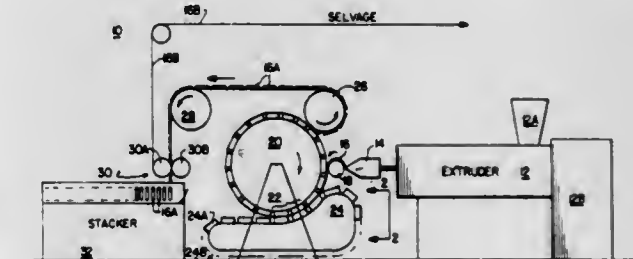
Thomas W. Winstead, Cockeysville, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 177,582, Aug. 13, 1980. This application Apr. 20, 1982, Ser. No. 370,293

Int. Cl.<sup>3</sup> B29C 17/04, 17/10; B29D 7/02

U.S. Cl. 425—142

23 Claims



1. Forming means for continuously thermo-forming molded products from a continuously extruded web of thermoplastic material and utilizing the heat of extrusion to maintain the web in a thermoformable state, comprising: extrusion means continuously emitting a heated thermoformable web of thermoplastic material; rotary mold wheel means downstream from said extrusion means having a plurality of mold cavities peripherally



positioned thereon in a correlated number of peripheral mold faces for receiving said heated thermoformable web on the periphery thereof at a point of ingestion; vacuum means in said mold wheel means selectively applying vacuum to the interior of said mold cavities to constrain respective portions of said web to be drawn into said mold cavities to form products conforming to the shape of said mold cavities; plural reciprocable interlinked assist means immediately downstream of said point of ingestion and immediately adjacent and conformally extending over a predetermined arc of registry with the periphery of said mold wheel for applying a constraining force to discrete portions of said web over said mold cavities in conjunction with the action of said vacuum means over substantially the length of said arc of registry to enhance the draw of said web into said mold cavities; discharge means for continuously stripping said web and said thermoformed products from said mold wheel; separating means for separating said thermoformed products from said web in the provision of web selvage; and return means returning said selvage to said extrusion means for recycling.

4,420,301

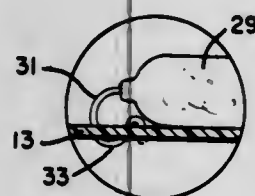
**MINIATURE MULTILAMP PHOTOFLASH ARRAY**  
John W. Shaffer, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 29, 1981, Ser. No. 277,797

Int. Cl.<sup>3</sup> F21K 5/00

U.S. Cl. 431—359

13 Claims



1. A multilamp photoflash array comprising:
  - a housing member having a back portion and an attachable front portion, said back portion having inner and outer surfaces and a camera mounting means extending outwardly therefrom and said front portion being light transmittable;
  - a printed circuit disposed on said inner surface of said back portion of said housing member and on said camera mounting means for providing an electrical signal from a camera to said printed circuit;
  - a reflector unit disposed intermediate said back and front portions of said housing member, said reflector unit having a plurality of cavities each having a reflective surface and formed to receive a flashlamp; and
  - a flashlamp disposed within each one of said cavities of said reflector unit and characterized by the improvement wherein each of said flashlamps has a pair of electrical conductors extending through and supported by said reflector unit and contacting said printed circuit on said inner surface of said back portion of said housing member.

4,420,302

**METHOD AND APPARATUS FOR THERMALLY TREATING PULVERULENT MATERIALS**  
Hans B. Knudsen, Kolding, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Nov. 16, 1981, Ser. No. 321,724

Claims priority, application United Kingdom, Nov. 17, 1980, 8036838

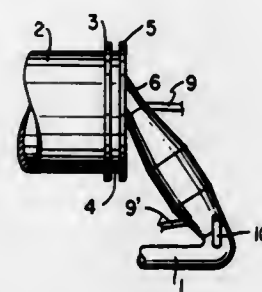
Int. Cl.<sup>3</sup> F27B 15/00; F26B 17/00; C04B 7/02

U.S. Cl. 432—14

25 Claims

1. Method of thermally treating pulverulent material in a rotary kiln having its axis inclined to the horizontal, the rotary

kiln having an upper end and a lower end, an upper portion and a lower portion, comprising: introducing the material and fuel in suspension in a gas into the upper portion of the rotary kiln adjacent its upper end by introducing the material in suspension with a tangential velocity component; thermally treating the material in the upper portion so as to raise the temperature of the material to approximately its sintering temperature;



separating the material from the suspension in the upper portion of the rotary kiln as a result of said introducing the material in suspension with a tangential velocity component; further thermally treating the separated material during its passage through the rotary kiln; discharging the thermally treated material from the lower end of the rotary kiln; and withdrawing the gas from the rotary kiln through at least one of its ends.

4,420,303

**METHOD AND APPARATUS FOR THERMALLY TREATING PULVERULENT MATERIALS**  
Hans B. Knudsen, Kolding, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

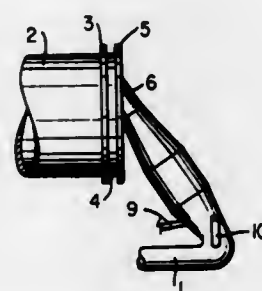
Filed Nov. 16, 1981, Ser. No. 321,700

Claims priority, application United Kingdom, Nov. 17, 1980, 8036856

Int. Cl.<sup>3</sup> F27B 15/00; F26B 17/00; C04B 7/02

U.S. Cl. 432—14

19 Claims



1. Method of thermally treating pulverulent material in a reaction chamber having its axis slightly inclined to the horizontal, the reaction chamber having an upper end and a lower end, an upper portion and a lower portion, comprising thermally treating the material in suspension in a gas to a predetermined treating temperature outside the reaction chamber, introducing the material in suspension with a tangential velocity component in the upper portion of the reaction chamber adjacent its upper end such that the material heated to the predetermined treating temperature is separated from the suspension in said upper portion of the reaction chamber, as a result of said introducing the material in suspension with a tangential velocity component, rotating the reaction chamber, further thermally treating the separated material during its passage through the reaction chamber, discharging the thermally treated separated material from a lower end portion of the reaction chamber, and withdrawing the gas from the reaction chamber through at least one of its ends.

4,420,304

**APPARATUS FOR MANUFACTURING RAPIDLY COOLED SOLIDIFIED SLAG**

Genji Nakatani; Kazuo Kanai; Haruo Itoh; Yasuto Takasaki; Kenji Ohkoshi, and Yoshinobu Yanagida, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

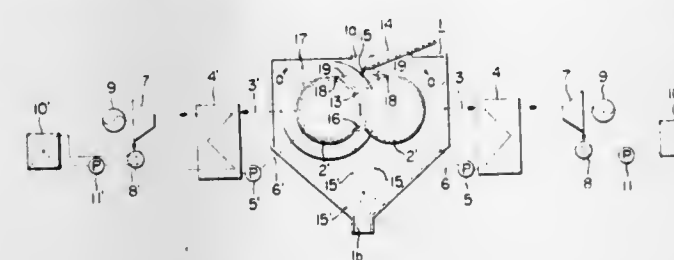
Filed Jan. 13, 1982, Ser. No. 339,143

Claims priority, application Japan, Jan. 30, 1981, 56-12778

Int. Cl.<sup>3</sup> F27D 15/02; F28D 11/02; C21B 3/06

U.S. Cl. 432—83

4 Claims



1. An apparatus for manufacturing a rapidly cooled solidified slag, which comprises:
  - a pair of cooling drums each having the same diameter and the same length, the axial lines of said pair of cooling drums being arranged in parallel with each other in the same horizontal plane, the peripheral surfaces of said pair of cooling drums being in contact with each other;
  - a driving means for rotating said pair of cooling drums, said driving means being adapted to rotate said pair of cooling drums in directions opposite to each other at the same peripheral speed in the rising direction of the peripheral surface of each of said pair of cooling drums at the contact portion of said pair of cooling drums;
  - a pair of weirs provided at the both ends of said pair of cooling drums, said pair of weirs forming a slag sump in cooperation with the upper half of the peripheral surface of each of said pair of cooling drums;
  - a slag feeding means arranged above said pair of cooling drums, for pouring a molten slag into said slag sump;
  - a scraper provided so as to be in contact with the lower half of the peripheral surface of each of said pair of cooling drums;
  - a cooling medium for cooling said pair of cooling drums, said cooling medium being supplied into each of said pair of cooling drums through the center axle of each of said pair of cooling drums to cool same, said cooling medium exchanging heat with said molten slag in said slag sump, which has been deposited onto the peripheral surface of each of said pair of cooling drums, along with the rotation of each of said pair of cooling drums, and, said cooling medium which has exchanged heat with said molten slag being discharged through said center axle of each of said pair of cooling drums for heat recovery;
  - whereby said molten slag deposited onto the peripheral surfaces of said pair of cooling drums is converted into a rapidly cooled solidified slag through heat exchange with said cooling medium and is then peeled off from the peripheral surfaces of said pair of cooling drums by means of said scraper, along with the rotation of said pair of cooling drums;
  - a pair of gas nozzles for controlling the thickness of said molten slag which has been deposited onto the peripheral surfaces of said pair of cooling drums to a predetermined thickness, each of said pair of gas nozzles being provided adjacent to the peripheral surface of each of said pair of cooling drums at a location between the uppermost position of the peripheral surface of each of said pair of cooling drums and said slag sump, each of said pair of gas nozzles having a slit which has substantially the same length as the length of said cooling drums, said slit of each of said pair of gas nozzles being arranged horizontally and in parallel with the axial lines of said cooling drums, each of said pair of gas nozzles uniformly ejecting a gas onto said molten slag deposited on the peripheral surface of each of said pair of cooling drums to blow part of said molten slag deposited on the surface of

each of said pair of cooling drums back into said slag sump, thereby uniformly reducing the thickness of said molten slag deposited on the peripheral surface of each of said pair of cooling drums; and each of said pair of weirs having an annular shape and having a hollow portion therein, each of said pair of weirs being fixed to each of the ends of the peripheral surface of one of said pair of cooling drums so that two circular flanges are formed around the entire circumference thereof at right angles to the axial line of said one cooling drum, said hollow portion of each of said pair of weirs communicating with the interior of said one cooling drum, and, said cooling medium passing through said hollow portion of each of said pair of weirs and said one cooling drum, thereby cooling said pair of weirs and said one cooling drum.

4,420,305

**OBLIQUE ORAL IMPLANT**

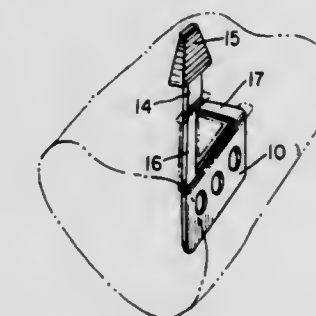
Leonard I. Linkow, 1530 Palisade Ave., Fort Lee, N.J. 07024

Filed Sep. 14, 1982, Ser. No. 418,043

Int. Cl.<sup>3</sup> A61C 13/00

U.S. Cl. 433—176

4 Claims



1. An oral implant for permanently implanting an artificial tooth supporting structure in a jawbone at a certain location along the plane of occlusion where the jawbone is insufficient to permit the insertion of an implant blade, comprising:
  - a remote blade adapted for positioning into the jawbone at a location remote buccal-lingually from the certain location and at a position wherein there is sufficient bone structure to support it;
  - at least one post at the certain location along the plane of occlusion, said post being adapted for mounting an artificial tooth; and
  - cross-connecting structure extending buccal-lingually for connecting the post and the remote blade.

4,420,306

**TETRAACRYLIC AND TETRAMETHACRYLIC ESTERS AND DENTAL MATERIALS CONTAINING SAME**

Jan A. Orlowski, Altadena, Calif.; Helmar Wagner, Darmstadt-Arheilgen, Fed. Rep. of Germany, and David V. Butler, W. Covina, Calif., assignors to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,922

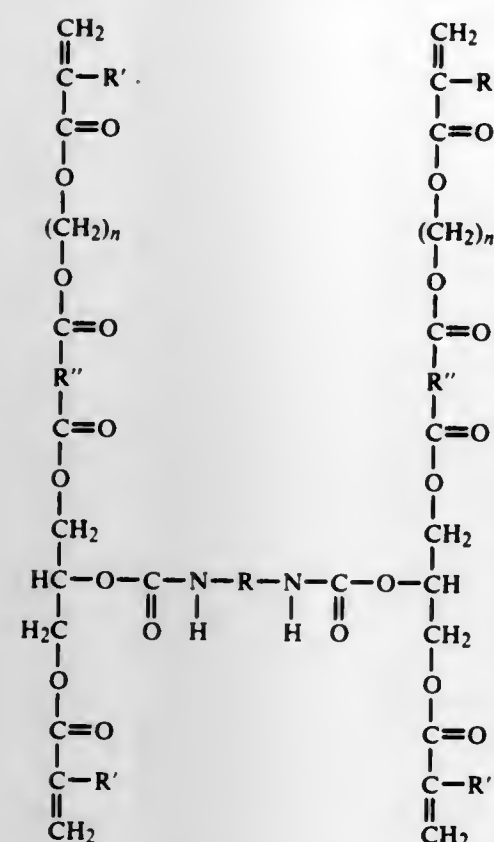
Int. Cl.<sup>3</sup> A61K 6/08

U.S. Cl. 433—228

12 Claims

1. Tetraacrylic and tetramethacrylic acid esters of the general formula





where R is a divalent (ar)aliphatic, cycloaliphatic, or aromatic group with 4 to 18 carbon atoms; R' is H or methyl; R'' is a  $-\text{CH}=\text{CH}-$ ,  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2-$ , an optionally substituted or hydrogenated benzene group, a cyclohexane group, or a cis-norbornene group, and n is 2 or 3.

## CHEMICAL

4,420,307

## PRINTING PROCESS

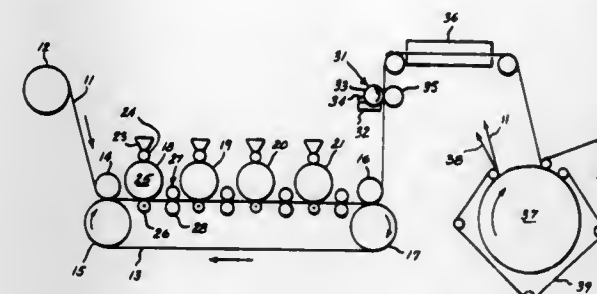
Emery J. Gorondy, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 28, 1982, Ser. No. 392,789

Int. Cl.<sup>3</sup> D06P 5/20

U.S. Cl. 8-444

5 Claims



1. A process for dyeing a disperse dyeable textile material comprising the steps of:

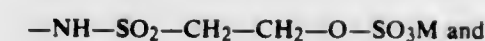
forming a latent magnetic image in a magnetic imaging member comprising a ferromagnetic material imposed on an electrically conductive support;

developing the latent magnetic image by applying thereto a ferromagnetic toner comprising a ferromagnetic component, a dye component containing a dye that is substantially sublimable at from 160° to 215° C., and a resin which substantially encapsulates the ferromagnetic component and the dye component,

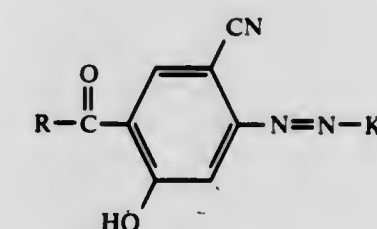
transferring the developed image from the magnetic imaging member to a surface of a paper sheet, applying a layer of a sublimable-dye-permeable polymeric material over the image to the paper sheet,

bringing said polymeric material into contact with a disperse dyeable textile material to be dyed,

heating the disperse dyeable textile material and the polymeric film and paper sheet to cause substantial sublimation of the dye component, thereby transferring said dye image from the paper through the polymeric material to form a dye image on the disperse dyeable textile material.



and printing on, in the desired pattern, a discharge reserve paste which, besides the discharge reserving agent, also contains, optionally, dyestuffs which are resistant to discharging agents, and by subsequently subjecting the material to a heat treatment at temperatures of 100° to 230° C., in which process, if no reactive dyestuffs which are dischargeable to white are present, the discharge reserving agent employed is a base which produces a pH value of at least 8 in a 5% strength aqueous solution, or is a discharge reserving agent based on sulphites which contains an alkali metal sulphite or an alkali metal bisulphite in combination with an alkali metal carbonate or bicarbonate and, optionally, an aldehyde, and which, optionally contains a nonionic detergent, and if the abovementioned reactive dyestuffs which are dischargeable to white are present, the discharge reserving agent based on sulphites is employed, the improvement which comprises employing as the dischargeable disperse dyestuffs, dyestuffs having the formula I



(I)

in which R is optionally substituted alkyl having 1 to 8 carbon atoms, optionally substituted alkoxy having 1 to 8 C atoms, and K is the radical of a coupling component of the benzene, naphthalene, pyridine, benzpyridine, diazole, thiazole, indole, carbazole, oxazole or diazine series or the series of enolisable 1,3-dicarbonyl compounds, the molecule of which dyestuffs contains not more than one esterified carboxyl group.

4,420,309

PROCESS FOR THE CONTINUOUS OR SEMICONTINUOUS DYEING OF TUBULAR KNITTED FABRICS OF CELLULOSE FIBERS WITH AZO DEVELOPING DYESTUFFS AND ACRYLAMIDE POLYMER

Hans-Ulrich von der Eltz, Frankfurt am Main; Peter Heinisch, Kelkheim, and Hans J. Ballmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 288,014, Jul. 29, 1981, abandoned. This application Jul. 22, 1982, Ser. No. 401,015

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028844

Int. Cl.<sup>3</sup> D06P 1/12, 3/68

U.S. Cl. 8-555

11 Claims

1. In a process for the even dyeing of a tubular knitted fabric in hose form, consisting of or containing preponderantly cellulose fibers, with at least one water-insoluble azo dyestuff produced on the fiber according to a continuous or semicontinuous method, in which the impregnation is performed by prepadding the hose fabric with a coupling component under alkaline conditions, and subsequently the development of the dyestuff is effected, wet-in-wet, by slop padding the textile goods with a diazo component in the presence of an acid and/or an acid-forming substance, the improvement which comprises incorporation into the alkaline impregnation bath containing the coupling component a combination of a polymeric component selected from the group consisting of homopolymers and copolymers of acrylic acid amide and mixtures thereof, said polymeric component being incorporated in an amount of from 10 to 30 g/l in the form of a 2 to 8% (by weight) aqueous formulation, and of from 2 to 20 g/l of an

4,420,308

PROCESS FOR THE PRODUCTION OF RESERVE EFFECTS ON POLYESTER TEXTILES AND POLYESTER/CELLULOSE MIXED FIBRE TEXTILES: DISCHARGE PRINTING WITH DISPERSE AZO DYE WITH ALKYL OR ALKOXY CARBONYL, CYAND AND HYDROXY PHENYL GROUP

Ulrich Bühler, Schöneck; Horst Kindler, Frankfurt; Klaus Kühlein, Kelkheim; Maria Kallay, Königstein; Uwe Kosubek, Büttelborn; Rudolf Löwenfeld, Dreieich, and Kurt Roth, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 384,074

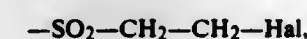
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1981, 3135433

Int. Cl.<sup>3</sup> C09B 29/01; D06P 5/12

U.S. Cl. 8-464

8 Claims

1. In the process for the preparation of white patterns or patterns of various colors on a colored substrate on textile materials comprising hydrophobic synthetic fibres or on textile materials based on mixed fibres composed of polyester and cellulose comprising impregnating the materials with dye liquors which, besides the customary dyeing and padding auxiliaries, contain disperse dyestuffs which are dischargeable to white, and if mixed fibre textiles are processed, contain, optionally, reactive dyestuffs which are dischargeable to white, and which have, as a reactive anchor, a group of the formula





anionic wetting agent; and likewise incorporating into the acidic developing liquor containing the diazo component capable of being coupled a combination of a polymeric component selected from the group consisting of homopolymers and copolymers of acrylic acid amide and mixtures thereof, said polymeric component being incorporated in an amount of from 30 to 60 g/l in the form of a 2 to 8% (by weight) aqueous formulation, and of from 2 to 20 g/l of an anionic or nonionic wetting agent.

4,420,310

# USE OF OXYALKYLATED NOVOLAKS AS PREPARATION AGENTS FOR DISPERSE DYE STUFFS AND PREPARATIONS MADE WITH SAID AGENTS

Konrad Oplitz, Liederbach; Max Grossmann, Frankfurt am Main; Hurbert Kruse, Kelkheim; Manfred Schneider, Eppstein, and Heinz Uhrig, Steinbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 111,793

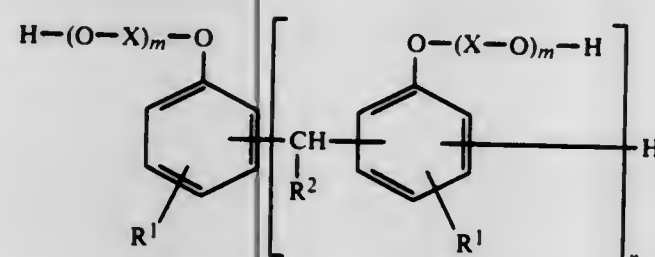
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1979, 2901461

Int. Cl.<sup>3</sup> B06P 1/56, 1/16

U.S. Cl. 8-560

13 Claims

1. A disperse dyestuff preparation containing an effective amount of a water-soluble oxalkylate of the formula



wherein R<sup>1</sup> is straight-chain or branched alkyl of from 1 to 18 carbon atoms, R<sup>2</sup> is hydrogen or straight-chain or branched alkyl of from 1 to 18 carbon atoms, X is ethylene, propylene or both ethylene and propylene, m is a number of from 6 to 100 and n is a number of from 1 to 12.

4,420,311

# DIESEL FUEL COMPOSITION

Samuel G. Thomas, Jr., Rochester, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 9, 1982, Ser. No. 440,182

Int. Cl.<sup>3</sup> C10L 1/22

U.S. Cl. 44-53

2 Claims

1. Liquid fuel adapted for use in a diesel engine, said fuel being selected from the group consisting of liquid hydrocarbons of the diesel boiling range, alcohols and mixtures thereof, and said fuel containing a cetane increasing amount of an additive of the formula



wherein R is selected from the group consisting of hydrogen, alkyl containing 1-12 carbon atoms and alkoxy containing 1-12 carbon atoms and n is an integer from 0 to 3.

# 4,420,312 METHOD FOR PRODUCTION OF HIGH FLUORIDE COMPATIBILITY DENTIFRICE ABRASIVES AND COMPOSITIONS

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 41,952, May 23, 1979, which is a continuation of Ser. No. 862,384, Dec. 20, 1977, abandoned. This application Sep. 23, 1980, Ser. No. 189,881

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.<sup>3</sup> C04B 31/16; C09C 1/68

U.S. Cl. 51-308

8 Claims

1. A method for the production of an abrasive composition comprising a precipitated amorphous silicon dioxide, which silicon dioxide has been prepared from a fresh water alkali metal silicate solution by acidulation, and has been intimately reacted with a compound of an alkaline earth metal so as to have present therein about 10-300 parts per million of alkaline earth metal ions in said amorphous silicon dioxide and which exhibits a Radioactive Dentin Abrasion value of at least 40, a pack density of about 0.24 to 0.55 grams per milliliter, an oil absorption of about 70-95 cc/100 grams, a BET surface area of about 100-250 m<sup>2</sup>/g, and a percent loss on ignition of about 4-6%, said abrasive composition, when incorporated into toothpaste compositions containing a fluoride therapeutic agent, providing a toothpaste composition which exhibits minimal loss of soluble fluoride upon storage at normal temperatures, and providing a fluoride compatibility value to the toothpaste of at least 90%, said method comprising (a) forming an aqueous solution of an alkali metal silicate having an SiO<sub>2</sub> to X<sub>2</sub>O mole ratio of about 2.0 to 2.7, wherein X is alkali metal, at a reaction temperature in the range of about 77° to 91° C., (b) acidulating said alkali metal silicate solution with a mineral acid until precipitation of silicon dioxide is substantially complete, then continuing the mineral acid addition until the pH is 6.0 or less, (c) digesting by heating at a temperature for a period of 10-30 minutes, (d) filtering the resulting slurry and washing the solid product with fresh water, (e) reslurrying the resulting wet cake in water and under agitation conditions, (f) adding sufficient alkaline earth metal ion in the form of a sufficiently soluble alkaline earth metal compound in sufficient amount to add to said wet cake alkaline earth metal ions in the range of 10-300 parts per million based on the dry recoverable product in said slurry, (g) agitating the resulting mixture to provide adherence of the effective level of said alkaline earth metal treatment on the surface of said silicon dioxide, and (h) drying and recovering the solid abrasive composition.

4,420,313

# METHOD FOR DUST REMOVAL FROM SOLID-GAS CONTACT REACTOR

Michio Hada; Yoshihiro Shiraishi; Masao Hino, and Seto Toru, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Hiroshima, Japan

Continuation of Ser. No. 210,379, Nov. 26, 1980, abandoned.

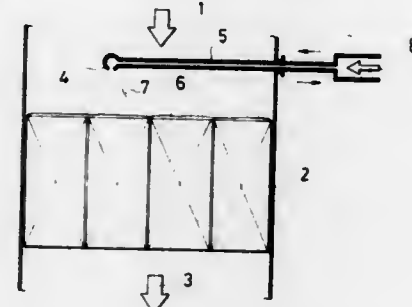
This application Mar. 12, 1982, Ser. No. 357,684

Claims priority, application Japan, Nov. 26, 1979, 54-152684

Int. Cl.<sup>3</sup> B01D 46/04

U.S. Cl. 55-96

6 Claims



1. A method for removing dust particles from the packings

4,420,315

# NESTING AIR FILTERS

Eli J. Kershaw, 530 Retreat La., Powell, Ohio 43065

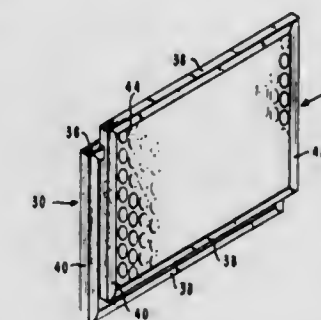
Continuation-in-part of Ser. No. 136,909, Apr. 3, 1980. This

application Jan. 22, 1981, Ser. No. 227,218

Int. Cl.<sup>3</sup> B01D 46/10

U.S. Cl. 55-501

25 Claims



1. In a stack of air filters each including a filter element of fibrous material and a quadrangular frame for supporting said filter element at its marginal edges, the improvement comprising:

a set of recesses formed in each filter frame at positions adjacent to diagonally opposite corners of said frame, each of said recesses being adapted to receive the frame of another air filter, said air filters being stacked with first and second air filters in the stack overlapped and arranged in a laterally offset relationship and subsequent air filters in the stack also overlapped and arranged in a laterally offset relationship and with the recesses of each air filter receiving the frame of the next air filter in the stack to allow said first and second air filters to nest together and to allow said second air filter and each subsequent air filter to nest with the next air filter in the stack.

4,420,314

# GAS-SOLIDS SEPARATOR

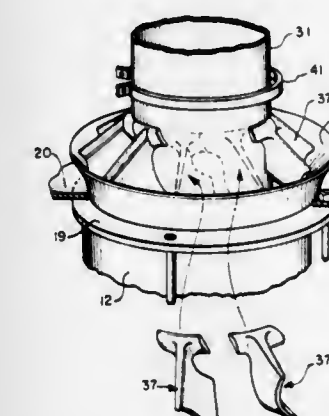
Alvah V. Barron, Jr., Birmingham, Ala., assignor to Barron Industries, Inc., Leeds, Ala.

Continuation of Ser. No. 802,830, Jun. 2, 1977, abandoned. This application Jan. 23, 1979, Ser. No. 5,812

Int. Cl.<sup>3</sup> B01D 45/12

U.S. Cl. 55-436

3 Claims



2. An apparatus for removing particulate matter from gases which comprises:

an outer tube having a tube section and a bell-mouth-shaped lip forming its upper end;  
an inner tube having an entrance end and an exit end, said inner tube being coaxial with respect to said outer tube, said entrance end extending partially into said outer tube and said exit end extending beyond said upper end;  
a plurality of stationary, airfoil-shaped vanes, secured next to one another around an annular passageway defined between said inner tube and said outer tube and spaced apart sufficiently to permit gases to pass between them, each vane being a separate element removable and replaceable without disturbing other vanes of said apparatus, said vanes having leading edges substantially thicker than the remaining portion of said vanes, said leading edges extending upstream of said passageway, said vanes being shaped for imparting a vortical path to gases passing through said annular passageway, said bell-mouth-shaped upper end and said airfoil-shaped vanes with their thick edges extending above the passageway improving laminarity of flow through said annular passageway.

4,420,316

# FILTER APPARATUS AND METHOD OF MAKING IT

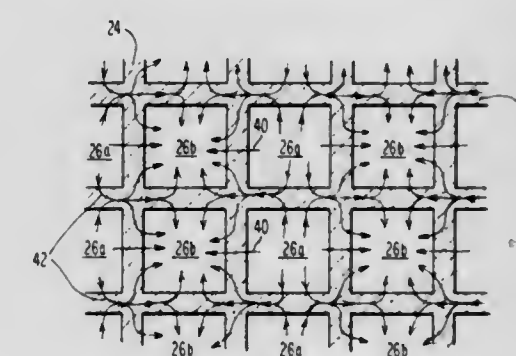
Rodney I. Frost, Corning, and Wayne H. Pitcher, Jr., Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,998

Int. Cl.<sup>3</sup> B01D 39/20

U.S. Cl. 55-523

14 Claims



1. In an apparatus for filtering solid particulates from fluids including a filter of honeycomb structure comprising:

a matrix of interconnected thin porous walls comprising at least one inlet end face and at least one outlet end face of the filter and a multiplicity of cells, each cell extending through the filter from at least one of the inlet or outlet end faces,  
an outlet group of cells each open at at least one outlet end face and closed at each adjoining inlet end face,  
an inlet group of cells each open at at least one inlet end face and closed at each adjoining outlet end face, substantially all cells of the inlet group each sharing at least one thin wall in common with another adjoining cell of the inlet group, and  
the thin walls containing interconnected open porosity of a



volume and size sufficient to enable the fluid to flow completely across the narrow dimension and through the longer dimensions of the thin walls and to restrain most or all of the solid particulates from passing either completely across or completely through the thin walls in any direction,

whereby filtering occurs through all thin walls defining each inlet cell.

14. A method of fabricating a structure for filtering solid particulates from fluid passed through the body comprising the steps of:

providing a matrix of thin interconnected porous walls defining at least one inlet and one outlet end face and a multiplicity of cells extending substantially through the structure from an inlet or outlet end face, the walls containing interconnected open porosity of a volume and size sufficient to enable the fluid to flow completely across and through the thin walls in any direction, including through the longer dimensions of the thin walls, and to restrain at least a significant portion of the solid particulates in the fluid from passing either completely across or through the thin walls in any direction,

forming an inlet group of cells, each inlet cell being open at at least one inlet end face and closed along any adjoining outlet end face and some inlet cells sharing thin walls in common with other inlet cells; and

forming an outlet group of cells, each outlet cell being open at at least one outlet end face and closed along any adjoining inlet end face.

4,420,317

#### PROCESS FOR RECOVERING VAPORIZED SOLVENT WHICH ELIMINATES HEAT EXCHANGERS

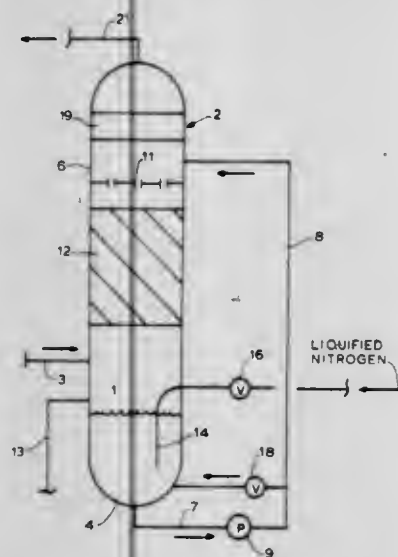
Nelson Stewart, 151-18 35th Ave., Flushing, N.Y. 11354

Filed Oct. 29, 1981, Ser. No. 316,354

Int. Cl.<sup>3</sup> F25J 3/00

U.S. Cl. 62-20

12 Claims



1. A process for recovering solvent vapor by passing said vapor through a container having a first, second, and third portion while contacting in said second portion, flowing chilled liquid solvent, which condenses said vapor, the first portion of said container including a liquid solvent reservoir of recovered liquid solvent, comprising the steps of:

introducing said solvent vapor into said first portion of said container;

transporting chilled liquid solvent from the liquid solvent reservoir in said first portion of said container to said third portion of said container for enabling said liquid solvent to flow through liquid/vapor/gas contacting means positioned within said second portion of said container to condense solvent vapor within said second portion; and, introducing liquified gas directly into said liquid solvent reservoir within said first portion of said container at rates selected to provide turbulence sufficient to avoid equip-

ment clogging problems otherwise incidental to tracewater freezing in said liquid solvent.

4,420,318

#### VACUUM FREEZING PROCESS WITH MULTIPLE PHASE TRANSFORMATIONS OF LOW PRESSURE VAPOR

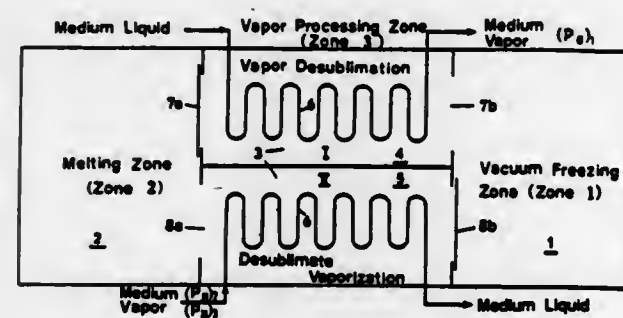
Chen-Yen Cheng, and Sing-Wang Cheng, both of 9605 La Playa St., NE., Albuquerque, N. Mex. 87111

Filed Oct. 28, 1981, Ser. No. 315,858

Int. Cl.<sup>3</sup> B01D 9/04

U.S. Cl. 62-542

16 Claims



1. A process of separating a mixture containing a solvent and at least one low volatility solute through the formation of a mass of solvent crystals that comprises a first step of flash vaporizing the mixture under a reduced pressure to simultaneously form solvent crystals and thereby transform the mixture into a first vapor whose pressure is lower than the triple point pressure of the solvent and a first condensed mass that contains the solvent crystals, a second step of cooling the first vapor under a pressure lower than the said triple point pressure to thereby transform the first vapor into a second condensed mass containing a mass of solvent solid, a third step of melting the solvent solid to transform the second condensed mass into a melt liquid, a fourth step of vaporizing a mass of solvent liquid to thereby form a second vapor whose pressure is slightly higher than the said triple point pressure, and a fifth step of bringing the second vapor and solvent crystals derived from the first condensed mass into a heat exchange relation to thereby condense the second vapor and melt the solvent crystals.

4,420,319

#### MUSHROOM GROWTH ENHANCERS AND METHOD FOR PREPARING SAME

R. Barry Holtz, Los Gatos, Calif., assignor to Spawn Mate, Inc., San Jose, Calif.

PCT No. PCT/US80/01136, § 371 Date Aug. 9, 1981, § 102(e) Date Aug. 9, 1981, PCT Pub. No. WO82/00637, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 25, 1980, Ser. No. 298,241

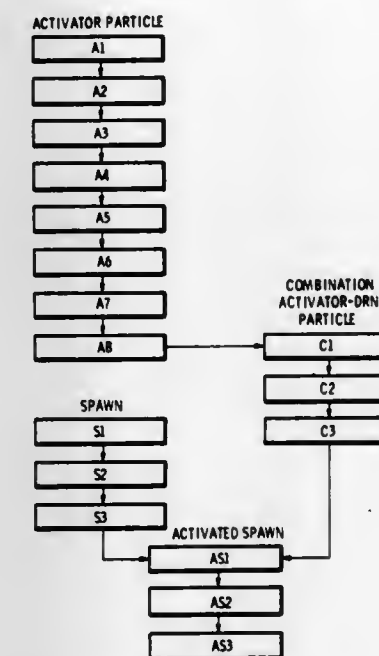
Int. Cl.<sup>3</sup> C05G 3/00; A01G 1/04

U.S. Cl. 71-5

21 Claims

1. A method of preparing a biological activator and nutrient material for use with mushroom cultures, in steps comprising: preparing a plurality of activator particles, said activator particles being adapted to induce enzyme synthesis within the cell and said particles being generally spherical in shape and including an inner core of at least one readily assimilable lipid material surrounded by a layer of at least one antioxidant-surfactant, said antioxidant-surfactant being adapted to slow cellular aging by inhibiting free radical formation, and microencapsulated by an outer layer of activated protein said activated protein being easily accessible to nascent mushroom mycelium; coagglomerating an amount of the activator particles with a larger amount by weight of a delayed released nutrient material in the presence of a binding agent to form discrete combined particles of relatively small size, said delayed released nutrient material being in the form of particles,

approximately one thousand times larger in size than the activator particles, and including a lipid droplet microencapsulated by a layer of partially denatured protein solids, said protein solids being less accessible to said mushroom mycelium such that said mycelium will preferentially attack the activator particles; drying the resulting coagglomerated particles; and



contacting said coagglomerated particles with mushroom spawn.

14. The method of preparing as recited in claim 13 wherein said mushroom spawn has been inoculated onto seed grain approximately four days before being put into proximity with said coagglomerated particles.

4,420,320

#### METHOD OF BIOLOGICALLY DRYING WASTE MATERIAL

Randolph Hartmann, Karlsruhe, and Helmut Schriewer, Maximiliansau, both of Fed. Rep. of Germany, assignors to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

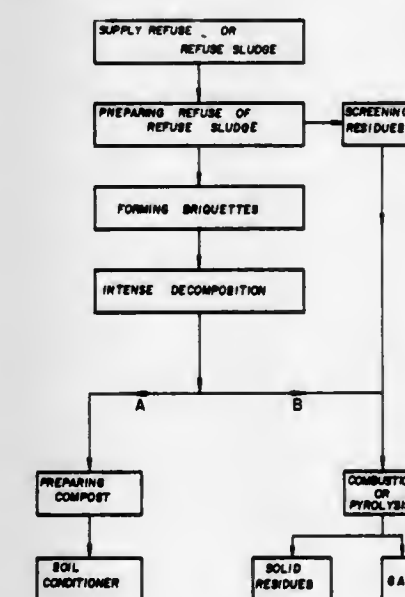
Continuation-in-part of Ser. No. 299,060, Sep. 3, 1981, abandoned, which is a continuation of Ser. No. 125,778, Feb. 29, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,509

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939229

Int. Cl.<sup>3</sup> C05F 7/00; C02C 3/00

U.S. Cl. 71-13

1 Claim



1. A method of producing soil conditioners from waste

material, and of utilizing the internal energy thereof, while reducing the volume of the waste material at the same time, wherein initial compacts of a refuse-sewage sludge mixture are subjected to intense rotting whereby the water content thereof is reduced from a value from about 50 to 60% to about 20%, and the compacts become dried and storable, comprising the steps of:

grinding and screening the dried and storable compacts, with a screen to form a coarse fraction remaining as oversize on the screen and a screened-out fine fraction; the screened-out fine fraction being directly usable as a soil conditioner; newly compacting the coarse fraction remaining as oversize on the screen; and thereafter thermally treating only the newly compacted coarse fraction by one of low-temperature carbonization and combustion.

4,420,321

#### PROCESS FOR REMOVAL OF CARBON BLACK FLOC ASSOCIATED WITH WET-PROCESS PHOSPHORIC ACID IN THE PRODUCTION OF FERTILIZERS

Joseph F. Wilson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1982, Ser. No. 429,739

Int. Cl.<sup>3</sup> C05B 11/00, 7/00; C01B 25/16

U.S. Cl. 71-43

5 Claims

1. A method for removing carbon floc from wet-process phosphoric acid during the conversion of said acid to liquid fertilizer by neutralization with ammonia, said method comprising contacting said wet-process phosphoric acid with ammonia in a pipe reactor at an elevated temperature in the range of about 400° to about 700° F. in the presence of a sufficient amount of oxidizing agent to provide a colorless solution.

4,420,322

#### HERBICIDAL ANTIDOTES

Reed A. Gray, Saratoga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

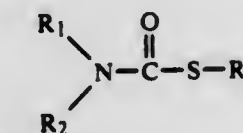
Filed Apr. 2, 1979, Ser. No. 26,112

Int. Cl.<sup>3</sup> A01N 25/32

U.S. Cl. 71-82

7 Claims

1. In the method of controlling weeds in crops by applying to the soil in which crops have been planted (a) an herbicidally effective amount of thiocarbamate herbicide of the formula



in which

R<sub>1</sub> is selected from the group consisting of 1 to 6 carbon alkyl and 2 to 6 carbon alkenyl;

R<sub>2</sub> is selected from the group consisting of 1 to 6 carbon alkyl, 2 to 6 carbon alkenyl, cyclohexyl and phenyl; or R<sub>1</sub> and R<sub>2</sub> taken together with the nitrogen atom to which they are attached form hexahydro-1H-azepine; and

R<sub>3</sub> is selected from the group consisting of 1 to 6 carbon alkyl, 1 to 6 carbon haloalkyl, 5 to 10 carbon alkylene alkylene ring, phenyl and benzyl; whereby the improvement consists in reducing the injury to said crop by employing

(b) a non-phytotoxic antidotally effective amount of azide salt selected from the group consisting of alkali or alkaline earth elements or ammonium.



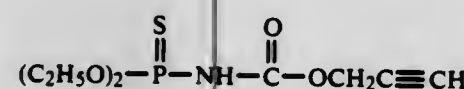
4,420,323  
THIOPHOSPHORYL CARBAMATE HERBICIDE  
ANTIDOTES

Edmund J. Gaughan, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.  
Filed May 10, 1982, Ser. No. 376,489  
Int. Cl.<sup>3</sup> A01N 57/10, 37/00

U.S. Cl. 71—87

4 Claims

1. The method of protecting a crop from injury due to the thiolcarbamate herbicide S-propyl N,N-dipropyl thiolcarbamate, comprising preplant incorporation in the soil treated with said herbicide in which said crop is to be planted, a non-phytotoxic antidotal effective amount of a compound corresponding to the formula



4,420,324  
5-AMINO-1-DI-OR TRI-SUBSTITUTED  
PHENYLPIRAZOLE-4-CARBOXYLIC ACID METHYL  
ESTERS

Karl Eicken, Wachenheim; Peter Plath, Ludwigshafen, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Del.X  
Filed Nov. 18, 1981, Ser. No. 322,673

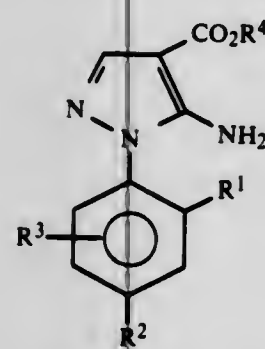
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045903; Jul. 4, 1981, 3126479

Int. Cl.<sup>3</sup> A01N 43/56

U.S. Cl. 71—92

4 Claims

1. A 5-amino-1-phenylpyrazole-4-carboxylic acid ester of the formula



where R<sup>1</sup> is methyl, trifluoromethyl, chlorine or bromine, R<sup>2</sup> is chlorine, bromine, iodine or C<sub>1</sub>-C<sub>3</sub>-alkylsulfonyl, R<sup>3</sup> is hydrogen, chlorine or bromine, or is methoxy in the 5-position, in which case R<sup>1</sup> and R<sup>2</sup> are chlorine, whilst R<sup>2</sup> is hydrogen if R<sup>3</sup> is chlorine in the 3-position, and R<sup>4</sup> is methyl.

3. A herbicidal composition comprising a carrier and/or diluent and a herbicidal effective amount of a compound as defined in claim 1.

4,420,325  
HERBICIDAL SULFONAMIDES

Richard F. Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

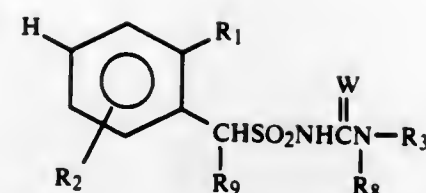
Continuation-in-part of Ser. No. 306,212, Sep. 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 203,638, Nov. 3, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,138

Int. Cl.<sup>3</sup> A01N 43/54, 43/66; C07D 239/42

U.S. Cl. 71—92

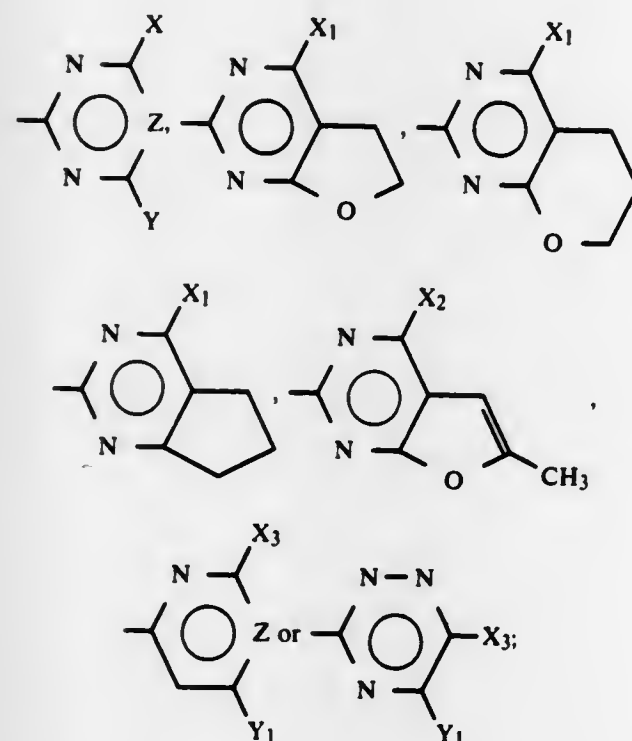
38 Claims

1. A compound of the formula:



wherein

R<sub>1</sub> is F, Cl, Br, CF<sub>3</sub>, C<sub>1</sub>-C<sub>3</sub> alkoxy, C<sub>1</sub>-C<sub>3</sub> alkyl, NO<sub>2</sub>, CO<sub>2</sub>R<sub>4</sub>, SO<sub>2</sub>R<sub>5</sub>, SO<sub>2</sub>NR<sub>6</sub>R<sub>7</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub>, SO<sub>2</sub>OCH<sub>2</sub>CF<sub>3</sub>, OSO<sub>2</sub>R<sub>5</sub> or CH<sub>2</sub>L;  
L is SO<sub>2</sub>NR<sub>6</sub>R<sub>7</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, CO<sub>2</sub>CH<sub>3</sub> or CO<sub>2</sub>C<sub>2</sub>H<sub>5</sub>;  
R<sub>2</sub> is H, Cl, Br, F, CF<sub>3</sub> or OCH<sub>3</sub>;  
R<sub>4</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl, CH<sub>2</sub>CH=CH<sub>2</sub>, CH<sub>2</sub>CH<sub>2</sub>Cl, or CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>;  
R<sub>5</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl or CF<sub>3</sub>;  
R<sub>6</sub> and R<sub>7</sub> are independently C<sub>1</sub>-C<sub>3</sub> alkyl;  
R<sub>8</sub> is H or CH<sub>3</sub>;  
R<sub>9</sub> is H or C<sub>1</sub>-C<sub>3</sub> alkyl;  
R<sub>3</sub> is



W is O or S;

X is CH<sub>3</sub>, OCH<sub>3</sub> or Cl;Y is CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub>, OC<sub>2</sub>H<sub>5</sub>, CH<sub>2</sub>OCH<sub>3</sub>, NH<sub>2</sub>, NHCH<sub>3</sub> or N(CH<sub>3</sub>)<sub>2</sub>;

Z is CH or N;

X<sub>1</sub> is H, Cl, CH<sub>3</sub>, OCH<sub>3</sub> or OC<sub>2</sub>H<sub>5</sub>;X<sub>2</sub> is CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, OCH<sub>3</sub> or OC<sub>2</sub>H<sub>5</sub>;X<sub>3</sub> is CH<sub>3</sub> or OCH<sub>3</sub>; andY<sub>1</sub> is CH<sub>3</sub> or OCH<sub>3</sub>; and their agriculturally suitable salts; provided that:(1) when W is S, then R<sub>8</sub> is H;(2) the total number of carbon atoms of R<sub>6</sub> and R<sub>7</sub> is less than or equal to 4; and(3) when X is Cl, then Z is CH and Y is NH<sub>2</sub>, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub> or OCH<sub>3</sub>.

20. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,420,326  
SYNERGISTIC HERBICIDAL COMPOSITION  
Allyn R. Bell, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 972,584, Dec. 22, 1978, abandoned. This application May 2, 1980, Ser. No. 145,960  
Int. Cl.<sup>3</sup> A01N 43/64, 43/40

U.S. Cl. 71—93

10 Claims

1. A herbicidal composition consisting essentially of a herbicidally effective amount of

- (a) 2-(1-(2,5-dimethylphenyl)ethylsulfonyl)pyridine N-oxide,  
(b) 4-amino-6-tert.-butyl-3-(methylthio)-1,2,4-triazin-5(4H)-one, and  
(c) an inert diluent selected from liquid carriers, solid carriers and mixtures thereof;  
wherein the ratio of (a)/(b) is 0.5/1 to 4/1 by weight.

4,420,327  
TETRAHYDROPHthalIMIDES AND HERBICIDAL  
COMPOSITION

Tetsuo Jikihara, Kawasaki; Masatsugu Oda, Yokohama; Kazuyuki Ushinohama, Yokohama; Hisao Watanabe, Yokohama, and Seichi Suzuki, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan  
Filed Oct. 5, 1981, Ser. No. 308,824

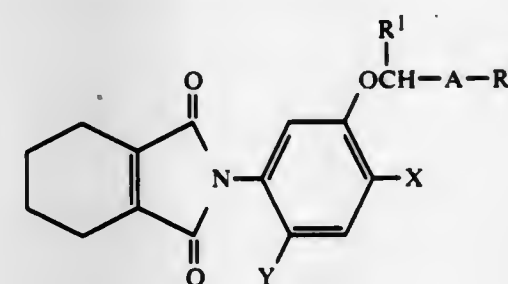
Claims priority, application Japan, Oct. 7, 1980, 55-140074; Oct. 9, 1980, 55-141777

Int. Cl.<sup>3</sup> A01N 43/38; C07D 209/48

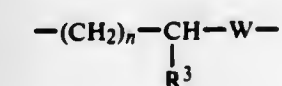
U.S. Cl. 71—96

31 Claims

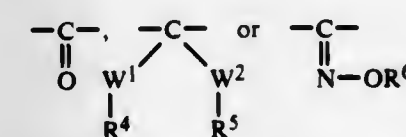
1. A 3,4,5,6-tetrahydrophthalimide of the formula:



wherein X represents hydrogen or halogen; Y represents hydrogen or halogen; R<sup>1</sup> represents hydrogen or a C<sub>1-8</sub> alkyl group; R<sup>2</sup> represents hydrogen or a C<sub>1-4</sub> alkyl or phenyl group or R<sup>1</sup> and R<sup>2</sup>, when bonded directly together, complete a cyclic radical with the R<sup>1</sup> bonded R<sup>2</sup> portion of the cyclic radical being a radical of the formula:



R<sup>3</sup> represents hydrogen or a lower alkyl group; W represents —O— or —CH<sub>2</sub>—; n is 1 or 2, A represents



W<sup>1</sup> and W<sup>2</sup> each represents —O— or —S—; R<sup>4</sup> and R<sup>5</sup> may be the same or different and each represents a C<sub>1-4</sub> alkyl group or R<sup>4</sup> and R<sup>5</sup> when bonded directly together complete a lower alkylene group; R<sup>6</sup> represents hydrogen, a C<sub>1-6</sub> alkyl, a lower alkenyl, a lower alkynyl, a carboxyl-acyl, a C<sub>2-5</sub> alkoxy-carbonyl, carbamoyl, methylcarbamoyl, dimethylcarbamoyl, ethylcarbamoyl, diethylcarbamoyl, butylmethylcarbamoyl, ethylbutylcarbamoyl or a phenylcarbamoyl group.

9. A herbicidal composition, which comprises: a herbicidally

effective amount of compound (I) of claim 1 as an active ingredient and a carrier.

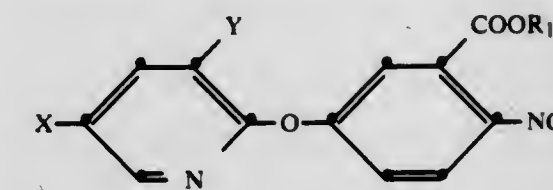
4,420,328  
DERIVATIVES OF  
5-(PYRIDYL-2-OXY)-2-NITROBENZOIC ACID, AND  
HERBICIDAL COMPOSITIONS CONTAINING THEM  
Hermann Rempfer, Ettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.  
Division of Ser. No. 174,985, Aug. 4, 1980, Pat. No. 4,326,880.  
This application Jan. 26, 1982, Ser. No. 342,879  
Claims priority, application Switzerland, Aug. 4, 1980, 7430/79

Int. Cl.<sup>3</sup> C07D 213/64; A01N 43/40

U.S. Cl. 71—94

9 Claims

1. A compound of the formula



in which,

X is trifluoromethyl, fluorodichloromethyl or chlorine,

Y is trifluoromethyl or chlorine, and

R<sub>1</sub> is C<sub>1</sub> or C<sub>2</sub> alkylene substituted by methoxycarbonyl or ethoxycarbonyl.

5. A herbicidal composition which comprises, as active ingredient, an effective amount of a 5-(pyridyl-2'-oxy)-2-nitrobenzoic acid derivative according to claim 1 and a herbicidally acceptable carrier.

4,420,329  
STABLE COLLOIDAL DISPERSIONS OF  
TRIACONTANOL

Robert G. Laughlin, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 273,524, Jun. 15, 1981, abandoned. This application Nov. 9, 1981, Ser. No. 319,565  
Int. Cl.<sup>3</sup> A01N 31/02

U.S. Cl. 71—122

25 Claims

1. A stable colloidal dispersion comprising:

- (a) from about 10<sup>-10</sup> g/l to about 0.5 g/l of 1-triacontanol having a mean particle radius of less than about 0.3 microns, and  
(b) water.

4,420,330  
STABILIZATION OF PYROPHORIC FERROMAGNETIC  
ACICULAR METAL PARTICLES CONSISTING  
ESSENTIALLY OF IRON

Helmut Jakusch, Frankenthal; Werner Loeser, Ludwigshafen; Eberhard Koester, Frankenthal; Peter Rudolf, Neuhofen; Werner Senkpiel, Laudenbach, and Werner Steck, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 16, 1982, Ser. No. 368,984  
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116489

Int. Cl.<sup>3</sup> C22C 1/04

U.S. Cl. 75—0.5 AA

4 Claims

1. A process for stabilizing pyrophoric acicular ferromagnetic metal particles consisting essentially of iron, by reaction with oxygen-containing gases, wherein, in a first stage at from 25° to 45° C., up to 1/2 of the passivating layer present in the final state is formed and thereafter, in a second stage at from 50° to 70° C., the pyrophoric particles are treated with an oxygen-containing inert gas until the entire passivating layer has



formed, the temperature range for each stage being controlled by means of the oxygen content of the inert gas stream.

4,420,331

# PROCESS FOR THE REMOVAL OF ARSENIC COMPOUNDS FROM TUNGSTEN OR MOLYBDENUM CONCENTRATES

Jan P. van't Sant, Westervort, and Arjen Nieuwhof, Arnhem, both of Netherlands, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Jan. 21, 1982, Ser. No. 341,417

Claims priority, application Netherlands, Feb. 12, 1981, 8100668

Int. Cl.<sup>3</sup> C22B 1/11, 1/12; C01G 39/00, 41/00

U.S. Cl. 75—6

1 Claim

1. A process for removing loellingite and arsenopyrite from an ore comprising molybdenite and iron tungstate which comprises subjecting the ore in a finely ground state to selective flotation yielding a product stream basically comprising molybdenite and another product stream basically comprising iron tungstate, subjecting the molybdenite stream to flotation yielding a molybdenite concentrate comprising loellingite and arsenopyrite impurities, subjecting the molybdenite concentrate to extraction with an aqueous solution of a ferric compound at a pH below 2.5 and a temperature of at least 60° C. and recovering a purified molybdenite comprising less than 800 ppm of arsenic, subjecting the iron tungstate product stream to leaching with a strong acid, to lower the content of iron compounds in this product stream, subjecting the leached product stream to magnetic separation yielding an iron tungstate concentrate having a reduced iron content and a solution of an iron salt, subjecting the iron tungstate concentrate to extraction with an aqueous solution of a ferric compound at a pH below 2.5 and a temperature of at least 60° C. and recovering a purified iron tungstate comprising less than 2000 ppm of arsenic.

4,420,332

# PROCESS FOR THE PRODUCTION OF REDUCED IRON AND THERMAL CRACKING OF HEAVY OILS

Kenji Mori, Kiichi Narita, Ryuzo Ijiri, Tsuneo Morimitsu, Dentaro Kaneko, all of Kobe; Nobuo Uemura, Nishinomiya; Yoshifumi Kameoka, and Mamoru Taniuchi, both of Kobe, all of Japan, assignors to Research Association for Residual Oil Processing, Tokyo, Japan

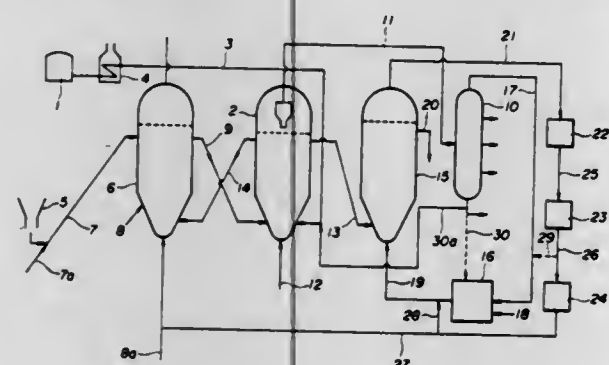
Filed Dec. 9, 1981, Ser. No. 329,033

Claims priority, application Japan, Dec. 22, 1980, 55-182441

Int. Cl.<sup>3</sup> C21B 13/02

U.S. Cl. 75—26

26 Claims



1. A process for concurrently carrying out production of reduced iron and thermal cracking of a heavy oil which comprises the steps of

(a) introducing a fine iron ore and a heavy oil into a fluidized-bed thermal cracking reactor to effect thermal cracking of the heavy oil at a temperature in the range of 500° to 600° C. into products of thermal cracking and carbonaceous by-product material which is deposited on the particles of the fine iron ore; said heavy oil being a vacuum distillation residue oil having a Conradson carbon

value of 5 to 35% and a specific gravity of 0.9 to 1.10, and said fine iron ore being in the form of particles having an average diameter of about 10–30 μm,

(b) introducing the fine iron ore with deposits of said carbonaceous material formed in the step (a) into a first fluidized-bed reducing furnace and contacting a reducing gas at high temperature blown thereto in a fluidized state to reduce the fine iron ore into reduced iron at a temperature in the range from 800° to 1000° C. and to form an exhaust gas,

(c) separating a cracked gas, light oil and residual oil by distillation from said products of thermal cracking formed in the step (a) in a fractionation system,

(d) transferring a part of said reduced iron formed in step (b) to a gas reformer and forming a fluidized-bed of said transferred reduced iron in said gas reformer and reforming said cracked gas or said residual oil by contact with the fluidized reduced iron in said gas reformer into a reducing gas mainly composed of hydrogen and carbon monoxide, and

(e) blowing the reducing gas into the fluidized-bed reducing furnace.

4,420,333

# POWDERY DESULFURIZER COMPOSITION

Atsushi Takahashi, Tokyo; Yoshiharu Muratsubaki, Uozu, and Hiroyuki Ishizaka, Mitaka, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1981, Ser. No. 260,884

Claims priority, application Japan, May 10, 1980, 55-61261

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C21C 7/02

U.S. Cl. 75—55

10 Claims

1. A powdery desulfurizer composition for injection desulfurization of molten iron, said composition consisting essentially of 30 to 90% by weight of quicklime and 70 to 10% by weight of diamide lime, wherein the quicklime is obtained by calcining diamide lime under an oxygen-excessive atmosphere under conditions such that at least some calcium carbonate and at least some carbon remains in the quicklime, and not more than 20 parts by weight of a carbonaceous material and not more than 8 parts by weight of a desulfurization aid, each per 100 parts by weight of the quicklime and diamide lime, said composition being further characterized by its capability to be transported by a carrier gas at an amount of carrier gas of 6 NI/Kg or less and by its capability to desulfurize molten iron in an injection desulfurization process using an amount of carrier gas of 6 NI/Kg or less at a desulfurization ratio of at least about 55%.

4,420,334

# METHOD FOR CONTROLLING THE BOTTOM-BLOWING GAS IN TOP-AND-BOTTOM BLOWN CONVERTER STEEL MAKING

Yoshiei Kato, Kyoji Nakanishi, and Tsutomu Nozaki, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP81/00240, § 371 Date May 17, 1982, § 102(e)

Date May 17, 1982, PCT Pub. No. WO82/01013, PCT Pub.

Date Apr. 1, 1982

PCT Filed Sep. 19, 1981, Ser. No. 385,408

Claims priority, application Japan, Sep. 19, 1980, 55-131403

Int. Cl.<sup>3</sup> C21C 5/32, 5/34

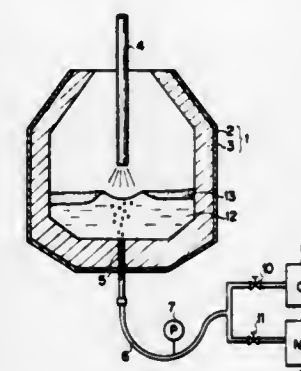
U.S. Cl. 75—60

4 Claims

1. In top and bottom blown converter steel making wherein an oxidizing gas is blown onto the surface of a molten iron in the converter through a lance disposed above the molten iron surface while a bottom blowing gas is blown through at least one single pipe bottom blowing tuyere in the bottom of the converter, a method of controlling the bottom blowing gas for

avoiding buildup of iron on the tuyere and burn back of the tuyere, comprising:

detecting the pressure of the bottom blowing gas supplied into said bottom blowing tuyere; and  
when the bottom blowing gas is an inert gas and the pressure of the inert gas rises and is detected as reaching the upper limit of a predetermined pressure range, changing the gas



supplied to the bottom blowing tuyere to an oxidizing gas containing at least 60% of oxygen gas; and  
when the pressure of the thus supplied oxidizing gas drops and is detected as reaching the lower limit of said predetermined pressure range, changing the gas supplied to the bottom blowing tuyere back to the inert gas, thereby alternately supplying the oxidizing gas and the inert gas to the bottom blowing tuyere.

4,420,335

# MATERIALS FOR ROLLS

Tomio Takagi, Osaka; Jitsuhiko Ueda, Kobe; Tadaomi Fujii, Nara, and Kazuhiko Tanaka, Osaka, all of Japan, assignors to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan

Filed Jan. 6, 1982, Ser. No. 337,472

Claims priority, application Japan, Feb. 5, 1981, 56-16513

Int. Cl.<sup>3</sup> C22C 38/06

U.S. Cl. 75—124

12 Claims

1. A roll material comprising, in proportions by weight, 0.04–0.20% C, 0.2–0.8% Si, 0.4–1.5% Mn, 0.2–1.0% Ni, 10.0–14.0% Cr, 0.5–4% Cu, 0.1–0.5% V, 0.01–0.35% Nb, 0.01–0.06% Al, P and S each in a reduced amount of up to 0.03% as impurity elements, and the balance Fe.

4,420,336

# PROCESS OF IMPROVING CORROSION RESISTANCE IN POROUS STAINLESS STEEL BODIES AND ARTICLE

Erhard Klar, Beachwood, and Mary A. Pao, Concord, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,954

Int. Cl.<sup>3</sup> B22F 1/00

U.S. Cl. 75—246

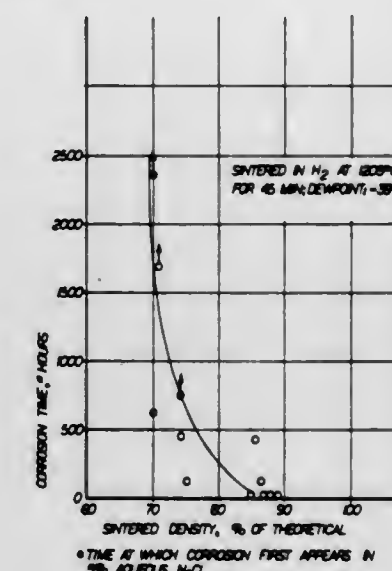
6 Claims

1. A foraminous body having improved corrosion resistance to aqueous nitric acid, 10%, and being formed of tin-containing water atomized, compacted and sintered austenitic stainless steel alloy powder compacted and sintered to less than 80% of theoretical density and characterized by being formed of a prealloyed stainless steel alloy powder containing from 0.1% to 10% by weight of tin.

4. A process for improving the corrosion resistance to aqueous nitric acid, 10%, of austenitic stainless steel foraminous body comprising:

(a) compacting water atomized austenitic stainless steel alloy powder in the form of said foraminous body and containing from 0.1% to 10% by weight of prealloyed tin to form a compact;  
(b) sintering the compact in a dissociated ammonia or synthetic nitrogen atmosphere at a temperature of at least

about 1125° C. to a final density less than 80% of theoretical density; and



(c) cooling the sintered compact in a dissociated ammonia atmosphere.

4,420,337

# BISMUTH INHIBITORS FOR ACID GAS CONDITIONING SOLUTIONS

Billy D. Oakes, Lake Jackson; Michael S. Dupart, Alvin, both of Tex., and David C. Cringle, Melbourne, Australia, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 1, 1982, Ser. No. 394,209

Int. Cl.<sup>3</sup> C09K 3/00

U.S. Cl. 106—14.15

4 Claims

1. A corrosion inhibited composition useful to inhibit corrosion in stainless steel acid gas removal equipment which comprises

(A) an aqueous alkanolamine solution, and  
(B) a corrosion effective amount of a soluble bismuth compound in the trivalent state.

4,420,338

# SCREEN-PRINTING INK

Francis Ortega, Brunoy, France, assignor to U.S. Philips Corporation, New York, N.Y.

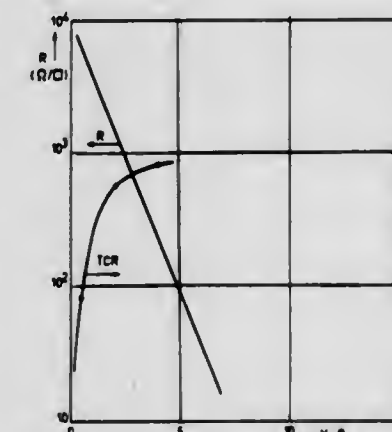
Filed Sep. 15, 1981, Ser. No. 302,280

Claims priority, application France, Sep. 15, 1980, 80 19851

Int. Cl.<sup>3</sup> C09D 11/02

U.S. Cl. 106—20

9 Claims



1. A screen-printing ink for producing a TCR modifier containing resistor by firing in a neutral atmosphere, said ink comprising a mixture of one or more metalhexaborides, a temporary binder and a glass as the permanent binder, characterized in that the glass is an alkaline earth metal borate consisting of an alkaline earth metal oxide and boron oxide or an alkaline earth metal silicoborate consisting of an alkaline earth



metal oxide, boron oxide and silicon dioxide which glass is modified by a quantity of not more than 5 mole% of one or more metal oxides selected from the group consisting of oxides of vanadium, molybdenum, niobium, tungsten, manganese, iron, zirconium and tantalum.

#### 4,420,339 COLLAGEN FIBERS FOR USE IN MEDICAL TREATMENTS

Tadaaki Kato, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Nishinobashi, Japan  
Filed Mar. 18, 1982, Ser. No. 359,309

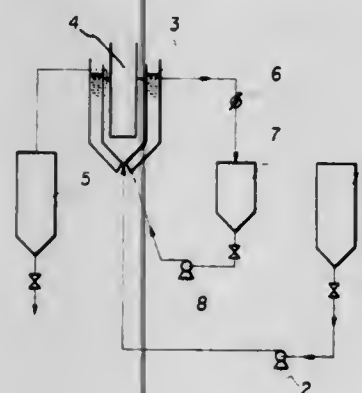
Claims priority, application Japan, Mar. 27, 1981, 56-46021; Mar. 27, 1981, 56-46022

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C07G 7/00; C08L 89/06

U.S. Cl. 106—124

6 Claims



1. Collagen fibers for use in medical treatments, having amino acid residues of 312 to 340 glycine residues, 119 to 138 proline residues, 94 to 100 hydroxyproline residues and 2.6 to 5.5 tyrosin residues per 1000 total amino acid residues thereof, a denaturation temperature in a range of 31° to 40° C., and S-constant of 1.12 to 1.62.

#### 4,420,340 COLOR RETENTION PIGMENT FOR PAINT COMPOSITIONS USING LATEX VEHICLES

Bernard Mohr, Louisville, Ky.; Nicholas J. Pappas, Somers; Kuldip S. Chopra, Grand Island, both of N.Y., and George A. Salensky, Whitehouse Station, N.J., assignors to Elkem Metals Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 343,550, Jan. 28, 1982, abandoned. This application Nov. 10, 1982, Ser. No. 440,573  
Int. Cl.<sup>3</sup> C09D 5/02

U.S. Cl. 106—288 B

7 Claims

1. In a conventional water emulsion paint composition containing predominately acrylic emulsion, a thickener, dispersants and a color pigment; the improvement for enhancing the color stability and fade resistance of the paint formulation, said improvement comprising the addition to said paint formulation of a color pigment composed of finely-divided manganomanganic oxide spherical fume particles recovered from the oxygen blowing of molten ferro-manganese.

#### 4,420,341 STABILIZED SURFACE MODIFIED FILLERS

Thomas H. Ferrigno, 29 Clover Hill Cir., Trenton, N.J. 08638  
Filed Apr. 5, 1982, Ser. No. 365,673

Int. Cl.<sup>3</sup> C09C 1/42

U.S. Cl. 106—308 Q

11 Claims

1. A stabilized surface modified filler consisting of:  
(a) an organic acid reactive filler selected from the group consisting of calcite, aragonite, amphiboles including tremolite, anthophyllite, and actinolite, brucite, antigorite, talc, chlorite, wollastonite, gibbsite, diasporite, boehmite and mixtures thereof having a size range of from 100

percent minus 10 mesh U.S. Standard sieves to about 0.07 micrometers equivalent spherical diameter;

- (b) an organic acid selected from the group consisting of organic acids having 3 to 24 carbon atoms and zero to 5 double bonds including cyclic rosin acids, isostearic, ricinoleic, licanic and diacids maleic and itaconic and mixtures thereof such that the molar ratio is at least one of unsaturated acid to 4 of saturated acid to entirely unsaturated acid, present from about 0.1 to 10 percent by weight of the filler;  
(c) an antioxidant present from about 0.005 to 0.1 percent based on the weight of the filler; and  
(d) a liquid agent present from 0 to about 100% based on weight of the organic acid, being liquid at about 15°–55° C. and having boiling points above about 200° C. at atmospheric pressure and substantially non-reactive with said organic acid below about 120° C.

#### 4,420,342 METHOD OF PREVENTION OF DEPOSITS IN THE PIPES OF WASTE HEAT BOILERS

Hans Gettert, Gross-Sachsen, and Knut Kaempfer, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,197

Int. Cl.<sup>3</sup> C23G 1/02

U.S. Cl. 134—3

4 Claims

1. A process for preventing nickel, iron and vanadium deposits in the pipes of waste heat boilers employed for cooling gases which are formed by partially oxidizing metal and chloride-containing fossil fuel with more than 2 weight percent sulfur, wherein the pipes are flushed, at the operating temperature, with hydrogen-containing gases which contain little or no H<sub>2</sub>S.

#### 4,420,343 PROCESS FOR THE THERMAL DECOCKING OF CRACKED GAS COOLERS

Artur Sliwka, Kirchheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,963

Int. Cl.<sup>3</sup> B08B 9/02

U.S. Cl. 134—22.15

2 Claims

1. A process for the thermal decoking of cracked gas coolers for the indirect cooling, by means of water, of ethylene-containing cracked gases which are obtained by thermal cracking of hydrocarbons in the presence of steam in an indirectly heated tube cracking furnace at cracked gas exit temperatures of above 750° C., which process comprises: stopping the introduction of the hydrocarbon to be cracked to the cracking furnace, and passing a steam/air mixture through the indirectly heated cracking tubes of the furnace and at the same time through the downstream cracked gas cooler and, after completion of decoking of the cracking tubes of the furnace, stopping the supply of steam and thereafter passing only heated air or an air/oxygen mixture through the indirectly heated cracking tubes of the tube cracking furnace in such an amount that the ratio of the hourly weight throughput of heated air or heated air/oxygen mixture to the hourly throughput of hydrocarbon during thermal cracking is from 0.1 to 3, such air or air/oxygen mixture being heated to temperatures of from 600° to 1,100° C. and passing the heated air or air/oxygen mixture through the cracked gas cooler tubes which are to be decoked for a sufficient period to substantially decoke said cooler tubes and maintaining at the same time a steam pressure of at least 90 bar on the boiling water side of the cracked gas cooler.

#### 4,420,344 CMOS SOURCE/DRAIN IMPLANT PROCESS WITHOUT COMPENSATION OF POLYSILICON DOPING

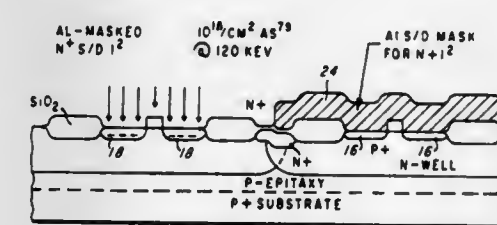
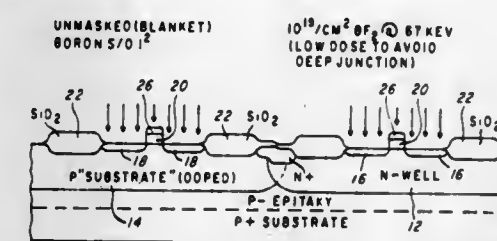
Roderick D. Davies, Richardson, and David B. Scott, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 15, 1981, Ser. No. 311,713

Int. Cl.<sup>3</sup> H01L 21/263, 21/26

U.S. Cl. 148—1.5

7 Claims



1. A process for forming both first-conductivity-type-channel and second-conductivity-type-channel transistors in respective selected areas of a semiconductor surface, said transistors each respectively comprising a gate, a source, and a drain, said process comprising the steps of:

- providing a layer of doped first-conductivity-type polysilicon atop said semiconductor surface;  
applying a patterned etch mask layer atop said polysilicon layer, said patterned etch mask layer overlying the respective selected locations of said respective gates of said transistors;  
anisotropically etching said polysilicon layer except where said polysilicon layer is covered by a portion of said patterned etch mask layer;  
implanting a second-conductivity-type dopant in the respective desired locations both of the respective sources and drains both of said second-conductivity-type-channel transistors and one of said first-conductivity-type-channel transistors, said patterned etch mask layer not being removed before said second-type implanting step; and  
implanting a first-conductivity-type dopant in the respective desired locations of said respective sources and drains of said first-type-channel transistors, said first-type dopant being applied at a higher dose than said second-type dopant;  
wherein said first- and second-type dopants are such that the presence of said first-type dopant within said semiconductor surface reduces the diffusivity of said second-type dopant.

#### 4,420,345 METHOD FOR MANUFACTURE OF ALUMINUM ALLOY CASTING

Tadao Ito, Fuji, and Akio Hashimoto, Numazu, both of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,881

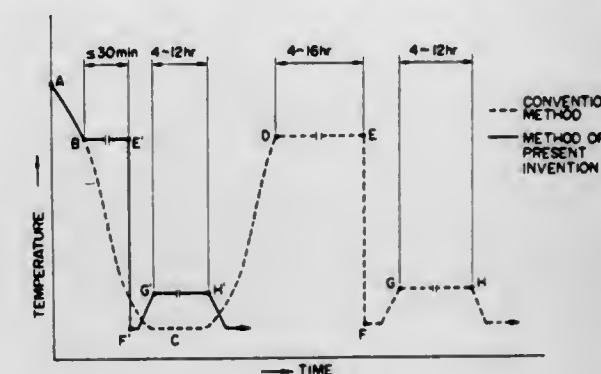
Int. Cl.<sup>3</sup> C22F 1/04

U.S. Cl. 148—3

3 Claims

1. A method for the manufacture of cast articles of aluminum alloy, which comprises the steps of (1) pouring into a metal mold a molten Al-Si-Mg type casting alloy containing antimony (Sb) in the range of 0.03 to 1.0% by weight; (2) after complete solidification of the cast body within the mold but

before said cast body has cooled below about 450° C., placing said cast body in a heating furnace kept at temperatures in the range of from 500° to 550° C. for about 5–30 minutes; (3) then



quenching the cast body in cold water or warm water; and (4) subjecting the quenched cast body to a conventional artificial aging treatment.

#### 4,420,346 METHOD OF PREPARING CONTACTS AND ELECTRODES OF ELECTRIC VACUUM APPARATUSES

German S. Belkin, ulitsa 1 Maya, 1, kv. 46, Zheleznodorzhny, Moskovskaya oblast; Stal N. Voskresensky, Angarskaya ulitsa, 49, korpus 1, kv. 22, Moscow; Viktor Y. Kiselev, Perovskaya ulitsa 40, korpus 4, kv. 12, Moscow; Ida A. Lukatskaya, ulitsa Moldagulovoi, 28 korpus 3, kv. 68, Moscow; Valery V. Rodionov, ulitsa Metallurgov, 41-b, kv. 22, Tula; Mikhail N. Skurikhin, Martenovskaya ulitsa, 21/12, kv. 1, Tula; Irina B. Frolova, ulitsa Metallurgov, 43-a, kv. 69, Tula; Vyacheslav S. Zuev, ulitsa Bratlev Zhabrovyykh, 32, kv. 160, Tula; Lev I. Korneev, ulitsa Anosova, 8/16, kv. 1, Tula; Rauza A. Chervonenkis, ulitsa Butlerova, 26, korpus 2, kv. 33, Moscow; Efim M. Rabinovich, ulitsa Metallurgov, 35/7, kv. 35, Tula; Tatyana P. Volkova, ulitsa Chaplygina, 619 kv. 21, Tula, and German A. Goryaev, Priuspskaya ulitsa, 9-a, kv. 85, Tula, all of U.S.S.R.

PCT No. PCT/SU80/00187, § 371 Date Jul. 16, 1982, § 102(e) Date Jul. 16, 1982, PCT Pub. No. WO82/01960, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 28, 1980, Ser. No. 403,648

Int. Cl.<sup>3</sup> C25D 5/34

U.S. Cl. 148—4

1 Claim



1. A method of preparing contacts and electrodes of electric vacuum apparatuses comprising the steps of exposing the surface of the contacts (electrodes) to a concentrated thermal flux of 10<sup>4</sup> to 10<sup>6</sup> W/cm<sup>2</sup> in a vacuum or in the atmosphere of an inert gas and subjecting said surface to subsequent cooling, said concentrated thermal flux is applied for 21 to 100 ms and a rate of cooling during the cooling step is chosen to be within the range 10<sup>4</sup> to 10<sup>6</sup> K/s.



4,420,347

**PROCESS FOR PRODUCING AN AUSTENITIC STAINLESS STEEL SHEET OR STRIP**

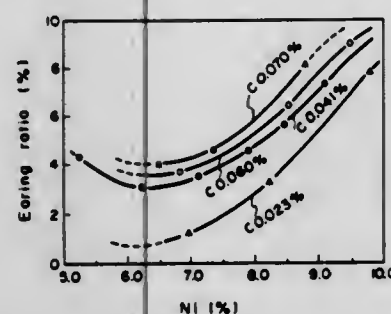
Masanori Ueda, Kitakyusushi; Hidehiko Sumitomo, and Hirofumi Yoshimura, both of Hikarishi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,876

Claims priority, application Japan, Jul. 31, 1981, 56-120068

Int. Cl.<sup>3</sup> C21D 7/02

U.S. Cl. 148—12 E



1. A process for producing a sheet or strip of an austenitic stainless steel, comprising:

casting a slab from a molten steel containing, by weight, up to 0.070% carbon, up to 1.0% silicon, up to 3.0% manganese, up to 0.040% phosphorus, up to 0.030% sulfur, 16.0 to 19.0% chromium, 6.0 to 9.0% nickel and up to 0.2% nitrogen, the percentages of carbon and nickel satisfying the following relationship:

$$(102 \times \text{carbon } \%) + (4 \times \text{nickel } \%) \leq 39.5\%$$

hot rolling said slab;  
descaling said hot rolled steel;  
cold rolling said steel; and  
annealing said cold rolled steel.

4,420,348

**AMORPHOUS ALLOY FOR MAGNETIC HEAD CORE**

Kazuo Shiki, Kanagawa; Shigekazu Otomo, Hachioji; Mitsuhiko Kudo, Hamuramachi, and Mitsuo Abe, Yokohama, all of Japan, assignors to Hitachi, Ltd.; Hitachi Metals, Ltd. and Research Development Corporation of Japan, all of Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,456

Claims priority, application Japan, Mar. 28, 1980, 55/38888

Int. Cl.<sup>3</sup> C22C 33/00

U.S. Cl. 148—403

1. Amorphous alloy for magnetic head core, represented by the general formula:



wherein the value of x is 0.04–0.07, the value of a is 0.73–0.75, the value of b is 0.005–0.03, and the value of c is 0.02–0.06, whereby said alloy has a saturation flux density of 8 kG or higher, permeability of more than 5000 at 20 kHz and magnetostriction of less than  $10^{-6}$  such that said alloy can be utilized for magnetic head cores.

4,420,349

**EMULSION EXPLOSIVE COMPOSITIONS AND METHOD OF PREPARATION**

Howard A. Bampfield, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Ontario, Canada

Filed Jan. 10, 1983, Ser. No. 456,843

Claims priority, application Canada, Feb. 2, 1982, 395372

Int. Cl.<sup>3</sup> C06B 45/00

U.S. Cl. 149—2

1. A thermally and storage stable water-in-oil emulsion explosive of putty-like consistency comprising a water-immiscible liquid organic fuel continuous phase, an aqueous inorganic

oxidizer salt solution discontinuous phase and from 0.5 to 4% by weight of the total composition of a dimer acid glyceride as emulsifier wherein the dimer acid has a carbon atom chain length of  $\text{C}_{18}$ – $\text{C}_{60}$ .

4,420,350

**DOUBLEBASE BALLISTIC MODIFIERS**

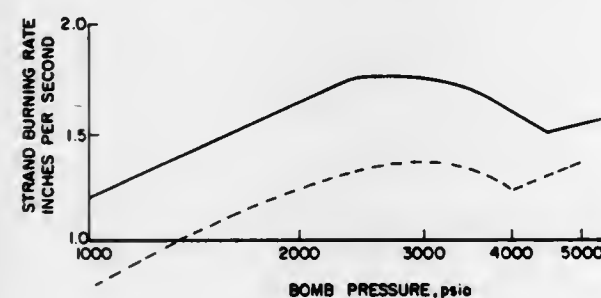
Albert T. Camp, Welcome, Md., and Elmer R. Csanady, Hedgesville, W. Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1980, Ser. No. 155,894

Int. Cl.<sup>3</sup> C06B 25/26

U.S. Cl. 149—98

14 Claims



1. In a double base propellant comprising an energetic polymer and an energetic plasticizer, the improvement comprising the addition, based on total weight of propellant, from about 0.2 to 7 weight percent of a first ballistic modifier selected from the class consisting of copper, lead, tin, and bismuth chelates of a substituted hydroxybenzophenone selected from the class consisting of, 2-hydroxy-4-alkoxybenzophenone, and 2,2'-dihydroxy-4,4'-dialkoxybenzophenone, and mixtures thereof.

4,420,351

**METHOD OF MAKING DECORATIVE LAMINATED PRODUCTS SUCH AS TILES, PANELS OR WEBS FROM CELLULOSIC MATERIALS**

Eduard Lussi; Ulf L. Ahlstedt, and Sven A. Ryden, all of Ronneby, Sweden, assignors to Tarkett AB, Ronneby, Sweden

Filed Apr. 29, 1982, Ser. No. 373,165

Int. Cl.<sup>3</sup> B32B 31/12, 31/20, 31/26

U.S. Cl. 156—62.4

6 Claims

1. A method of making decorative laminated products, such as tiles, panels or webs, which comprises the steps of granulating a cellulosic material, mixing the granulate with a fusible plastics and making a mat therefrom, cutting from a cellulosic material thin slices which in the state obtained with the through holes and recesses therein are placed on the mat thus made, applying a film of fusible plastics on the thin slices of cellulosic material, and compressing the laminate thus obtained under supply of heat for melting the plastics and urging the material of the mat into the holes and recesses of the slice, and then cooling the compressed tile.

3. A method as claimed in claim 1 including the further step of subjecting the tile after cooling to free heating and cooling for relief formation of the plastics film.

4,420,352

**ABSORBABLE-SUSCEPTOR JOINING OF CERAMIC SURFACES**

James E. Schroeder, Claremont, and Paul J. Shlichta, San Pedro, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 10, 1983, Ser. No. 465,367

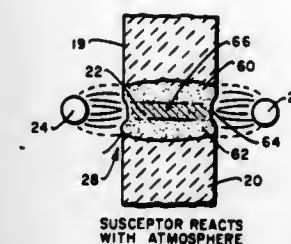
Int. Cl.<sup>3</sup> C03B 29/00; C04B 33/34, 37/00

U.S. Cl. 156—89

14 Claims

1. A method of joining ceramic surfaces comprising the steps of:

placing a thin film of metal susceptor material at the interface between the surfaces to form an abutting assembly, said metal being reactive with a gas to form a compound soluble in the ceramic;



melting the film and adjacent zones of ceramic;  
reacting the susceptor with a gas to form said compound;  
dissolving said compound in the molten ceramic; and  
cooling the assembly to form a joint.

4,420,353

**METHOD OF MAKING A STOOL SAMPLING DEVICE**

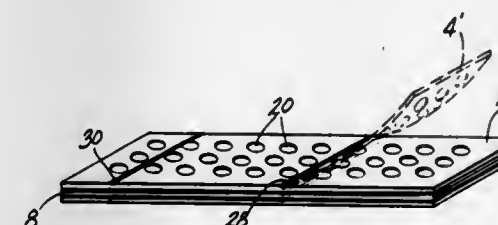
Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437

Continuation-in-part of Ser. No. 110,437, Jan. 7, 1980, Pat. No. 4,273,741, and Ser. No. 203,083, Nov. 3, 1980, Pat. No. 4,367,750. This application May 22, 1981, Ser. No. 266,151

Int. Cl.<sup>3</sup> G01N 1/02, 33/52, 33/72

U.S. Cl. 156—227

3 Claims



1. A method of forming a biological material sampling device, said method comprising the steps of:

- providing a first roll of a pliant impermeable material;
- providing a second roll of a pliant absorbent material;
- providing a third roll of a pliant screening material;
- feeding material from said first, second and third rolls into overlying relationship;
- applying strips of adhesive to edge portions of the surface of said pliant, impermeable material adjacent to said pliant absorbent material;
- applying strips of a releasable, reusable material to the edge portions of the surface of said pliant, absorbent material adjacent to said pliant screening material;
- bonding said pliant, impermeable material, said pliant, absorbent material and said pliant screening material to form a laminate;
- forming transverse fold lines on said laminate; and
- cutting said laminate transversely to form individual sampling devices.

4,420,354

**PROCESS FOR SECURING PROJECTING STUDS IN THE ENDS OF WOOD RESIN COMPOSITE BODIES AND THE LIKE AND THE STRUCTURE FORMED THEREBY**

Meade A. Gougeon, and Jan C. Gougeon, both of Bay City, Mich., assignors to Gougeon Brothers, Inc., Bay City, Mich.

Filed Jun. 14, 1982, Ser. No. 387,930

Int. Cl.<sup>3</sup> B29B 31/00

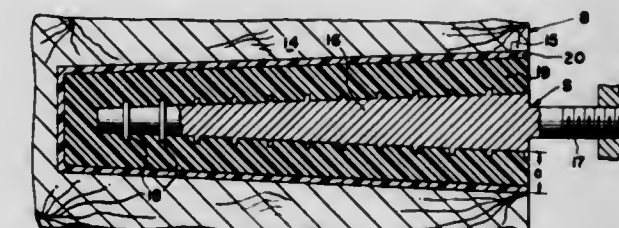
U.S. Cl. 156—242

12 Claims

1. A process for securing projecting metallic studs in fixed located position in composite structures such as the ends of elongate hollow windmill blades wherein the blades have

bonded synthetic plastic wood-resin composite bodies with an end plate formed by a block in which the studs are to be bonded, comprising the steps of:

- roughing frustoconical-shaped plug bodies of the studs while substantially protecting threaded ends projecting therefrom;
- casting frustoconical exothermically curing resin-hardener-filler sleeves of predetermined thickness around the plug body of each stud only, in a mold, while leaving the projecting threaded ends free of the resin;
- curing the sleeves in the mold to harden them and then removing the studs from the mold with the hardened sleeves encapsulating them;



d. forming a plurality of frustoconical stud receiving openings in a predetermined pattern, in the block following the general configuration of the blade perimeter;

- inserting the plug portions with encapsulated cured sleeves thereon into the openings and providing a more viscous coating of substantially lesser thickness than said sleeves of the same, or a compatible, resin between the internal walls of the openings and the sleeves;
- locating the sleeves and the plugs in fixtured positions in the openings to protrude the threaded ends in predetermined projected position and relatively spaced apart positions; and
- curing the coatings in situ with the release of insufficient heat to interfere with bonding of the coatings to both the sleeves and marginal walls of the openings.

4,420,355

**RIBBON APPLICATOR HEAD**

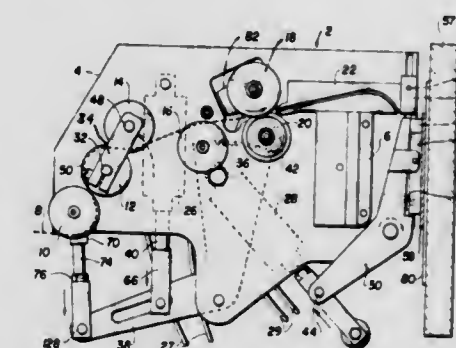
Walter Saur, Ditzingen, Fed. Rep. of Germany, assignor to Bedford Industries, Inc., Worthington, Minn. and Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 364,034

Int. Cl.<sup>3</sup> B32B 31/18, 35/00

U.S. Cl. 156—250

16 Claims



1. In an item processing machine having an adhering element, a supply of ribbon-like material and an applicator head for processing the ribbon-like material, wherein the applicator head includes:

- an activator means connected to control operation of the applicator head;  
a guide means for guiding the ribbon-like material;  
a blade means for cutting the ribbon-like material;  
an accumulating means connected to the activator means such that in a first state the accumulating means accumulates a pre-selected length of ribbon-like material, and



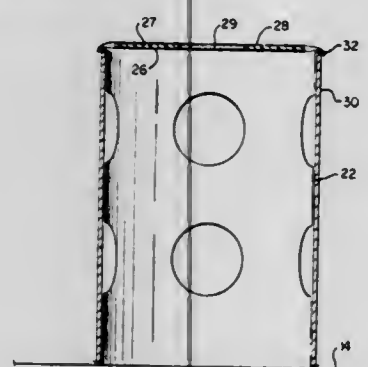
such that in a second state the accumulating means feeds the ribbon-like material to the guide means; an applying means positioned to receive the ribbon-like material from the guide means, and connected to the activator means to be activated by the activator means such that the applying means engages the blade means to cut the ribbon-like material and presents the ribbon-like material to the adhering element, which adheres the ribbon-like material to the item.

4,420,356

**FLOTATION MATTRESS AND METHOD**

Michael Carpenter, 227 Easton S., Laurel, Md. 20810  
Division of Ser. No. 16,175, Feb. 28, 1979, Pat. No. 4,325,152.  
This application Mar. 3, 1982, Ser. No. 354,438  
Int. Cl.<sup>3</sup> B29C 27/04; H05B 7/06  
U.S. Cl. 156—251

9 Claims



1. A method of manufacture of a flotation mattress having damping chambers disposed within the envelope comprising the steps of forming a cylinder of flexible liquid-impermeable sheet material having openings therein, placing the said cylinder of material inside a cylindrical mandrel of substantially the same outer profile as the said cylinder of material, placing the opposite edges of the opposing ends of said cylinder of material over the edges of said mandrel, placing a plurality of layers of an extent greater than the outer profile of the said cylinder of material over one end of said cylindrical mandrel, said plurality of layers having a buoyant material disposed between said layers, placing the said cylindrical mandrel on a bottom sheet of liquid-impermeable material, sealing one end of said cylinder of material to said bottom sheet and sealing said layers to the other end of said cylinder of material.

4,420,357

**APPARATUS AND METHOD FOR THE MANUFACTURE OF PARTICLEBOARD**

Harry Neubauer, Berndt Greten, and Günter Seeger, all of Springe, Fed. Rep. of Germany, assignors to Bison-Werke Bähre & Greten GmbH & Co. KG, Springe, Fed. Rep. of Germany

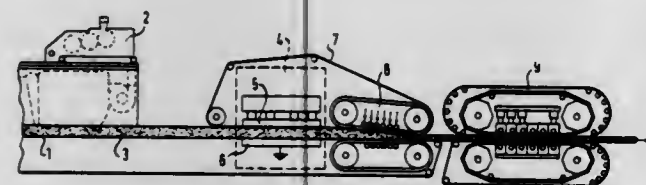
Filed Feb. 19, 1982, Ser. No. 350,552

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107589

Int. Cl.<sup>3</sup> B29C 19/02

U.S. Cl. 156—274.6

20 Claims



1. Apparatus for the continuous manufacture of boards from a mat of electrically poorly conducting material in the form of particles, fibers or the like, together with at least one heat hardenable binder dispersed therein, said apparatus comprising: at least one high frequency heating device having input

and output ends and mutually spaced upper and lower stationary electrode plates defining a working gap; means for adjusting said upper electrode plate in a vertical direction to adjust said working gap and thus the capacitance of said high frequency heating device; an endless conveyor band for transporting the mat through said working gap from said input end to said output end between said mutually spaced electrode plates; a retaining band extending through said working gap and intended, in operation, to lie on the upper side of said conveyor band and retain said material in position on said mat; wherein the mutual spacing of the electrode plates is substantially equal to or less than the thickness of the mat at said input end, so that said mat passes without an air gap through said working gap with said retaining band grazingly contacting said upper electrode plate, and with said conveyor band grazingly contacting said lower electrode plate, and wherein said electrode plates are adapted to facilitate relative sliding movement of said conveyor band and said retaining band thereover.

4,420,358

**APPARATUS FOR THE PRODUCTION OF A GLUED WOOD JOINT**

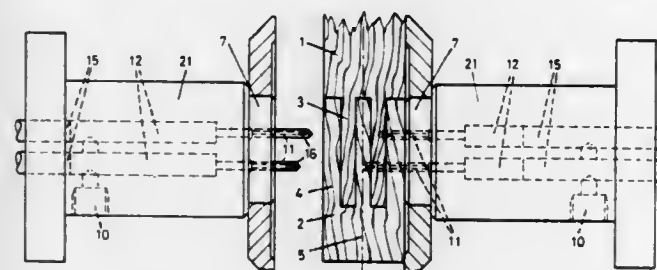
Emanuel Kindt, and Joachim Sautter, both of Otelfingen, Switzerland, assignors to E. Kindt AG, Otelfingen, Switzerland  
Filed Sep. 23, 1981, Ser. No. 304,888

Claims priority, application Switzerland, Sep. 25, 1980, 7193/80

Int. Cl.<sup>3</sup> B27G 11/00

U.S. Cl. 156—356

6 Claims



1. An apparatus for a glued wood joint having flat surfaces comprising: means for tightly holding together the flat surfaces to be glued; at least one injection needle which can be driven into the wood, said needle having a solid needle tip and a side outlet opening through which adhesive can be delivered; a primary hydraulic means for driving said needle into the wood up to a depth at which the side outlet opening of the needle comes into contact with the flat surfaces; the needle having an axis which extends transverse to a plane of the flat surfaces; means for delivering a precise amount of fluid adhesive through the needle under pressure to distribute the adhesive between the surfaces, and means for automatically controlling the primary hydraulic means for driving the needle into the wood and the means for delivering a precise amount of fluid adhesive through the needle.

4,420,359

**APPARATUS FOR PRODUCING FIBER-REINFORCED PLASTIC SHEET STRUCTURES**

William B. Goldsworthy, Rancho Palos Verdes, Calif., assignor to Goldsworthy Engineering, Inc., Torrance, Calif.

Filed Aug. 5, 1981, Ser. No. 290,358

Int. Cl.<sup>3</sup> B32B 35/00

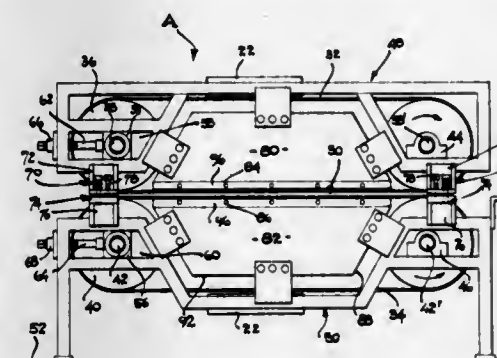
U.S. Cl. 156—379.8

53 Claims

1. Apparatus for producing a fiber reinforced plastic sheet laminate structure comprised of at least two laminable members, said apparatus comprising:

- (a) means for bringing a first laminable member comprised of fiber reinforcing material into incidental relationship with common relatively flat surfaces of endwise abutted relatively rigid second laminable members,
- (b) first and second continuous belts, each of said belts hav-

- ing a first surface and a second surface with the second surfaces of said belts having portions which are opposed and spaced apart from each other forming an opening there between for receiving said laminable members during movement of said members,
- (c) a pair of separate housings with each forming a plenum chamber and each chamber having a wall facing the first surface of each of said belts and located so that each one of said belts surrounds and moves around an individual one of said housings,
- (d) a continuous seal on said wall of each of said housings and extending toward the belt nearest that housing, said seals each having an end portion capable of engaging said first surface of said first and second belts in sliding engagement therewith to create a gas receiving area formed by said wall of each said housing and said belt surrounding that housing and said continuous seal on that housing,
- (e) aperture means in said wall of each said housing permitting passage of a gas under pressure to form a body of gas in said gas receiving area adjacent the wall of each housing



ing which bears against the first surface of said belts and urges said second surface of each of said belts into contact with said laminable members with relatively uniform pressure in said gas receiving areas to cause contact of opposed surfaces of said laminable members with relatively uniform pressure and thereby also enable a curing of a resin matrix impregnated in said reinforcing material and relatively uniform lamination of said laminable members, and

- (f) separate driving means in advance of said belts for forceably driving said laminable members through said apparatus and by pushing the laminable members through the opening between said belts without any driving force created by said belts so that the laminable members are forced through said opening and engage and impart a driving force to said belts, but which belts nevertheless apply a laminating pressure to the laminable members therebetween, and thereby also permitting the belts surrounding the associated housings to be essentially floatable about the associated housings.

4,420,360

**APPARATUS FOR THE INDUSTRIAL PRODUCTION OF FLOCK COATED ELECTRICAL WIRE**

Claude Batisse, Berck Plage, France, assignor to Flocord S.A., Luxembourg

Filed Jul. 1, 1981, Ser. No. 279,306

Claims priority, application France, Jul. 2, 1980, 80 14771; Jun. 4, 1981, 81 11103

Int. Cl.<sup>3</sup> H01B 13/16; B32B 33/00

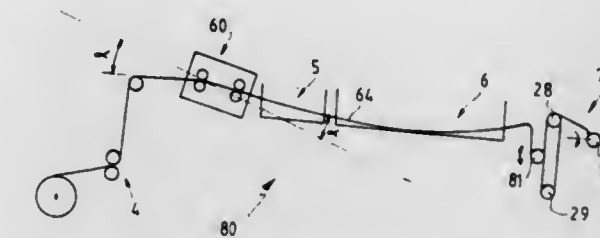
U.S. Cl. 156—390

7 Claims

1. Apparatus for producing electrical conducting wire having a coating of flock, comprising

- (a) first means for supporting the wire as the wire moves,
- (b) means for coating the wire with an adhesive as the wire moves,
- (c) means for depositing a coat of flock on the adhesive coated wire as the wire moves,

- (d) heating means for drying the flock coated wire as the wire moves,
- (e) means for cooling and brushing the flock coated wire as the wire moves,
- (f) second means for supporting the wire as the wire moves, the means specified in (b), (c), (d), and (e) above being



disposed between the first and second wire support means, and  
(g) means for controlling the movement of the wire between the first and second wire support means whereby the moving wire is maintained in the free unsupported state therebetween.

4,420,361

**APPARATUS FOR ALIGNING BENT GLASS SHEETS FOR ASSEMBLY INTO BENT GLASS SHEET SANDWICHES**

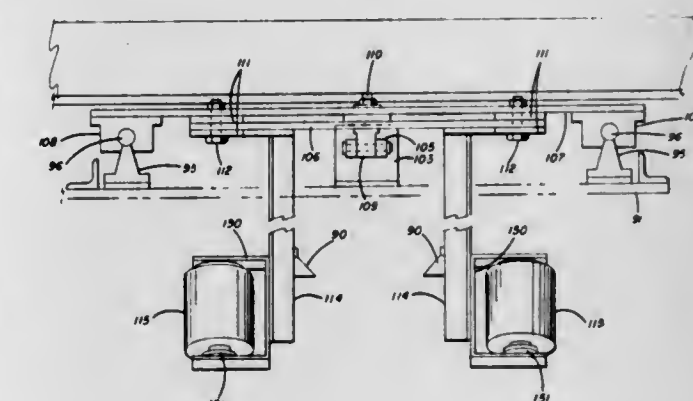
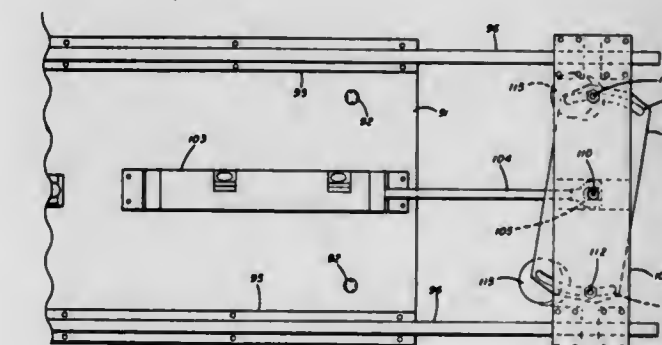
James L. Valimont, Cheswick, and Barry L. Shadle, Leechburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.  
Division of Ser. No. 287,608, Jul. 28, 1981, Pat. No. 4,367,107.

This application Sep. 17, 1982, Ser. No. 419,271

Int. Cl.<sup>3</sup> B32B 17/10, 17/04; B65H 29/24

U.S. Cl. 156—556

16 Claims



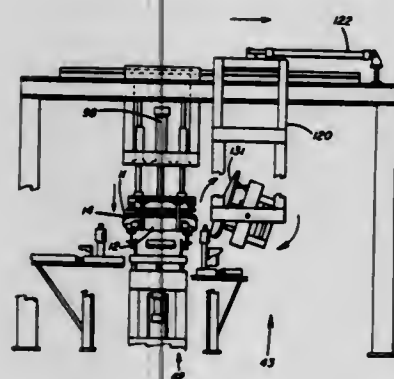
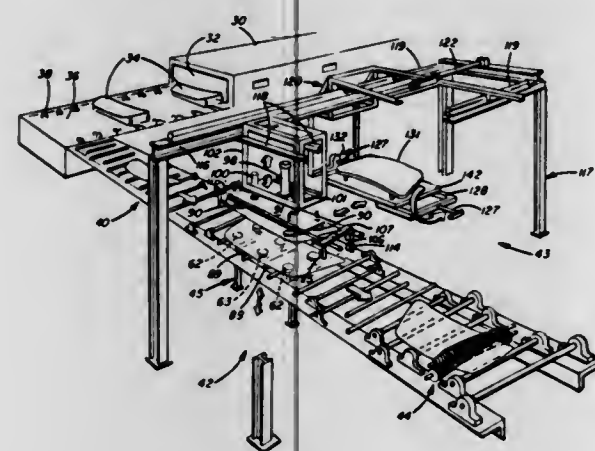
1. Apparatus for aligning and bonding a pair of bent glass sheets comprising an upper bent glass sheet and a lower bent glass sheet of matching concave elevational configuration at an assembly station comprising means for supporting said pair of bent glass sheets on a support at a lower level, means comprising a pair of transversely spaced, linear rotating rolls mounted for free rotation about oblique axes extending approximately parallel to the thickness of corresponding end edge surfaces adjacent thereto for engaging each of the opposite longitudinal end edge surfaces of said bent glass sheets at transversely



spaced portions at an upper level to align said glass sheets longitudinally of said assembly station, means including a pair of side edge aligning rolls for engaging each of the opposite side edges of said sheets at longitudinally spaced portions at a lower level to align said glass sheets transversely of said assembly station, means to retract said linear rotating rolls for disengaging said linear rotating rolls from engagement with said longitudinal end edge portions, a first set of vacuum cups, means to lift said first set of vacuum cups into position for lifting said bent glass sheets in unison from said support on said first set of vacuum cups while maintaining said side edge alignment rolls in engagement with said opposite side edge portions, a second set of vacuum cups, means to lower said second set of vacuum cups into position for engaging the top surface of the upper bent glass sheet of said pair with said second set of vacuum cups, means for applying vacuum to said cups to hold the engaged glass sheet surfaces thereagainst, means for separating said side edge alignment rolls from said side edges, means to separate said sets of vacuum cups from one another while applying vacuum thereto for separating said bent glass sheets in a direction of their thickness to form a gap between said glass sheets at said assembly station sufficiently wide for inserting a sheet of flexible interlayer material into said gap, means for inserting said sheet of flexible interlayer material into said gap into a position of alignment over said lower bent glass sheet and means urging said sets of vacuum cups toward one another for assembling said glass sheets to form a sandwich with said sheets of flexible interlayer material, and means to apply sufficient heat and pressure to laminate said sandwich.

4,420,362

**SHAPED MOLD AND A METHOD OF USING SAME TO ASSEMBLE SANDWICH OF A SHEET OF FLEXIBLE INTERLAYER MATERIAL WITH BENT GLASS SHEETS**  
James L. Valimont, Cheswick, and Hershel L. Phares, Apollo, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.  
Division of Ser. No. 287,607, Jul. 28, 1981, Pat. No. 4,366,013.  
This application Sep. 20, 1982, Ser. No. 420,441  
Int. Cl.<sup>3</sup> B32B 17/04, 17/10; B65H 29/24  
U.S. Cl. 156—563 7 Claims



1. Apparatus for assembling a sandwich comprising a pair of

bent glass sheets of matching curvature comprising an upper bent glass sheet and a lower bent glass sheet shaped to a concave elevational configuration and a flexible sheet of interlayer material therebetween or for assembling a subassembly comprising said lower bent glass sheet and said flexible sheet comprising an assembly station,

a vacuum mold having an apertured first wall having a curved configuration conforming to the elevational configuration of said bent glass sheets,

means to deliver said pair of bent glass sheets in said concave elevational configuration to a vertically extending space within said assembly station,

means to separate said bent glass sheets from one another to provide a gap between said bent glass sheets sufficiently large to permit entry of said vacuum mold between said bent glass sheets,

a mold loading station adjacent said assembly station, means to selectively apply vacuum to said vacuum mold, a carriage,

means at said mold loading station for pivotally supporting said vacuum mold relative to said carriage for movement between a first orientation wherein said first wall has an upwardly facing convex elevational configuration for facilitating mounting said flexible sheet of interlayer material thereon and a second orientation wherein said first wall has a downwardly facing concave elevational configuration and said flexible sheet is supported thereagainst by vacuum,

means to move said carriage from said mold loading station to said assembly station when said vacuum mold is at said second orientation, said carriage moving means being constructed and arranged to deliver said vacuum mold into a position within said gap and said vertically extending space in vertical alignment over said lower bent glass sheet,

means to move said vacuum mold in a downward vertical direction relative to said vertically extending space in alignment with said lower bent glass sheet to engage said flexible sheet against said lower bent glass sheet to form a subassembly.

4,420,363

**ONE-BATH ETCHING METHOD FOR PROCESSING GRAVURE PLATE, AND ETCHING CONDITION CALCULATING DEVICE**

Eiichi Tachibana, Toda, and Tetsuro Katsuta, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

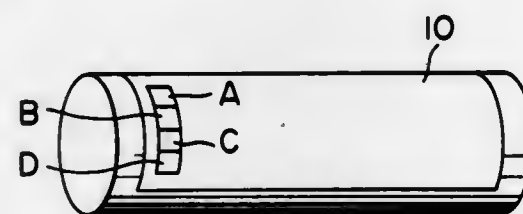
Filed Nov. 26, 1982, Ser. No. 444,517

Claims priority, application Japan, Dec. 4, 1981, 56-195354; Feb. 12, 1982, 57-20888

Int. Cl.<sup>3</sup> B41C 1/00

U.S. Cl. 156—627

5 Claims



1. A one-bath etching process in which, in forming gravure cells in the surface of a gravure cylinder by supplying an etching solution having a predetermined density, cell depths are controlled by varying the rotational speed of said cylinder; in which data on relations between inspecting solution permeation times of a resist layer on said cylinder and set cell depths are compared with reference data which include data on relationships between inspecting solution permeation times and

etching solution permeation times, with respect to the gradations of a testing gradation scale, of said resist layer and data on relationships between inspecting solution permeation times and cell depths with respect to the combinations of etching times and cylinder speeds, to obtain a total etching time and a cylinder speed before said etching solution is supplied, and thereafter said cylinder is etched according to said total etching time and cylinder speed thus obtained.

4,420,364

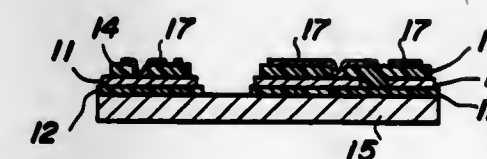
**HIGH-INSULATION MULTI-LAYER DEVICE FORMED ON A METAL SUBSTRATE**

Takashi Nukii, Nara; Shigeo Nakabu, Nara; Masaru Iwasaki, Izumisano, and Katsunobu Awane, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 42,951, May 29, 1982, which is a continuation of Ser. No. 847,912, Nov. 2, 1977, abandoned. This application May 19, 1982, Ser. No. 379,722

Claims priority, application Japan, Nov. 2, 1976, 51-132121; Mar. 24, 1977, 52-33064

Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06; C23F 1/02  
U.S. Cl. 156—631 3 Claims



1. A method for fabricating a multi-layer substrate comprising the steps of:

preparing a provisional supporting plate;  
forming bottom thin-film conductors on said provisional supporting plate in a desired pattern;  
attaching a high-insulation adhesive sheet to said provisional supporting plate so as to cover said bottom thin-film conductors;

half-curing said high-insulation adhesive sheet;  
separating said high-insulation adhesive sheet from said provisional supporting plate in such a manner that said bottom thin-film conductors are mounted on said high-insulation adhesive sheet;

disposing said separated high-insulation adhesive sheet on a metal plate in such a manner that said bottom thin-film conductors face outward;

disposing high-insulation organic film on said high-insulation adhesive sheet in such a manner that said high-insulation organic film covers said bottom thin-film conductors;  
curing said high-insulation adhesive sheet to tightly connect said high-insulation adhesive sheet to said metal plate and said high-insulation organic film; and  
forming top conductors on said high-insulation organic film.

4,420,365

**FORMATION OF PATTERNED FILM OVER SEMICONDUCTOR STRUCTURE**

William I. Lehrer, Los Altos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Mar. 14, 1983, Ser. No. 474,866

Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06

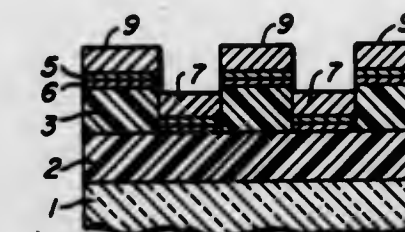
U.S. Cl. 156—643

10 Claims

1. A method of selectively removing portions of an etchable layer on a substrate according to a predetermined pattern, which method comprises:

(a) applying to said layer a first mask which is positive with respect to said pattern,  
(b) adhesively binding to said masked layer an agent catalytic to the reception of electroless metal deposition,  
(c) immersing said substrate in an electroless metal depositing bath and removing said first mask to form a second

mask of electrolessly deposited metal, which second mask is negative with respect to said pattern, and



(d) forming by plasma etching openings in said layer in the unmasked areas thereof.

4,420,366

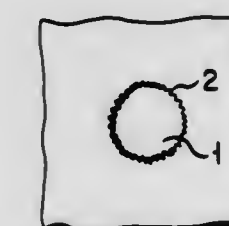
**METHOD FOR MANUFACTURING SHADOW MASK**  
Koichi Oka, Hiroshi Tanaka, and Makoto Harigae, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 24, 1983, Ser. No. 478,544

Claims priority, application Japan, Mar. 29, 1982, 57-48974  
Int. Cl.<sup>3</sup> C23F 1/02

U.S. Cl. 156—644

3 Claims



1. A method for manufacturing a shadow mask by spraying an Fe-Ni alloy sheet with a ferric chloride solution to form an aperture for passing an electron beam therethrough, wherein the ferric chloride solution is controlled to have a content of  $0.30 \pm 0.20\%$  by weight of free hydrochloric acid within a ferric chloride solution temperature range between  $40^\circ\text{C}$ . and  $70^\circ\text{C}$ ., to have a total amount of  $\text{Fe}^{++}$  ions and  $\text{Ni}^{++}$  ions of not more than  $15\%$  by weight, and to have a specific gravity which falls within a region bounded between a curve plotted according to a relation  $1.461 - (4.63 \times 10^{-4} \times T) - (1.96 \times 10^{-6} \times T^2)$  (where  $T$  is a ferric chloride solution temperature) and a curve plotted according to a relation  $1.552 + (7.79 \times 10^{-5} \times T) - (1.18 \times 10^{-5} \times T^2)$ .

4,420,367

**METHOD FOR ETCHING A RECRYSTALLIZED ALUMINUM FOIL FOR ELECTROLYTIC CAPACITORS**  
Günter Löcher, Nattheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,515

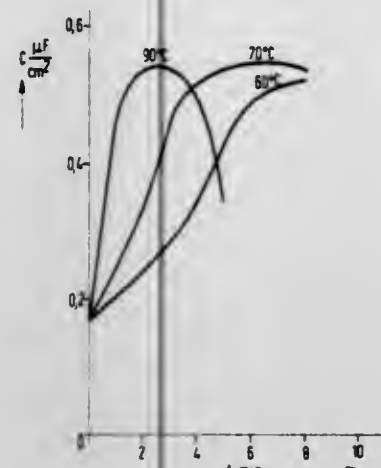
Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118151

Int. Cl.<sup>3</sup> B44C 1/22; C03C 15/00, 25/06; C23F 1/02  
U.S. Cl. 156—651 10 Claims

1. Method for etching a recrystallized aluminum foil for electrolytic capacitors which comprises subjecting the recrystallized aluminum foil in a first etching stage to electrolytic tunnel formation to form a tunnel structure in the aluminum,



and subsequently subjecting the aluminum foil with the tunnel structure from the first etching stage in at least one further



non-electrolytic etching stage in a solution free of halogen ions to effect tunnel enlargement by chemical etching.

4,420,368

## LATEX BINDERS FOR FIBROUS WEBS

John E. Drach, Montgomery County, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Jul. 24, 1981, Ser. No. 286,077

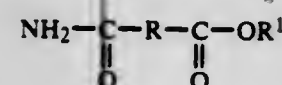
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> D21H 3/38

U.S. Cl. 162—8

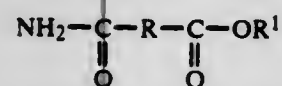
11 Claims

1. A cellulosic fibrous non-woven web wherein the cellulose fibers are chemically modified by a cross-linking reaction with a binder comprising a copolymer latex of a monomer which is a polymerizable half-acid, half-amide corresponding to the following general formula:



wherein R is a hydrocarbon chain containing a multiple bond capable of radical polymerization and R<sup>1</sup> is H and at least one other ethylenically unsaturated monomer.

10. In a papermaking process, the step of re-pulping a cellulosic fibrous web wherein the cellulose fibers are chemically modified by a cross-linking reaction with a binder comprising a copolymer latex of a monomer which is a polymerizable half-acid, half-amide corresponding to the following general formula:



wherein R is a hydrocarbon chain containing a multiple bond capable of radical polymerization and R<sup>1</sup> is H and at least one other ethylenically unsaturated monomer.

4,420,369

## PROCESS FOR THE DECOLORIZATION OF PULP MILL BLEACH PLANT EFFLUENT

David C. Eaton, Frederick, Md.; Thomas K. Kirk, Verona, Wis., and Hou-min Chang, Raleigh, N.C., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 25, 1982, Ser. No. 352,426

Int. Cl.<sup>3</sup> D21C 11/00

U.S. Cl. 162—29

10 Claims

1. A process for the decolorization of pulp mill bleach plant caustic extraction effluent comprising the steps wherein pulp

and paper mill sludge containing aluminum, iron and calcium in acid-soluble form is acidified to an extent sufficient to dissolve from said sludge aluminum cations in an amount of at least about 0.004 grams per liter of said effluent to be decolorized, ferric cations in an amount of at least about 0.007 grams per liter of said effluent to be decolorized, and calcium cations in an amount of at least about 0.086 grams per liter of said effluent to be decolorized; said acidified sludge is mixed with said effluent; the resultant mixture of said acidified sludge and said effluent is raised to at least neutral pH, thereby forming a precipitate containing at least part of the colored material from said effluent; and said precipitate is separated from the accompanying liquor.

4,420,370

## PULP AGITATING DEVICE AND METHOD HAVING MULTIPLE PROTRUDING INSERTS

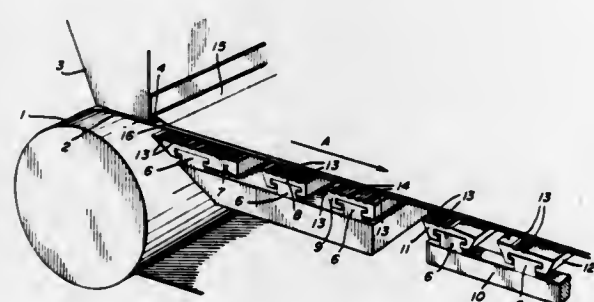
Nabil R. Saad, Kanata, Canada, assignor to JWI Ltd., Ontario, Canada

Filed Jul. 19, 1982, Ser. No. 399,344

Int. Cl.<sup>3</sup> D21F 1/54

U.S. Cl. 162—209

15 Claims



1. A pulp agitating device comprising a support member having a single upper surface, a plurality of slots in said upper surface, each said slot having retention means for holding a respective one of a plurality of inserts in sliding engagement therein, said inserts being closely spaced and disposed in parallel relationship to one another and extending in a cross-machine direction and protruding above said upper surface to form cross-machine channels therebetween, said support member being supported in contact with a moving endless forming fabric of a paper-making machine to induce micro-pressure pulses to said moving forming fabric whereby fibers are agitated in pulp suspension on said fabric to obtain better distribution of said fibers.

15. A method of agitating fibers in a pulp suspension in a moving endless forming fabric of a paper-making machine, said method comprising the steps of positioning a support element having a single upper surface having formed therein a plurality of slots provided with retention means for holding a respective one of a plurality of inserts in sliding engagement therein, positioning said inserts in said slots in closely spaced parallel relationship to one another and extending in a cross-machine direction and protruding above said upper surface to form cross-machine channels therebetween, displacing a surface of said forming fabric in contact with said inserts while supporting on an opposite surface said pulp suspension; inducing, by means of said channels, micro-pressure pulses to said moving forming fabric whereby fibers are agitated in said pulp suspension to obtain better distribution of said fibers.

4,420,371

## ENERGY ABSORBERS FOR VIBRATING HEADBOXES

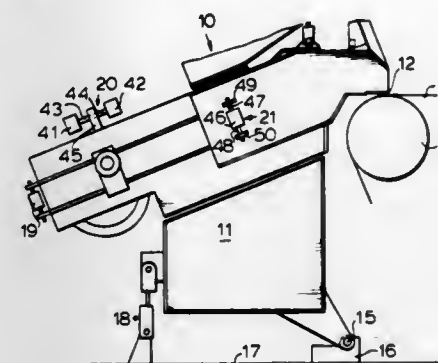
Carl B. Dahl, Rockton, Ill., and Jere W. Crouse, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed May 25, 1982, Ser. No. 381,899

Int. Cl.<sup>3</sup> D21F 1/02

U.S. Cl. 162—272

7 Claims



1. In a headbox assembly wherein a headbox is subject to extraneous vibrational energy from adjoining machinery or the like, the improvement which comprises:

at least one vibration absorber rigidly secured to said headbox in the plane of vibration of said extraneous vibration, said vibration absorber creating a node at said headbox to absorb vibrational energy transmitted thereto.

4,420,372

## HIGH BULK PAPERMAKING SYSTEM

Ronald E. Hostetler, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

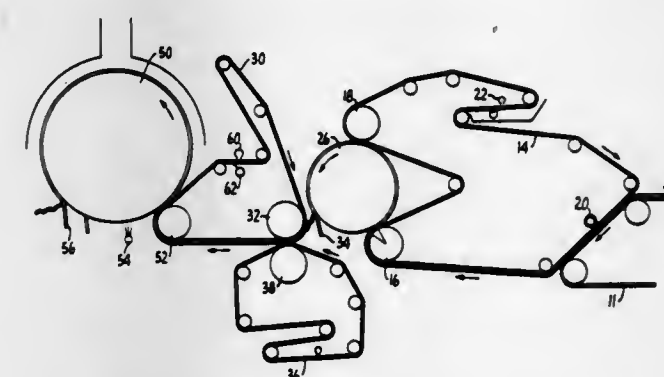
Division of Ser. No. 322,109, Nov. 16, 1981, Pat. No. 4,356,059.

This application Jul. 12, 1982, Ser. No. 396,994

Int. Cl.<sup>3</sup> B31F 1/12

U.S. Cl. 162—280

4 Claims



1. Apparatus for manufacturing a bulky, soft and absorbent paper web comprising:

first rotatable dryer means having a smooth heated surface; web delivery means defining a nip with said first dryer means and cooperable therewith to compact said web substantially overall and apply said web to said first dryer means surface;

web doctoring means for doctoring said web from said first dryer means surface;

a press means for receiving said web from said first drying means surface, said press means defined by a dewatering felt loop and an open mesh imprinting fabric loop formed of woven filaments having spaced compaction elements and defining voids between the filaments said compaction elements constitute at least about 5% of the total web supporting surface of said imprinting fabric; and

second rotatable dryer means having a smooth heated creping surface and web doctoring means for doctoring said web from said second dryer means surface, said imprinting fabric extending between said press and said creping surface of said second dryer means and defining a nip with the creping surface whereby said web is delivered from

said press to said creping surface in essentially undisturbed condition and applied to said creping surface.

4,420,373

## ENERGY CONVERSION METHOD AND SYSTEM

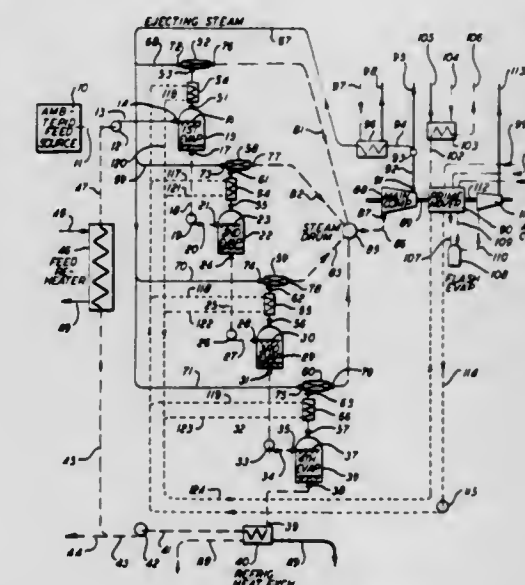
Dan Egosi, 7 Ben Gurion Blvd., Tel Aviv, Israel  
Division of Ser. No. 910,098, May 30, 1978, Pat. No. 4,282,070.

This application Aug. 3, 1981, Ser. No. 289,843

Int. Cl.<sup>3</sup> B01D 1/28; C02F 1/04; F22D 1/00

U.S. Cl. 202—173

14 Claims



1. A system for continuously generating usable heat energy, cooling capacity and pure water from an aqueous feed medium, the system including:

at least one evaporation chamber having an inlet for an aqueous feed medium at a predetermined initial temperature, an outlet for water vapor evaporated from the aqueous feed medium in the chamber, and an outlet for the cooled remainder of the aqueous feed medium as an eventual source of cooling capacity from the system;

mechanical compressor means having at least one inlet corresponding to said at least one evaporation chamber and coupled to the vapor outlet thereof for maintaining the chamber at a predetermined under-pressure below the boiling pressure of the aqueous feed medium at said initial temperature and for withdrawing the evaporated water vapor from the chamber, the compressor further having an outlet for the vapor compressed therein to a usable output enthalpy as a first source of output heat energy from the system and an eventual source of pure water;

engine means energized by fuel consumption for driving the mechanical compressor means; and means for utilizing the waste heat of the engine means to provide additional sources of output heat energy from the system, wherein said system comprises:

at least one steam ejector having an ejecting steam inlet, a vapor inlet connected to the vapor outlet of a corresponding evaporation chamber, and a combined ejecting steam-/evacuated vapor outlet connected to an inlet of the mechanical compressor means.

4,420,374

## WATER DEGASIFICATION AND DISTILLATION APPARATUS

John C. Ellis, Jr., 1084 Palmer Ave., Larchmont, N.Y. 10538

Filed Jun. 3, 1981, Ser. No. 269,880

Int. Cl.<sup>3</sup> B01D 3/02; C02F 1/04

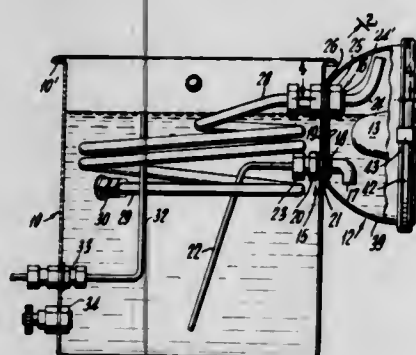
U.S. Cl. 202—176

3 Claims

1. Water degasification and distillation apparatus comprising



a container for holding water to be degasified and distilled, a condenser having an inlet and outlet within said container, a boiler including heating means, individual conduits coupling said boiler to the inlet of said condenser and to said container, said boiler being positioned relative to said container so that the water level in the container will periodically be the same as the water level in the boiler and will partially fill the boiler, and said heating means will generate steam within said boiler at a rate greater than the capability of said condenser to handle the generated steam thus periodically forcing water from the boiler to the container and interrupting the boiling each time water is displaced from the boiler, said boiler being affixed to the outer side of said container, said individual conduits includ-



ing a first conduit extending from said container into the lower portion of said boiler and a second conduit extending from the upper portion of said boiler into said container and coupled to the inlet side of said condenser, and said boiler is formed of two cooperating housing portions, a partition separating said housing portions and sealed to at least one of said housing portions and said heating means is carried by said partition and projects into said one housing portion and said first and second conduits communicating with said one housing portion with one of said conduits extending into said container for the circulation of water in said container to and from said boiler and the other of said conduits being connected to said condenser for condensing water vapor produced in said one housing portion by said heating means.

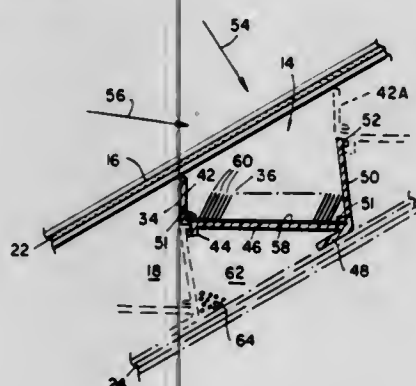
#### 4,420,375 SOLAR STILL

Frank D. Husson, 10414 Woodchuck Point, San Diego, Calif. 92131

Filed Aug. 28, 1981, Ser. No. 297,228  
Int. Cl.<sup>3</sup> B01D 1/00

U.S. Cl. 202-234

7 Claims



1. A solar still comprising: spaced, parallel sidewalls including channel means along the upper edges thereof; a plurality of interlocking, angled trays extending between said sidewalls at an angle whereby the bottoms of said trays are level when said still is placed at an angle for use; a heat absorber element in the bottom of each said tray, said absorber element comprising a bottom plate resting on the bottom of said tray and a plurality of upstanding, spaced,

parallel vanes, said absorber element being of a dark, heat-absorbing color; an upper wall connecting said sidewalls at the upper end; a lower wall connecting said sidewalls at the lower end; transparent plate means slidably engaging said channel means and forming a cover for said still, said plate means butting against said lower wall; and condensate collection means on the interior of said lower wall, whereby condensate coming off said cover plate onto said lower wall may flow by gravity out of said still.

#### 4,420,376

#### SEPARATION OF RESORCINOL FROM NON-EXTRACTABLE IMPURITIES

Ward J. Burkholder, Gonzales, La., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 23, 1982, Ser. No. 410,346  
Int. Cl.<sup>3</sup> B01D 3/38, 3/40; C07C 39/08

U.S. Cl. 203-29

7 Claims

1. In a process for the manufacture of resorcinol from a rearranged oxidation product of m-diisopropylbenzene in an acetone solution, the improvement which comprises neutralizing said rearranged product to a pH, measured as 10% by weight solution in acetone of the rearranged oxidation product, in the range of from about 4.5 to about 6.3, filtering said neutralized solution to remove any salts therefrom, adding toluene to said filtered solution in an amount to provide a weight ratio of said filtered solution to toluene of from about 4:1 to about 1:2, distilling said acetone from the mixture of filtered solution and toluene at reflux temperature, steam distilling said acetone-free rearranged product/toluene mixture at a bottoms temperature in the range of from about 130° C. to about 300° C., separating the aqueous resorcinol-containing phase from the toluene phase, and thereafter recovering the resorcinol from said aqueous phase.

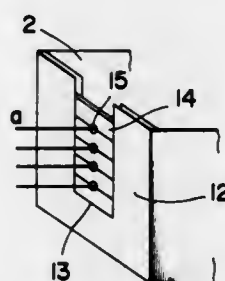
#### 4,420,377

METHOD FOR CONTINUOUSLY ELECTROPLATING WIRE OR THE LIKE AND APPARATUS THEREFOR  
Shoji Shiga; Akitoshi Suzuki; Yasuo Goma, and Kenji Kawada, all of Nikko, Japan, assignors to The Furukawa Electric Company, Ltd., Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,779  
Int. Cl.<sup>3</sup> C25D 7/06, 17/06

U.S. Cl. 204-28

14 Claims



1. A continuous electroplating method for wire, comprising the steps of providing at least one group of vertical, rotatable drums comprising two or more drums; connecting said drums to the cathode side of an electric power supply running a conductive wire between said drums spirally from the bottom toward the top in multiple stages; and passing said conductive wire repeatedly through an electrolyte of an electroplating electrolytic cell positioned between said drums; wherein back end of said electroplating electrolytic cell is provided with a vertically oriented slit to allow the passage of said conductive wire through the cell, each slit having a plurality of horizontally oriented weir plates that are placed one on top of the other within the slits at each end of the cell, said slits being substantially closed by said horizontally oriented weir plates; said weir plates having a vertical line of wire passage holes for

running said conductive wires in multiple stages through said cell, the holes being formed at joint surfaces between individual adjacent weir plates enclosing the wire circumference.

#### 4,420,378

#### METHOD FOR FORMING DECORATIVE COLORED STREAK PATTERNS ON THE SURFACE OF AN ALUMINUM SHAPED ARTICLE

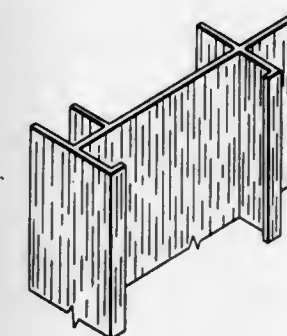
Masatake Tsuboi, Kurobe; Hatsuhiro Hirono, Nyuzen, and Kazuo Aikawa, Namerikawa, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,671

Claims priority, application Japan, Sep. 30, 1980, 55-136181  
Int. Cl.<sup>3</sup> C25D 11/20

U.S. Cl. 204-35 N

8 Claims



1. A method for forming decorative colored streak patterns on the surface of a shaped article of aluminum or an aluminum-based alloy by erosion which comprises the successive steps of (a) carrying out an anodic direct current electrolysis with the aluminum article having been previously provided with an anodically oxidized surface film as the anode in an electrolytic solution containing at least one kind of alkali metal ions or alkaline earth metal ions for a period of from 0.5 to 10 minutes, (b) thereafter carrying out a cathodic direct current electrolysis with the aluminum article as the cathode in an electrolytic solution of substantially the same composition as used in the anodic direct current electrolysis of the step (a) for period of from 5 to 20 minutes to form eroded streak patterns engraved in the surface of the aluminum article, (c) anodizing the surface of the aluminum article having been provided with the streak patterns in an electrolytic solution containing at least one inorganic or organic acid to form an anodically oxidized surface film thereon, and (d) subjecting the aluminum article provided with the anodically oxidized surface film to a coloring treatment.

#### 4,420,379

METHOD FOR THE FORMATION OF POLYCRYSTALLINE SILICON LAYERS, AND ITS APPLICATION IN THE MANUFACTURE OF A SELF-ALIGNED, NON PLANAR, MOS TRANSISTOR  
Eugene Tonnel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 16, 1980, Ser. No. 187,960

Claims priority, application France, Sep. 18, 1979, 79 23242  
Int. Cl.<sup>3</sup> C25D 11/32

U.S. Cl. 204-38 A

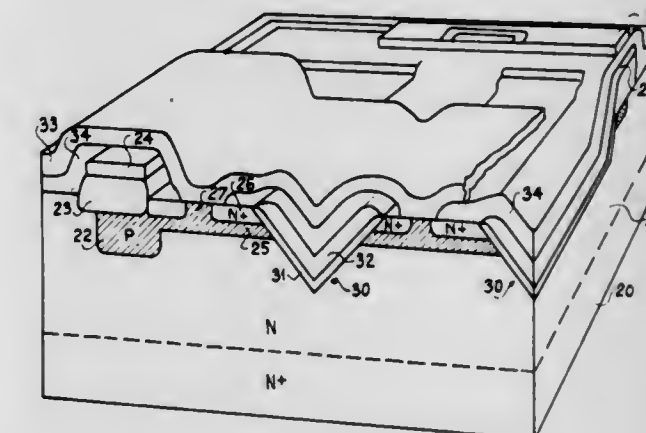
6 Claims

1. A method for the localized formation of polycrystalline silicon layers on silica covered zones of a silicon plate, comprising the following steps: depositing a substantially uniform layer of polycrystalline silicon on a first face of the plate having zones covered with silica, anodizing the plate by placing it in an acid bath that is an aqueous solution of 2 to 15% hydrofluoric acid and providing an electric current in this bath between a second face of the plate and an electrode placed in the bath to

remove the polycrystalline silicon from zones of the first face of the plate not covered with silica.

3. A method for manufacturing a non planar MOS transistor structure from a silicon plate, comprising the following successive steps:

- forming slots in the plate and covering them with a layer of silicon oxide,
- depositing a substantially uniform layer of polycrystalline silicon on a first face of the plate including the slots and anodizing the plate by placing it in an acid bath and



circulating a current in this bath between a second face of the plate and an electrode placed in the bath to remove the polycrystalline silicon from those areas of the plate not having a silicon oxide layer,

- successively implanting, diffusing and masking using the polycrystalline silicon formed on the silica as a limit to the implantation mask on one side and on the other of the slots to obtain a classical non planar MOS transistor structure, and
- applying metallizations and connections.

#### 4,420,380

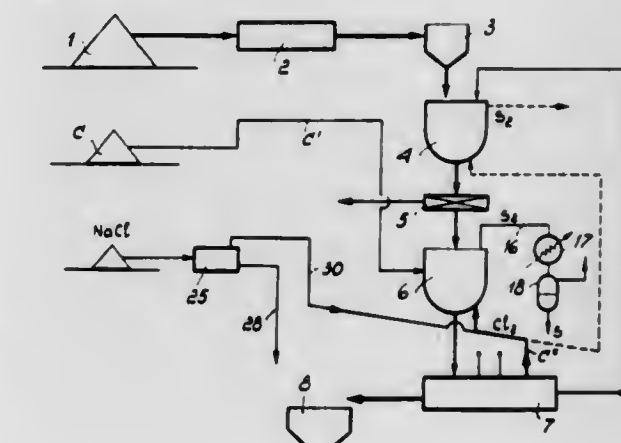
#### METHOD FOR EXTRACTING HEAVY METALS FROM SULPHURATED MINERAL CONCENTRATES

Umberto Ducati, Milan, Italy, assignor to Gianfranco Rambaldi, Concesio, Italy

Filed Mar. 9, 1981, Ser. No. 242,091  
Int. Cl.<sup>3</sup> C25C 3/00, 3/34

U.S. Cl. 204-66

9 Claims



1. A method for extracting heavy metals from mineral concentrates containing said heavy metals at least partly in sulphurated and at least partly in oxidized form, characterized in that it comprises the steps of dissolving said concentrates in a bath of molten alkali metal chlorides, or of a mixture of prevailing amount of said alkali metal chlorides with a lower amount of chlorides of said heavy metals, chlorinating the concentrates by injecting chlorine gas into the bath to which carbon has been added in an amount sufficient to prevent formation of sulphur dioxide, whereby vapors of pure sulphur are evolved



as by-product, said chlorination being carried out at a temperature in the range of from 450° to 650° C. and subjecting then the bath to electrolysis to separate said heavy metals to the cathode and chlorine to the anode.

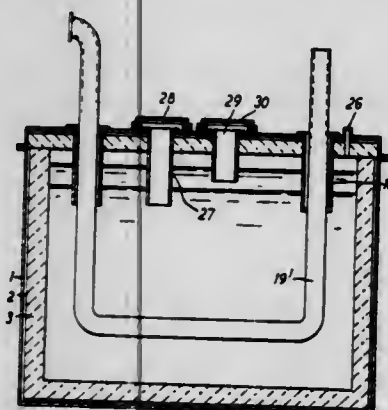
#### 4,420,381 ELECTROLYTIC METHOD AND CELL FOR METAL PRODUCTION

Olivo G. Silvillotti, Kingston, Canada, and Junkichi Iseki, Osaka, Japan, assignors to Alcan International Limited, Montreal, Calif.

Filed Feb. 8, 1982, Ser. No. 347,084  
Claims priority, application United Kingdom, Feb. 26, 1981, 8106040

Int. Cl.<sup>3</sup> C25C 3/00, 3/04, 7/06  
U.S. Cl. 204—70

10 Claims



small in relation to the radius of curvature of said cylindrical surface.

1. A method for the production of metal by electrolysis of a molten electrolyte, which is more dense than the metal, by passage of current between at least one vertically arranged anode and one vertically arranged cathode immersed in said electrolyte in an electrolysis chamber and conveying the product metal to a product collection chamber characterised in that

- (a) the molten metal is collected in the product collection chamber as a supernatant layer to shield the electrolyte from atmospheric moisture,
- (b) a thermally insulating cover is maintained over said molten metal to minimise heat loss from said molten metal,
- (c) an atmosphere effective for reducing oxidation of such metal to non-significant levels, is maintained over said molten metal,
- (d) the electrolyte temperature is held down to a desired value by passage of a heat exchange fluid through heat exchanger means in direct contact with the molten electrolyte.

#### 4,420,382 METHOD FOR CONTROLLING END EFFECT ON ANODES USED FOR CATHODIC PROTECTION AND OTHER APPLICATIONS

George Riedl, Pierrefonds, Canada, assignor to Alcan International Limited, Montreal, Canada

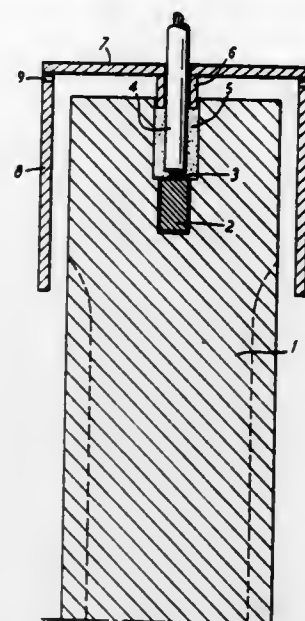
Filed Jan. 13, 1981, Ser. No. 224,803  
Claims priority, application United Kingdom, Jan. 18, 1980, 8001783

Int. Cl.<sup>3</sup> C23F 13/00  
U.S. Cl. 204—147

10 Claims

1. A method of improving the performance of a generally cylindrical anode having an insulated conductor electrically connected at one end thereof and being located within a surrounding body of corrosive medium which comprises placing a shield formed of electrically non-conducting material in said medium and around a minor portion of the length of the cylindrical surface of the anode and around said insulated conduc-

tor at said one end of said anode, said shield being spaced away from said cylindrical surface by a substantial distance which is



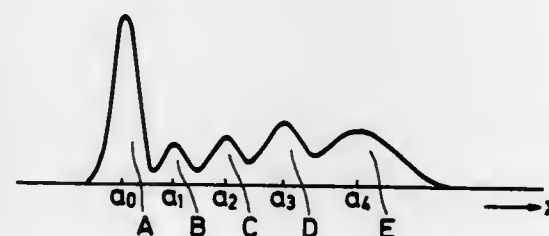
#### 4,420,383 FRACTIONATING METHOD IN ELECTROPHORESIS

Toshihide Fujiwara, Hachioji, and Shinichi Kamachi, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,495  
Claims priority, application Japan, Jul. 10, 1980, 55-94161; Jul. 10, 1980, 55-94162

Int. Cl.<sup>3</sup> G01N 27/26  
U.S. Cl. 204—180 G

5 Claims



1. A fractionating method in electrophoresis comprising a first step wherein points on an abscissa corresponding to peak tops and minimum points on a densitogram obtained by electrophoresizing a reference human serum sample are determined in advance by scanning the densitogram obtained by electrophoresizing said reference serum sample and are memorized as reference positions, a second step wherein said reference positions are made to correspond so as to have the same basic position on an abscissa of a densitogram obtained by electrophoresizing a human serum sample to be examined, a third step wherein the points on the abscissa corresponding to minimum points on the densitogram obtained by electrophoresizing said human serum sample to be examined are automatically compared with said reference positions corresponding to them and only the points on the abscissa corresponding to the minimum points nearest to said reference positions are treated as boundary points; and a fourth step wherein said reference positions are treated as boundary points when the points on the abscissa corresponding to the minimum points nearest to said reference positions are not present in said third step.

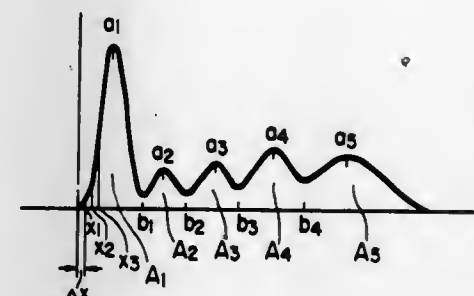
#### 4,420,384 METHOD FOR DETERMINING BOUNDARY POINTS ON ELECTROPHORETIC PATTERNS AND MEANS THEREFOR

Toshihide Fujiwara, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,537  
Claims priority, application Japan, Aug. 22, 1980, 55-115659  
Int. Cl.<sup>3</sup> G01N 27/26

U.S. Cl. 204—180 G

2 Claims



1. A method for determining boundary points on electrophoretic patterns, comprising a step wherein a densitogram is obtained from fractionated patterns formed by an electrophoresis, a step wherein the data obtained by sampling from said densitogram and the boundary point information determined on the basis of said data are memorized in a computer, and a step wherein the boundary point erasing or new boundary point setting information is put into said computer by a terminal device on the basis of an analogue pattern obtained from said fractionated patterns to alter the boundary point information memorized in said computer, a boundary point being put into said computer on the basis of an input distance information when the boundary point is to be added, and the boundary point being erased by putting the address number of the boundary point into said computer when the boundary point is to be erased.

#### 4,420,385 APPARATUS AND PROCESS FOR SPUTTER DEPOSITION OF REACTED THIN FILMS

Larry D. Hartsough, Berkeley, Calif., assignor to Gryphon Products, Hayward, Calif.

Filed Apr. 15, 1983, Ser. No. 485,556  
Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 R

12 Claims

1. A method of forming a thin reacted film of selected thickness on a substrate, said method comprising the steps of:

- (a) placing said substrate in the process chamber of a sputtering apparatus, said chamber having a sputtering zone and a separate reaction zone;
- (b) providing an inert atmosphere in said sputtering zone and a chemically reactive atmosphere in said reaction zone;
- (c) sputter depositing a layer of first material onto said substrate in said sputtering zone;
- (d) subsequently moving said substrate from said sputtering zone to said reaction zone; (e) retaining said substrate in said reaction zone for a residence time sufficient to convert said layer of first material to a reacted layer of second material; (f) returning said substrate to said sputtering zone; and
- (g) repeating steps (c) through (f) until a desired thickness of reacted film is formed on the substrate.

#### 4,420,386 METHOD FOR PURE ION PLATING USING MAGNETIC FIELDS

Gerald W. White, Dallas, Tex., assignor to White Engineering Corporation, Dallas, Tex.

Filed Apr. 22, 1983, Ser. No. 487,748  
Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 N

14 Claims

1. A method for ion plating a substrate within a chamber with a plating material comprising the steps of: evacuating said chamber; vaporizing plating material in the evacuated chamber; placing an electron saturated magnetic field adjacent the substrate for positive ionization of evaporant atoms of the vaporized plating material; and applying a negative bias on the substrate for attracting positive ions of the vaporized plating material.

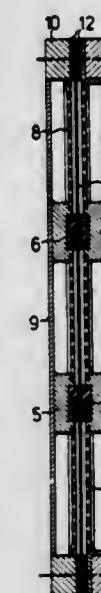
#### 4,420,387 ELECTROLYSIS APPARATUS

Dieter Bergner, Kurt Hannesen, both of Kelkheim; Wilfried Schulte, Hofheim am Taunus, and Peter Stelmets, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 129,179  
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909640

Int. Cl.<sup>3</sup> C25B 9/00, 11/06, 11/10, 13/08  
U.S. Cl. 204—263

9 Claims



1. In electrolysis apparatus for the manufacture of chlorine from an aqueous alkali metal halide solution, including at least one electrolytic cell having an anode, a cathode and a separating wall interposed between said anode and cathode; a housing formed of two shells for containing said anode, cathode and separating wall; means provided in said housing for feeding electrolysis starting materials therein and/or discharging the products of electrolysis therefrom; said shells having rims which, when the apparatus is assembled, clamp said separating wall therebetween; sealing elements positioned between said separating wall and the respective rims; and at least one pair of electrically non-conductive elements mechanically coupled to respective ones of said shells and having said separating wall disposed therebetween for establishing a spacing between said anode and cathode and a separation between said separating wall and each of said anode and cathode; the improvement wherein said anode and cathode both extend to the rims of said shells and are in mechanical and electrically conductive contact with respective ones of said rims; and electrically conductive spacer elements fixed to said shells and being in mechanical and electrical contact with respective ones of said anode and cathode.



# **4,420,388** HYDROTREATING VACUUM GAS OILS WITH CATALYST AND ADDED ORGANIC FLUORINE COMPOUND

Ralph J. Bertolacini, Naperville; James F. Mosby, Palos Heights, and John G. Schwartz, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.  
Filed Sep. 14, 1981, Ser. No. 301,754  
Int. Cl.<sup>3</sup> C10G 47/12

U.S. Cl. 208—112

7 Claims

1. The method of hydrotreating which comprises converting at least 20 percent by weight of a vacuum gas oil fraction boiling above 650° F. into products having a boiling point less than about 650° F. with a hydrodesulfurization catalyst comprising a Group VIB and Group VIII metal on a support consisting essentially of alumina wherein an organic fluorine compound is added to the vacuum gas oil during hydrotreating and the vacuum gas oil is hydrotreated under hydrogen at a temperature of at least 740° F.

**4,420,389**

## DE-ASHING LUBRICATING OILS

Alden E. Beckworth; Jerald A. Howell, and Donald C. Tabler, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.  
Filed Sep. 14, 1982, Ser. No. 417,937  
Int. Cl.<sup>3</sup> C10G 17/00, 9/12, 9/16; C10M 11/00

U.S. Cl. 208—251 R

9 Claims

1. In a process for the production of an essentially ash-free oil stock from a lubricating oil containing ash-forming components wherein the process comprises:

- contacting said lubricating oil with an aqueous solution of a treating agent comprising a suitable ammonium salt under conditions sufficient to dispense said agent in said lubricating oil and to react said agent with ash-forming components of said lubricating oil;
  - removing a major portion of the water from the mixture resulting from combining said aqueous solution and said lubricating oil;
  - heating at least a portion of the product resulting from step (b) in the temperature range of about 300° to about 420° C. for a period of time sufficient to increase the amount of ash-forming components that can be removed from the oil;
  - cooling the product from step (c) to a temperature in the range of about 100° to about 180° C.; and
  - separating solids from the product of step (d);
- the improvement comprising conducting step (c) by passing the oil from step (b) into a soaking vessel containing a large volume of said oil having a soaking temperature in the range of about 300° C. to about 420° C. before the oil from step (b) is heated to a temperature higher than 200° C. and passing portions of said large volume of oil through a heating coil wherein said oil is heated to a temperature in the range of 300° C. to 420° C. and recycled to said soaking vessel wherein the residence time for the oil in said soaking vessel is such that the fouling of the heating coil is less than it would be if the oil from step (b) were heated to the same temperature by being passed directly through the heating coil.

**4,420,390**

## MAGNETIC SEPARATOR FOR PARTICULATES

Ronald Carr, 23743 Research Dr., Farmington, Mich. 48024  
Filed Jan. 25, 1982, Ser. No. 342,154  
Int. Cl.<sup>3</sup> B03C 1/14

U.S. Cl. 209—216

13 Claims

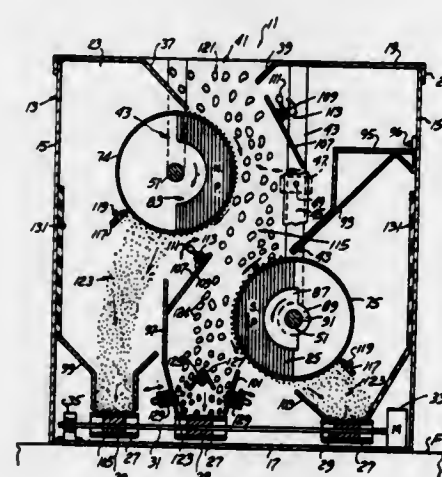
1. A magnetic separator for particulates containing prime material and ferrous particles comprising a housing of predetermined length having end walls, side walls of the same length, a bottom wall and a removable cover of the same length having a central throat inlet along the length thereof; a pair of parallel, vertically and laterally displaced hollow metallic rolls, each having spaced ends, rotatively

mounted and journaled upon said end walls and of a length extending substantially the length of said housing; an elongated permanent magnet of semi-cylindrical form non-rotatively mounted within each roll, said magnets being of opposite polarity, with their convex surfaces being opposed and arranged along the inner side of each roll;

a pair of elongated, vertically and laterally displaced adjustable flow control dampers extending along the length of said housing, pivotally mounted and supported between said end walls and defining with said inlet and rolls a vertical first flow path;

an elongated first hopper underlying said first flow path extending the length of said housing and having a constricted underlying outlet;

a first conveyor within said housing along its length underlying said first hopper and having spaced ends projecting outwardly of said end walls for delivering prime material outwardly of said housing;



second and third hoppers within said housing along its length spaced from opposite sides of said first hopper underlying said rolls respectively, each hopper having spaced ends and a constricted underlying outlet; the ferrous particles adhering to said rolls respectively and successively dropping into said second and third hoppers respectively;

and corresponding second and third conveyors within said housing along its length underlying said second and third hoppers respectively and projecting outwardly of said end walls for delivering ferrous particles outwardly of said housing;

said rolls being rotatable relative to said magnets, whereby the magnetic attractive force is continuously applied to ferrous particles within said particulates in said first flow path;

said ferrous particles adhering to said rolls until the corresponding roll surface has moved away from the magnets, releasing said ferrous particles to fall by gravity into the second and third hoppers respectively.

**4,420,391**

## SCREEN TENSIONING ARRANGEMENT

Martin J. Sharki, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.  
Filed Oct. 13, 1981, Ser. No. 310,007  
Int. Cl.<sup>3</sup> B07B 1/49

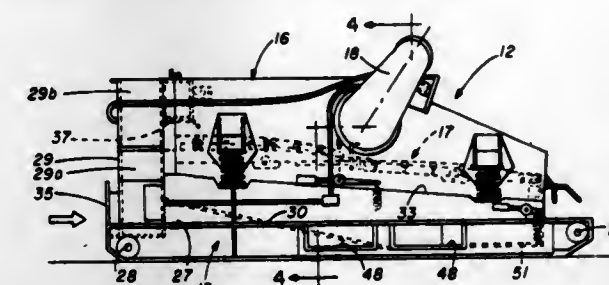
U.S. Cl. 209—403

4 Claims

1. In a vibrating screen of the type including a base, a screen box resiliently supported on the base and having a feed end and a discharge end longitudinally spaced from the feed end, screen means removably secured to said screen box and extending longitudinally, drive means including a rotating eccentric weight vibrator attached to said screen box for vibrating said screen means in a generally longitudinal direction, said

vibrating screen means been used for fine screening of solids from a slurry containing solids, the improvement which comprises:

said screen means including at least two overlying layers of relatively fine mesh screen cloth; and



tension means connected to the ends of said overlying layers of screen cloth for tensioning said overlying layers of screen cloth in a longitudinal direction parallel to the direction of motion of said screen whereby relative longitudinal motion between said overlying layers of screen cloth is substantially eliminated.

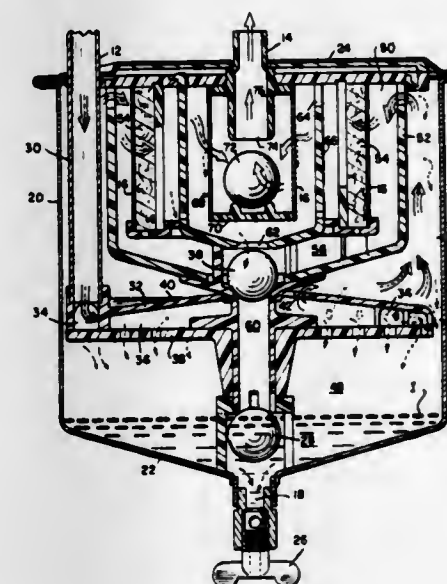
**4,420,392**

## FUEL-WATER SEPARATOR WITH FLOW-REDUCTION FEATURE

Robert S. Harris, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.  
Continuation-in-part of Ser. No. 241,076, Mar. 6, 1981, Pat. No. 4,384,962. This application Mar. 4, 1982, Ser. No. 354,813  
Int. Cl.<sup>3</sup> B01D 21/26

U.S. Cl. 210—86

10 Claims



1. A fuel-water separator comprising a container, an inlet to and an outlet from the container, the inlet and outlet being connectable in a fuel line supplying an engine, a pair of passages leading to the outlet, a first of which is much larger than the second, means inside said container defining a progression of spaces through which the fuel moves from the inlet to the outlet, said space-defining means being disposed in said container to direct the fuel through a series of downwardly and upwardly directed paths as it moves through said spaces to cause the higher density water to move downwardly while the lower density fuel moves upwardly, said space-defining means further defining openings in the lower portions of said spaces through which the separated water drains downwardly, first valve means for closing at least one of said openings to control the fuel and water movement, and

second valve means actuable by a predetermined amount of water in the container for closing said larger passage whereby only restricted operation of said engine is permit-

ted by virtue of the fuel flow rate through said smaller passage.

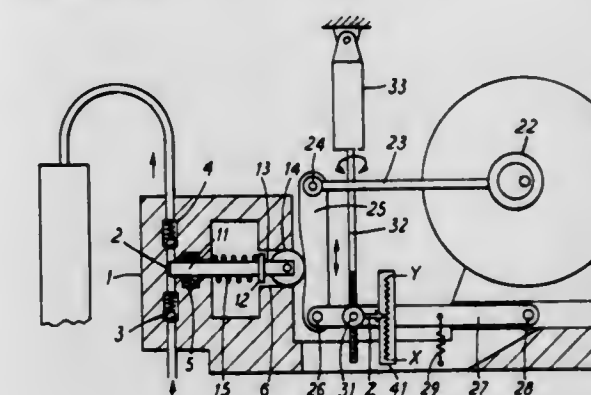
**4,420,393**

## PUMP FOR LIQUID CHROMATOGRAPHY AND A CHROMATOGRAPH INCLUDING THE PUMP

Sydney W. Smith, Hitchin, England, assignor to Applied Chromatograph Systems Limited, Luton, England  
Filed Nov. 6, 1981, Ser. No. 318,819  
Int. Cl.<sup>3</sup> B01D 15/08

U.S. Cl. 210—101

7 Claims



1. A liquid chromatograph comprising a pump having a single pump unit including a single chamber, a valve-controlled inlet, a valve-controlled outlet, a single reciprocating element arranged for reciprocating movement within said chamber, and varying means for varying the length of stroke of said reciprocating element, said pump further comprising a constant-speed driving means for driving said pump unit via said varying means and for effecting reciprocating movement of said reciprocating element at a constant frequency between 5 and 100 strokes per second and including a chromatography column having an inlet connected by a pipe, without any pulse damper, to the outlet of said pump, and monitoring means for monitoring said varying means to thereby provide information on the length of the stroke of said reciprocating element and thus the delivery of said pump.

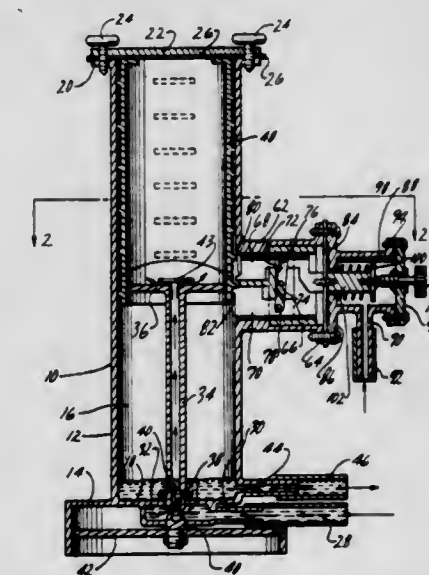
**4,420,394**

## SOLID GRANULAR CHLORINE DISPENSER FOR SWIMMING POOLS

Kenneth Lewis, 11201 S. Garfield, South Gate, Calif. 90280  
Continuation-in-part of Ser. No. 205,589, Nov. 10, 1980, abandoned. This application Nov. 6, 1981, Ser. No. 318,954  
Int. Cl.<sup>3</sup> E04H 3/20

U.S. Cl. 210—169

24 Claims



1. Apparatus for dissolving highly soluble chlorine com-



pound granules into a pool or the like in which a pump periodically operates to circulate water from the pool through a filter and back to the pool, the apparatus comprising:

a housing, means defining the side walls of a vertical chamber within the housing for receiving the chlorine compound granules, means providing a bottom surface in the chamber for initially supporting the chlorine compound granules when they are poured into the chamber, means directing a flow of water over said bottom surface in the chamber for wetting and dissolving the lowermost granules in the chamber adjacent the bottom surface, the wetted granules immediately above the surface of the water expanding against the sides of the chamber and forming a bridge supporting the still dry granules in the upper portion of the chamber, and means for adjusting the vertical level of the bottom surface upwardly relative to the side walls of the chamber to raise the level of the water flowing across said surface in relation to said vertical chamber to bring the water into contact with the under surface of said bridge formed by the undissolved chlorine granules within the chamber, said means for adjusting the vertical level of the bottom surface in relation to said vertical chamber including means responsive to cycling the pump off and on for adjusting the position of the bottom surface relative to the vertical chamber by a predetermined incremental amount with each off-on cycle of the pump.

4,420,395

## BLOOD PURIFICATION DEVICE

Masao Tanihara; Toshihide Nakashima, both of Kurashiki, and Koichi Takakura, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

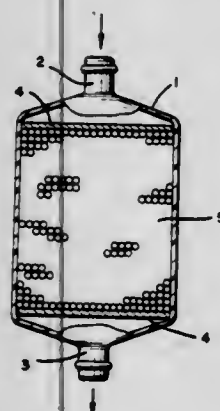
Filed Jul. 7, 1982, Ser. No. 395,975

Claims priority, application Japan, Jul. 10, 1981, 56-108670

Int. Cl.<sup>3</sup> B01D 39/06

U.S. Cl. 210-263

13 Claims



1. A blood purification device which comprises an adsorbent layer of packed, substantially spherical, porous granules made of a material selected from the group consisting of porous glass, porous silica, and porous silica-alumina and having at least 0.1 μmole/m<sup>2</sup> of the silanol group on the surface thereof, a blood inlet and a blood outlet.

4,420,396

## FILTER DEVICE FOR FUEL TANK

Kiyokazu Yamamoto, Fujisawa; Ko Hiratsuka, Chigasaki; Toshie Tanaka, Machida, and Shigeyuki Iwasaki, Machida, all of Japan, assignors to Nifco Inc. and Jidosha Denki Kogyo Kabushiki Kaisha, both of Yokohama, Japan

Filed May 4, 1982, Ser. No. 374,782

Claims priority, application Japan, May 8, 1981, 56-68205

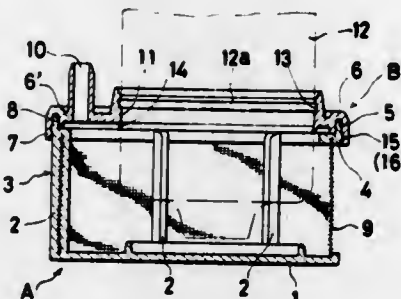
Int. Cl.<sup>3</sup> B01D 27/04, 35/02

U.S. Cl. 210-416.4

28 Claims

1. In a filter device for a fuel tank, comprising an upper wall formed integrally with, or admitting therethrough, a tubular member so as to support in position said tubular member, a bottom wall spaced from said upper wall, and a cylindrical

wall consisting of a plurality of circumferentially spaced columns serving to support in position a mesh encircling a space intervening between said upper wall and said bottom wall, said cylindrical wall and either said upper wall or said bottom wall being molded of a plastic material in one integral part, the remaining bottom wall or upper wall being molded of a plastic material in one separate part, and said separate part being fixed to the free end of said cylindrical wall of said one integral part, the improvement which comprises an inner fitting peripheral wall surface provided on either the free end of said cylindrical



wall of said one integral part or said separate part, an outer fitting peripheral wall surface provided on the alternative, a continuous protuberance formed in a circumferential direction on one of said two peripheral wall surfaces, a continuous recess formed in a circumferential direction on the other peripheral wall surface, the part containing said outer fitting peripheral wall surface being formed of a plastic material having a relatively small rate of dimensional change, and the part containing said inner fitting peripheral wall surface being formed of a plastic material having a relatively large rate of dimensional change.

4,420,397

## METHOD OF TREATING WASTE LIQUORS CONTAINING PHENOL

Yasuyuki Kaneko, Nagoya; Masao Itoh, Anjo, and Shinji Takahashi, Chigasaki, all of Japan, assignors to Nagoya University, Nagoya, Japan

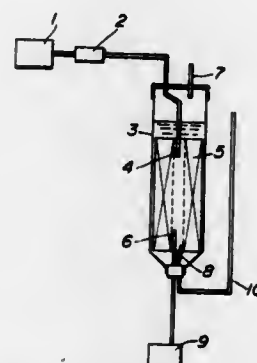
Filed Dec. 17, 1981, Ser. No. 331,808

Claims priority, application Japan, Dec. 19, 1980, 55-180020; Dec. 23, 1980, 55-182318

Int. Cl.<sup>3</sup> C02F 3/34; C12N 1/14; C12R 1/645

U.S. Cl. 210-611

23 Claims



1. A method of treating a waste liquor containing phenol, comprising:

pure-culturing a fungus of *Aureobasidium* sp. No. 14, FERM BP-1 on a support soaked with a preculture medium to produce mold-supports masses, said support being selected from the group consisting of fibrous materials and porous materials;

culturing the thus obtained mold-supports masses on said support in a waste liquor containing about 1,200 ppm or less of cyanide and about 3,000 ppm or less of phenol under aeration in a treating tank set with a filling skeleton

having a network structure at a temperature of about 20°-40° C. and a pH of about 3-9; decomposing and assimilating phenol in the waste liquor in said treating tank by the oxidizing activity of said fungus under aeration; culturing said fungus in the waste liquor in the treating tank under aeration so as to produce a large mold-hyphal-supports masses; and removing the fungal cells from the treated waste liquor.

4,420,398

## FILTRATION METHOD FOR CELL PRODUCED ANTIVIRAL SUBSTANCES

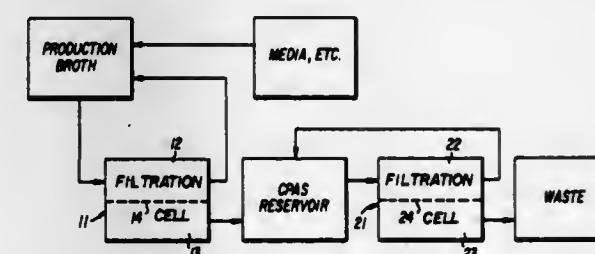
Franco Castino, Sudbury, Mass., assignor to American National Red Cross, Washington, D.C.

Filed Aug. 13, 1981, Ser. No. 292,582

Int. Cl.<sup>3</sup> B01D 13/00, 31/00

U.S. Cl. 210-641

24 Claims



1. A separation method for extracting Cell-Produced-Antiviral-Substances (CPAS) from a production broth containing the living cells which produce the CPAS consisting essentially of:

subjecting said broth and said living cells to a non-dead-end membrane filtration wherein the broth and said living cells are perfused into a first filtration cell and caused to flow across an ultra-filtration membrane in said cell which membrane has a nominal molecular weight cut-off of from twice to about five times the maximum molecular weight of the CPAS,

permitting a first filtrate to pass through said membrane consisting essentially of CPAS and some molecular species,

retaining in a first retentate all remaining portions of said broth, and wherein a diafiltration process is afforded by a partially-closed cycle continuous or semicontinuous flow, in which said first filtrate removed from the broth is replaced with an equal volume of media, thus maintaining a constant suspension volume throughout the process, and said first retentate is cycled back to the broth.

4,420,399

## QUATERNARY AMINOMETHYL PHOSPHONATES AS SCALE INHIBITORS

Derek Redmore, Webster Groves, MO, assignor to Petrolite Corporation, St. Louis, Mo.

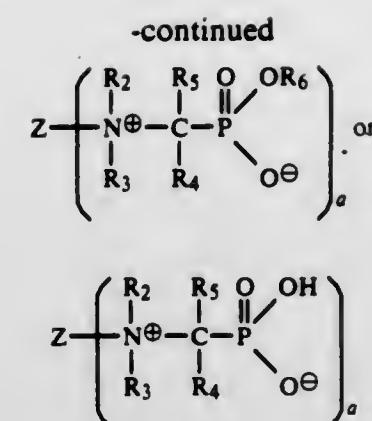
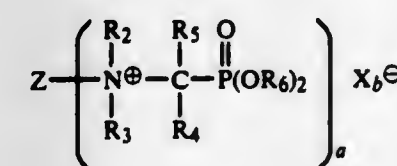
Continuation-in-part of Ser. No. 898,250, Apr. 20, 1978, abandoned, Continuation of Ser. No. 409,875, Oct. 26, 1973, abandoned. This application May 28, 1982, Ser. No. 382,870

Int. Cl.<sup>3</sup> C02F 5/14

U.S. Cl. 210-700

12 Claims

1. A process of inhibiting scale which comprises treating an aqueous system with scale inhibiting amounts of a quaternary aminophosphonate having the general formula



where Z is alkylene, alkyl, alkenyl, aryl or aralkyl, R<sub>2</sub> and R<sub>3</sub> are alkyl, alkenyl, aryl, or aralkyl, R<sub>4</sub> and R<sub>5</sub> are hydrogen or alkyl, R<sub>6</sub> is alkyl having 1 to 4 carbon atoms, a is 1 or 2 and b is 1 or 2, with the proviso that when Z is alkylene, a and b are 2 and when Z is alkyl, alkenyl, aryl or aralkyl a and b are 1, with the further proviso that Z and R<sub>2</sub> may be joined to form a cyclic group and X is an anion.

4,420,400

## HYDROCARBON PRODUCTS DAMAGE CONTROL SYSTEMS

William Weitzen, Bethesda, Md., assignor to General Technology Applications, Inc., Reston, Va.

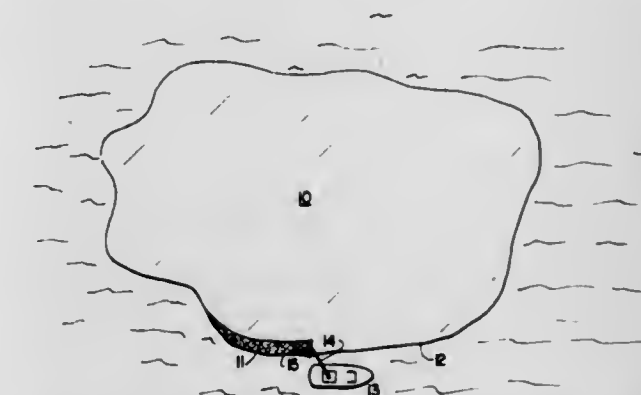
Continuation-in-part of Ser. No. 156,626, Jun. 5, 1980, abandoned. This application Jan. 22, 1982, Ser. No. 341,617

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C02C 1/22, 1/54

U.S. Cl. 210-710

23 Claims



1. A method for bodying spilled liquid hydrocarbons which comprises dissolving sufficient polymer therein to form a non-flowing material of semi-solid to solid consistency by contacting said spilled hydrocarbons with a slurry of cryogenically comminuted polymer particles in a liquid cryogenic refrigerant.

15. A method for recovering spilled crude oil which comprises dissolving a polymer in said spilled oil by contacting said spilled oil with a slurry of cryogenically comminuted polymer particles in liquid nitrogen, said polymer displaying solubility in said crude oil and being heat decomposable, in an amount sufficient to convert said crude oil to a thickened, semi-solid to solid state, collecting said solidified oil and thereafter heating said solidified oil to a temperature whereat said polymer decomposes and said oil reverts to liquid form.



4,420,401

## SOLUTION WASTE TREATMENT

George A. Kretas, Everett, and Irving R. Ireland, Newton Lower Falls, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

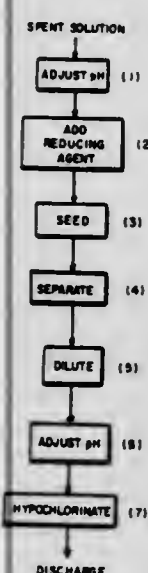
Division of Ser. No. 101,637, Oct. 14, 1979, which is a division of Ser. No. 40,954, May 21, 1979, Pat. No. 4,260,493. This application Jun. 22, 1981, Ser. No. 275,856

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C02F 1/52, 1/70

U.S. Cl. 210—714

7 Claims



1. A process for removing dissolved metal from spent copper or nickel plating solutions containing a dissolved metal selected from the group of nickel and copper ions, and active complexing agent, said process comprising the steps of rendering said solution an electroless metal plating solution by adjusting the pH of the solution and adding a reducing agent to the solution in an amount sufficient to cause plate-out of the dissolved metal in solution and contacting the solution with a seeder for a time sufficient to plate substantially all of said metal from solution onto said seeder, said seeder comprising a particulate material of large surface area having a colloidal noble metal catalytic to deposition of the dissolved metal in solution absorbed on its surface, said particulate material with said absorbed colloidal noble metal having a thin layer of metal over at least 50 percent of its surface, said thin layer of metal being selected from the group of copper and nickel and being copper when said spent metal plating solution is a copper plating solution and being nickel when said spent plating solution is a nickel plating solution and separating said seeder from said plating solution.

4,420,402

## METHOD AND APPARATUS WITH COUCH PRESS FOR DEWATERING A SLURRY OF FINE PARTICLES

Joseph A. Bolton, Queensbury, and Louis L. Dufresne, Glens Falls, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,084

Int. Cl.<sup>3</sup> B01D 37/00

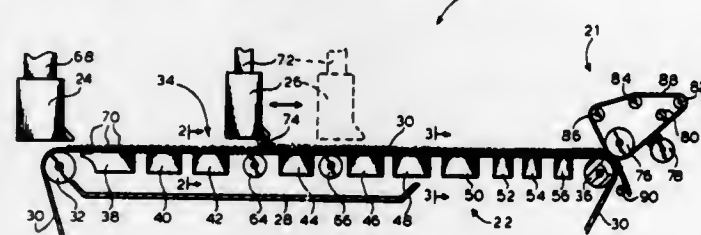
U.S. Cl. 210—783

18 Claims

1. An apparatus for dewatering a slurry of particles comprising: forming fabric; means for driving said forming fabric with said means being sized; primary headbox being sized for feeding a first slurry of particles at a predetermined rate onto the forming fabric; secondary headbox being sized for feeding a second slurry of particles at a predetermined rate onto the first slurry of particles deposited on the forming fabric; suction means being sized and positioned so as to provide a vacuum on forming fabric passing thereby; said forming fabric being of sufficient porosity and said suction means providing sufficient vacuum so as to allow dewatering of the first and second slurry of particles on the forming fabric by the suction means; said

means for driving said forming fabric drives at a rate sufficient to provide a mat of essentially only two discrete layers on the forming fabric; and a couch press receiving said mat for further dewatering thereof.

10. A method for dewatering a slurry of particles comprising: providing a primary headbox, secondary headbox, suction means, forming fabric of preselected porosity, means for driving the forming fabric, and a couch press; feeding a first slurry of particles at a first rate from the primary headbox onto the



forming fabric; feeding a second slurry of particles at a second rate from a secondary headbox onto the first slurry of particles; creating a sufficient vacuum on the first and second slurry of particles through the forming fabric by the suction means to cause dewatering of the first and second slurries thereon; driving said forming fabric at a fourth rate of speed by the driving means; said first, second, third and fourth rates of speed being sufficient so as to provide a mat of essentially only two discrete layers; and directing said mat to the couch press for further dewatering thereof.

4,420,403

## FILTER MODULE

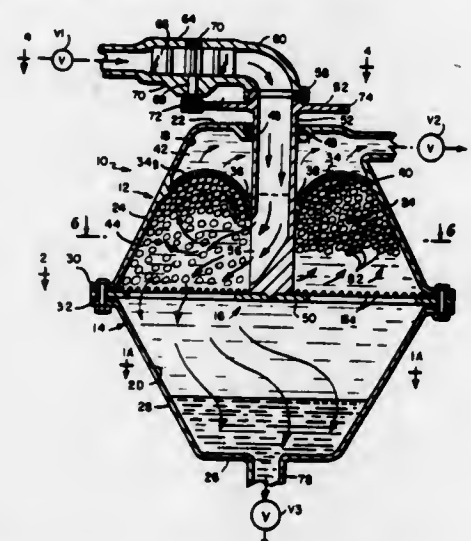
Wesley M. Tufts, Holliston, Mass., assignor to Control Fluidics, Inc., West Bridgewater, Mass.

Filed Aug. 2, 1982, Ser. No. 404,635

Int. Cl.<sup>3</sup> B01D 23/10, 33/18

U.S. Cl. 210—787

28 Claims



25. A filter module comprising means defining a chamber having facing upper and lower frustoconical portions defining upper and lower chambers, a reticulated partition positioned diametrically of the chamber at the junction of the upper and lower chambers dividing the module symmetrically, a rotor, a bearing at the top of the module and a bearing at the center of the reticulated partition rotatably supporting the rotor, an annular reticulated partition positioned about the rotor between the top of the upper chamber and the bottom thereof, the partition dividing the upper chamber into a discharge chamber at the top and a filter chamber therebelow, a plurality of discrete bodies within said filter chamber, said partitions containing a plurality of circular holes and a plurality of elongate slots too small to prevent passage of the discrete bodies but large enough to permit filtrate to pass through and said

rotor defining an axial passage, one end of which is positioned at the top of the module externally thereof and the other end of which enters the chamber between the partitions, means at the top of the module for drawing off filtrate, means at the bottom of the module for drawing off solids, a drive member fixed to the rotor and means mounted to the module for drivably driving the drive member and, hence, effecting rotation of the rotor.

4,420,404

## PROCESS FOR DEWATERING FINE GRANULAR MATERIALS

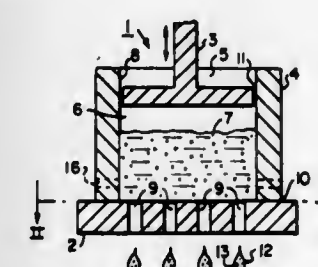
David W. Coate, and Joseph G. Selmeczi, both of Pittsburgh, Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 226,691, Jan. 21, 1981, abandoned. This application Dec. 14, 1981, Ser. No. 330,227

Int. Cl.<sup>3</sup> B01D 33/00

U.S. Cl. 210—808

4 Claims



1. A process for the dewatering of fine granular material and producing a coarse puck product comprising:

loading the fine granular material into an enclosed compression chamber having a drainage opening therein which is open and forms a non-tortuous path leading from the compression chamber, and wherein said granular material has a particle size one to five times smaller than the width of said drainage opening; and

applying a compressive force against the material thereby initially expressing fluid and material from the compression chamber via the non-tortuous path through the drainage opening until the intergranular friction of the particles of the material is increased so that material fluidization ceases allowing agglomeration of the material to occur and bridging of the drainage opening to take place thereby forming a coarse puck product.

4,420,405

## WATER BASED DRILLING MUD ADDITIVE

Jack L. McCrary, Lafayette, La., assignor to Icarus, Inc., Lafayette, La.

Filed Aug. 10, 1981, Ser. No. 291,396

Int. Cl.<sup>3</sup> C09K 7/02

U.S. Cl. 252—8.5 A

18 Claims

1. A process for producing a water based drilling mud additive which comprises:

(a) reacting with water in a first reaction zone at a temperature between 210°-280° F., a mixture having components comprising in percent by weight ratios:

Gilsonite	55-60%
Lignite	15-25%
Sodium Sulfite	15-25%
Water Soluble Base Compound	5-10%

for a period of time between 0.5-3.0 hours;

(b) reacting with water in a second reaction zone at a temperature between 210°-280° F., a mixture having components comprising in percent by weight ratios:

Tannin	25-40%
Lignite	35-45%
Sodium Sulfite	15-20%
Paraformaldehyde	1-5%
Water Soluble Base Compound	5-15%

for a period of time between 0.5-3.0 hours;

(c) removing by drying from said reaction zones substantially all of the water remaining after reacting to produce a first dried reaction product and a second dried reaction product; and

(d) blending equal portions by weight of said first and second reaction products.

4. A process for producing a water based drilling mud additive which comprises:

(a) reacting with water at a temperature between 210°-280° F. for a period of time between 0.5-3.0 hours, a mixture having components which comprise in percent by weight ratios:

Gilsonite	25-30%
Lignite	25-35%
Tannin	10-20%
Sodium Sulfite	15-25%
Paraformaldehyde	1-5%
Water Soluble Base Compound	5-15%

and;

(b) removing by drying substantially all of the water remaining after termination of the reacting to produce a dried product.

4,420,406

## THICKENED HEAVY BRINES

Roy F. House, Houston, and Lonnie D. Hoover, Chappell Hill, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jun. 20, 1980, Ser. No. 161,444

Int. Cl.<sup>3</sup> E21B 43/00

U.S. Cl. 252—8.55 R

13 Claims

1. A thickened brine solution having a density in the range of from about 14.2 ppg to about 15.6 ppg and consisting essentially of water, at least 20% by weight zinc bromide, calcium bromide, and a viscosifying amount of hydroxyethyl cellulose.

4,420,407

## METHOD OF LUBRICATING UPPER CYLINDER OF MARINE DIESEL ENGINE

Rodney L. Sung, Fishkill; Benjamin H. Zoleski, Beacon; William P. Cullen, Fishkill, and Mahmoud S. Kablaoui, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 22, 1981, Ser. No. 313,564

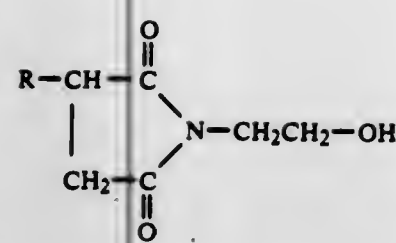
Int. Cl.<sup>3</sup> C10M 1/40

U.S. Cl. 252—33.4

3 Claims

1. A method for lubricating the upper cylinder zone of a slow speed marine diesel engine wherein the fuel employed is a high sulfur residual fuel oil which continuously generates acidity which comprises injecting into the upper cylinder zone of said engine a lubricating oil composition having a Total Base Number in the range from about 50-100 comprising a mineral lubricating oil, from about 10-20 wt % of an overbased calcium sulfonate having a Total Base Number from about 300-450, and a friction modifying amount of an N-hydroxyethyl alkenylsuccinimide represented by the following formula:





in which R is a straight chain hydrocarbon radical having from about 12 to 18 carbon atoms.

4,420,408

**MAGNETIC RECORDING MEDIUM**

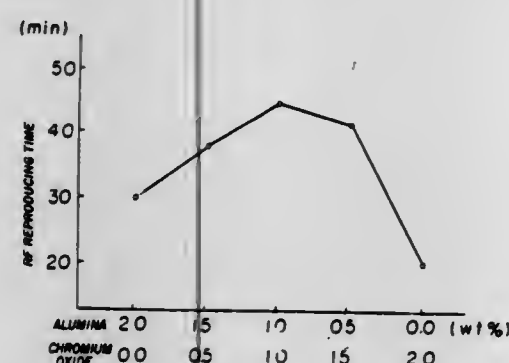
Norifumi Kajimoto, and Kinji Sasaki, both of Tokyo, Japan, assigns to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 20, 1981, Ser. No. 265,676

Claims priority, application Japan, Jun. 13, 1980, 55-78925  
Int. Cl.<sup>3</sup> H01F 1/00; G11B 5/70

U.S. Cl. 256-62.54

5 Claims



1. A magnetic recording medium which comprises an admixture consisting of at least two fine abrasive powders having different true specific gravities differing by more than 1.0, each of said powders being of a Moh's hardness of at least 7, in a magnetic layer containing a magnetic powder, the ratio of the two fine abrasive powders being in the range of 2:8 to 8:2.

4,420,409

**HYDRAULIC SYSTEM AND HYDRAULIC FLUID COMPOSITIONS COMPRISING SILOXANE-OXYALKYLENE COPOLYMERS**

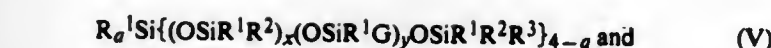
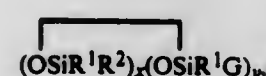
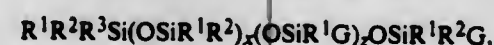
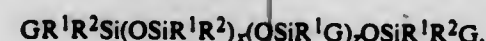
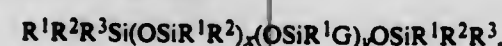
Yoshimasa Fukano, and Minoru Yoshizawa, both of Chiba, Japan, assigns to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,840  
Int. Cl.<sup>3</sup> C10M 3/44

U.S. Cl. 252-78.3

10 Claims

1. A hydraulic fluid composition consisting essentially of 1 to 99 percent by weight, based on the weight of the hydraulic fluid composition, of at least one siloxane-oxyalkylene copolymer and 1 to 99 percent by weight, based on the weight of the hydraulic fluid composition, of an oxyalkylene polymer oil which is compatible with the siloxane-oxyalkylene copolymer, said siloxane-oxyalkylene copolymer being selected from the group consisting of



wherein each R<sup>1</sup> and R<sup>2</sup> denotes, independently, an alkyl radical, a halogen-substituted alkyl radical or a phenyl radical; each R<sup>3</sup> denotes, independently, an alkyl radical, a halogen-substituted alkyl radical, a phenyl radical, a hydroxyl radicals or an alkoxy radical; each G denotes, independently, a radical having the formula —D(OC<sub>n</sub>H<sub>2n</sub>)<sub>m</sub>R<sup>4</sup> wherein D denotes a divalent hydrocarbon radical and R<sup>4</sup> denotes a hydroxyl radical or a monovalent organic radical; and each subscript denotes a number such that a=0 or 1, n=2 to 10 inclusive, m=1 to 500 inclusive, x=0 to 500 inclusive, y=1 to 500 inclusive and z=0 to 500 inclusive.

4,420,410

**PERSONAL CARE CLEANSING AGENT**

Rudolf Hüttinger, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 299,184

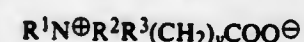
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3033929

Int. Cl.<sup>3</sup> C11D 1/90, 7/26; A61K 7/06

U.S. Cl. 252-117

3 Claims

1. An aqueous solution of a mixture of:  
(a) betaines having the formula



in which

R<sup>1</sup> is an alkyl radical of a fatty acid with 6 to 18 carbon atoms or the R<sup>4</sup>CONH(CH<sub>2</sub>)<sub>x</sub> radical, in which R<sup>4</sup> is an alkyl radical of a fatty acid with 6 to 18 carbon atoms, and

x=2 or 3,

R<sup>2</sup> and R<sup>3</sup> are the same or different and represent alkyl radicals with 1 to 4 carbon atoms and

y=1, 2, or 3;

(b) one or more anionic compounds selected from the group consisting of sodium or ammonium alkyl ether sulfate, alkanolamine alkyl ether sulfate, and alkanolamine alkyl sulfate, wherein the alkyl group has 8 to 14 carbon atoms; and

(c) the weight ratio of a:b being about from 3:7 to 7:3,

(c) monoglycerides of fatty acids, the fatty acid component having from 8 to 18 carbon atoms and the minimum content of monoester being about 70 weight percent, the amount of monoglycerides being from about 2 to 35 weight percent based on the amount of betaine.

4,420,411

**PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OF DETERGENTS USING UNSATURATED BRANCH CHAIN KETONES**

Richard M. Boden, Monmouth Beach, and Theodore J. Tyszkiewicz, Sayreville, both of N.J., assigns to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 384,961

Int. Cl.<sup>3</sup> C11D 3/50

U.S. Cl. 252-174.11

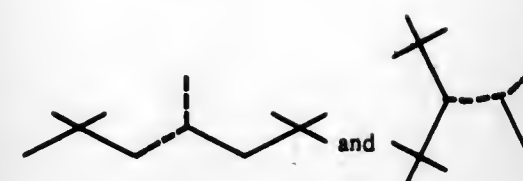
1 Claim

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base, an aroma augmenting or enhancing quantity of at least one product prepared by the process of (a) trimerizing isobutylene to form triisobutylene, a mixture of substances defined according to the structures:

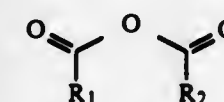
(IV)



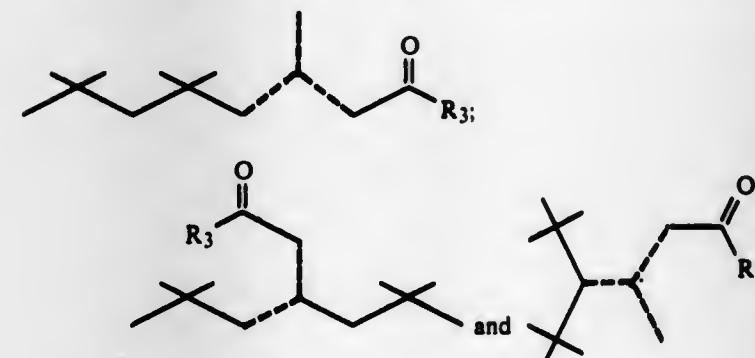
-continued



wherein in each of the molecules one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond and (b) reacting the resulting triisobutylene composition of matter with an alkanic acid anhydride having the structure:



wherein R<sub>1</sub> and R<sub>2</sub> are the same or different and are each selected from the group consisting of methyl and ethyl, in the presence of a Lewis acid catalyst thereby producing a mixture of compounds comprising the compounds defined according to the structures:



wherein R<sub>3</sub> represents methyl or ethyl and in each of the molecules one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represents a carbon-carbon single bond.

4,420,412

**ACTIVATION OF HYPOCHLORITE BLEACHING OF DYES**

Louis F. Wong, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

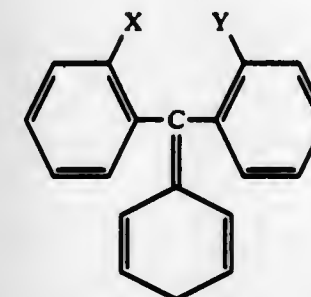
Division of Ser. No. 204,120, Nov. 5, 1980, Pat. No. 4,353,866.  
This application Dec. 23, 1981, Ser. No. 333,953

Int. Cl.<sup>3</sup> C11D 3/395

U.S. Cl. 252-186.38

6 Claims

1. A method of bleaching water-soluble, ortho-substituted triarylmethane dyes which have in their structure the moiety



wherein X is selected from the group consisting of substituent groups other than hydrogen or methyl and Y is selected from the group consisting of X, hydrogen and methyl, said method comprising the step of forming a solution comprising from about 0.02 to about 2 ppm of said dye, from about 2 to about 30 ppm of available chlorine from hypochlorite ion, at least about 0.1 ppm bromide ion and at least about 0.1 ppm ammonium ion,

the available chlorine to dye ratio in said solution being from about 2:1 to about 150:1, and the pH of said solution being from about 6 to about 9.5.

4,420,413

**OXYALKYLATED ADDITION PRODUCTS FROM ETHYLENE OXIDE-PROPYLENE OXIDE BLOCK POLYMERS AND BIS-GLYCIDYL ETHERS AND THEIR USE**

Helmut Diery, Kelkheim, and Martin Hille, Liederbach, both of Fed. Rep. of Germany, assigns to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 332,968

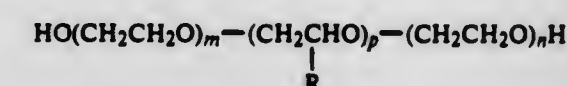
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049450

Int. Cl.<sup>3</sup> B01D 17/04; C08L 63/00

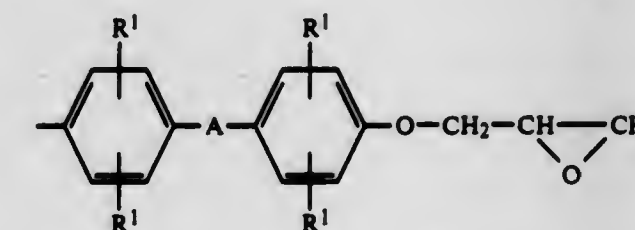
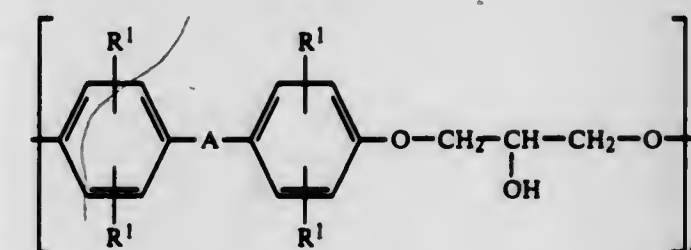
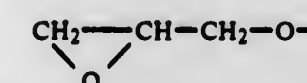
U.S. Cl. 252-331

3 Claims

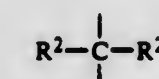
1. An oxyalkylated addition product, said addition product being formed from the components consisting essentially of an ethylene oxide-propylene oxide block polymer and a bis-glycidyl ether, said addition product being obtained by the addition of an ethylene oxide-propylene oxide block polymer of the formula



in which R denotes methyl or ethyl, n and m are numbers which are so chosen that the content of polyethylene oxide groups constitutes 5 to 80% of the molecular weight of the block polymer and p is a number larger than 10, to a bis-glycidyl ether of the formula



in which the R<sub>1</sub>'s can be identical or different and denote hydrogen, C<sub>1</sub>-C<sub>4</sub>-alkyl or halogen, in particular chlorine, A denotes a direct bond, a sulfonyl or cyclohexyl group or a group of the formula



R<sup>2</sup> denotes hydrogen, methyl or phenyl and a is an integer from 0 to 10, said addition product being subsequently oxyalkylated with propylene oxide or butylene oxide and 0-50% ethylene oxide, the amount of the propylene oxide or butylene oxide which is added last being 1 to 90% by weight of the total molecule, the amount of the ethylene oxide, which may have



also been added, being up to 50% by weight of the total molecule.

4,420,414

## CORROSION INHIBITION SYSTEM

Frederick W. Valone, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

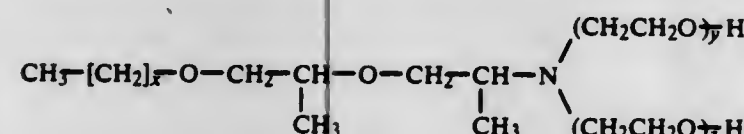
Filed Apr. 11, 1983, Ser. No. 484,049

Int. Cl.<sup>3</sup> C23F 11/00

U.S. Cl. 252-392

28 Claims

23. An oil-dispersible corrosion inhibiting solution comprising: about 1% to about 10% by weight of an ethoxylated tertiary amine, represented by the formula



wherein x is about 9 to about 11 and the sum of (y+z) is about 2 to about 50; about 65% to about 75% by weight of about a one to one mixture of a low molecular weight alcohol and water and about 25% to about 35% by weight of an organic inhibitor formed by the reaction of about a one to one mixture of an amide and an alkyl amidoamine with about 100% to about 120% of the stoichiometric amount of a mixture of organic acids needed to neutralize the amide and amidoamine mixture at a temperature of about 75° to about 95° C. for about one to about two hours, said amide formed by the reaction of an ethoxylated diamine with a fatty acid having about 15 to 20 carbon atoms per carboxylic acid group, said mixture of organic acids being approximately a three to two to one mixture of a fatty acid having about 15 to 20 carbon atoms per carboxylic acid group, an oxyacid, and a dimer-trimer acid having about 15 to 20 carbon atoms per carboxylic acid group, respectively.

4,420,415

## PROCESS FOR THE PRODUCTION OF CARBON MOLECULAR SIEVES

Nakaji Yuki, Kukizaki, and Hiroshi Kitagawa, Ibaragi, both of Japan, assignors to Director-General of Agency of Industrial Science & Technology, Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 294,930

Claims priority, application Japan, Aug. 27, 1980, 55-117930

Int. Cl.<sup>3</sup> B01J 20/20; C01B 31/08; B01D 53/02

U.S. Cl. 502-180

5 Claims

1. In a process for the production of carbon molecular sieves, including the steps of subjecting a vinylidene chloride copolymer to carbonization conditions for the removal of its chlorine component as hydrogen chloride, pulverizing the resulting product to a grain size of 100 mesh or finer, admixing the pulverized product with a carbonaceous sintering agent and an organic binder to obtain a mixture, pelletizing the mixture, and carbonizing the resulting pellets, the improvement comprising:

said admixing step, wherein said sintering agent includes a carbonaceous material derived from petroleum or coal and capable of forming a high-strength coke upon carbonization, is used in an amount of 10 to 14% based on the weight of said pulverized product and is a member selected from the group consisting of coal tar pitch, petroleum pitch and coking coal, and said organic binder is used in an amount of from 10 to 15% based on the weight of said pulverized product and includes a tenacious organic substance capable of being partially gasified when heated, with the remaining ungasified components being carbonized, and is selected from microcrystalline cellulose, a liquid resin, waste molasses and a sulfite pulp waste liquor, and

said step of carbonizing said pellets, wherein said pellets are heated to a temperature in the range of 750° to 1000° C. at a heating rate of 5° to 7° C./min and then maintained at that temperature for 30 to 90 min; said molecular sieve having at least 80% of its total pore volume in pores with diameters of 4 to 4.3 Å.

4. The process according to claim 1, wherein said sintering agent has a grain size of 100 mesh or finer.

5. The process according to claim 1, wherein the heating of said pellets up to 300° C. is carried out at any optional heating rate and the heating of said pellets above 300° C. is carried out at a heating rate of 5° to 7° C./min.

4,420,416

## UNSATURATED POLYESTERS PREPARED FROM A DICARBOXYLIC ACID AND DIBROMONEOPENTYL GLYCOL

Eric R. Larsen, and Ernest L. Ecker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich. Division of Ser. No. 189,236, Sep. 22, 1980, Pat. No. 4,384,109, which is a continuation-in-part of Ser. No. 99,259, Dec. 3, 1979, abandoned. This application Jul. 19, 1982, Ser. No. 399,631

Int. Cl.<sup>3</sup> B01J 31/02; C08G 63/20

U.S. Cl. 502-168

6 Claims

1. A composition useful for making polyesters when reacted with a polycarboxylic acid, said composition comprising a solid solution of catalytic amounts of up to about 1 weight percent of an aryl sulfonic acid in dibromoneopentyl glycol.

4,420,417

## ETHYLENE POLYMERIZATION CATALYST AND A PROCESS FOR ITS PREPARATION

Genevieve Le Brasseur, Bully les Mines, France, assignor to Societe Chimique des Charbonnages-CdF Chimie, Paris, France

Filed Jul. 29, 1982, Ser. No. 403,067

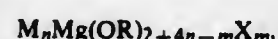
Claims priority, application France, Jul. 30, 1981, 81 14813

Int. Cl.<sup>3</sup> C08F 4/64

U.S. Cl. 502-169

8 Claims

1. A catalyst for polymerization of ethylene having the general formula:



wherein X is at least one halogen, M is at least one transition metal selected from the group consisting of the metals of groups IVa to VIa of the Periodic Table, R is an alkyl radical containing from 1 to 4 carbon atoms,  $0.05 \leq n \leq 0.6$  and  $0 < m < n+1$ .

4,420,418

## PARA-SELECTIVE ZEOLITE CATALYSTS

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 322,629

Int. Cl.<sup>3</sup> B01J 37/10, 29/28, 27/18

U.S. Cl. 502-77

10 Claims

2. A method for treating a chemically modified zeolite catalyst in order to enhance the para-selectivity of said catalyst without significantly diminishing the activity thereof when said catalyst is utilized to promote alkylation of aromatic compounds, said catalyst comprising both a crystalline zeolite material having a constraint index within the approximate range of 1 to 12 and a silica/alumina mole ratio of at least 12 and a minor proportion of one or more difficulty reducible oxides, said method comprising

(a) improving the para-selectivity of said catalyst while at the same time lowering the activity of said catalyst by contacting said catalyst with a carboxylic acid selected from acetic acid, propanoic acid, butanoic acid, pentanoic

acid, 2-methylpropanoic acid, 2,2-dimethylpropanoic acid, 2-methylbutanoic acid, 3-methylbutanoic acid and anhydrides of said carboxylic acids at a temperature between about 0° C. and 100° C.; and thereafter

(b) improving the activity of the catalyst of step (a) without significantly diminishing the para-selectivity of the catalyst of step (a) by contacting said catalyst of step (a) with water vapor at a temperature between about 40° C. and 700° C. for at least about 1 hour.

3. A method according to claim 2 wherein said difficulty reducible oxide is selected from magnesium oxide, calcium oxide, phosphorus oxide, combinations of magnesium oxide and phosphorus oxide and combinations of calcium oxide and phosphorus oxide.

4. A method according to claim 3 wherein said carboxylic acid is acetic acid.

8. A process for treating a chemically modified zeolite catalyst in order to enhance the para-selectivity of said catalyst without significantly diminishing the activity thereof when said catalyst is utilized to promote alkylation of aromatic compounds, said catalyst comprising both a crystalline zeolite material selected from ZSM-5, ZS-11, ZMS-12, ZMS-23, ZMS-35, ZMS-38 and ZMS-48 and a minor proportion of one or more difficulty reducible oxides selected from magnesium oxide, calcium oxide, phosphorus oxide, combinations of magnesium oxide and phosphorus oxide and combinations of calcium oxide and phosphorus oxide, said method comprising

(a) improving the para-selectivity of said catalyst while at the same time lowering the activity of said catalyst by contacting said catalyst with acetic acid or acetic anhydride at a temperature between about 0° C. and 100° C.; and thereafter

(b) improving the activity of the catalyst of step (a) without significantly diminishing the para-selectivity of the catalyst of step (a) by contacting said catalyst of step (a) with water vapor at a temperature between about 40° C. and 700° C. for at least about 1 hour.

4,420,419

## ABRASION-RESISTANT GRANULAR ZEOLITE AND PROCESS FOR PREPARATION THEREOF

Masahide Ogawa; Tetsuo Masuko, both of Shibata; Kunio Goto; Hideo Sugai, both of Nakajo, and Masao Takahashi, Shiunji, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 8, 1982, Ser. No. 355,380

Claims priority, application Japan, Mar. 10, 1981, 56-33138

Int. Cl.<sup>3</sup> B01J 29/08, 29/18, 35/08

U.S. Cl. 502-68

8 Claims

1. An abrasion-resistant granular zeolite formed from a mixture of a synthetic crystalline zeolite and a clay binder, said granular zeolite comprising a core composed of a synthetic zeolite-clay binder mixture containing the synthetic zeolite at a content higher than the average synthetic zeolite content in the total granular zeolite and a shell composed of a synthetic zeolite-clay binder mixture containing the clay binder at a content higher than the average clay binder content in the total granular zeolite, wherein the core and shell are present at a core/shell weight ratio of from 99/1 to 80/20, the core contains the synthetic zeolite and clay binder at a zeolite/binder weight ratio of from 90/10 to 60/40, the shell contains the clay binder and synthetic zeolite at a binder/zeolite weight ratio of from 95/5 to 30/70, the shell contains the clay binder at a content higher by at least 10 by weight than the binder content in the core, and said core and shell being calcined to harden the clay binder.

6. A process for the preparation of an abrasion-resistant granular zeolite, which comprises the steps of granulating a primary mixture containing a synthetic zeolite and a clay binder at a zeolite/binder weight ratio of from 90/10 to 60/40 by using an aqueous solution of a water-soluble polymeric binder as a granulating medium, thereby to form wet core particles, dry-blending the resulting wet core particles with a secondary powdery mixture containing the synthetic zeolite

and the clay binder at a binder/zeolite weight ratio of from 95/5 to 30/70 to form a shell coating of said powdery mixture on the surface of the core particles, said secondary mixture containing the clay binder at a content higher by at least 10% by weight than the clay binder content in the primary mixture and drying and calcining the resulting coated particles.

4,420,420

## RHODIUM CATALYST AND METHOD FOR PREPARING THE SAME

Yukimitsu Mita, Oita; Ken-ichi Sano, Kawasaki; Shinya Matsuhira, and Tetsuo Nakajo, both of Oita, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 254,074, Apr. 14, 1981, Pat. No. 4,376,724. This application Jul. 14, 1982, Ser. No. 398,181

Claims priority, applications Japan, Apr. 14, 1980, 55-48131; Apr. 14, 1980, 55-48132

Int. Cl.<sup>3</sup> B01J 21/06, 23/46

U.S. Cl. 502-261

4 Claims

1. A rhodium catalyst comprising active rhodium metal supported on a silica type or titania type support, said active rhodium being in the surface layer or near the surface layer of the particles of the support.

3. A rhodium catalyst comprising active rhodium metal supported on a silica type or titania type support, said active rhodium being in the surface layer or near the surface layer of the particles of the support and said catalyst being prepared by:

- (i) adding sodium hydroxide or potassium hydroxide to an aqueous solution of a water-soluble rhodium salt to adjust the pH of the aqueous solution to at least 10, whereby said water-soluble rhodium salt is converted to rhodium hydroxide;
- (ii) dipping a silica type or titania type support into said aqueous solution of rhodium hydroxide; and
- (iii) drying and reducing the support impregnated with rhodium hydroxide, whereby the impregnated rhodium hydroxide is reduced to rhodium metal.

4,420,421

## PROCESS FOR THE PREPARATION OF CATALYSTS BASED ON IRON AND MOLYBDENUM OXIDES

Roberto Canavesi, Arese; Giancarlo Aglietti, Milan, and Roberto Ghezzi, Cusano Milanino, all of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Dec. 2, 1981, Ser. No. 326,623

Claims priority, application Italy, Dec. 2, 1980, 26348 A/80

Int. Cl.<sup>3</sup> B01J 23/88

U.S. Cl. 502-316

6 Claims

1. Process for the preparation based on iron and molybdenum oxides, which are active in the oxidation of methanol to formaldehyde, characterized in that an aqueous solution of a soluble ferric salt is brought into contact with an aqueous solution of sodium molybdate having a pH value within the range 5.2 to 5.5 and a molybdenum content of about 32 to 33 g/liter; the molar ratio of the Molybdenum, as MoO<sub>3</sub>, to iron, as Fe<sub>2</sub>O<sub>3</sub>, being greater than 2:1; the precipitate obtained is then washed with de-ionized water until the sodium content of the precipitate is equal or less than 150 ppm, the washed precipitate is then treated by known methods to obtain the final active catalyst.

4,420,422

## METHOD FOR MAKING HIGH SURFACE AREA BISMUTH-CONTAINING PYROCHLORES

August Ferretti, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 1, 1982, Ser. No. 438,717

Int. Cl.<sup>3</sup> H01B 1/06

U.S. Cl. 252-518

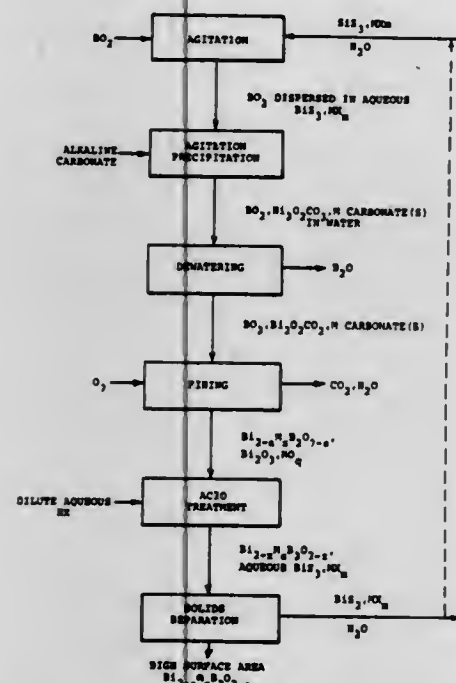
6 Claims

1. A process for making a pyrochlore corresponding to the formula Bi<sub>2-x</sub>M<sub>x</sub>B<sub>2</sub>O<sub>7-x</sub>, wherein M is selected from the group consisting of cadmium, copper, lead, indium, gadolin-



ium, silver and mixtures thereof, B is selected from the group consisting of ruthenium, iridium and mixtures thereof, x is from 0 to 0.5, and z is from 0 to 1, comprising the sequential steps of:

(a) firing an intimate admixture of finely divided particles of  $\text{BO}_2$ ,  $\text{Bi}_2\text{O}_2\text{CO}_3$  and carbonate(s) of M when x is greater than zero at a temperature between the thermal decomposition temperature of  $\text{Bi}_2\text{O}_2\text{CO}_3$  and  $650^\circ\text{C}$ . in an oxidizing atmosphere to form a reaction product comprising



$\text{Bi}_2\text{O}_3$ ,  $\text{Bi}_{2-x}\text{M}_x\text{B}_2\text{O}_7$  and oxide(s) of M, the mole ratio of Bi to B being at least 1.4 to 1;

(b) forming a dispersion of the fired reaction product of step (a) in dilute aqueous mineral acid in an amount and for a time sufficient to dissolve substantially all the  $\text{Bi}_2\text{O}_3$  and, if present, oxides of M in the reaction product; and

(c) separating the acid-treated reaction product of step (b) from the dispersion medium.

#### 4,420,423 METHYL SUBSTITUTED-2-OXOHXANE DERIVATIVES AND PROCESS FOR PREPARING AND USING SAME

Richard M. Boden, Monmouth Beach; Lambert Dekker, Wyck-off; Frederick L. Schmitt, Holmdel, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

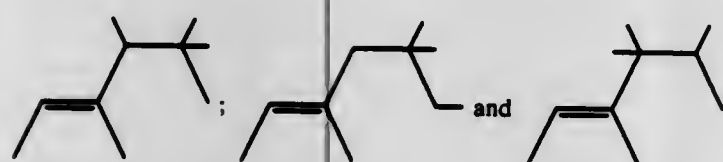
Continuation-in-part of Ser. No. 195,630, Oct. 9, 1980, Pat. No. 4,335,009, which is a continuation-in-part of Ser. No. 160,788, Jun. 19, 1980, Pat. No. 4,287,084. This application Feb. 4, 1982, Ser. No. 345,666

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

U.S. Cl. 252-522 R 6 Claims

1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of intimately admixing with the perfume composition or cologne or perfumed article, an aroma augmenting or enhancing quantity of a product produced according to the process consisting of the steps of:

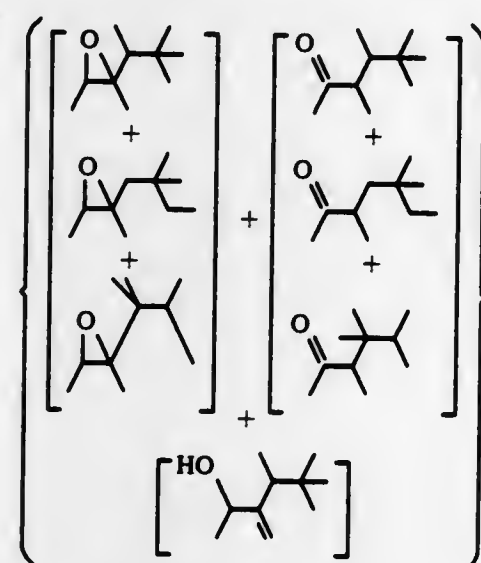
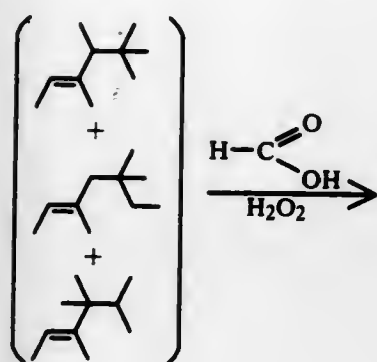
(i) dimerizing two moles of isoamylene in the presence of an acidic catalyst to form diisoamylene which is a mixture of molecules having the structures:



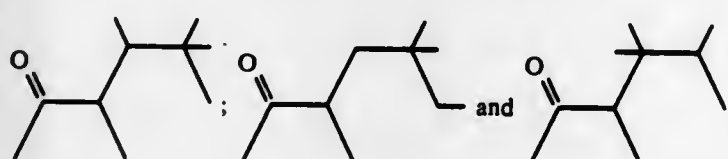
having a distillation range of  $36^\circ\text{--}40^\circ\text{C}$ ., vapor tempera-

ture;  $74^\circ\text{--}94^\circ\text{C}$ . liquid temperature and 4-5 mm/Hg pressure;

(ii) intimately admixing the resulting diisoamylene mixture with concentrated hydrogen peroxide and formic acid whereby a mixture of alcohols, epoxides and ketones is formed according to the reaction:

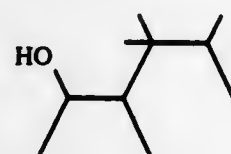
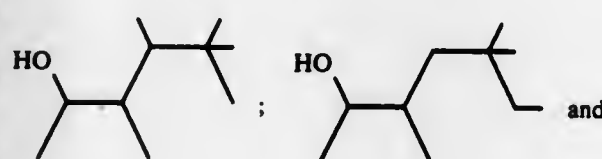


(iii) distilling the resulting reaction product at a temperature in the range of  $93^\circ\text{--}100^\circ\text{C}$ . vapor temperature;  $109^\circ\text{--}120^\circ\text{C}$ . liquid temperature at 50 mm/Hg pressure in order to isolate a mixture of compounds having the structure:



and

(iv) intimately admixing the resulting mixture with an alkali metal borohydride whereby a mixture of compounds is formed having the structures:



distilling at a vapor temperature in the range of  $90^\circ\text{--}93^\circ\text{C}$ .; a liquid temperature in the range of  $97^\circ\text{--}108^\circ\text{C}$ . and a pressure of 14 mm/Hg.

#### 4,420,424 NEW PEPTIDES AND A PROCESS FOR THEIR PREPARATION

Rolf Geiger, Frankfurt am Main; Wolfgang König, Hofheim am Taunus, and Gerd Johnscher, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

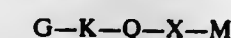
Continuation of Ser. No. 188,820, Sep. 19, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 319,267

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938420

Int. Cl. C07C 103/52

U.S. Cl. 260-112.5 R

1. A peptide of the formula



wherein

G is arginine, lysine, ornithine, or homoarginine, all in the L- or their D-configuration, or is unsubstituted  $\omega$ -aminoalkanoic acid,  $\omega$ -guanidinoalkanoic acid, or  $\omega$ -dimethylaminoalkanoic acid having 3-6 C atoms, or is such  $\omega$ -aminoalkanoic acid,  $\omega$ -guanidinoalkanoic acid, or  $\omega$ -dimethylaminoalkanoic acid substituted with an amino group in the L- or D-configuration, which amino group in turn may carry

alkanoyl having 1-6 C atoms,

aroyl having 7-11 C atoms,

cycloalkanoic acid having up to 2 alkyl C atoms and 5-7 cycloalkyl C atoms,

aralkanoic acid having up to a total of 9 C atoms and wherein a  $-\text{CH}_2-$  group can be replaced by  $-\text{O}-$  or  $-\text{S}-$ , alkoxycarbonyl or aralkyloxycarbonyl having up to 7 carbon atoms, or

succinoyl, succinamoyl, glutaroyl, glutaminyl, pyroglutamyl, phthaloyl, phthalimidyl, or 2-carboxybenzoyl;

K is a basic amino acid;

Q is L- or D-glutamic acid, D-aspartic acid, or D- $\alpha$ -aminoadipic acid;

X is L-valine or L-isoleucine; and

M is an L- or D-amino acid having a hydrophobic side chain, or is an ester, amide, alkylamide, or alkylester having 1-6 C atoms of such an acid, or is an aralkylester having 7-10 C atoms of such an acid.

#### 4,420,425 METHOD FOR PROCESSING PROTEIN FROM NONBINDING OILSEED BY ULTRAFILTRATION AND SOLUBILIZATION

James T. Lawhon, College Station, Tex., assignor to The Texas A&M University System, College Station, Tex.

Filed Aug. 2, 1982, Ser. No. 404,125

Int. Cl. A23J 1/14

U.S. Cl. 260-123.5

46 Claims

1. A method of processing nonbinding oilseeds comprising the steps of:

solubilizing at least a portion of the protein contained in the oilseed to produce a filterable protein feed stream; and

passing the protein feed stream through an ultrafiltration membrane system with a molecular weight cutoff of about 70,000 daltons to separate out proteins, while controlling the concentration of the feed to limit self filtering and produce a permeate and a retentate, the retentate having a substantially bland taste and colorless appearance when dried.

#### 4,420,426 6-ALPHA-HALOPENICILLANIC ACID 1,1-DIOXIDES

Bernard S. Moore, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 17,810, Mar. 5, 1979, abandoned. This application Dec. 9, 1980, Ser. No. 214,757

Int. Cl. C07D 499/00

U.S. Cl. 260-245.2 R

7 Claims

1. (2S,5R,6S)-6- $\alpha$ -Bromo-3,3-dimethyl-7-oxo-4-thia-1-

azabicyclo[3.2.0]heptane-2-carboxylic acid, S,S-dioxide, or a base salt thereof or a readily hydrolyzable ester thereof.

#### 4,420,427 PROCESS FOR THE SEPARATION OF STEROLS OR MIXTURES OF STEROLS

Antti Hamunen, Lappeenranta, Finland, assignor to OY Kaukus AB, Lappeenranta, Finland

Filed Jul. 8, 1982, Ser. No. 396,336

Claims priority, application Finland, Jul. 21, 1981, 812278

Int. Cl. C07J 9/00

U.S. Cl. 260-397.25

10 Claims

1. A process for the separation of one or more sterols or mixtures of sterols selectively from sterol-containing unsaponifiable material obtained from sulphate soap, saponifiable vegetable oils, tall oil or any other material of vegetable origin, comprising the steps of:

(a) adding to the sterol-containing fraction a solvent selected from the group consisting of methanol, ethanol, a mixture of methanol and ethanol, and a mixture of methyl ethyl ketone and water containing more than 5% by weight of water, wherein the weight ratio of sterol-containing material:solvent=1:0.2 to 1:20,

(b) mixing the mixture of solvent and sterol-containing fraction at room temperature, heating said mixture, when required, for dissolving undesired neutral components and cooling to room temperature or below it,

(c) filtering precipitated sitosterol, and

(d) removing the non-sterolic components in the sitosterol precipitate by washing the precipitate with a suitable solvent.

#### 4,420,428 16-KETOANDROSTENE-17-DITHIOKETALS

Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

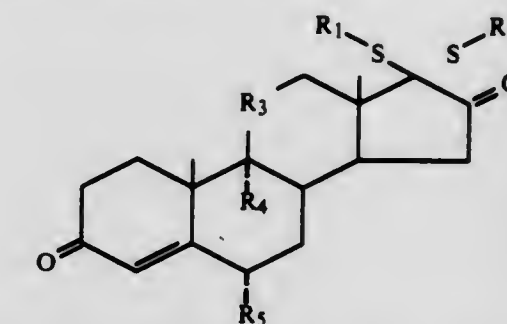
Filed Dec. 27, 1982, Ser. No. 453,314

Int. Cl. C07J 7/00

U.S. Cl. 260-397.45

13 Claims

1. A steroid having the formula



or 1,2-dehydro and 6,7-dehydro derivatives thereof, wherein  $\text{R}_1$  and  $\text{R}_2$  are the same or different and each is alkyl, cycloalkyl or aryl;

$\text{R}_3$  is carbonyl,  $\beta$ -hydroxymethylene or  $\beta$ -acetyloxymethylene;

$\text{R}_4$  is hydrogen or halogen; and

$\text{R}_5$  is hydrogen, methyl, hydroxy, alkanoyl, alkanoyloxy, or halogen.



4,420,429

**PRODUCTION OF ALKYL ESTERS OF SATURATED ALIPHATIC CARBOXYLIC ACIDS**

Wolfgang H. E. Müller, and Peter Hofmann, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls A.G., Marl, Fed. Rep. of Germany

Filed Aug. 11, 1981, Ser. No. 291,952

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034421

Int. Cl.<sup>3</sup> C11C 3/02

U.S. Cl. 260—410.9 R

10 Claims

1. In a process for preparing an alkylester of a saturated aliphatic carboxylic acid by:

- reacting at elevated temperatures and pressure, input material comprising olefin, alkanol and carbon monoxide in the presence of a catalyst consisting of a cobalt compound and a promoter selected from the group consisting of pyridine, non-ortho-substituted alkylpyridine, and mixtures thereof to form a reaction mixture containing water, said alkylester, unreacted olefin, unreacted promoter, catalyst residue, and unreacted alkanol;
  - separating alkylester from said water, unreacted olefin, unreacted promoter, catalyst residue, and unreacted alkanol;
  - regenerating said catalyst residue; and
  - feeding back to step (a) said water, said unreacted olefin, said unreacted promoter, said regenerating catalyst, and said unreacted alkanol, the improvement comprising:
- (e) separating water from the groups consisting of said water and said unreacted alkanol or said water and said unreacted promoter.

4,420,430

**METHOD FOR PREPARING ORGANO GERMANIUM PROPIONIC ACID DERIVATIVES**

Ching-Te Chang, Taipei; Lian-Tze Lee, Hsinchu, both of Taiwan, and Hsueh-Ling Su, St. Paul, Minn., assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

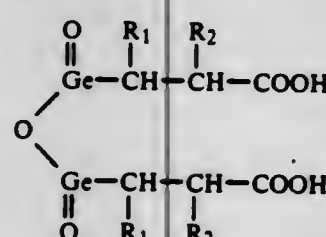
Filed Feb. 1, 1982, Ser. No. 344,375

Int. Cl.<sup>3</sup> C07F 7/30

U.S. Cl. 260—429 R

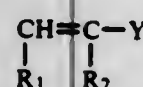
17 Claims

1. A process for preparing an organo germanium sesquioxide derivative of the following formula (II):



where R<sub>1</sub> and R<sub>2</sub> are independently hydrogen or lower alkyl, comprising in combination the steps of:

- reacting germanium tetrachloride with hypophosphorous acid or its salts, whereby the germanium tetrachloride is reduced,
- thereafter adding to the reaction mixture an acrylic acid derivative of the following formula (I):



where R<sub>1</sub> and R<sub>2</sub> are as previously defined and Y is COOH, COOR (R being lower alkyl), CONH<sub>2</sub> or CN, and

(iii) hydrolyzing the product of step (ii) whereby the said compound of formula II is formed.

4,420,431

**SALTS OF 3-CYANO-3-ALKENE-SULFINIC ACIDS AND SALTS OF 3-CARBAMOYL-3-ALKENE SULFONIC ACIDS AND PREPARATIONS THEREOF**

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

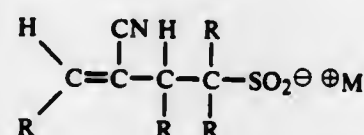
Filed Feb. 13, 1979, Ser. No. 11,744

Int. Cl.<sup>3</sup> C07C 120/00, 121/30, 121/66, 143/16

U.S. Cl. 260—465.9

11 Claims

1. Salts of 3-cyano-3-alkenesulfinic acids which correspond to formula I



wherein the R groups are hydrogen or alkyl, cycloalkyl and phenyl groups containing from 1 to 6 carbon atoms per group or alkoxy-substituted alkyl and cycloalkyl groups containing from 2 to 6 carbon atoms per group, with the further proviso that compounds of formula I contain a maximum of 12 carbon atoms per molecule and wherein M is an alkali metal or quaternary ammonium group of up to and including 6 carbon atoms.

4,420,432

**CRYSTALLINE SALT OF BASIC L-AMINO ACID WITH L-MALIC ACID AND PROCESS FOR THE PREPARATION THEREOF**

Ichiro Chibata, Suita; Akihiko Sumi, Ashiya; Hiroshi Ito, Itami; Osamu Ohtsuki, Nagaokakyo, and Nozomu Izutsu, Yao, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Continuation of Ser. No. 93,810, Nov. 13, 1979, abandoned. This application Jan. 5, 1982, Ser. No. 337,320

Claims priority, application Japan, Nov. 20, 1978, 53-143603; Apr. 6, 1979, 54-42378

Int. Cl.<sup>3</sup> C07C 101/00

U.S. Cl. 260—501.11

6 Claims

1. A method for preparing a neutral crystalline salt of a basic L-amino acid and L-malic acid which comprises reacting 2 moles of said L-amino acid taken from the class consisting of L-ornithine, L-arginine, and L-lysine with 1 mole of L-malic acid in an aqueous medium, concentrating the reaction mixture until it contains about 20% to about 70% by weight of said neutral salt, mixing the concentrated mixture with a hydrophilic organic solvent taken from the class consisting of an alkanol of 1 to 3 carbon atoms, an alkanone of 3 to 5 carbon atoms, N,N'-dimethylformamide and mixtures thereof, to a water content of the system for crystallization of about 10% to about 30% by volume, crystallizing said neutral salt and recovering said salt from the reaction mixture.

4,420,433

**PROCESS FOR THE PREPARATION OF FLUORINE-SUBSTITUTED CARBOXYLIC ACID CHLORIDES AND THEIR USE**

Rudolf Braden, and Erich Klauke, both of Odenthal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,568

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129274

Int. Cl.<sup>3</sup> C07C 51/58

U.S. Cl. 260—544 D

20 Claims

1. A process for the preparation of a fluorine-substituted carboxylic acid chloride which comprises contacting a fluorine substituted carboxylic acid fluoride at an elevated temperature with silicon tetrachloride or titanium tetrachloride.

4,420,434

**PERFLUORALKYL ANION/PERFLUOROALKYL CATION ION PAIR COMPLEXES**

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 9, 1981, Ser. No. 223,640

Int. Cl.<sup>3</sup> C07C 143/00, 53/00

U.S. Cl. 260—501.12

4 Claims

1. A hydrolytically stable ion pair complex of the formula



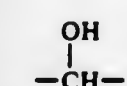
wherein

R<sub>f</sub> and R<sub>f</sub>' independently represent perfluoroalkyl of 4 to 12 carbon atoms;

A and A' independently represent



where G'' is independently —SO<sub>2</sub>NH—, —CONH— or



and each alkylene is straight or branched chain alkylene of 1 to 6 carbon atoms;

R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are independently hydrogen, phenyl, alkyl of 1 to 8 carbon atoms which is unsubstituted or is substituted by halo, hydroxy or phenyl; or is —CHR<sub>4</sub>CH<sub>2</sub>O—, R<sub>5</sub> where y is 1 to 20, R<sub>4</sub> is hydrogen or alkyl of 1 to 4 carbon atoms and R<sub>5</sub> is hydrogen or methyl; or R<sub>1</sub> and R<sub>2</sub> taken together with the nitrogen to which they are attached represent piperidino, morpholino or piperazino; or R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> taken together with the nitrogen to which they are attached represent pyridinium or pyridinium substituted by alkyl of 1 to 4 carbon atoms; and

Q represents the carboxy, sulfo, phosphato or phosphono anion.

4,420,435

**ALPHA-HYDROXY-PHOSPHONIC ACID ESTERS**

Hellmut Hoffmann; Fritz Maurer, both of Wuppertal; Uwe Priesnitz, Unna-Massen, and Hans-Jochem Riebel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 140,644, Apr. 16, 1980, Pat. No. 4,358,409.

This application Jun. 22, 1982, Ser. No. 391,092

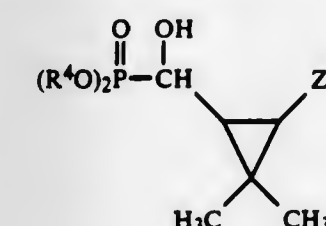
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917620; Jul. 21, 1979, 2929636

Int. Cl.<sup>3</sup> C07F 9/40

U.S. Cl. 260—940

1 Claim

1. An α-hydroxy-phosphonic acid ester of the formula



in which

R<sup>4</sup> each independently represents alkyl or phenyl or the two radicals R<sup>4</sup> together represent alkylene and Z<sup>2</sup> represents cyano, carbamoyl, acetyl or C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl.

4,420,436

**2-SUBSTITUTED 5-PHENOXYPHENYLPHOSPHONIC ACID DERIVATIVES**

Ludwig Maier, Arlesheim, and Dieter Dürr, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 117,167, Jan. 31, 1980, Pat. No. 4,322,375.

This application Dec. 28, 1981, Ser. No. 334,862

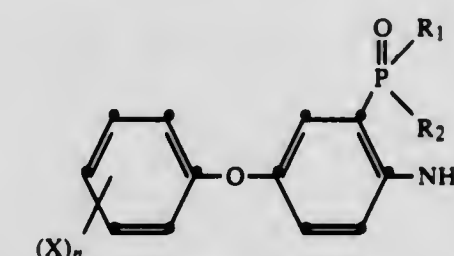
Claims priority, application Switzerland, Feb. 6, 1979, 1147/79

Int. Cl.<sup>3</sup> C07F 9/40, 9/44; A01N 57/22

U.S. Cl. 260—944

3 Claims

1. A 2-substituted 5-phenoxyphenoxphosphonic acid derivative of the formula



wherein

each of R<sub>1</sub> and R<sub>2</sub> is hydroxy, lower alkoxy, lower alkylthio, alkylamino, dialkylamino, chlorine, benzyloxy or benzylthio,

X is halogen, —CF<sub>3</sub>, —NO<sub>2</sub>, —CN, —CONH<sub>2</sub> or —CSNH<sub>2</sub>, and

n is an integer from 0 to 2.

4,420,437

**PREPARATION OF A**

**2-ARALKYL-5,5-DIALKYL-1,3,2-DIOXAPHOSPHORINAN-2-ONE FROM**

**2-ARALKOXY-5,5-DIALKYL-1,3,2-DIOXAPHOSPHORINANE**

Peter F. Epstein, Glen Burnie, Md.; Richard D. Peveler, Wyckoff, and Michael H. Fisch, Wayne, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

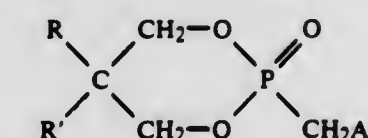
Filed Aug. 6, 1981, Ser. No. 290,532

Int. Cl.<sup>3</sup> C07F 9/40

U.S. Cl. 260—969

5 Claims

1. A process for preparing a 2-aralkyl-5,5-dialkyl-1,3,2-dioxaphosphorinan-2-one having the formula:



in which R is an alkyl group having 1 to 2 carbon atoms and R' is an alkyl group having 1 to 9 carbon atoms, and Ar is an aryl group having 6 to 18 carbon atoms, that comprises heating a 2-aralkoxy-5,5-dialkyl-1,3,2-dioxaphosphorinan-2-one with a catalytic quantity of an aralkyl halide the halide being selected from the group consisting of bromine, chlorine and iodine, and recovering a 2-aralkyl-5,5-dialkyl-1,3,2-dioxaphosphorinan-2-one from the mixture.

4,420,438

**CARBURETOR THROTTLE VALVE METHOD AND APPARATUS**

Carl C. Goosen, Rte. 3, Box 1250, Palomino Way, Oviedo, Fla. 32765

Filed Dec. 9, 1981, Ser. No. 328,860

Int. Cl.<sup>3</sup> F02M 9/08

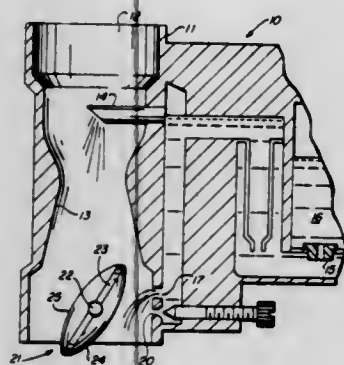
U.S. Cl. 261—65

4 Claims

1. An internal combustion engine carburetor throttle comprising in combination:



an engine carburetor having at least one air intake and one fuel inlet and a passageway therethrough into the intake manifold of the engine;  
a throttle shaft rotatably mounted below the venturi in said passageway through said carburetor having a throttle plate attached thereto;  
a pair of air foil segments, one segment attached to each side of said throttle shaft and to each other, said throttle segments and throttle plate forming a predetermined shaped air foil for streamlining the fluid flow into the intake



manifold of said engine, said pair of segments attached to said throttle shaft and throttle plate forming a generally lenticular shape with said existing throttle plate with each segment having a groove therein on a flat side thereof for fitting over a portion of said throttle shaft and each segment being mounted offset to said throttle shaft to line up with tapered edges of said throttle plate to form an air foil with said throttle plate; and  
one said air foil segment being threaded for receiving a screw through the other air foil segment and through the throttle shaft.

4,420,439

**CONSTANT PRESSURE CARBURETTORS**

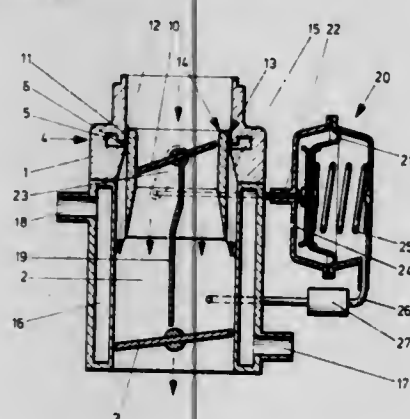
Günter Härtel, Neuss; Armin Schürfeld, and Anwar Abidin, both of Meerbusch, all of Fed. Rep. of Germany, assignors to Bösch & Pierburg System oHG, Neuss, Fed. Rep. of Germany  
Filed Jan. 29, 1982, Ser. No. 343,974

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104559

Int. Cl.<sup>3</sup> F02M 15/04

U.S. Cl. 261—142

24 Claims



1. A constant pressure carburetor for an internal combustion engine, said carburetor comprising a mixing chamber, a tubular wall surrounding said mixing chamber, a selectively actuatable main throttle valve located downstream of said mixing chamber, an inner tube located within and substantially concentrically with said tubular wall, a choke valve located adjacent the upstream end of said inner tube upstream of said mixing chamber, said choke valve being openable in dependence upon the magnitude of the air flow through said carburetor, at least one duct located between said tubular wall and said inner tube and said duct extending in the direction of air flow through said carburetor and leading into said mixing

chamber from a location upstream of said mixing chamber, said duct has a flow cross-sectional area which is small compared to that of said inner tube, said at least one duct is provided with a flow constricting profile at the inlet end thereof for constricting the flow through said duct for producing a stable air flow through said duct, and a fuel distributing device for discharging fuel into said at least one duct downstream of said flow restricting profile, said distributing device including fuel metering means controlled by said choke valve, wherein the improvement comprises a partition wall located within said mixing chamber, said partition wall extending in the direction of air flow through said mixing chamber and substantially preventing air flow transverse of the direction of said air flow through said mixing chamber, and said fuel distributing device arranged for supplying fuel onto said tubular wall.

4,420,440

**FILM CARTRIDGE MANUFACTURE AND FILLING METHOD AND APPARATUS**

Horst F. Marz, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada

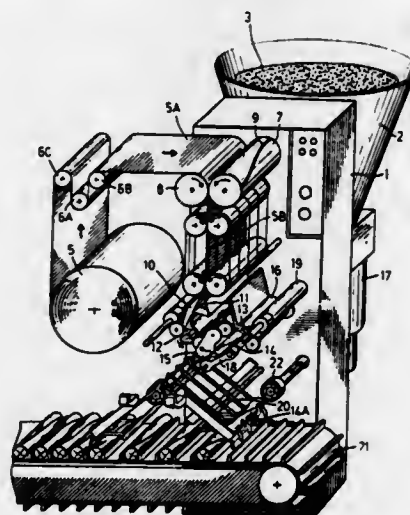
Filed Dec. 15, 1982, Ser. No. 450,144

Claims priority, application Canada, Feb. 2, 1982, 395363

Int. Cl.<sup>3</sup> C06B 21/00

U.S. Cl. 264—3 B

9 Claims



1. A method for packing viscous, gel-like explosives into convolute paper tubes which comprises the steps of  
(a) feeding a pre-cut section of paper film to a continuously rotating, hollow winding/extrusion mandrel to form a cylindrical convolutely wound paper shell thereon,  
(b) closing one end of the said paper shell upon the said mandrel by means of an inwardly folded crimp,  
(c) extruding a cylindrical column of viscous, gel-like explosives through a tubular element within the said hollow mandrel and into and against the crimp-closed end of said paper shell, the said shell being simultaneously slid along the said mandrel by the force of the explosive extrudate,  
(d) cutting and separating the said cylindrical explosive column at a point adjacent the leading open end of the said mandrel and indented within the said paper shell to provide an unfilled paper shell end portion,  
(e) displacing the said filled paper shell from the said mandrel,  
(f) restraining the said displaced, filled shell in a holding means, and  
(g) closing the said open end of said restrained filled shell by means of an inwardly folded crimp.

4,420,441

**METHOD OF MAKING A TWO-PHASE OR MULTI-PHASE METALLIC MATERIAL**

Alfred R. E. Singer, Swansea, Wales, assignor to National Research Development Corp., London, England

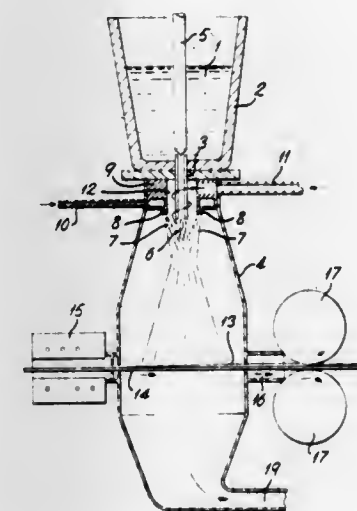
Filed Feb. 15, 1983, Ser. No. 466,474

Claims priority, application United Kingdom, Feb. 23, 1982, 8205347; Jul. 20, 1982, 8220970

Int. Cl.<sup>3</sup> B29C 6/00

U.S. Cl. 264—7

17 Claims



1. A method of making a multi-phase metallic material comprising elemental or metallic particles of a high-melting-point phase dispersed in a lower-melting-point metallic matrix phase (the particles being of a material which would be soluble under equilibrium conditions in the matrix material at the melting point of the matrix material), wherein the method comprises forming a spray of molten matrix material, introducing the particles into the spray, and directing the spray onto a colder surface to solidify the matrix spray and form the multi-phase material, wherein the temperature of the spray is below the melting point of the particles, with the result that, despite the notional solubility of the particles material, no perceptible dissolution of particles occurs.

4,420,442

**MANUFACTURING PROCESS FOR HOLLOW MICROSPHERES**

Bruce W. Sands, Malvern, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Division of Ser. No. 253,139, Apr. 13, 1981, abandoned. This application Sep. 21, 1982, Ser. No. 421,002

Int. Cl.<sup>3</sup> B29C 6/00

U.S. Cl. 264—13

6 Claims

1. In the process of preparing hollow microspheres by spray drying an aqueous dispersion of film-forming substance and recovering the product the improvement consisting of adding a porosity reducing amount of a water miscible organic solvent selected from the group consisting of cellosolve, cellosolve acetate, ethyl cellosolve, diglyme and tetraglyme with a boiling point of at least 100° C. prior to spray drying.

4,420,443

**METHOD FOR PRODUCING SPHERICAL PARTICLES OF CARBON AND OF ACTIVATED CARBON**

Hisatsugu Kaji, and Kazuhiro Watanabe, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Continuation-in-part of Ser. No. 201,928, Oct. 29, 1980, abandoned. This application Dec. 9, 1982, Ser. No. 448,267

Claims priority, application Japan, Nov. 2, 1979, 54-142154

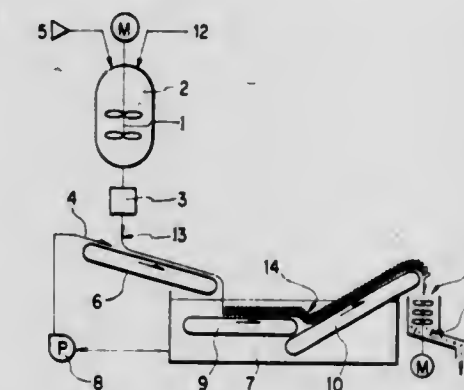
Int. Cl.<sup>3</sup> B22B 11/01

U.S. Cl. 264—15

3 Claims

1. In the method for producing spherical particles of carbon from a carbonaceous pitch, wherein said pitch is mixed with a

viscosity-reducing agent, the pitch viscosity-reducing agent mixture is heated and formed into spherical particles, the viscosity-reducing agent is extracted from the spherical particles, said particles are then infusibilized and baked or activated to obtain the spherical particles of carbon, wherein the improvement comprises: melt-extruding said mixture through a nozzle to form string-like bodies; simultaneously cooling and stretching the string-like bodies by letting said bodies flow together with a water flow rate of 0.5 to 5 m/sec on a inclined conduit or an inclined belt-conveyor to form a mixture of brittle string-



like bodies of 0.2 to 2.5 mm in diameter; breaking the brittle string-like bodies into stick-like bodies with a length to diameter ratio of 1 to 5; putting the stick-like bodies into hot water kept at a temperature higher than the softening point of the mixture, thereby transforming the stick-like bodies into the spherical particles; cooling the spherical particles by putting said particles into cold water kept at a temperature lower than the softening point of the mixture; and collecting the spherical particles of the mixture which are solid at ordinary temperature.

4,420,444

**PROCESS FOR FORMING PHOSPHOR POWDER LAYER**

Hiromichi Yamada, Hino; Atsushi Suzuki; Yoichi Oba, both of Higashiyamato; Yoko Uchida, Kawasaki; Hideki Kohno, Tokyo; Tadashi Fukino, Hachioji, and Minoru Yoshida, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,623

Int. Cl.<sup>3</sup> C09K 11/00

U.S. Cl. 264—21

13 Claims

1. A process for forming a phosphor powder layer which comprises a step of mixing a phosphor powder with a polymer emulsion, said polymer emulsion having a solid content of 4 to 33% by weight based on the weight of the phosphor powder, a step of drying the mixture, a step of pulverizing the resulting dried mixture to give the phosphor powder coated with a polymer, and a step of molding the phosphor powder coated with the polymer in a mold under pressure and heat.

4,420,445

**COAL PELLETS PRODUCTION**

Sueshi Yamamoto, Tokyo; Kenichi Nagata, Yachiyo; Jisaku Tanimichi, Yokohama, and Yoshiharu Takebe, Tokyo, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1982, Ser. No. 337,169

Claims priority, application Japan, Jul. 10, 1980, 54-94155

Int. Cl.<sup>3</sup> B01J 2/12

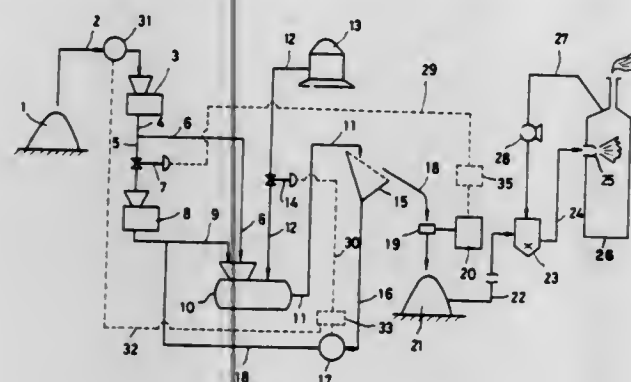
U.S. Cl. 264—40.4

2 Claims

1. A method of making fuel pellets from coal particles, comprising:  
(a) milling raw coal to form a mixture of coal particles comprising:  
1. 50-75 wt. % of coarse coal particles having a maximum particle size of 3-7 mm, and



2. 50-25 wt. % of fine coal particles having a maximum particle size of 0.5 mm,
- (b) introducing the mixture of coal particle sizes into a pelletizer.
- (c) introducing into said mixture in said pelletizer a hydrocarbon oil binder for said coal particles, in an amount of 1-8 wt. % of said mixture,
- (d) treating said coal mixture and binder in said pelletizer to



form coal pellets having said fine particles attached about the coarse particles,

- (e) measuring the yield of said coal pellets produced in said pelletizer, and controlling the amount of binder oil added to said mixture, based upon said measured pellet yield, and
- (f) measuring values for grindability of said produced coal pellets, and controlling the composition of said coarse and fine particles in said formed mixture in step (a) on the basis of said measured grindability values.

4,420,446

#### METHOD FOR MOLD TEMPERATURE CONTROL

Horst K. Wieder, Watertown; Klaus A. Wieder, Helenville, and Joseph Haberkorn, Watertown, all of Wis., assignors to Cito Products, Inc., Watertown, Wis.

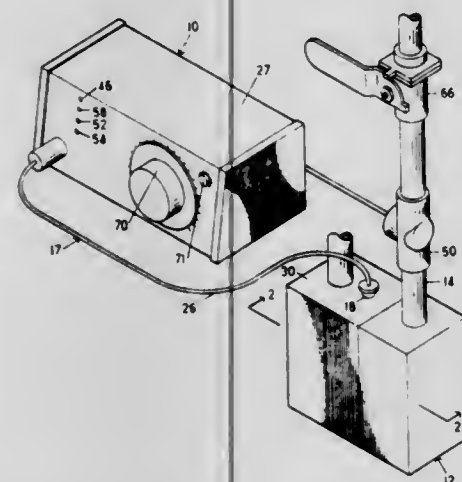
Division of Ser. No. 179,886, Aug. 20, 1980, Pat. No. 4,354,812.

This application Mar. 15, 1982, Ser. No. 357,920

Int. Cl.<sup>3</sup> B29C 25/00

U.S. Cl. 264-40.6

1 Claim



1. A method of controlling the temperature of a fluid cooled mold having cooling channels therein comprising the steps of:

- (a) injecting liquid plastic into the mold to thereby raise its temperature;
- (b) simultaneously sensing the temperature of the mold;
- (c) simultaneously comparing the sensed temperature to a selected control temperature indicative of the proper operating temperature of the mold;
- (d) passing a flow of cooling fluid through the cooling channels in the mold when the sensed temperature of the mold is above the selected control temperature;
- (e) cutting off the flow of cooling fluid through the mold such that cooling fluid dwells in the cooling channels of

- the mold when the sensed temperature drops below the selected control temperature;
- (f) again injecting liquid plastic into the mold to raise its temperature;
- (g) again passing a flow of cooling fluid through the cooling channels in the mold when the sensed temperature of the mold is above the selected control temperature; and
- (h) again cutting off the flow of cooling fluid through the mold such that cooling fluid dwells in the cooling channels of the mold when the sensed temperature drops below the selected control temperature.

4,420,447

#### PROCESS FOR PRODUCING FOAM MOLDINGS WITH AN INSERT

Akira Nakashima, Komaki, Japan, assignor to Tokai Chemical Industries, Ltd., Komaki, Japan

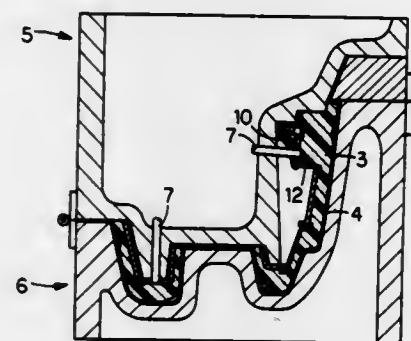
Filed Jan. 5, 1982, Ser. No. 337,171

Claims priority, application Japan, Jan. 16, 1981, 56-5806

Int. Cl.<sup>3</sup> B29D 27/04

U.S. Cl. 264-46.4

10 Claims



1. A process for producing a foam molding including an insert of predetermined shape wherein the insert is set in a mold consisting essentially of a core block and a cavity block for foaming a foamable material in a cavity defined in said mold so as to form a foamed body on one side of said insert, said process comprising the steps of:

- preparing an insert assembly consisting of said insert and a film having portions adhering to a surface of said insert on said one side thereof, said film extending so as to match a partial profile of said foamed body and covering a surface of said core and cavity blocks, said film further having skirt portions adapted to extend between respective joining portion of said core and cavity blocks;
- setting said insert assembly on said one of the core and cavity blocks such that said skirt portions extend over the surface of said joining portion of the one block;
- enclosing said cavity by joining said core and cavity blocks such that said skirt portions are pinched by said joining portions; and
- pouring said foamable material into a space formed between said film and a surface of the other blocks to define said cavity.

4,420,448

#### POLYMER FOAM PROCESS

Charles M. Krutchen, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 26, 1982, Ser. No. 412,044

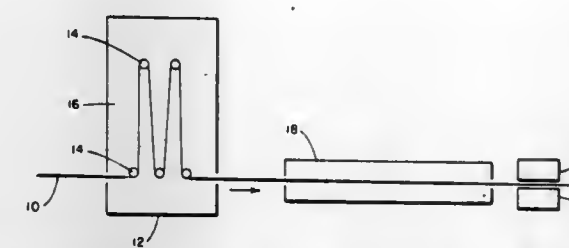
Int. Cl.<sup>3</sup> B29D 27/00

U.S. Cl. 264-53

19 Claims

1. A method for treating foamed styrene polymer sheet

comprising exposing said polymer sheet to an atmosphere of at least substantially carbon dioxide at a temperature sufficient to



cause transpiration, absorption or dissolution of carbon dioxide into said polymer.

4,420,449

#### PROCESS FOR PRODUCING ARTICLES FROM POLYTETRAFLUOROETHYLENE

Zenas Crocker, Osterville, Mass., and A. Nelson Wright, St. Agathe des Monts, Canada, assignors to Synergistics Chemicals Limited, Concord, Canada

Filed Apr. 19, 1982, Ser. No. 369,584

Int. Cl.<sup>3</sup> B29C 19/02

U.S. Cl. 264-68

16 Claims

1. A process for production of a shaped polytetrafluoroethylene article comprising:

- introducing polytetrafluoroethylene granules into a high intensity mixer comprising an enclosed container having a plurality of blades rotatable on arms about a central axis; rotating said blades at a blade tip speed of at least 30 meters per second whereby the polytetrafluoroethylene granules are subjected to an intense mixing and thermokinetic heating action of the rotating blades until the granules become heated to a predetermined discharge temperature of above 370° C.;
- discharging the polytetrafluoroethylene granules at said discharge temperature;
- forming the discharged, heated, granules into an article of desired shape at or below said discharge temperature; and
- cooling the shaped article.

4,420,450

#### MANUFACTURE OF SPRINGS OF FIBRE REINFORCED COMPOSITE MATERIAL

Barry J. Marsh, Penkridge, England, assignor to GKN Technology Limited, Wolverhampton, England

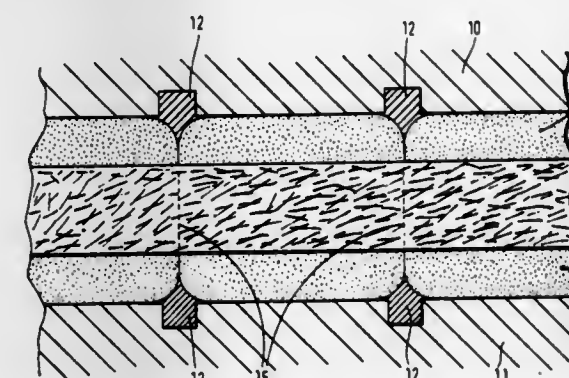
Filed Mar. 16, 1982, Ser. No. 358,594

Claims priority, application United Kingdom, Mar. 21, 1981, 8108916

Int. Cl.<sup>3</sup> B28B 11/12

U.S. Cl. 264-118

6 Claims



1. In a method of manufacturing leaf springs from composite, fibre reinforced resin material, the method comprising: forming an assembly of resin impregnated fibres of sufficient width to constitute a number of individual springs in side-by-side relationship;

subjecting the assembly to a moulding process including a treatment to cure the resin and set the fibres therein; cutting the cured assembly along at least one plane extending longitudinally of the assembly and between opposed surfaces thereof to form said individual springs; the improvement comprising forming, during said moulding process, depressions in said surfaces along said planes where the assembly is to be cut, whereby fibres adjacent said surfaces remain undisturbed by said cutting.

4,420,451

#### METHOD FOR FILM EXTRUSION COMPRISING ROTARY DIE PARTS

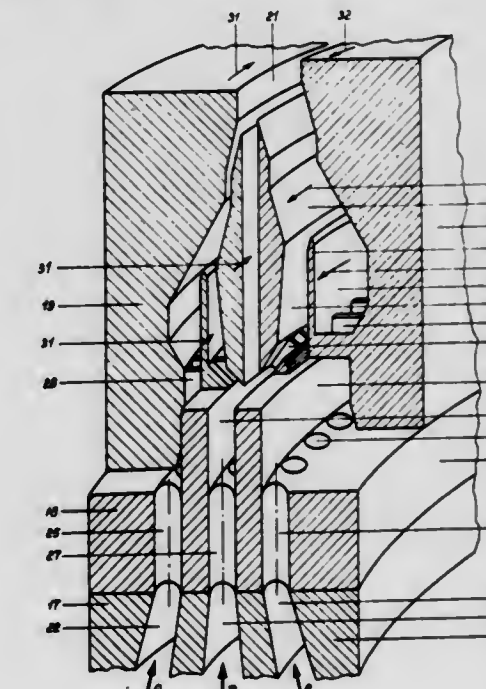
Ole-Bendt Rasmussen, 7, Topstykke, 3460 Birkerød, Denmark Continuation of Ser. No. 803,896, Jun. 6, 1977, abandoned, which is a division of Ser. No. 592,273, Jul. 1, 1975, Pat. No. 4,039,364. This application Oct. 7, 1980, Ser. No. 194,862

Claims priority, application United Kingdom, Jul. 5, 1974, 29807/74; Dec. 11, 1974, 53644/74

Int. Cl.<sup>3</sup> B29F 3/10

U.S. Cl. 264-173

3 Claims



1. A method of extruding a laminated polymer sheet of improved properties comprising the steps of extruding in an extrusion die a dispersion of two molten polymer materials in at least two generally concentric tubular streams rotating relative to one another, subjecting the respective tubular streams during such extrusion to significant attenuation generally in the direction of extrusion flow to attenuate and elongate the dispersed polymer material, combining the separate attenuated tubular streams into a common stream while continuing the extrusion thereof, discharging the common stream while the polymers therein remain in molten condition from said die through an exit passage defined by two generally concentric spaced apart cylindrical walls while rotating such walls in generally opposite relative directions whereby the opposite surfaces of the common extruded stream contiguous to such walls are subjected while passing through said exit passage to the smearing action of said rotating walls to thereby peripherally shear out the attenuated polymer dispersion through the thickness of the common stream, allowing the common extruded stream to solidify after emergence from such exit passage, and finally collecting the thus solidified tubular sheet.



4,420,452

**PROCESS AND DEVICE FOR INJECTION-MOLDING PLASTICS**

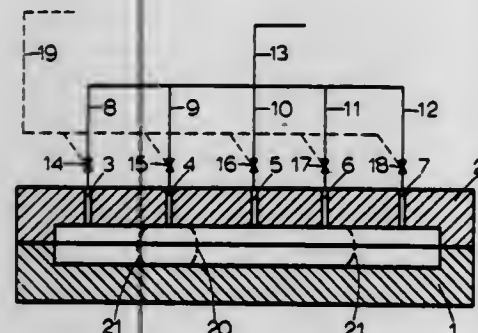
Hendrik van Dalen, Geleen, and Willem Schlösser, Kerkrade, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Jun. 26, 1981, Ser. No. 277,854

Int. Cl.<sup>3</sup> B29F 1/00

U.S. Cl. 264—328.8

4 Claims



1. A process for the injection-molding of plastic material consisting essentially in:  
initially introducing the material charge into a mold having a plurality of entry gates through less than all of said gates, and subsequently introducing the material through at least one additional entry gate only after said flow front has passed said additional gate.

4,420,453

**METHOD OF MAKING POLYESTER CORD RADIAL TIRES**

Myron T. Ayers, Akron, Ohio, assignor to The General Tire &amp; Rubber Company, Akron, Ohio

Filed Aug. 13, 1980, Ser. No. 177,710

Int. Cl.<sup>3</sup> B29C 25/00

U.S. Cl. 264—502

1 Claim

1. A method of making a polyester cord tire including the curing of the tire under heat and pressure in a mold at a curing temperature of at least 335° F. (168° C.) and then post-cure inflating the tire outside the mold to a pressure of at least 120 kilopascals before the tire cools below the heat shrink temperature of the polyester cord, wherein the improvement comprises a time delay between said curing of the tire in a mold and said post-cure inflation, the length of said time delay being such as to allow the temperature of the polyester cords in said tire underneath the tread shoulder portions of the tire to fall to between 295° F. and 305° F. (146° C. to 152° C.).

4,420,454

**METHOD OF MAKING A PLASTIC HOLLOW ARTICLE**

Kiyoshi Kawaguchi, Yokohama; Muneki Yamada, Fujisawa; Nobuyuki Kato, Yokohama; Fumio Kanou, Yokohama; Akira Sakamoto, Yokohama, and Minoru Mitsuhashi, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Limited, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,147

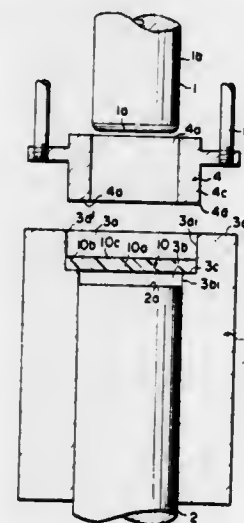
Int. Cl.<sup>3</sup> B29C 17/03, 17/04; B29D 9/04

U.S. Cl. 264—512

15 Claims

1. A method of making a plastic hollow article having a flange portion, a sidewall portion and a bottom wall portion, at least said sidewall portion being molecularly oriented, which comprises clamping a peripheral portion corresponding to said flange portion of a flat, molecularly orientable plastic material stock of substantially uniform thickness having a temperature below the upper limit of the molecularly orientable temperatures of said plastic material, such that the material of the peripheral portion will not flow radially, inwardly; thereafter introducing the central portion of said plastic material stock substantially corresponding to said bottom portion into a die cavity by moving a first plunger and a second plunger in said die cavity while compressing said central portion between said

first plunger and said second plunger, said first and second plungers being moveable between an original position and a second position, said die cavity having a straight, axially extending inside surface with a clearance between said inside surface and a side surface of said first plunger being larger than the thickness of a sidewall portion of a hollow preform to be formed, such that the compressing force by the first plunger and the second plunger is kept comparatively high in a beginning stage of introducing the plastic material stock into the die cavity, thereby causing the plastic material forced out to substantially fill the space between the first plunger and the inside surface of said die cavity, and thereafter the compressing force is reduced and said introducing is continued to said position thereby permitting the filled plastic material to be drawn in the



axial-direction, to form a hollow preform having a sidewall portion made from the plastic material which has been forced out from between the first plunger and the second plunger, said sidewall portion being kept in contact with the side surface of the first plunger kept at about molecularly orientable temperature; withdrawing the first plunger from said second plunger to said original position thereof and supplying a fluid under pressure, during said withdrawing, into said hollow preform to expand radially said sidewall portion, so that said sidewall portion is brought into contact with the inside of said die cavity kept at a temperature below the lower limit of said molecularly orientable temperatures for cooling and solidifying, whereby said sidewall portion of said plastic hollow article is formed from said sidewall portion of said hollow preform.

4,420,455

**END PLUG GAUGING DEVICE AND METHOD**

Frank D. Qurnell, and Nordahl H. Skarshaug, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 12, 1981, Ser. No. 233,841

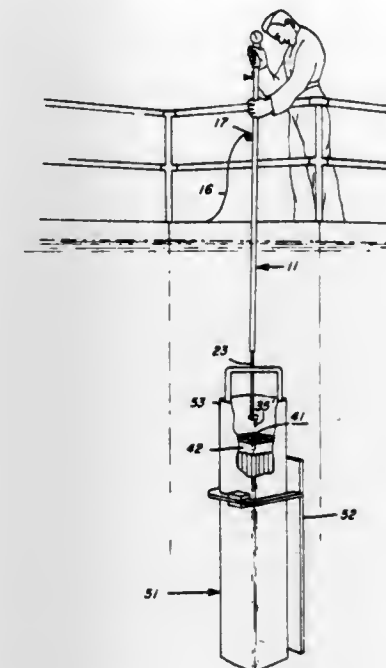
Int. Cl.<sup>3</sup> G21C 17/00; G01B 5/14

U.S. Cl. 376—245

13 Claims

1. An end plug gauging device for use in determining the axial position of nuclear fuel elements in the upper tie plate of a reactor fuel bundle submerged in a pool of water, comprising mounting means for mounting a position indicator including a plunger for actuating said indicator in proportion to the degree of depression of the plunger, said mounting means including a lower end for placement on a reference plane defined by the submerged upper surface of said upper tie plate, and means slidably, coaxially mounted within said mounting means, said means slidably mounted being in cooperation with said plunger

and acting as an extension of said plunger, and including a tip extendable below said lower end of said mounting means to



engage the end of the shank of an end plug of a fuel rod in said upper tie plate.

4,420,456

**MOUNTING OF POWER CONDUCTOR AND INSTRUMENT LEAD PENETRATIONS FOR NUCLEAR REACTOR INSTALLATIONS**

Walter Nickel, Viernheim; Josef Schoening, Hambruecken, and Hans-Georg Schwiers, Ketsch, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

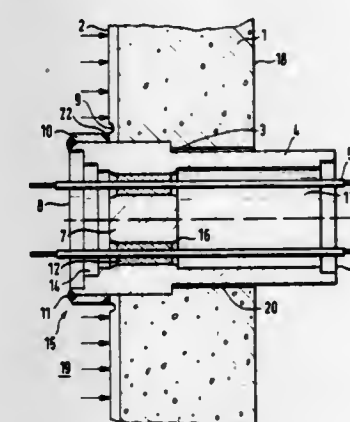
Filed Apr. 23, 1981, Ser. No. 256,973

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015494

Int. Cl.<sup>3</sup> G21C 17/00

U.S. Cl. 376—245

15 Claims



1. A mounting construction for power conductors and instrument leads passing through a wall of a nuclear reactor pressure vessel comprising:

- a cylindrical metal housing having a first outer circumference larger than a second outer circumference and a shoulder area between said first and second circumferences, said cylindrical metal housing being tightly fitted along its length and outer circumference in a passageway in said nuclear reactor pressure vessel wall, and terminating with a part of said first outer circumference inside said pressure vessel;
- a metal, cylindrical tube segment tightly surrounding said part of the first outer circumference within said pressure vessel and fixedly attached thereto with a lip weld;

at least one electrical conductor extending through the length of said cylindrical metal housing, and solid filler material at least partially filling the space within said cylindrical metal housing.

4,420,457

**FUEL ASSEMBLY**

Jacques Le Pargneux, Lyon, France, assignor to Framatome, Courbevoie, France

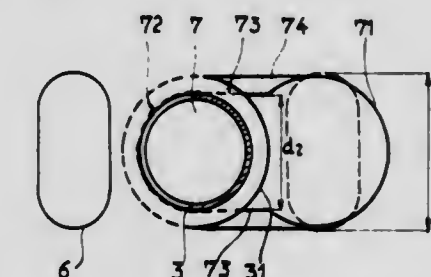
Filed Sep. 18, 1981, Ser. No. 303,673

Claims priority, application France, Oct. 8, 1980, 80 21499

Int. Cl.<sup>3</sup> G21C 3/32

U.S. Cl. 376—446

5 Claims



1. A fuel assembly for a nuclear reactor, including a plurality of fuel elements arranged vertically in a supporting frame including two endpieces, the upper 1 and lower 2 respectively, to which are attached the ends of a plurality of vertical tubes 3 along which are arranged a plurality of grids 4 for retaining the fuel elements 5, each endpiece 1(2) comprising a plane base 11 (21) upon which are arranged a first series of orifices 7 in which the ends of the tubes 3 are engaged and fixed and a second series of orifices 6 for the flow of fluid for cooling the fuel elements 5, characterized by the fact that the base 11 (21) of each endpiece 1 (2) is associated with an inner plate 15 (25) equipped with the same series of orifices 70 for engagement of the tubes 3 and 60 for the flow of fluid, the said inner plate 15 (25) being joined side by side with the said base 1 (2) and connected to it by detachable means 18 (26) of attachment so as to form a whole having the mechanical characteristics demanded of the base 1 (2), and by the fact that the orifices 70 for engagement of the tubes 3, arranged in the inner plate 18 (25), have an oblong cross-section and are equipped with parts 74 for attachment, which cooperate with corresponding parts 31 arranged on the end of each tube 3 for the attachment of these tubes by transverse displacement of the inner plate, the whole being then locked by attachment of the base to the inner plate.

4,420,458

**NUCLEAR FUEL ASSEMBLY WITH COOLANT CONDUCTING TUBE**

Thomas G. Dunlap; William G. Jameson, Jr., both of San Jose; Carl R. Mefford, Los Gatos; Harold L. Nelson, and James E. Cearley, both of San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Apr. 29, 1981, Ser. No. 258,639

Int. Cl.<sup>3</sup> G21C 3/32

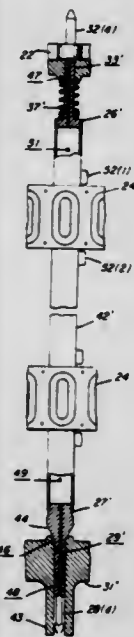
U.S. Cl. 376—447

10 Claims

1. A nuclear fuel assembly comprising: a plurality of nuclear fuel rods each fitted with an upper end plug and a lower end plug with axially extending shanks; support means providing a plurality of support positions for retaining said fuel rods in spaced array, said support means including a lower tie plate including a support grid formed with support cavities for receiving the lower end plug shanks of said fuel rods and an upper tie plate formed with support cavities for receiving the upper end plug shanks of said fuel rods, said lower tie plate further including a nose piece extending from said support grid



and forming a coolant receiving chamber; a moderator containing tube in one of said support positions, said tube being fitted with an upper end plug with an axially extending upper end plug shank engaging a support cavity in said upper tie plate and a lower end plug with an axially extending lower end plug shank engaging a support cavity in said support grid of said lower tie plate, said upper end plug shank being elongated and extending substantially above the upper surface of said upper tie plate; a plurality of axially spaced spacers for laterally supporting said fuel rods and said tube; spacer retaining means fixed to said tube for engaging said spacers to prevent substantial axial displacement thereof, said lower end plug shanks of said tube and its mating support cavity in said support grid of



said lower tie plate being formed with a transverse cross section shape which prevents rotation of said tube to prevent disengagement of said spacer retaining means from said spacers, said lower end plug shank of said tube being elongated and having a length greater than the length of the lower end plug shanks of said fuel rods whereby it extends substantially below the lower surface of said support grid of said lower tie plate into said coolant receiving chamber, said mating support cavity for the elongated lower end plug shank of said tube being formed with a boss extended downward into said chamber and surrounding said elongated lower end plug shank of said tube to protect it from coolant flow in said chamber whereby flow induced vibration of said elongated lower end plug shank is prevented.

4,420,459

#### METHOD OF MAKING PREFORMS FOR BRAZING AND HARDFACING

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 198,684, Oct. 20, 1980, abandoned. This application Jan. 15, 1982, Ser. No. 339,358  
Int. Cl.<sup>3</sup> B22F 1/00

U.S. Cl. 419-61

9 Claims

1. A method suitable for manufacturing flat brittle metal alloy brazing preforms comprising:

- forming a powder of a predetermined particle size, said powder being said brittle metal alloy;
- mixing said powder with a volatile organic vehicle to form a paste of a predetermined viscosity;
- covering a screen having opening between the strands thereof with a light sensitive coating to fill the opening between said strands with said light sensitive coating;
- masking said screen with a sheet having an image of a desired preform pattern;
- exposing said coating with light through said sheet to sensitize said coating with said image;
- etching the coating to remove said sensitized areas to

define an opening in said coating, said opening having said preform pattern,

- placing a substrate on one side of said screen;
- forcing a predetermined amount of said paste through said opening from the opposing side of said screen to form a deposit upon said substrate, said deposit being a green preform relatively uniform in thickness; and
- heating said green preform to remove said organic vehicle to form said flat, brittle metal alloy.

4,420,460

#### GRAIN REFINEMENT OF TITANIUM ALLOYS

Frank A. Crossley, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1982, Ser. No. 446,331

Int. Cl.<sup>3</sup> C22C 14/00

U.S. Cl. 420-417

7 Claims

1. A method for the grain refinement of cast titanium alloys containing at least 70 weight percent titanium comprising inoculating said molten alloys prior to or during casting thereof with at least one material which is not completely dissolved in said alloys and which is selected from the group of materials consisting of titanium and 0.4 to 15 weight percent carbon, titanium and 1.4 to 6 weight percent nitrogen and titanium and 1.3 to 10 weight percent oxygen, said material being added to titanium alloys in amounts of about 0.5 to about 1 milligram of inoculant per pound of alloy when the average inoculant particle size is about one micrometer.

4,420,461

#### AGGLUTINATION-INHIBITION TEST KIT FOR DETECTING IMMUNE COMPLEXES

Rudolph P. Reckel, Bridgewater, and Joanne L. Harris, Annandale, both of N.J., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed May 26, 1982, Ser. No. 382,261

Int. Cl.<sup>3</sup> G01N 33/54

U.S. Cl. 422-61

4 Claims

1. A kit for detecting immune complexes in a biological fluid, said immune complexes having endogenously bound Clq comprising:

- human erythrocytes coated with purified Clq; and
- rabbit anti-human Clq immunoglobulin.

4,420,462

#### CATALYTIC HEAT EXCHANGER

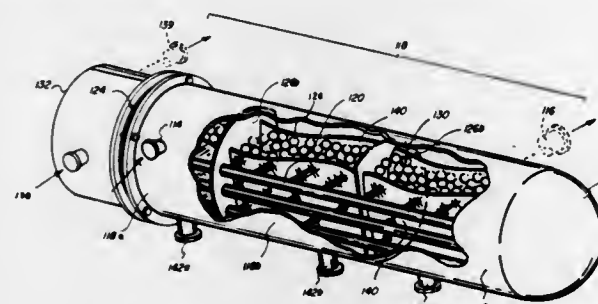
Robert A. Clyde, P.O. Box 983, Asheville, N.C. 28802

Filed Mar. 22, 1982, Ser. No. 360,605

Int. Cl.<sup>3</sup> F28D 7/06

U.S. Cl. 422-201

13 Claims



1. A catalytic heat exchanger useful for carrying out a catalytic reaction wherein a gaseous or vaporized mixture is flowed into contact with catalytic material reactive with such mixture, said catalytic heat exchanger comprising:

- a hollow container defining a reaction zone for the gaseous or vaporized mixture and the catalytic material;
- an inlet conduit and an outlet conduit for the gaseous or

vaporized mixture respectively located at opposite ends of said reaction zone;

- baffle means disposed within said reaction zone transverse to the flow of the gaseous or vaporized mixture, said baffle means occupying a substantial but incomplete cross-section of said reaction zone available for the flow of the gaseous or vaporized mixture so as to form a tortuous flow path for the gaseous or vaporized mixture and to divide said reaction zone into at least first and second regions having first and second transverse volumes, respectively, which vary as a function of the distance from said inlet conduit;
- means for supporting catalytic material within said first and second regions of said reaction zone; and
- heat exchange means disposed within said first and second regions of said reaction zone and adapted to circulate a heat exchange fluid therethrough in a manner such that a gaseous or vaporized mixture flowing through said reaction zone sequentially (1) flows across said heat exchange means, (2) flows through the catalytic material located in said first region, (3) flows around said baffle means, (4) flows across said heat exchange means, and (5) flows through the catalytic material located in said second region.

4,420,464

#### RECOVERY OF VANADIUM FROM CARBONACEOUS MATERIALS

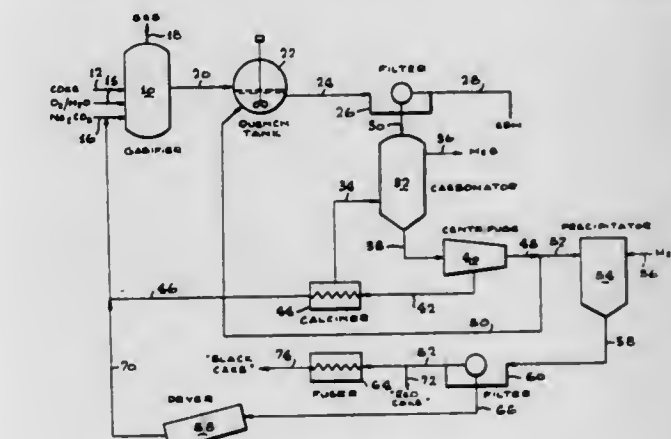
Kenneth M. Barclay, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 26, 1981, Ser. No. 314,611

Int. Cl.<sup>3</sup> C22B 34/22; C01G 31/00, 31/02

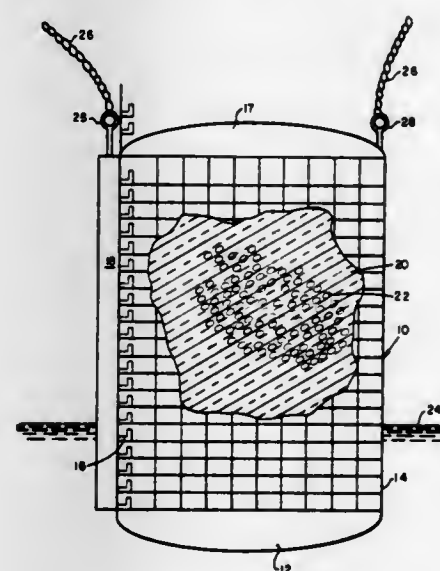
U.S. Cl. 423-65

19 Claims



1. A process for recovering vanadium values from a carbonaceous material containing vanadium which comprises: treating said carbonaceous material with an oxygen-containing gas in a molten salt comprising an alkali metal carbonate to convert the vanadium present in said carbonaceous material into water-soluble vanadium compounds; quenching at least a part of the melt containing said water-soluble vanadium compounds in an aqueous solution; removing ash from the resulting quenched melt solution; reacting the de-ashed quenched melt solution with carbon dioxide to produce alkali metal bicarbonates and hydrogen sulfide gas and to lower the alkalinity of said solution from about pH 13.0 to a pH in the range of about pH 8.0 to pH 9.5; separating precipitated alkali metal bicarbonates from a solution containing alkali metal bicarbonates, alkali metal carbonates and water-soluble vanadium compounds; heating the separated precipitated alkali metal bicarbonates to release carbon dioxide therefrom and to form alkali metal carbonates; recycling the thus formed alkali metal carbonates to said molten salt; treating said solution containing unprecipitated alkali metal bicarbonates, alkali metal carbonates and water-soluble vanadium compounds with sulfuric acid at a temperature in the range of about 75°-125° C. and a pH in the range of about pH 1.0 to pH 3.5 to form insoluble alkali metal vanadates and soluble alkali metal sulfates; recovering said alkali metal vanadates; and recycling said alkali metal sulfates to provide at least a part of said molten salt.

19. A process for recovering vanadium values from a carbonaceous material containing vanadium which comprises: treating said carbonaceous material with an oxygen-containing gas in a molten salt comprising an alkali metal carbonate to convert the vanadium present in said carbonaceous material to water-soluble vanadium compounds; quenching at least a part of the melt containing said water-soluble vanadium compounds in an aqueous solution; treating said quenched melt solution with carbon dioxide to produce alkali metal bicarbonates and to convert a substantial proportion of the silicates present in the quenched melt to silica and to lower the alkalinity of said solution from about pH 13.0 to a pH in the range of about pH 9.5 to pH 10.0; removing ash and silica from the resulting carbon dioxide-treated quenched melt solution; stripping hydrogen sulfide from the de-ashed carbon dioxide-treated quenched melt solution;



1. An apparatus for feeding slowly soluble water-soluble chemicals into the basin of a cooling tower which contains water which comprises a rigid mesh cylindrical drum having a bottom, sides, and an open top, vertically, spaced-apart hooks positioned along the inside of the drum, a plastic mesh bag which contains solid, slowly soluble water-soluble chemicals affixed to one or more of said hooks, and means positioned at the top of the rigid mesh cylindrical drum for suspending it below the water level of the basin of a cooling tower.



treating the resulting stripped solution with carbon dioxide to provide a pH in the range of about pH 8.0 to pH 8.2 and to precipitate alkali metal bicarbonates;  
separating precipitated alkali metal bicarbonates from a solution containing alkali metal bicarbonates, alkali metal carbonates and water-soluble vanadium compounds;  
heating the separated precipitated alkali metal bicarbonates to release carbon-dioxide therefrom and to form alkali metal carbonates;  
recycling the thus formed alkali metal carbonates to said molten salt;  
treating said solution containing unprecipitated metal bicarbonates, alkali metal carbonates and water-soluble vanadium compounds with sulfuric acid at a temperature in the range of about 75°-125° C. at a pH in the range of about pH 1.0 to pH 3.5 to form insoluble alkali metal vanadates and soluble alkali metal sulfates;  
recovering said alkali metal vanadates; and  
recycling said alkali metal sulfates to provide at least a part of said molten salt.

4,420,465

**PROCESS FOR DESULFURIZING AN EXHAUST GAS**  
Naoharu Shinoda; Atsushi Tatani; Naohiko Ukawa; Michio Oshima; Susumu Okino; and Sadaichi Shigeta, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,835  
Claims priority, application Japan, Jun. 22, 1981, 56-95258  
Int. Cl.<sup>3</sup> C01B 17/00

U.S. Cl. 423-242

1. A process for desulfurizing an exhaust gas which comprises desulfurizing an exhaust gas containing SO<sub>2</sub> by contacting the exhaust gas with an aqueous slurry containing calcium compounds as an absorbent and aluminum compounds, said aluminum compounds originating as impurities in the absorbent, the exhaust gas and make-up water used to prepare the slurry, wherein the concentration of dissolved aluminum ions in said slurry is determined and a manganese compound is supplied into said slurry in such a manner that the ratio of the concentration of manganese, including both solid and liquid manganese, to the concentration of the dissolved aluminum ions is in a molar ratio of at least about 0.01 in the slurry so as to improve the desulfurization of the exhaust gas.

4,420,466

**PROCESS FOR PRODUCING PHOSPHORUS PENTOXIDE**

Won C. Park, Irvine, and Jacob J. Mu, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.  
Filed May 10, 1982, Ser. No. 376,341

Int. Cl.<sup>3</sup> C01B 25/12, 25/16, 25/01, 25/02

U.S. Cl. 423-304

1. A process for producing phosphorus pentoxide from phosphate ore comprising the steps of:  
mixing beneficiated phosphate ore with lime and solid carbonaceous material in amounts to produce a feed mixture having a CaO/SiO<sub>2</sub> mole ratio greater than about 8.0;  
forming the feed mixture into pellets;  
heating the pellets, by exposure to radiation emanating from an oxidation zone, to a temperature sufficient to reduce the phosphate in the pellets by reaction with the solid carbonaceous material to form elemental phosphorus vapors without substantial melting of the pellets; and  
providing sufficient oxygen-containing gas to cause oxidation of the elemental phosphorus vapor within the oxidation zone to produce phosphorus pentoxide and to heat the pellets.

4,420,467

ZEOLITE NU-5

Thomas V. Whittam, Darlington, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 17, 1981, Ser. No. 331,832

Claims priority, application United Kingdom, Dec. 17, 1980, 8040395

Int. Cl.<sup>3</sup> C01B 33/20, 33/28; B01J 29/04

U.S. Cl. 423-328

6 Claims

1. A synthetic zeolite material having a molar composition expressed by the formula: 0.5 to 1.5R<sub>2</sub>O:Y<sub>2</sub>O<sub>3</sub>:45 to 100XO<sub>2</sub>:O to 2000H<sub>2</sub>O wherein R is a monovalent cation or 1/n of a cation of valency n, X is silicon or germanium, Y is aluminium, and H<sub>2</sub>O is water of hydration additional to water notionally present when R is H, and having an X-ray diffraction pattern as set out in Table I.

4,420,468

**METHOD OF TREATING CONVERTED POTASSIUM SULFATE FOR REDUCING A SMALL AMOUNT OF CHLORINE CONTAINED THEREIN**

Yoshisato Yamashita; Masanobu Inoue, both of Minamata-shi, and Kohichi Fukatsu, Yachiyoshi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jan. 29, 1982, Ser. No. 344,011

Claims priority, application Japan, Jun. 15, 1981, 56-92015

Int. Cl.<sup>3</sup> C01B 7/01; C01D 15/06

U.S. Cl. 423-482

15 Claims

1. A method for the recovery of converted potassium sulfate having a low chlorine content comprising:  
providing a potassium sulfate mixture prepared by mixing and heating potassium chloride with one of sulfuric acid and potassium hydrogen sulfate, said mixture comprising hydrogen sulfate, chlorine and sulfuric acid;  
screening the mixture with a 60-mesh Tyler screen;  
recovering the portion of the mixture passing through the 60-mesh Tyler screen as a portion having a low chlorine content;  
pulverizing the portion of the mixture remaining on the 60-mesh Tyler screening; and  
calcining the pulverized mixture at a temperature of 300°-500° C. for a time of five minutes to one hour to reduce the chlorine content.

4,420,469

**PYROHYDROLYSIS OF COLUMBIUM OXYFLUORIDE TO COLUMBIUM OXIDE**

Roger M. Bergman, Sanatoga; Edwin J. Bielecki, Boyertown, and Charles R. Nippert, Jr., Pottstown, all of Pa., assignors to Cabot Corporation, Boston, Mass.

Filed Jun. 1, 1982, Ser. No. 384,077

Int. Cl.<sup>3</sup> C01G 33/00

U.S. Cl. 423-592

7 Claims

1. A process for the production of columbium oxide comprising: pyrohydrolyzing a columbium oxyfluoride material by heating it at a temperature ranging from at least about 600° C. to about 1200° C. in the presence of a flowing water vapor atmosphere containing at least about two percent by volume water introduced at a rate sufficient to provide at least about 0.5 mole of water per mole of said columbium oxyfluoride reactant during the time of reaction of CbO<sub>2</sub>F to form CbOF<sub>3</sub>.

4,420,470

**PERCUTANEOUS ABSORPTION TYPE PHARMACEUTICAL PREPARATION OF ISOSORBIDE DINITRATE OR PENTAERYTHRITOL TETRANITRATE IN PRESSURE-SENSITIVE LAMINATE**

Saburo Otsuka; Toshiyuki Yoshikawa; Shoichi Tokuda, and Yuuseke Ito, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka and Toa Eiyo Ltd., Tokyo, both of Japan

Filed Jan. 8, 1982, Ser. No. 338,190

Claims priority, application Japan, Jan. 8, 1981, 56-1805

Int. Cl.<sup>3</sup> A61L 15/03; A61F 13/00; A61K 9/70

U.S. Cl. 424-28

11 Claims

1. A pharmaceutical preparation comprising a flexible backing and a base material formed on the flexible backing, said base material comprising a layer of a polymer having a glass transition temperature (T<sub>g</sub>) of from -70° C. to -10° C. and exhibiting pressure-sensitivity at room temperature, and isosorbide dinitrate (ISDN) or pentaerythritol tetranitrate (PETN) retained in said base material, wherein the polymer contains at least 50% by weight alkyl acrylate or methacrylate containing an average of at least 4 carbon atoms in the alkyl moiety, wherein the isosorbide dinitrate or pentaerythritol tetranitrate concentration in the base material is from 0.5 to 20% by weight and wherein the laminate is composed of a polyester and a member selected from an ethylene-vinylacetate copolymer and an ethylene-ethylacrylate copolymer which prevents the crystallization of the isosorbide dinitrate or pentaerythritol tetranitrate.

4,420,471

**CITRUS FLAVORED MOUTHWASH FORMULATION METHOD**

Craig T. Elton, Rochelle Park, N.J., and Stephen Reynolds, Maybrook, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 10, 1983, Ser. No. 457,093

Int. Cl.<sup>3</sup> A61K 7/16, 7/26

U.S. Cl. 424-49

12 Claims

1. A method of formulating a liquid mouthwash comprising from about 0.01 to about 0.5% of citrus flavor oil, about 0.1 to about 2.0% emulsifier, about 1% to about 25% C<sub>2-3</sub> alcohol and about 60 to about 95% part water, including the steps of:  
(a) preparing a blend of the alcohol with the citrus flavor oil;  
(b) preparing a second blend of water and the emulsifier;  
(c) subsequently combining blends (a) and (b); and  
(d) intimately mixing the resultant combination.

4,420,472

**PRENYL METHYL CARBONATE AND ORGANOLEPTIC USES THEREOF**

Richard M. Boden, Ocean; Manfred H. Vock, Locust, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

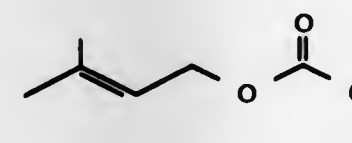
Filed Sep. 30, 1982, Ser. No. 430,947

Int. Cl.<sup>3</sup> A61K 7/16, 7/26; C07C 69/96; C11B 9/00

U.S. Cl. 424-58

4 Claims

1. Prenyl methyl carbonate defined according to the structure:



4,420,473

**ANTIBIOTIC, MF266 SUBSTANCE AND PRODUCTION THEREOF**

Hamao Umezawa; Tomio Takeuchi; Masa Hamada, all of Tokyo; Shinichi Kondo, Yokohama, and Kiyoto Ishii, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,923

Claims priority, application Japan, Sep. 12, 1980, 55-126087

Int. Cl.<sup>3</sup> A61K 35/00; C12P 1/06

U.S. Cl. 424-118

5 Claims

1. The MF266 substance which is a red colored amphoteric compound and of which the hydrochloride decomposes at 178°-180° C. and shows a specific optical rotation  $[\alpha]_D^{25} = +370^\circ$  (c 0.1, methanol) and an elemental analysis: C 49.00%, H 6.56%, N 3.39%, O 28.58%, Cl 7.17%, the infrared absorption spectrum of the MF266 substance hydrochloride pelleted in potassium bromide giving main absorption peaks as shown in FIG. 1 of the attached drawings, and the ultraviolet absorption spectra of the MF266 substance hydrochloride giving absorption maxima at 220, 235, 254, 290, 380, 475, 496, 535 and 575 nm with E<sub>1cm</sub><sup>1%</sup> values of 208, 276, 232, 64, 28, 96, 100, 64 and 14, respectively when determined in methanol; absorption maxima at 220 (shoulder), 235, 254, 290, 380, 480, 497, 535 and 570 nm with E<sub>1cm</sub><sup>1%</sup> values of 188, 264, 241, 64, 28, 92, 100, 60 and 14, respectively when determined in 0.1 N hydrogen chloride in 90% aqueous methanol; and absorption maxima at 213, 253, 292, 360, 560 and 597 nm with E<sub>1cm</sub><sup>1%</sup> values of 688, 247, 48, 36, 100 and 100, respectively when determined in solution in 0.1 N aqueous sodium hydroxide in 90% aqueous methanol as shown in FIG. 2 of the attached drawings, the MF266 substance hydrochloride being further characterized by that it is soluble in water, methanol, dimethyl-sulfoxide and pyridine but sparingly soluble in chloroform, acetone, benzene and ethyl acetate and that it gives a single spot at R<sub>f</sub> 0.27 in a thin layer chromatography on silica gel developed with chloroform-methanol-10% aqueous ammonium acetate (20:15:1 by volume) and a single spot at R<sub>f</sub> 0.06 in the same silica gel thin layer chromatography developed with chloroform-methanol (1:1 by volume) and a single spot at R<sub>f</sub> 0.10 in the same silica gel thin layer chromatography developed with chloroform-methanol-acetic acid (20:5:1 by volume) as eluent.

4,420,474

**SYNERGISTIC ANTIFUNGAL COMPOSITIONS**

Richard B. Sykes, Rocky Hill, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 15, 1979, Ser. No. 85,161

Int. Cl.<sup>3</sup> A61K 35/00, 31/415

U.S. Cl. 424-121

1 Claim

1. A composition for the treatment of a fungal infection comprising a combination of azalomycin F and econazole, wherein the weight ratio of azalomycin F to econazole is from about 8:1 to 1:4.

4,420,475

**SILICON-BEARING AMIDES**

Robert E. Damon, II, Randolph, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 80,424, Oct. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 74,002, Sep. 10, 1979, abandoned. This application Dec. 11, 1980, Ser. No. 215,414

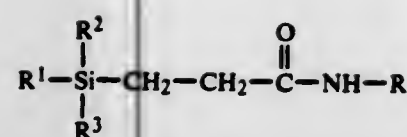
Int. Cl.<sup>3</sup> C07F 7/10; A01N 55/00; A61K 31/695

U.S. Cl. 424-184

32 Claims

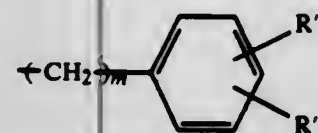
1. A compound of the formula:





wherein each of

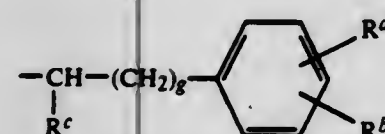
$R^1$ ,  $R^2$  and  $R^3$  is, independently, alkyl having from 1 to 22 carbon atoms; or a radical of the formula



in which

$m$  is 0, 1 or 2, and each of  $R'$  and  $R''$  is independently a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 127; and  $R$  is an aralkyl-type radical of the formula (a), (c) or (d)

(a)



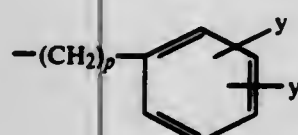
wherein

$g$  is 0, 1 or 2;

$R^a$  is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

$R^b$  is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and  $R^c$  is subtype (i) a hydrogen atom; subtype (ii), a radical of the structure

(ii)



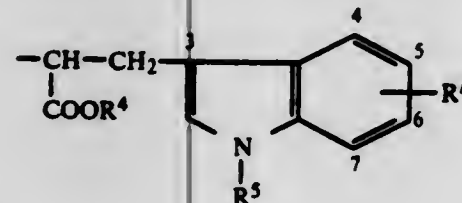
in which

$p$  is 0, 1 or 2, and

$y$  is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and

$y'$  is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or subtype (iii) alkyl having from 1 to 8 carbon atoms; or

(c)



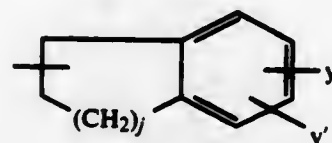
wherein

$R^b$  is as defined above;

$R^4$  is hydrogen; an equivalent of a cation which results in the

formation of a salt which is pharmaceutically acceptable; alkyl having from 1 to 8 carbon atoms; or benzyl;  $R^5$  is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or

(d)

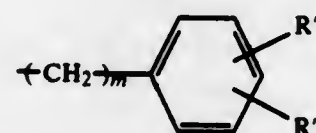


wherein

$y$  and  $y'$  are as defined above; and

$j$  is a whole integer of from 1 to 4;

providing that at least one of  $R^1$ ,  $R^2$  and  $R^3$  is of the formula



#### 4,420,476

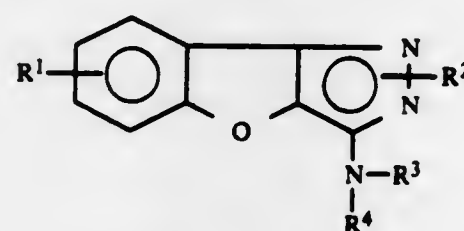
**BENZOFURO[3,2-C]PYRAZOL-3-AMINE DERIVATIVES**  
Adolf Philipp, St. Laurent; Ivo Jirkovsky, Montreal, and Rene Martel, Candiac, all of Canada, assignors to Averst McKenna & Harrison, Inc., Montreal, Canada

Filed May 24, 1982, Ser. No. 380,973

Int. Cl.<sup>3</sup> A61K 31/62, 31/485, 31/415, 31/44; C07D 491/44 U.S. Cl. 424-232

30 Claims

1. A compound of the formula



in which  $R^1$  is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or trifluoromethyl;  $R^2$  represents one lower alkyl substituent on either of the adjacent nitrogen atoms;  $R^3$  is hydrogen, lower alkyl, trihalomethyl(lower)alkyl; oxo(lower alkyl); lower alkanoyl; 2-, 3- or 4-pyridinyl(lower)alkyl; lower alkylaminocarbonyl; or lower alkylaminothiocarbonyl; and  $R^4$  is hydrogen or lower alkyl; or a therapeutically acceptable acid addition salt thereof.

28. A method of producing analgesia in a mammal, which comprises administering to the mammal an effective analgesic amount of a compound of claim 1, or a therapeutically acceptable acid addition salt thereof.

29. A method of producing analgesia in a mammal, which comprises administering to the mammal an effective analgesic amount of a compound of claim 1, or a therapeutically acceptable acid addition salt thereof, in combination with an effective amount of another analgesic agent selected from acetylsalicylic acid, acetaminophen, aminopyrine, etodolac, codeine or morphine.

#### 4,420,477

##### CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Yoshikazu Inoue, Amagasaki; Nobuyoshi Yasuda, and Masayoshi Murata, both of Mino, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Nov. 24, 1980, Ser. No. 209,988

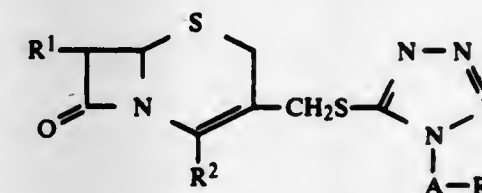
Claims priority, application United Kingdom, Nov. 30, 1979, 7941417

Int. Cl.<sup>3</sup> C07D 501/36; A61K 31/545

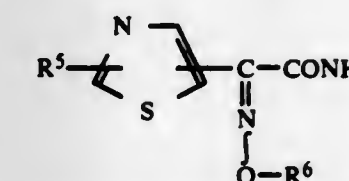
U.S. Cl. 424-246

23 Claims

1. A cephem compound of the formula:



wherein  $R^1$  is a group of the formula:



in which  $R^5$  is amino or a protected amino group; and  $R^6$  is lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, cyclo(lower)alkenyl, aryl, ar(lower)alkyl, or halogen-substituted ar(lower)alkyl;

$R^2$  is carboxy or a protected carboxy group;

$A$  is hydroxy(lower)alkylene, amino(lower) alkylene, protected amino(lower)alkylene, lower alkenylene, hydroxyimino(lower)alkylene, lower alkoxyimino(lower) alkylene, or lower alkenyloxyimino(lower) alkylene; and  $R^3$  is carboxy or a protected carboxy group, and pharmaceutically acceptable salts thereof.

#### 4,420,478

##### NOVEL OXIMES

Rene Heymes, Romainville, and Andre Lutz, Strasbourg, both of France, assignors to Ronssel Uclaf, Paris, France

Filed Apr. 9, 1979, Ser. No. 28,372

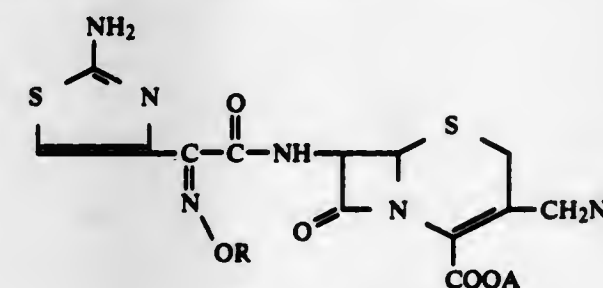
Claims priority, application France, Apr. 14, 1978, 78 11065; Oct. 5, 1978, 78 28465

Int. Cl.<sup>3</sup> A61K 31/545; C07D 501/46

U.S. Cl. 424-246

24 Claims

1. A compound selected from the group consisting of syn isomers of oximes of 3-azidomethyl-7-aminothiazolyl-cephalosporanic acids of the formula



wherein  $R$  is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl and alkynyl of 2 to 4 carbon atoms, benzoyl and  $-(CH_2)_n-R_1$ ,  $n$  is an integer from 1 to 4,  $R_1$  is selected from the group consisting of  $NH_2$  and  $-COOA'$  and  $A'$  and  $A$  are selected from the group consisting of hydrogen, alkali metal, alkaline earth metal,  $-NH_4$ , an easily cleavable ester group selected from the group consisting of methoxymethyl,  $\alpha$ -methoxyethyl, ethoxymethyl, iso-

propyloxymethyl,  $\alpha$ -ethoxyethyl, methylthiomethyl, ethylthiomethyl, isopropylthiomethyl, pivaloyloxymethyl, acetoxymethyl, propionyloxymethyl, isobutyryloxymethyl, isovaleryloxymethyl, isovaleryloxyethyl, propionyloxyethyl 1-acetoxyethyl, 1-acetoxypropyl, 1-acetoxybutyl, 1-acetoxyhexyl and 1-acetoxyheptyl and a non-toxic, pharmaceutically acceptable organic amine and their non-toxic, pharmaceutically acceptable acid addition salts.

9. An antibiotic composition comprising an antibiotically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

#### 4,420,479

##### OLEFINIC BENZIMIDAZOLES, FORMULATIONS, AND ANTIVIRAL METHODS

Tina M. Morwick; Charles J. Paget, both of Indianapolis, and James H. Wilkel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

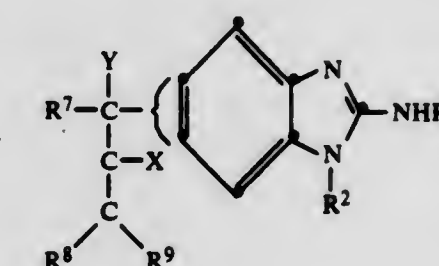
Filed Apr. 8, 1982, Ser. No. 366,760

Int. Cl.<sup>3</sup> A61K 31/415; C07D 235/30

U.S. Cl. 424-246

46 Claims

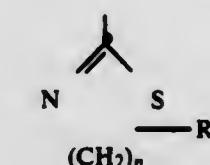
1. A compound of the formula



wherein:

$R^1$  is hydrogen or  $C_1-C_4$  alkanoyl;

$R^2$  is hydrogen,  $-SO_2R^3$  or a group of the formula



in which:

$R^3$  is  $C_1-C_5$  alkyl,  $C_3-C_7$  cycloalkyl, phenyl, furyl, thienyl, or  $R^5R^6N$ , wherein  $R^5$  and  $R^6$  independently are  $C_1-C_3$  alkyl, or taken together with the nitrogen to which they are attached are pyrrolidino, piperidino or morpholino;

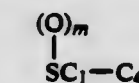
$R^4$  is hydrogen,  $C_1-C_3$  alkyl, phenyl, or benzyl; and

$n$  is 2 or 3;

$R^7$  is hydrogen,  $C_1-C_7$  alkyl,  $C_3-C_7$  cycloalkyl,  $(C_3-C_7$  cycloalkyl)methyl, 1- $(C_3-C_7$  cycloalkyl)ethyl, phenyl, or phenyl substituted with one group selected from hydroxy, halo,  $C_1-C_4$  alkoxy, nitro or trifluoromethyl;

$X$  is hydrogen and  $Y$  is hydroxy, or together  $X$  and  $Y$  form a bond;

$R^8$  and  $R^9$  independently are hydrogen, halo, cyano, nitro,



alkyl,  $CH_2R^{10}$ ,  $COR^{10}$ , phenyl, or phenyl substituted with one group selected from hydroxy, halo,  $C_1-C_4$  alkoxy, nitro or trifluoromethyl;

$m$  is 0, 1 or 2;

$R^{10}$  is hydroxy,  $C_1-C_4$  alkoxy,  $C_1-C_4$  alkanoyloxy, halo,  $C_3-C_6$  cycloalkyl- $C_1-C_4$  alkoxy, or  $(O-C_1-C_4$  alkyl-),  $NR^{11}R^{12}$  where  $y$  is 0 or 1, and

$R^{11}$  and  $R^{12}$  independently are hydrogen or  $C_1-C_4$  alkyl; provided that one and only one of  $R^5$  and  $R^6$  is hydrogen,

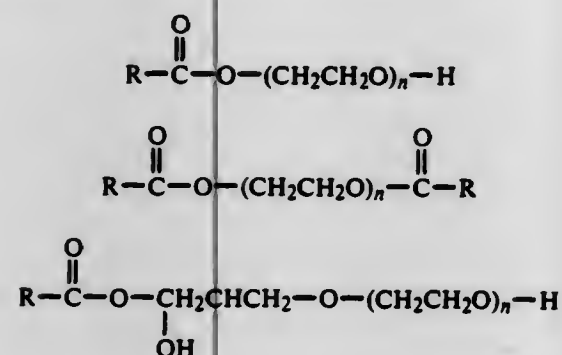






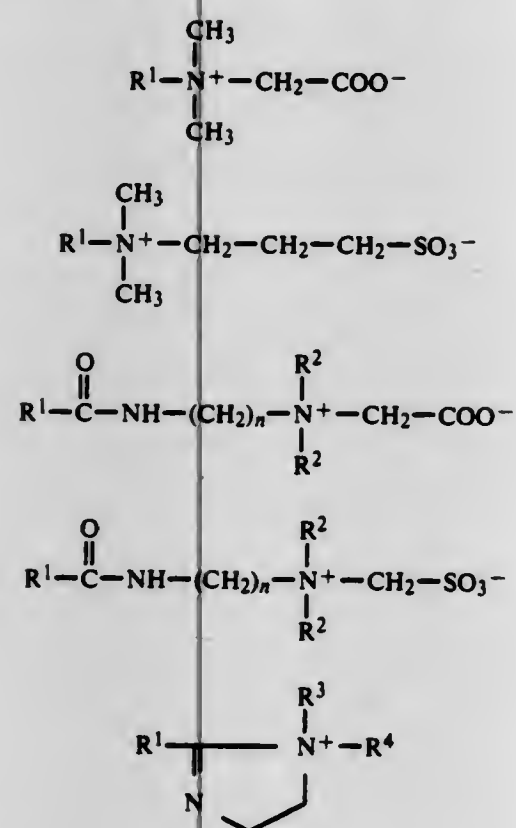
atoms and separating the two 4-(R-NH)-1-pyridinyl groups by from 4 to 18 carbon atoms; A is a pharmaceutically acceptable anion; m is 1 or 3; n is 1 or 2; x is 1, 2 or 3; and (m)(2)=(n)(x);

(B) from about 0.75% to about 30% by weight of one or more polyethylene glycol ester surfactants having the structural formulas

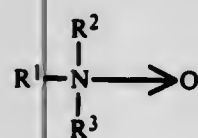


wherein R is alkyl or alkenyl having from about 8 to about 20 carbon atoms or lanolin and n is an integer from about 8 to about 200;

(C) from about 0.5% to about 30% by weight of one or more surfactants selected from the group consisting of (a) betaines having the structural formulas



wherein R<sup>1</sup> is alkyl or alkenyl having from about 8 to about 18 carbon atoms; R<sup>2</sup> is methyl, ethyl or 2-hydroxyethyl; R<sup>3</sup> is 2-hydroxyethyl or CH<sub>2</sub>COO<sup>-</sup>; R<sup>4</sup> is CH<sub>2</sub>COO<sup>-</sup> or CH<sub>2</sub>CH<sub>2</sub>O-CH<sub>2</sub>COO<sup>-</sup>; an n is 2 or 3; and (b) amine oxides having the structural formula



wherein R<sup>1</sup> taken alone is methyl, ethyl or 2-hydroxyethyl; R<sup>2</sup> taken alone is methyl, ethyl or 2-hydroxyethyl; R<sup>1</sup> and R<sup>2</sup> taken together are morpholino; R<sup>3</sup> is alkyl having from about 8 to about 18 carbon atoms or R<sup>4</sup>CONH(CH<sub>2</sub>)<sub>3</sub> wherein R<sup>4</sup> is alkyl having from about 8

to about 18 carbon atoms; and wherein 2-hydroxyethyl can be condensed with from 1 to about 200 units of ethylene oxide; and

(D) water, aqueous ethyl alcohol, aqueous isopropyl alcohol or an aqueous ethyl alcohol-isopropyl alcohol mixture.

4,420,485

# 1'-[3-(1,2-BENZISOXAZOL-3-YL)PROPYL]SPIRO[BENZOFURAN-2(3H),3'] OR 4'-PIPERIDINES OR 3'-PYRROLIDINES]

Larry Davis, Sergeantsville, and Frank A. Pierrat, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

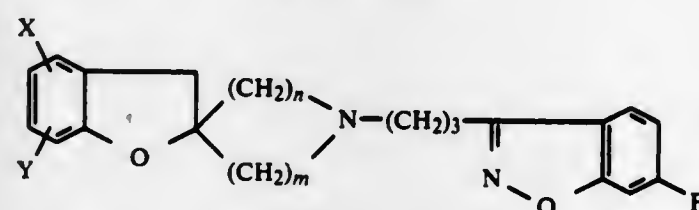
Filed Sep. 29, 1982, Ser. No. 424,379

Int. Cl.<sup>3</sup> A61K 31/445, 31/42; C07D 413/14

U.S. Cl. 424-267

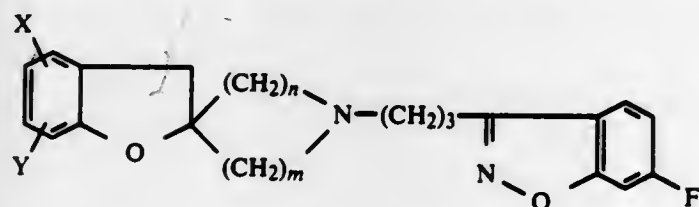
37 Claims

1. A compound having the formula



where X and Y are the same or different and are hydrogen, halogen, lower alkoxy, lower alkyl, nitro, hydroxyl, and CF<sub>3</sub>; and n is an integer of 1 or 2; m is an integer of 2 or 3; and the sum of m and n is 3 or 4; and the pharmaceutically acceptable acid addition salts thereof.

27. A method of lowering the blood pressure in a mammal which comprises administering to a mammal a blood pressure reducing amount of a compound of the formula



where X and Y are the same or different and are hydrogen, halogen, lower alkoxy, lower alkyl, nitro, hydroxyl and CF<sub>3</sub>; n is an integer of 1 or 2; m is an integer of 2 or 3; and the sum of m and n is 3 or 4; and the pharmaceutically acceptable acid addition salts thereof.

4,420,486

# BENZOXAZOLONE DERIVATIVES, PROCESSES FOR PREPARATION THEREOF AND COMPOSITIONS CONTAINING THEM

Hiroshi Ohyama, Chigasaki; Kimiyoshi Kaneko, Isehara; Hiromichi Ishikawa, Atsugi; Sanae Takada, Atsugi; Ken Morita, Atsugi; Takuo Wada, Hatano; Masahiko Miyahara, and Masazumi Arakawa, both of Atsugi, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

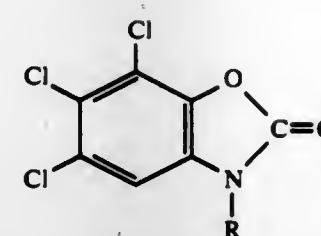
Filed Jan. 22, 1981, Ser. No. 227,377

Int. Cl.<sup>3</sup> C07D 263/58; A01N 43/76

U.S. Cl. 424-272

9 Claims

1. A 5,6,7-trichlorobenzoxazolone compound of the formula



wherein R is hydrogen, a (C<sub>1</sub>-C<sub>4</sub>) alkyl, a (C<sub>1</sub>-C<sub>4</sub>)alkyl-carbonyl, a chloro (C<sub>1</sub>-C<sub>4</sub>)alkylcarbonyl, a (C<sub>1</sub>-C<sub>4</sub>)alkyloxycarbonyl, a mono- or di-(C<sub>1</sub>-C<sub>4</sub>)alkylaminocarbonyl, a (C<sub>1</sub>-C<sub>4</sub>)alkylsulfonyl or phenylsulfonyl.

4,420,487

# DIURETIC AND ANTIHYPERTENSIVE BENZIMIDAZOLES

Bola V. Shetty, Stamford, Conn., and Arthur McFadden, East Brunswick, N.J., assignors to The Purdue Frederick Company, Norwalk, Conn.

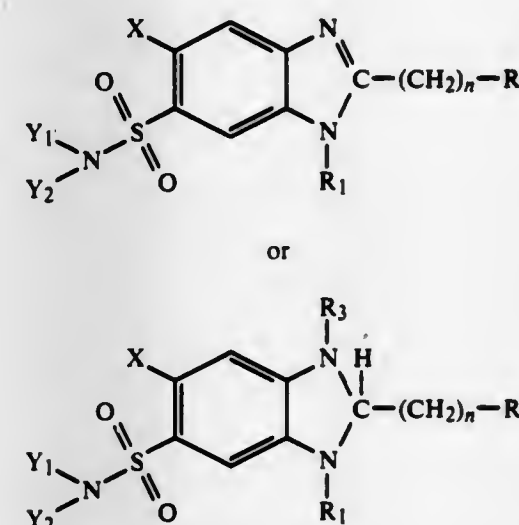
Continuation-in-part of Ser. No. 895,048, Apr. 10, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 164,554

Int. Cl.<sup>3</sup> A61K 31/415; C07D 235/04, 231/42, 263/50

U.S. Cl. 424-273 B

17 Claims

1. A compound of the formula:



or a physiologically compatible salt thereof, wherein:

X=halogen or trifluoromethyl,

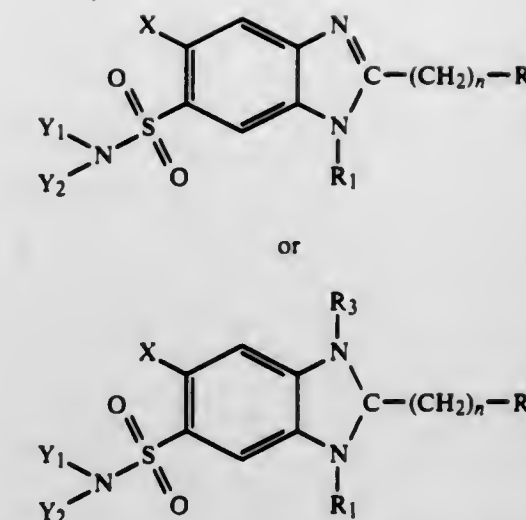
Y<sub>1</sub> and Y<sub>2</sub>=independently hydrogen or lower alkyl,

R<sub>1</sub>=hydrogen, lower alkyl, furfuryl, phenyl substituted by lower alkyl, by lower alkoxy or by halogen, n=0 or an integer from 1-4,

R<sub>2</sub>=amino, hydrogen, hydroxyl, mercapto, lower alkyl mercapto, furyl, adamantanyl, halogen, lower alkyl, phenyl, phenyl substituted by lower alkyl, phenyl substituted by halogen, biphenyl, formamido, guanidino, guanidino substituted by lower alkyl and amino substituted by lower alkyl, by carboxy, by carboxy-lower alkyl, by lower alkyl-carboxy, by phenyl, by phenyl substituted by carboxy, by phenyl substituted by hydroxy, by phenyl substituted by lower alkyl, by phenyl substituted by halogen, by furfuryl, and by carboxy substituted by phenoxy lower alkyl, and

R<sub>3</sub>=hydrogen, lower alkyl, phenyl or substituted phenyl substituted by lower alkyl, lower alkoxy or halogen.

16. The method of achieving a diuretic effect, which comprises administering to a subject requiring the same a diuretic effective amount of a compound of the formula:



or a physiologically compatible salt thereof, wherein:

X=halogen or trifluoromethyl,

Y<sub>1</sub> and Y<sub>2</sub>=independently hydrogen or lower alkyl,

R<sub>1</sub>=hydrogen, lower alkyl, furfuryl, phenyl substituted by lower alkyl, by lower alkoxy or by halogen, n=0 or an integer from 1-4,

R<sub>2</sub>=amino, hydrogen, hydroxyl, mercapto, lower alkyl mercapto, furyl, adamantanyl, halogen, lower alkyl, phenyl, phenyl substituted by lower alkyl, phenyl substituted by halogen, biphenyl, formamido, guanidino, guanidino substituted by lower alkyl and amino substituted by lower alkyl, by carboxy, by carboxy-lower alkyl, by lower alkyl-carboxy, by phenyl, by phenyl substituted by carboxy, by phenyl substituted by hydroxy, by phenyl substituted by lower alkyl, by phenyl substituted by halogen, by furfuryl, and by carboxy substituted by phenoxy lower alkyl, and

R<sub>3</sub>=hydrogen, lower alkyl, phenyl or substituted phenyl, substituted by lower alkyl, lower alkoxy or halogen.

4,420,488

# QUATERNARY

## 1,1-DIPHENYL-4-PYRROLIDINIUM-2-BUTYNE SALTS, A PROCESS FOR THEIR PRODUCTION AND MEDICAMENTS CONTAINING THESE COMPOUNDS

Walter Liebenow, and Hans Liedtke, both of Nuremberg, Fed. Rep. of Germany, assignors to Ludwig Heumann & Co. GmbH, Nuremberg, Fed. Rep. of Germany

Filed Mar. 13, 1981, Ser. No. 243,618

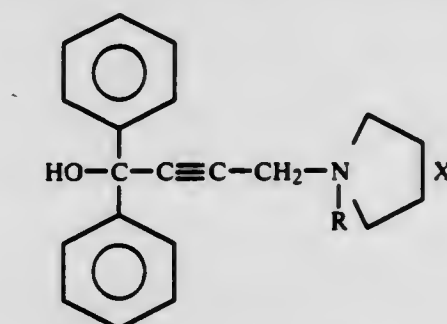
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1980, 3010152

Int. Cl.<sup>3</sup> A61K 31/40; C07D 207/04

U.S. Cl. 424-274

3 Claims

1. A method of treating a warm-blooded mammal, comprising administering to a warm-blooded mammal an anti-ulcerogenically effective amount of a quaternary 1,1-diphenyl-4-pyrrolidinium-2-butyne salt of the formula:



in which R represents methyl or ethyl and X is a chlorine or bromine atom, to elicit an anti-ulcerogenic response.



4,420,489

**SUGARS WITH SULFUR REPLACING THE RING OXYGEN ATOM AS ANTIRADIATION AGENTS**

Roy L. Whistler, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.  
Continuation-in-part of Ser. No. 180,304, Aug. 22, 1980, abandoned. This application Oct. 7, 1981, Ser. No. 309,280  
Int. Cl.<sup>3</sup> A61K 31/38

U.S. Cl. 424—275

7 Claims

1. A method of treatment of an animal utilizing a ring sugar with sulfur replacing a ring oxygen atom, said method comprising the step of treating said animal with a sulfur sugar that does not adversely affect the cellular metabolism of the animal and which is transportable into the animal's cells prior to exposure of the animal to electromagnetic radiation, with the dosage of said sulfur sugar utilized to treat said animal being in an effective amount of minimize the effect of electromagnetic radiation-induced free radicals on the animal's cells.

7. A method of treatment of an animal to minimize the effect of free radicals on the animal's tissue, the treatment method comprising the steps of determining the identity of a ring sugar having a ring oxygen atom replaced by a sulfur atom which is transportable through the animal's gastrointestinal tract to the animal's cardiovascular system and is absorbed from the animal's cardiovascular system into the animal's cells, said ring sugar being selected from the group consisting of 6-thio-D-fructose, 5-thio-D-galactose, 5-thio-2-deoxyribose, and 5-thio-D-ribose and mixtures thereof, and causing the animal to ingest said ring sugar in a dosage of between about 10 mg/kg and 500 mg/kg.

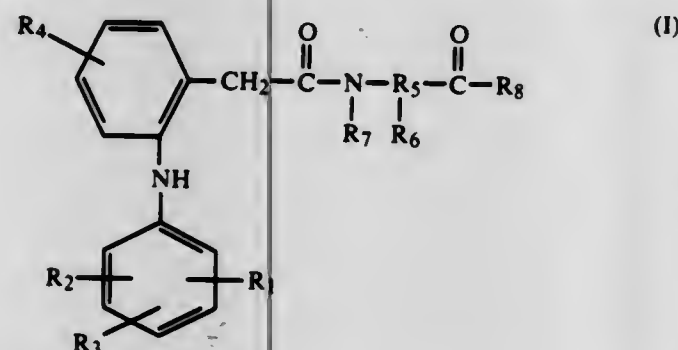
**SUBSTITUTED PHENYLACETIC ACID AMIDE COMPOUNDS**

Alfred Sallmann, Bottmingen, and Gerhard Baschang, Bettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Division of Ser. No. 33,295, Apr. 25, 1979, Pat. No. 4,250,192, which is a continuation of Ser. No. 905,087, May 11, 1978, abandoned, and Ser. No. 906,292, May 15, 1978, abandoned.  
This application Dec. 17, 1980, Ser. No. 217,368  
Claims priority, application Luxembourg, May 11, 1977, 77316; Sep. 4, 1977, 78106  
Int. Cl.<sup>3</sup> A61K 31/24; C07C 101/44

U.S. Cl. 424—309

7 Claims

1. A phenylacetic acid amide compound of the formula



in which R<sub>1</sub> is hydrogen, lower alkyl, lower alkoxy, halogen having an atomic number of not more than 35 or trifluoromethyl, R<sub>2</sub> is hydrogen, lower alkyl, lower alkoxy, halogen having an atomic number of not more than 35 or trifluoromethyl, R<sub>3</sub> is hydrogen, lower alkyl, lower alkoxy or halogen having an atomic number of not more than 35 and R<sub>4</sub> is hydrogen, lower alkyl, lower alkoxy or halogen having an atomic number of not more than 35, R<sub>5</sub> is lower alkylene or lower alkylidene, R<sub>6</sub> is phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxy and/or halogen, R<sub>7</sub> is hydrogen, and the group —C(=O)—R<sub>8</sub> is carboxyl or lower alkylcarbonyl, or a therapeutically acceptable salt thereof.

7. A pharmaceutical preparation containing an antiinflam-

matory effective amount of a compound as claimed in claim 1 together with conventional pharmaceutical excipients.

4,420,491

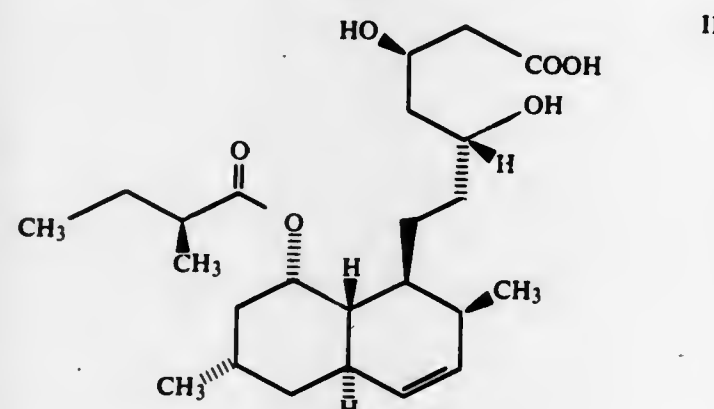
**HYPOCHOLESTEREMIC FERMENTATION PRODUCTS AND PROCESS OF PREPARATION**

George Albers-Schonberg, Princeton, N.J.; Henry Joshua, Staten Island, N.Y., and Maria B. Lopez, Elizabeth, N.J., assignors to Merck & Co., Inc., Rahway, N.J.  
Division of Ser. No. 154,157, May 28, 1980, Pat. No. 4,294,846, which is a continuation-in-part of Ser. No. 77,807, Sep. 21, 1979, abandoned. This application May 28, 1981, Ser. No. 267,972  
Int. Cl.<sup>3</sup> C07C 69/28, 69/76; A61K 31/22

U.S. Cl. 424—311

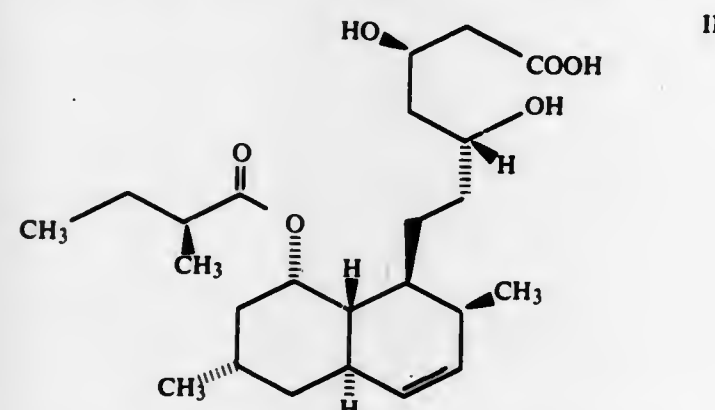
12 Claims

1. The compound:



in substantially pure form or a pharmaceutically acceptable salt or a lower alkyl ester or a substituted lower alkyl ester wherein the substituent is phenyl, dimethylamino, or acetylaminio.

7. An antihypercholesterolemic pharmaceutical composition comprising a pharmaceutical carrier and an effective antihypercholesterolemic amount of the compound:



in substantially pure form or a pharmaceutically acceptable salt or a lower alkyl ester or a substituted lower alkyl ester wherein the substituent is phenyl, dimethylamino, or acetylaminio.

4,420,492

**METHOD FOR SHUCKING BIVALVE MOLLUSKS USING MICROWAVE ENERGY**

Leonard S. Taylor, Silver Spring, Md., assignor to University of Maryland, College Park, Md.  
Filed Jul. 19, 1982, Ser. No. 399,164  
Int. Cl.<sup>3</sup> A22C 29/04

U.S. Cl. 426—241

13 Claims

1. A method of opening an oyster wherein the oyster includes (a) two shells which are hinged together at one end and have edible contents therebetween, and (b) an adductor muscle coupled to and extending between the respective inner surfaces of the two shells, the adductor muscle selectively moving the shells together and apart, the method comprising the step of: locally heating the adductor muscle of the oyster; wherein, except for a spot at the adductor muscle, at least

substantially all the contents of the opened oyster remain raw and unheated.

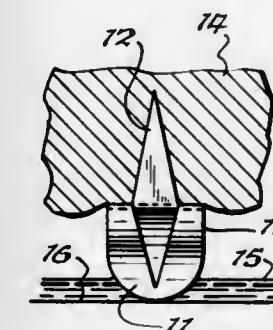
4,420,493

**MEAT SUPPORT AND METHOD OF USE**

Edward T. Greck, Amherst, N.Y., assignor to Neat Products, Inc., Amherst, N.Y.  
Continuation-in-part of Ser. No. 297,701, Aug. 31, 1981, abandoned. This application Apr. 21, 1983, Ser. No. 487,105  
Int. Cl.<sup>3</sup> A47J 37/04

U.S. Cl. 426—420

10 Claims



6. An elongated support device useful in cooking meats comprising:

- a semi-circular main raised support portion and
- a triangular-shaped prong integral with said main support portion and extending upwardly therefrom for piercing engagement with meat to be cooked; said main raised support portion comprising in the longitudinal direction, opposite end portions including rounded edges across the width of said device and on each end thereof and an intermediate section between said opposite end portions at a substantially higher elevation than said end portions, said triangular-shaped prong integral with said intermediate section and attached thereto at the base portion of said triangular prong, said rounded edges adapted to contact and rest in only point contact with the bottom of a cooking vessel, said semi-circular main raised portion having a horizontally planar surface wherein any point on a transverse line drawn across any part of the width of said surface is substantially equidistant from the bottom surface of said cooking vessel, and wherein the portions of said intermediate section immediately and horizontally adjacent to said prong are substantially parallel with the said surface of said cooking vessel; said support device dimensioned and shaped to be used in combination with a plurality of other said support devices such that said supports, being applied to the bottom surface of meat to be cooked by piercing, supports said meat above the bottom of a cooking pan with said rounded edges in point contact with the pan.

4,420,494

**PROCESS FOR MAKING SKIN-ON POTATO BOATS**

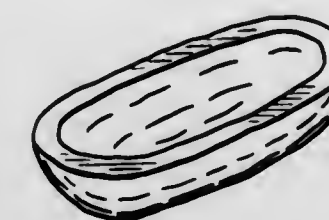
Jerome J. Glantz, Tualatin, Oreg., assignor to Lamb-Weston, Inc., Portland, Oreg.  
Continuation-in-part of Ser. No. 380,066, May 20, 1982, abandoned. This application Aug. 20, 1982, Ser. No. 409,870  
Int. Cl.<sup>3</sup> A23L 1/216

U.S. Cl. 426—441

29 Claims

1. A method of preparing a potato boat comprising the steps of:
  - blanching a whole potato under conditions and for a period of time sufficient to gelatinize the outer layer of the potato to a desired thickness, thereby leaving an ungelatinized center portion;
  - slicing the potato into sections to form a potato section having an exposed cut surface containing a gelatinized outer layer and an ungelatinized center portion; and

impinging an abrading means upon the exposed cut surface of the potato section to remove the ungelatinized portion



of the potato section while leaving the gelatinized outer layer of the potato section substantially intact.

4,420,495

**METHOD AND APPARATUS FOR PREPARING FOAMY SAUCES OR THE LIKE**

Josef Hammer, Freiburg i. Br.; Lothar Schiel, Waldkirch, and Hans Kratt, Mannheim, all of Fed. Rep. of Germany, assignors to Grossküchenanlagen Ing. Josef Hammer, Freiburg i. Br., Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,827

Claims priority, application Fed. Rep. of Germany, May 17, 1980, 3018956; Oct. 22, 1980, 3039797

Int. Cl.<sup>3</sup> A23C 15/04; A23L 1/24, 1/22

U.S. Cl. 426—564

17 Claims

1. A method of producing a sauce comprising the steps of:
  - mixing a plurality of ingredients including butter and/or a butter substitute and egg yolk to form a semifinished sauce in substantially non-foamy condition;
  - storing said semifinished sauce without substantial spoilage thereof; and
  - admitting a gas into and homogenizing said semifinished sauce subsequent to the storage step to convert said semifinished sauce into a foamy sauce for consumption.

4,420,496

**LOW TEMPERATURE RELEASE AGENT COMPOSITIONS PARTICULARLY USEFUL FOR FROZEN FOOD PRODUCTS**

Harold W. Hanson, Jr., Newport Beach, and Cody Munhofen, Huntington Beach, both of Calif., assignors to Par Way Manufacturing Co., Los Angeles, Calif.

Continuation-in-part of Ser. No. 89,500, Oct. 30, 1979, abandoned. This application Oct. 21, 1980, Ser. No. 199,373  
Int. Cl.<sup>3</sup> A23D 5/02

U.S. Cl. 426—609

10 Claims

1. A method for the reduction of surface tension and adhesion between contacting material surfaces in a low temperature range comprising the steps of:
  - providing a release agent composition comprising:
    - from about 4 to about 18 weight percent lecithin;
    - from about 20 to about 80 weight percent white mineral oil having a Saybolt viscosity at 100° F. of at least about 250 and a specific gravity at 15.6° C. of from about 0.880 to about 0.895; and
    - remainder being at least one oil which is substantially liquid when held at a temperature of below about 0° F. for at least 24 hours and a relatively high degree of unsaturation, above about 80 weight percent; and
  - applying said release agent composition to at least one contact surface of said material in an amount effective to substantially reduce the surface tensions and adhesion between contacting material surfaces; wherein the reduction of surface tension and adhesion between contacting material surfaces is effected in a low temperature range of from about 40° F. to about -150° F.







exposed surface of the advancing base web a coating of a flowable uncured thermosetting resin, then directing the advancing base web and the coating of uncured flowable resin thereon from the first roll and guiding the coated surface of the base web onto a second roll spaced apart from the peripheral surface of said first roll a predetermined distance to form a fixed narrow gap therebetween of a width greater than the thickness of said base web, and while rotating said second roll at a peripheral speed substantially equal to that of said first roll, said second roll having a peripheral surface with a predetermined texture corresponding to the desired surface characteristic to be produced in the sheet, advancing the base web along an arcuate path around the periphery of the second roll while maintaining the coating of uncured thermosetting resin in contact with the peripheral surface thereof and while contacting the coating with a curing agent to thereby cure and harden the coating, and directing the base web away from the second roll to thereby separate the cured and hardened coating from the peripheral surface of the second roll and to thus produce a sheet with a predetermined surface characteristic of high quality and fine definition accurately reproducing the predetermined surface texture of said second roll.

4,420,503

# LOW TEMPERATURE ELEVATED PRESSURE GLASS FLOW/RE-FLOW PROCESS

Chung W. Leung, Belle Mead; Robert H. Dawson, Princeton, both of N.J.; Martin A. Blumenfeld, Tequesta, Fla., and Dennis P. Biondi, Santa Ana, Calif., assignors to RCA Corporation, New York, N.Y.

Filed May 17, 1982, Ser. No. 379,103

Int. Cl.<sup>3</sup> H01L 21/316

U.S. Cl. 427—85

9 Claims

1. A process for forming tapered apertures in a glass layer of a semiconductor device comprising the steps of:  
forming the glass layer;  
forming apertures in the glass layer;  
maintaining the glass layer at an elevated pressure above atmospheric pressure;  
heating the glass layer at the elevated pressure; and  
maintaining the heated glass layer at the elevated pressure for a period of time sufficient to only soften the layer and taper the edges of the apertures.

4,420,504

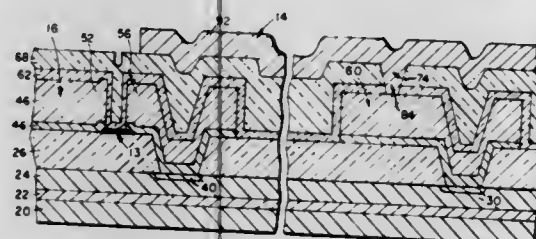
# PROGRAMMABLE READ ONLY MEMORY

Kersi F. Cooper, San Jose, and Jerry W. Drake, Los Gatos, both of Calif., assignors to Raytheon Company, Lexington, Mass. Division of Ser. No. 219,124, Dec. 22, 1980, abandoned. This application May 17, 1982, Ser. No. 378,585

Int. Cl.<sup>3</sup> B05D 5/12; B44C 1/22; C03C 15/00; C23F 1/02

U.S. Cl. 427—90

17 Claims



1. A method comprising the steps of:  
(a) forming a layer of fusible material on a body;  
(b) forming a first metallization layer in contact with a portion of the layer of fusible material;  
(c) forming a first insulating layer over the first metallization layer and over a portion of the layer of fusible material;  
(d) forming a second insulating layer of a material different from the first insulating layer over the first insulating layer

with the thickness of the second insulating layer being greater than the thickness of the first insulating layer;  
(e) forming a via through a region of the first and second insulating layers exposing an underlying portion of the first metallization layer; and  
(f) depositing a second metallization layer over the second insulating layer and through the via onto the exposed underlying portion of the first metallization layer.

4,420,505

# METHOD OF MAKING A THIN FILM MAGNETIC HEAD HAVING GOOD LOW FREQUENCY RESPONSE

Benjamin B. Meckel, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

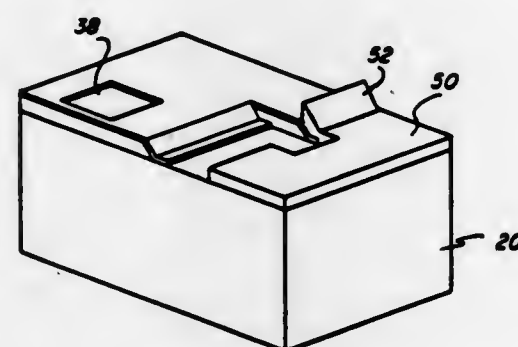
Division of Ser. No. 231,201, Feb. 4, 1983, Pat. No. 4,399,479.

This application Mar. 28, 1983, Ser. No. 479,420

Int. Cl.<sup>3</sup> B05D 5/12

U.S. Cl. 427—131

4 Claims



1. A method useful in the manufacture of a thin film magnetic head having good long wavelength response comprising the steps of:

- depositing a first film of magnetic material on a first part of a substantially planar non-magnetic substrate, the second part thereof being shielded from said deposition by means of a mask,
  - during said deposition of said first film of magnetic material, moving said mask to reveal more, but not all, of said second part of said substrate, thereby tapering an edge of said first film,
  - depositing a non-magnetic film on the tapered edge of said first film of magnetic material, and
  - depositing a second magnetic film on said second part of said non-magnetic substrate and upon the non-magnetic film on said tapered edge of said first film,
- said two magnetic films constituting a pair of head poles, and said non-magnetic film constituting a slant gap structure between said poles.

4,420,506

# METHOD OF MANUFACTURING AN ARTICLE OF A SYNTHETIC RESIN WHICH HAS A METAL LAYER

Johan W. A. Nelissen; Johannes J. Ponjee; Petrus E. J. Leijer, and Johannes Van Ruler, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 338,708, Jan. 11, 1982, abandoned. This application Sep. 17, 1982, Ser. No. 419,350

Claims priority, application Netherlands, Jul. 16, 1981, 8103375

Int. Cl.<sup>3</sup> B05D 1/38, 3/10

U.S. Cl. 427—162

6 Claims

1. A method of manufacturing a synthetic resin provided on at least a part of its surface with a metal layer comprising  
(A) polymerizing a monomer composition comprising monomeric acrylates and a polymerizable N-substituted pyrrolidone compound,  
(B) treating the resulting synthetic resin article with an aromatic carboxylic acid which in the nucleus is substituted with one or more hydroxy groups or glucose derivatives thereof,

(C) providing the resultant treated article, by electroless deposition, with a metal layer.

4,420,507

# PROCESS FOR IMPROVING OPACITY OF POLYESTER TEXTILE MATERIALS

Francis W. Marco, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 128,619, Mar. 10, 1980, Pat. No. 4,283,452, which is a continuation-in-part of Ser. No. 72,959, Sep. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 40,032, May 17, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 215,193

Int. Cl.<sup>3</sup> B05D 5/00; D06C 29/00

U.S. Cl. 427—170

16 Claims



1. A process for improving opacity of a polyester fiber-containing textile material comprising the steps of:

- providing an aqueous dispersion of titanium dioxide pigment having a particle size of at least about 0.18 micron;
- contacting said textile material with said aqueous dispersion under agitation conditions and at a pH of less than about 7.5 whereby said titanium dioxide pigment exhausts from said dispersion; and
- thereafter heat setting said material.

4,420,508

# POWDER COATING THE INTERIOR OF PIPE

Jack E. Gibson, 4905 Pepperidge Pl., Odessa, Tex. 79762

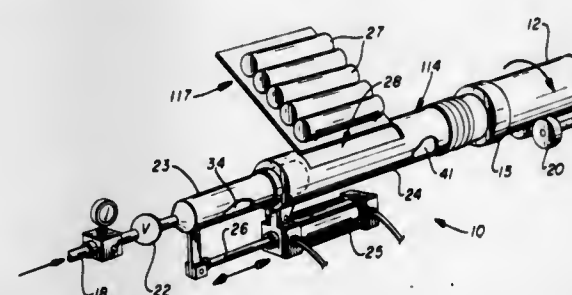
Continuation-in-part of Ser. No. 118,660, Feb. 4, 1980. This application Feb. 23, 1981, Ser. No. 237,380

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B05D 1/06, 7/22

U.S. Cl. 427—183

13 Claims



1. Method of powder coating the interior of a tubular element with a synthetic plastic resin material comprising the steps of:

- preheating the element to a temperature in excess of the fusion temperature of a synthetic plastic resin powder;
- rotating the preheated element about its longitudinal axis at a speed which enables any subsequently fused plastic resin material to spread into a continuous film;
- measuring powdered synthetic resin material to provide a single charge of powdered material which is sufficient for coating the entire interior surface of the preheated element;
- placing the single charge into a container which has an

4,420,509

# COPPER-CLAD POLYESTER-GLASS FIBER LAMINATES

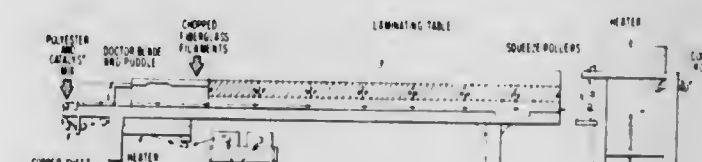
David Barrell, Temple City; Donald E. Kennedy, Baldwin Park; James J. Marino, Jr., Monrovia, and Donald C. Rollen, Rialto, all of Calif., assignors to Glasteel Tennessee, Inc., Collierville, Tenn.

Filed Aug. 11, 1981, Ser. No. 291,929

Int. Cl.<sup>3</sup> B05D 3/00

U.S. Cl. 427—206

13 Claims



1. A continuous process for preparing a copper foil laminate having at least one sheet of copper foil directly bonded to a face of a sheet of a glass fiber reinforced linear polyester resin, comprising:

- applying a coating of a linear polyester resin to a first copper foil,
- distributing glass fiber filaments on said linear polyester resin coating,
- heating said glass fiber containing linear polyester resin coated copper foil to partially gel said resin,
- applying pressure to said partially gelled linear polyester resin coated copper foil, and
- curing said linear polyester resin.



4,420,510

**METHOD FOR APPLYING A FOAMED ADHESIVE UNDER START-STOP CONDITIONS**

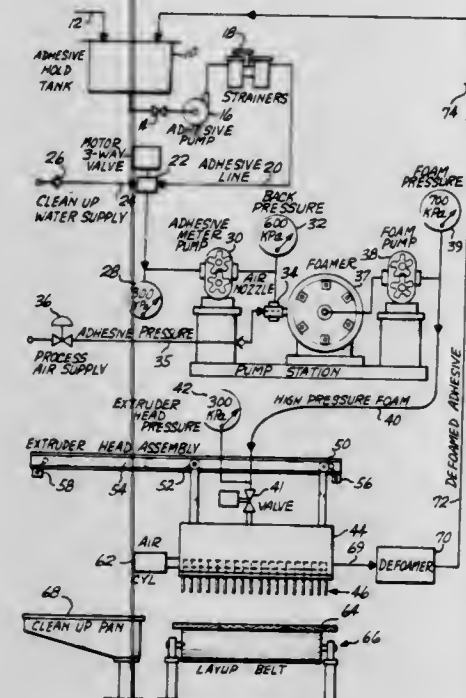
Arden L. Kunkel, Tacoma, and Darrell E. Pierson, Federal Way, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 23, 1982, Ser. No. 360,852

Int. Cl.<sup>3</sup> B05D 5/10

U.S. Cl. 427-208.2

23 Claims



1. A process for applying a uniform amount of a foamed adhesive to a substrate normally moving at a uniform rate of speed but subject to stops and starts at irregular intervals which comprises:

- extruding a predetermined amount of the foamed adhesive from an extrusion head onto the moving substrate;
- sending a signal to stop the conveyor line moving the substrate, simultaneously closing a first valve to cut off the supply of foamed adhesive to the extrusion head, said valve being located in the foamed adhesive supply line in the proximity of the extrusion head so as to define a predetermined volume of foamed adhesive remaining under residual pressure in the head;
- permitting the foamed adhesive remaining in the extrusion head to continue to flow onto the decelerating substrate from the action of the retained pressure so that it is applied at a decreasing rate as the residual pressure in the extrusion head drops; and
- at approximately the time when the substrate has decelerated to a complete stop, closing a second valve located at a point in the extrusion head system where the foamed adhesive is at essentially atmospheric pressure in order to stop any further flow of adhesive onto the substrate so that during the deceleration period the substrate receives an essentially uniform spread weight & foamed adhesive without overspreading or creating adhesive free gaps.

4,420,511

**METHOD FOR COATING AN OBJECT**

Kurt H. Liedberg, Skara, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jun. 13, 1979, Ser. No. 48,014

Claims priority, application Sweden, Jun. 13, 1978, 7806810

Int. Cl.<sup>3</sup> B05D 7/22

U.S. Cl. 427-236

5 Claims

1. A method for coating at least one surface of an object with a liquid coating material having thixotropic properties comprising

spraying said coating material on a major portion of said at least one surface to partially coat said at least one surface, applying mechanical vibrations or repeated impact forces to

said at least one surface which is partially coated with said coating material to decrease the viscosity of said material coated on said major portion of said at least one surface so that said material flows over the uncoated portions of said at least one surface, and

then stopping said application of mechanical vibrations or repeated impact forces to cause said coating material to gel and cease to flow.

2. The method of claim 1 wherein said at least one surface of said object which is being coated comprises the interior walls of a hollow body on which the coating material is applied by spraying through one or more injection openings in said hollow body, and wherein said mechanical vibrations or repeated impact forces are applied to the outside of said hollow body and wherein said hollow body transmits said mechanical vibrations or repeated impact forces to the said at least one surface.

4,420,512

**EMULSION TYPE SIZING AGENT FOR CARBON FIBERS, PROCESS FOR ITS PREPARATION, AND METHOD FOR USING SAME**

Hiroyasu Ogawa, Mishima, and Mikio Shima, Shizuoka, both of Japan, assignors to Toho Belsol Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,198

Claims priority, application Japan, Sep. 7, 1981, 56-139701

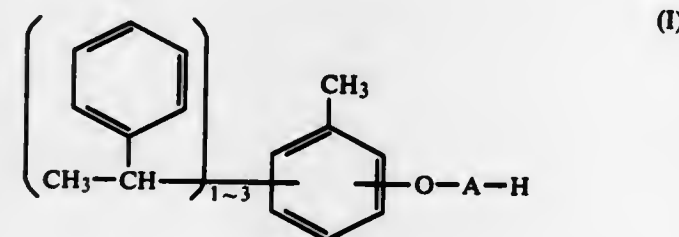
Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427-386

20 Claims

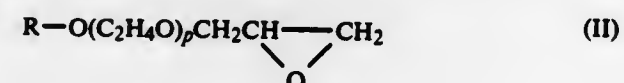
17. A method for sizing carbon fibers, comprising: depositing on the fibers a sizing agent containing:

a compound represented by the following general formula (I):

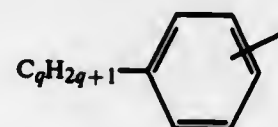


wherein A represents  $(\text{C}_2\text{H}_4\text{O})_l$  or  $(\text{C}_2\text{H}_4\text{O})_n(\text{C}_3\text{H}_6\text{O})_m$  [l is 18 to 70; n is 18 to 70; and m is 2 to 50 ( $1 \leq n/m \leq 35$ )];

a compound represented by the following general formula (II):



wherein R represents  $\text{C}_q\text{H}_{2q+1}$  or



(q is 10 to 18; and p is 15 to 70); and an epoxy resin.

4,420,513

**SYNTHETIC RUNNING SURFACE**

Harry E. Coke, and Gary W. Gill, both of Carrollton, Tex., assignors to Southwest Techni-Systems, Inc., Dallas, Tex.

Filed Aug. 21, 1981, Ser. No. 295,023

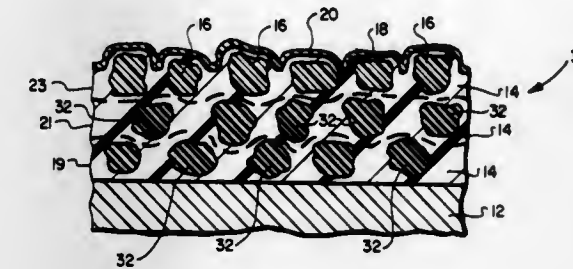
Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427-407.1

13 Claims

1. A method for forming a synthetic surface particularly adapted for use as a running track comprising the steps of: providing a quantity of a liquid composition which is curable to form a solid elastomeric coating;

mixing into said liquid composition a quantity of particles of solid elastomeric material sufficiently to substantially encapsulate said particles by said liquid composition and to obtain a substantially dispersed mixture; and



applying said mixture to a substrate in a plurality of discrete layers and wherein the concentration of said particles by weight in the top layer of said surface is greater than in the bottom layer.

4,420,515

**METALLIZATION PROCESS FOR PROTECTING DOCUMENTS OF VALUE**

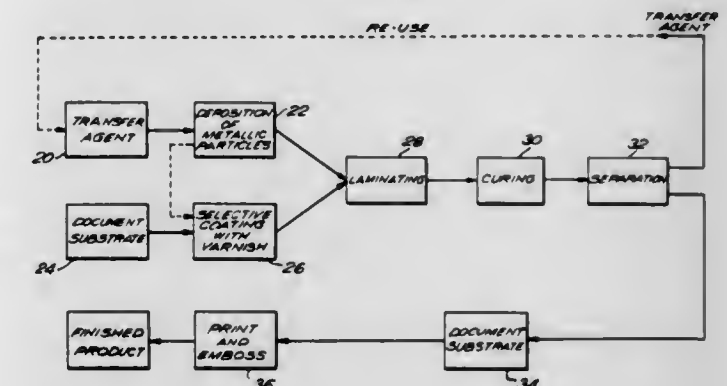
Maurice A. Amon, New York, N.Y., and Haim Bretler, Lausanne, Switzerland, assignors to Sicpa Holding, S.A., Glarus, Switzerland

Filed Aug. 21, 1981, Ser. No. 295,014

Int. Cl.<sup>3</sup> B32B 3/30; B44C 1/16; B41M 3/14

U.S. Cl. 428-29

5 Claims



1. A process for preventing the counterfeiting of a valuable document comprising the steps of:

depositing, on a reusable transfer agent, a film of metallic particles of the order of magnitude of substantially less than 1000 Angstroms in thickness; coating portions of a valuable document substrate with varnish at predetermined locations; laminating said valuable document substrate and said transfer agent together before said varnish is cured so that said metallic particles are embedded in said varnish at said predetermined locations; curing said varnish; separating said transfer agent from said valuable document substrate whereby said valuable document substrate is provided at said predetermined locations with said film of metallic particles, which film permits some light transmission, appears continuous and smooth, and exhibits a specular metallic finish; and simultaneously printing and embossing said valuable document substrate, said printing being applied to locations other than said predetermined locations and said embossing being applied only at said predetermined locations so as to form a latent image in said film of metallic particles in said predetermined locations, said latent image being clearly visible from a first angle of view and being essentially invisible from a second angle of view and said latent image being formed without the use of ink.

4,420,516

**COMPOSITE FILMS FOR DEEP-DRAWN PACKINGS**

Wolfgang Ermert; Hans W. Funk, both of Bomlitz, and Rudi Klein, Walsrode, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,307

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114771

Int. Cl.<sup>3</sup> B65D 3/28; B32B 27/10

U.S. Cl. 428-35

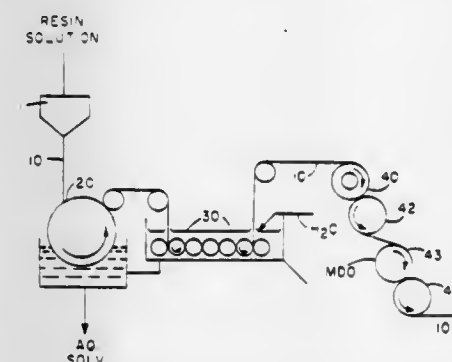
15 Claims

1. A heat-sealable composite film shrinkable by deep drawing, which comprises

- at least one layer of at least one copolyamide 6/12 containing at least 50% by weight of  $\epsilon$ -caprolactam units and having a melting temperature of 75° to 215° C.,
- at least one heat-sealable layer of a copolymer containing at least 50 mole percent of ethylene and, optionally,
- an adhesive or adhesion-promoting layer between layers 1 and 2.

1. A continuous process for impregnating a polyacrylonitrile aquagel film with a totally or highly water-soluble poly (ethylene glycol) having a molecular weight within the range of from about 285 to about 7500 comprising:

passing the aquagel film at substantially constant rate through a water solution of said poly (ethylene glycol), said aquagel containing at least about 40 weight % water uniformly dispersed in the polyacrylonitrile; contacting the aquagel strip with aqueous solution during a predetermined residence time in the bath; passing the aquagel strip from the bath while removing excess aqueous poly (ethylene glycol) therefrom; and metering poly (ethylene glycol) to the aqueous solution at a concentration greater than the aqueous solution of the bath at a rate substantially proportional to desired steady state treatment of poly (ethylene glycol) for the aquagel strip.



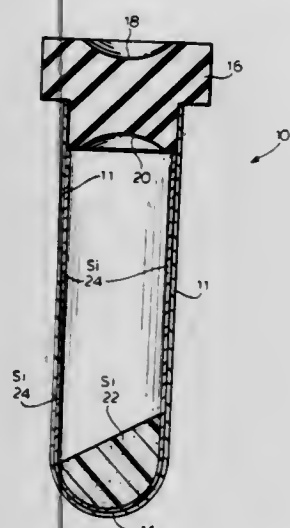


# 4,420,517 METHODS FOR IMPROVING UNIFORMITY OF SILICA FILMS ON SUBSTRATES

Keramat Ali, Sumter, S.C., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed May 6, 1982, Ser. No. 375,635  
Int. Cl.<sup>3</sup> A01N 1/02; B05D 3/02; B32B 9/04  
U.S. Cl. 428—35

16 Claims



9. A blood collection container with a uniform blood releasable silica film coating the internal surfaces thereof, obtained by the process of

- forming a mixture by admixing ethylsilicate and isopropyl alcohol;
- adding to the mixture formed from said forming step a hydrolyzing material;
- hydrolyzing said mixture obtained from said forming and adding steps to obtain a sol;
- coating said sol obtained from said hydrolyzing step onto said internal surfaces of said blood collection container; and
- heating said coating from said coating step at elevated temperatures for the period of time necessary to dry said coating.

# 4,420,518 HOT MELT RECHARGE SYSTEM

Donald J. Progar, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 24, 1982, Ser. No. 361,215  
Int. Cl.<sup>3</sup> B32B 7/02; C09J 7/00  
U.S. Cl. 428—40

6 Claims



1. An article of manufacture comprising in combination with a strip of hot melt adhesive composition, means for positioning and utilizing said strip of solid hot melt adhesive at a point of use therefor;

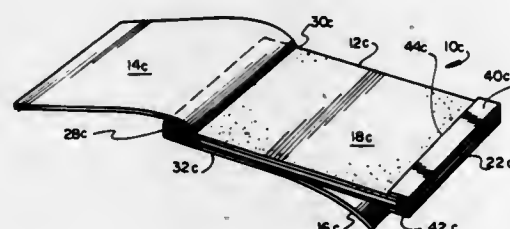
said means including a first protective sheet in contact with one surface of said strip of hot melt adhesive and extending beyond the edge surfaces thereof, a second protective sheet in contact with the opposite surface of said strip of adhesive and extending beyond the edge surfaces thereof and having a length short of the length of said first protective sheet, said second protective sheet having a pressure sensitive adhesive layer thereon to provide attachment thereof to said strip of hot melt adhesive and said first protective sheet to thereby sandwich said strip of hot melt adhesive therebetween, and reinforced tab ends on each of said first and said second sheets to facilitate separation and

removal of both said sheets for exposed utilization of said hot melt adhesive strip at the point of use thereof.

# 4,420,519 NAPKIN RETAINER

Charles O. Stiemmons, 679 Ardleigh Dr., Akron, Ohio 44303  
Continuation of Ser. No. 255,305, Apr. 17, 1981, abandoned.  
This application Sep. 29, 1982, Ser. No. 426,938  
Int. Cl.<sup>3</sup> B32B 7/10; B41L 1/04; G09F 19/00; A45F 5/04  
U.S. Cl. 428—40

2 Claims



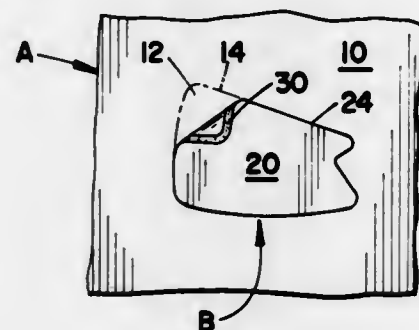
1. A napkin retainer comprising a tape portion having adhesive coating on both sides and top and bottom protective covers each having adhesive release agent coated on one side, the tape portion being sandwiched between the top and bottom protective covers and juxtaposed with the adhesive release side of the top and bottom protective covers adjacent the adhesive of the tape portion, the top and bottom protective covers each having a hinge strip along one end without the adhesive release agent coated thereon and each protective cover having a nonserving score line located along a boundary between the adhesive release agent on each protective cover and the hinge strip so that the protective covers are permanently attached to the tape portion along a first end of the tape portion and will remain in their folded back position, and wherein the top and bottom protective covers are coextensive with the tape portion and each have a second end, remote from the hinge strip, that is cut laterally to provide pick tabs which will not be snagged during handling.

# 4,420,520 AREA COATED PAINT MASK AND METHOD

Wallace R. Jones, Waite Hill Village; Paul A. Krieger, Bay Village, and John F. Haas, Chagrin Falls, all of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio  
Continuation of Ser. No. 165,721, Jul. 3, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,481  
Int. Cl.<sup>3</sup> B32B 7/10

U.S. Cl. 428—42

8 Claims



1. A method of masking a workpiece to facilitate spray painting of a workpiece first area which is separated from a workpiece second area by a continuous demarcation zone, said method comprising:

providing a thin, flexible paint mask sheet having opposed faces; applying an adhesive coating to one face of said mask sheet in a manner forming an adhesive band similar in overall contour to the outline of said demarcation zone

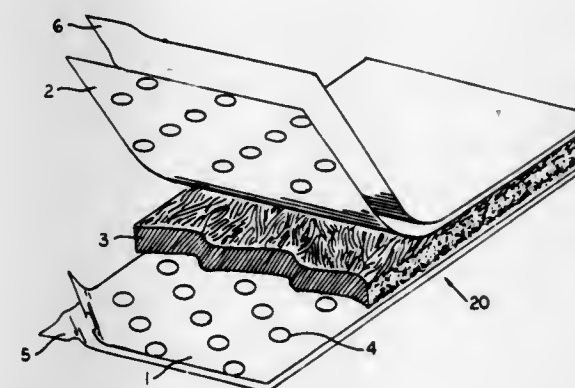
and having one side edge extending along said mask sheet at least substantially coextensive with said demarcation zone with another side edge laterally spaced from said one side edge, said mask sheet and adhesive being capable of withstanding 350° F. oven baking for at least one hour; applying a release surface on the other face of said mask sheet releasably compatible with said adhesive; stacking a plurality of identical mask sheets to produce a mask pad having a predetermined number of identical ones of said mask sheets disposed in a stacked relationship with on face of each mask sheet directly engaging the release surface on the other face of the next adjacent mask sheet; cutting said stacked mask sheets to form a plurality of masks each having a peripheral edge of the same general conformation as the demarcation zone and with said adhesive band on one side edge disposed on said mask at least adjacent said peripheral edge; individually removing a mask from said pad; placing said mask on said workpiece second area with said mask peripheral edge being positioned to at least generally correspond to said continuous demarcation zone; causing said mask to precisely cover said workpiece second area along and coextensive with said demarcation zone at least at said adhesive band one side edge; directing a paint spray toward said workpiece to effect painting of said workpiece first area; and, removing said mask from association with said workpiece.

# 4,420,521 THERMAL GARMENT DESIGN

George S. Carr, 5307 Gallatin St., Hyattsville, Md. 20781  
Filed Mar. 25, 1982, Ser. No. 361,755  
Int. Cl.<sup>3</sup> A41D 1/22

U.S. Cl. 428—74

4 Claims



1. In combination:  
a thermal garment insulation means of a fiber layer sandwiched between two layers of fabric;  
said fiber and fabric layers with two reflective plastic film layers intervening;  
said plastic film layers having venting holes offset from one another in opposing layers.

# 4,420,522 PILE FABRIC PRODUCTION METHOD USING POLYURETHANE BINDING AGENT

Yutaka Masuda, Otsu; Toshiaki Takai, Ehime, and Shunroku Tohyama, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan  
Filed Dec. 13, 1982, Ser. No. 449,192  
Claims priority, application Japan, Dec. 15, 1981, 56-200905  
Int. Cl.<sup>3</sup> B32B 3/00

U.S. Cl. 428—95

6 Claims

6. The pile fabric which is prepared by binding a pile component, using as a pile binding agent a combination comprising:  
(a) a compound which contains two or more aziridine groups or two or more blocked isocyanate groups in one molecule, and

(b) a polyurethane binding agent solution which satisfies the formula

$$0.10 \leq (\log P + 1) \leq 0.2$$

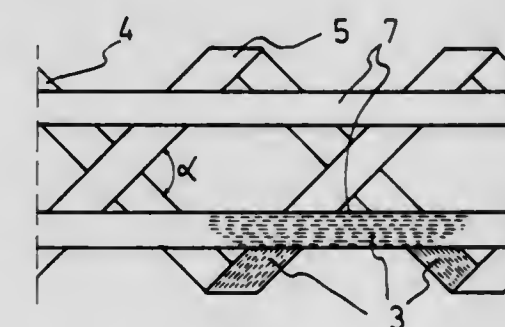
wherein P is the viscosity in poise of polyurethane solution and C is the concentration of polyurethane.

# 4,420,523 ENERGY-ABSORBING LAMINATE

Andre Wieme, Zvevegem, Belgium, assignor to N. V. Bekaert S.A., Zvevegem, Belgium  
Filed Jan. 24, 1983, Ser. No. 460,165  
Claims priority, application Belgium, Feb. 1, 1982, 1/10411  
Int. Cl.<sup>3</sup> B32B 5/12

U.S. Cl. 428—109

6 Claims



1. An energy-absorbing laminate comprising at least one layer (1) of a stiff material which on at least one of its plane sides throughout a part of its surface is covered with an elastomer layer (2) in which twisted fiber bundles (3) are embedded, characterized in that this elastomer layer (2) is in the form of a grid structure, built up of at least two series of substantially parallel elastomer strips (4, 5) reinforced with twisted fiber bundles (3), which strips intersect at an angle  $\alpha$  between 10° and 120° and which are bonded to one another in the common contact areas (6).

# 4,420,524 BITUMEN, ATACTIC POLYPROPYLENE AND PROPYLENE/ETHYLENE COPOLYMER COMPOSITIONS AND WATER-PROOFING MEMBRANES USING THE SAME

Romolo Gorgati, Bologna, Italy, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio  
Continuation-in-part of Ser. No. 273,212, Jun. 12, 1981, Pat. No. 4,368,228, which is a continuation-in-part of Ser. No. 143,138, Apr. 23, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,295

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> B32B 5/12  
U.S. Cl. 428—110

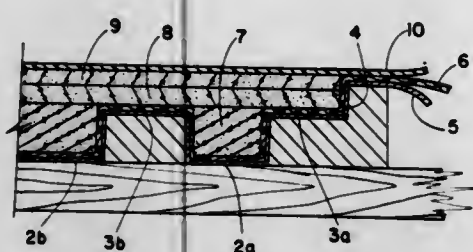
10 Claims

1. A prefabricated waterproofing membrane which comprises a series of superposed reinforcing layers including a fiberglass mat and a bonded fiberglass net/polyester mat, said layers being impregnated with bitumen mixed with at least one thermoplastic polymer selected from the group consisting of an amorphous copolymer of ethylene/propylene, atactic polypropylene, polyisobutylene and styrene-butadiene-styrene block copolymer, the bitumen polymer mixture having a ring and ball softening point of at least 105° C.



**4,420,525**  
**THIN DECORATIVE CEMENTITIOUS VENEERS AND A METHOD FOR MAKING SAME**  
 David M. Parks, 119 Colonial Rd., Great Neck, N.Y. 11021  
 Filed Feb. 11, 1982, Ser. No. 347,999  
 Int. Cl.<sup>3</sup> B32B 3/00; B29C 9/00  
 U.S. Cl. 428—156

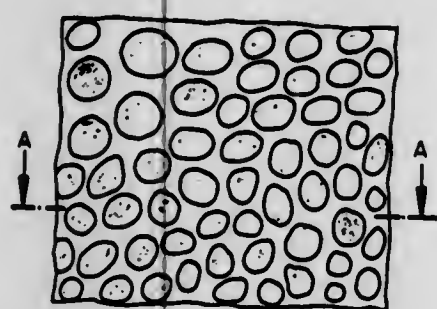
16 Claims



1. A method of making a thin decorative cementitious veneer of about 5 to 60 mils thick which comprises the steps of: providing at least one waterproof mold with an engraving having an intaglio design or pattern; placing an overhanging wet cloth on the engraved mold; placing a plastic hydraulic colored cement mix onto said wet cloth and forcing said cement mix into the incised portions of the engraving to simultaneously form a casting and a temporary cloth mold which is the exact copy of the original mold; compacting said plastic cement, by removing excess water; immediately removing said cement casting together with the temporary cloth mold from the engraved mold before it sets; removing the temporary cloth casting from said plastic cement casting before it sets; and storing said plastic casting until it sets by air curing.

**4,420,526**  
**SOUND ABSORBING IRREGULARLY SHAPED PANEL**  
 Hermann Schilling, and Reinhard Stief, both of Weinheim, Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany  
 Filed Sep. 29, 1981, Ser. No. 306,861  
 Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039651  
 Int. Cl.<sup>3</sup> B32B 5/14  
 U.S. Cl. 428—171

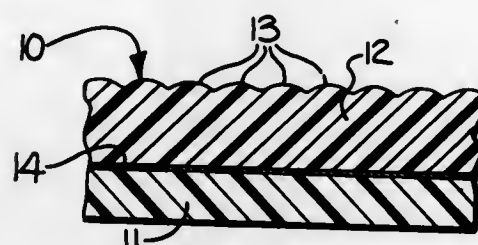
10 Claims



1. A sound absorbing, irregularly shaped panel comprising a deep-drawn, non-woven fabric of matted endless intersecting polyester fibers, said fibers having a denier of from about 4 to 12, and a distribution of fine pores on their surfaces, said fibers being autogenously bonded together at their points of intersection and bonded together in the immediate vicinity of said intersection points by a cross-linked chemical binder, so as to prevent covibration of said fibers in response to absorbed sound waves, said fabric being compressed to a degree such that a shaped panel having a thickness of 1 to 3 mm has an acoustical impedance of from about 30 to about 100 Rayl.

**4,420,527**  
**THERMOSET RELIEF PATTERNED SHEET**  
 Kenneth E. Conley, Matthews, N.C., assignor to Rexham Corporation, New York, N.Y.  
 Division of Ser. No. 184,240, Sep. 5, 1980. This application Aug. 24, 1981, Ser. No. 295,706  
 Int. Cl.<sup>3</sup> B32B 3/00; G02B 27/00; B05B 5/00  
 U.S. Cl. 428—172

13 Claims



1. A flexible, composite sheet material having a patterned relief surface of high quality and definition said composite sheet material comprising a flexible base film having opposing front and rear surfaces with the distance therebetween varying over the extent of the base film due to inherent accuracy limitations in the production of said base film and resulting in relatively small but measurable variations in the thickness of the base film, and a continuous coating of a cured thermosetting polymer extending over substantially the entire front surface of said base film and bonded thereto, said coating having a non-planar outer surface defining a predetermined relief pattern of high quality and durability and of fine definition in said thermosetting polymer layer, the thickness of said cured thermosetting polymer layer in which said relief pattern is formed compensatingly varying in relation to said variations in thickness of said base film so that the distance from the outermost surface portions of the relief pattern to the rear surface of said base film is uniform throughout the sheet material in spite of said variations in thickness of the base film whereby variations in thickness in the overall composite sheet are eliminated.

**4,420,528**  
**TRANSFER FILM FOR ELECTROPHOTOGRAPHIC COPIER**  
 Toshiaki Okiyama, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
 Continuation of Ser. No. 278,029, Jun. 29, 1981, abandoned.  
 This application Jan. 28, 1983, Ser. No. 461,713  
 Claims priority, application Japan, Jun. 30, 1980, 55-89415  
 Int. Cl.<sup>3</sup> B32B 5/16, 27/06  
 U.S. Cl. 428—220

2 Claims

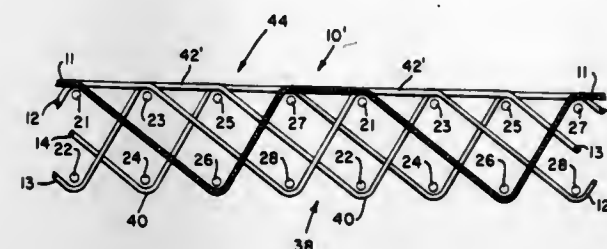
1. A transfer film of the type used in connection with an electrophotographic copier, comprising: polysulfone resin, wherein said film comprised of polysulfone resin is matted and has a dynamic friction coefficient of from 0.6 to 2.0, a static friction coefficient of from 0.8 to 2.3, comprises an inorganic or organic particulate additive in an amount to provide a surface resistance of from  $1 \times 10^{10}$  to  $1 \times 10^{15}$  ohms, wherein at least one side of said film has a surface roughness of 2.0 micron or more, said film being self-supporting and having a thickness of from 25 to 100  $\mu$ m.

**4,420,529**  
**ANTI-STATIC DRYER FABRICS**  
 William T. Westhead, Waycross, Ga., assignor to Scapa Dryers, Inc., Waycross, Ga.  
 Filed Aug. 22, 1980, Ser. No. 180,444  
 Int. Cl.<sup>3</sup> B32B 5/16  
 U.S. Cl. 428—244

30 Claims

1. A dryer fabric having face and back surfaces, said dryer fabric comprising:  
 a plurality of machine direction and cross-machine direction

yarns interwoven to define machine roll contacting floats on both the face and back surfaces of said fabric, a select number of the yarns that define said floats being anti-static yarns, said select number of yarns chosen so that floats



defined by anti-static yarns are present on both the face and back surfaces of said fabric, each of said anti-static yarns comprising a non-conductive synthetic yarn incorporating a component exhibiting anti-static properties.

**4,420,530**  
**COATING AGENTS AND THERMOPLASTIC RESIN FILMS COATED THEREWITH**  
 Takashi Toyoda; Yoza Ohba; Masaaki Yamanaka, all of Omigawa, and Kanji Shirai, Hazaki, all of Japan, assignors to Oji Yuka Goseishi Kabushiki Kaisha, Tokyo, Japan  
 Filed Mar. 8, 1982, Ser. No. 356,149  
 Claims priority, application Japan, Mar. 12, 1981, 56-34568  
 Int. Cl.<sup>3</sup> B32B 5/16, 27/32  
 U.S. Cl. 428—323

7 Claims

1. A coated film having excellent printability which comprises a base film having a surface layer of a polyolefin film containing an inorganic fine powder, said film having on the surface thereof 5 cracks/mm<sup>2</sup> or more and which cracks are 0.1 to 10 microns in width and 0.3 to 30 microns in length and a coating layer formed on the surface film layer, said coating layer having been formed by coating the surface film layer with an aqueous solution of a resin composition and drying the coating solution, said coating layer containing 0.005 to 1 g/m<sup>2</sup> of the solid content of said aqueous solution, said resin composition comprising:

- (A) 100 parts by weight of a water-soluble polymer containing tertiary or quaternary nitrogen;
- (B) 5 to 75 parts by weight of a water-soluble polyaminepolyamide-epichlorohydrin adduct; and
- (C) 5 to 100 parts by weight of a water-soluble polyimine compound selected from the group consisting of polyethyleneimine, poly(ethyleneimine-urea) and ethyleneimine adducts of polyaminepolyamide.

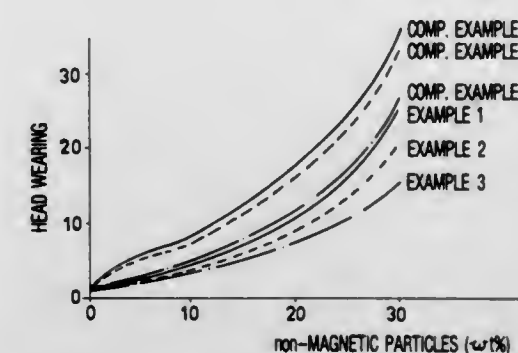
4. The coated film according to claim 1, in which the fine inorganic powder is calcium carbonate of a particle size of 0.1 to 10 microns, and the content thereof in said polyolefin layer is 10 to 200 parts by weight for 100 parts by weight of the polyolefin.

**4,420,531**  
**MAGNETIC RECORDING MEDIUM**  
 Fuminori Tokuda, Saku, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan  
 Filed Sep. 17, 1981, Ser. No. 303,288  
 Claims priority, application Japan, Sep. 25, 1980, 55-132343  
 Int. Cl.<sup>3</sup> G11B 5/70  
 U.S. Cl. 428—329

5 Claims

1. A magnetic recording medium composed of a base and a magnetic coating formed thereon and comprising a binder and a magnetic powder dispersed in the binder, characterized in that said magnetic powder contains a nonmagnetic powder having an average particle size of not more than 2  $\mu$ m and a Mohs hardness of at least 6, in an amount of 1 to 20% on the

basis of the weight of the magnetic powder, and said binder contains a dispersant resin having a functional group attached



thereto expressed by the formula  $-\text{SO}_3\text{M}$  where M is a monovalent metal.

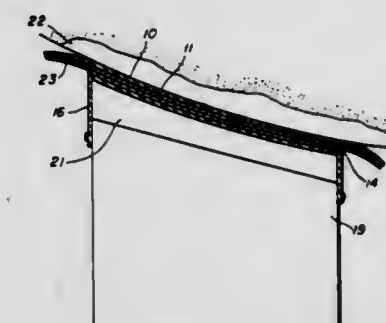
**4,420,532**  
**MAGNETIC RECORDING MEDIUM**  
 Nobutaka Yamaguchi; Masaaki Fujiyama, and Norio Nasu, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan  
 Filed Mar. 31, 1982, Ser. No. 364,181  
 Claims priority, application Japan, Mar. 31, 1981, 56-46448  
 Int. Cl.<sup>3</sup> G11B 5/70; B32B 5/16  
 U.S. Cl. 428—329

6 Claims

1. A magnetic recording medium comprising a magnetic recording layer on the surface of a non-magnetic support, in which the magnetic recording layer contains (i) a ferromagnetic powder, (ii) 1 to 10% by weight based on the weight of the ferromagnetic powder of an abrasive having a Mohs' hardness of at least 6, (iii) 5 to 50% by volume based on the volume of the ferromagnetic powder of colloidal silica and (iv) 0.1 to 2% by weight based on the weight of the ferromagnetic powder of a saturated or unsaturated fatty acid having 6 to 22 carbon atoms and 0.1 to 2% by weight based on the weight of the ferromagnetic powder of a fatty acid ester having a melting point of at most 60° C.

**4,420,533**  
**METHOD AND APPARATUS FOR COATING SUBMERGED PORTIONS OF FLOATING STRUCTURES**  
 Herman S. Preiser, 2 Revell Rd., Severna Park, Md. 21146; Arthur Ticker, 12117 Maddox La., Bowie, Md. 20715, and Kenneth J. Hatley, 38 Lawrence Rd., Madison, N.J. 07940  
 Division of Ser. No. 131,312, Mar. 18, 1980, Pat. No. 4,321,101.  
 This application Oct. 23, 1981, Ser. No. 314,330  
 Int. Cl.<sup>3</sup> C09J 7/02  
 U.S. Cl. 428—351

4 Claims



1. A multilayered tape sandwich structure for use in coating those areas of a ship hull obscured by the docking block when the ship is in dry dock comprising:

- a first tape for attachment to the ship hull;
- an adhesive operable underwater applied to one face of the first tape for adhering said tape to the ship hull;
- a second tape for attachment to the supporting surface of a docking block;
- a water soluble soap means interspersed between said first tape and said second tape to provide ease of separation



and to accommodate sliding movement between said tapes; and an adhesive means for attaching said second tape to a docking block.

**4,420,534**  
**CONDUCTIVE COMPOSITE FILAMENTS AND METHODS FOR PRODUCING SAID COMPOSITE FILAMENTS**

Masao Matsui, Takatsuki, Hiroshi Naito, and Kazuo Okamoto, both of Osaka, all of Japan, assignors to Kanebo Synthetic Fibers Ltd., Osaka and Kanebo, Ltd., Tokyo, both of Japan  
Filed May 28, 1981, Ser. No. 268,026  
Claims priority, application Japan, Jun. 6, 1980, 55-76901; Jun. 14, 1980, 55-80753; Jun. 19, 1980, 55-83650  
Int. Cl.<sup>3</sup> D02G 3/00

U.S. Cl. 428—372

31 Claims



1. A unitary, elongated, electrically conductive, bi-component filament which in transverse cross-section consists essentially of an electrically conductive component in the form of one or more relatively thin, elongated layers which extend transversely of the cross-section of the filament and the remainder of the filament being an electrically non-conductive component, said electrically conductive component being made of a mixture of electrically conductive metal oxide particles with at least one polymer having a crystallinity of not less than 60%, said polymer being selected from the group consisting of thermoplastic polymers and solvent-soluble polymers, said electrically non-conductive component being made of a thermoplastic fiber-forming polymer, said polymer used to form said electrically conductive component being poor in affinity to said fiber-forming polymer, at least one exposed end of each said layer being exposed on the outer surface of the filament, the opposite surfaces of each said layer being adhered to said electrically non-conductive component, the thickness of each said layer throughout substantially all of its length being at least as great as the thickness of said layer at said exposed end so as to prevent separation of said electrically conductive component from said electrically non-conductive component, said layer or layers having a specific resistance of not more than  $10^7$  ohm-cm, said layer or layers occupying from 1 to 40% of the total cross-sectional area of the filament and the exposed end or ends of said layer or layers occupying from 1 to 30% of the total surface area of the filament.

**4,420,535**  
**BONDABLE POLYAMIDE**

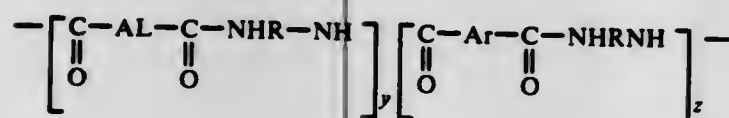
George A. Walrath, Scotia, and Scott D. Smith, Ballston, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,385  
Int. Cl.<sup>3</sup> B32B 15/00, 27/00; H01B 7/00

U.S. Cl. 428—379

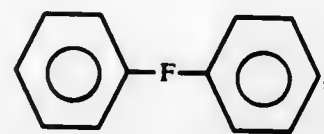
73 Claims

1. A self bondable insulated wire comprising a conductor and an insulating layer of a copolyamide having the recurring unit



where AL is the divalent hydrocarbon residue of an unsubstituted

aliphatic dicarboxylic acid having at least 6 carbon atoms, R is tolylene, phenylene,



where F is O, CH<sub>2</sub>, or SO<sub>2</sub> or is a cycloaliphatic hydrocarbon, Ar is p-phenylene, y is 35 to 80% of the recurring units and z is 65 to 20% of the recurring units.

**4,420,536**  
**SELF-BONDING MAGNET WIRE**

Hollis S. Saunders, and Lionel J. Payette, both of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.  
Filed Nov. 23, 1981, Ser. No. 324,228  
Int. Cl.<sup>3</sup> B32B 27/00; H01B 7/00

U.S. Cl. 428—383

5 Claims

1. A self-bonding magnet wire comprising an electrically conducting substrate having an electrically insulating outer coating thereon consisting essentially of a layer of a blend of nylon 612 and nylon 11 wherein the nylon 11 is present in an amount up to about 25% by weight.

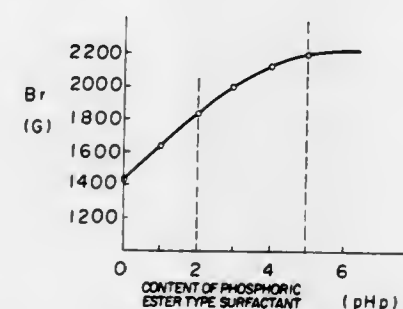
**4,420,537**  
**MAGNETIC RECORDING MEDIUM HAVING COBALT ADSORBED IRON OXIDE LAYER**

Masashi Hayama, Hiroto Saguchi, and Kenji Hirabayashi, all of Tokyo, Japan, assignors to TDK Electronics Co. Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,356  
Claims priority, application Japan, Nov. 28, 1979, 54-152913  
Int. Cl.<sup>3</sup> G11B 5/70; B32B 5/16

U.S. Cl. 428—403

1 Claim



1. A magnetic recording medium having a coercive force Hc of 950 to 1200 Oe and a residual magnetic flux  $\phi_r$  of 0.35 to 0.6 maxwell which comprises a substrate coated with a magnetic composition comprising a cobalt adsorbed iron oxide powder, a phosphoric ester type anionic surfactant as a dispersing agent at a ratio of 2 wt.% to 5 wt.% based on said iron oxide powder, and a binder at a ratio of said iron oxide powder to said binder of 4 to 7.

**4,420,538**  
**HEAT-SENSITIVE RECORDING MATERIALS**

Teruo Nakamura, Nishinomiya, and Naoto Arai, Ikeda, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

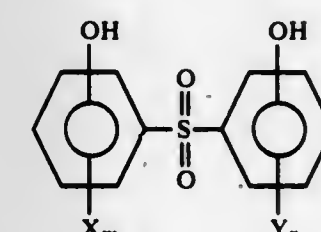
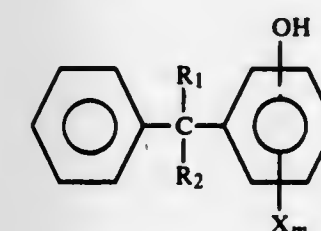
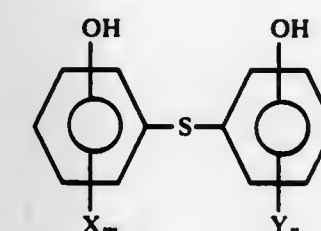
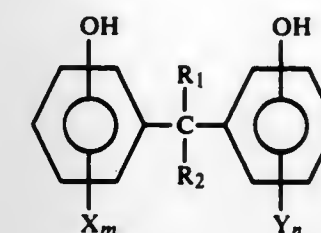
Filed Dec. 31, 1981, Ser. No. 336,174  
Claims priority, application Japan, Jan. 13, 1981, 56-4738  
Int. Cl.<sup>3</sup> B41M 5/18

U.S. Cl. 428—411

9 Claims

1. A heat-sensitive recording material comprising a support having a recording layer provided thereon, said recording layer containing (1) at least one colorless or pale-colored basic dye, (2) hydroquinone monobenzyl ether, and (3) at least one

compound selected from compounds represented by the formulae (I) to (IV);



wherein X and Y are each a chlorine atom, an alkyl group having 1 to 7 carbon atoms, a phenyl group or a benzyl group; m and n are each an integer of 0 to 3; and R<sub>1</sub> and R<sub>2</sub> are each a hydrogen atom, an alkyl group having 1 to 7 carbon atoms, a phenyl group or a benzyl group, or R<sub>1</sub> and R<sub>2</sub> may jointly form a cyclohexane ring.

**4,420,539**  
**PROCESS FOR PRODUCING ANTIFRICTION MATERIALS**

Valery I. Kostikov, ulitsa Maril Ulyanov, 9 korpus 2, kv. 12, Moscow; Jury I. Koshelev, Oktyabrsky prospekt, 356, kv. 8; Vasily D. Telegin, Oktyabrsky prospekt, 306, kv. 71, both of Ljubertsky Moskovskoi oblasti; Alexandr A. Khomenko, ulitsa Perovskaya, 40, korpus 2, kv. 8, and Evgeny F. Filimonov, Frunzensky val 16 kv. 67, both of Moscow, all of U.S.S.R.  
PCT No. PCT/SU80/00101, § 371 Date Jan. 26, 1982, § 102(e) Date Jan. 26, 1982, PCT Pub. No. WO81/03452, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 9, 1980, Ser. No. 346,038  
Claims priority, application U.S.S.R., Jan. 28, 1978, 2589530; France, Aug. 29, 1980, 80 18808

Int. Cl.<sup>3</sup> B32B 9/06, 15/04; B05D 3/00, 3/02

U.S. Cl. 428—450

20 Claims

1. A process of making antifriction products, comprising the steps of:

heat treating a siliconized graphite base consisting of about 5 to about 25% by weight of silicon; about 25 to 55 percent by weight of silicon carbide, balance carbon, to a temperature of 1500° to 2000° C. under a vacuum of 10<sup>-1</sup> to 10<sup>-3</sup> mm Hg and then impregnating said base with friction-resistant metals or alloys thereof.

3. The process of claim 1, wherein said heat treating is carried out for 15 to 60 minutes.

9. The process of claim 3, further including the step of machining said base after impregnation to give an article of predetermined size and shape.

10. The process of claim 9, wherein said metal is copper,

gold, silver, platinum, lead, tin, zinc, antimony, aluminum, bismuth or indium.

**4,420,540**  
**MAGNETIC RECORDING MEDIUM**  
Hiroshi Ogawa, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Sep. 30, 1982, Ser. No. 431,534  
Claims priority, application Japan, Nov. 6, 1981, 56-177987  
Int. Cl.<sup>3</sup> H01F 10/02

U.S. Cl. 428—457

7 Claims

1. A magnetic recording medium, comprising:  
a non-magnetic flexible support base, having coated thereon;  
a magnetic layer comprised of a ferromagnetic powder dispersed in a binder and a branched saturated fatty acid having a melting point of 20° C. or less and having 12 or more carbon atoms.

**4,420,541**  
**RADIATION POLYMERIZABLE COMPOUNDS AND CONDUCTIVE COATINGS FROM SAME**

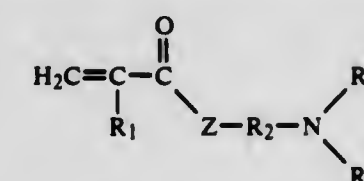
Gregory D. Shay, Oak Forrest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio  
Division of Ser. No. 217,873, Dec. 18, 1980, Pat. No. 4,322,331.  
This application Oct. 22, 1981, Ser. No. 313,876  
Int. Cl.<sup>3</sup> B32B 27/32

U.S. Cl. 428—523

5 Claims

1. A process for treating a substrate to impart conductive characteristics which comprises:

(i) applying a radiation crosslinkable coating onto the surface of the substrate; and  
(ii) subjecting the radiation crosslinkable coating to actinic radiation sufficient to cause crosslinking of said coating; wherein said coating is an aqueous solution of a quaternary ammonium salt obtained by mixing reactive amounts of:  
(a) at least one tertiary amine of the formula:



wherein R<sub>1</sub> is H or CH<sub>3</sub>, Z is O or NH, R<sub>2</sub> is an aliphatic radical of from 1 to 6 carbon atoms or aryl of from 6 to 10 carbon atoms, R<sub>3</sub> and R<sub>4</sub> are the same or different and are selected from the group consisting of aliphatic radicals containing from 1 to 10 carbon atoms and aryl radicals containing from 6 to 10 carbon atoms; and  
(b) at least one halide having from 2 to 6 halogen atoms and selected from the group consisting of aliphatic halides having from 1 to 10 carbon atoms and arene halides having from 7 to 20 carbon atoms.

**4,420,542**  
**ARTICLE AND METHOD FOR WOOD PRESERVATION**  
Edward E. Sowers, Mooresville, Ind., assignor to Reilly Tar & Chemical Corp., Indianapolis, Ind.

Filed Oct. 25, 1982, Ser. No. 436,573  
Int. Cl.<sup>3</sup> B32B 23/08; B05D 3/02

U.S. Cl. 428—541

45 Claims

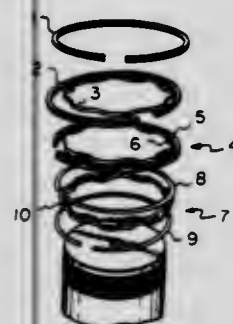
1. A method for preserving wood, comprising the step of treating the wood with a polymer with pendant groups containing pyridine rings complexed with copper.



**4,420,543**  
**BEARING MEMBER OF AN INTERNAL COMBUSTION ENGINE, HAVING A FLAME SPRAYED SURFACE**  
 Katsumi Kondo; Yoshio Fuwa, both of Toyota; Akira Harayama, and Toru Nakahara, both of Okaya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Teikoku Piston Ring Co., Ltd., Tokyo, both of Japan

Filed Nov. 3, 1980, Ser. No. 203,603  
 Claims priority, application Japan, Nov. 9, 1979, 54-145138  
 Int. Cl.<sup>3</sup> B22F 7/34, 7/08; F16J 9/00  
 U.S. Cl. 428-564

12 Claims



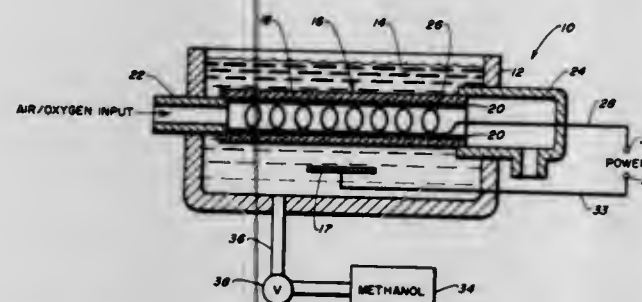
1. A bearing face coated with a flame sprayed material for use in an internal combustion engine, characterized in that the flame sprayed layer applied on the bearing face is composed of from 55 to 90% of ferrocchrome and from 10 to 45% of a self-fluxing alloy.

6. A bearing face coated with a flame sprayed material for use in an internal combustion engine, characterized in that the flame sprayed layer applied on the bearing face is composed of from 55 to 85% of ferrocchrome, from 10 to 30% of self-fluxing alloy, and from 5 to 15% of molybdenum.

**4,420,544**  
**HIGH PERFORMANCE METHANOL-OXYGEN FUEL CELL WITH HOLLOW FIBER ELECTRODE**  
 Daniel D. Lawson, Arcadia, and John D. Ingham, La Crescenta, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 2, 1981, Ser. No. 307,848  
 Int. Cl.<sup>3</sup> H01M 8/00  
 U.S. Cl. 429-13

19 Claims



1. A fuel cell comprising:  
 a cell enclosure forming a chamber for containing a body of aqueous electrolyte;  
 an inlet connected to the chamber;  
 a gas-impermeable, ion-permeable tubular electrode formed of a fine filamentary, synthetic resin hollow fiber having ion exchange functionality disposed within said chamber, said electrode having a gas inlet end and a gas outlet end, a gas permeable layer of catalytic metal deposited on the inside surface thereof and a high surface area first current collector in contact with the catalytic deposit;  
 a second current collector disposed within the chamber so as to be immersed in said body of electrolyte, when present; means for supplying a flow of gaseous oxidant to said gas inlet end;  
 a source of water-soluble electrochemically active liquid fuel;  
 means connecting said source to said inlet for supplying said

water soluble electrochemically active liquid fuel to the chamber for containing the body of aqueous electrolyte whereby said liquid fuel and electrolyte form a liquid anode for oxidizing said fuel at said second current collector and the oxidant gas is simultaneously reduced at the first current collector developing an electrochemical potential between the second current collector and the first current collector;

and means connected to said first and second current collectors for extracting electrical energy from the cell.

13. A method of electrochemically generating electrical energy in a fuel cell comprising the steps of:

immersing in aqueous electrolyte a gas-impermeable, ion-impermeable tubular electrode in the form of a fine, filamentary, synthetic resin hollow fiber having ion exchange functionality and having a gas permeable layer of catalytic metal deposited on the inside surface thereof and having a high surface area first current collector in contact with the metal layer;

immersing a second current collector in said aqueous electrolyte;

flowing a oxidant gas through said electrode while flowing a water soluble electrochemically active liquid fuel into said aqueous electrolyte;

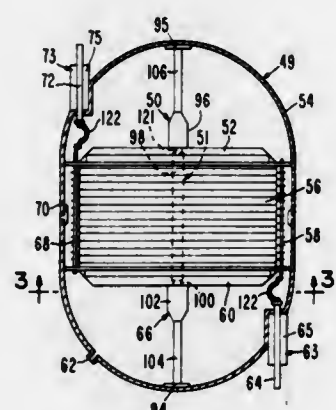
reducing said oxidant at said first current collector and oxidizing said fuel at said second current collectors to produce electrical energy; and

extracting said energy from said first current collector and second collectors.

**4,420,545**  
**LIGHTWEIGHT METAL-GAS BATTERY**  
 Theodore O. Meyer, Sunnyvale, and Thomas E. Hickman, Cupertino, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Nov. 5, 1981, Ser. No. 318,512  
 Int. Cl.<sup>3</sup> H01M 2/30  
 U.S. Cl. 429-101

13 Claims



1. A pressurized metal-gas battery comprising:  
 an enclosed pressure vessel containing a stack of substantially flat electrodes, a reactant gas, and an electrolyte;  
 a substantially flat non-conductive end plate placed on each of two ends of said stack, said end plates sandwiching said stack therebetween;  
 a generally cylindrical non-conductive center rod passing through the centers of said stack and end plates, said rod aligned with the major axis of said pressure vessel;  
 wherein said end plates and center rod exert pressure against the inner wall of said vessel but are not bonded thereto, so that the electrode stack is mechanically supported and is not significantly disrupted by changes in size of the pressure vessel during cycling of the battery.

**4,420,546**  
**MEMBER FOR ELECTROPHOTOGRAPHY WITH A-SI AND C-SI LAYERS**  
 Junichiro Kanbe, Yokohama, and Tadaji Fukuda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,434  
 Claims priority, application Japan, Aug. 29, 1980, 55-120270  
 Int. Cl.<sup>3</sup> G03G 5/082, 5/14  
 U.S. Cl. 430-57

9 Claims



1. An electrophotographic image forming member which comprises:

(a) a substrate for use in an electrophotographic process, and  
 (b) a photoconductive layer constructed with (i) a crystalline silicon layer from 100 Å to 1 micron in thickness overlying said substrate, and (ii) an amorphous layer from 3 to 100 microns in thickness overlying said crystalline silicon layer, wherein said amorphous layer consists essentially of an amorphous material containing silicon atom as a matrix and a member selected from the group consisting of hydrogen atom in amounts from 1 to 40 atomic percent, halogen atom in amounts from 1 to 40% and a mixture of hydrogen atom and halogen atom in amounts from 1 to 40 atomic percent.

**4,420,547**  
**PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY HAVING ULTRAVIOLET ABSORPTION LAYER**  
 Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 303,867  
 Claims priority, application Japan, Oct. 16, 1980, 55-143692  
 Int. Cl.<sup>3</sup> G03G 5/10  
 U.S. Cl. 430-57

4 Claims

1. A photosensitive member for electrophotography, comprising:

a first photoconductive layer formed on a conductive layer and having a range of photoconductive response extending over a range of light rays from ultraviolet rays to visible light;  
 a filter layer for absorption of ultraviolet rays formed on the first photoconductive layer;  
 a second photoconductive layer of light transmissibility formed on the filter layer of ultraviolet absorption and being sensitive only to ultraviolet rays; and  
 said photosensitive member functioning to hold the charge which defines an electrostatic latent image between said first and second photoconductive layers to avoid said charge directly contacting a developer.

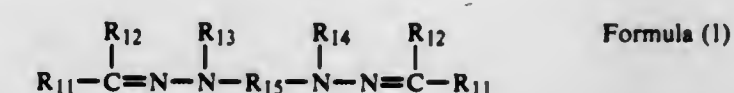
**4,420,548**  
**ELECTROPHOTOGRAPHIC MEMBER WITH HYDRAZONE OR KETAZINE COMPOUNDS**  
 Kiyoshi Sakai, Mitaka; Minoru Mabuchi; Toshiko Suzuki, both of Tokyo; Yuji Egarashi, Hino, and Shozo Ishikawa, Sayama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,673  
 Claims priority, application Japan, Nov. 28, 1980, 55-166560; Jul. 23, 1981, 56-115483  
 Int. Cl.<sup>3</sup> G03G 5/06, 5/14  
 U.S. Cl. 430-59

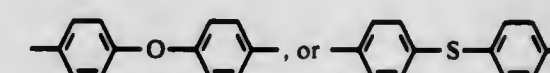
42 Claims

1. An electrophotographic photosensitive member characterized by having a layer containing at least one of hydrazone

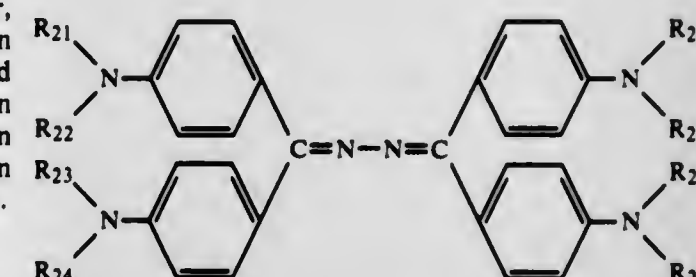
group compounds represented by the following formula (1) or of ketazine group compounds represented by the following formula (2):



wherein R<sub>11</sub> and R<sub>12</sub> independently of one another are hydrogen, substituted or unsubstituted aryl, or substituted or unsubstituted heterocyclic radical; R<sub>13</sub> and R<sub>14</sub> independently of one another are substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, substituted heterocyclic radical; and R<sub>15</sub> is a divalent hydrocarbon radical which may be substituted, a divalent organic residue derived from a heterocyclic ring which may be substituted,



Formula (2)



wherein R<sub>21</sub>, R<sub>22</sub>, R<sub>23</sub>, and R<sub>24</sub> independently of one another are substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl, or R<sub>21</sub> and R<sub>22</sub>, together with the nitrogen which links them, is cyclic amino radical, and R<sub>23</sub> and R<sub>24</sub>, together with the nitrogen which links them, is cyclic amino radical.

26. An electrophotographic photosensitive member according to claim 1, wherein said layer containing at least one of hydrazone group compounds or of ketazine group compounds has a function to transport the electric charge generated in a charge generation layer.

**4,420,549**  
**LITHOGRAPHIC SUBSTRATE AND ITS PROCESS OF MANUFACTURE**

Donald E. Cadwell, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
 Filed Sep. 8, 1981, Ser. No. 299,721  
 Int. Cl.<sup>3</sup> G03C 1/94

U.S. Cl. 430-158

7 Claims

1. An article comprising an aluminum or aluminized substrate bearing on at least one aluminum or aluminized surface thereof a ceramic coating comprising a polymeric form of aluminum phosphate or mixtures of aluminum phosphates, said coating being substantially free of particulate material, wherein a photosensitive layer is coated on said ceramic layer.



**4,420,550**  
**PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE MAGENTA DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF**

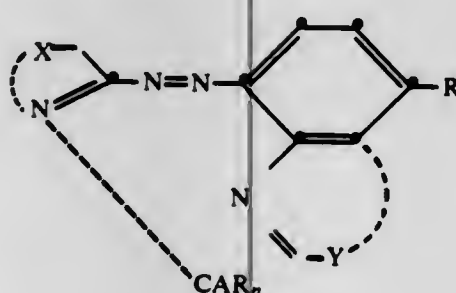
Steven Evans, Rochester, and James K. Elwood, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
 Continuation-in-part of Ser. No. 380,843, May 21, 1982, abandoned. This application Jan. 17, 1983, Ser. No. 458,499  
 Int. Cl.<sup>3</sup> G03C 5/54, 1/40, 1/10, 7/00

U.S. Cl. 430—223

44 Claims

24. In a photographic assemblage comprising:

- (i) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; and
- (ii) a dye image-receiving layer; the improvement wherein said dye image-providing material is a nondiffusible compound capable of releasing at least one diffusible magenta dye moiety comprising a 4-(2-heterocyclyazo)phenol having a heterocyclic ring fused thereto, said compound having the formula:



wherein:

- (a) X represents the atoms necessary to complete a 5- or 6-membered heterocyclic ring;
- (b) Y represents the atoms necessary to complete a 5- or 6-membered heterocyclic fused ring;
- (c) CAR represents a ballasted carrier moiety capable of releasing said diffusible magenta dye moiety as a function of development of said silver halide emulsion layer under alkaline conditions;
- (d) R represents a hydroxy group, a salt thereof, or a hydrolyzable precursor thereof, or CAR which is linked to said dye moiety through an oxygen atom thereon; and
- (e) n is 0, 1 or 2, with the proviso that when n is 0, then R is CAR which is linked to said dye moiety through an oxygen atom thereon.

**4,420,551**

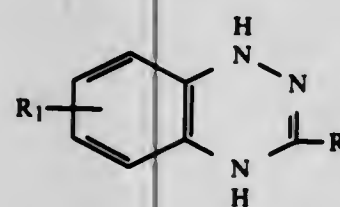
**NOVEL BENZOTRIAZINE DEVELOPERS AND PHOTOGRAPHIC PRODUCT AND METHOD**

Emmett S. McCaskill, Wellesley, Mass., assignor to Polaroid Corporation, Cambridge, Mass.  
 Filed Jan. 31, 1983, Ser. No. 450,373  
 Int. Cl.<sup>3</sup> G03C 5/54, 1/48, 5/30, 1/06

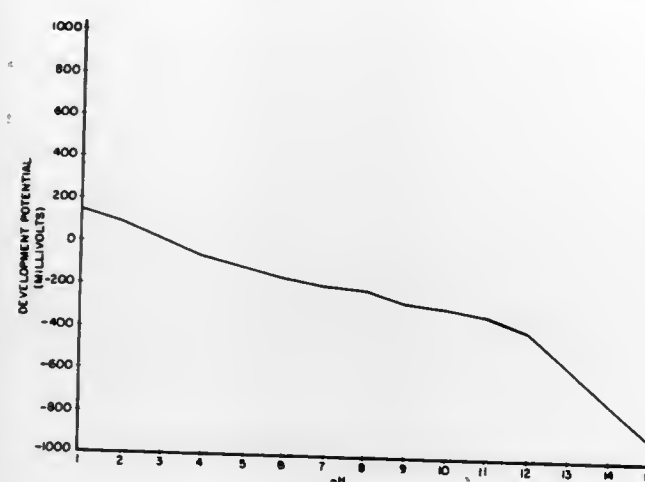
U.S. Cl. 430—234

8 Claims

6. A photographic product comprising a support, a silver halide emulsion carried on said support and a developing agent in a layer on the same side of said support as said silver halide emulsion, said developing agent represented by the formula



wherein R is H, alkyl, alkoxy or aryl, R<sub>1</sub> is H, alkyl, —CF<sub>3</sub>, —COOH, —NH<sub>2</sub>, —NHSO<sub>2</sub>R<sub>2</sub> or —OR<sub>2</sub>, and R<sub>2</sub> is alkyl.



8. The product as defined in claim 6 and further including a silver halide solvent and a layer of an image receiving material.

**4,420,552**

**METHOD OF PRODUCING PRINTED IMAGES WITH A COLOR FACSIMILE PRINTING DEVICE**

Richard M. Peck, 3113 Club Dr., Allentown, Pa. 18103; Robert B. Reif, Grove City, and Loren R. Albrechtson, Columbus, both of Ohio, assignors to Richard M. Peck, Allentown, Pa.  
 Division of Ser. No. 244,523, Mar. 16, 1981, Pat. No. 4,390,614.  
 This application Jan. 25, 1983, Ser. No. 460,720

Int. Cl.<sup>3</sup> G03C 11/12, 1/40

U.S. Cl. 430—252

16 Claims

1. A method of producing printed images comprising the steps of (1) exposing a printing device to radiation, said printing device comprising a printing element and a transparent photosensitive ink wherein said printing element comprises pores having openings at a printing surface of said element and said ink is disposed within said pores and is restricted from lateral movement within the element, (2) developing said photosensitive ink, and (3) transferring said ink to a substrate.

**4,420,553**

**PHOTOSENSITIVE RECORDING MATERIAL AND PHOTOGRAPHIC PROCESSES WHEREIN SAID MATERIAL IS USED**

Jan F. Van Besauw, Mortsel; Luc H. Leenders, Tielen; Dirk M. D'hont, Mortsel; Hendrik E. Kokelenberg, Merksem, and Rafaeel P. Samijn, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed May 10, 1982, Ser. No. 376,596

Claims priority, application United Kingdom, May 15, 1981, 8114926

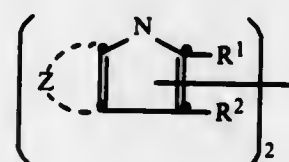
Int. Cl.<sup>3</sup> G03C 1/52, 1/68

U.S. Cl. 430—275

7 Claims

1. A photosensitive recording material comprising a supported or self-supporting binder layer incorporating an organic photoradical precursor compound in operative relationship with an image-forming precursor compound which is capable of taking part in image formation by reaction with photoradicals formed by photoexposing said photoradical precursor compound, characterized in that

- (1) the photoradical precursor compound is a di- or tri(2,3-aryl substituted indolyl) compound free from Zerewitinoff active hydrogen, and is within the scope of the following general formulae:



**4,420,555**

**PHOTOGRAPHIC MATERIALS CONTAINING YELLOW FILTER DYES**

Spencer M. Krueger, Beaverton, Oreg., and James W. Brown, III, Spencerport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

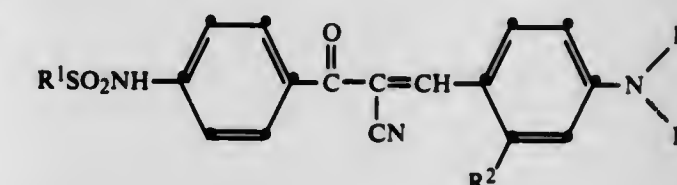
Filed Jul. 19, 1982, Ser. No. 399,405

Int. Cl.<sup>3</sup> G03C 1/00

U.S. Cl. 430—507

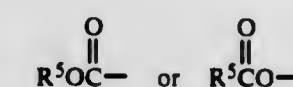
10 Claims

1. In a photographic element comprising a support, a silver halide emulsion layer sensitive to a region of the visible spectrum in addition to the blue region, and a yellow filter layer between the silver halide emulsion layer and the intended source of exposure, the improvement wherein the yellow filter layer comprises a yellow dye represented by the structural formula:



where:

- R<sup>1</sup> is alkyl of 1 to 3 carbon atoms;
- R<sup>2</sup> is hydrogen or alkyl of 1 to 3 carbon atoms;
- R<sup>3</sup> and R<sup>4</sup> each individually alkyl of 1 to 3 carbon atoms, at least one of which is terminated with



and

R<sup>5</sup> is alkyl of 1 to 3 carbon atoms or fluoroalkyl of 1 to 3 carbon atoms.

**4,420,556**

**PHOTOGRAPHIC SILVER HALIDE MATERIALS**

(1) Robert E. Booms, Rochester, N.Y., and Colin Holstead, Hertfordshire, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 10, 1981, Ser. No. 300,713

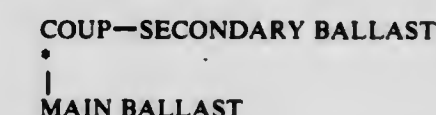
Claims priority, application United Kingdom, Sep. 11, 1980, 8029467

Int. Cl.<sup>3</sup> G03C 1/40

U.S. Cl. 430—549

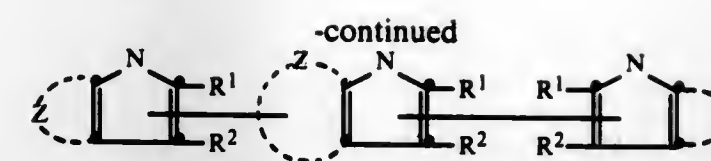
14 Claims

1. A silver halide photographic element comprising at least one silver halide emulsion layer and nondiffusible dye-forming couplers associated with the layer or layers wherein the nondiffusible dye-forming couplers comprise a first nondiffusible dye-forming coupler which, upon reaction with oxidized color developing agent, yields a nondiffusible first dye and a second, different, nondiffusible dye-forming coupler which, upon reaction with oxidized color developing agent, yields a second dye of such mobility that said second dye in combination with said first dye produces controlled image smearing in said photographic element, said second coupler yielding a dye of limited mobility and having the structure:



wherein:

COUP is a dye-forming coupler moiety, the asterisk (\*) denoting the coupling position thereof;  
 MAIN BALLAST is a group, attached to the coupling position of COUP and detachable therefrom by means of reaction of COUP with oxidized color developing agent,



wherein:

- Z represents the atoms necessary to close an adjacent carbocyclic aromatic ring, and
- each of R<sup>1</sup> and R<sup>2</sup> is an aryl substituent or a substituted aryl substituent, the positions of the double bonds in the indole rings being determined by the position of the linkage between the rings, and
- (2) the image-forming precursor compound is selected from the group consisting of (a) a reducing compound containing Zerewitinoff active hydrogen and (b) a free radical polymerizable non-gaseous ethylenically unsaturated compound in combination with a free radical producing electron-donor agent.

**4,420,554**

**SILVER HALIDE PHOTOSENSITIVE MATERIALS**

Minoru Ohashi; Kiyoshi Futaki, and Katsuaki Iwaosa, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Feb. 17, 1982, Ser. No. 349,525

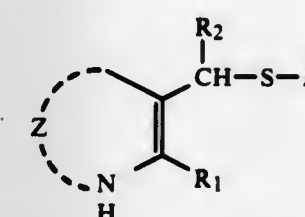
Claims priority, application Japan, Feb. 17, 1981, 56-21764; Feb. 18, 1981, 56-21425

Int. Cl.<sup>3</sup> G03C 1/34

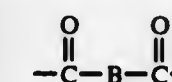
U.S. Cl. 430—446

10 Claims

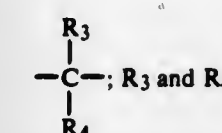
1. In a silver halide photographic photosensitive material which comprises a support and photographic layers provided thereon, the improvement which comprises including in at least one of silver halide emulsion layers and colloid layers permeable to water through to or out from said emulsion layer at least one development fog inhibiting compound represented by the following general formula (I):



wherein A represents the heterocyclic group of a mercapto-antifoggant; Z represents a diacyl group of the formula



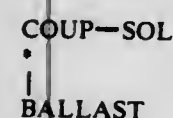
or an atomic group necessary to form an indole ring; R<sub>1</sub> represents a hydrogen atom, alkyl group, phenyl group, carboxyl group or alkoxy carbonyl group; R<sub>2</sub> represents a hydrogen atom, alkyl group or phenyl group; B represents a methylene group of the formula



each represents a hydrogen atom or alkyl group; and the positions from 4 to 7 of the indole ring may be substituted with a halogen atom, alkyl group, phenyl group, alkoxy group, hydroxyl group, nitro group, carboxyl group or alkoxy carbonyl group.



which is of such size and configuration as to render the coupler nondiffusible, and  
**SECONDARY BALLAST** is a group, attached to a non-coupling position of COUP, which is of such size and configuration that the dye formed by coupling of COUP with oxidized color developing agent is slightly mobile.  
 2. A silver halide photographic element comprising at least one silver halide emulsion layer and nondiffusible dye-forming couplers associated with the layer or layers wherein the nondiffusible dye-forming couplers comprise a first nondiffusible dye-forming coupler which, upon reaction with oxidized color developing agent, yields a nondiffusible first dye and a second, different, nondiffusible dye-forming coupler which, upon reaction with oxidized color developing agent, yields a second dye of such mobility that said second dye in combination with said first dye produces controlled image smearing in said photographic element, said second coupler yielding a diffusible dye and having the structure:



COUP is a dye-forming coupler moiety, the asterisk (\*) denoting the coupling position thereof;  
 BALLAST is a group, attached to the coupling position of COUP and detachable therefrom by means of reaction of COUP with oxidized color developing agent, which is of such size and configuration as to render the coupler nondiffusible; and  
 SOL is a solubilizing substituent, attached to a non-coupling position of COUP, which renders the dye formed by coupling of COUP with oxidized color developing agent diffusible in the alkaline environment present during photographic processing and, associated with the layer containing the second coupler, a mordant which immobilizes the diffusible dye.

4,420,557

# **COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A NON-DIFFUSIBLE ELECTRON DONOR PRECURSOR COMPOUND**

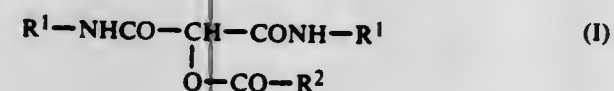
Heinrich Odenwälder, and Paul Marx, both of Leverkusen, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
 Filed Oct. 25, 1982, Ser. No. 436,581  
 Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3144037

Int. Cl.<sup>3</sup> G03C 1/40, 1/48, 1/06, 5/30

U.S. Cl. 430-559

5 Claims

1. A color photographic recording material comprising at least one light-sensitive silver halide emulsion layer and associated thereto a non-diffusing color-providing compound, which material contains, in at least one light-sensitive silver halide emulsion layer or in a non-light-sensitive binder layer, a non-diffusing electron donor precursor compound (ED precursor compound), from which a non-diffusing ED compound is formed under alkaline development conditions, wherein the improvement comprises the ED precursor compound corresponds to the following formula I



wherein

R<sup>1</sup> represents a carbocyclic or heterocyclic aromatic group, R<sup>2</sup> represents hydrogen, alkyl, alkenyl, aryl or acyl; and at least one of the radicals R<sup>1</sup> and R<sup>2</sup> contains a ballast radical.

# **BRIGHT FIELD LIGHT MICROSCOPIC METHOD OF ENUMERATING AND CHARACTERIZING SUBTYPES OF WHITE BLOOD CELLS AND THEIR PRECURSORS**

Jan R. De Mey, Turnhout, and Marc K. J. J. Moeremans, Mol, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 233,809, Feb. 12, 1981, abandoned. This application Oct. 29, 1981, Ser. No. 316,204  
 Int. Cl.<sup>3</sup> G01N 33/48, 33/52, 33/54

U.S. Cl. 435-7

19 Claims

1. A bright field light microscopic method for the quantitative determination and characterization of white blood cells and precursors thereof, which comprises the steps of  
 (i) labeling viable cells of the desired subtype by allowing them to react first with specific non-labeled antibodies and thereafter with appropriate gold-labeled secondary antibodies, whereby the cells are, until fixation, allowed to undergo extensive patching of the antigens, but are prevented from capping and all forms of internalization by keeping them in contact with an effective concentration of an appropriate inhibitor of oxidative phosphorylation;  
 (ii) fixing the cells and staining the cells with endogenous peroxidase activity by contacting them with an appropriate peroxidase-indicator; and  
 (iii) counting and identifying the gold-labeled cells in a given sample under the bright field light microscope.

4,420,559

# **METHOD OF ENZYMATICALLY CONVERTING A SUBSTRATE USING MEMBRANE VESICLES**

Ulrich Zimmermann, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 248,318, Mar. 27, 1981, abandoned, which is a continuation of Ser. No. 61,517, Jul. 27, 1979, abandoned, which is a continuation of Ser. No. 871,217, Jan. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 688,918, May 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 472,472, May 22, 1974, abandoned. This application Dec. 10, 1982, Ser. No. 448,721  
 Claims priority, application Fed. Rep. of Germany, May 23, 1973, 2326161

Int. Cl.<sup>3</sup> C12P 19/14

U.S. Cl. 435-99

5 Claims

1. A method for enzymatically converting a substrate in an aqueous solution using an enzyme entrapped in membrane vesicles and suspended in the solution, the method comprising the steps of:  
 suspending erythrocytes in a first aqueous solution having an osmolarity which is less than 70% of the content of the erythrocytes said solution containing at least 0.5 mM/l of ions selected from the group consisting of magnesium, calcium and potassium ions; and low enough to increase the permeability of the membrane of the erythrocytes;  
 leaving said erythrocytes in said first aqueous solution until osmotic equilibrium is reached between the contents of said erythrocytes and said first solution, thereby producing membrane vesicles from said erythrocytes and loading said membrane vesicles with an enzyme;  
 adding to said first solution containing said enzyme loaded membrane vesicles osmotically active substances selected from the group consisting of calcium, potassium, and sodium ions to increase the osmolarity of the first solution thereby reducing said permeability of the membrane of the membrane vesicles entrapping the enzymes therein;  
 separating said loaded membrane vesicles from said first aqueous solution;  
 suspending said loaded membrane vesicles in a second aqueous solution having an osmolarity up to 20% less than the osmolarity of said loaded membrane vesicle, said second aqueous solution containing the substrate to be degraded;  
 holding said loaded membrane vesicles in said second aque-

ous solution for a period of time sufficient to allow the substrate to enter said membrane vesicles and be degraded by said enzyme and to produce reaction products which reaction products leave said membrane vesicles and accumulate in said second aqueous solution; and  
 separating said loaded membrane vesicles from said reaction products.

4,420,560

# **METHOD FOR MODIFICATION OF FATS AND OILS**

Takaharu Matsuo, Sennan; Norio Sawamura, Osaka; Yukio Hashimoto, Kishiwada, and Wataru Hashida, Osaka, all of Japan, assignors to Fuji Oil Company, Limited, Japan

Filed Nov. 17, 1981, Ser. No. 322,248

Int. Cl.<sup>3</sup> C12P 7/64

U.S. Cl. 435-134

10 Claims

1. In a method for the modification of a fat or oil by selectively transesterifying:  
 a mixture, designated as mixture A, which mixture comprises: a glyceride-type fat or oil to be modified, designated as material A and a fatty acid or a monohydric alcohol ester thereof, designated as material B,  
 in the presence of an enzyme catalyst having a selective transesterification activity, designated as catalyst A; and  
 recovering the modified fat or oil designated as resultant A, fatty acid or monohydric alcohol ester thereof reaction residues, designated as resultant B and enzyme catalyst, designated as catalyst B, from the reaction mixture; and  
 then producing a hard butter from the resultant A,  
 the improvement which comprises hydrogenating a part or all the resultant B and reusing the thus hydrogenated product, designated as material C, as a part of the mixture A.

4,420,561

# **FERMENTATION PROCESS**

Nai Y. Chen, Titusville, and Joseph N. Mile, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,461

Int. Cl.<sup>3</sup> C12P 7/06

U.S. Cl. 435-161

10 Claims

1. In an ethanol fermentation process in which an aqueous solution of fermentable sugar is converted by an ethanol-producing microorganism to carbon dioxide and a dilute aqueous solution of ethanol with the ethanol being present in the solution at a concentration which does not exceed a predetermined maximum level, said predetermined maximum level of ethanol being selected to be that which is below the level of ethanol causing fermentation to substantially cease, the improvement comprising selectively sorbing ethanol present in the solution during fermentation within a hydrophobic crystalline aluminosilicate ZSM-5 or HZSM-5 zeolite possessing a silica to alumina ratio of greater than about 12 so that the non-sorbed ethanol present in the solution does not exceed the predetermined maximum level of concentration therein, and thereafter desorbing sorbed ethanol from the zeolite by stripping said zeolite with the carbon dioxide obtained from the ethanol fermentation process.

4,420,562

# **METHOD FOR PRODUCING CREATINASE**

Shigeru Ikuta; Kazuo Matsuura, and Hideo Misaki, all of Shizuoka, Japan, assignors to Toyo Jozo Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 338,607, Jan. 11, 1982, abandoned, which is a continuation-in-part of Ser. No. 158,800, Jun. 12, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,458

Claims priority, application Japan, Jul. 4, 1979, 54-85260

Int. Cl.<sup>3</sup> C12N 9/78; C12R 1/07

U.S. Cl. 435-227

3 Claims

1. A method for producing and isolating creatinase which

# **PROCESS FOR THE PRODUCTION OF OSMOTOLERANT YEAST**

Shao L. Chen, and Feliks Gutmanis, both of Milwaukee, Wis., assignors to Universal Foods Corporation, Milwaukee, Wis.  
 Continuation of Ser. No. 140,262, Apr. 14, 1980, abandoned.  
 This application Jun. 17, 1982, Ser. No. 389,321

Int. Cl.<sup>3</sup> C12N 1/36

U.S. Cl. 435-245

14 Claims

1. In a process for producing an osmotolerant baker's yeast by propagating yeast in a series of stages and harvesting yeast from the last stage, the improvement which comprises:  
 (a) incrementally feeding nutrient containing water-soluble, ionic, non-nutritive salts to all of the highly aerobic yeast propagative stages except the last stage, said nutrient containing said non-nutritive salts in amounts sufficient to provide a final total ionic concentration of said non-nutritive salts in each of said stages of at least between about 1 and 2% on a weight/volume basis when yeast growth is completed in each of said storage;  
 (b) incrementally feeding nutrient containing water-soluble, ionic, non-nutritive salts to the last propagative stage of the yeast produced in the preceding stages wherein the said salt in said nutrient is supplemented with additional non-nutritive, ionizable, water-soluble salt in amounts sufficient to provide a final total ionic concentration of said non-nutritive salts in said last stage of at least 2.5% on a weight/volume basis when the yeast growth in said last stage is complete; and  
 (c) harvesting the resulting osmotolerant yeast from the said last stage.

4,420,564

# **BLOOD SUGAR ANALYZER HAVING FIXED ENZYME MEMBRANE SENSOR**

Nobuhiko Tsuji; Keijiro Nakamura, both of Yokosuka; Koichi Endoh, Hino; Toshiyoshi Hamada, and Keiichi Ishida, both of Tokyo, all of Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

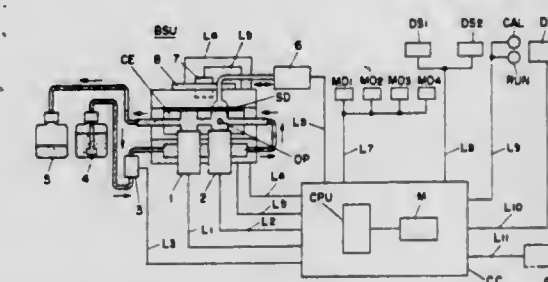
Filed Nov. 4, 1981, Ser. No. 318,000

Claims priority, application Japan, Nov. 21, 1980, 55-163334; Nov. 21, 1980, 55-163335; Dec. 9, 1980, 55-172658; Dec. 9, 1980, 55-172659; Dec. 9, 1980, 55-172661; Dec. 9, 1980, 55-172662; Dec. 9, 1980, 55-172663

Int. Cl.<sup>3</sup> G01N 33/66

U.S. Cl. 435-288

15 Claims



1. A blood sugar analyzing apparatus having a reaction cell which houses a fixed enzyme membrane sensor and a measuring electrode and which receives a blood specimen, said fixed enzyme membrane sensor measuring the blood sugar concentration in the blood specimen as a function of a reaction current signal generated in the sensor by the chemical reaction, and



means for calculating a reaction current offset for adjusting the measured reaction current value to more accurately detect the actual blood sugar concentration by subtracting said offset from said measured reaction current value; and said apparatus having monitoring means for sensing a plurality of operational values including reaction cell current, reaction cell temperature and reaction current offset, to compare said sensed values with predetermined corresponding ranges, and to display an error signal when at least one of said values exceeds its corresponding range, to thereby provide information concerning operation conditions and maintenance needs to an operator.

4,420,565

# METHOD FOR DETERMINING FLOW PATTERNS IN SUBTERRANEAN PETROLEUM AND MINERAL CONTAINING FORMATIONS

Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 221,692, Dec. 31, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,544 Int. Cl.<sup>3</sup> G01N 33/24, 31/08

U.S. Cl. 436—27

8 Claims

1. The method for determining flow patterns within a subterranean formation penetrated by a spaced apart injection system and production system, said method comprising injecting into the formation at a predetermined depth in the injection system a solution containing a tracer compound present in sufficient quantity for identification, recovering said solution containing tracer compound in the production system, determining the depth of recovery, and identifying said tracer compounds by gas chromatography and flame ionization detector; said tracer being a volatile water-soluble organic compound containing a hydrocarbon moiety and phosphorus.

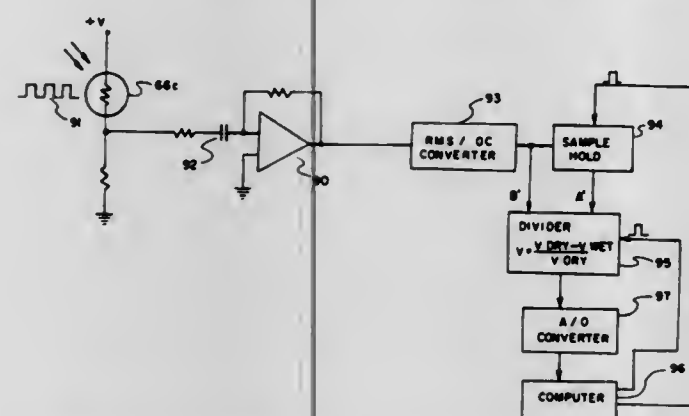
4,420,566

# METHOD AND APPARATUS FOR DETECTING SAMPLE FLUID ON AN ANALYSIS SLIDE

Thomas C. Jessop, Webster, and Donald De Jager, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 10, 1982, Ser. No. 387,124  
Int. Cl.<sup>3</sup> G01N 35/00, 35/06, 21/00, 33/18  
U.S. Cl. 436—46

20 Claims



1. Apparatus for detecting a sample fluid containing a substantial portion of water on a test element adapted to receive a predetermined quantity of the sample fluid from a metering device and to produce a response proportional to a selected analyte in the fluid, an element being of a type for the selected analyte and having certain reflectance characteristics, said apparatus comprising:  
means for projecting a beam of radiation comprising wavelengths absorbed by water onto a surface of a test element; sensor means for detecting the intensity of radiation within the absorption band of water reflected from a surface of a test element and for producing an output proportional to said intensity, said sensor means being adapted to produce a first output from radiation received before fluid is metered onto

an element and a second output after fluid is metered thereon; and

means for processing said outputs, said processing means including means for receiving an input indicative of the reflectance characteristics of said type of test element and for comparing the difference between said first and second outputs with a predetermined value which corresponds to a sufficient amount of fluid on said type of test element, and means for producing a signal in the event the amount of fluid is not sufficient to produce a proper response.

10. A method for detecting a sample fluid containing a substantial portion of water on an analysis slide, said slide being adapted to receive a predetermined quantity of sample fluid and to produce a response proportional to a selected analyte in the fluid, said slide being selected from more than one type, each type being for a particular analyte and having a defined range of values of reflectivity which varies between a relatively high reflectivity when the slide does not contain any fluid and a relatively low reflectivity after fluid has been deposited on the slide, said method comprising the steps of:

- projecting radiation comprising wavelengths absorbed by water onto a dry slide before the metering of fluid thereon;
- detecting the intensity of radiation within the absorption band of water reflected from said dry slide;
- projecting radiation comprising wavelengths absorbed by water onto said slide after the metering of fluid thereon;
- detecting the intensity of radiation within the absorption band of water reflected from said slide after the metering of fluid onto the slide;
- comparing the difference between the intensity of radiation reflected from said dry slide and from said slide after fluid has been metered thereon with a predetermined value within the reflectivity range of the type of slide suitable for said selected analyte to determine if sufficient fluid has been metered onto the slide to produce a proper response; and
- producing a signal in the event the amount of fluid is not sufficient for a proper response.

4,420,567

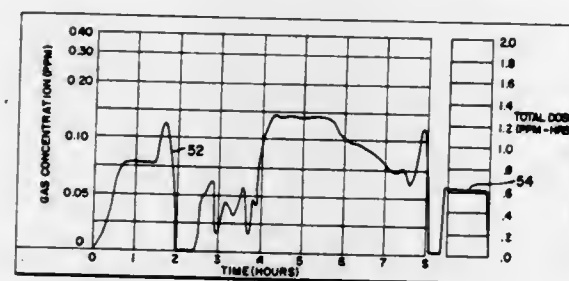
# HYDRIDE GAS DETECTING TAPE

Roberta McMahon, Chicago, and Franco F. Fiorese, Elmhurst, both of Ill., assignors to MDA Scientific, Inc., Glenview, Ill.

Filed Oct. 22, 1981, Ser. No. 313,651  
Int. Cl.<sup>3</sup> G01N 31/08

U.S. Cl. 436—169

11 Claims



1. A substrate for detecting hydride gases comprising a solid absorbent material and a detector composition impregnating the absorbent material, said detector composition consisting essentially of silver nitrate, an organic or inorganic acid to stabilize the silver nitrate and a glycol to maintain the substrate in a moist condition whereby the substrate is capable of reaction with a hydride gas for the development of color as a measure of the hydride concentration.

8. A method for detecting hydride gases comprising:

- contacting a hydride-containing gas with a substrate for detecting hydride gases comprising a solid absorbent material impregnated with a detector composition, said detector composition consisting essentially of silver nitrate, an organic or inorganic acid to stabilize the silver nitrate and a glycol to maintain the substrate in a moist condition whereby the substrate is capable of reaction

- with a hydride-containing gas for the development of color;  
(b) sampling said hydride-containing gas over a given period of time by allowing diffusion of said gas onto the porous member to produce the detectable color; and  
(c) determining the intensity of the color as a measure of the concentration of hydride gases in the atmosphere.

4,420,568

# FLUORESCENT POLARIZATION IMMUNOASSAY UTILIZING SUBSTITUTED TRIAZINYLAMINOFLUORESCINS

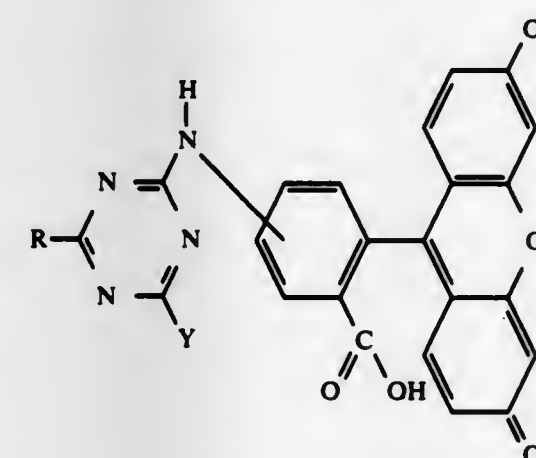
Chao-Huei J. Wang, Gurnee; Stephen D. Stroupe, Libertyville, and Michael E. Jolley, Round Lake, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 173,553, Jul. 30, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 325,872 Int. Cl.<sup>3</sup> G01N 33/54, 33/58, 33/52, 33/74

U.S. Cl. 436—536

34 Claims

1. A method for determining ligands in a sample comprising intermixing with said sample a biologically acceptable salt of a tracer of the formula:



wherein

Y is halo or lower alkyl; and

R is a ligand-analog wherein said ligand-analog has at least one common epitope with said ligand so as to be specifically recognizable by a common antibody;  
and an antibody capable of specifically recognizing said ligand and said tracer; and then determining the amount of tracer bound to antibody by fluorescence polarization techniques as a measure of the amount of ligand in the sample.

4,420,569

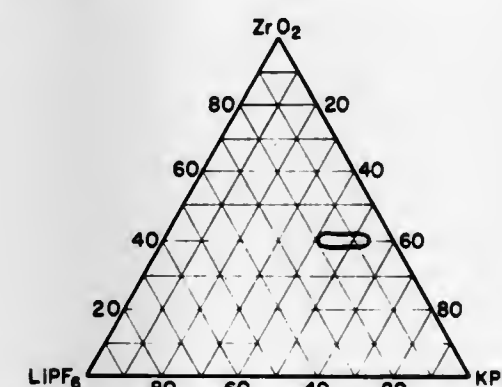
# ALKALI METAL ZIRCONOFLUOROPHOSPHATE GLASSES

Paul A. Tick, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,898  
Int. Cl.<sup>3</sup> C03C 1/00, 3/18

U.S. Cl. 501—30

3 Claims



1. A transparent glass having a refractive index in the vicinity

of 1.45, a density in the area of 3.1 g/cm<sup>3</sup>, an electrical resistivity on the order of 10<sup>9</sup> ohm-cm, and a transition temperature below 200° C. having a batch composition within the Li<sub>2</sub>O-K<sub>2</sub>O-ZrO<sub>2</sub>-F-P<sub>2</sub>O<sub>5</sub> system as generally depicted in terms of mole percent in FIG. 2.

3. A transparent glass according to claim 1 having a stoichiometry, on a chemically analyzed basis, of about Zr<sub>3.2</sub>P<sub>1.2</sub>(Li+K)<sub>5.6</sub>F<sub>15.7</sub>O<sub>5.1</sub>.

4,420,570

# REACTION INJECTION MOLDED ELASTOMER CONTAINING AN INTERNAL MOLD RELEASE MADE BY A TWO-STREAM SYSTEM

Richard J. G. Dominguez, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,260  
Int. Cl.<sup>3</sup> C12P 13/16, 17/04

U.S. Cl. 521—112

9 Claims

1. A method for making a reaction injection molded elastomer which will release from its mold with reduced frequency of application of external mold release agents comprising injecting exactly two streams via a RIM machine into a mold cavity of the desired configuration, a formulation comprising in the first stream a high molecular weight polyhydric polyether, a low molecular weight active hydrogen containing compound of at least two functionality and an internal mold release agent, and in the second stream an aromatic polyisocyanate and tin catalyst in an amount equal to 100% of the tin catalyst present in the formulation.

5. A method as in claim 1 where the internal mold release agent comprises a dimethyl siloxane with organic acid groups.

4,420,571

# PHENOLIC FRICTION PARTICLES

John R. Blickensderfer, and Luba A. Pacala, both of Belle Mead, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 141,142, Apr. 17, 1980, abandoned.  
This application Jul. 13, 1982, Ser. No. 397,896  
Int. Cl.<sup>3</sup> C08J 5/14; C08L 5/00, 61/06

U.S. Cl. 523—149

20 Claims

1. In a process for the production of substantially completely cured resin friction particles the essential steps of:

(A) reacting, in an aqueous medium at a temperature of from about 50° C. to about 100° C., (I) a mixture of phenols, said mixture comprised of from 25 to 100 mole percent of tri-and/or tetrafunctional phenols and from 0 to 75 mole percent of difunctional phenols; (II) from 1.1 to 3 moles per mole of phenol moiety of an aldehyde containing from 1 to 11 carbon atoms, (III) from 0.01 to 1 mole per mole of phenol moiety of a reaction promoting compound chosen from the group of alkali and alkaline earth hydroxides and oxides and the primary, secondary and tertiary amines having up to 10 carbon atoms and (IV) from 0.05 to 6 weight percent of a protective colloid based on the weight of compounds (I), (II) and (III); for a period of time such that a particulate, heat reactive, and substantially water-insoluble phenol resin is formed which is dispersed in said aqueous medium;

(B) adding an acid compound to the aqueous dispersion of step (A) in an amount such that the pH of the aqueous dispersion is from 0 to 4, and substantially completely curing the resin particles, and

(C) separating the resin particles from the aqueous medium.



4,420,572

# CONTINUOUS PROCESS FOR THE PRODUCTION OF HIGHLY CONCENTRATED SPINNING SOLUTIONS OF ACRYLONITRILE POLYMERS AND A SUITABLE DEVICE FOR THIS PURPOSE

Ernst Hördt; Helmut Vollmüller, both of Kelkheim; Heinz D. Bernhard, St. Goar, and Harald M. Strobel, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,805

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048059

Int. Cl.<sup>3</sup> C08J 3/08

U.S. Cl. 523—322

3 Claims

1. A continuous process for the production of highly concentrated spinning solutions from acrylonitrile polymers, which consists essentially of dissolving in one step in a stirred mixing vessel, which contains, as the stirrer, only one disc-shaped stirrer rotating in a horizontal plane, the peripheral velocity of which stirrer can be controlled from about 4 to about 25 m/sec, this peripheral velocity being sufficient to stir vigorously, with the formation of a vortex, the solution contained in the stirred mixing vessel, metering in, separately and at room temperature, the polymer to be dissolved and the solvent into the vortex, discharging continuously the finished spinning solution at the bottom of the stirred mixing vessel at such a rate that the liquid level in the vessel is maintained at a constant value, and maintaining the temperature of the solution in the vessel at a constant preset value in the range from about 60 to about 120° C. by controlling the peripheral velocity of the stirrer, the average residence time of the polymer in the vessel being about 5 to 30 minutes.

4,420,573

# METHOD OF TREATING WATER-IN-OIL DISPERSIONS

Sidney G. Fogg, Ashted, Frank C. Robertson, Woking, and Douglas Wilson, Godalming, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Mar. 17, 1982, Ser. No. 359,054

Claims priority, application United Kingdom, Mar. 28, 1981, 8109803; Oct. 24, 1981, 8132137

Int. Cl.<sup>3</sup> C02B 9/02

U.S. Cl. 523—333

12 Claims

1. A method of treating a dispersion of salt water-in-oil comprising mixing the dispersion with a latex of rubber having a high wet gel strength, said dispersion containing oil as the continuous phase and water as the dispersed phase in an amount of 20 to 80% by volume.

4,420,574

UNGELED

# POLYEPOXIDE-POLYOXYALKYLENEPOLYAMINE RESINS, AQUEOUS DISPERSIONS THEREOF, AND THEIR USE IN CATIONIC ELECTRODEPOSITION

Thomas C. Moriarity, Allison Park, and William J. Geiger, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 284,865, Jul. 20, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,551

Int. Cl.<sup>3</sup> C08L 63/02

U.S. Cl. 523—404

9 Claims

1. An aqueous resinous dispersion which contains from: (A) 0.5 to 40 percent by weight of an ungelled resin formed from reacting: (i) a polyepoxide with (ii) a polyoxyalkylenepolyamine; the ratio of equivalents of active hydrogens in (ii), with primary amine groups being considered monofunctional, to equivalents of epoxy in (i) being within the range of 1.20 to 1.70:1, the reaction product being at least partially neutralized with acid to provide cationic groups, (B) 60 to 99.5 percent by weight of an additional cationic resin

different from (A) and which is electrodepositable on a cathode; the percentages by weight being based on total weight of (A) plus (B).

4,420,575

# WATER REDUCIBLE AEROSOL PAINTS

Stanley Rapaport, Shaker Heights, and Francis J. Cachat, Rocky River, both of Ohio, assignors to Plasti-Kote Company, Inc., Medina, Ohio

Filed Jul. 26, 1982, Ser. No. 401,838

Int. Cl.<sup>3</sup> C09D 3/66, 5/02

U.S. Cl. 523—504

11 Claims

1. An aerosol paint under atomizing paint dispensing pressures characterized by a carrier water phase, a film-forming paint phase, and a liquid substantially water-miscible propellant phase in mutually compatible admixture; and polymeric, non-volatile, film-forming solids component constituting from about 5–15%, the water from about 15–40%, and said propellant about 20–40% of said aerosol paint: at least one portion of said polymeric film-forming component consisting essentially of a low molecular weight monomer modified alkyl resin of less than 6,000 units and an acid value between about 40 and 80, said acid value neutralized with an alkaline base, said base at least in part consisting of the group selected from ammonia and amines; and at least one other portion of said polymeric film-forming component consisting of an emulsion polymer latex having a molecular weight substantially greater than said alkyl, but less than 1 million; said total polymeric binder in combination in said aerosol paint with an excess of 5%, but not more than about 30% of at least one of the following water-miscible volatile organic solvent groups (a) low molecular weight alcohols, ketones, and esters and (b) high molecular weight glycol ethers and esters; said aerosol paint having a pH of from about 8.0 to 8.5.

4,420,576

# PLASTICS BASED COMPOSITION CONTAINING A POLYESTER RESIN AND ALKALINE MODIFIED STARCH GRANULES

Gerald J. L. Griffin, London, England, assignor to Coloroll Limited, London, England

Filed Jul. 29, 1981, Ser. No. 287,913

Claims priority, application United Kingdom, Aug. 6, 1980, 8025601

Int. Cl.<sup>3</sup> C08L 3/00, 3/04

U.S. Cl. 524—47

2 Claims

1. A plastics-based composition comprising a polyester resin and starch granules which, prior to mixing with the resin, are rendered reactive with the resin by a surface implant of alkali metal or alkaline earth metal ions.

4,420,577

# SELF-EXTINGUISHING POLYOLEFIN COMPOSITIONS

Guido Bertelli, and Renato Locatelli, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 27, 1982, Ser. No. 372,388

Claims priority, application Italy, Apr. 30, 1981, 21459 A/81

Int. Cl.<sup>3</sup> C08K 5/36, 5/46, 5/47

U.S. Cl. 524—83

3 Claims

1. Self-extinguishing polyolefinic compositions consisting of: (1) from 52 to 96.55% by weight of an olefinic polymer or copolymer; (2) from 3 to 30% by weight of a compound selected from the group consisting 1,3,5-triazines, urea and dicyandiamide; (3) from 0.3 to 3% by weight of a free-radical promoting compound selected from the group consisting of: 2,3-dimethyl-2,3-diphenyl-butane and 2,3-dimethyl-2,3-diphenyl-hexane; (4) from 0.15 to 15% by weight of a sulphur-nitrogenous compound having either one of the following two (2) general formulae:

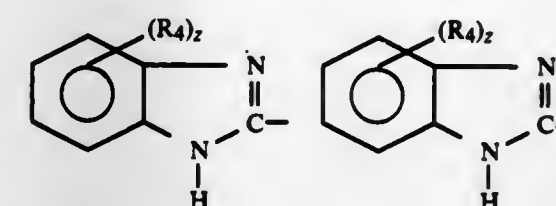
$$(R_1-S-nR_3)$$

$$R_2=S$$

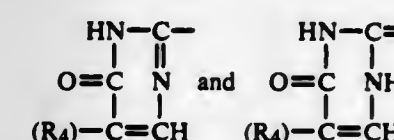
wherein:

S=sulphur atom

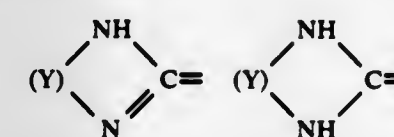
R<sub>1</sub>, R<sub>2</sub>=radicals selected from the group consisting of (a) imidazol, in which R<sub>1</sub> and R<sub>2</sub> are respectively of the formulae:



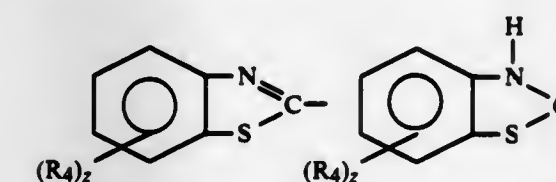
(b) uracyl, with R<sub>1</sub> and R<sub>2</sub> respectively having the formulae:



(c) alkylene urea, with R<sub>1</sub> and R<sub>2</sub> of the corresponding respective formulae:



(d) benzothiazol, with R<sub>1</sub> and R<sub>2</sub> having respectively the formulae:



R<sub>3</sub>=H, or a metal belonging to Group II (A) or (B) of the Periodic System, or aluminum;  
R<sub>4</sub>=alkyl radical containing from 1 to 4 carbon atoms, or a halogen;  
Y=an alkylene radical containing from 2 to 3 carbon atoms, or an alkylene radical containing substituent groups R<sub>4</sub>;  
n=valency of metal R<sub>3</sub>;  
z=a number comprised between 0 and 3, extremes included.

4,420,578

# SURFACE TREATMENT OF GLASS CONTAINERS

Rodger G. Hagens, Hamilton, and Dominic K. Hui, Oakville, both of Canada, assignors to Diversy Corporation, Mississauga, Canada

Continuation-in-part of Ser. No. 205,091, Nov. 10, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 302,303

Int. Cl.<sup>3</sup> C08K 5/09

U.S. Cl. 524—322

4 Claims

1. A composition for coating returnable glass bottles comprising about 0.5–50% by weight of an amino functional polydimethylsiloxane, about 5 to 49.9% by weight of an organic solvent, about 0.1 to 10% by weight of a nonionic surfactant, about 0–10% by weight of a quaternary surfactant and about 0–50% by weight of a fatty carboxylic acid having 10 to 22 carbon atoms or a mixture thereof, said composition containing

a minimum of 0.1% quaternary surfactant or a minimum of 0.1% fatty carboxylic acid or of both.

(II)

4,420,579

# ANTIOXIDANT COMPOSITIONS

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

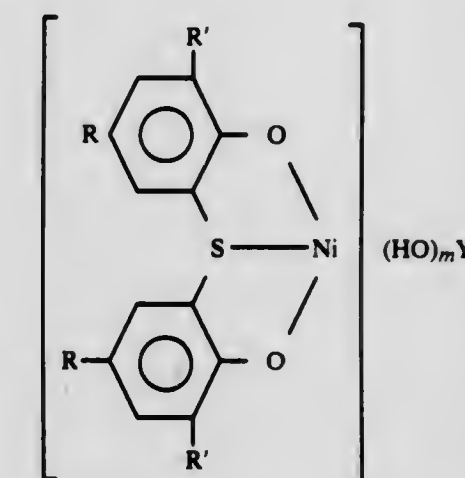
Continuation of Ser. No. 1,662, Jan. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 901,938, May 1, 1978, Pat. No. 4,198,303. This application Jan. 8, 1982, Ser. No. 338,452. The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> C08K 5/36

U.S. Cl. 524—328

2 Claims

1. A composition comprising a major proportion of a C<sub>2</sub>–C<sub>4</sub> polyolefin polymer normally susceptible to oxidative degradation and a minor amount sufficient to impart antioxidant properties and/or ultra-violet or visible light stabilization thereto of an additive mixture consisting essentially of a nickel organosulfur-containing hydroxy complex having the following general structure



where each R is hydrogen or an alkyl group having from 1 to about 30 carbon atoms, each R' is hydrogen or an alkyl group containing from 1–8 carbon atoms in any isomeric configuration except those in which a carbon atom bonded to a ring carbon atom is in turn bonded to more than two other carbon atoms, Y is an alkyl, alkylene, aralkyl, or alkylene aryl group having from 1 to about 40 carbon atoms and n is from 1 to 4 and m is from 1 to 6 with the provision that m is never less than n and a hindered phenol selected from 2,6-di-t-butyl-p-cresol, 4,4'-methylenebis-(2,6-di-t-butyl-m-cresol), 4,4'-butylidenebis-(6-t-butyl-m-cresol), 4,4'-methylenebis-(2,6-di-t-butylphenol), 2,6-di-t-butylphenol, tetrakis [methylene 3-(3',5'-di-t-butyl-4-hydroxyphenyl) propionate] methane, 4,4'-butylidenebis-(2,6-di-t-butylphenol), 2,4,6-tri-t-butyl phenol and/or an arylamine.

4,420,580

# METHOD FOR PREPARING FILLED POLYOLEFIN RESINS AND THE RESIN MADE THEREFROM

Jim T. Herman; Kenneth L. Bryce, both of Angleton, and Gerald M. Lancaster, Surfside, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 8, 1982, Ser. No. 346,806

Int. Cl.<sup>3</sup> C08K 3/20, 3/26; C08L 23/04; C08F 20/06

U.S. Cl. 524—424

12 Claims

1. A method of preparing filled polyolefin resins which consisting essentially of forming a melt of a polyolefin resin; blending into the melt an inorganic metal filler which is any polyvalent inorganic metal oxide, hydroxide or salt which reacts with the acid moiety of an ethylene-acid copolymer and a copolymer of ethylene and an alpha, beta-ethylenically unsaturated carboxylic acid; and solidifying the resultant melt blend to form a filled polyolefin resin.







convertible to a carboxyl group with at least one crosslinking agent selected from the group consisting of a polyfunctional epoxy compound containing at least two epoxy groups and a polyamine having a molecular weight of 60-5000 and represented by a general formula  $H-(NH-CH_2-CH_2-)_nNH_2$  wherein  $n$  is an integer of 1 to 110, said resin being in the form of a powder capable of passing through a 20-mesh Tyler screen and absorbing 20-500 times its own weight of distilled water.

**4,420,589**  
**POLYMER COMPOSITION INCLUDING**  
**POLYACRYLONITRILE POLYMERS AND PROCESS**  
**FOR PREPARING SAME**

Vladimir A. Stoy, 281 Jefferson Rd., Princeton, N.J. 08540  
Division of Ser. No. 166,032, Jul. 7, 1980, Pat. No. 4,379,874.  
This application Sep. 27, 1982, Ser. No. 423,731  
Int. Cl.<sup>3</sup> C08L 53/00, 33/20

U.S. Cl. 525-93

14 Claims

1. A process for producing a polymer composition which comprises:

- forming a solution of polyacrylonitrile polymer and a block copolymer with acrylonitrile and non-crystalline polymer sequences with an average number of said sequences per multiblock copolymer being equal and at least 2 in a solvent system said acrylonitrile sequence having a mean molecular weight of at least 500, said non-crystalline polymer sequence being comprised of at least about 10 units and constituting one or more highly polar units selected from the group consisting of acrylamide, N-substituted acrylamide, acrylic acid, esters of acrylic acid, salts of acrylic acid, hydrazides of acrylic acid and glutarimide; and
- separating said solvent system from said solution to form a polymer composition.

**4,420,590**  
**BACTERIOCIDAL RESINS AND DISINFECTION OF**  
**WATER THEREWITH**

William J. Gartner, Bartlett, Ill., assignor to Hallex, Inc., Streamwood, Ill.

Filed Apr. 6, 1981, Ser. No. 251,337

Int. Cl.<sup>3</sup> B01J 41/12; C08F 8/20

U.S. Cl. 525-357

4 Claims

1. A method for the preparation of polyhalide bacteriocidal resins comprising admixing a strong base anion-exchange resin having ion exchange sites with an essentially solid-free aqueous solution of elemental iodine, potassium iodide, and potassium bromide, the elemental iodine being present in proportions, by weight, substantially exceeding that of the potassium iodide, and the potassium iodide being present in proportions, by weight, substantially exceeding that of the potassium bromide, and the elemental iodine being present in proportions exceeding the sum of the amounts of the potassium iodide and the potassium bromide, the materials used in the preparation of said polyhalide bacteriocidal resin being in the ratios represented by the following:

Elemental iodine—200-230 g

KBr—10-30 g

Potassium iodide—90-120 g

H<sub>2</sub>O—40-60 g

Starting strong base anion-exchange resin—0.6 L  
whereby to produce a resin having attached to a predominant number of such sites a complex of iodine and bromine ions.

**4,420,591**  
**METHOD FOR REDUCING WALL FOULING IN VINYL**  
**CHLORIDE POLYMERIZATION**

Lawrence K. Wempe, Center Valley, and Bernard D. Bauman, Coopersburg, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 5, 1982, Ser. No. 365,117

Int. Cl.<sup>3</sup> C08F 14/06

U.S. Cl. 526-62

4 Claims

1. In a suspension polymerization process wherein a recipe comprising vinyl chloride or a mixture of vinyl chloride and another vinyl monomer, water, a suspension agent, and a monomer soluble polymerization initiator is charged to a stainless steel reactor and subsequently polymerized at an elevated temperature to produce a vinyl chloride containing polymer, the improvement for reducing wall fouling in said stainless steel reactor which comprises:

wetting the internal reactor surface with a solution comprising from about 0.0001-10% by weight of selenous acid and heating the reactor surface to a temperature of from about 40°-100° C. for a period of at least five minutes prior to charging the recipe to the reactor.

**4,420,592**  
**PROCESS FOR MULTI-STEP GASEOUS PHASE**  
**POLYMERIZATION OF OLEFINS**

Akifumi Kato, Ohtake; Junichi Yoshida, Iwakuni, and Ryotchi Yamamoto, Waki, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Oct. 8, 1981, Ser. No. 309,588

Claims priority, application Japan, Oct. 9, 1980, 55-140531  
Int. Cl.<sup>3</sup> C08F 2/34

U.S. Cl. 526-65

2 Claims

1. In a process for polymerizing an olefin in the gaseous phase in a multiplicity of steps in at least two independent polymerization zones connected to each other by a transfer passage, which comprises feeding an olefin and a catalyst into a first polymerization zone, polymerizing the olefin in the gaseous phase, intermittently or continuously withdrawing a gaseous stream containing the resulting polymer from the first zone and feeding it into said transfer passage, introducing the withdrawn polymer-containing gaseous stream into a second polymerization zone through the transfer passage, feeding the olefin or an olefin into the second zone with or without feeding an additional supply of the catalyst thereinto, and polymerizing the olefin in the gaseous phase in the second zone; the improvement wherein an inert gas zone is provided in the transfer passage, and at least a part of the gas components of the gaseous stream containing the polymer is replaced by an inert gas selected from the group consisting of saturated hydrocarbons having 1 to 5 carbon atoms and nitrogen.

**4,420,593**  
**PROCESS FOR PRODUCING  $\alpha$ -OLEFIN POLYMERS**

Akihiro Sato, Chibaken; Kazutsune Kikuta, Ichiharashi; Kenji Matsuda, Ichiharashi; Toshihiro Uwai, Ichiharashi, and Tooru Hanari, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 28, 1981, Ser. No. 306,228

Claims priority, application Japan, Sep. 29, 1980, 55-134235  
The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08F 4/66

U.S. Cl. 526-128

33 Claims

1. A process for producing  $\alpha$ -olefin polymers which comprises

- producing a material either:
  - by reducing  $TiCl_4$  with a metal of Group IIa or Group IIb of the Periodic Table, and subjecting the resulting material to milling or heat treatment to produce a solid product I, or
  - by reducing  $TiCl_4$  with either an organoaluminum

compound or a reaction product of an organoaluminum compound with an electron donor to thereby produce a solid product III, or

(c) by reducing a reaction product of  $TiCl_4$  with an electron donor with either an organoaluminum compound or the reaction product of an organoaluminum compound with an electron donor to thereby produce a solid product V,

(2) reacting solid product I or III or V with either

(a) an electron donor (C), or

(b) an electron acceptor (D), or

(c) the reaction product (G) of an electron donor (C) with an electron acceptor (D),

said reaction being carried out by milling reaction or suspension reaction, stepwise one to five times, said reaction resulting in solid product II or IV or VI respectively,

(3) in a preactivating step combining the solid product (a titanium tri-chloride containing composition) resulting from step (2) with an organoaluminum compound (E) and preactivating the resulting combination with an  $\alpha$ -olefin (F),

(4) before, during, or after the preactivation, reacting the combination in step (3) with a reaction product (H) obtained by reacting one mole of a trialkylaluminum with 0.01 to 5 mols of an electron donor, the reaction of said combination with said reaction product being carried out at a temperature of 0° to 100° C. under a pressure of 0 to 10 kg/cm<sup>2</sup>G for a period of one minute to 20 hours and the amount of said reaction product used in this reaction being 0.05 to 10 g based on 1 g of the titanium trichloride-containing composition contained in said combination; and

(5) polymerizing an  $\alpha$ -olefin or  $\alpha$ -olefins in the presence of the preactivated catalyst resulting from step (4).

**4,420,594**  
**METHOD FOR POLYMERIZING ETHYLENE**

Haruo Ueno, Chiba; Takefumi Yano, Ichihara; Michimasa Shimizu, Ichihara; Masanori Tamura, Ichihara, and Sakae Yuasa, Ichihara, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Feb. 18, 1982, Ser. No. 349,872

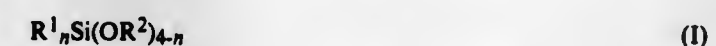
Claims priority, application Japan, Feb. 26, 1981, 56-26102  
The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C08F 4/02, 10/02

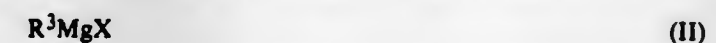
U.S. Cl. 526-128

32 Claims

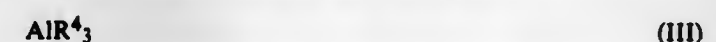
1. A method for polymerizing ethylene which comprises bringing a feed containing ethylene into contact with a catalyst comprising (A) a solid catalytic ingredient which has been prepared in such a manner that (a) a reaction product of an aluminum halide with an organic silicon compound of the formula (I):



wherein  $R^1$  represents a member selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms and a phenyl radical,  $R^2$  represents an alkyl radical having 1 to 8 carbon atoms, and  $n$  represents an integer of from 1 to 3, is reacted with a Grignard compound of the formula (II):



wherein  $R^3$  represents an alkyl radical having 1 to 8 carbon atoms and  $X$  represents a halogen atom and (b) the resultant solid reaction product is brought into contact with a titanium tetrahalide and (B) another catalytic ingredient consisting of at least one trialkyl aluminum of the formula (III):



wherein  $R^4$  represents an alkyl radical having 2 to 6 carbon atoms.

**4,420,595**  
**PROCESS FOR THE PREPARATION OF COPOLYMERS**  
**OF ETHYLENE WITH AT LEAST ONE OTHER**  
**1-ALKENE**

Georges G. Evens, Maasmechelen, Belgium, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Jul. 10, 1981, Ser. No. 282,012

Claims priority, application Netherlands, Jul. 11, 1980, 8003997; Jun. 5, 1981, 8102723

Int. Cl.<sup>3</sup> C08F 4/68, 210/18

U.S. Cl. 526-141

9 Claims

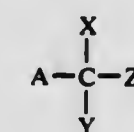
1. A process for copolymerization to form copolymers containing

from 25-85 Wt.% of ethylene units, from 15-75 Wt.% of units of at least one other 1-alkene, and up to 20% of units of aliphatic or alicyclic polyunsaturated monomer of from 3 to 20 carbon atoms and having at least two carbon-carbon double bonds

wherein the catalyst system employed contains

(I) a compound of metal from Periodic Table Groups IV-b-VIb,

(II) a compound of metal from Periodic Table Groups I-III in which at least one hydrocarbon group is bound directly to the metal atom through a carbon atom in the presence of a halogen compound of the general formula



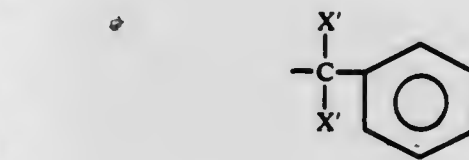
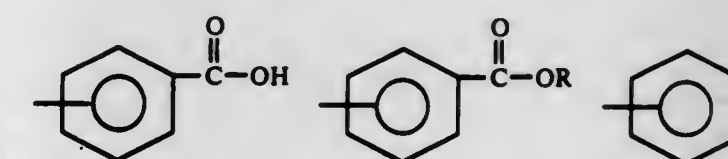
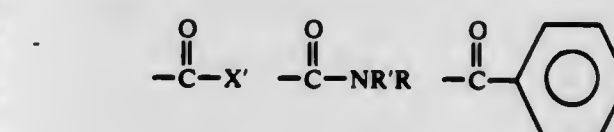
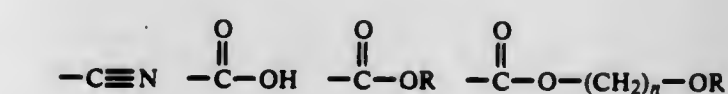
wherein

A is a phenyl or benzoyl group having from one to two substituent nitro groups,

X is a chlorine or bromine atom,

Y is a chlorine, bromine or hydrogen atom, or a hydrocarbon group of from 1 to 8 carbon atoms, and

Z is a hydrogen atom or a group of one of the following formulae, wherein R and R' represent a hydrocarbon group of 1 to 8 carbon atoms and X' is a chlorine or bromine atom:









**4,420,603**  
**CONTINUOUS, SOLVENT-FREE PROCESS FOR PREPARING THERMOPLASTIC POLYAMIDES AND POLYESTERAMIDES**

Robert G. Nelb, II, North Haven, and Richard W. Oertel, III, Guilford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 27, 1982, Ser. No. 424,419

Int. Cl.<sup>3</sup> C08G 18/32

U.S. Cl. 528—80

12 Claims

1. A continuous process for the preparation of a thermoplastic polymer characterized by the presence of a recurring amide group which process comprises the steps of:

continuously feeding an organic diisocyanate and a dicarboxylic acid in substantially stoichiometric proportions to the inlet port of a continuous reactor; continuously conveying said mixture of reactants through said reactor and increasing the temperature of said mixture incrementally from an initial temperature at which evolution of carbon dioxide first commences to a final temperature at which polymer formation is substantially complete, the rate of said incremental increase in temperature being adjusted so that the carbon dioxide which is evolved continuously during the reaction can be vented completely from a plurality of vents provided at intervals throughout the said reactor; and continuously removing the resulting polymer from said reactor via a shaping zone.

**4,420,604**  
**ADMIXTURE OF 2,4,6-TRIS(DIMETHYL AMINOMETHYL)PHENYL AS A CURING AGENT FOR AN EPOXY THREAD LOCKING COMPOSITION**

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Filed Jan. 23, 1981, Ser. No. 227,624

Int. Cl.<sup>3</sup> C08G 59/62

U.S. Cl. 528—93

12 Claims

1. A high torque, high temperature resistant thread locking mixture acting between confronting surfaces of a pair of threaded members comprising epoxy resin and a specific phenol curing agent consisting of a mixture of 2, 4, 6 - Tris (dimethylaminomethyl) phenol in approximately equal amounts by volume.

**4,420,605**  
**COATING COMPOSITIONS HAVING DUAL CURING MECHANISMS**

Marvin L. Kaufman, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 221,610, Dec. 31, 1980, abandoned.

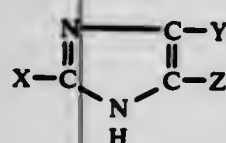
This application Aug. 26, 1982, Ser. No. 412,043

Int. Cl.<sup>3</sup> C08G 59/50, 59/64, 59/68

U.S. Cl. 528—94

21 Claims

1. A coating composition comprising:  
 (A) at least one 1,2 epoxy resin;  
 (B) a modified imidazole catalyst comprising an imidazole having the formula:



where

X is methyl, ethyl, or phenyl and Y and Z are hydrogen or methyl; said imidazole being modified by addition of a C<sub>1</sub>-C<sub>18</sub> alkyl (meth)acrylate, addition of a 1,2-monoepoxide or carbamoylation; followed by neutralization with a lower fatty acid, a lower alkylene

radical. the remaining recurring units are based on the copolymerization of at least one dibasic acid or at least one lactam with at least one primary diamine or a mixture of primary diamines and wherein R is a divalent aliphatic or aromatic hydrocarbon radical.

dicarboxylic acid, or an aromatic polycarboxylic acid; and  
 (C) a polyfunctional reactant selected from polyhydric phenols, polycarboxylic acids and dicyandiamide.

**4,420,606**  
**ONE COMPONENT WATER REDUCED EPOXY ADHESIVES**

Harold G. Waddill, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,683

Int. Cl.<sup>3</sup> C08G 59/50

U.S. Cl. 528—111

16 Claims

1. An epoxy resin composition comprising:  
 (A) a polyepoxide which has been reacted with from 50 wt % to 70 wt % of a polyoxyalkylene monoamine of molecular weight 900 to 2000; and  
 (B) a curative agent.

**4,420,607**  
**POLYESTERS OF TRANS-4,4-STILBENEDICARBOXYLIC ACID, TEREPHTHALIC ACID OR 2,6-NAPHTHALENEDICARBOXYLIC ACID, AND 1,2-PROPANEDIOL**

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1983, Ser. No. 475,567

Int. Cl.<sup>3</sup> C08G 63/18, 63/54

U.S. Cl. 528—298

5 Claims

1. A polyester comprising repeating units prepared from 100 to 60 mol % trans-4,4-stilbenedicarboxylic acid or esters thereof, repeating units prepared from 0 to 40 mol % terephthalic acid or 2,6-naphthalenedicarboxylic acid or esters thereof, and repeating units prepared from 1,2 propanediol, said polyester having an inherent viscosity of about 0.13 or more determined at 25° C. in 60/40 (wt./wt.) phenol/tetrachloroethane (PTCE) at a concentration of 0.5 g./100 mL and said polyester when injection molded into 1/4 inch flexure bars exhibits a flexural modulus of about 900,000 psi or more.

**4,420,608**  
**POLYAMIDES FROM ITACONIC ACID AND DIAMINES**

Edwin F. Morello, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 211,587, Dec. 1, 1980. This application Dec.

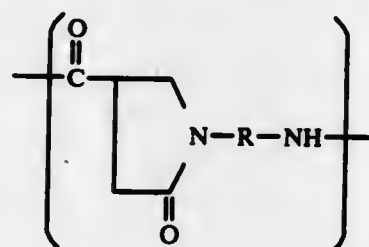
4, 1981, Ser. No. 327,605

Int. Cl.<sup>3</sup> C08G 69/14

U.S. Cl. 528—324

12 Claims

1. A solid copolyamide containing 2-75 percent of the recurring units of the following recurring structure:



**4,420,609**  
**CATALYST DEACTIVATION IN PROPYLENE POLYMERS USING AMMONIUM SALTS**

Chi-Hung Lin, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 16, 1981, Ser. No. 311,935

Int. Cl.<sup>3</sup> C08F 6/02

U.S. Cl. 528—486

7 Claims

1. A method of deactivating a polyolefin powder containing active catalyst comprising contacting said polymer powder with an inert gas containing about 4 to about 10 wt.% based on the polymer of an ammonium salt selected from the group consisting of ammonium acetate and ammonium bicarbonate in a dry state for about 10 to about 90 minutes in a fluidized bed.

**4,420,610**  
**SOLVENT EXCHANGE PROCESS FOR CARBOXYL CONTAINING POLYMER SLURRIES**

Eugene J. Sehm, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 19, 1983, Ser. No. 459,065

Int. Cl.<sup>3</sup> C08K 5/01

U.S. Cl. 528—501

16 Claims

1. A process for exchanging the solvent, having a boiling point of less than about 125° C., used as the polymerization media in the polymerization of unsaturated carboxylic acid monomers to form a slurry of the carboxylic acid polymer in the polymerization media, with a petroleum based, substantially aliphatic, hydrocarbon liquid having a boiling range of about 140° C. to about 350° C., comprising heating the slurry to distill off the polymerization media in the presence of the petroleum base liquid that is present in the slurry being heated at least before about 50 volume percent of the polymerization media has been removed by distillation, and continuing the distillation until substantially all of the polymerization media has been distilled off and replaced during the distillation with the petroleum base liquid in amounts equal to at least about one-half the volume of the polymerization media originally present in the slurry, the total amount of polymerization media and/or petroleum base liquid present in the slurry during the distillation being sufficient to maintain the polymer slurry during the exchange of the polymerization media and the petroleum base liquid, whereby a slurry of the carboxylic acid polymer in the petroleum base liquid is obtained.

**4,420,611**  
**STABILIZATION OF IRRADIATED CARBOXYMETHYL CELLULOSE**

Bernard J. Scheve, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 18, 1982, Ser. No. 359,553

Int. Cl.<sup>3</sup> C08B 11/20

U.S. Cl. 536—88

10 Claims

1. A process for the treatment of irradiated carboxymethyl cellulose which consisting essentially of heat treating irradiated carboxymethyl cellulose at a temperature from about 50° C. to about 150° C. for a time sufficient to effect stabilization.

**4,420,612**  
**CATALYST MEMBRANE**

Seiichi Aiba; Kazuhisa Hiratani, both of Yatabe, and Tsutomu Nakagawa, Musashino, all of Japan, assignors to Director General of Agency of Industrial Science & Technology, Tokyo, Japan

Division of Ser. No. 339,741, Jan. 15, 1982, abandoned. This

application Feb. 28, 1983, Ser. No. 470,640

Claims priority, application Japan, Jan. 19, 1981, 56-6072

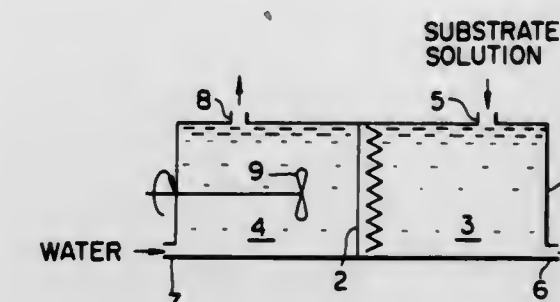
Int. Cl.<sup>3</sup> C08B 31/00

U.S. Cl. 536—102

7 Claims

1. A method of hydrolyzing an acid-catalyzable, water soluble organic substance, comprising contacting a solution containing said substance with a catalyst membrane which com-

prises a porous polytetrafluoroethylene membrane having grafted thereon polystyrenesulfonic acid, wherein said porous



polytetrafluoroethylene membrane has a thickness of 30 to 200 u and an average pore size diameter of 0.1 to 1.2 u.

**4,420,613**  
**DIHYDROBENZOTHAZINE COMPOUNDS AND THE PREPARATION THEREOF**

Paul Uhrhan, Odenthal; Edmund Krauthausen, Cologne; Kurt Rainer Stahlke, Kuerten; Gerwolf Quass, Cologne, and Lothar Ruetz, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 17, 1982, Ser. No. 358,891

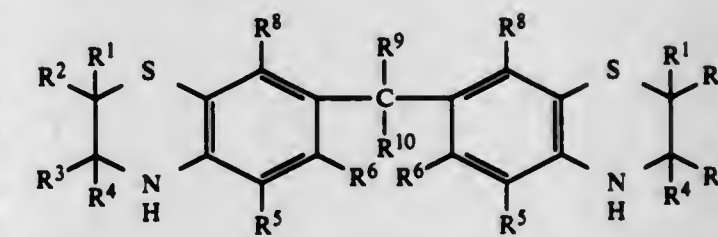
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111513

Int. Cl.<sup>3</sup> C07D 279/16, 417/06, 417/14

U.S. Cl. 544—51

7 Claims

1. A compound of the formula



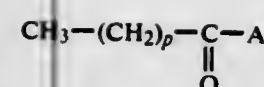
wherein

R<sup>1</sup> and R<sup>2</sup>, which may be the same or different, each represents hydrogen, lower alkyl containing from 1 to 4 carbon atoms, cycloalkyl containing from 5 to 8 carbon atoms, aralkyl containing from 7 to 11 carbon atoms or carbocyclic aryl having 6 carbon atoms or together represent a radical —(CH<sub>2</sub>)<sub>m</sub>— wherein m represents an integer of from 4 to 7;

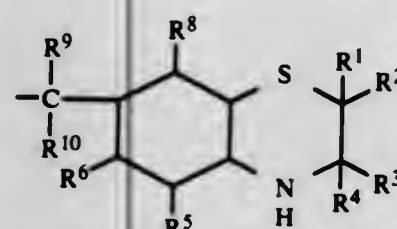
R<sup>3</sup> and R<sup>4</sup> which may be the same or different, each represents lower alkyl containing from 1 to 4 carbon atoms, cyclohexyl, aralkyl containing from 7 to 11 carbon atoms or carbocyclic aryl having 6 carbon atoms or together represent a radical —(CH<sub>2</sub>)<sub>n</sub>— wherein n represents an integer of from 4 to 7, or one of the radicals R<sup>3</sup> or R<sup>4</sup> together with R<sup>1</sup> or R<sup>2</sup> represents an alkylene radical containing from 3 to 6 carbon atoms;

R<sup>6</sup> and R<sup>8</sup>, which may be the same or different, each represents hydrogen, halogen, nitro, linear or branched alkyl containing from 1 to 12 carbon atoms, linear or branched alkenyl containing from 2 to 12 carbon atoms, aralkyl containing from 7 to 11 carbon atoms, cycloalkyl containing from 5 to 8 carbon atoms, and the radicals R<sup>5</sup> are the same or different and represent hydrogen, halogen, nitro, linear or branched alkyl containing from 1 to 12 carbon atoms, linear or branched alkenyl containing from 2 to 12 carbon atoms, cycloalkyl containing from 5 to 8 carbon atoms, aralkyl containing from 7 to 11 carbon atoms, alkoxy, the radical





wherein  
p represents an integer of from 0 to 20, preferably from 8 to 16, and  
A represents  $-(\text{CH}_2)_q-$ ,  $-\text{O}-(\text{CH}_2)_q-$ ,  $-\text{NH}-(\text{CH}_2)_q-$  or  $-\text{S}-(\text{CH}_2)_q-$   
q=0 to 4, preferably 0 or 1, or the radical



wherein  
R<sup>1</sup> to R<sup>6</sup> and R<sup>8</sup> are as defined above, while R<sup>9</sup> and R<sup>10</sup> represent the radicals defined below, and R<sup>7</sup> and R<sup>10</sup> independently represent hydrogen, carbocyclic aryl having 6 carbon atoms, linear or branched alkyl containing from 1 to 12 carbon atoms, cycloalkyl or cycloalkenyl containing from 5 to 8 carbon atoms or R<sup>9</sup> and R<sup>10</sup> together with the carbon atoms to which they are attached complete a cycloalkyl radical containing from 5 to 7 carbon atoms.

## 4,420,614

## CYANOPHENOXYPHENYL AMINES

Colin Wilshire, Doncaster East, and Rene Jongen, Parkville, both of Australia, assignors to ICI Australia Limited, Victoria, Australia

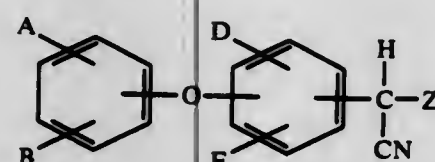
Filed Sep. 8, 1981, Ser. No. 300,191

Claims priority, application Australia, Oct. 3, 1980, PE5871

Int. Cl.<sup>3</sup> C07D 295/14, 207/16; C07C 121/78

U.S. Cl. 544-163

1. A compound of formula I



wherein:

A, B, D and E are independently chosen from the group consisting of hydrogen, halogen, C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> haloalkyl and C<sub>1</sub> to C<sub>6</sub> alkoxy; and Z is chosen from NR<sup>1</sup>R<sup>2</sup> and N<sup>+</sup>R<sup>1</sup>R<sup>2</sup>R<sup>3</sup>X<sup>-</sup> wherein:

R<sup>1</sup> and R<sup>2</sup> are independently chosen from the group consisting of C<sub>1</sub> to C<sub>6</sub> alkyl, phenyl, benzyl, and the groups phenyl and benzyl wherein in each group the phenyl ring is substituted with from one to three substituents chosen from the group consisting of halogen, nitro, cyano, hydroxy, C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> alkoxy and C<sub>1</sub> to C<sub>6</sub> haloalkyl, or R<sup>1</sup> and R<sup>2</sup> are linked to form a heterocyclic ring chosen from the group consisting of 1-pyrrolyl, 1-imidazolyl, 1-pyrrolidinyl, 1-pyrrolinyl, 1-imidazolyl, piperidino, 1-piperazinyl and morpholino;

R<sup>3</sup> is chosen from the group consisting of C<sub>1</sub> to C<sub>6</sub> alkyl, phenyl, benzyl, and the groups phenyl and benzyl wherein in each group the phenyl ring is substituted with from one to three substituents chosen from the group consisting of halogen, nitro, cyano, hydroxy, C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> alkoxy and C<sub>1</sub> to C<sub>6</sub> haloalkyl, or N<sup>+</sup>R<sup>1</sup>R<sup>2</sup>R<sup>3</sup> is a pyridinium, pyrazinium, pyrimidinium or pyridazinium ring; and

X<sup>-</sup> is the anion of an organic or an inorganic acid.

## 4,420,615

## SUBSTITUTED PYRIDOPYRIMIDINES AS GASTRIC SECRETION INHIBITORS

William A. Bolhofer, Frederick; Edward J. Cragoe, Lansdale, and Jacob M. Hoffman, Jr., North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

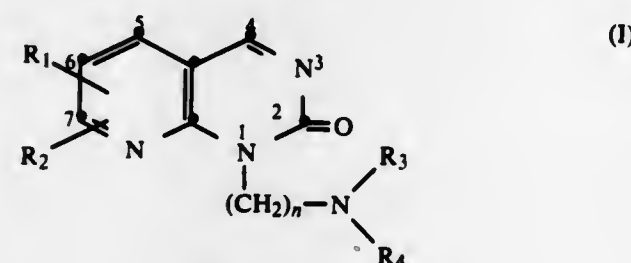
Filed Aug. 24, 1981, Ser. No. 295,930

Int. Cl.<sup>3</sup> C07D 471/14; A61K 31/495

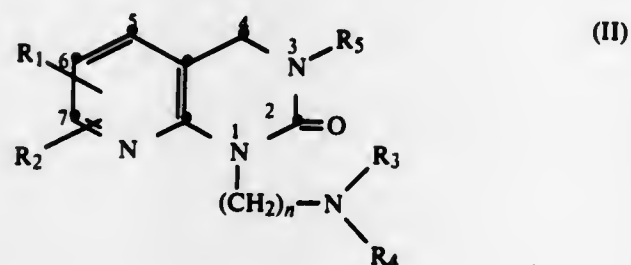
U.S. Cl. 544-279

1. Compounds having the formulae:

8 Claims



and



wherein:

R<sub>1</sub> and R<sub>2</sub> are independently hydrogen, haloloweralkyl, loweralkyl, loweralkoxy;

R<sub>3</sub> and R<sub>4</sub> are independently hydrogen, loweralkyl, cyclo-loweralkyl, or R<sub>3</sub> and R<sub>4</sub> may be joined, together with the nitrogen to which they are attached to form a piperazine ring or an N-loweralkyl piperazine ring;

R<sub>5</sub> is hydrogen or lower alkyl;

n is 2-5; and,

I the physiologically acceptable salts thereof.

## 4,420,616

## OXIDATIVE PROCESS FOR THE PREPARATION OF COPPER QUINOLINATE

Seishi Ikegami, Yao, and Yoshihiro Hatano, Osaka, both of Japan, assignors to Yamamoto Kagaku Gosei Co., Ltd., Osaka, Japan

Filed Feb. 20, 1981, Ser. No. 236,945

Claims priority, application Japan, Feb. 25, 1980, 55-21623

Int. Cl.<sup>3</sup> C07D 213/87

U.S. Cl. 546-5

3 Claims

1. A process for the preparation of copper quinolate by oxidizing quinoline with hydrogen peroxide in a mixture of water and sulfuric acid in the presence of copper sulfate at a temperature of 55°-75° C. and isolating copper quinolate from the reaction media, wherein the molar ratio of sulfuric acid to quinoline is greater than 1 to 1, the molar ratio of hydrogen peroxide to quinoline is 10.8 to 1 or greater, the concentration of sulfuric acid is from about 10 to about 30% in said mixture, the oxidation reaction is carried out under a pressure of less than 400 mm Hg and said process is performed by adding copper oxide, quinoline and hydrogen peroxide to the reaction media left after isolation of copper quinolate prepared according to a previous run of the process.

## 4,420,617

## 5-PYRIDINYL-PYRIDIN-2-AMINES

George Y. Leshar; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

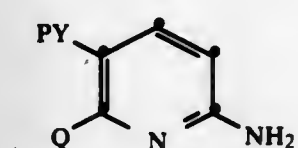
Continuation-in-part of Ser. No. 307,778, Oct. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 135,100, Mar. 28, 1980, Pat. No. 4,297,360. This application Jul. 6, 1982, Ser. No. 395,737

Int. Cl.<sup>3</sup> C07D 401/04

U.S. Cl. 546-257

5 Claims

1. A 5-PY-6-Q-pyridin-2-amine having the formula



or pharmaceutically acceptable acid-addition salt thereof, where Q is hydrogen or lower-alkyl, and PY is 4-pyridinyl or 4-pyridinyl having one or two lower-alkyl substituents.

## 4,420,618

## PROCESS FOR PRODUCING

## 5-CHLORO-β-TRIFLUOROMETHYLPYRIDINES

Isao Yokomichi, Morioka; Takahiro Haga, Kusatsu; Rikuo Nasu, Kyoto; Kuniki Nagatani, and Toshio Nakajima, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Continuation of Ser. No. 237,481, Feb. 23, 1981, abandoned.

This application Jul. 26, 1982, Ser. No. 401,744

Claims priority, application Japan, Mar. 7, 1980, 55-28826

Int. Cl.<sup>3</sup> C07D 213/26, 213/61

U.S. Cl. 546-345

9 Claims

1. A process for producing 5,6-dichloro-β-trifluoromethylpyridine or 2,5,6-trichloro-β-trifluoromethylpyridine which comprises reacting 6-chloro-β-trifluoromethylpyridine or 2,6-dichloro-β-trifluoromethylpyridine with chlorine gas to chlorinate the 5-position of the pyridine nucleus thereof:

(1) at a temperature of 100° C. to 250° C. and at least sufficient amount of chlorine for the reaction;

(2) in the presence of a catalyst of amount of at least 40% by weight (based on the 6-chloro or/and 2,6-dichloro-β-trifluoromethylpyridine), the catalyst being chlorides of a metallic element selected from the group consisting of iron, tungsten, molybdenum, titanium, and antimony.

## 4,420,619

## IMIDAZOLE UREA AND AMIDO COMPOUNDS

Adrian Marxer, Muttens, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 14,661, Feb. 23, 1979, Pat. No. 4,292,429.

This application Mar. 25, 1981, Ser. No. 247,427

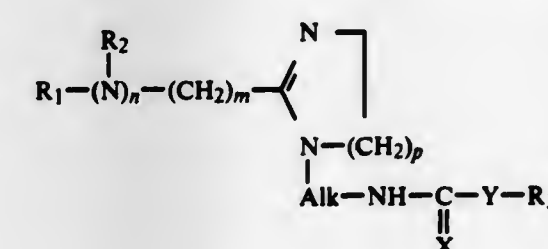
Claims priority, application Switzerland, Mar. 8, 1978, 2519/78

Int. Cl.<sup>3</sup> A61K 31/415; C07D 233/20, 233/50, 233/06

U.S. Cl. 548-352

5 Claims

1. An urea or amido compound of formula



in which R<sub>1</sub> is phenyl or phenyl substituted by a group selected from halogen, lower alkyl, lower alkoxy and R<sub>3</sub> is phenyl or phenyl substituted by a group selected from halogen, lower alkyl, lower alkoxy, lower alkoxy-carbonyl, carboxyl or trifluoro-

romethyl, R<sub>2</sub> is hydrogen or lower alkyl, n is 0 to 1, m is 0 or 1, p is 1, Alk is a lower alkylene radical with 2-3 carbon atoms in the linear chain X is oxygen or sulphur, and Y the imino group or a direct bond, or therapeutically acceptable salts thereof.

## 4,420,620

## PREPARATION OF 2-PYRROLIDONES

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

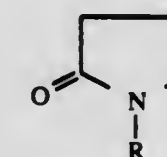
Filed Nov. 27, 1981, Ser. No. 325,449

Int. Cl.<sup>3</sup> C07D 201/08

U.S. Cl. 548-554

7 Claims

1. A process for preparing an unsubstituted or N-substituted pyrrolidone having the structure:



wherein R is H, a lower alkyl, or a lower hydroxyalkyl which comprises the step of reacting methyl 4-oxobutylate with a compound having the formula



wherein R is as previously defined, and hydrogen in the presence of a catalytically effective amount of a hydrogenation catalyst selected from the group consisting of palladium, platinum, nickel and ruthenium and alloys and compounds of the foregoing at a temperature of from 80° to 200° C. and a partial pressure of hydrogen of from 250 to 2,000 psig for from about 15 minutes to about 24 hours thus forming said unsubstituted or N-substituted pyrrolidone and methanol by-product.

## 4,420,621

## PREPARATION OF POLYCARBOXYLIC COMPOUNDS

Eddie N. Gutierrez, Fort Lee, and Vincent Lambert, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

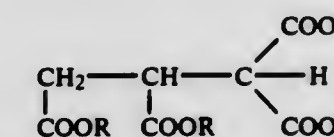
Continuation of Ser. No. 47,859, Jun. 12, 1979, abandoned, which is a continuation of Ser. No. 905,308, May 12, 1978, abandoned, which is a division of Ser. No. 642,804, Dec. 22, 1975, Pat. No. 4,123,459. This application Dec. 17, 1980, Ser. No. 217,347

Int. Cl.<sup>3</sup> C07D 307/32; C07C 51/38

U.S. Cl. 549-322

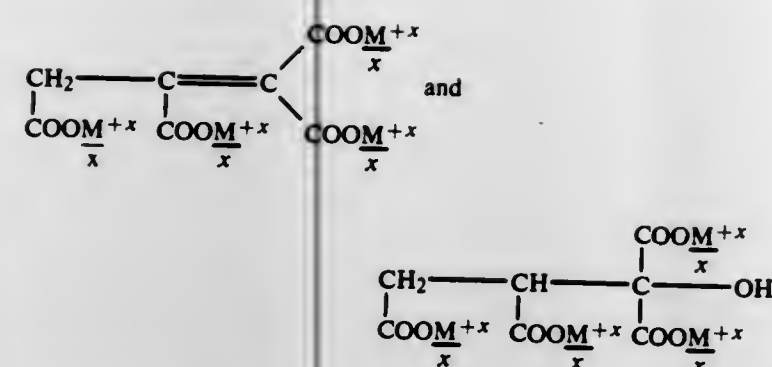
5 Claims

1. A process for preparing a mixture of aconitic acid and lactones of isocitric acid and allosictric acid comprising chlorinating a compound of the formula



wherein R independently represents a lower primary alkyl group of 1 to 4 carbon atoms in an aqueous medium with hypochlorous acid to form a chlorinated tetraester; dehydrohalogenating and saponifying said chlorinated tetraester in an aqueous medium with M/x<sup>+</sup>OH<sup>-</sup>, wherein M represents a lithium, sodium, potassium calcium, strontium or barium cation and x represents 1 or 2 and is equivalent to the valency of M, to form an aqueous mixture of propene and hydroxy propane compounds of the formulas





acidifying said aqueous mixture with a mineral acid to a pH of less than 2 to form said acetic acid and said lactones.

4,420,622

### PROCESS FOR THE PREPARATION OF A 5-ALKYL-BUTYROLACTONE

Cornelis G. M. van de Moedijk, Elstoo, and Petrus H. J. Janssen, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

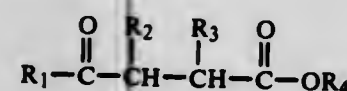
Filed May 21, 1982, Ser. No. 380,757

Claims priority, application Netherlands, Jul. 2, 1981, 8103173

Int. Cl.<sup>3</sup> C07D 307/32

U.S. Cl. 549—326

1. A process for the preparation of a 5-alkyl-butyrolactone compound comprising reacting a keto-ester of the formula



wherein R<sub>1</sub> represents an alkyl group of 1-4 carbon atoms, R<sub>2</sub> and R<sub>3</sub> each independently represent hydrogen or an alkyl group of 1-4 carbon atoms and R<sub>4</sub> represents a hydrogen group having at most 8 carbon atoms, with hydrogen at a temperature of 150°-325° C., in the gas phase and in the presence of a solid particulate hydrogenation catalyst, containing a metal or a compound of a metal from Group VIII or Group Ib of the Periodic Table, and recovering from the reaction mixture obtained a 5-alkyl-butyrolactone which has the general formula



where R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> have the meaning indicated above.

4,420,623

### PROCESS AND INTERMEDIATES FOR PREPARING 6-METHYLSPECTINOMYCIN AND ANALOGS THEREOF

David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 285,165, Jul. 20, 1981, Pat. No. 4,380,652.

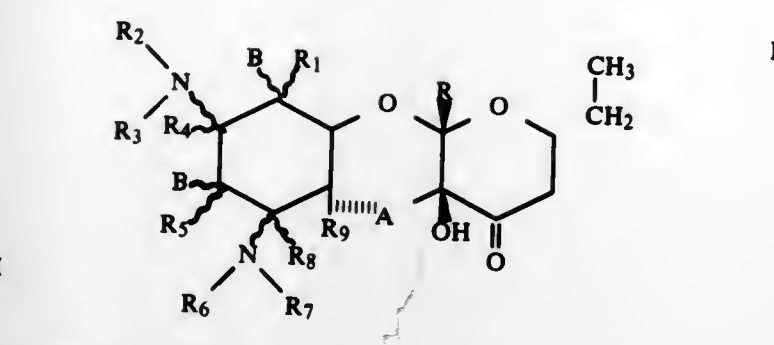
This application Mar. 17, 1982, Ser. No. 358,957

Int. Cl.<sup>3</sup> C07D 319/20, 327/06

U.S. Cl. 549—361

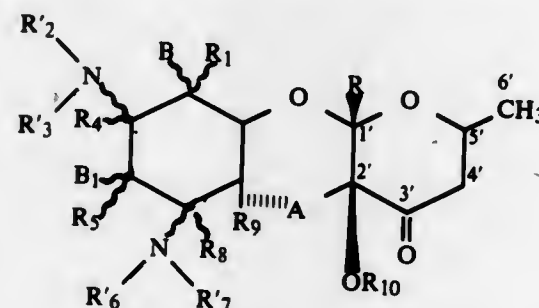
3 Claims

1. A process for preparing a compound having the formula

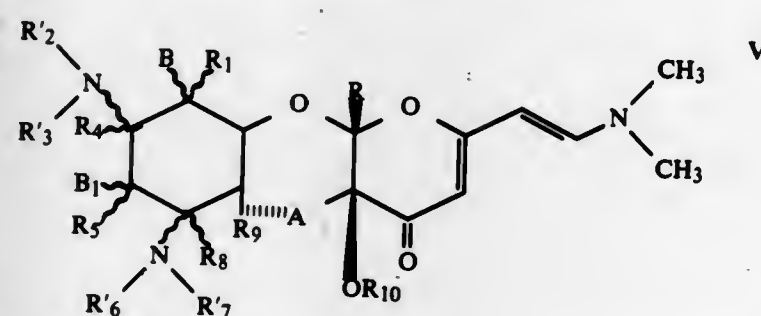


which comprises

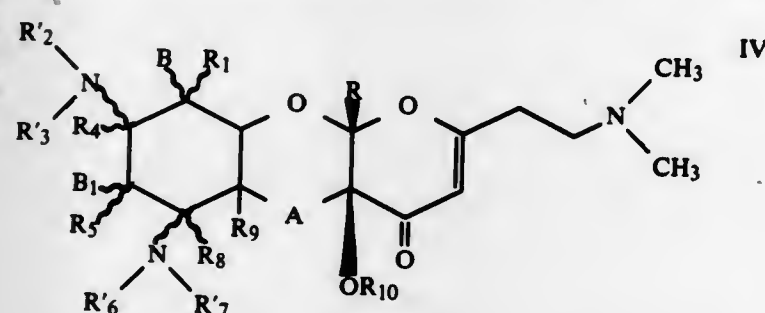
(a) reacting a compound having the formula



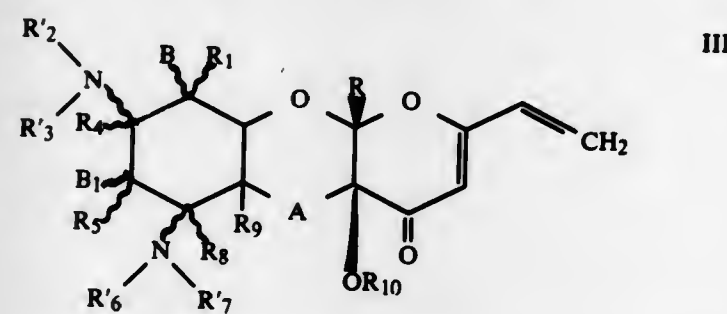
with dimethylformamide dimethylacetal to obtain a compound having the formula



(b) reacting the compound of formula V with sodium cyanoborohydride to obtain a compound having the formula



(c) reacting the compound of formula IV with methyl iodide to obtain a compound having the formula



(d) reducing the compound of formula III with hydrogen in the presence of a platinum catalyst to obtain a compound having the formula

4,420,625

### ALKYLENE OXIDES PRODUCED BY DIRECT OXIDATION OF OLEFINS OVER TRANSITION METAL BORATES IN THE PRESENCE OF A NON-POLAR, AROMATIC ORGANIC SOLVENT

John R. Sanderson; Walter H. Brader, Jr., and Lewis W. Watts, Jr., all of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

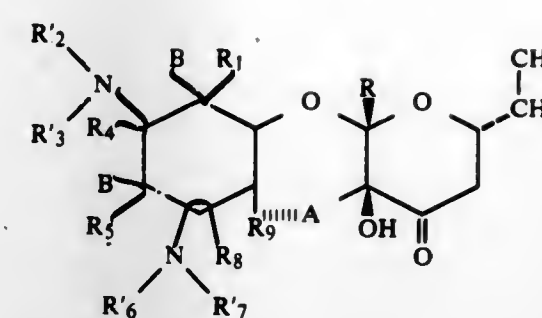
Filed Sep. 23, 1982, Ser. No. 421,925

Int. Cl.<sup>3</sup> C07D 301/06

U.S. Cl. 549—533

16 Claims

1. A process for the production of alkylene oxides comprising reacting an olefin or a mixture of olefins with oxygen in the presence of a transition metal borate catalyst and a non-polar, aromatic organic solvent.



and

(e) deprotecting the compound of formula II to obtain I, wherein R is hydrogen or alkyl and R<sub>1</sub> through R<sub>9</sub> are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkynyl with the proviso that one of R<sub>2</sub> and R<sub>3</sub> is always hydrogen and one of R<sub>6</sub> and R<sub>7</sub> is always hydrogen, and B and B<sub>1</sub> are the same or different and are selected from the group consisting of hydrogen, hydroxy, alkoxy, o-lower alkenyl, thio, thio lower alkyl and thio-lower alkenyl; and A is selected from the group consisting of oxygen and sulfur; R<sub>2</sub>, R<sub>3</sub>, R<sub>6</sub> and R<sub>7</sub> are selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, and a blocking group selected from the group consisting of aralkoxycarbonyl, halogenated-alkoxycarbonyl and alkoxycarbonyl; with the proviso that that one of R<sub>2</sub> and R<sub>3</sub> is always a blocking group and one of R<sub>6</sub> and R<sub>7</sub> is always a blocking group; and R<sub>10</sub> is acyl.

4,420,626

### DIOXATRICYCLIC PROSTACYCLIN ANALOGS

Martin F. Haslanger, Lambertville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 305,663, Sep. 25, 1981, Pat. No. 4,360,685.

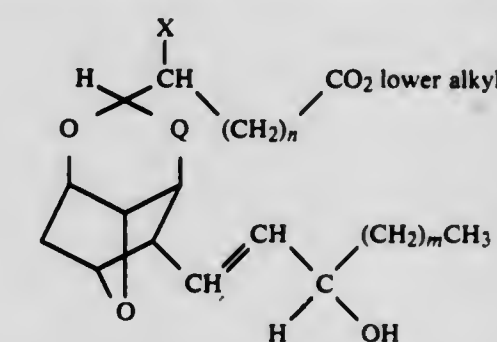
This application Jun. 28, 1982, Ser. No. 393,207

Int. Cl.<sup>3</sup> C07D 311/78, 307/93

U.S. Cl. 549—386

7 Claims

1. A prostacyclin analog intermediate having the structure



including all stereoisomers thereof; wherein Q is a single bond or —CH<sub>2</sub>—, X is Br or I, m is 1 to 9, and n is 3 or 4.

4,420,624

### PROCESS FOR PREPARING SPECTINOMYCIN ANALOGS

David R. White, and Richard C. Thomas, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 150,530, May 16, 1980, Pat. No. 4,351,771.

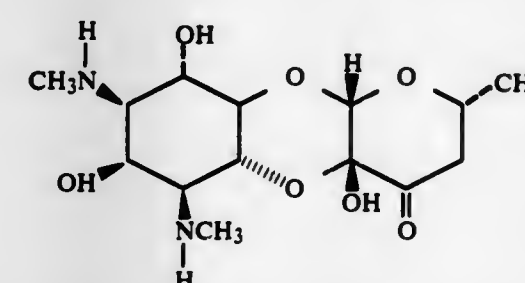
This application Mar. 17, 1982, Ser. No. 359,006

Int. Cl.<sup>3</sup> C07D 327/06, 327/08, 323/04, 319/20

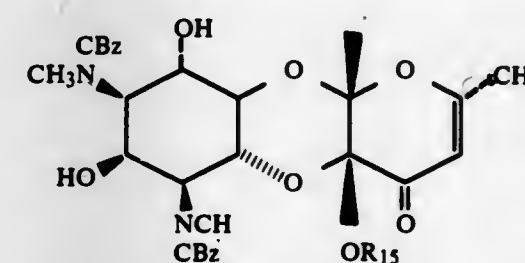
U.S. Cl. 549—361

4 Claims

1. A process for preparing a compound having the formula



which comprises reacting a compound having the formula



with hydrogen in the presence of a base wherein R<sub>15</sub> is acyl or hydrogen and CBz is carbobenzyloxy.

4,420,627

### HYDRAZINE DYES

Gary N. Widiger, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

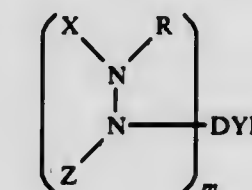
Filed Dec. 18, 1981, Ser. No. 332,020

Int. Cl.<sup>3</sup> G03C 1/40

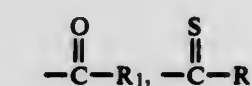
U.S. Cl. 549—394

2 Claims

1. A compound represented by the formula

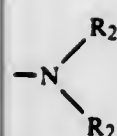


wherein X is



or —SO<sub>2</sub>R<sub>1</sub>; Z is H, alkyl or aryl; R is H, alkyl or aryl provided that Z and R are not both H; DYE is a xanthene dye moiety; R<sub>1</sub> is H, alkyl, aryl, —NH<sub>2</sub>, NHR<sub>2</sub>,





or OR<sub>2</sub>; R<sub>2</sub> is H, alkyl or aryl; and m is 1 or 2.

4,420,628

### PROCESS FOR PREPARING THREO-2-HYDROXY-3-(4-METHOXYPHENYL)-3-(2-NITROPHENYLTHIO)-PROPIONIC ESTER

Hirozumi Inoue, Oizumi-Gakuen, and Tomiki Hashiyama, Ageo, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

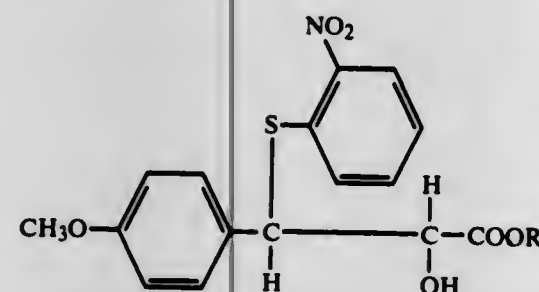
Filed Feb. 8, 1982, Ser. No. 346,922

Claims priority, application Japan, Feb. 27, 1981, 56-28779; May 22, 1981, 56-78317

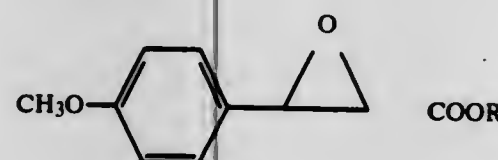
Int. Cl.<sup>3</sup> C07C 149/40

U.S. Cl. 560—17

1. A method for preparing a threo-2-hydroxy-3-(4-methoxyphenyl)-3-(2-nitrophenylthio)propionic ester of the formula:



wherein R is an ester residue, which comprises condensing a trans-3-(4-methoxyphenyl)glycidic ester of the formula:



wherein R is the same as defined above, with 2-nitrothiophenol in the presence of a Lewis acid selected from the group consisting of boron trifluoride, stannous halide, stannic halide, zinc halide, ferrous halide, ferric halide, cuprous halide, cupric halide, antimony trihalide, antimony pentahalide, cadmium halide, nickel halide, stannous alkanoate, stannic alkanoate, zinc alkanoate, zinc salicylate, zinc oxalate, sulfuric acid, perhalogenic acid, alkanoic acid, aromatic carboxylic acid, sulfonic acid, phosphoric acid and polyphosphoric acid.

4,420,629

### METHOD OF PREPARING 3-ALKYL-6-METHYL-β-RESORCYLIC ACID ESTERS

Hans-Georg Schmidt, Nieder-kassel-Ranzel, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

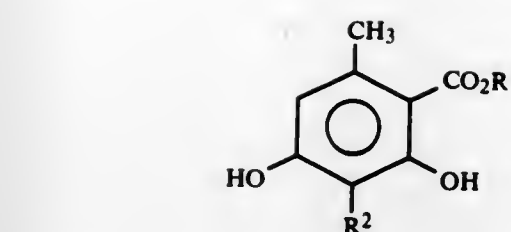
Filed Sep. 10, 1982, Ser. No. 416,733

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136720

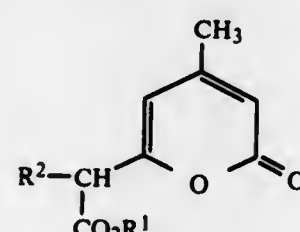
Int. Cl.<sup>3</sup> C07C 69/88

U.S. Cl. 560—70

1. Process of preparing 3-alkyl-6-methyl-β-resorcylic acid esters of the formula



wherein R<sup>1</sup> and R<sup>2</sup> are individually select from alkyl groups from 1 to 10 carbon atoms which process comprises reacting an alpha-pyrone of the formula



wherein R<sup>1</sup> and R<sup>2</sup> are identified as above with a base, to result in the desired ester compound.

4,420,630

### POLYMERIZABLE VINYL BENZOATES

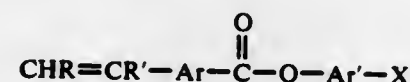
Paul D. Yacobucci, and John C. Wilson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,548

Int. Cl.<sup>3</sup> C07C 69/76

U.S. Cl. 560—104

1. A compound having the formula:



wherein:

R and R' are independently selected from the group consisting of H, halide and alkyl;  
Ar and Ar' are independently arylene;  
X is selected from the group consisting of NHSO<sub>2</sub>R<sup>2</sup>, CH<sub>2</sub>NHSO<sub>2</sub>R<sup>2</sup> and SO<sub>2</sub>NHR<sup>2</sup>; and  
R<sup>2</sup> is selected from the group consisting of alkyl, aryl and aralkyl.

4,420,631

### ESTERS OF THE CARBOXYLIC ACID

Takehiro Amano, Urawa; Toshihisa Ogawa, Ageo; Kensei Yoshikawa, Kitamoto; Yoshinori Shiobara, Ohmiya; Tatsuhiko Sano, Ohmiya; Yutaka Ohuchi, Ohmiya; Tohru Tanami, Tokyo; Shoichi Ito, Tokyo, and Jiro Sawada, Tokyo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

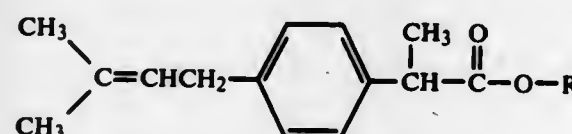
Filed May 19, 1982, Ser. No. 379,632

Int. Cl.<sup>3</sup> C07L 69/76

U.S. Cl. 560—104

5 Claims

1. A carboxylic acid ester having the following general formula



wherein R is alkoxyalkyl having 2 to 6 carbon atoms, cycloalkyl having 5 or 6 carbon atoms, tetrahydrofurfuryl, alkyl having 1 to 6 carbon atoms or said alkyl substituted with 1 or 2 hydroxy groups.

4,420,632

### COMPOSITION AND PROCESS

Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

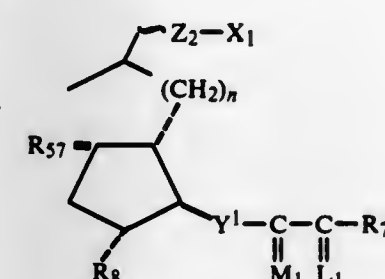
Continuation-in-part of Ser. No. 140,547, Apr. 15, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 219,175

Int. Cl.<sup>3</sup> C07C 177/00, 57/26

U.S. Cl. 560—119

6 Claims

1. A carbacyclin analog of formula X:



wherein n is one or 2;

wherein L<sub>1</sub> is α-R<sub>3</sub>:β-R<sub>4</sub>, α-R<sub>4</sub>:β-R<sub>3</sub>, or a mixture of α-R<sub>3</sub>:β-R<sub>4</sub> and α-R<sub>4</sub>:β-R<sub>3</sub>, wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R<sub>3</sub> and R<sub>4</sub> is fluoro only when the other is hydrogen or fluoro;

wherein M<sub>1</sub> is α-OH:β-R<sub>5</sub> or α-R<sub>5</sub>:β-OH, wherein R<sub>5</sub> is hydrogen or methyl;

wherein R<sub>7</sub> is

- (1) —C<sub>m</sub>H<sub>2m</sub>—CH<sub>3</sub>, wherein m is an integer from one to 5, inclusive,
- (2) phenoxy optionally substituted by one, two or three chloro, fluoro, trifluoromethyl, (C<sub>1</sub>-C<sub>3</sub>)alkyl, or (C<sub>1</sub>-C<sub>3</sub>)alkoxy, with the proviso that not more than two substituents are other than alkyl, with the proviso that R<sub>7</sub> is phenoxy or substituted phenoxy, only when R<sub>3</sub> and R<sub>4</sub> are hydrogen or methyl, being the same or different,
- (3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, two or three chloro, fluoro, trifluoromethyl, (C<sub>1</sub>-C<sub>3</sub>)alkyl, or (C<sub>1</sub>-C<sub>3</sub>)alkoxy, with the proviso that not more than two substituents are other than alkyl,
- (4) cis—CH=CH—CH<sub>2</sub>—CH<sub>3</sub>,
- (5) —(CH<sub>2</sub>)<sub>2</sub>—CH(OH)—CH<sub>3</sub>, or
- (6) —(CH<sub>2</sub>)<sub>3</sub>—CH=C(CH<sub>3</sub>)<sub>2</sub>;

wherein —C(L<sub>1</sub>)—R<sub>7</sub> taken together is

- (1) (C<sub>4</sub>-C<sub>7</sub>)cycloalkyl optionally substituted by one to 3 (C<sub>1</sub>-C<sub>3</sub>)alkyl;
- (2) 2-(2-furyl)ethyl,
- (3) 2-(3-thienyl)ethoxy, or
- (4) 3-thienyloxymethyl;

wherein R<sub>8</sub> is hydroxy, hydroxymethyl, or hydrogen;

wherein R<sub>57</sub> is (C<sub>1</sub>-C<sub>4</sub>)alkyl;

wherein X<sub>1</sub> is

- (1) —COOR<sub>1</sub>, wherein R<sub>1</sub> is
  - (a) hydrogen,
  - (b) (C<sub>1</sub>-C<sub>12</sub>)alkyl,
  - (c) (C<sub>3</sub>-C<sub>10</sub>)cycloalkyl,
  - (d) (C<sub>7</sub>-C<sub>12</sub>)aralkyl,
  - (e) phenyl, optionally substituted with one, 2 or 3 chloro or (C<sub>1</sub>-C<sub>3</sub>)alkyl,
- (f) phenyl substituted in the para position by
  - (i) —NH—CO—R<sub>25</sub>,
  - (ii) —CO—R<sub>26</sub>,
  - (iii) —O—CO—R<sub>54</sub>, or
  - (iv) —CH=N—NH—CO—NH<sub>2</sub> wherein R<sub>25</sub> is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —N<sub>2</sub>; R<sub>26</sub> is methyl, phenyl, —NH<sub>2</sub>, or methoxy; and R<sub>54</sub> is phenyl or acetamidophenyl; inclusive, or
- (g) a pharmacologically acceptable cation;
  - (2) —CH<sub>2</sub>OH,
  - (3) —COL<sub>4</sub>, wherein L<sub>4</sub> is

(a) amino of the formula —NR<sub>51</sub>R<sub>52</sub>, wherein R<sub>51</sub> and R<sub>52</sub> are

- (i) hydrogen,
- (ii) (C<sub>1</sub>-C<sub>12</sub>)alkyl,
- (iii) (C<sub>3</sub>-C<sub>10</sub>)cycloalkyl,
- (iv) (C<sub>7</sub>-C<sub>12</sub>)aralkyl,
- (v) phenyl, optionally substituted with one, 2 or 3 chloro, (C<sub>1</sub>-C<sub>3</sub>)alkyl, hydroxy, carboxy, (C<sub>2</sub>-C<sub>5</sub>)alkoxycarbonyl, or nitro,
- (vi) (C<sub>2</sub>-C<sub>5</sub>)carboxyalkyl,
- (vii) (C<sub>2</sub>-C<sub>5</sub>)carbamoylalkyl,
- (viii) (C<sub>2</sub>-C<sub>5</sub>)cyanoalkyl,
- (ix) (C<sub>3</sub>-C<sub>6</sub>)acetylalkyl,
- (x) (C<sub>7</sub>-C<sub>11</sub>)benzoalkyl, optionally substituted by one, 2 or 3 chloro, (C<sub>1</sub>-C<sub>3</sub>)alkyl, hydroxy, (C<sub>1</sub>-C<sub>3</sub>)alkoxy, carboxy, (C<sub>2</sub>-C<sub>5</sub>)alkoxycarbonyl, or nitro,
- (xi) pyridyl, optionally substituted by one, 2 or 3 chloro, (C<sub>1</sub>-C<sub>3</sub>)alkyl, or (C<sub>1</sub>-C<sub>3</sub>)alkoxy,
- (xii) (C<sub>6</sub>-C<sub>9</sub>)pyridylalkyl optionally substituted by one, 2 or 3 chloro, (C<sub>1</sub>-C<sub>3</sub>)alkyl, hydroxy, or (C<sub>1</sub>-C<sub>3</sub>)alkyl,
- (xiii) (C<sub>1</sub>-C<sub>4</sub>)hydroxyalkyl,
- (xiv) (C<sub>1</sub>-C<sub>4</sub>)dihydroxyalkyl,
- (xv) (C<sub>1</sub>-C<sub>4</sub>)trihydroxyalkyl,

with the further proviso that not more than one of R<sub>51</sub> and R<sub>52</sub> is other than hydrogen or alkyl,

(b) cycloamino selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino, hexamethylenimino, pyrrolino, or 3,4-dihydropiperidinyl optionally substituted by one or 2 (C<sub>1</sub>-C<sub>12</sub>)alkyl of one to 12 carbon atoms, inclusive,

(c) carbonylamino of the formula —NR<sub>53</sub>COR<sub>51</sub>, wherein R<sub>53</sub> is hydrogen or (C<sub>1</sub>-C<sub>4</sub>)alkyl and R<sub>51</sub> is other than hydrogen, but otherwise as defined above,

(d) sulfonylamino of the formula —NR<sub>53</sub>SO<sub>2</sub>R<sub>51</sub>, wherein R<sub>51</sub> and R<sub>53</sub> are as defined in (c),

(4) —CH<sub>2</sub>NL<sub>2</sub>L<sub>3</sub>, wherein L<sub>2</sub> and L<sub>3</sub> are hydrogen or (C<sub>1</sub>-C<sub>4</sub>)alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when X<sub>1</sub> is —CH<sub>2</sub>NL<sub>2</sub>L<sub>3</sub>,

wherein Y<sub>1</sub> is trans—CH=CH—, cis—CH=CH—, —CH<sub>2</sub>CH<sub>2</sub>—, or —C≡C—; and

wherein Z<sub>2</sub> is

- (1) —CH<sub>2</sub>—(CH<sub>2</sub>)<sub>f</sub>—C(R<sub>2</sub>)<sub>2</sub>, wherein R<sub>2</sub> is hydrogen or fluoro and f is zero, one, 2, or 3, or
- (2) trans—CH<sub>2</sub>—CH=CH—.

4,420,633

### PROCESS FOR THE PREPARATION OF AN ESTER OF FORMIC ACID

Shinichi Furusaki; Noriaki Manada; Hisao Yamashina, and Masaoki Matsuda, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Dec. 17, 1981, Ser. No. 331,614

Claims priority, application Japan, Jan. 8, 1981, 56-707

Int. Cl.<sup>3</sup> C07C 67/36, 69/06

U.S. Cl. 560—232

20 Claims

1. A process for the preparation of an ester of formic acid which comprises reacting hydrogen, carbon monoxide and an ester of nitrous acid in a catalytic vapor phase reaction in the presence of a platinum group metal or a salt thereof and at a temperature of not less than 40° C. under a pressure of 0.1 to 100 atmospheres.



4,420,634

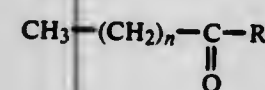
**PROCESS FOR THE OXIDATION OF UNSATURATED ALIPHATIC HYDROCARBONS**

Franco Codignola, Largo Corsia dei Servi 3; Paolo Gronchi, Via Servio Tullio 4; Renato del Rosso, Via Palmanova 67, and Paolo Centola, Via Palsiello 28, all of Milan, Italy

Filed Dec. 4, 1980, Ser. No. 214,032

Claims priority, application Italy, Jun. 10, 1980, 22676 A/80 Int. Cl.<sup>3</sup> C07C 51/25, 51/09, 27/12, 45/32, 45/34, 45/35, 45/37 U.S. Cl. 562—512.2

8 Claims  
1. A process for the selective oxidation in liquid phase of mono-unsaturated aliphatic hydrocarbons to obtain compounds having the formula:



wherein: R=H, OH or C<sub>1</sub>-C<sub>2</sub> alkyl and n=0 or 1, wherein the oxidation is conducted in the presence of oxygen or air, in an organic solvent, at a temperature of 70° to 150° C. and at a pressure of 5 to 50 atmospheres, in the presence of a catalyst consisting of a trivalent cobalt complex formed by a cobalt salt of an organic acid containing at least two carbon atoms with a carbonyl compound of the aldehyde or ketone type.

4,420,635

**AMMONIUM CARBAMATE PRODUCTION**

James M. Washington, Richmond; Dale R. Fillenwarth, Ashland, and Francis V. Utsch, Midlothian, all of Va., assignors to Philip Morris Inc., New York, N.Y.

Filed Aug. 11, 1980, Ser. No. 177,291

Int. Cl.<sup>3</sup> C07C 125/02

U.S. Cl. 562—555

3 Claims

1. A process adapted for producing free-flowing ammonium carbamate having an average particle size between about 2–10 microns, and having a purity of substantially 100 percent, which process comprises (1) injecting a pressurized stream of anhydrous liquid carbon dioxide into a moisture-free environment, wherein adiabatic expansion decreases the temperature of the carbon dioxide into the range between about 10° F. and –110° F.; and (2) contacting the adiabatically expanding carbon dioxide with a stream of anhydrous liquid ammonia to form particulate ammonium carbamate, wherein the molar ratio of carbon dioxide to ammonia in the contacting zone is between about 1.5–5:1, and the temperature in the contacting zone is maintained in the range between about 70° F. and 120° F., and wherein said liquid ammonia is injected into the approximate center of said stream of carbon dioxide in order to increase mixing.

4,420,636

**CALCIUM AMMONIUM LACTATE**

Fred W. Juengst, Jr., Green Bay, and John A. Dika, Kewaunee, both of Wis., assignors to Calor Agriculture Research, Inc., Okemos, Mich.

Division of Ser. No. 109,480, Jan. 4, 1980, Pat. No. 4,333,956, which is a continuation-in-part of Ser. No. 93,162, Nov. 13, 1979, abandoned. This application Oct. 27, 1981, Ser. No. 315,462

Int. Cl.<sup>3</sup> C07C 59/08

U.S. Cl. 562—589

1 Claim

1. The solid crystalline substance calcium ammonium lactate dihydrate having monolithic symmetry.

4,420,637

**META-PHENYLENEDIAMINES**

Andree Bugaut, Boulogne, and Jean-Jacques Vandenbossche, Aulnay-sous-Bois, both of France, assignors to L'Oreal, Paris, France

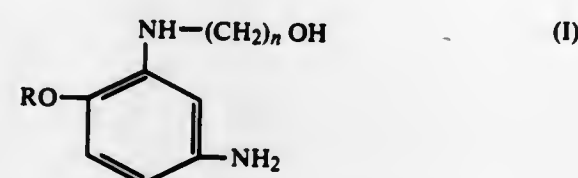
Filed Jul. 2, 1979, Ser. No. 53,813

Claims priority, application France, Jul. 12, 1978, 78 20848 Int. Cl.<sup>3</sup> C07C 91/40, 91/42

U.S. Cl. 564—443

34 Claims

1. A compound of the general formula



in which R represents an alkyl radical containing from 1 to 4 carbon atoms and n is an integer of from 1 to 3, or an acid salt thereof.

4,420,638

**FLUORINATED ETHER-KETONES**

Ronald E. Uschold, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1982, Ser. No. 353,816

Int. Cl.<sup>3</sup> C07C 49/175, 49/227

U.S. Cl. 568—415

5 Claims

1. Compound of the formula



wherein n is an integer and is 1 to 6 and X and X<sup>1</sup> are both Cl or X is F or OR wherein R is methyl, alkyl of 2 to 6 carbon atoms, alkyl of 2 to 6 carbon atoms interrupted with ether oxygen, cyclohexyl or phenyl and X<sup>1</sup> is H.

4. Compound of the formula



wherein n is an integer and is 1 to 6.

4,420,639

**AROMATIC COMPOUNDS**

Anthony W. Lake, Guildford Surrey, and Carl J. Rose, London, both of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 955,197, Oct. 27, 1978, abandoned, which is a continuation of Ser. No. 795,119, May 9, 1977, which is a division of Ser. No. 748,676, Dec. 8, 1976, Pat. No. 4,061,799, which is a continuation-in-part of Ser. No. 563,159, Mar. 28, 1975, abandoned, which is a division of Ser. No. 501,733, Aug. 29, 1974, abandoned. This application Nov. 12, 1981, Ser. No. 320,190

Claims priority, application United Kingdom, Sep. 11, 1973, 42550/73

Int. Cl.<sup>3</sup> C07C 49/215

U.S. Cl. 568—328

4 Claims

4. 4-(6'-Methoxy-2'-naphthyl)butan-2-one.

4,420,640

**METHOD OF PRODUCING 1,9-NONANEDIAL AND 9-HYDROXY-7-NONEN-1-AL**

Mitsuo Matsumoto; Noriaki Yoshimura, and Masuhiko Tamura, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 27, 1982, Ser. No. 372,337

Claims priority, application Japan, Apr. 30, 1981, 56-66367; May 26, 1981, 56-80642

Int. Cl.<sup>3</sup> C07C 45/50

U.S. Cl. 568—454

6 Claims

1. A method of producing 1,9-nonanedial which comprises reacting 2,7-octadien-1-ol with a mixture of hydrogen and carbon monoxide in an organic solvent in the presence of a rhodium catalyst and 30–300 equivalents of a monodentate tertiary organic phosphorus compound per gram atom of rhodium at a hydrogen partial pressure of 0.5–20 kg/cm<sup>2</sup> (absolute) and a carbon monoxide partial pressure of 0.1–5.0 kg/cm<sup>2</sup> (absolute), wherein said reacting is carried out at a temperature of 40°–130° C.

4,420,641

**FORMALDEHYDE PRODUCTION**

H. Robert Gerberich, and Eldred T. Smith, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 287,385, Jul. 27, 1981. This application Jan. 12, 1983, Ser. No. 457,335

Int. Cl.<sup>3</sup> C07C 47/052

U.S. Cl. 568—473

21 Claims

1. In a process for the production of formaldehyde by oxidative dehydrogenation of methanol vapor with oxygen gas at elevated temperatures from about 500° C. to about 700° C., the improvement comprising passing a vapor mixture comprising methanol and an oxygen-containing gas over a catalyst comprising lead and silver on a support having a surface area below about 5 m<sup>2</sup>/g, the weight ratio of lead to silver ranging from about 0.005 to about 0.15.

4,420,642

**SELECTIVE REMOVAL AND RECOVERY OF CATECHOL MIXED WITH 2-METHALLYLOXYPHENOL**

Borivoj R. Franko-Filipasic, Morrisville, Pa., and James Snyder, Yardville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 18, 1982, Ser. No. 349,810

Int. Cl.<sup>3</sup> C07C 37/66

U.S. Cl. 568—753

7 Claims

1. A process for selectively removing unreacted catechol from a mixture comprising catechol, 2-methallyloxyphenol, reaction salts, and an organic solvent comprising treating said mixture with an aqueous solution of a base selected from an alkali metal hydroxide or carbonate, the aqueous solution comprising from 2 to 2.5 equivalents of base per mole of catechol present in said mixture, separating the resulting aqueous phase from the resulting organic phase, then recovering catechol from the aqueous phase.

4,420,643

**EXTRACTION OF PHENOLS FROM AQUEOUS SOLUTIONS**

Christos Savides, Somerville, and John H. Bright, Kendall Park, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

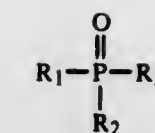
Filed Sep. 30, 1982, Ser. No. 429,907

Int. Cl.<sup>3</sup> C07C 37/68

U.S. Cl. 568—753

7 Claims

1. A process for the extraction of at least one mono- or polyhydric phenolic compound from aqueous solutions which comprises: (a) contacting said aqueous solution with an organic solution comprising (i) at least one tertiary phosphine oxide compound, represented by the formula:



wherein R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> individually represent alkyl groups containing from 1 to 20 carbon atoms, provided that at least two of said R groups contain 6 or more carbon atoms, and (ii) a C<sub>10</sub> to C<sub>16</sub> alkyl-substituted aromatic hydrocarbon having a boiling point of at least about 200° C.; and (b) separating the organic phase from the aqueous phase.

4,420,644

**LIGNIN HYDROCRACKING PROCESS TO PRODUCE PHENOL AND BENZENE**

Derk T. A. Hulbers, Pennington, and Hugh J. Parkhurst, Jr., Plainsboro, both of N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Aug. 24, 1981, Ser. No. 295,459

Int. Cl.<sup>3</sup> C07C 37/00

U.S. Cl. 568—806

9 Claims

1. A process for hydrocracking lignin-containing feed materials to produce mono-aromatic phenolic products, comprising:

- (a) mixing the lignin-containing feed with sufficient process-derived slurring oil to provide a pumpable slurry mixture;
- (b) feeding the lignin and oil slurry with hydrogen into a hydrocracking reaction zone containing an ebullated bed of particulate catalyst;
- (c) maintaining said catalytic reaction zone at temperature within range of 650°–850° F., hydrogen partial pressure of 500–2500 psig, and space velocity within the range of 0.1–10 wt./hr./wt. catalyst;
- (d) phase separating the reaction zone effluent stream to recover a hydrogen-containing gas stream and aromatic oils having normal boiling range of 500°–900° F. as said slurring oil; and
- (e) withdrawing a mono-aromatic liquid product stream boiling below about 500° F. and containing at least about 25 W % phenolic product.

4,420,645

**PROCESS FOR THE NITRATION OF HALOBENZENES**

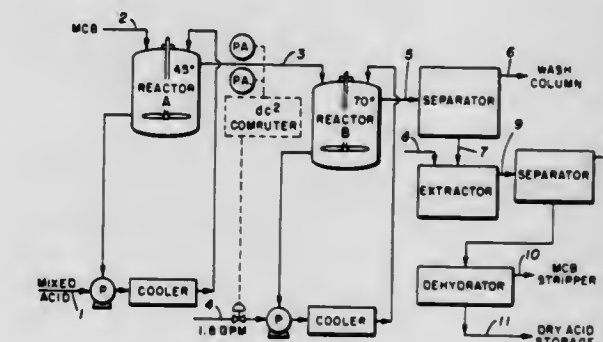
Kumbakonam R. Vaidyanathan, Creve Coeur, Mo., assignor to Monsanto Company

Filed Jul. 19, 1982, Ser. No. 399,637

Int. Cl.<sup>3</sup> C07C 79/12

U.S. Cl. 568—937

10 Claims



1. In a continuous process for the production of nitrohalobenzene from monohalobenzene by reacting monohalobenzene with nitric acid and a second acid selected from the group consisting of sulfuric acid, phosphoric acid, sulfonic acid and mixtures of the above, the improvement comprising:

- (1) feeding nitric acid, the second acid and an excess over the stoichiometrically required monohalobenzene to a first



reactor with controlled cooling so as to obtain a conversion of at least about 75% of the nitric acid, and  
(2) continuously feeding the reaction product of (1) into a second reactor into which is also continuously fed the proportion of the second acid stoichiometrically required as of the time of feeding the reaction product of (1) into the second reactor, with controlled cooling so as to obtain a conversion of at least about 98% of the nitric acid.

#### 4,420,646 FEEDSTOCKS FOR THE PRODUCTION OF SYNTHETIC LUBRICANTS

Jerome W. Darden; Lewis W. Watts, Jr., and Edward T. Marquis, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,491  
Int. Cl.<sup>3</sup> C07C 1/16, 3/18

U.S. Cl. 585—10

10 Claims

1. A process for oligomerizing mono olefins comprising contacting a mixture of alpha olefins and internal olefins comprising greater than 50 and less than 99 weight percent of internal olefins where both the alpha and internal olefins each have between 9 and 24 carbon atoms, inclusive, and the alpha and internal olefins have carbon numbers identical to or within one carbon number of each other and in which the internal olefins have the double bond randomly distributed, with a catalyst comprising boron trifluoride and a protonic promoter under oligomerization conditions to produce a crude oligomer product, removing only the unreacted monomer and hydrogenating the remainder.

3. A synthetic lubricant component having a viscosity at 210° F. of between 3.5 and 5.0 centistokes, a viscosity at 25° C. of between 25 and 40 centistokes, a viscosity index of greater than 100 and a thermogravimetric analysis value of greater than 80 weight percent, being produced by oligomerizing a mixture of alpha olefins and internal olefins having greater than 50 but less than 99 weight percent of internal olefins and both alpha and internal olefins each having between 9 and 24 carbon atoms, inclusive, and the alpha and internal olefins have carbon numbers identical to or within one carbon number of each other and in which the internal olefins have the double bond randomly distributed, by means of reacting the mixture of olefins in the presence of boron trifluoride catalyst and a protonic promoter at a temperature between 25° and 150° C. to produce a crude oligomer product, removing only the unreacted monomer and hydrogenating the remainder.

4,420,647  
SEMI-SYNTHETIC LUBRICATING OIL COMPOSITION  
Kenneth G. Hammond, Poughkeepsie; Joseph C. Sendra, Fishkill, both of N.Y.; Lewis W. Watts, Jr., Austin, Tex.; Edward T. Marquis, Austin, Tex., and John M. Larkin, Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,859  
Int. Cl.<sup>3</sup> C10M 1/18; C07C 1/16, 3/18

U.S. Cl. 585—10

23 Claims

1. A lubricating oil composition comprising  
a. a major portion of a synthetic lubricant component or a mixture of the synthetic lubricant component and a lubricating hydrocarbon mineral base oil, the synthetic lubricant component being made by contacting a mixture of olefins having between 9 and 24 carbon atoms, inclusive,

and having greater than 50 weight percent internal olefins, where the double bond of the olefin is randomly distributed throughout the carbon chain, the balance being alpha olefins, with a catalyst comprising boron trifluoride at a temperature between about 25° and about 150° C. sufficient to effect oligomerization of said olefins, then hydrogenating the oligomerized olefins to make the synthetic lubricant component, and  
b. minor portions of additive components.

4,420,648  
PROCESS FOR HYDROGENATING ORGANIC COMPOUNDS WITH A SUPPORTED COBALT-SILICA COPRECIPITATED HYDROGENATION CATALYST  
James L. Carter, and Allan E. Barnett, both of Westfield, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 514, Jan. 2, 1979, abandoned. This application Sep. 19, 1979, Ser. No. 77,011

Int. Cl.<sup>3</sup> C07C 5/10

U.S. Cl. 585—269

11 Claims

1. A process for hydrogenating organic compounds which comprises contacting at least one hydrogenatable organic compound with hydrogen in the presence of a calcined and reduced coprecipitated catalyst consisting essentially of cobalt, silica, and solid porous particles, said catalyst being characterized as having a B.E.T. total surface area ranging from about 150 to about 350 m<sup>2</sup>/g and a reduced metal surface area ranging from about 5 to about 20 m<sup>2</sup>/g as determined by hydrogen chemisorption, after reduction at 400° C., wherein the amount of cobalt in the catalyst ranges from about 25 wt. % to about 70 wt. % based on the total weight of the calcined and reduced catalyst, wherein said catalyst has been prepared by coprecipitating cobalt and silicate ions in the presence of said solid porous particles.

4,420,649  
HYDROCARBON DEHYDROGENATION WITH A MULTIMETALLIC CATALYTIC COMPOSITE  
George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 301,065, Sep. 11, 1981, Pat. No. 4,396,540, which is a continuation-in-part of Ser. No. 246,828, Mar. 23, 1981, Pat. No. 4,358,399, which is a division of Ser. No. 82,436, Oct. 5, 1979, Pat. No. 4,268,377, which is a continuation-in-part of Ser. No. 848,699, Nov. 4, 1977, Pat. No. 4,183,804. This application Feb. 7, 1983, Ser. No. 464,437

Int. Cl.<sup>3</sup> C07C 5/36, 5/40; B01J 27/08

U.S. Cl. 585—434

15 Claims

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at hydrocarbon dehydrogenation conditions, with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed ruthenium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state during the incorporation and pyrolysis of the ruthenium carbonyl component, and of a rhenium component.

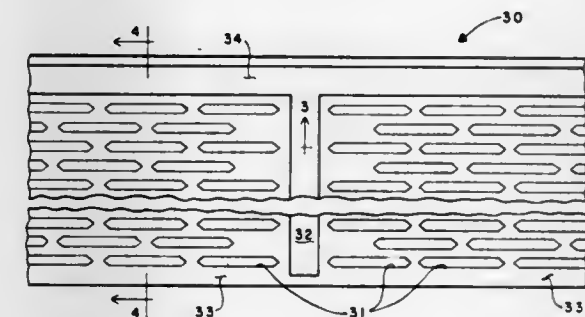
## ELECTRICAL

#### 4,420,650 WEDGED CHANNEL VERTICAL JUNCTION SILICON SOLAR CELL

Joseph F. Wise, Dayton, and James F. Holt, Medway, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.  
Filed Mar. 9, 1982, Ser. No. 356,573  
Int. Cl.<sup>3</sup> H01L 31/06

U.S. Cl. 136—255

3 Claims



1. A vertical junction solar cell comprising:
  - a. a semiconductor substrate of predetermined thickness having substantially parallel upper and lower surfaces;
  - b. a plurality of spaced, electrically conducting strips on said upper surface and separating said upper surface into a plurality of distinct active areas, and an electrical header strip joining said conducting strips to provide a first electrical contact for said cell;
  - c. a second electrical contact on said lower surface; and
  - d. a multiplicity of channels formed in each of said active areas, said channels having a depth substantially less than said substrate thickness and being arranged along the lengths thereof in substantially parallel rows, each row comprising a plurality of said channels defined by a plurality of thin vertical ribs of said substrate between adjacent rows which include the vertical junctions of said cell, and by a plurality of regions of said substrate between proximate ends of said channels in each row, each of said channels in each row having adjacent thereto and near its midpoint at least one said region of an adjacent row, whereby each of said channels in each row is offset with respect to corresponding channels in the adjacent rows.

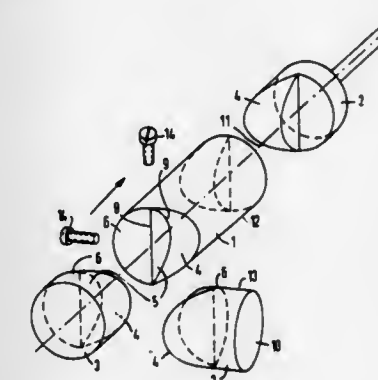
4,420,651  
PROXIMITY SWITCH OPERABLE WITHOUT PHYSICAL CONTACT  
Dieter Teich, Schwandorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 294,035  
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033750

Int. Cl.<sup>3</sup> H05K 5/00

U.S. Cl. 174—50

2 Claims



1. In a proximity switch which can be operated without physical contact and which comprises an elongate, columnar

housing having at least one lateral wall lying parallel to and spaced a predetermined distance from the principal axis of the housing, the housing being symmetrical about two orthogonal axes of symmetry which are perpendicular to the principal axis, and the housing having at least two parts which are joined at abutting surfaces which intersect the principal axis at an angle, the improvement in which:

the abutting surfaces joining the parts each comprise first, second and third abutting surfaces, the first surface being parallel to the principal axis, and the second and third surfaces each intersecting the first surface at an angle of 90°, the greatest dimension of the first abutting surface, measured in the direction of the principal axis, being equal to the shortest distance from the principal axis to the lateral wall;

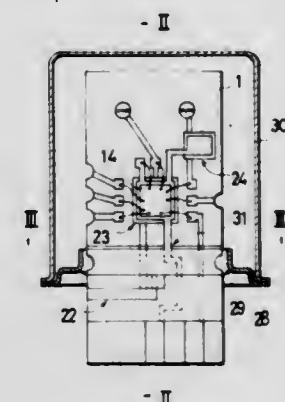
the housing is circular in cross section; and  
the first abutting surface is joined to the second abutting surface along a straight line and to the third abutting surface along a semicircle, the area of the first surface being equal to half the cross-sectional area of the housing.

4,420,652  
HERMETICALLY SEALED PACKAGE  
Hitoshi Ikeno, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,411  
Claims priority, application Japan, Sep. 2, 1980, 55-121624  
Int. Cl.<sup>3</sup> H05K 5/06

U.S. Cl. 174—52 H

2 Claims



1. A hermetically sealed package comprising: a shell having a through hole; a circuit board consisting of a sealed part, a fixed part and a projecting part, and having a circuit pattern extending from said sealed part through said fixed part to said projecting part on at least one surface thereof, and being inserted into said through hole; a non-conductive fixing material fixing hermetically said fixed part of said circuit board into said through hole of said shell; and a can fixed hermetically to said shell, and sealing said sealed part of said circuit board together with said shell.

4,420,653  
HIGH CAPACITANCE BUS BAR AND METHOD OF MANUFACTURE THEREOF  
Sunichi Fukuda, Kukizaki, and Masaaki Muto, Ryugasaki, both of Japan, assignors to Rogers Corporation, Rogers, Conn.  
Filed May 29, 1980, Ser. No. 154,376  
Int. Cl.<sup>3</sup> H01B 7/08

U.S. Cl. 174—72 B

19 Claims

18. A bus bar comprising:
  - at least a pair of elongated, flat, parallel conductors;
  - a layer of insulating material bonded to facing surfaces of each of said conductors;
  - a plurality of flat rectangular dielectric elements sandwiched between said layers of insulating material, said dielectric elements having oppositely disposed metallized faces and being spacially separated;
  - means establishing electrical connection between an exposed

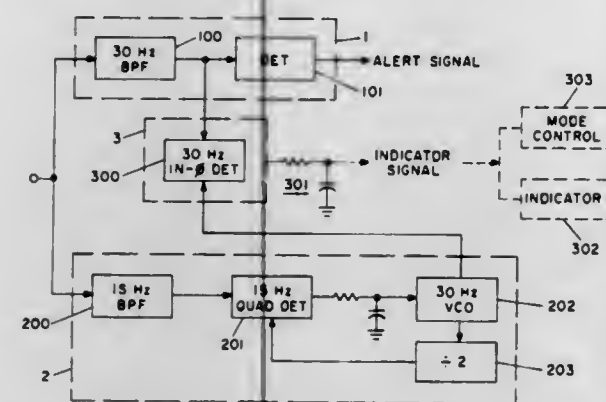






detecting the presence of first and second low frequency pilot signals which are interrelated in frequency and phase and which are modulated on the AM carrier wave along with the multiphonic program information, said apparatus comprising:

- (a) first means for detecting the presence of the first pilot signal in the modulation of a received AM radio wave and providing a first detection signal in response thereto;



- (b) second means for detecting the presence of the second pilot signal in the modulation of said received AM radio wave and providing a second detection signal in response thereto; and
- (c) third means responsive to said first and second detection signals for determining whether said first pilot signal and said second pilot signal are present and in a predetermined phase relationship, and if so then providing an indicator signal indicating the reception of a multiphonic broadcast.

#### 4,420,659 BI-STABLE MECHANISM AND ANTI-THEFT DEVICE FOR A MOTOR VEHICLE COMPRISING SUCH MECHANISM

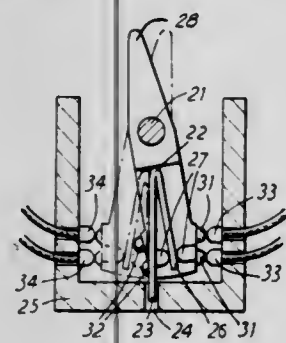
Guy Neyret, Oullins, France, assignor to Sodex Magister, Societe d'Exploitation des Brevets. Neiman, Croissy, France  
Division of Ser. No. 212,774, Dec. 4, 1980, Pat. No. 4,350,852.

This application Mar. 29, 1982, Ser. No. 363,206

Claims priority, application France, Dec. 7, 1979, 79 30061  
Int. Cl.<sup>3</sup> H01H 5/04

U.S. Cl. 200—67 A

4 Claims



1. A bi-stable mechanism comprising:
- (a) a housing having one wall provided with a hole therein and other walls providing abutments,
- (b) a lever pivotally mounted between its ends in said housing about an axis and movable between first and second stable positions determined by engagement of the lever with said abutments, said lever having a recess therein formed by a reduced thickness of the lever on one side of said axis, and
- (c) a spring for urging said lever towards one of said stable positions according to selection, said spring being of a hairpin type spring of which the end of the first leg is engaged in said hole so as to be pivotable therein about the axis of said first leg and the end of the second leg is connected with the lever, said spring being located in said recess, the arrangement being such that movement of the

lever pivots the spring about the pivotal axis of said first leg, the distance between the said ends of the legs of the spring when the lever is in either stable position is greater than the distance between said end of the first leg of the spring and the point of engagement of the end of the other leg of the spring with the lever when the lever is at its center position whereby the spring becomes more compressed as the lever approaches the center position where the lever is unstable and wherein the first leg is perpendicular to the axis of said lever.

#### 4,420,660 CIRCUIT BREAKER

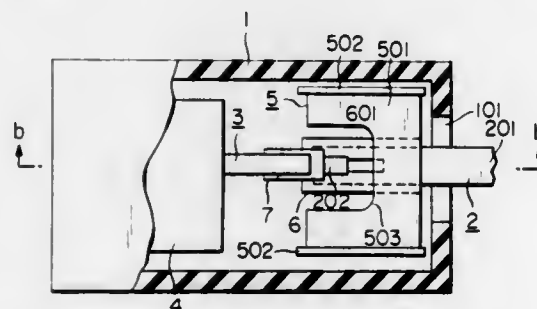
Fumiyuki Hisatsune; Shinji Yamagata; Junichi Terachi, all of Fukuyama, and Hajimu Yoshiyasu, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Feb. 19, 1982, Ser. No. 350,174

Claims priority, application Japan, Feb. 26, 1981, 56-27927; Feb. 27, 1981, 56-29660

Int. Cl.<sup>3</sup> H01H 9/30

U.S. Cl. 200—144 R

4 Claims



1. A circuit breaker comprising:
- a pair of contactors each of which has a conductor and a contact secured thereto, said contacts abutting each other when said conductors are close to each other, one of said contactors being fixed and the other being movable away from and toward said one contactor to open and close an electric circuit,
- arc shields of a material having a resistivity greater than the material of said conductors and said contacts, one positioned on each of said contactors surrounding the periphery of said contacts, for narrowing the arc generated between said contacts when said contacts separate,
- at least said shield on said fixed contactor having an arc running groove therein, one end of which is adjacent to the contact therewithin and which has a width no greater than that of said contact, and extending away from said contact in a direction in which the arc formed between said contacts runs when said contacts separate, and
- an arc extinguishing plate assembly having a row of a plurality of arc extinguishing plates for extinguishing an arc produced between said contacts when said contacts separate, said plate assembly being positioned adjacent the other end of said arc running groove in said fixed contactor and the other end of said arc running groove extending to a position at which the edges of the plates in said arc extinguishing plate assembly which are toward said contacts overlie the other end of said arc running groove.

#### 4,420,661 SWITCHING MECHANISM WITH A VACUUM CIRCUIT BREAKER BETWEEN A BUS BAR AND A CABLE CONNECTION PIECE

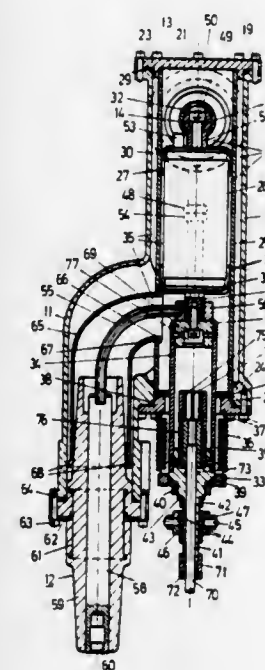
Arnold Efinger, Trossingen, and Erwin Moser, Karlsruhe-Rüppurr, both of Fed. Rep. of Germany, assignors to Wickmann-Werke Böblingen GmbH, Böblingen, Fed. Rep. of Germany  
Filed Mar. 30, 1982, Ser. No. 363,508

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112776

Int. Cl.<sup>3</sup> H01H 33/66

U.S. Cl. 200—144 B

7 Claims



1. A switching mechanism, comprising:
- a bus bar having an inner conductor and a tubular outer sleeve piece;
- a cable connection having an inner conductor;
- a vacuum circuit breaker having a vacuum container and being arranged between said bus bar and said cable connection; said vacuum circuit breaker having an immovable contact having an end projecting from said vacuum container and fastened transversely to said inner conductor of said bus bar; said vacuum circuit breaker also having a movable counter contact connected to said inner conductor of said cable connection;
- an insulating body associated with said counter contact for axially actuating same;
- an electrically conductive outer sleeve which includes a rigid cylindrical tube having at one end a branch for receiving said cable connection, and at the other end a T-shaped base part for receiving a portion of said inner conductor of said bus bar; said tubular outer sleeve of said bus bar being flanged to one arm of said T-shaped base part, and an end cover being flanged to the other arm of said base part;
- an electrically insulated inner sleeve which forms a support structure for coaxial fixation of those conductor parts which form the current path, namely said inner conductor of said bus bar, said immovable contact of said vacuum circuit breaker, and said movable counter contact thereof; and
- an insulating oil bed for said conductor parts which form the current path, said insulating oil bed separating said electrically conductive outer sleeve and said electrically insulated inner sleeve from each other.

#### 4,420,662 COMPRESSED-GAS CIRCUIT BREAKER

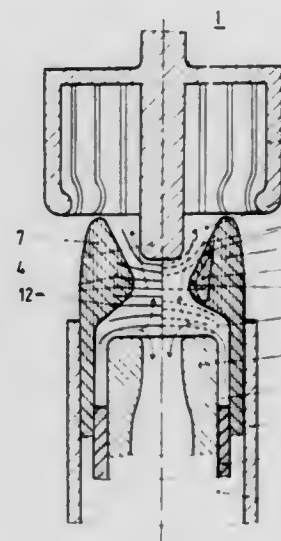
Lutz Niemeyer, and Klaus Ragaller, both of Schweiz, Switzerland, assignors to BBC Brown, Boveri & Company Ltd., Switzerland  
Filed Oct. 29, 1981, Ser. No. 316,518

Claims priority, application Switzerland, Oct. 31, 1980, 8102/80

Int. Cl.<sup>3</sup> H01H 33/70, 33/10

U.S. Cl. 200—148 R

9 Claims



1. Compressed-gas circuit breaker comprising two contact members which move relative to one another, a nozzle which is made of dielectric material and is attached to a first member of the two contact members, means for causing compressed gas to flow through the constriction of the nozzle, from a compression-space into an expansion-space, the gas being used for extinguishing the arc which occurs on operating the circuit breaker, and at least one annular insert at the nozzle constriction, the insert being arranged so that it is electrically isolated with respect to the two contact members and is capable of assuming a potential unrelated to the potential of either of said two contact members and exhibits a first capacitance with respect to the first contact member and a second capacitance with respect to the second contact member, magnitudes of the capacitances being chosen, by suitable arrangement and dimensioning of the insert, so that an electric field, and is formed on applying a voltage between the contact members, is displaced, in the region of the nozzle construction, at least partially from the surface of the nozzle, into the compression-space and into the expansion-space.

#### 4,420,663 MATERIAL FOR ELECTRICAL DEVICES HAVING A FLEXIBLE MEMBER

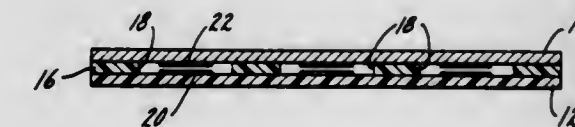
Willis A. Larson, Crystal Lake, and Edwina K. Dulen, Fox Lake, both of Ill., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Dec. 8, 1980, Ser. No. 213,948

Int. Cl.<sup>3</sup> H01H 3/12, 9/24

U.S. Cl. 200—159 B

7 Claims



1. An electrical switch having a flexible component made of paper said flexible component having electrical conductive areas printed thereon.



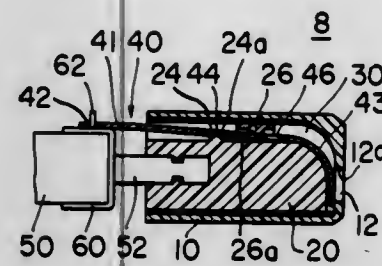
4,420,664

## DISPLAY TYPE PUSH BUTTON

Toshihiro Takahashi, Tsurugashima, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan  
 Filed Jan. 21, 1983, Ser. No. 460,049  
 Claims priority, application Japan, Jan. 25, 1982, 57-8322[U]  
 Int. Cl.<sup>3</sup> H01H 9/16

U.S. Cl. 200—308

3 Claims



1. A display type push button which comprises a push button body having a display window on the front end thereof, a passage which is extended, in the form of a curve, from the rear end of said push button body to said window, and a display plate made of elastic material, said display plate being laid in said passage in such a manner as to reciprocate along said passage and having a stationary end portion which is secured to a switch body, so that, when a switch is turned on and off by operating said push button coupled thereto, said display plate displays the operations of said switch with the free end portion thereof going to and from said window; in which said push button body has first and second protrusions which are protruded into said passage in the opposite directions and are spaced away from each other in the direction of movement of said display plate, and said display plate has first and second through-holes, in such a manner that, as said display plate reciprocates along said passage, at a first position said first protrusion is engaged with said first through-hole while said display plate is depressed by said second protrusion, and at a second position said second protrusion is engaged with said second through-hole while said display plate is depressed by said first protrusion so that said display plate is rocked with said stationary end portion as a fulcrum.

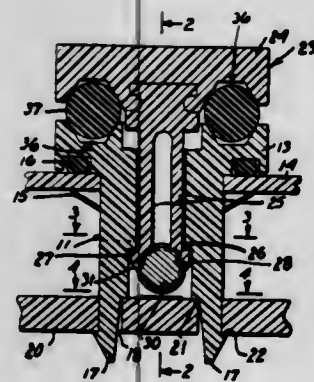
4,420,665

## MOISTURE PROOF SWITCH ASSEMBLY

Richard A. Conrad, 1422 Phillips St., Vista, Calif. 92083  
 Filed Sep. 15, 1982, Ser. No. 418,441  
 Int. Cl.<sup>3</sup> H01H 13/06

U.S. Cl. 200—302

8 Claims



1. A moisture proof switch assembly comprising housing means, a pair of electrical contacts carried by said housing means, a switch member including a push button portion and a pair of jaws extending from said push button portion into said housing means, an electric contact member removably carried by said jaws, an annular sealing member of elastomeric material surrounding said jaws and interposed between said housing means and said push button portion,

at least one locking shoulder on said housing means, a latching shoulder on at least one of said jaws engagable with said locking shoulder for maintaining said sealing member compressed between said housing means and said push button portion whereby to seal said housing means from entrance of moisture therein, said push button portion being depressible whereby to further compress said sealing member and to cause said contact member to engage said contacts, one of said jaws being flexible relative to the other to disengage said latching shoulder from said locking shoulder, and said contact member when carried by said jaws preventing said one jaw from disengaging said latching shoulder from said locking shoulder.

4,420,666

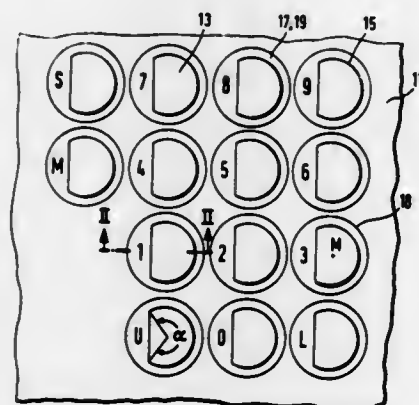
## ELECTRICAL KEY CONTACT

Gerd Kammerer, St. Georgen, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, St. Georgen, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,312  
 Int. Cl.<sup>3</sup> H01H 9/18, 13/14

U.S. Cl. 200—340

9 Claims



1. In a key pad apparatus which includes a generally planar cover plate having an opening therethrough, electrical switch means supported on one side of said cover plate and having a key button which is supported for movement in directions generally perpendicular to said cover plate, projects through said opening therein, and has a cross section substantially coincident in size and shape with said opening, movement of said key button effecting operation of said switch means, and means defining indicia near said key button on the side of said cover plate opposite said one side, the improvement comprising wherein said cover plate has first and second regions which each have the shape of a closed geometric figure, said second region being a portion of, having a size slightly smaller than, and being substantially centered in said first region and being defined by complementary first and second portions, the perimeters of said first and second portions each having a portion which is coincident with a respective portion of said closed geometric figure which bounds said second region, said opening through said cover plate and said first portion of said second region thereof being coincident, said first region of said cover plate being curved and lying out of the plane of said cover plate, and said indicia being provided within said second portion of said second region.

4,420,667

## INDUCTION HEATING METHOD AND APPARATUS FOR ELONGATED WORKPIECES

John C. Lewis, Dundas, Canada, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Jun. 21, 1982, Ser. No. 390,409  
 Int. Cl.<sup>3</sup> H05B 5/00

U.S. Cl. 219—10.41

5 Claims

3. A method of inductively heating to a substantially uniform

4,420,669

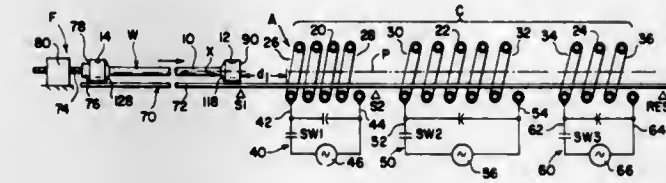
## DATA INPUT APPARATUS FOR MICROWAVE OVEN CONTROLLERS

Gerald W. Scaif, Johnson City, Tenn., and James H. Koberlein, Georgetown, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 273,294, Jun. 15, 1981, abandoned. This application Dec. 28, 1981, Ser. No. 335,023  
 Int. Cl.<sup>3</sup> H05B 6/68; G08C 9/00

U.S. Cl. 219—10.55 B

3 Claims



(b) actuating a time delay circuit control means for said coils, when the said leading end portion of the advancing workpiece reaches a predetermined pre-entry distance from the entrance end of said first coil, to progressively effect the energization of the said first coil only during passage therethrough of the said leading end portion of the workpiece, the energization of the said second coil only during passage therethrough of said intermediate portion of the workpiece, and the energization of the said third coil only during passage therethrough of the said trailing end portion of the workpiece.

4,420,668

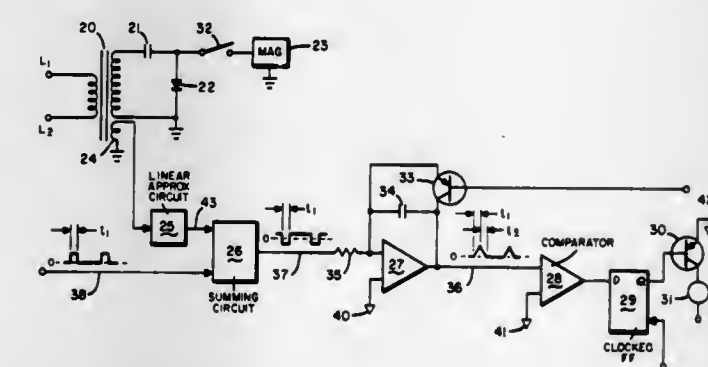
## CONSTANT POWER MICROWAVE OVEN

Gerald L. Larson, Minnetonka; Robert L. Ellis, Brooklyn Park, and Daniel A. Baker, St. Louis Park, all of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 25, 1981, Ser. No. 277,459  
 Int. Cl.<sup>3</sup> H05B 6/68

U.S. Cl. 219—10.55 B

9 Claims



1. In a microwave oven including a magnetron for transmitting microwave energy to a cooking cavity, a power supply for driving the magnetron, and a controller having stored food cooking data corresponding to a plurality of food types and masses, the improvement comprising: means for measuring the power supplied to said magnetron; means for comparing said measured power to a predetermined desired average power corresponding to one of said plurality of food types and masses, and means to vary the duty cycle of said magnetron to cause the average power supplied to said magnetron to equal said predetermined desired average powers such that the actual cooking time is equal to the predetermined cooking time said one of said plurality of food types and masses.

4,420,670

## CONTROL FOR DIELECTRIC HEATING IN BLOW MOLDING MACHINE

Fred J. Croswell, Felicity, and Charles P. Shinkle, Bethel, both of Ohio, assignors to Cincinnati Milacron Industries, Inc., Cincinnati, Ohio

Filed Mar. 5, 1982, Ser. No. 355,222  
 Int. Cl.<sup>3</sup> H05B 6/60, 6/50

U.S. Cl. 219—10.81

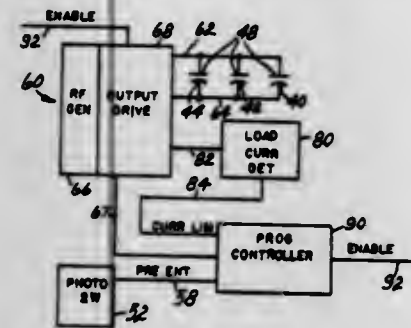
11 Claims

1. In an apparatus for dielectric heating a plurality of thermoplastic article preforms having heating station, said heating station having a plurality of pairs of electrodes energizable by a radio frequency generator, the generator being provided



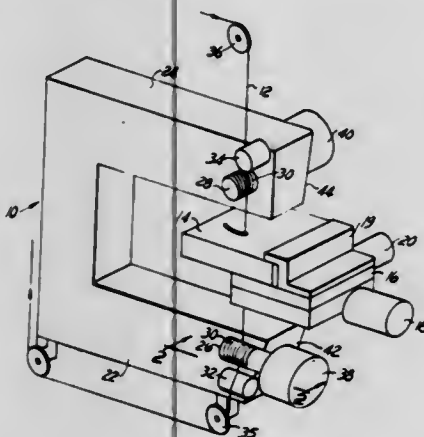
with a load current sensor producing a current limit signal at a selectable load current magnitude and an input circuit for selectively energizing and deenergizing the electrodes in response to a control signal, the preforms to be heated being placed between the electrodes of the pairs, an improved control apparatus comprising:

- (a) means responsive to the number of preforms resident in the heating station for selecting interval control and current control, current control being selected when the number of resident preforms equals the number of pairs of electrodes;



- (b) timing means responsive to the selecting means for producing an interval control signal for application to the input circuit to effect energization of the electrode pairs for a predetermined period of time in response to interval control being selected; and
- (c) current control means responsive to the selecting means and the current limit signal for producing a current control signal for application to the input circuit to effect energization of the electrode pairs until a predetermined load current magnitude is reached in response to current control being selected.

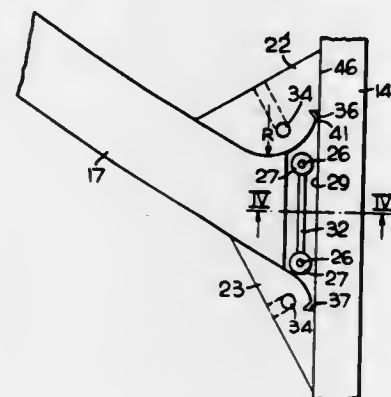
**4,420,671**  
**HELICOIDAL GUIDE FOR WIRE ELECTRODE OF AN EDM APPARATUS**  
Benno I. Bonga, Crans, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland  
Filed Sep. 14, 1981, Ser. No. 302,061  
Int. Cl.<sup>3</sup> B23P 1/08  
U.S. Cl. 219—69 W



1. An improvement for an EDM apparatus wherein a cut is effected by electrical discharges in a workpiece by means of an electrode tool in the form of an electrically-conductive wire, said apparatus comprising a pair of wire guide and support members each mounted at the end of each of a pair of support arms one disposed on one side and the other on the other side of a machining zone between said workpiece and said wire whereby said wire has a longitudinal axis disposed at an angle relative to said workpiece, and a pair of servo-motors for displacing said pair of support arms and said workpiece relative to each other according to a predetermined path, said improvement comprising at least one of the electrode wire support and guide members being in the form of a rotatable cylindrical member, a helical groove on the peripheral surface

of said cylindrical member, said helical groove having a bottom and sidewall surfaces, and a motor for driving said cylindrical member in rotation, whereby said wire is supported and guided by a portion of the surfaces of said helical groove and the angle of said wire relative to said workpiece is varied as a function of the rotation of said cylindrical member having said helical groove on the peripheral surface thereof.

**4,420,672**  
**METHOD AND APPARATUS TO PRODUCE ELECTROSLAG T-JOINTS WHERE FILLETS ARE REQUIRED**  
James R. Nolt, Jr., Mt. Wolf, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.  
Continuation-in-part of Ser. No. 43,006, May 29, 1979, abandoned. This application May 4, 1981, Ser. No. 260,073  
Int. Cl.<sup>3</sup> B23K 25/00  
U.S. Cl. 219—73.1

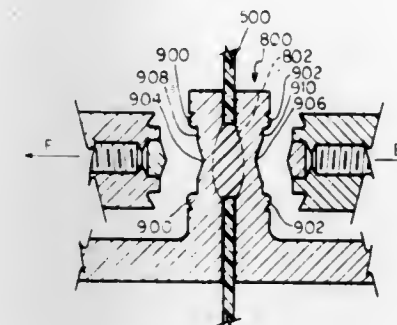


1. A method of forming a T-joint having fillets of a desired contour between two angularly related members comprising the steps of:
- positioning fillet material retaining means along the joint to be formed;
  - providing fillet material in the joint prior to welding;
  - providing flux to the joint at one side of the fillet material retaining means;
  - providing slag relief means in said fillet material retaining means adjacent to the head of the T-joint to be formed;
  - providing communicating means between the T-joint space and the slag relief means for slag to run into the relief means;
  - providing electric current to the members to generate heat to melt the base material of the members and the fillet material to a molten state.

**4,420,673**  
**ELECTRODES FOR USE IN THE EXTRUSION-FUSION WELDING OF LEAD PARTS THROUGH AN APERTURE IN A BATTERY CASE AND METHOD OF EXTRUDING, FUSING AND FORGING LEAD CONNECTIONS IN BATTERY CASES**  
William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.  
Continuation of Ser. No. 29,255, Apr. 11, 1979, Pat. No. 4,346,283, which is a division of Ser. No. 790,881, Apr. 26, 1977, Pat. No. 4,166,210. This application Oct. 20, 1981, Ser. No. 313,139  
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.  
Int. Cl.<sup>3</sup> B23K 11/30  
U.S. Cl. 219—78.16

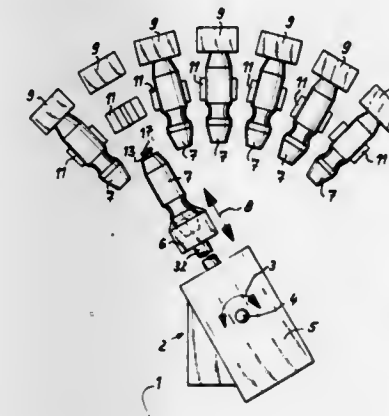
1. A method of welding lead parts through an aperture in the wall of a battery case to form a connection therethrough, said wall having a substantially flat surface adjacent the perimeter of said aperture, the method comprising the steps of:
- (a) positioning said parts on opposing sides of said aperture to at least entirely overlap said aperture;

- (b) upsetting at least a portion of said parts into said aperture to touch within said aperture;
- (c) passing current through said parts to melt portions of said parts at least within said aperture;
- (d) compressing at least said melted portions within said aperture to fill said aperture; and



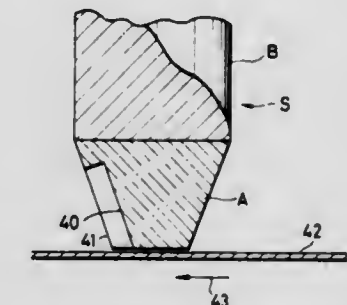
- (e) forging unmelted portions of said parts generally surrounding said aperture and opposite said flat surface at least during a portion of said compression step, preventing expulsion of said melted portions.

**4,420,674**  
**PROCEDURE AND DEVICE FOR WELDING STUDS AND SIMILAR PARTS TO A WORK PIECE**  
Ernst G. Jordan, Menden, Fed. Rep. of Germany, assignor to OBO Bettermann OHG, Fed. Rep. of Germany  
Filed Nov. 23, 1981, Ser. No. 323,727  
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108840  
Int. Cl.<sup>3</sup> B23K 9/12, 9/20  
U.S. Cl. 219—99



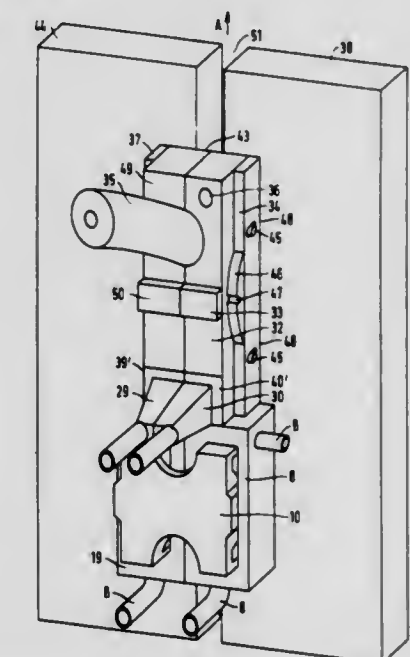
1. A process for welding studs and similar parts to a work-piece by a stud-welding device operating at least semiautomatically, which process comprises supplying studs mechanically from an external source, individually and in weldable position, to a stud holder, holding the stud holder in a stud-holding device, moving it to welding position and welding the held stud, causing the stud-welding device to return the stud holder to transfer position ready to receive another stud; operatively associating a plurality of stud holders with the stud-welding device, alternatively connecting the stud holders to the stud-welding device in accordance with a selectable call-up program, so that a given stud holder equipped with a stud and connected to the stud-welding device is separated from the stud-welding device after the weld has been performed and the transfer position has been reached, and holding it in that position, the above procedural sequence being controlled electrically or electronically.

**4,420,675**  
**METHOD FOR MAKING A STYLUS HAVING A CONDUCTIVE CARBON LAYER AND A STYLUS MADE BY THE METHOD**  
Hideaki Takehara, Fujisawa, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan  
Filed Dec. 1, 1981, Ser. No. 326,391  
Claims priority, application Japan, May 26, 1981, 56-79889  
Int. Cl.<sup>3</sup> B23K 27/00  
U.S. Cl. 219—121 LM



1. A method for fabricating a record stylus for use in detecting signals recorded in a capacitance disk, comprising the steps of:
- (a) placing a diamond body in an oxygen containing environment; and
  - (b) irradiating a predetermined area of the diamond body extending in a direction away from the point where the stylus makes contact with said disk with a beam of heat-producing energy to convert the carbon constituent of the diamond of said area into a conductive layer of carbon.

**4,420,676**  
**WELDING APPARATUS**  
Peter Hirsch, Aachen-Laurensberg; Bernhard Wübbels, Borken, and Iwar Thomson, Aachen, all of Fed. Rep. of Germany, assignors to Friedrich Eichhorn, Aachen, Fed. Rep. of Germany  
Filed Apr. 28, 1981, Ser. No. 258,051  
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016582  
Int. Cl.<sup>3</sup> H05B 1/00; B23K 25/00  
U.S. Cl. 219—160



1. A welding shoe for a vertical welding machine comprising a holder adapted to be connected to a member of said machine for moving said shoe along the surface of a pair of substantial planar workpieces arranged upright in edge to edge relation narrowly spaced from each other to form a vertical



elongate welding gap, first and second sliding segments having surfaces adapted to be in contact with the surfaces of said workpieces, means for separately and independently mounting said sliding segments on said holder in edge to edge relation to define a longitudinal centre groove extending along the mid plane of said welding gap said mid plane being defined as passing through said welding gap perpendicular to the plane of said workpieces, said mounting means comprising a first swivel joint

lying along a horizontal axis perpendicular to the mid plane of the welding gap, and a second swivel joint lying along a vertical axis parallel to the mid plane of the welding gap, each of said joints being set in slotted guides extending perpendicular to the vertical plane of the workpieces to permit movement of said respective segment toward and away from said workpiece while simultaneously permitting said respective segment to swivel independently about each of said joints, and spring means for resiliently biasing said segments away from said holder to maintain the surface of said segment normal in a vertical plane.

4,420,677

## HEATING SYSTEM

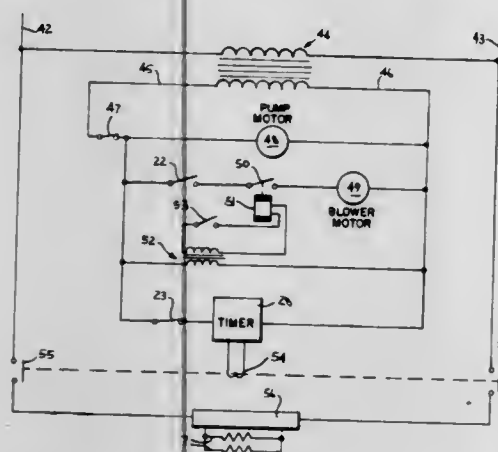
Everett J. Partington, 620 South Elizabeth, Oconomowoc, Wis. 53066

Continuation of Ser. No. 64,112, Aug. 6, 1979, abandoned. This application Oct. 2, 1981, Ser. No. 308,114

Int. Cl.<sup>3</sup> H05B 1/02; F24H 7/00

U.S. Cl. 219—341

5 Claims



1. A heating system, comprising a closed conduit to contain a liquid, a portion of said conduit constituting a heating chamber, pumping means disposed in the conduit to continuously circulate the liquid through the conduit, a resistance heating unit spaced out of contact with the chamber to heat the liquid in the chamber, heat exchange means disposed in the conduit for transferring heat to air passing over said heat exchange means, proportional timer means operably connected to the heating unit for continuously operating said heating means in cycles of uniform duration, each cycle composed of an "on" interval in which the heating unit is energized and an "off" interval in which the heating unit is deenergized to thereby provide a pulsed heating output, the duration of the "on" and "off" intervals within the cycle each being selectively variable throughout substantially the entire duration of said cycle, temperature sensing means responsive to the temperature of the liquid upstream of the heating chamber and operably connected to said timer means to vary the duration of the "on" interval of said cycle in proportion to the deviation of the liquid temperature from a predetermined set temperature, a duct system connected to a zone to be heated, said heat exchange means disposed within said duct system, a blower disposed in said duct system and disposed to direct air across said heat exchange means and through said duct system, and a thermostat disposed in the zone to be heated and operably connected to said blower, said thermostat means being opera-

ble to actuate the blower when the temperature in said zone falls beneath a predetermined value.

4,420,678

## LUNCH BUCKET

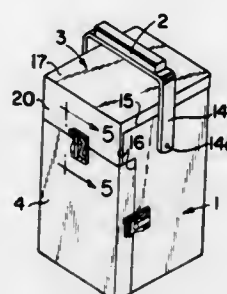
Frank H. Kalb, 13901 W. Marquette Dr., New Berlin, Wis. 53151

Filed Apr. 3, 1981, Ser. No. 250,136

Int. Cl.<sup>3</sup> A21B 1/52; F27D 11/00

U.S. Cl. 219—387

7 Claims



1. A lunch bucket adapted to be carried by an individual workman for on-site use thereby comprising an elongated substantially tubular housing having a substantially greater vertical height than the width and than the depth, said housing having a width substantially the same as the depth to define a cross-section substantially corresponding to a lunch-type sandwich, a handle means secured to the upper end of the housing, said housing having an open top and open front, a top cover secured to said housing at said open top and having a depending side wall projecting down over said open front, a front cover secured to said housing at said open front and extended between said depending side wall and the lower end of said housing, said housing including a plurality of shelf-members defining a plurality of vertically spaced compartments including an uppermost compartment accessible through said open top and through said open side within the length of said depending side wall, and an electrical heating unit including an insulating support and adapted to be releasably deposited within said uppermost compartment.

4,420,679

## GAS CHROMATOGRAPHIC OVEN USING SYMMETRICAL FLOW OF PREHEATED - PREMIXED AMBIENT AIR

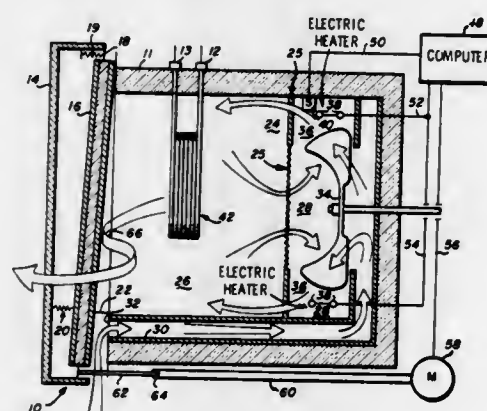
Robert L. Howe, San Ramon, Calif., assignor to Delta Associates, Inc., San Jose, Calif.

Filed Feb. 26, 1982, Ser. No. 352,656

Int. Cl.<sup>3</sup> B01D 15/08; H05B 1/02; F27D 7/04

U.S. Cl. 219—400

7 Claims



1. Apparatus for operating a gas chromatographic oven at near ambient temperature with minimal temperature gradients, comprising in combination:

a housing means with an outer access door and a central chamber consisting of an anterior chamber for providing a heated environment for chromatographic test apparatus and a posterior chamber for minimizing thermal gradients by providing a homogeneous oven temperature about said test apparatus;

insulation means located within the walls of the housing means for providing a thermal boundary between said central chamber and the ambient environment;

plenum chamber means positioned between said central chamber and the housing means for preheating intake air prior to introduction of said air into said central chamber to eliminate temperature differentials in said central chamber;

adjustable inner baffle means positioned between the housing means and said outer access door for regulating the flow of said intake air to the plenum chamber and exhaust air from said anterior chamber;

partition means connected to the inner baffle means for isolating said intake air to the plenum chamber from exhaust air of said anterior chamber;

actuator means located outside the housing means and in mechanical communication with the inner baffle means for positioning the inner baffle means;

air distribution means positioned within said posterior chamber for premixing said intake air with existing central chamber air and distributing said premixed air to said anterior chamber;

heater means positioned within said posterior chamber for heating said premixed air to a program temperature to minimize oven thermal gradients;

sensor means positioned within said posterior chamber of the housing means for sensing the temperature within said central chamber; and

an automatic control means connected to said actuator means and said heater means for receiving temperature data from said sensor means and for transmitting control signals to said heater and actuator means in response to temperature.

pressure contact with one another to define a nip between them, and in which at least one of said rollers is a heating roller, the improvement comprising forming each of said rollers as a deformable thin cylinder, in combination with means elastically supporting each cylinder at its ends, and a pair of aligned pressure rollers extending substantially the full length of said revolving rollers and between them respectively exerting a pressure against said revolving rollers in a direction perpendicular to the axes thereof, whereby said pressure rollers acting upon said elastically supported deformable pressure rollers form between the latter a constant elastically deformable restorable nip across the entire length of said revolving rollers.

4,420,681

## GOLF BALL WARMER

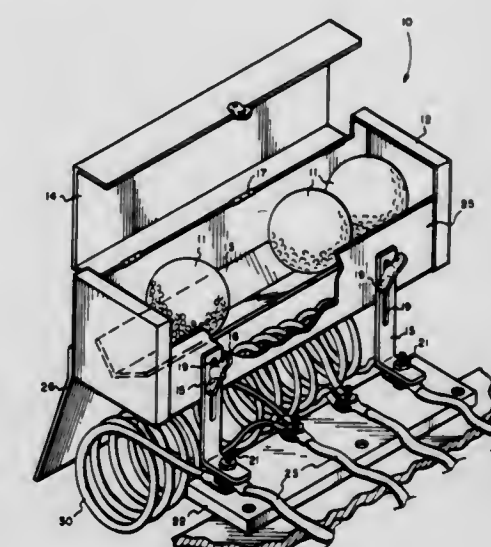
Howard M. Arnold, 3704 Linwood, Royal Oak, Mich. 48073

Filed May 3, 1982, Ser. No. 374,423

Int. Cl.<sup>3</sup> H05B 3/06

U.S. Cl. 219—521

4 Claims



1. For attachment to an electric golf cart having fixed electrical resistance elements for speed control of said cart, said resistance elements having sufficient electrical current flowing therethrough to produce sufficient heat during normal operation of said cart to warm golf balls, a golf ball warmer for warming golf balls comprising:

a horizontal elongate container for golf balls having a hinged cover and an opening along the bottom portion of said container, said container formed from a electrically non-conductive material;

electrically insulated mounting means for mounting said container essentially horizontally over said speed control electrical resistance elements of said golf cart; and

a baffle in the form of a V-shaped trough whereby a golf ball is supported by said trough by a two-point contact therewith, said baffle disposed in and attached to said container having a shape adapted to support a plurality of golf balls, said baffle directing heated air from said electrical resistance elements into said container and protecting said golf balls from direct radiant heat from said electrical resistance;

whereby heated air rising from said electrical resistance elements circulates in said container thereby raising the temperature of said golf balls.

4,420,680

## HEAT ROLLER TYPE FIXING MEANS

Takashi Itoh, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

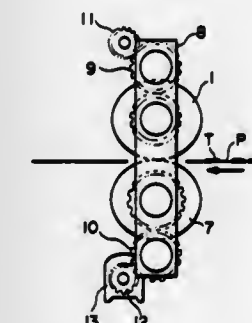
Filed May 3, 1982, Ser. No. 373,845

Claims priority, application Japan, May 18, 1981, 56-73514

Int. Cl.<sup>3</sup> H05B 1/00

U.S. Cl. 219—469

3 Claims



1. In a fixing means for an electrostatic recording apparatus and the like which comprise a pair of revolving rollers in



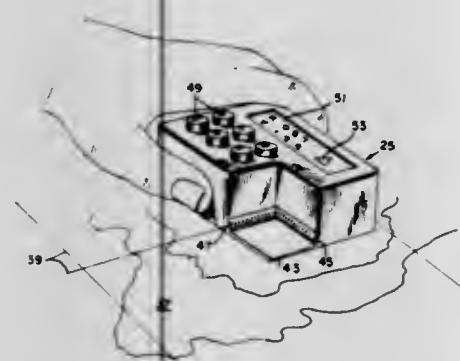
# 4,420,682 INTERACTIVE MAP INFORMATION EXCHANGE SYSTEM

William A. Huber, Sea Girt, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 22, 1982, Ser. No. 360,272  
Int. Cl.<sup>3</sup> G06K 7/10

U.S. Cl. 235—472

23 Claims



1. Apparatus for quickly and accurately exchanging military information between military units, comprising; a map divided into a plurality of map elements or mels, each of said mels being encoded in binary digital form to indicate the x and y coordinates of each said mel, each of said mels being divided into a plurality of sub-mels, means to encode data points to be plotted on said map into binary digital words in which a first group of binary digits of greater significance represent the mel in which the said data point is located and in which the remainder of said binary digits comprises a second group of digits of less significance representing the sub-mel at which said data point is located, one such binary word being provided for each x and y coordinate of each said data point, said apparatus further comprising a manually operated stylus comprising a pair of code sensors adapted to read said first groups of binary digits encoded on said mels, and further apparatus on said stylus to locate the proper sub-mel within the proper mel by utilizing said second group of binary digits.

4,420,683

Patent Not Issued For This Number

# 4,420,684 LARGE-SURFACE FAST PHOTODETECTOR SENSITIVE IN THE 0.8-1.1 μM RANGE

Andre Gauthier, Paris, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Jun. 9, 1981, Ser. No. 271,953

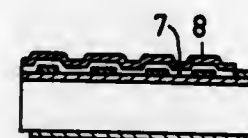
Claims priority, application France, Jun. 13, 1980, 80 13187  
Int. Cl.<sup>3</sup> H01J 39/12

U.S. Cl. 250—211 J

1 Claim

1. In a large-surface photovoltaic photodetector, sensitive in the 0.8-1.1 μm range, comprising a substrate made of silicon with resistivity higher than 10<sup>3</sup> Ω.cm, a diffusion layer having a thickness smaller than 1 μm defining a PN junction, a filter placed on the face exposed to the radiations in order to stop the radiations having a wave-length shorter than a predetermined

length, and contacts for application of a bias potential, characterized in that the filter is a layer of CdTe integrated in the



detector and stopping the radiations having a wave-length shorter than 0.8 μm.

# 4,420,685 METHOD AND EQUIPMENT FOR DETECTING TOOL FAILURE

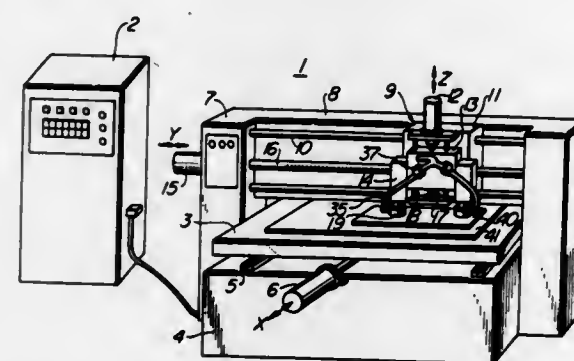
Tamio Ghtani, Kawasaki, and Yasuhiko Kanaya, Machida, both of Japan, assignors to Hitachi Seiko, Ltd., Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,580

Claims priority, application Japan, Aug. 24, 1979, 54-115795  
Int. Cl.<sup>3</sup> G01V 9/04

U.S. Cl. 250—222.2

7 Claims



6. In a drilling machine, a drilling tool failure detection equipment characterized by the provision of a drilling tool,

a feed means for moving the drilling tool to or away from a work,

a work holding means which is provided with a through hole through which said drilling tool is extended toward the work when said drilling tool is moved toward the work and which is provided with a guide means communicated with said through hole,

a supporting means for supporting said work holding means in such a way that said work holding means is movable in the direction perpendicular to the axis of said drilling tool, a small chamber or space defined around said drilling tool by said work holding means,

a chip or particle collection means comprising a duct communicated with said small chamber or space and a suction source communicated with said duct for collecting chips or particles resulting from the drilling of the work, and chip or particle detection means for detecting the quantity of collected chips or particles, whereby whether the drilling tool is intact or broken is detected from the quantity of collected and detected chips or particles.

# 4,420,686 SCANNING ELECTRON MICROSCOPE OR SIMILAR EQUIPMENT CAPABLE OF DISPLAYING SIMULTANEOUSLY A PLURALITY OF IMAGES OF SPECIMEN

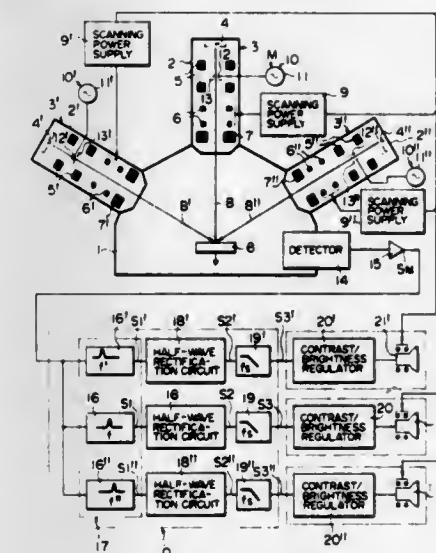
Akira Onoguchi, Chofu; Mitsuhiro Miyazawa, Sagami-hara; Shigetomo Yamazaki, Hachioji, and Masahiro Inoue, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Akashi Seisakusho, Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,163

Claims priority, application Japan, Jan. 29, 1981, 56-11810  
Int. Cl.<sup>3</sup> G01N 23/00; G21K 7/00

U.S. Cl. 250—310

7 Claims



1. A scanning electron microscope or similar equipment capable of irradiating a plurality of beams of charged particles onto a specimen and displaying simultaneously the plurality of images of the specimen, comprising charged particle beam modulation means capable of modulating the intensities of said beams of charged particles through the deflection of said beams by different frequencies, a detector capable of simultaneously detecting signals obtained by irradiating onto the specimen the plurality of beams of charged particles which have been modulated by the charged particle beam modulation means, demodulation selector means capable of demodulating signals from said detector and selecting each specimen image signal from the plurality of pieces of specimen image information obtained by said beams of charged particles, and display means capable of displaying the plurality of images of the specimen upon receipt of signals from said demodulation selector means.

4,420,687

NON-DISPERSIVE INFRARED GAS ANALYZER  
Mark S. Martinez, San Gabriel, and Harold W. Pust, Huntington Beach, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 28, 1982, Ser. No. 437,486

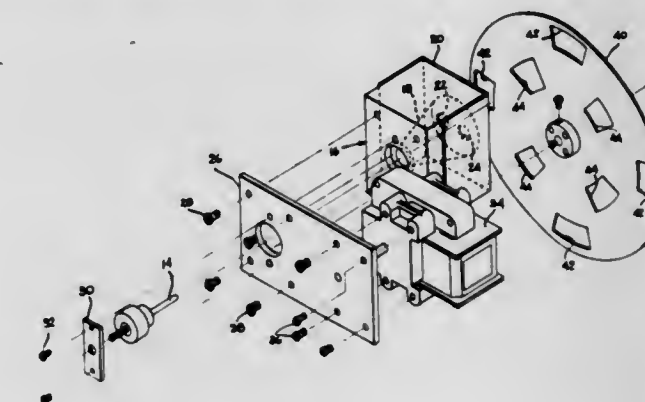
Int. Cl.<sup>3</sup> G01J 1/00

U.S. Cl. 250—343

8 Claims

1. A gas analyzer comprising:  
radiation generating means for providing a directed beam of radiation;  
a generally cylindrical reference cell for containing a reference gas and having first and second ends;  
a generally cylindrical measurement cell for containing a sample gas to be analyzed and having first and second ends and an inner diameter substantially equal to the inner diameter of the reference cell;  
interrupter means for interrupting the directed beam to provide first and second sequentially pulsed beams, including a disk rotated about its center and having a plurality of circumferentially spaced apart generally arcuate shaped outer apertures for generating the second pulsed beam and a plurality of circumferentially spaced apart

generally arcuate shaped inner apertures for generating the first pulsed beam;  
first and second baffles each having a first circular aperture substantially equal to the inner diameter of the reference cell and a second circular reducing aperture having a diameter less than the inner diameter of the reference cell; radiation detection means for measuring the radiation from the two sequentially pulsed beams of radiation; and means for positioning the radiation generating means, the interrupter means, the first and second baffles, the reference and measurement cells and the radiation detection



means so that rotation of the disk in cooperation with its inner and outer apertures interrupts the directed beam to produce the first and second sequentially pulsed beams, respectively, which are directed axially through the second and first circular apertures, respectively, of the first baffle, and then through the first ends of the reference and cells respectively, and so that the radiation beams subsequently emanating from the second ends of the reference and measurement cells are axially directed through the first and second circular apertures, respectively, of the second baffle, and then to the detection means.

4,420,688

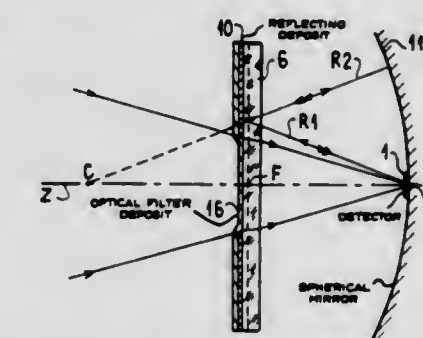
DEVICE FOR DETECTING INFRARED RADIATION  
Jean-Francois Le Bars, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 21, 1981, Ser. No. 285,566

Claims priority, application France, Jul. 22, 1980, 80 16126  
Int. Cl.<sup>3</sup> G01J 1/00

U.S. Cl. 250—352

15 Claims



1. A device for detection of infrared radiation comprising:  
a detector having at least one photo detector element for detecting the infrared radiation which arrives at the detector along a receiving optical path;  
a cooling device within which the detector is supported by a metallic cold table and downstream of a transparent window which insures fluid-tightness while allowing the received radiation to pass to the detector; and  
reflecting means whereby the angle of view of the detector is limited and the radiation emitted by the detector externally of the desired angle of view is reflected back to said detector, said means being constituted by a mirror formed by a reflecting deposit on one face of a transparent element interposed on the optical path of reception of said

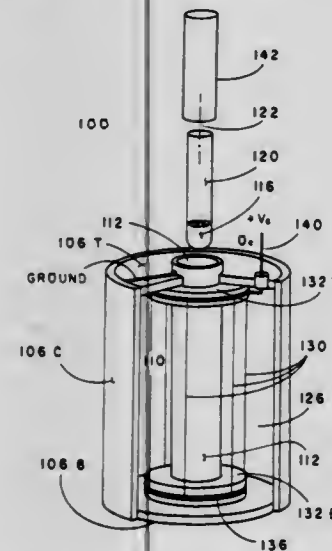


infrared radiation, said reflecting deposit preventing by reflection the reception of radiation located externally of the angle of view, and being formed externally of the cooling device and at least at the level of the outer face of the window.

**4,420,689**  
**MULTI-ANODE DEEP WELL RADIATION DETECTOR**  
Arthur H. Rogers, Los Altos, Calif.; Kevin J. Sullivan, Medfield, Mass., and Gerald R. Mansfield, Painted Post, N.Y., assignors to Medical and Scientific Designs Inc., Rockland, Mass.  
Filed Dec. 22, 1981, Ser. No. 333,629  
Int. Cl.<sup>3</sup> G01T 1/18

U.S. Cl. 250—385

37 Claims



1. An apparatus for assaying a radioactive sample within an assay region for individual gamma radiations emitted therefrom, by providing an output charge in response to each detected gamma radiation propagating from the radioactive source in the assay region, comprising:  
a plurality of spaced fine anode wires;  
area cathode means encompassing the assay region containing the radioactive sample, and spaced from the anode wires defining a collection region between the cathode means and the anode wires through which the gamma radiations propagate;  
conversion medium within the collection region for individually converting the energy of at least a portion of the gamma radiations into transient charged particles;  
power source for maintaining an electric field across the collection region from the anode wires to the area cathode means, which electric field accelerates the transient positive charge towards the area cathode, and accelerates the transient negative particles towards the anode wires causing avalanche multiplication and collection of the negative particles onto the anode wires for defining the output charge; and  
a barrier means between the assay region and the collection region for physically isolating the conversion medium from the radioactive sample.

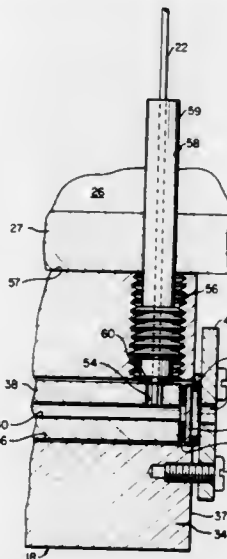
**4,420,690**  
**SPECTROMETRIC MICROSAMPLING GAS CELLS**  
Donald Kuehl, Winchester, Mass., assignor to Bio-Rad Laboratories, Inc., Richmond, Calif.  
Filed Mar. 5, 1982, Ser. No. 354,933  
Int. Cl.<sup>3</sup> G01N 21/00, 23/10

U.S. Cl. 250—428

7 Claims

1. A sample cell for absorption spectrometry of small volume samples in a continuously flowing carrier gas stream, said sample cell comprising in combination:  
a holder in the form of a body of thermally conductive material, said body having an elongate bore penetrating therethrough substantially normal to and between a first and a second face of said body, said body further being

provided with a pair of secondary bores extending radially from said elongate bore and communicating therewith and with the exterior of said body, a one each of said secondary bores being located adjacent a respective one of said first and second faces;  
an elongate open-ended hollow tube dimensioned to fit said elongate bore and to extend therein substantially from said first face to said second face, said tube being further provided with a pair of radial openings communicating between the interior and the exterior of said tube and disposed substantially in axial alignment with said secondary bores;



a pair of fluid conductive transfer line means, each of said transfer line means being disposed in fluid communication with the interior of said tube and the exterior of said body through a respective combined radial opening and secondary bore;  
means sealing and transferline means to said tube; and  
a pair of window means, each of said window means being secured to a respective one of said first and second faces and abutting and sealing a respective open end of said hollow tube.

**4,420,691**  
**METHOD OF ALIGNING ELECTRON BEAM APPARATUS**

John J. Zasio, Sunnyvale, Calif., assignor to Fujitsu Limited, Kawasaki, Japan

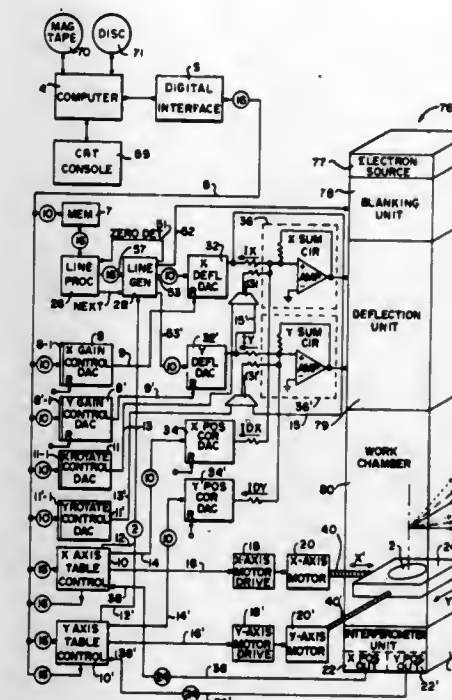
Filed Dec. 28, 1978, Ser. No. 973,909  
Int. Cl.<sup>3</sup> G01M 21/00; A61K 27/02

U.S. Cl. 250—491.1

6 Claims

1. In an electron beam exposure apparatus including an electron source, beam deflection means, a work chamber, an X-Y table within said work chamber, and a work piece holder including alignment device mounted on said table, a method of aligning said electron beam and exposing a work piece to said electron beam comprising the steps of  
(a) moving said table and said work piece to focus said electron beam on a fixed alignment mark on said work piece,  
(b) aligning said electron beam to said fixed alignment mark on said work piece by adjusting gain and rotation of said electron beam to conform to the coordinates of said work piece,  
(c) determining the coordinates of said table relative to the coordinates of said work piece mounted in said holder on

said table by noting the coordinates of at least two known positions on said work piece on the axes of said table, and



(d) moving said table whereby a plurality of partitions of said work piece are exposed to said electron beam.

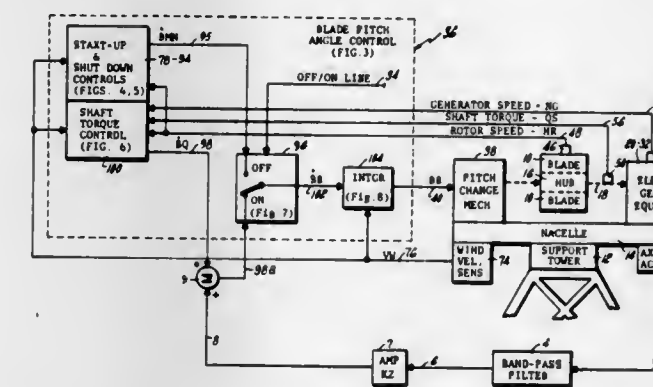
**4,420,692**  
**MOTION RESPONSIVE WIND TURBINE TOWER DAMPING**

Joseph M. Kos, Holyoke, Mass.; John P. Patrick, South Windsor, and Kermit I. Harner, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 2, 1982, Ser. No. 364,706  
Int. Cl.<sup>3</sup> F03D 9/00, 7/04

U.S. Cl. 290—44

4 Claims



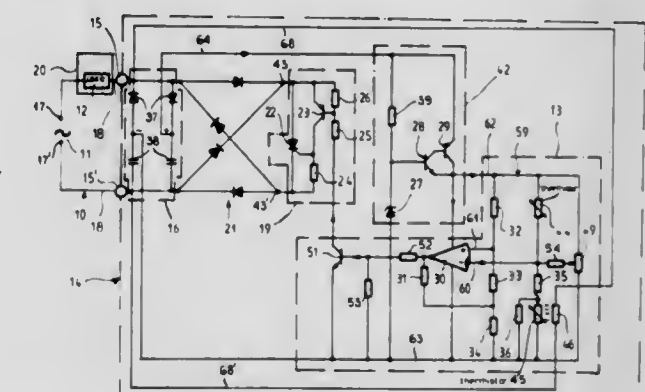
1. A wind turbine system for generating electric power, comprising:  
a tower;  
a rotor disposed on said tower including blades disposed for rotation about an axis and a blade pitch angle change mechanism;  
means for providing an actual torque/power signal indicative of actual torque/power generated by said wind turbine system; and  
signal processing means for providing a reference torque/power signal indicative of desired generated torque/power, and for providing to said blade pitch angle change mechanism a blade pitch angle reference signal as a function of the difference between said actual torque/power signal and said reference torque/power signal;  
characterized by:  
motion responsive means disposed on said tower in the vicinity of said rotor for providing a motion signal indica-

tive of motion of said tower parallel with said blade rotation axis; and  
said signal processing means comprising means for providing said blade pitch angle reference signal as a function of both said motion signal and the difference between said actual torque/power signal and said reference torque/power signal.

**4,420,693**  
**LOAD-CONTROL SYSTEM WITH TWO-CONDUCTOR SUPPLY CIRCUIT**  
Henning Becker, and Fritz Jauss, both of Schönaich, Fed. Rep. of Germany, assignors to Centra-Bürkle GmbH & Co., Schönaich, Fed. Rep. of Germany  
Filed Oct. 23, 1981, Ser. No. 314,434  
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042947  
Int. Cl.<sup>3</sup> F23N 5/20; G05D 23/00

U.S. Cl. 307—66

19 Claims



1. A load-control system responsive to variations in an external parameter, comprising:  
a diode bridge connected across a variable-impedance control element;  
a loop circuit including a pair of conductors with input ends connected across a power supply in the form of an alternating-current source and with output ends connected across said diode bridge;  
a load inserted in one of said conductors between said input and output ends;  
sensing means coupled to said control element for switching same between a low-impedance state and a high-impedance state, respectively corresponding to a high and a low load current, in response to predetermined changes in said external parameter; and  
feed means including a voltage-doubling rectifier bridge connected across said output ends between said load and said diode bridge for keeping said sensing means operational even in said low-impedance state of said control element, said rectifier bridge having a first pair of adjoining arms with two relatively inverted diodes connected to one of said output ends and having a second pair of adjoining arms with two capacitors connected to the other of said output ends, said feed means further including two direct-current supply leads connected to respective junctions of said first pair of arms with said second pair of arms.

**4,420,694**  
**MUTING CIRCUIT**  
Teppel Yokota, Funabashi, and Yoshiro Joichi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed Jul. 22, 1981, Ser. No. 285,839  
Claims priority, application Japan, Jul. 28, 1980, 55-103321  
Int. Cl.<sup>3</sup> H01H 7/16

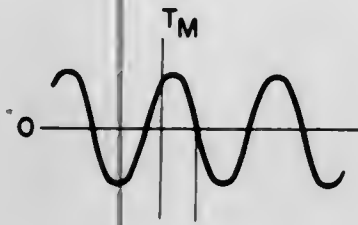
U.S. Cl. 307—130

2 Claims

1. A digital muting circuit comprising, an input terminal for receiving a PCM signal having words of plural bits, an output



terminal for deriving said PCM signal, a controlling circuit for generating a muting signal, a detecting circuit for examining the bit pattern of said PCM signal to produce a detected signal when the signal level of the waveform corresponding to said



PCM signal is less than a predetermined value, and switching means connected between said input terminal and said output terminal and for replacing said PCM signal with a PCM signal having a bit pattern representing the zero level by receiving said detected signal while said muting signal is generated.

4,420,695

**SYNCHRONOUS PRIORITY CIRCUIT**

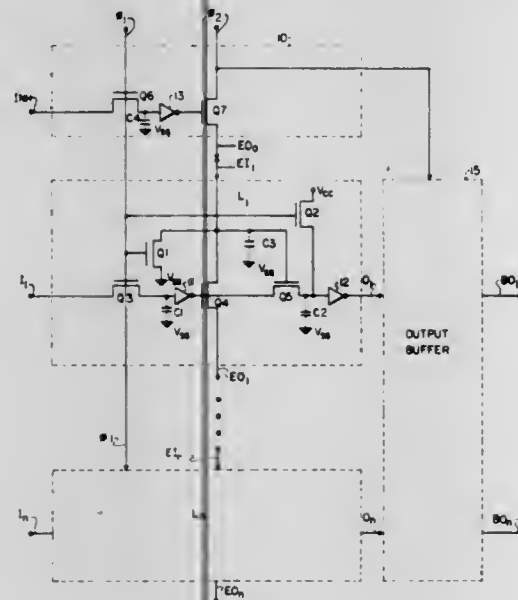
Amnon Fisher, Ramat Hasharon, Israel, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 26, 1981, Ser. No. 267,381

Int. Cl.<sup>3</sup> H03K 17/693, 17/26, 5/153, 5/22

U.S. Cl. 307-242

2 Claims



2. A synchronous priority circuit, comprising "n" input terminals having a descending order of priority 1, ..., k, ..., n, wherein "k" and "n" are positive integers greater than 1; "n" output terminals corresponding to the "n" input terminals; and

a logic circuit connected to the "n" input terminals and the "n" output terminals for causing a logical "true" signal to be provided from any given output terminal in response to a logical "true" signal being provided at its corresponding input terminal when a logical "true" signal is not provided at any higher priority input terminal, wherein the logic circuit comprises

"n" logic elements, each of which is connected between one of the input terminals and its corresponding output terminal and each of which has an enable input and an enable output, wherein the logic elements are interconnected, with the enable input of the "kth" logic element being connected to the enable output of the "(k-1)th" logic element;

wherein each logic element provides a logical "true" signal to the output terminal connected thereto only in response to both a logical "true" signal at the corresponding input terminal and an enable signal at its enable input, and further provides an enable signal at its enable output only if a "true" signal is provided to its

enable input, and it does not provide a logical "true" signal to the output terminal connected to the logic element;

means for providing an enable signal to the enable input of the first logic element;

means for inhibiting the provision of an enable signal to the enable input of the first logic element; and

a current path between the enable input and the enable output in each logic element wherein the current path includes a field effect transistor connected in series between the enable input and the enable output, with its gate being coupled to the corresponding input terminal for preventing an enabling signal from being provided from the enable output when a logical "true" signal is provided at the corresponding input terminal.

4,420,696

**PULSE TRAIN PRODUCING APPARATUS**

Kazutoshi Gemma, Sagami-hara, and Noriaki Hashimoto, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

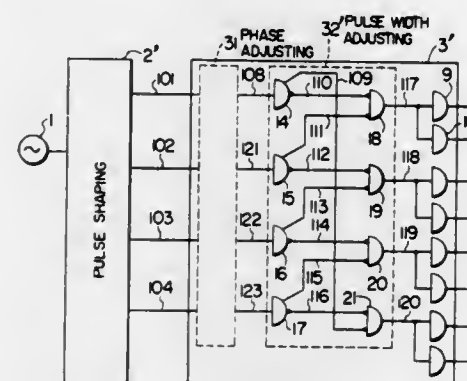
Filed Feb. 25, 1981, Ser. No. 238,039

Claims priority, application Japan, Feb. 25, 1980, 55/22600

Int. Cl.<sup>3</sup> H03K 5/15, 19/21

U.S. Cl. 307-262

14 Claims



1. A pulse train producing apparatus comprising first means for generating a plurality of pulse trains different in phase from one another, the pulses in one train generated from said first means overlapping at respective trailing edge portions including the trailing edges thereof, respectively, with leading edge portions including the leading edges of the pulses in a different train, and second means receiving said pulse trains generated from said first means to cut away the overlapping trailing or leading edge portions of the respective pulses in each of said pulse trains, said second means including a binary output circuit provided for each of the pulse trains to generate a non-inverted output and an inverted output in response to each of the pulses thereof, and an AND circuit connected to said binary output circuit for making an AND operation on the non-inverted output appearing from said binary output circuit and the inverted output appearing from the binary output circuit provided for a different one of said pulse trains.

4,420,697

**PROCESS AND APPARATUS FOR MONITORING THREAD BREAKAGE BY THE USE OF A THRESHOLD DEVICE**

Gerhard Fiedler, Greiz; Werner Fritzsche, Greiz-Moschwitz; Frank Herold, and Uwe Tolkmitt, both of Greiz, all of German Democratic Rep., assignors to VEB Kombinat Wolle und Seide, Meerane, German Democratic Rep.

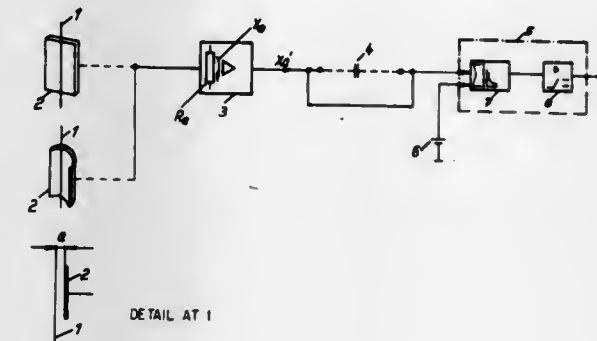
Filed Apr. 7, 1981, Ser. No. 251,811

Claims priority, application German Democratic Rep., Apr. 29, 1980, 220763; Oct. 9, 1980, 224417; Nov. 21, 1980, 225376

Int. Cl.<sup>3</sup> D01H 13/16; G01R 29/12; D04B 35/14

U.S. Cl. 307-308

11 Claims



1. An apparatus for monitoring breakage of a moving thread, comprising a flat or concave plane electrode positioned in the proximity of but not touching the thread so that an electrical charge corresponding to the stochastic charge on the thread is electrostatically induced on said electrode, and an amplifier having a high input impedance connected to said electrode so that a potential signal corresponding to the stochastic charge is provided at the output of said amplifier, so long as the thread has not broken.

4,420,698

**PEAK DETECTOR**

Johannes F. A. Raadsen, Enschede, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

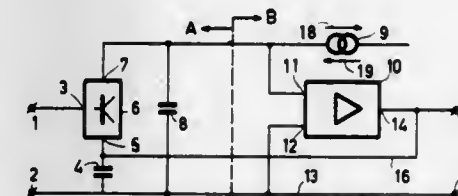
Filed Feb. 20, 1981, Ser. No. 236,358

Claims priority, application Netherlands, Feb. 29, 1980, 8001234

Int. Cl.<sup>3</sup> H03K 5/153; G01R 19/04

U.S. Cl. 307-351

9 Claims



1. A peak detector comprising, first and second input terminals for receiving an input voltage having a peak value, a voltage comparator circuit comprising a transistor having base, emitter and collector electrodes, means connecting said first input terminal to one of said emitter and base electrodes, a first capacitor operative as a storage element and connected to the other one of said emitter and base electrodes, a current source arrangement, a charging circuit coupled to said first capacitor and comprising an amplifier arrangement having a high-ohmic input connected to the collector electrode of said transistor and to said current source arrangement, a second capacitor connected to said collector electrode of the transistor, means coupling said first and second capacitors to the second input terminal and to a point of reference potential, said voltage comparator circuit being operative to compare said input voltage with the voltage across the first capacitor so as to control the charge on said first capacitor in a compensating sense if the capacitor voltage is not directly proportional to the

4,420,699

**FREQUENCY TO VOLTAGE CONVERTER FOR A DIGITAL TACHOMETER**

Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

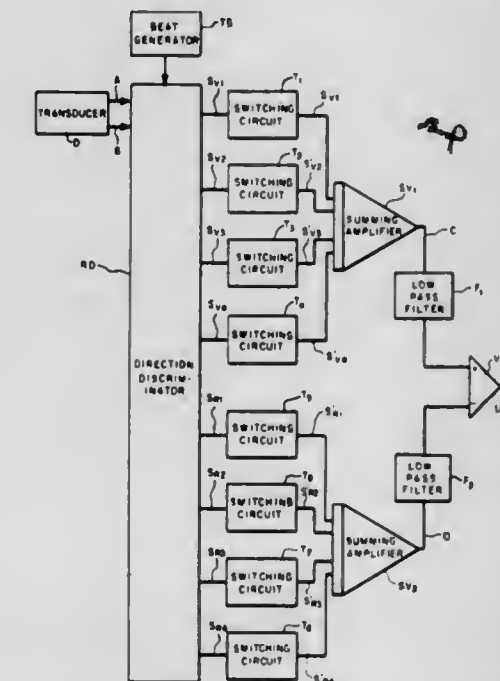
Filed Mar. 30, 1982, Ser. No. 363,475

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115497

Int. Cl.<sup>3</sup> H03K 5/26, 9/04

U.S. Cl. 307-519

9 Claims



1. A frequency-to-voltage converter for use with an incremental measuring system of the type which generates at least two periodic measured signals, said converter comprising:

direction discriminator means, responsive to the measured signals, for generating at least two forward pulse trains and at least two backward pulse trains in response to the phase relationship between the measured signals, the at least two forward pulse trains each having a frequency corresponding to and no less than that of the measured signals and phase shifted with respect to one another, the at least two backward pulse trains each having a frequency corresponding to and no less than that of the measured signals and phase shifted with respect to one another;

at least two first switching means, each coupled to the discriminator means to receive a respective one of the forward pulse trains, for generating a sequence of constant energy pulses in response to the respective pulse train;

at least two second switching means, each coupled to the discriminator means to receive a respective one of the backward pulse trains, for generating a sequence of constant energy pulses in response to the respective pulse train; means for combining the sequences of constant energy pulses from the first switching means to generate a first composite signal;

means for combining the sequences of constant energy pulses from the second switching means to generate a second composite signal;

a differential amplifier having two input terminals and an output terminal;

means for passing low frequency components of the first composite signal to the first input terminal; and



means for passing low frequency components of the second composite signal to the second input terminal.

#### 4,420,700 SEMICONDUCTOR CURRENT REGULATOR AND SWITCH

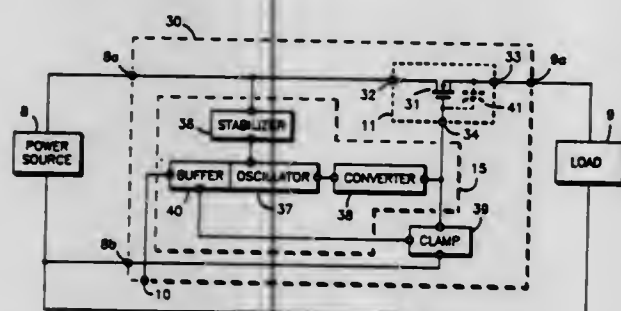
Gary V. Fay, and Alvin Pshaenich, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 24, 1981, Ser. No. 267,227

Int. Cl.<sup>3</sup> H03K 17/00; G05F 1/56

U.S. Cl. 307—571

9 Claims



1. An apparatus responsive to an external signal for regulating the flow of current from a power source of predetermined voltage to a load, comprising:

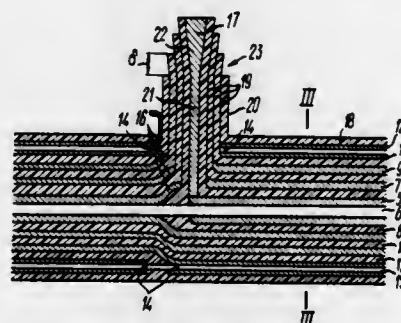
enhancement mode type current conducting means for regulating current flow between a first power terminal adapted to be coupled to said power source and a second power terminal adapted to be coupled to said load, and having a control means for enabling said current flow only in response to a control voltage larger than said predetermined voltage;

clamp means responsive to said external signal and coupled to said control means for disabling said current flow only in response to a turn-off portion of said external signal; driver means coupled to said power source and said control means for generating said control voltage from said predetermined voltage in response only to a turn-on portion of said external signal, wherein said driver means comprise; stabilizer means coupled to said first power terminal and having a limited voltage output;

oscillator means responsive to said external signal, coupled to said stabilizer voltage output and having an output for oscillatory signals; and

converter means coupled to said output for oscillatory signals and to said control means for converting said oscillatory signals to unidirectional pulses for accumulation in storage capacitance to produce said control voltage on said control means.

of the generator high-voltage winding, located in the front part of the generator stator and joined to the inlet bar in the zone of a high-voltage lead-in and cooling ducts characterized in that conducting layers (1,2,3,4) made up of insulated conductors form summary turns of the generator high-voltage winding in the shape of concentrically arranged tubes (5,7,9,11,12) connected to one another in the high-voltage lead-in zone by template tubular elements (16) securing consecutive transition of the tube (5) of the first summary turn of the high-voltage winding into the tube (7) of the second summary turn, of the tube (7) of the secondary summary turn into a tube (9) of the third summary turn and so on until the tube (9) of the penultimate summary turn changes over into the tube (11 and 12) of the last summary turn of the high-voltage generator winding, which is the zero potential lead-out, the cooling ducts being separated into a central cooling duct (6) which, in this case, is the internal central space of the tube of the first summary turn of the generator high-voltage winding and peripheral cooling ducts (15), each such duct being formed by two adjoining tubes



(11 and 12) which are electrically connected by jumpers (14) and produce one summary turn of the generator high-voltage winding, whereas the inlet bar (17) having the maximum potential and a coating composed of insulation layers (8,10,13) separated by sheaths (19), each sheath (19) being connected to its turn of the generator high-voltage winding, is made of a cylinder (21) and a truncated cone (22), wherein one base of the cylinder (21) is connected to the beginning of the first summary turn of the generator high-voltage winding and the other base of said cylinder (21) is connected to the beginning of the first summary turn of the generator high-voltage winding and the other base of said cylinder (21) is the smaller base of the truncated cone (22), the insulation layer (8) with its sheath (19), which is adjacent to the inlet bar (17) is equal in height thereto, whereas each subsequent insulation layer (10,13) with its sheath (10) is arranged below the preceding insulation layer by the same value  $\delta$ , the inlet bar (17) and all adjacent insulation layers (8,10,13,18) with their sheaths (19,20) constituting a high-voltage inlet element (23).

#### 4,420,702 RESILIENT MOTOR MOUNTING FOR AN ELECTRIC DRY SHAVER OR THE LIKE

Ingomar Mixner, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 202,034, Oct. 29, 1980, abandoned.

This application Jul. 12, 1982, Ser. No. 397,390

Claims priority, application Austria, Nov. 22, 1979, 7441/79 Int. Cl.<sup>3</sup> H02K 5/04

U.S. Cl. 310—50

2 Claims

1. An apparatus such as a dry shaver, which comprises a housing assembly forced by two opposing housing shells; an electric motor within the housing assembly; at least one support member formed integrally with and extending inwardly from only one housing shell; an elastic pad associated with the inwardly projecting end of said support member; a resilient hook member adjacent said one support member, said resilient hook member being formed integrally with said one housing shell and projecting inwardly from only said one housing shell; a hook portion at the free end of said resilient hook member, said hook portion engaging an edge portion of the motor and urging said motor against the elastic pad and its associated

PCT No. PCT/SU80/00220, § 371 Date Aug. 26, 1982, § 102(e) Date Aug. 26, 1982, PCT Pub. No. WO82/02460, PCT Pub. Date Jul. 22, 1982

PCT Filed Dec. 30, 1980, Ser. No. 414,371

Int. Cl.<sup>3</sup> H02K 3/24

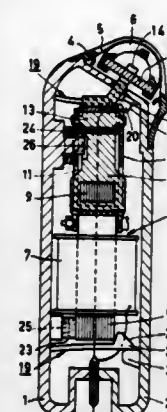
U.S. Cl. 310—54

1 Claim

1. A coupling unit for connection of a generator high-voltage winding and an inlet bar, comprising insulated conductors

support member to hold the motor only against said one housing shell; and a projection extending inwardly from only the other housing shell, said projection engaging the free end of

said frame on opposite sides of the rotor, magnet and worm gear, said covers and said continuous hollow non-magnetic frame thereby forming the housing for said motor drive.



#### 4,420,704 SMALL ELECTRIC MOTOR

Takaichi Mabuchi, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Japan

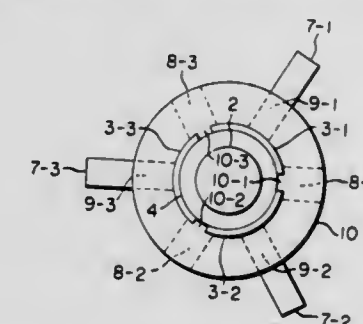
Filed Oct. 13, 1981, Ser. No. 310,629

Claims priority, application Japan, Oct. 23, 1980, 55-151495[U]

Int. Cl.<sup>3</sup> H02K 13/06

U.S. Cl. 310—220

6 Claims



the resilient hook member and constituting a stop for the same to thereby position the resilient hook member relative to the motor.

#### 4,420,703 PERMANENT MAGNET MOTOR DRIVEN WINDOW LIFTER

Peter Adam, Höchberg; Werner Seuffert, Bergheinfeld, and Abdul R. Saeed, Würzburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

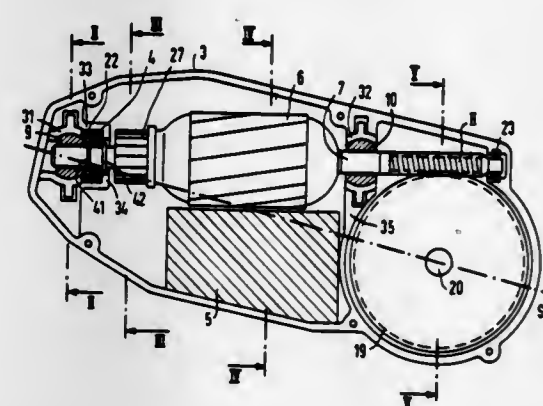
Continuation of Ser. No. 144,572, Apr. 28, 1980, which is a continuation of Ser. No. 964,634, Nov. 11, 1978. This application Jul. 23, 1982, Ser. No. 400,989

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 2556531

Int. Cl.<sup>3</sup> H02K 21/26

U.S. Cl. 310—154

8 Claims



1. A motor drive useful in a window lifter for motor vehicles, having an integrated narrow housing comprising:

(a) a substantially continuous hollow, non-magnetic frame;

(b) a permanent magnet DC motor comprising

(1) a rotor;

(2) a single permanent magnet; and

(3) first and second pole plates for conducting flux from said magnet to opposite sides of said rotor, said pole plates in contact with said magnet on opposite sides thereof;

(c) a worm gear drive comprising:

(1) a drive shaft extending from said rotor and connected to a worm;

(2) a worm gear which lies in the plane of the drive shaft engaging said worm;

(d) said single permanent magnet located adjacent to the rotor on the same side of the shaft as the worm gear and bounded on one side by said rotor on an adjacent side by said worm gear and on the side opposite said rotor by said hollow non-magnetic frame; and

(e) said pole plates being in the form of covers fastened to

1. A commutator portion of a small electric motor, comprising:

a rotatable motor rotor shaft;

an insulating cylinder fixed to said shaft having an enlarged diameter portion, said enlarged diameter portion having a plurality of spaced guide grooves therein;

a plurality of commutator segments circumferentially spaced on a portion of said insulating cylinder, each commutator segment having a commutator terminal extending through a respective one of said guide grooves and a gap defined between adjacent commutator segments;

said enlarged diameter portion of said insulating cylinder having a reservoir defined therein for accommodating each gap; an electrically conductive adhesive disposed in each reservoir and deposited in such a manner as to bridge each gap, said electrically conductive adhesive being a mixture prepared by mixing both or one of metallic powder and carbon powder with an adhesive which hardens; and

means connected to said enlarged diameter portion for separating each reservoir from portions of said commutator segments adapted to be contacted by brushes of the small electric motor.

#### 4,420,705 CONTACT AND TERMINAL ASSEMBLY FOR A BRUSH WEAR INDICATOR

Dan W. Kimberlin, Erie, Pa., assignor to General Electric Company, Research Triangle Park, N.C.

Filed May 26, 1982, Ser. No. 382,034

Int. Cl.<sup>3</sup> H02K 13/00

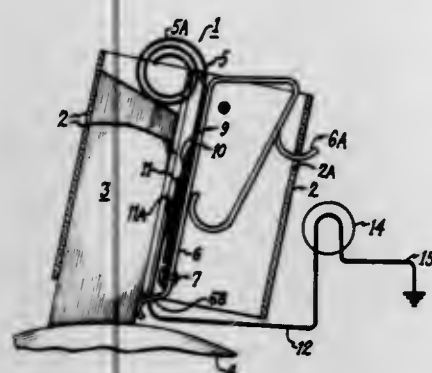
U.S. Cl. 310—242

8 Claims

1. A brush wear indicator contact and terminal assembly, for use with a self-winding brush-follower spring having a coil portion that operates as a contactor to complete an electrical circuit with the assembly thereby to actuate a signal responsive to the occurrence of a predetermined degree of brush wear, comprising, a sheet of flexible dielectric material fastened to said spring adjacent the uncoiled end thereof, a generally flat, bendable contact plate having a ridge on a first surface thereof and having a groove on a second surface thereof, said groove being adapted to receive an electrical conductor therein, an electrical conductor having a predetermined part thereof mounted in said groove and in electrical conducting relationship to the contact plate, said contact plate being mounted in fixed relation to said sheet of dielectric material and to the uncoiled end of said spring, with the groove in the plate facing



said sheet to position the ridge on the contact plate in the path of movement of the coil portion of the spring so that the ridge is engaged by the coil responsive to the spring winding up and moving the coil a predetermined distance toward the fixed end



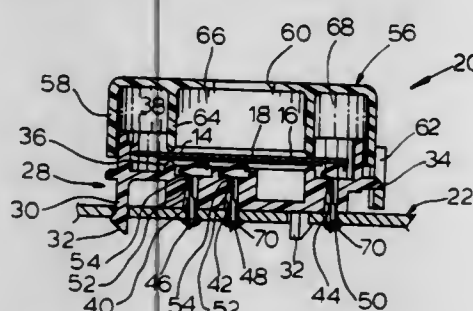
of the spring, thereby to electrically connect the spring to said electrical conductor, said sheet of dielectric material being effective to electrically isolate the contact plate from the spring responsive to said coil being disengaged from said ridge.

#### 4,420,706 CONNECTOR ASSEMBLY FOR A PIEZOELECTRIC TRANSDUCER

Donald J. Siebold, Naperville; Michael K. Troy, Westmont, and William R. Lenz, Crestwood, all of Ill., assignors to Molex Incorporated, Lisle, Ill.  
Continuation of Ser. No. 138,088, Apr. 7, 1980, abandoned, which is a continuation of Ser. No. 3,477, Jan. 15, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 335,071  
Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—324

17 Claims



1. A connector assembly for supporting a piezoelectric transducer disc in a position generally parallel to and spaced above a surface of a printed circuit board, said connector assembly comprising:

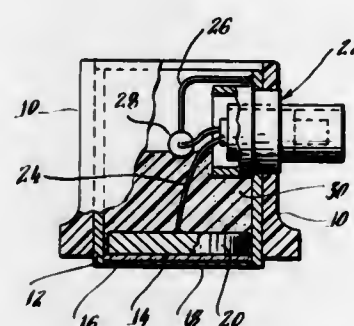
- a unitary formed conductive body having
  - a base structure;
  - first tab means extending downwardly from said base structure for connection to the printed circuit board and for positioning said base structure adjacent said printed circuit board surface;
  - a plurality of disc holding means extending upwardly from said base structure engageable with the periphery of the disc at spaced locations around the disc periphery for releasably supporting the disc above the base means and for electrically contacting the disc periphery;
  - a contact supporting portion;
  - additional tab means extending downwardly from said contact supporting portion for connection to the printed circuit board and for positioning said contact supporting portion adjacent said printed circuit board surface;
  - a resilient contact extending upwardly from said contact supporting portion and adapted to electrically and resiliently engage said disc at a region spaced inwardly from the disc periphery; and
  - a frangible portion interconnecting said base structure and said contact supporting portion, said frangible portion

being separable from said conductive body for electrically isolating said contact supporting portion from said base structure.

4,420,707  
BACKING FOR ULTRASONIC TRANSDUCER CRYSTAL  
Howard E. VanValkenburg, New Fairfield, Conn., assignor to Automation Industries, Inc., Greenwich, Conn.  
Filed Aug. 9, 1982, Ser. No. 406,122  
Int. Cl.<sup>3</sup> H01L 41/08

U.S. Cl. 310—327

4 Claims



1. An electroacoustic transducer for ultrasonic inspection systems and the like which comprises:

- a piezoelectric element having front and back faces; and
- a rigid plate in intimate contact with the back face of the crystal having high ultrasonic energy attenuation characteristics, said plate being formed substantially solely of porous sintered metal.

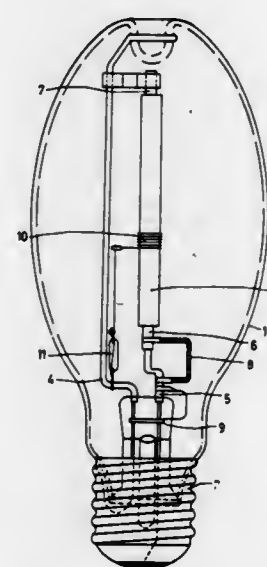
4,420,708  
HIGH-PRESSURE SODIUM VAPOR DISCHARGE LAMP  
Cornelis A. J. Jacobs, and Peter A. W. Tielemans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 960,419, Nov. 13, 1978, abandoned.  
This application Aug. 28, 1980, Ser. No. 182,192  
Claims priority, application Netherlands, Dec. 2, 1977, 7713348

Int. Cl.<sup>3</sup> H01J 61/073

U.S. Cl. 313—628

2 Claims



1. A high-pressure sodium vapor discharge lamp which comprises: a hermetically sealed tubular ceramic discharge vessel containing sodium, mercury and a rare gas, at least first and second lead-through conductors extending through said discharge vessel, at least first and second electrodes disposed in said discharge vessel which are respectively connected to said first and second lead-through conductors, said electrodes extending into said vessel and having a plurality of turns of tungsten wire disposed around the end thereof extending into said ves-

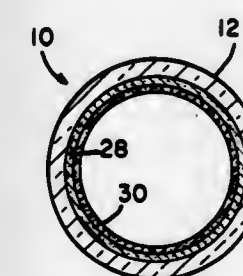
sel, the space intermediate said turns being filled with an electron-emitting material substantially consisting of alkaline earth metals bound to oxygen and tungsten bound to oxygen, said electron-emitting material comprising barium, strontium and calcium as alkaline earth metals bound to oxygen and that the molar ratio of the total quantity of said alkaline earth metals bound to oxygen to the tungsten bound to oxygen is between 8 and 50.

4,420,709  
FLUORESCENT LAMP EMPLOYING MEANS FOR CONTROLLING EMISSION OF SHORT WAVELENGTH ULTRAVIOLET RADIATION  
Kendrick D. Ratray, Danvers, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 9, 1981, Ser. No. 319,339  
Int. Cl.<sup>3</sup> H01J 1/62

U.S. Cl. 313—486

2 Claims

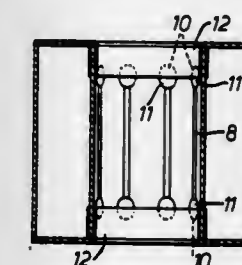


1. A fluorescent lamp useful in the biomedical treatment of skin disorders, said lamp comprising means for generating a relatively broad spectrum of ultra violet radiation including desirable long wavelength radiation and less desirable short wavelength radiation, the improvement comprising: a layer of a first phosphor within said lamp, said first phosphor being adhered to the interior surface of said lamp and absorbing said short wavelength radiation and re-emitting this absorbed energy as said long wavelength radiation; said means for generating said relatively broad spectrum of ultraviolet radiation including a low pressure mercury arc discharge and a second layer of phosphor overlying said first phosphor.

4,420,710  
CO-AXIAL MAGNETRONS  
Alan H. Pickering, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, England  
Filed Aug. 14, 1981, Ser. No. 292,749  
Claims priority, application United Kingdom, Aug. 14, 1980, 8026569

Int. Cl.<sup>3</sup> H01J 25/50  
U.S. Cl. 315—39.77

9 Claims



1. A co-axial magnetron comprising:  
an outer cylinder having a longitudinal axis;  
an anode member coaxial with said longitudinal axis and surrounded by said outer cylinder, the space between said anode member and said outer cylinder forming a main resonant cavity;  
partition means connected to said anode member for forming a plurality of subsidiary cavities within the space

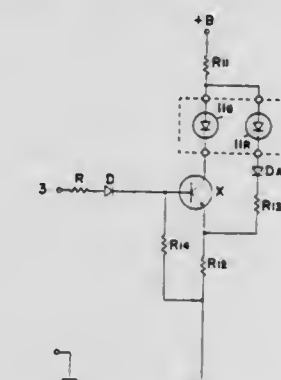
defined by said anode member, said anode member having a plurality of slots extending through the wall thereof in the direction of said longitudinal axis for coupling said main resonant cavity to at least one of said subsidiary cavities, each of said slots having an elongated central portion and opposite ends; and  
a resistive attenuating material located within at least one of said slots at at least one end thereof to attenuate undesired slot modes of oscillation.

4,420,711  
CIRCUIT ARRANGEMENT FOR DIFFERENT COLOR LIGHT EMISSION  
Solchi Takahashi, Tokyo, and Susumu Kobayashi, Ebina, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jun. 11, 1982, Ser. No. 387,432  
Claims priority, application Japan, Jun. 15, 1981, 56-87718[U]  
Int. Cl.<sup>3</sup> H05B 37/02

U.S. Cl. 315—296

6 Claims



1. A circuit arrangement for different color light emission, comprising:

- (a) first series circuit of a first light-emitting element having a given color, a diode and a resistor; and
- (b) a second series circuit of a second light-emitting element having another color, and an active element, said active element being responsive to an input control signal so as to change a current flowing therethrough, said first and second series circuits being connected in parallel and interposed between two terminals of a power source, the impedance of said first series circuit being selected to be much greater than that of said second series circuit when said active element is conductive.

4,420,712  
ELECTRIC DRIVE FOR SYNCHRONOUS DISPLACEMENT OF MECHANICALLY INDEPENDENT MACHINE ASSEMBLIES MOVING ALONG EQUIDISTANT TRAJECTORIES

Viktor T. Bellkov; Anatoly D. Ivlev; Valentin M. Sitnichenko; Vladimir I. Shvets, and Leonid V. Bushtian, all of Odessa, U.S.S.R., assignors to Odessky Ordena Trudovogo Kraskogo, Odessa, U.S.S.R.

PCT No. PCT/SU81/00032, § 371 Date Dec. 7, 1981, § 102(e) Date Dec. 7, 1981, PCT Pub. No. WO81/03092, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 10, 1981, Ser. No. 329,280  
Claims priority, application U.S.S.R., Apr. 19, 1980, 2912668  
Int. Cl.<sup>3</sup> H02K 41/03

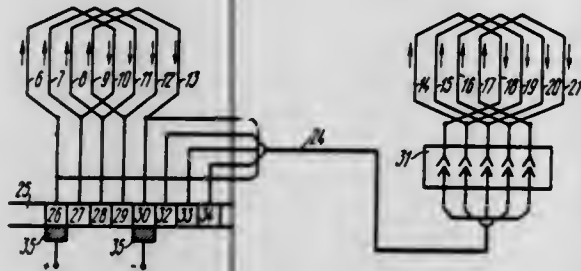
U.S. Cl. 318—41

3 Claims

1. An electric drive for synchronous displacement of mechanically independent machine assemblies moving along equidistant trajectories, comprising at least two d.c. electric motors electrically connected to one another, each including a stationary former of magnetic field, a movable portion located within the zone of action of this magnetic field, an excitation



winding and conductors of sections of an armature winding, and a commutating device connected to the armature winding sections, characterized in that each former of magnetic field is a ferromagnetic strip provided with pole-forming projections disposed in two rows along the displacement direction, the pole-forming projections of one row being shifted relative to the pole-forming projections of another row, the movable portion of each motor is a ferromagnetic module carrying the



excitation winding and conductors of the armature winding, the conductors of the armature winding accomplish electrical connection between the motors, and the ends of sections thereof, terminated at the side of one of the motors, are connected to the commutating device for forced commutation of these sections as a function of a relative location of the ferromagnetic modules and the pole-forming projections of corresponding formers of magnetic field.

4,420,713

#### TURN-OFF CONTROL MEANS FOR AN AC-TO-DC ELECTRIC POWER CONVERTER

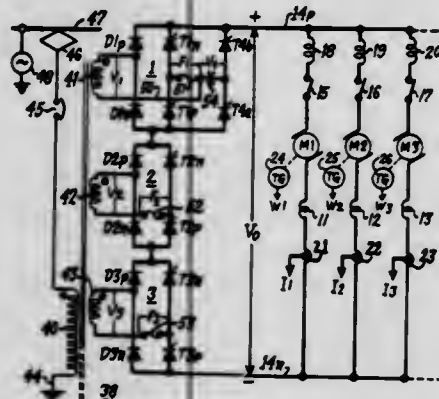
Prem G. N. Chandran, and Edward S. Matulevich, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Sep. 30, 1982, Ser. No. 429,727

Int. Cl.<sup>3</sup> H02P 5/12; H02M 7/155

U.S. Cl. 318—71

15 Claims



1. Improved means for controlling an electric power converter used to supply direct current to at least one electric motor, said converter comprising the combination of a plurality of rectifying circuits each having a-c input terminals, a pair of d-c output terminals, and controllable means including at least one pair of alternately conducting main electric valves for interconnecting said input and output terminals so as to convert alternating voltage at said input terminals to direct voltage of variable average magnitude at said output terminals, the pair of main valves in a first one of said rectifying circuits having cyclically operative valve turn off means respectively associated therewith, means for respectively applying a plurality of in-phase alternating voltages from an a-c power source to corresponding input terminals of said rectifying circuits, means for serially connecting the output terminal pairs of said rectifying circuits to an electric load circuit including said motor, whereby the voltage applied to said load circuit is the sum of the output voltages of all of said rectifying circuits, means for providing speed and current feedback signals respectively representative of the speed of said motor and

of the magnitude of current that said converter supplies thereto, means responsive to said feedback signals and to a given command signal for producing a control signal having a value that varies between predetermined first and second limits as a function of any error between actual and desired magnitudes of motor current, and turn on control means responsive to said control signal for generating a first set of firing signals capable of periodically turning on said main valves in said first rectifying circuit in synchronism with the alternating voltage applied to the input terminals thereof and for generating a second set of firing signals capable of periodically turning on the main valves in a second one of said rectifying circuits in synchronism with the alternating voltage applied to the input terminals thereof, the firing signals of said first set being nominally generated at an ignition angle ( $\alpha_1$ ) that varies from fully retarded to fully advanced as said control signal varies over a first predetermined range of values extending from said first limit to a preselected intermediate value of said control signal and the firing signals of said second set being nominally generated at an ignition angle ( $\alpha_2$ ) that varies from fully retarded to fully advanced as said control signal varies over a second predetermined range of values extending from approximately said preselected intermediate value to another control signal value outside of said first range, wherein the improvement comprises turn off control means responsive to said speed feedback signal and operative to control said valve turn off means so that normally said main valves in said first rectifying circuit are periodically turned off in synchronism with the alternating voltage applied to the input terminals thereof at a desired extinction angle ( $\beta$ ) which varies as a function of motor speed.

4,420,714

#### APPARATUS FOR CONTINUOUSLY INCREMENTING AN OUTPUT MEMBER

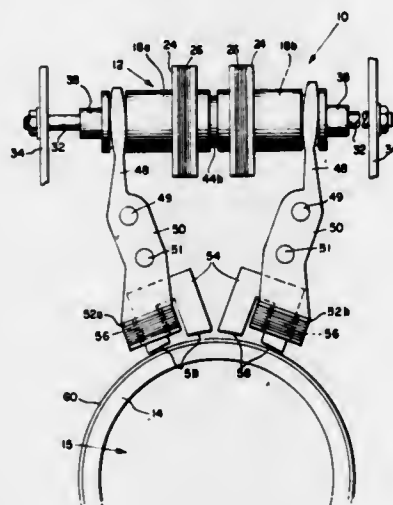
Christian C. Petersen, Westwood, and Bernard C. Westgate, Jr., Bradford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 2, 1981, Ser. No. 308,151

Int. Cl.<sup>3</sup> H02K 33/16; G03B 9/10

U.S. Cl. 318—135

15 Claims



1. Motion producing apparatus for moving an element along a given path, said apparatus comprising: a linear actuator having a pair of output members, said actuator being energizable for reciprocally moving in synchronism each of said output members in opposite directions; and means for alternately magnetically coupling said output members to said movable element so as to progressively move said element in a given direction along said given path.

4,420,715

#### APPARATUS FOR CONTROLLING MOTOR SPEED

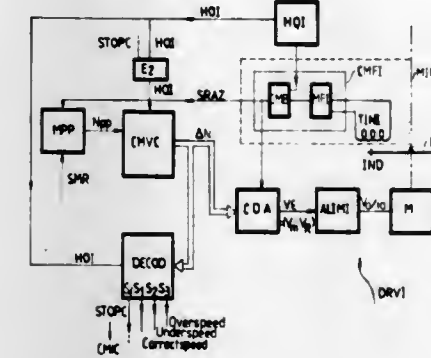
Georges Lecourtier, and Jean-Claude Bouquigny, both of Paris, France, assignors to CII Honeywell Bull, Paris, France  
Filed Jul. 2, 1981, Ser. No. 280,084

Claims priority, application France, Jul. 11, 1980, 80 15547

Int. Cl.<sup>3</sup> H02P 5/16

U.S. Cl. 318—301

12 Claims



1. Apparatus for controlling the rotational velocity of a motor comprising a counter, means for resetting the counter in response to a shaft driven by the motor passing a reference rotational position during each turn of the shaft, means for stepping the counter at a predetermined fixed frequency a plurality of times between adjacent resettings of the counter, whereby the counter has a count at the time of the resetting indicative of the deviation between the actual shaft speed and a set shaft speed, the means for resetting including means for controlling the value to which the counter is reset each time the shaft passes the reference position, the value controlling means including means responsive to a deviation count derived from the counter each time the counter is reset and a signal commensurate with a count preset into the counter when the counter was last reset for adding the deviation count to the last preset count, means responsive to the counter for deriving a velocity control signal for the motor each time the counter is reset, the velocity control signal having a magnitude directly proportional to the deviation, whereby the velocity control signal has a zero amplitude in response to a zero deviation, and means for controlling the motor velocity in response to the velocity control signal.

4,420,716

#### DC MOTOR CONTROL APPARATUS

Kazuyoshi Imazeki, and Masao Nakano, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

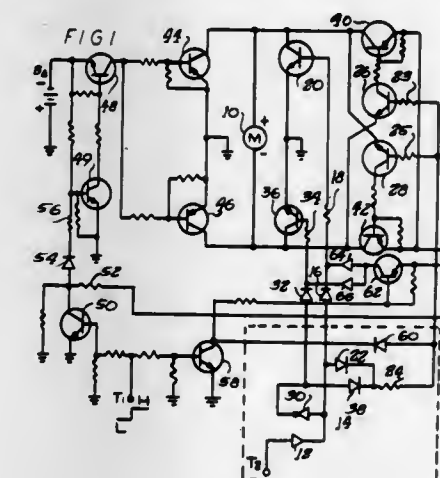
Filed Dec. 22, 1980, Ser. No. 219,314

Claims priority, application Japan, Dec. 29, 1979, 54-173098

Int. Cl.<sup>3</sup> H02P 3/14

U.S. Cl. 318—379

9 Claims



1. A DC motor control apparatus for controlling a DC

1037 O.G.—28

motor, comprising: a first pair of switching elements coupled intermediate a ground potential and oppositely-poled ends of said DC motor respectively, a second pair of switching elements coupled intermediate a source of driving potential and oppositely-poled ends of said DC motor respectively, circuit means coupled with said first and second pairs of switching elements and responsive to respective first and second predetermined logic contents of a two-bit binary logic signal for respectively actuating a selected one of each of said first and second pairs of switching elements for establishing a current path for forward direction and reverse direction operation of said DC motor, respectively, and a third pair of switching elements connected intermediate ground potential and said oppositely-poled ends of said DC motor respectively, said circuit means being further responsive to a third predetermined logic content of said two-bit binary logic signal for simultaneously actuating both of said first pair of switching elements and both of said third pair of switching elements to form a current path for releasing an electromotive force of either polarity from said DC motor during braking from rotation in either direction thereof.

4,420,717

#### USE OF MOTOR WINDING AS INTEGRATOR TO GENERATE SAWTOOTH FOR SWITCH MODE CURRENT REGULATOR

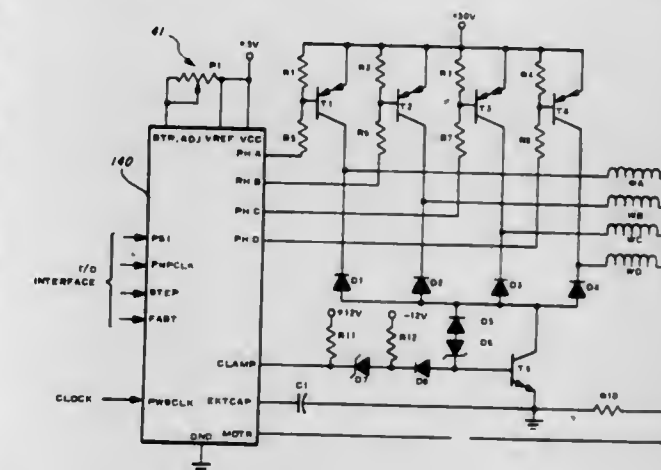
Steven J. Wallace, and Paul L. Culley, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 6, 1980, Ser. No. 193,988

Int. Cl.<sup>3</sup> H02K 29/04

U.S. Cl. 318—696

12 Claims



1. A printing terminal having a printing head movable by a stepper motor, an available DC power source, clocking means and means for selecting the coils of the stepper motor, comprising:

- power switching means connected to the DC power source and to the selected coil;
- control timing means connected to the power switching means for permitting the power switching means to close and open for a fixed cycle period, thereby respectively connecting the selected coil across and disconnecting from the DC power source;
- duty cycle varying means connected to the control timing means for activating the control timing means to vary the time of the power switching means to be opened and closed; and
- current sensing means connected to the selected coil for sensing the current flowing through the selected coil, and connected to the duty cycle varying means to activate the duty cycle varying means when the current reaches a predetermined level, and to deactivate the duty cycle varying means when the current drops below the predetermined level.

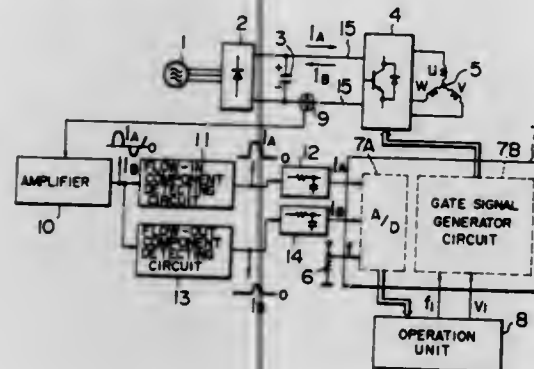


**4,420,718**  
**CONTROL SYSTEM FOR INDUCTION MOTOR USING INVERTER FOR AC POWER SUPPLY**  
 Keijiro Sakai; Yasuo Matsuda, both of Hitachi, and Mitsuyuki Honbu, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,809  
 Claims priority, application Japan, Dec. 5, 1980, 55-170953;  
 Jul. 1, 1981, 56-101176

Int. Cl.<sup>3</sup> H02P 5/40  
 U.S. Cl. 318-729

8 Claims



1. A control system for an induction motor driven by an AC output of variable frequency and voltage produced from an inverter which converts DC power obtained by a converter through conversion of AC power having constant voltage and constant frequency, said system comprising:

means for determining the value of a power factor estimation function  $\delta$  defined as function of a positive polarity component and of a negative polarity component of an input current of said inverter;

means for progressively increasing the output voltage of said inverter when the value of the function  $\delta$  is larger than  $\delta_1$  and decreasing the output voltage of said inverter when the value of the function  $\delta$  is less than  $\delta_2$ , where  $\delta_1$  and  $\delta_2$  are predetermined values of the function  $\delta$  and  $\delta_1 > \delta_2$ , and

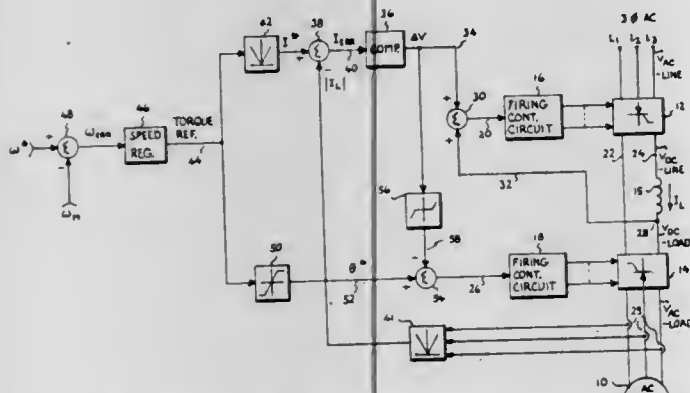
means for inhibiting the output voltage of said inverter from increasing beyond a predetermined upper limit and decreasing below a predetermined lower limit.

**4,420,719**  
**CROSS-TIED CURRENT REGULATOR FOR LOAD COMMUTATED INVERTER DRIVES**  
 John D. D'Atre, Saratoga, N.Y., and Loren H. Walker, Salem, Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 23, 1981, Ser. No. 333,929

Int. Cl.<sup>3</sup> H02P 5/40  
 U.S. Cl. 318-803

26 Claims



1. A method of controlling an AC load in response to an operational control signal by means of a source side converter coupled from an AC source to a load side converter via a DC

link and wherein said load side converter supplies power to said load, comprising the steps of:

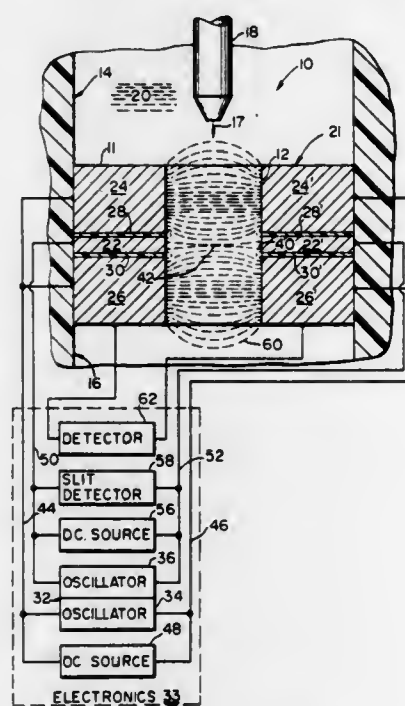
- generating first and second reference signals from said operational control signal;
- sensing an operational parameter of the load;
- comparing the first reference signal against the operational parameter of the load in a first signal channel and generating an error signal for controlling the source side converter;
- normally controlling the load side converter in response to said second reference signal applied via a second signal channel;
- sensing the value of said error signal or a value derived therefrom and in the event said value exceeds a predetermined value thereafter providing a third signal while said value exceeds said predetermined value;
- cross coupling said third signal from said first signal channel to said second signal channel and combining said third signal with said second reference signal; and
- from step (f) generating a modified command signal to control said load side converter until said value no longer exceeds said predetermined value and said second reference signal again resumes normal control of said load side converter.

**4,420,720**  
**FIELD FOCUSED PARTICLE SENSING ZONE**  
 William A. Newton, Dade County, Fla., and Marshall D. Graham, Framingham, Mass., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jun. 29, 1981, Ser. No. 279,920

Int. Cl.<sup>3</sup> G01N 27/00  
 U.S. Cl. 324-71.4

28 Claims



- A particle analyzer apparatus comprising:
  - means for providing a flow of a liquid suspension, having individual particles entrained therein, along a predetermined path;
  - a first pair of metal plates positioned on opposed sides of said predetermined path;
  - first energizing means for providing an electrical sensing field extending from one of said first plates through said liquid suspension to the other said first plate;
  - field focusing means including a second pair of metal plates positioned on opposed sides of said predetermined path adjacent to one side of said first pair of plates and a third pair of metal plates positioned on opposed sides of said predetermined path adjacent to the opposed side of said first pair of plates;
  - said field focusing means further including second energiz-

ing means for generating an electrical second field between said plates of said second pair and for generating an electrical third field between said plates of said third pair; said field focusing means further including field shaping means for angling at least a portion of said second and third fields in the direction of said sensing field to narrow the width of said sensing field along said predetermined path to a dimension less than the length of a given particle passing through said sensing field;

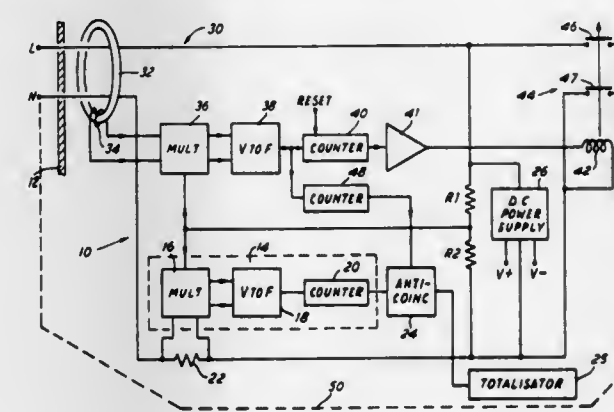
detector means coupled to said first pair of plates for detecting particle pulses caused by particles passing through said sensing field.

**4,420,721**  
**ELECTRICITY METERS**  
 Howard A. Dorey, Godalming, England, and Anthony J. Ley, Sceaux, France, assignors to Sangamo Weston Limited, Enfield, England

Filed Feb. 9, 1981, Ser. No. 232,498  
 Claims priority, application United Kingdom, Feb. 7, 1980, 8004198

Int. Cl.<sup>3</sup> G01R 11/24  
 U.S. Cl. 324-110

7 Claims



1. An electricity meter for measuring the amount of electrical energy supplied by an electrical power supplier to an electrical power consumer via an electrical power distribution circuit consisting of at least two wires, the meter comprising: current sensing means for sensing the current flowing in at least one of the wires;

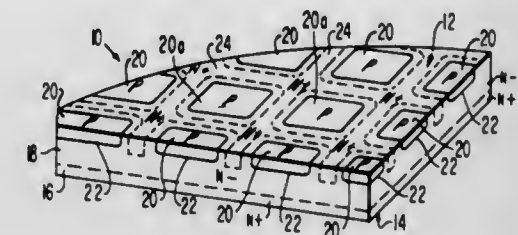
means responsive to the current sensed by the current sensing means for deriving the energy measurement; and fraud detection means for detecting attempts to fraudulently by-pass the meter, said fraud detection means comprising: means arranged to produce a signal representative of the instantaneous value of the difference between the respective currents flowing to and from the consumer via the meter;

an electronic multiplier arranged to multiply the current difference representative signal by a signal representative of the instantaneous value of the voltage between the wires, to produce a signal representative of the product thereof; and

a resettable integrating circuit arranged continuously to receive said product representative signal and to integrate it for a predetermined time prior to each resetting hereof, said integrating circuit including means for producing a signal indicative of an attempt to by-pass the meter when the integral of the product representative signal exceeds a predetermined value within the predetermined time.

**4,420,722**  
**TESTING SEMICONDUCTOR FURNACES FOR HEAVY METAL CONTAMINATION**  
 Albert A. Todd, Mountaintop, Pa., assignor to RCA Corporation, New York, N.Y.  
 Filed Nov. 14, 1980, Ser. No. 206,715  
 Int. Cl.<sup>3</sup> G01N 27/00, 27/12, 31/22  
 U.S. Cl. 324-158 R

5 Claims



1. A method of testing a semiconductor processing furnace for heavy metal contamination, said method comprising: providing a chip of semiconductor material having first and second major surfaces, an outer N+ region extending into said chip from the first major surface, an intermediate N- region extending into said chip from the second major surface, a plurality of outer P regions extending into said chip from the second major surface so as to form a plurality of junctions with the N- intermediate region, and an N+ isolation region extending into said chip from the second major surface, said N+ isolation region being located between the P regions so as to electrically isolate the P regions from each other and from the side surface of the chip;

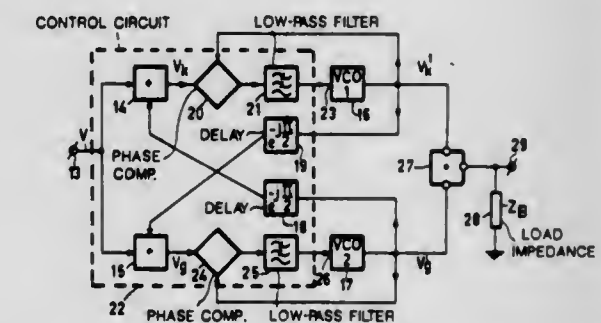
conveying said chip through the furnace to be tested while the furnace is operating under normal processing conditions; measuring the reverse recovery time of said chip after it is withdrawn from said furnace; and determining if the reverse recovery time has decreased.

**4,420,723**  
**PHASE LOCKED LOOP AMPLIFIER FOR VARIABLE AMPLITUDE RADIO WAVES**  
 Frank de Jager, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,607  
 Claims priority, application Netherlands, Apr. 1, 1980, 8001903

Int. Cl.<sup>3</sup> H03F 3/38  
 U.S. Cl. 330-10

7 Claims



1. An arrangement for generating an amplified modulated carrier signal the amplitude variations of which are smaller than the amplitude of the unmodulated carrier, characterized in that said arrangement comprises a first and a second controlled power oscillator, each having a control input and an output, and a control circuit connected to the respective control inputs of said first and second controlled power oscillators for making said oscillators oscillate at a substantially constant amplitude and at a frequency which substantially corresponds



to the carrier frequency, the outputs of said oscillators being coupled to the control circuit for generating control signals for the oscillators from comparisons between the modulated carrier signal and the oscillator signals, the arrangement also comprising an output circuit connected to the outputs of the oscillators for vectorially assembling an output signal which is said amplified modulated carrier signal.

4,420,724

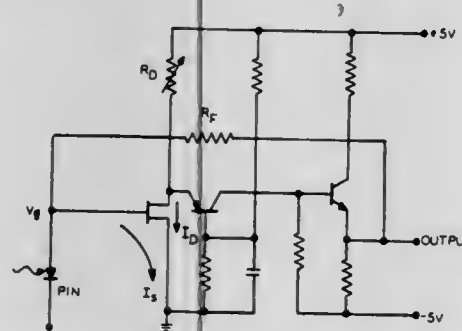
**FET AMPLIFIER WITH WIDE DYNAMIC RANGE**  
Brian Owen, Upper Milford Township, Lehigh County, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 17, 1982, Ser. No. 378,739

Int. Cl.<sup>3</sup> H03F 3/16, 3/08

U.S. Cl. 330—277

4 Claims



1. Amplifier for amplifying signals over a wide dynamic range from a first level to a second level higher than the first, the amplifier comprising a field effect transistor having a Schottky gate, means connecting the signal to be amplified to the Schottky gate, feedback means for adjusting the voltage on the Schottky gate in accordance with the voltage on the drain of the field effect transistor, and means for biasing the drain of the field effect transistor at a level producing substantial current flow from the Schottky gate to the source of the transistor over a significant part of said dynamic range near said second level.

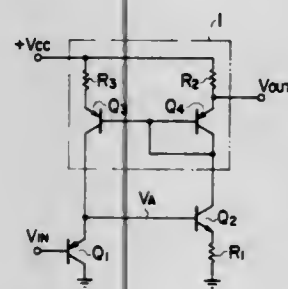
4,420,725

**WIDE-BANDWIDTH LOW-DISTORTION AMPLIFIER**  
Susumu Sueyoshi, and Kikuo Ishikawa, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan  
Continuation-in-part of Ser. No. 105,333, Dec. 19, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,276  
Claims priority, application Japan, Dec. 27, 1978, 53/163895; Dec. 29, 1978, 53/165071; Sep. 21, 1979, 54/121645

Int. Cl.<sup>3</sup> H03F 3/18

U.S. Cl. 330—288

8 Claims



1. An amplifier comprising:  
a first transistor to the base of which an input is applied, said first transistor being of a first conductivity type and having an emitter-collector current path for carrying a first emitter-collector current;  
a second transistor having a base to which an output of said first transistor is applied, said base of said second transistor having a base current, said second transistor being of a second conductivity type opposite to said first conductivity type of said first transistor having an emitter-collector

current path for carrying a second emitter-collector current;  
current supplying means for providing a first current at a first current terminal connected in common to said emitter-collector path of said first transistor and to said base of said second transistor whereby said first current is substantially equal to the sum of said base current of said second transistor and said first emitter-collector current of said first transistor, and for providing a second current at a second current terminal connected to said emitter-collector current path of said second transistor, whereby said second current is substantially equal to said second emitter-collector current, a ratio of said first and second currents being constant; and  
output means for providing an output voltage corresponding to variations in the current supplied to said second transistor.

4,420,726

**VOLTAGE-FOLLOWERS WITH LOW OFFSET VOLTAGES**

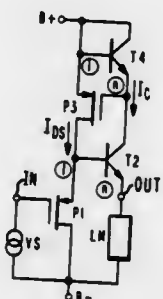
Allen L. Limberg, Titusville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 271,026

Int. Cl.<sup>3</sup> H03F 3/16

U.S. Cl. 330—288

12 Claims



1. In a circuit including:  
first and second transistors each having respective input, output and common electrodes, said transistors being of respective first and second types that can exhibit respective first and second potentials of first and second opposite polarities between their respective input and common electrodes when currents flow in respective conduction paths between their respective output and common electrodes;  
means for connecting said first and second transistors in cascade including a connection of the input electrode of said first transistor to an input point and for connecting the common electrode of said first transistor to the input electrode of said second transistor;  
load means coupled to the conduction path of said second transistor for receiving the current flow therethrough; and  
circuit means for conditioning said first transistor to exhibit said first potential of magnitude to compensate at least a portion of said second potential, said circuit means comprising:  
a third transistor of said first type and having input, output and common electrodes; and  
a current amplifier having an input connection to which the common electrode of said third transistor connects, having an output connection to which the common electrode of said first transistor is coupled, having a common connection against which the input electrode of said third transistor is biased, said current amplifier having an input circuit between its input and common connections for applying a potential of said first polarity between the input and common electrodes of said third transistor to establish a current in its conduction path, and having an output circuit between its output and common connections for applying a current directly related to the current in the conduction path of said third transistor to the common

electrode of said first transistor as substantially the entire current flow in its conduction path.

4,420,727

**SELF OSCILLATING ACOUSTIC DISPLACEMENT DETECTOR**

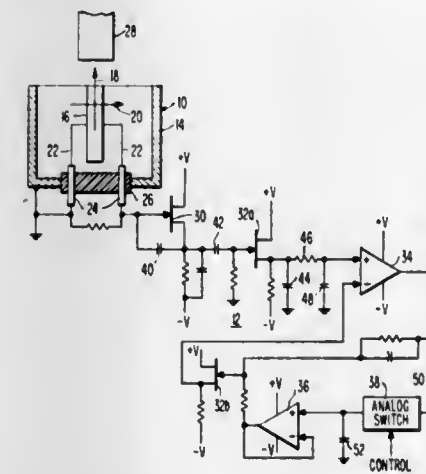
William G. Rau, Malvern, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 1, 1981, Ser. No. 307,484

Int. Cl.<sup>3</sup> H01L 41/02; G01R 23/12; G01S 1/72

U.S. Cl. 331—65

7 Claims



1. An acoustic displacement detector for detecting the position of an object with respect to a reference comprising:  
a transducer having a housing formed of electrically conductive material coupled to a source of reference potential, a piezoelectric crystal disposed within said housing and establishing said reference, said crystal having orthogonally oriented mechanical and electrical axes, said object being positioned with respect to said crystal such that its extremity proximal to the latter lies in a plane substantially perpendicular to the mechanical axis of said crystal,  
an oscillator network including a current amplifying device, electrical conductor means coupling said crystal to said oscillator network for generating oscillations, the acoustic energy generated by said crystal being transmitted along said mechanical axis thereof and being reflected from said extremity of said object back to said crystal, the phase of the reflected energy being a function of the position of said object with respect to said crystal and resulting in variations in the efficiency of energy storage in the latter, the amplitude of said oscillations being dependent upon said efficiency of energy storage, and  
means for detecting changes in said amplitude of oscillations as indicative of a displacement in the position of said object.

4,420,728

**ACOUSTIC WAVE DEVICES**

David E. Bower, London, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1981, Ser. No. 327,142

Claims priority, application United Kingdom, Dec. 19, 1980, 8040796

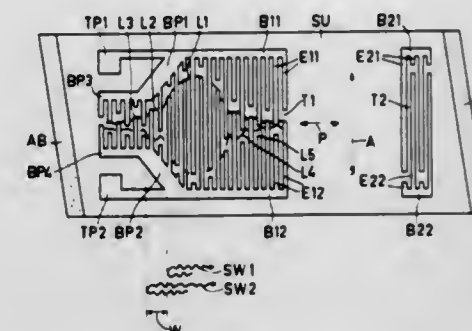
Int. Cl.<sup>3</sup> H03H 9/64, 9/42

U.S. Cl. 333—151

11 Claims

1. An acoustic wave device comprising a substrate able to propagate acoustic waves at a surface thereof, a transducer formed on said surface to launch or receive said acoustic waves at said surface along a propagation path through the transducer, the transducer including an interdigital array of two overlapping sets of electrodes with each set connected to one of two opposite bus bars, in which the length of the overlap envelope normal to the propagation path varies along the propagation path and the limits of the overlap envelope normal to the propagation path define the acoustic aperture of the transducer, and wherein each bus bar extends within the acous-

tic aperture, at least a part of each bus bar within the acoustic aperture being inclined to the propagation path and having a width W along the propagation path defined by  $2W = n\lambda/2$



where n is an odd integer and  $\lambda$  is the wavelength of said acoustic waves at substantially the maximum amplitude response frequency of the transducer.

4,420,729

**MICROWAVE PHASE-SHIFTING APPARATUS**

John V. Ashforth, Edinburgh, Scotland, assignor to Ferranti plc, Cheshire, England

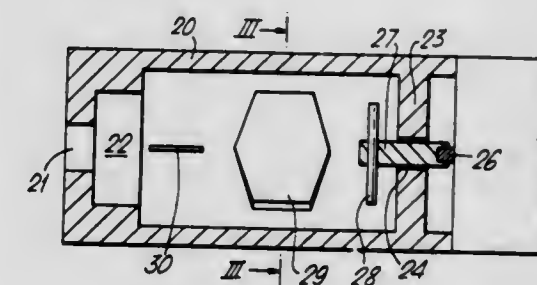
Filed Apr. 9, 1982, Ser. No. 367,110

Claims priority, application United Kingdom, Apr. 24, 1981, 8112668

Int. Cl.<sup>3</sup> H01P 1/18, 1/165

U.S. Cl. 333—159

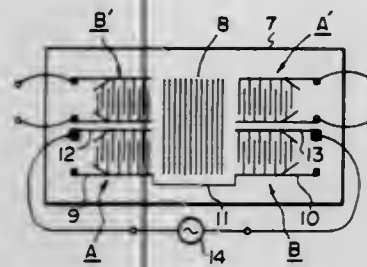
7 Claims



1. Microwave phase shifting apparatus which includes a section of waveguide of circular cross-section having a closed end and an open end and of a form which will support only a single mode of propagation at a required frequency, a fixed phase-shifting polarising member located in the waveguide section and of such dimensions and position within the section as to ensure that microwave energy directed from it towards the closed end of the section is circularly polarised, a shaft of dielectric material projecting through the closed end of the waveguide section along the longitudinal axis thereof for rotation about that axis, and a rotatable element supported by said shaft in a plane perpendicular to said axis between the polarising member and the closed end of the section, the form and position of the rotatable element being such that the element may be rotated about said axis such that linearly-polarised microwave energy entering the open end of the waveguide section is reflected out of the section with a reflection coefficient having unity magnitude and a phase angle component which may be continuously adjusted over a range of 360° in either direction.

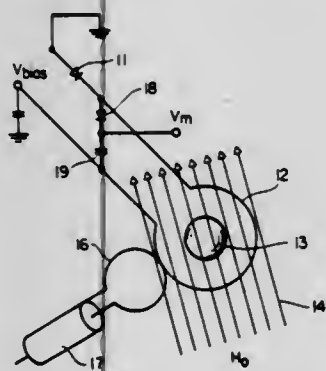


**4,420,730**  
**SURFACE ACOUSTIC WAVE FILTER**  
 Noboru Wakatsuki; Yuji Kojima, and Masaaki Ono, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
 Filed Oct. 22, 1981, Ser. No. 314,430  
 Claims priority, application Japan, Oct. 25, 1980, 55-148881  
 Int. Cl.<sup>3</sup> H03H 9/64, 9/70  
 U.S. Cl. 333—195



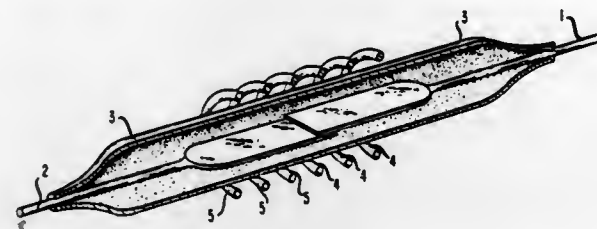
1. A surface acoustic wave filter comprising:  
 a substrate of piezoelectric material;  
 a multistrip coupler for changing the track of a signal comprising a plurality of parallel conductive strips;  
 at least two transducers disposed on one side of said multistrip coupler; and  
 at least another two transducers disposed on the other side of said multistrip coupler, the latter two transducers facing the former two transducers in which one pair of said transducers which face each other through said multistrip coupler constitute input transducers while the other pair of said transducers constitute output transducers, and in which said pair of output transducers are electrically disconnected from each other so that each output transducer receives an acoustic wave signal of different frequency.

**4,420,731**  
**CONTROLLED VOLTAGE YTTRIUM IRON GARNET (YIG) RESONATOR APPARATUS**  
 Christopher F. Schiebold, Los Altos, and William R. Green, La Honda, both of Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.  
 Filed Aug. 10, 1981, Ser. No. 291,618  
 Int. Cl.<sup>3</sup> H01P 7/00, 5/04, 1/218  
 U.S. Cl. 333—219



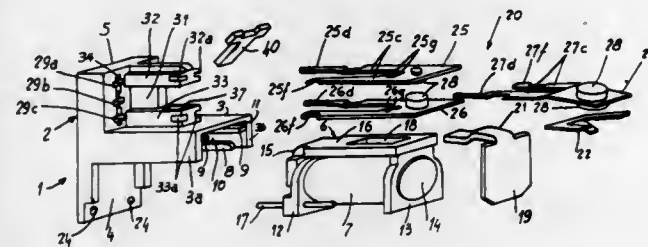
1. A controlled voltage YIG resonator comprising a YIG sphere, an input coupling loop coupled to said sphere, means providing a magnetic field to said YIG sphere, and a diode coupled to said resonator to limit the voltage developed across the resonator, said diode operating as a voltage clipping device which does not significantly detune the resonator.

**4,420,732**  
**MAGNETICALLY ACTUATED DEVICE COMPRISING A MAGNETICALLY ANISOTROPIC ELEMENT**  
 Sungho Jin, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Division of Ser. No. 194,252, Oct. 6, 1980, Pat. No. 4,337,100.  
 This application Jan. 18, 1982, Ser. No. 339,903  
 Int. Cl.<sup>3</sup> H01H 1/66, 51/00  
 U.S. Cl. 335—151



1. Device comprising electrical contact means and a magnetic component which is capable of being in at least two positions which here are designated as a first position and as a second position,  
 said component being in said first position or said second position depending on strength or direction or presence of a magnetic field,  
 said component comprising a body of a magnetically anisotropic metallic alloy having a magnetic squareness ratio which is greater than 0.7, and said body having remanent magnetic induction which is greater than 7000 gauss,  
 either said first position or else said second position being such that an electrical connection is formed between said contact means,  
 said device comprising means for exposing said body to at least a first magnetic field which causes said component to move from said first position to said second position,  
 said device being **CHARACTERIZED IN THAT** an amount of at least 95 weight percent of said alloy consists of Fe, Cr, and Mo,  
 Cr being in the range of 12-18 weight percent of said amount, and  
 Mo being in the range of 1-12 weight percent of said amount.

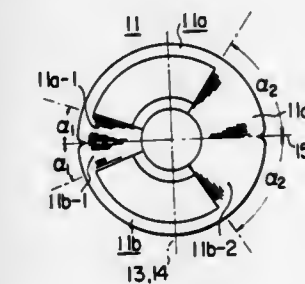
**4,420,733**  
**MINIATURIZED ELECTROMAGNETIC RELAY**  
 Fabio V. Palandri, Milan, Italy, assignor to AMF Incorporated, White Plains, N.Y.  
 Filed Mar. 25, 1982, Ser. No. 361,716  
 Int. Cl.<sup>3</sup> H01H 45/02, 50/04  
 U.S. Cl. 335—202



1. A miniaturized electromagnetic relay of the type having a yoke-coil-armature assembly and related return spring and contact bearing blades effective to be inserted into an insulating support structure formed by a front wall with a wall extending perpendicularly therefrom for separating said structure generally into two portions, with one portion being provided for receiving the yoke-coil-armature assembly and the return spring, while the other portion is provided for receiving said contact bearing blades, characterized in that:  
 the perpendicularly extending wall is generally of C-shaped cross-section having guiding and supporting means for receiving said yoke-coil-armature assembly and the return

spring; the front wall contains a first and a second group of slots provided therein for receiving a portion of said contact bearing blades and a partition member disposed between said first and second group of slots having means effective to receive mating coupling means provided on said contact bearing blades to support said blades at a predetermined position with respect to said slots; and a parallel piped housing open only on one side and including locking means effective to cooperate with complementary means provided on said insulating supporting structure, thereby cooperating with said front wall to receive and enclose said supporting structure yoke-coil-armature assembly, spring and contact bearing blade.

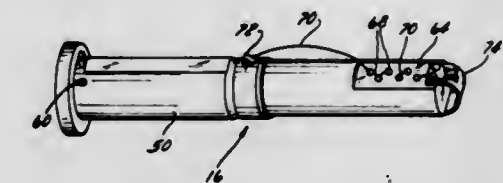
**4,420,734**  
**DEFLECTING YOKE FOR USE IN PICTURE TUBE OF PROJECTION COLOR TELEVISION RECEIVER SET**  
 Toshiharu Shimizu; Nobutaka Okuyama; Yoshikazu Naito, and Syuzo Matsumoto, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Filed Mar. 10, 1982, Ser. No. 356,906  
 Claims priority, application Japan, Mar. 11, 1981, 56-33891  
 Int. Cl.<sup>3</sup> H01F 5/00  
 U.S. Cl. 335—213



1. A deflecting yoke for use in picture tubes of a projection color television receiver set adapted for reproducing color light images on a screen, said projection color television receiver set including first, second and third picture tubes for emitting red, green and blue light images, respectively, said first, second and third picture tubes being juxtaposed to one another with respect to the screen,  
 light emitted from each of said first, second and third picture tubes being projected on the screen, and  
 said deflection yoke being used in outer-side ones of said three picture tubes, wherein said deflection yoke comprises:  
 (a) a core of a trumpet-like configuration made of magnetic material;  
 (b) a vertical deflection winding constituted by a pair of vertical deflection coils wound in a toroidal form on said core, said pair of vertical deflection coils producing vertical deflection magnetic fields within said core when a current is rendered to flow through said vertical coils, said vertical deflection magnetic field being operable to deflect an electron beam passing through the inside of said core in a vertical direction; and  
 (c) a horizontal deflection winding constituted by first and second horizontal coils each having a saddle-like configuration and disposed through and within said core, wherein each of said first and second horizontal coils has first and second side conductors,  
 said first side conductor having a first winding angular width and said second side conductor having a second winding angular width larger than the first winding angular width, the first side conductor of said first horizontal coil and the first side conductor of said second horizontal coil being adjacent to each other and producing, in a pair, a first horizontal deflection magnetic field of a convex-like configuration in a space within said core when a horizontal deflection current is rendered to flow through said first and second horizontal coil, said first horizontal deflection magnetic field not only deflecting the electron beam passing through and within said core in a horizontal direction, but also deflecting the elec-

tron beam in a vertical direction so as to decrease the vertical width of a raster scanned on a face plate of said picture tube,  
 the second side conductor of said first horizontal coil and the second side conductor of said second horizontal coil being adjacent to each other and producing, in a pair, a second horizontal deflection magnetic field of a convex-like configuration in a space within said core when a horizontal deflection current is rendered to flow through said first and second horizontal coil, said second horizontal deflection magnetic field not only deflecting the electron beam passing through and within said core to the horizontal direction, but also deflecting the electron beam to the vertical direction so as to increase the vertical width of a raster scanned on a face plate of said picture tube, whereby the electron beam deflected by said vertical deflection magnetic field produced by said vertical deflection winding and said first and second horizontal deflection magnetic fields produced by said horizontal deflection winding forms a raster scanned on the face plate of said picture tube in a trapezoid form.

**4,420,735**  
**LOW CURRENT CLEARING BACK UP FUSE**  
 Frank J. Muench, Jr., Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.  
 Filed Jul. 20, 1981, Ser. No. 284,606  
 Int. Cl.<sup>3</sup> H01H 85/30  
 U.S. Cl. 337—244



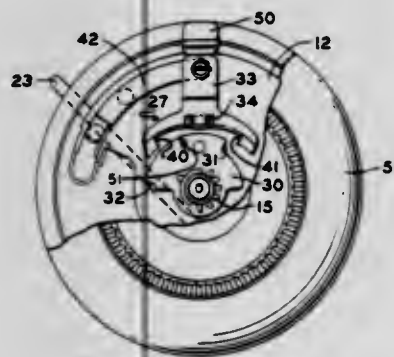
1. An energy-limiting fuse comprising a housing, an electrically conductive cap at each end of said housing, a spider assembly positioned within said housing, said spider assembly including a fuse element and electrically conductive means at each end of said spider assembly for terminating said fuse element, means electrically connecting each conductive means to the corresponding cap,  
 said spider having a recess at one end and first electrical contact means mounted at the inner portion of the recess, a first strain wire mounted on said spider connecting said contact means to said conductive means at the end of said spider assembly remote from said recess, a striker pin assembly at least partially mounted in said recess and including a second electrical contact means for engaging said first contact means, a second strain wire for activating said striker pin assembly upon vaporization of said wire, said second strain wire connecting said second contact means to the conductive means at the other end of said spider assembly.

**4,420,736**  
**HEATING AND COOLING THERMOSTAT WITH LIMITING ACTION SELECTED BY A SINGLE LEVER CHANGEOVER SWITCHING APPARATUS**  
 James H. Krueger, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.  
 Filed Dec. 24, 1981, Ser. No. 334,407  
 Int. Cl.<sup>3</sup> H01H 37/22

1. In a thermostat adapted for controlling heating and cooling apparatus comprising,  
 a base member,  
 temperature responsive switch means mounted on said base member,  
 temperature control point adjustment means mounted on



said base member and connected to adjust the control point temperature of said temperature responsive switch means,  
single lever changeover means mounted on said base member and connected to said temperature responsive switch means and adapted for selectively connecting either heating apparatus or cooling apparatus to said temperature responsive switch means,  
temperature control point limit means connected to said temperature control point adjustment means,  
first means connecting said single lever changeover means to said limit means to limit the range of movement of said control point adjustment means to a first range when said



lever is in the heating position and to a second range when said lever is in the cooling position,  
said control point adjustment means has a knob attached to a shaft mounted on said base to rotate said shaft to a selected position for selecting a temperature control point of said temperature responsive switch means,  
said limit means comprising  
a pair of stop members mounted on said shaft,  
a pivotal stop member mounted on said base member, and  
said first means comprising a connection between said single lever to said pivotal stop member to select said first or said second range of operation by positioning said pivotal stop member to selectively engage one of said pair of stop members.

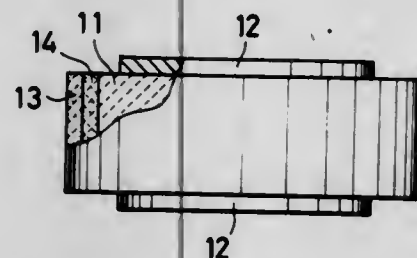
4,420,737

# POTENTIALLY NON-LINEAR RESISTOR AND PROCESS FOR PRODUCING THE SAME

Tadahiko Miyoshi; Takeo Yamazaki, and Kunihiro Maeda, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Continuation of Ser. No. 110,470, Jan. 8, 1980, abandoned. This application Oct. 30, 1981, Ser. No. 316,647  
Claims priority, application Japan, Jan. 16, 1979, 54-2203  
Int. Cl.<sup>3</sup> H01C 7/12

U.S. Cl. 338-21

15 Claims



1. A potentially non-linear resistor comprising a sintered product formed chiefly of a zinc oxide sintered body, the side surfaces of said product being provided with a glass layer and the end surfaces of said product being provided with electrodes, wherein said glass layer comprises a lead borosilicate glass that further contains tin oxide in an amount of 0.4 to 10% by weight.

4,420,738

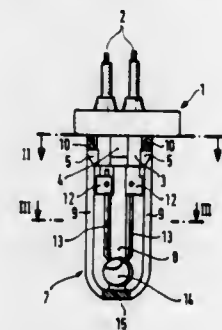
# TEMPERATURE SENSOR

Wolfgang Rehmann, Asperg, and Rudolf Sauer, Benningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Sep. 29, 1981, Ser. No. 306,976  
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044419

Int. Cl.<sup>3</sup> H01C 7/04

U.S. Cl. 338-28

7 Claims



1. A temperature sensor, intended in particular for an electronically controlled fuel injection system of an internal combustion engine, having a carrier body, said carrier body provided with electrical connections, said carrier body being further provided with a temperature-dependent resistor element, said carrier body being arranged to be received in a protective sheath surrounding said temperature-dependent resistor element, characterized in that said protective sheath is arranged to minimize contact between said temperature-dependent resistor element and said sheath, said protective sheath being provided with first and second apertures permitting free access to said temperature-dependent resistor element by a medium whose temperature is to be measured, said first and second apertures extending axially of said protective sheath, said first apertures comprising two apertures disposed in opposed relation to one another, said apertures opening on an end remote from said temperature-dependent resistor element, said second apertures comprising two apertures, at least one of which terminates in a crosspiece near said end, said crosspiece comprising a lock element provided on said protective sheath, and said carrier body and said protective sheath being connected together in a positively-engaged manner, said protective sheath having an elastically deformable end remote from said temperature-dependent resistor element, said carrier body provided with a protruding catch, said protective sheath further having a locking means, whereby said protruding catch and said locking means are brought into engagement when said carrier body is fully inserted into said protective sheath.

4,420,739

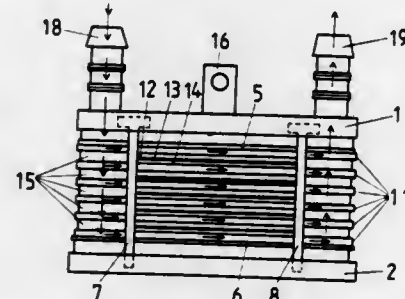
# LIQUID-COOLED ELECTRICAL ASSEMBLY

Peter Herren, Kirschbaumweg 11, 2563 Ipsach, Switzerland  
Filed Aug. 31, 1981, Ser. No. 297,630  
Claims priority, application Switzerland, Sep. 15, 1980, 6888/80

Int. Cl.<sup>3</sup> H01C 1/08

U.S. Cl. 338-53

19 Claims



1. In a liquid-cooled electrical assembly containing an arrangement for cooling at least one electrical component with

current flowing through it and having a coolant liquid flowing into an inlet of a cooler and heated-up coolant removed from the cooler through an outlet, the improvement which comprises:

the cooler comprising substantially sheet-like cooling elements each having an inlet opening and an outlet opening for the coolant;  
the cooling elements and electrical components being alternately stacked together to form a pile;  
the inlet opening of each cooling element being directly connected with a liquid coolant inlet of the cooler;  
the outlet opening of each cooling element being directly connected with a liquid coolant outlet of the cooler;  
each said inlet opening and outlet opening of each cooling element having a lengthwise axis disposed substantially perpendicular to a plane containing such cooling element; and  
said inlet openings and said outlet openings of said cooling elements mutually interconnecting said cooling elements in flow communication with one another.

4,420,740

# OBSTRUCTION WARNING SYSTEM

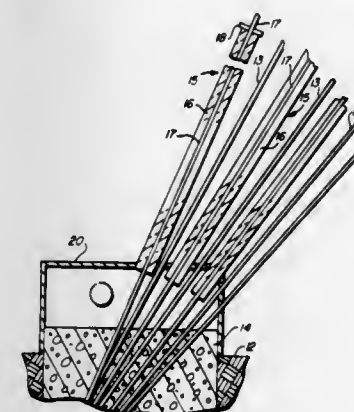
Herbert L. Brown, 671 Golf Course Dr., Ft. Walton Beach, Fla. 32548, and Frederick J. Mayer, 1107 Clark St., Tallahassee, Fla. 32301

Filed Aug. 31, 1981, Ser. No. 297,637

Int. Cl.<sup>3</sup> B64D 47/00; G08G 5/00

U.S. Cl. 340-28

11 Claims



1. An obstruction warning system comprising in combination:  
elongated optical light path means having a volume capable of transmitting light therethrough;  
at least one light source operatively connected to one end of said optical light path means for directing a light thereto;  
reflecting means attached to the other end of said elongated optical light path means for reflecting light from said light source;  
support means for supporting said optical light path means in a predetermined position adjacent an obstruction; and  
means to interrupt light from said light source along said optical path means to produce increased visibility of said elongated optical light path means.

4,420,741

# TRIM TAB POSITION MONITOR AND DISPLAY DEVICE

Donald O. West, P.O. Box 3673, Lacey, Wash. 98503  
PCT No. PCT/US81/01060, § 371 Date Aug. 6, 1981, § 102(e)  
Date Aug. 6, 1981, PCT Pub. No. WO83/00579, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 6, 1981, Ser. No. 297,530

Int. Cl.<sup>3</sup> G08B 23/00; B63B 1/22

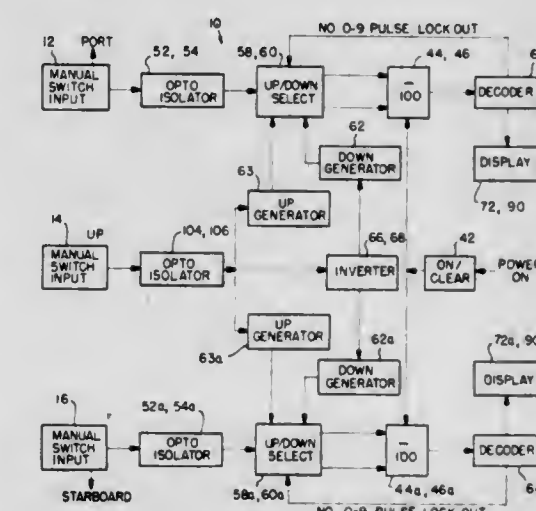
U.S. Cl. 340-29

5 Claims

1. On a boat having stern trim-tab means, power actuator means for said trim tab means and electrical control means for

said power actuator means, the improvement of a trim-tab position monitor and display device, comprising:

a. an enabling circuit means for receiving first, second and third pulses,  
b. coupling circuit means connecting said device to said trim-tab electrical control means, said electrical control means providing first raise or lower trim-tab pulses to said coupling circuit means which in turn is connected to and conducts said first pulses to said enabling circuit means,  
c. timer circuit means connected to said enabling circuit means for generating second timed pulses and conducting the same to said enabling circuit means,  
d. decoder circuit means connected to said enabling circuit means to provide a third enabling pulse to said enabling circuit means,



e. said enabling circuit means adapted to pass said second pulses to a counter circuit means upon the existence of predetermined conditions in said first, second and third pulses,  
f. counter circuit means connected to said enabling circuit means for accepting said second timed pulses from said enabling circuit means and to count the same,  
g. said decoder circuit means also connected to said counter circuit means for accepting pulses from said counter circuit means for selectively energizing a visual display panel; and  
h. said visual display panel connected to said decoder circuit means and having light emitting diodes in a predetermined display arrangement to indicate the position of said trim tab means between full up and full down positions.

4,420,742

# SCAN SIGNAL PROCESSING SYSTEM

Masaharu Tadauchi, Hitachi; Kiyohiko Tanno, Katsuta, and Taizoh Nakano, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed May 4, 1981, Ser. No. 260,090

Claims priority, application Japan, May 9, 1980, 55-60565; May 9, 1980, 55-60566

Int. Cl.<sup>3</sup> H03K 13/00

U.S. Cl. 340-347 AD

15 Claims

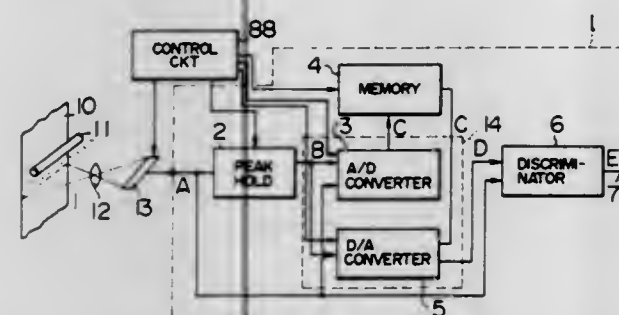
1. A scan signal processing system for converting an analog scan signal into a multi-level signal, the analog scan signal including a shading profile substantially common to each scan line, comprising:

input means adapted for receiving said analog scan signal;  
peak hold means connected to said input means, for detecting a peak of the analog scan signal and holding a corresponding peak value;  
digital memory means for storing and supplying digital data; converter means connected to said input means, said peak hold means, and said memory for normalizing said analog scan signal on a basis of said peak value, converting the



normalized signal into a digital signal and supplying the digital signal to said memory means, and also for denormalizing the digital signal supplied from said memory means on the basis of said peak value to supply the analog reference signal; and

discriminator means connected to said input means and said converter means for receiving said analog scan signal and



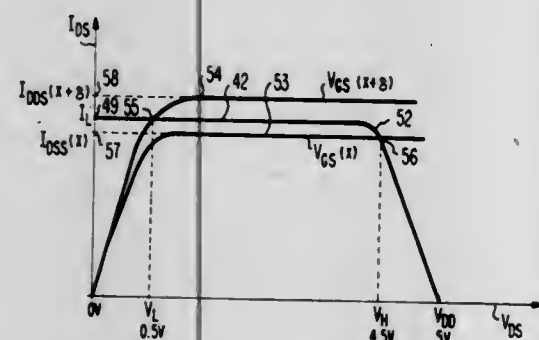
said analog reference signal, discriminating the analog scan signal based on the analog reference signal and producing a multi-level signal; the memory means and the converter means being adapted to be controlled to store a shading profile in the memory means in an initial scan period and producing shading characteristic using the stored shading profile and the peak value in a following scan period.

#### 4,420,743 VOLTAGE COMPARATOR USING UNEQUAL GATE WIDTH FET'S

Lakshminarasimha C. Upadhyayula, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.  
Continuation of Ser. No. 120,333, Feb. 11, 1980, abandoned.  
This application Dec. 24, 1981, Ser. No. 334,257  
Int. Cl.<sup>3</sup> H03K 13/02, 13/175

U.S. Cl. 340—347 AD

3 Claims



1. An apparatus for detecting the amplitude of an input signal relative to a predetermined threshold voltage, said apparatus comprising:

first and second field effect transistors (FET's), each having gate, source and drain electrodes;  
said first FET having its gate electrode coupled to its source electrode, and having a first gate electrode width to provide with a potential across said first FET a predetermined reference load current level through said first FET establishing said predetermined threshold voltage;  
said second FET having a second gate electrode width greater than said first width to thereby provide with a potential across said second FET, in response to a range of values of said input signal to said second FET gate electrode, a corresponding range of saturation current levels above and below said load current;  
said first and said second FET's connected in series across a source of potential; and  
means for coupling said input signal to said second FET gate electrode whereby when said input signal changes from a value which produces a saturation current level through said second FET above said load current to a value which

produces a saturation current level through said second FET below said load current the output level across said second FET changes.

#### 4,420,744 KEYBOARD CROSSPOINT ENCODER HAVING N-KEY ROLLOVER

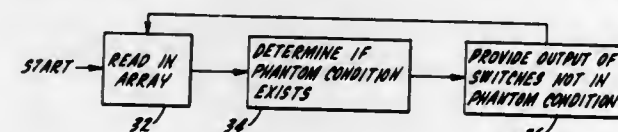
Joseph E. Jesson, Lake Villa, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Feb. 12, 1981, Ser. No. 233,903

Int. Cl.<sup>3</sup> G08C 25/00

U.S. Cl. 340—365 E

6 Claims



4. A method of operating a crosspoint encoder including the steps of detecting which crosspoints are closed, determining whether a phantom switch condition exists and providing an output of those crosspoints which are not involved in a phantom switch condition.

#### 4,420,745 SECURITY SYSTEM

Jacques Dray, and Paul P. Canobbio, both of Senlis, France, assignors to Societe Anonyme Trefflunon, Saint-Dizier, France

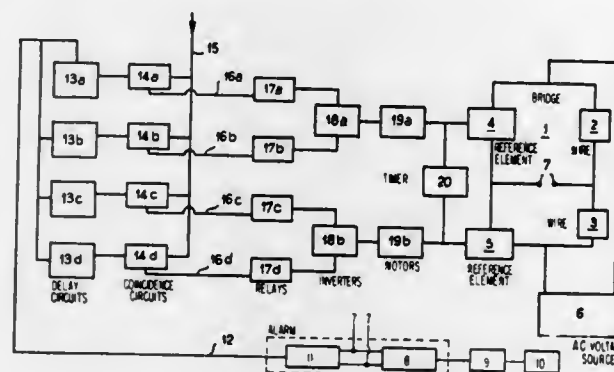
Continuation-in-part of Ser. No. 96,447, Nov. 21, 1979, abandoned. This application Dec. 8, 1981, Ser. No. 328,646

Claims priority, application France, Dec. 5, 1978, 78 34188

Int. Cl.<sup>3</sup> G08B 29/00

U.S. Cl. 340—510

11 Claims



1. A security system for indicating an intrusion into an area being protected, comprising

(a) a bridge circuit (1) including four branches and having pairs of input and output (7) terminals, said bridge circuit being subject to drift due to a shift in phase of an output signal produced at said output terminals relative to an input signal at said input terminals;  
(b) an alternating current voltage source (6) connected with said bridge circuit input terminals;  
(c) first and second conducting elements (2, 3) connected in two adjacent bridge branches, respectively;  
(d) a pair of reference elements (4, 5) connected in the remaining two bridge branches, respectively, at least one of said reference elements having a variable impedance;  
(e) intrusion indicating means, including  
(1) means (8) connected with said output terminals for monitoring the impedance of one of said conducting elements;  
(2) means (9) connected with said monitoring means to produce an alarm signal in response to a change in the impedance of said one conducting element resulting from an intrusion; and

(3) alarm circuit means (10) connected with said alarm signal producing means for activating an alarm in response to said alarm signal; and

(f) means for compensating for said bridge circuit drift, comprising

(1) phase shift detector means (11) connected with said output terminals for producing a drift signal corresponding to the output signal phase shift; and

(2) means connected with said phase shift detector means for modifying the impedance of said one reference element in response to said drift signal.

#### 4,420,746 SELF-CALIBRATING SMOKE DETECTOR AND METHOD

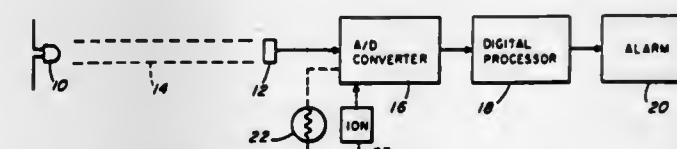
William J. Malinowski, Johnson St., P.O. Box 274, Bryantville, Mass. 02327

Continuation-in-part of Ser. No. 61,186, Jul. 27, 1979, Pat. No. 4,266,220. This application Mar. 24, 1981, Ser. No. 246,960

Int. Cl.<sup>3</sup> G08B 17/10

U.S. Cl. 340—630

8 Claims



1. The method of detecting an aerosol such as smoke in a gaseous medium, comprising the steps of

(a) directing at least one beam of light through said medium,  
(b) converting the light energy of said beam after passing through said medium to analog electrical signals,  
(c) converting said analog signals to digital signals,  
(d) cyclically and at relatively long intervals quantifying said digital signals and storing the quantity as a reference in place of the previous quantity,  
(e) cyclically and at relatively short intervals quantifying said digital signals and comparing the short interval quantity with the reference,  
(f) actuating an alarm in the event that any difference between the short interval quantity and the reference exceeds a predetermined amount,  
(g) measuring the ambient temperature to obtain second analog electrical signals corresponding to said temperature,  
(h) converting said second analog signals into second digital signals, and  
(i) applying said second digital signals to said first-mentioned digital signals at short intervals as a compensation for short term thermal effects in the conversion of said light energy to said first-mentioned analog signals.

#### 4,420,747 SHEET FEED MONITORING SYSTEM

Werner Kistner, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 172,930, Jul. 28, 1980. This application Oct. 6, 1980, Ser. No. 194,450

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930270

Int. Cl.<sup>3</sup> G08B 21/00

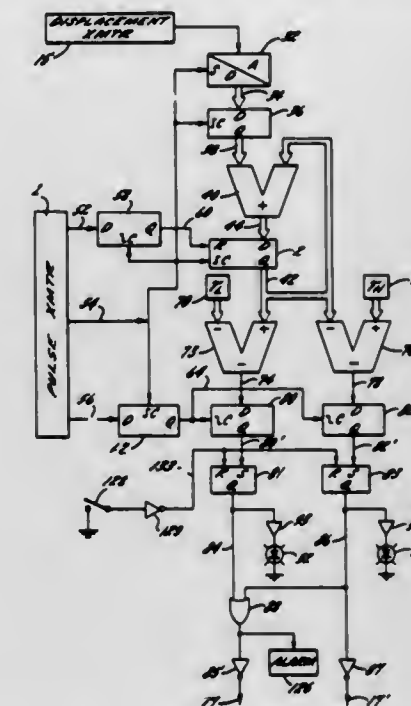
U.S. Cl. 340—674

10 Claims

1. A method of determining whether a sheet feed mechanism is feeding a predetermined number of superimposed sheets to a sheet processing machine during a given feed cycle comprising the steps of:

obtaining a plurality of measured values that are functionally related to sheet thickness at distinct points on the surface of the superimposed sheets, while the superimposed sheets are passing to the sheet processing machine,

converting the measured values to digital, numeric representation, totalling the numeric values in a digital accumulator register, and



comparing the total to a predetermined reference value, wherein the reference value is computed by averaging the totals obtained from previous sheet feeds where single sheet feeds were detected.

#### 4,420,748 PASSIVE DATA DISPLAY AND METHOD AND MEANS FOR CONTROL AND MONITORING THEREOF

Appenrodt Jürgen, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Klenzle Apparate GmbH, Villingen, Fed. Rep. of Germany

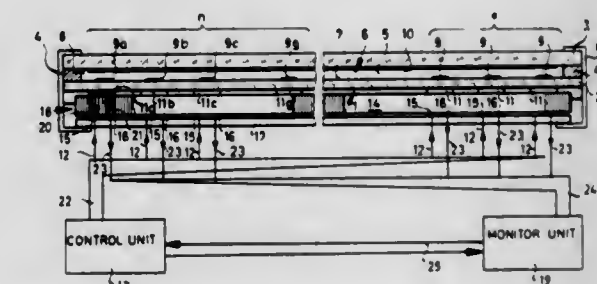
Filed Dec. 16, 1980, Ser. No. 217,036

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951584

Int. Cl.<sup>3</sup> G09G 3/18

U.S. Cl. 340—715

12 Claims



1. A display arrangement, comprising:  
a passive data display including a plurality of sets of segments, each set of segments being arranged so that activation of selected segments in any one of the sets produces an image of a desired symbol,  
a plurality of contacts each connected to a segment of said display,  
a printed circuit board having a pair of separate conductor leads facing each of said contacts,  
laminated elastic connector means having a pair of faces and a plurality of conductors extending between the faces, said connector means being positioned between the contacts and said conductor leads on said printed circuit board, and  
means for applying operating signals to said segments through one of said leads, and  
means for sensing the operation of said segments through the other of said leads on said printed circuit board.



# 4,420,749 CHARGE TRANSFER TYPE ELECTROCHROMIC DISPLAY DEVICES

Katubumi Koyanagi; Hiroshi Hamada, both of Nara; Kohzo Yano, Yamatokoriyama; Hiroshi Take, Ikoma, and Yasuhiko Inami, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

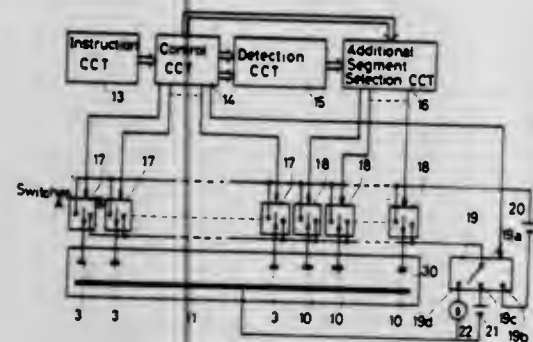
Filed Jun. 24, 1981, Ser. No. 276,970

Claims priority, application Japan, Jun. 30, 1980, 55-89847

Int. Cl.<sup>3</sup> G09G 3/16

U.S. Cl. 340—763

11 Claims



1. An electrochromic display device comprising: display segmented electrode means comprising a layer of electrochromic material; additional electrode means comprising a layer of electrochromic material; counter electrode means opposed to the display segmented electrode means; electrolyte means interposed between the display segmented electrode means and the counter electrode means; charge absorbing means connected between said display segmented electrode means, said additional electrode means and said counter electrode means for absorbing charges present in colored display segmented electrode means and in colored additional electrode means through the counter electrode means; and charge adding means connected between said display segmented electrode means, said additional electrode means and said counter electrode means for adding, through the counter electrode means, charges to the display segmented electrode means and the additional electrode means from which charge is removed; whereby a display pattern is changed by transferring charge among the display segmented electrode means and the additional electrode means and the total charge of the colored display electrode means and the colored additional electrode means is kept constant.

# 4,420,750 ALPHANUMERIC VISUAL DISPLAY OF THE MATRIX TYPE

Naonori Okabayashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1980, Ser. No. 135,156

Claims priority, application Japan, Mar. 30, 1979, 54-39045

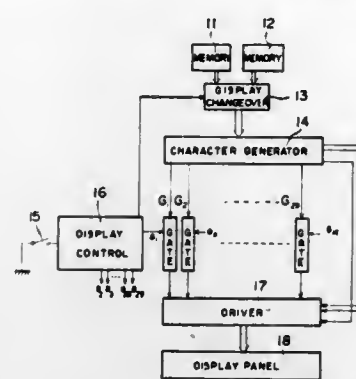
Int. Cl.<sup>3</sup> G09G 3/00

U.S. Cl. 340—791

8 Claims

1. A display device comprising a display panel having a matrix type display pattern defined by a number of columns, at least two columns being necessary to display each character or number; a pattern generator; and means responsive to said pattern generator for constraining said display panel to display numerical or character information by sequentially changing column by column the display state of said panel at a perceptible rate to simulate the left to right writing or erasing of said information by a

human being, said sequentially changing display state varying the appearance of each character of said display



panel while the relative position of each said character on said display panel remains stationary.

# 4,420,751 DETECTION METHOD AND APPARATUS FOR A USER DEVICE OR AUTOMATIC TELLER BANK MACHINE

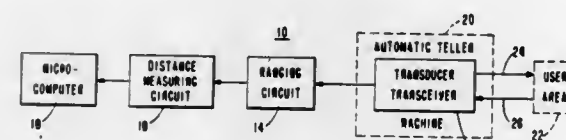
Bruno J. Paganini, Centerville, and William J. Hale, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 29, 1981, Ser. No. 316,378

Int. Cl.<sup>3</sup> H04Q 9/00; G08B 13/00

U.S. Cl. 340—825.33

20 Claims



1. A detector apparatus for providing control signals for controlling operation of an automatic teller machine comprising: determining means for determining whether or not a user is present within a defined user area associated with said machine and a user operating zone within said user area, said determining means comprising distance measurement means for providing distance indicating electrical signals indicative of the instantaneous distance of said user from said machine, and a computer means coupled to said distance measurement means for receipt of said distance indicating electrical signals to provide said control signals in response thereto.

# 4,420,752 REAL-TIME PARAMETER SENSOR-TRANSMITTER

Murray W. Davis, 20501 Woodmount, Harper Woods, Mich. 48225; Matthew J. Diedzic, Dearborn, Mich.; Robert F. Knapp, Livonia, Mich., and Bruce F. Whitney, South Lyon, Mich., assignors to Murray W. Davis, Harper Woods, Mich.

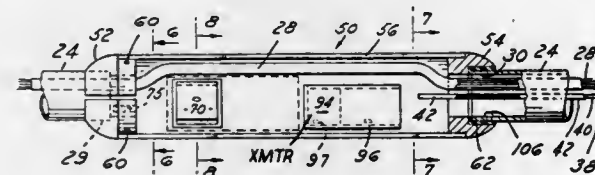
Division of Ser. No. 888,143, Mar. 20, 1978, Pat. No. 4,268,818.

This application Jan. 9, 1981, Ser. No. 223,608

Int. Cl.<sup>3</sup> G01D 5/12; H04B 3/54

U.S. Cl. 340—870.17

37 Claims



1. In an apparatus for measuring at least one parameter on a real time basis and including an electrically energizing alternating current carrying conductor and a transmitter for transmitting a signal proportional to said parameter, the improvement comprising:

# 4,420,754 MEASURING DEVICE FOR CAPACITIVE DETERMINATION OF THE RELATIVE POSITION OF TWO WITH RESPECT TO ONE ANOTHER MOVEABLE PARTS

Nils I. Andermo, Täby, Sweden, assignor to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan, Stockholm, Sweden

Continuation of Ser. No. 964,961, Nov. 30, 1978, abandoned.

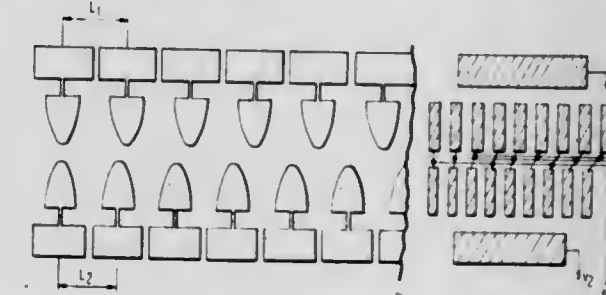
This application Jun. 9, 1981, Ser. No. 272,072

Claims priority, application Sweden, Dec. 9, 1977, 7714010

Int. Cl.<sup>3</sup> G08C 19/10

U.S. Cl. 340—870.37

3 Claims



1. A measuring device for capacitive determination of the relative position of two relatively movable parts with respect to one another, such as the scale and a slide of a hand manipulated measuring device comprising a slide provided with a number of groups of supply electrodes distributed along the direction of relative movement, each of the groups having n number of supply electrodes, n being an integer greater than 2, signal generator means having n number of signal outputs, each of the supply electrodes in each group being connected to a respective one of said signal outputs whereby all supply electrodes are supplied with voltages according to a cyclic pattern, the slide also being provided with at least one receiving electrode, a signal processing unit connected to at least one receiving electrode, the scale being provided with a single electronic pattern comprising internally galvanically isolated scale electrodes, each scale electrode comprising two mutually galvanically connected parts, one being a detecting part and being located close to the area of the scale over which the supply electrodes of the slide can be moved, the other of the two parts being a transferring part and being located close to the area over which the at least one receiving electrode of the slide can be moved, whereby the position of the slide along the scale generates a signal from the at least one receiving electrode which is derived from at least two adjacent supply electrode signals and the position of the slide with respect to the scale can be determined by the identification in the signal processing unit of the signals and their amplitude ratio.

# 4,420,755 TELEMETRY LOAD LINK ASSEMBLY

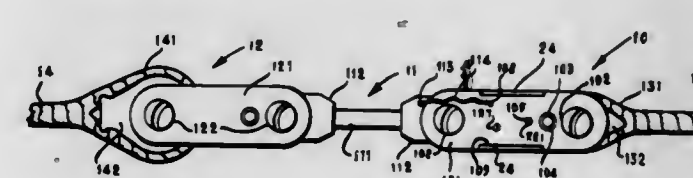
Robert J. Primbs, Jr., Layton, Utah, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 21, 1981, Ser. No. 295,034

Int. Cl.<sup>3</sup> G08C 19/04; B64D 1/00

U.S. Cl. 340—870.38

3 Claims



1. An improved mid-air recovery system having an aircraft with a winch and cable, said cable having a hook for capturing

means for receiving induced energy from said energized conductor for energizing said transmitter including a plurality of turns of wire wound around a mandrel, said plurality of turns of wire formed as the secondary winding of a transformer and said mandrel being at the same electrical potential as said conductor; and means for coupling the output of said transmitter back to said conductor in the form of an induced current so that said conductor also functions as the transmission medium for said transmitter output.

# 4,420,753 CIRCUIT ARRANGEMENT FOR THE TRANSMISSION OF MEASUREMENT VALUE SIGNALS

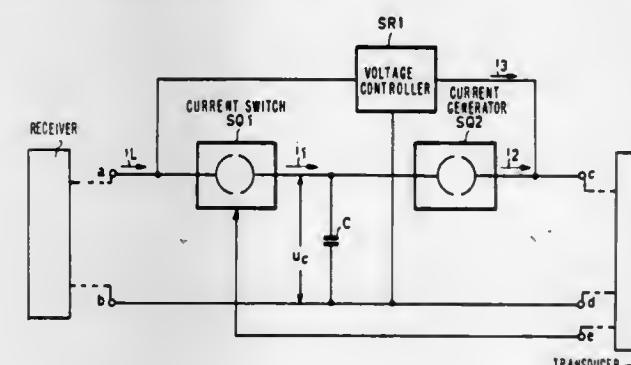
Dietrich Meyer-Ebrecht, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 611,819, Sep. 9, 1975, abandoned. This application Aug. 19, 1977, Ser. No. 825,965

Int. Cl.<sup>3</sup> G08C 19/12, 19/00, 25/02

U.S. Cl. 340—870.26

11 Claims



1. A circuit arrangement for coupling a measuring transducer to a remote receiver via a two-wire circuit which two-wire circuit at the same time supplies electric power from a remote voltage source for the operation of the measuring transducer, the circuit arrangement comprising, at the measuring transducer end of the two-wire circuit, first and second terminals coupled to the two-wire circuit, a current switch and a voltage controller connected to said first and second terminals of the two-wire circuit, third and fourth terminals connected to the measuring transducer to supply electric power thereto, said voltage controller being responsive to the voltage supplied between said first and second terminals of the two-wire circuit for converting said voltage into a constant voltage which it applies to said third and fourth terminals, said measuring transducer producing a frequency-analog measurement signal whose frequency is determined by the quantity measured by the transducer, electric power storage means, means including the current switch for charging the electric power storage means with current pulses taken from the remote voltage source, said current pulses having a repetition frequency equal to the frequency of the frequency-analog measuring signal so that the frequency of said current pulses is a measure of the transducer measurement-value signal, a current generator, and means including said current generator for coupling the power storage means to said third and fourth terminals so that the power storage means supplies a part of the operating current of the measuring transducer.



a parachute descending object, said improved mid-air recovery system comprising:

a telemetry load link assembly attached to said cable to measure and to transmit strain in said cable while said object is attached to said cable on said aircraft, said telemetry load link assembly having a load link rotatably connected to said cable, a load sensing link rotatably connected to said load link, and a telemetry load link rotatably connected between said load sensing link and said cable, said telemetry load link having a transmitter for receiving strain data from said load sensing link and for transmitting an RF strain signal, a housing for fixedly holding said transmitter and for holding a power supply for said transmitter in said telemetry load link, bolting means for connecting said telemetry load link to said load sensing link and said cable, a loop guide for connecting said cable to said bolting means, and a stabilizing pin for damping out oscillations between said telemetry load link and said cable;

a receiver located in said aircraft to receive said RF strain signal, said receiver outputting a strain signal; and strain monitor means for receiving said strain signal from said receiver and for outputting transformed strain data to be interpreted by a winch control for controlling a rate of winching of said cable that has hooked thereon said object to be recovered.

4,420,756

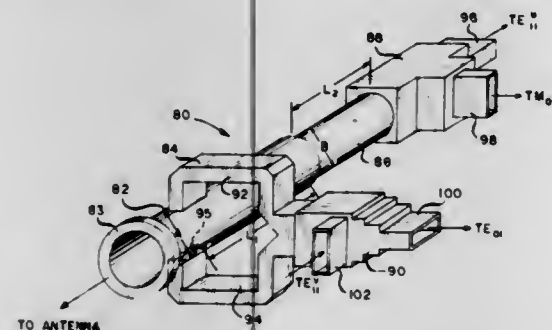
**MULTI-MODE TRACKING ANTENNA FEED SYSTEM**  
Shinobu J. Hamada, Ranch Palos Verdes, and Taro Yodokawa, La Palma, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 19, 1981, Ser. No. 226,328

Int. Cl.<sup>3</sup> G01S 13/44

U.S. Cl. 343—16 M

14 Claims



1. An apparatus for coupling linearly polarized electromagnetic wave energy including at least a first, a second, and a third waveguide mode of propagation, each having a predetermined frequency, to at least three channels; the apparatus comprising:

broadband means for coupling a first linearly polarized signal of said first waveguide mode to a first channel including a first portion comprising a first circular waveguide section characterized by a cutoff frequency less than said predetermined frequency for said first, second, and third waveguide modes and a second portion comprising a second circular waveguide section coaxially coupled to said first circular waveguide section and having a cutoff frequency less than said predetermined frequency for said first and second waveguide modes but greater than said predetermined frequency for said third waveguide mode, broadband means for coupling a second linearly polarized signal of said second waveguide mode to a second channel,

broadband means for coupling a third linearly polarized signal of said third waveguide mode to a third channel, said means for coupling said second linearly polarized signal comprising a first E-plane folded hybrid junction coupled

to said second circular waveguide section and having an E-port for propagating said second waveguide mode, said means for coupling said third waveguide mode signal comprising a second E-plane folded hybrid junction having an E-port for propagating said third waveguide mode, a two-port turnstile junction coupled at a first end to diametrically opposed aperture points on said first circular waveguide section and coupled at a second end to said second E-plane folded hybrid junction, and means for coupling a signal at a predetermined frequency, different from said predetermined frequency for said first, second, and third waveguide modes, from a fourth channel in a waveguide mode equal to one of said first, second and third waveguide modes, for propagation of a linearly polarized signal.

4,420,757

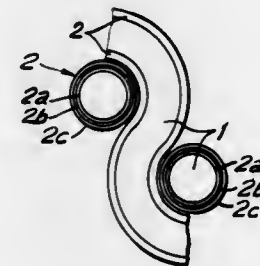
**METALLIZED SHEET FORM TEXTILE MATERIAL AND METHOD OF MAKING SAME**

Harold Ebneht, Leverkusen, and Hans-Georg Fitzky, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Continuation of Ser. No. 89,712, Oct. 30, 1979, Pat. No. 4,320,403. This application Jul. 6, 1981, Ser. No. 282,105  
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847485

Int. Cl.<sup>3</sup> H01Q 15/14

U.S. Cl. 343—912

11 Claims



1. In a method of reflecting radar waves, the improvement comprising using as a reflecting material, metallized filamentary woven textile material composed of synthetic polymers and/or natural fibers with nickel and an additional metallized layer thereover applied after activation thereof with a total metal layer thickness of from 0.02 to 2.5  $\mu\text{m}$  by currentless wet-chemical deposition and having a reflection loss of no greater than 0.9 dB and a protective layer on the material and over the metal layer.

4,420,758

**ELECTROTHERMIC NON-IMPACT RECORDING METHOD AND APPARATUS**

Yukio Tabata, and Toshiyuki Kawanishi, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Japan  
Filed May 26, 1982, Ser. No. 382,099  
Claims priority, application Japan, May 26, 1981, 56-79848; May 26, 1981, 56-99164

Int. Cl.<sup>3</sup> G02B 7/06

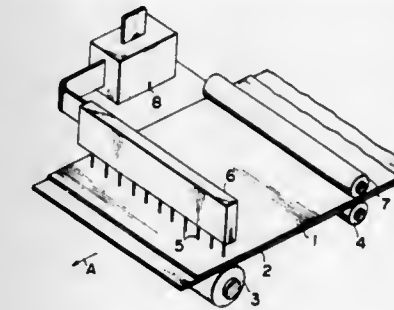
U.S. Cl. 346—76 PH

9 Claims

7. An electrothermic non-impact recording apparatus for printing with electroconductive thermal-transferable ink on a receiving surface comprising:

a recording electrode means comprising (i) a plurality of recording styli spaced at a predetermined distance from each other, which recording styli are in contact with an electroconductive ribbon comprising a thermal-transferable ink, in order to allow current to flow through said ink ribbon and to generate Joule's heat therein, and (ii) a return electrode which is in contact with said ink layer, and is disposed at a predetermined distance from said recording styli, with the total contact area with said ink

ribbon of said recording styli being smaller than the contact area with said ink ribbon of said return electrode; an image-delineating signal application means which is connected to said recording styli and to said return electrode and applies a predetermined image-delineating voltage across each portion of said ink ribbon between said recording styli and said return electrode, through resistor elements, each of which is inserted between one of said recording styli and one of the output terminals of said image-delineating signal application means from which said image-delineating electric current is output, the resistance of each resistor element being in the range of 1/10 to 10 times the resistance between the portion of said ink



ribbon between each recording stylus and said return electrode, thus causing said image-delineating electric current to flow through the portions in said ink ribbon immediately below said selected recording styli and to generate Joule's heat in said portions, by which Joule's heat said thermal-transferable ink material in said portions is melted and made transferable;

a reciprocating means for reciprocating said recording electrode means, passing over the surface of said recording medium, with said recording electrode means being in contact with said ink ribbon; and

a winding means for winding said ink ribbon thereon in the course of recording process in synchronization with the movement of said recording electrode means.

4,420,759

**CARD LOCKING DEVICE FOR TIME RECORDER**  
Kenji Maejima, Yokohama, Japan, assignor to Amano Corporation, Yokohama, Japan

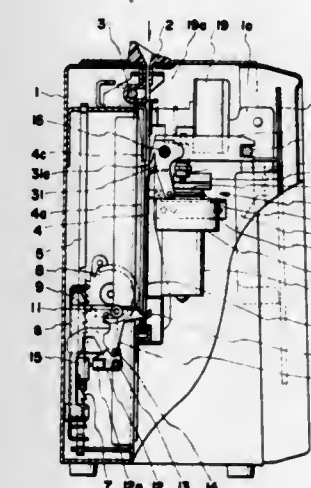
Filed Feb. 26, 1981, Ser. No. 238,556

Claims priority, application Japan, Mar. 14, 1980, 55-32472

Int. Cl.<sup>3</sup> G07C 1/08

U.S. Cl. 346—82

6 Claims



1. A card locking device for a time recorder of the kind arranged to receive a time card into a card guide passage thereof causing a switch to be turned on to actuate a motor which displaces a wire type dot matrix printer transversely relative to the direction of the insertion of the time card therein to print a variety of items on specific printing columns of the time card, said card locking device comprising: a locking lever

having a front part, said front part including a locking piece located on one side of the card guide passage; a locking counter-plate spaced from said locking piece located on the side of the card guide passage opposite said one side, said locking lever containing a spring means for resiliently rotating said locking lever toward the card guide passage so as to clamp the inserted time card between said locking piece and said locking counter-plate; and first cam means for engaging said locking lever to displace said locking lever away from the card guide passage against the resilient force of said spring means, said first cam means being responsive to rotation of the motor when actuated by the switch, to disengage said locking lever from said first cam means so that said spring means rotates said locking lever against the inserted time card to clamp the inserted time card so as to be immovable, and to displace said locking lever apart from the card guide passage to disengage said locking lever from the time card.

4,420,760

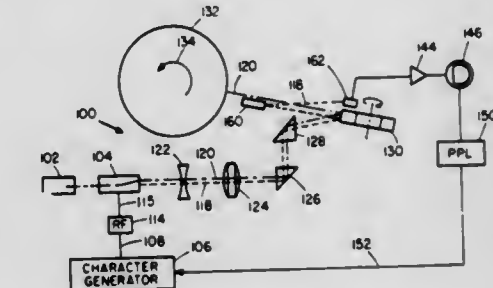
**PRINTER BEAM POSITION FEEDBACK SENSOR**  
Edwin R. Phillips, Rosemont, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,757

Int. Cl.<sup>3</sup> G01D 9/42, 15/10

U.S. Cl. 346—108

4 Claims



1. A printer beam position feedback sensor apparatus for use in laser printers said printers having a light source for transmitting a collimated light beam along a first path, a character generator and a light beam modulator connected thereto, said light beam modulator responsive to modulation signals from said character generator to modulate said light beam, said apparatus comprising:

rotating reflection means disposed within said first path for sweeping said light beam incident thereon at a constant rate within a planar region;

a surface to be swept, said surface disposed to intercept said planar region along a straight line;

a circular reflecting and beam splitting means disposed between said rotating reflection means and said surface and disposed at least partially within said planar region for reflecting at least a portion of said beam along a synchronization path, said circular reflecting beam splitting means including a base member having a first circular surface, a reflective member adjacent said first circular surface, means for forming a grid pattern with said reflective member, said grid forming means including a grid member adjacent said reflective member having a plurality of slots formed therein, and means for retaining and exposing said reflective and grid members including a cap member having a second circular surface urged toward said first circular surface by a fastening member, said reflective and grid members being retained between said first and second circular surfaces, said cap member having a slot formed therethrough for exposing said reflective and grid members

a photodetector means dispatch to receive light signals from said circular reflecting and beam splitting means and to transmit electrical signals in response to said received light signals; and

circuitry means connected between said photodetector means and the character generator to provide amplified



feedback synchronization signals to said character generator upon receipt of electrical signals from said photodetector means.

4,420,761

## SCANNING RECORDING APPARATUS

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

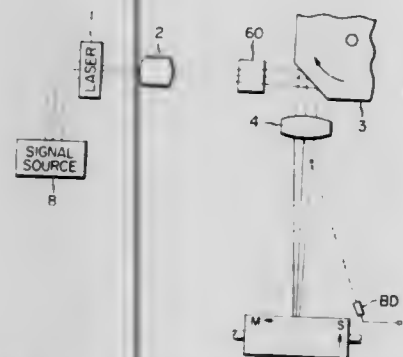
Filed May 25, 1982, Ser. No. 381,686

Claims priority, application Japan, Jun. 10, 1981, 56/89257

Int. Cl.<sup>3</sup> G01D 9/42, 15/10

U.S. Cl. 346—108

12 Claims



1. A scanning recording apparatus, comprising: recording means for forming plural dots in the subsidiary scanning direction; clock generator means for generating a clock signal; and control means for forming, from the clock signal generated by said clock generator means, plural reference signals having the same frequency but a different phase from that of the clock signal, and for controlling said recording means by the plural reference signals.

4,420,762

## CHART RECORDER

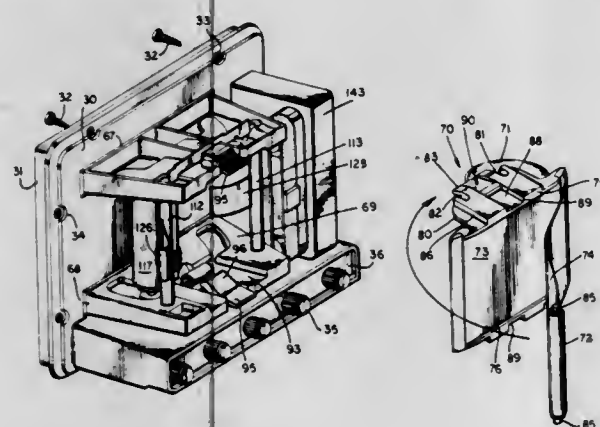
Wayne S. Andrews, Abbeville, Ala., assignor to Techsonic Industries, Inc., Eufaula, Ala.

Filed Feb. 1, 1982, Ser. No. 344,381

Int. Cl.<sup>3</sup> G01D 15/24

U.S. Cl. 346—136

28 Claims



1. Apparatus for recording variable data on a movable recording medium, comprising: means supporting a recording medium relative to a marking location; marking means movable along a closed path traversing said recording medium at said marking location, and including a member contacting said medium and operative to mark the recording medium at selected locations; said closed path traversed by the marking member including a first portion on which the recording medium is supported at said marking location, and including a second portion apart from the recording medium; and means disposed along said second portion for contact by said

marking member moving along the second portion of said path, so that the marking member is supported along the second portion and thereby traverses the path substantially without interruption.

4,420,763

## ELECTROMECHANICAL PRINTING DEVICE FOR A PRINTER OF THE SERIES-PARALLEL TYPE

Renaud Cuel; Henri Le Gledic, and Yvon Le Meur, all of Paris, France, assignors to Thomson-CSF, Paris, France

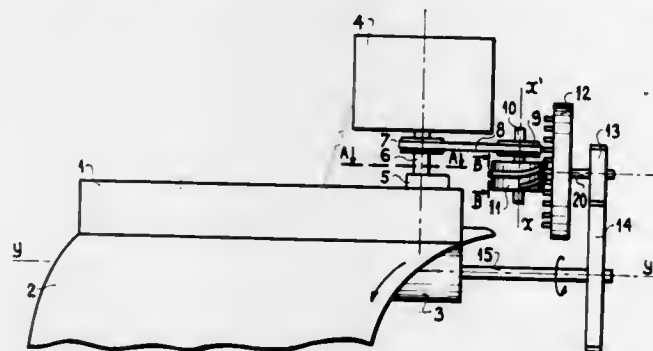
Filed Jan. 18, 1982, Ser. No. 340,018

Claims priority, application France, Jan. 27, 1981, 81 01464

Int. Cl.<sup>3</sup> G01D 15/24

U.S. Cl. 346—139 R

1 Claim



1. An electromechanical printing device for a printer of the series-parallel type, comprising: a printing head; a roller supporting a sheet to be printed; a rotary stepper motor; first transmission means for transforming the rotary movement generated by the motor into a rotational movement of the roller about its axis, so as to cause said sheet to advance; and second transmission means for transforming the rotary movement generated by said motor into a reciprocating rectilinear movement applied to the printing head, perpendicular to and synchronous with the movement of said sheet; said second transmission means comprising an eccentric mounted on the shaft of the motor and placed in an aperture provided in the printing head; said first transmission means comprising means coupled to said motor so as to transmit only one rotational step out of two and to transform it into a rotational movement applied to said roller, said last-mentioned means comprising: an endless screw having a thread formed of several sectors alternately circular in shape and helical in shape, each sector corresponding to a step of the motor; transmission means for transmitting the rotational movement of the motor to the endless screw; and a gear wheel, meshing with said endless screw and coupled to said roller so as to impart thereto a rotational movement.

4,420,764

## INK JET PRINTER HEAD

Junichi Okada, Shiojiri, Japan, assignor to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Filed Sep. 4, 1981, Ser. No. 299,470

Claims priority, application Japan, Sep. 8, 1980, 55-124259; Sep. 8, 1980, 55-124260; Sep. 8, 1980, 55-124261; Sep. 8, 1980, 55-124262; Sep. 8, 1980, 124263

Int. Cl.<sup>3</sup> G01D 15/18

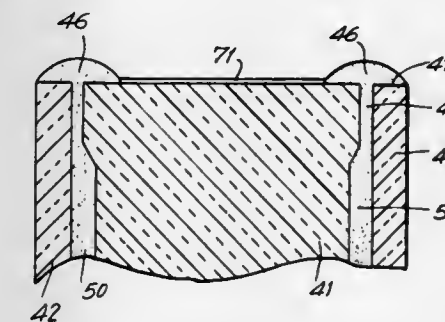
U.S. Cl. 346—140 R

9 Claims

1. An ink jet printer head for ejecting ink droplets for printing on a recording medium, comprising: a first substrate, said first substrate having a portion of a

front face formed thereon, said front face having a planar surface;

a pair of second substrates, said second substrates being positioned on opposite sides of said first substrate, and the end of each said second substrate being another portion of said front face, thickness of said second substrates being not more than half of that of said first substrate; a plurality of nozzles, each said nozzle having a discharge opening at said planar surface, said nozzles being arranged in two linear rows, droplets being ejected selectively through said nozzle discharge openings upon actuation of said ink jet printer head, said front face being subject to the formation of an ink layer thereon around said nozzle discharge openings,



an ink flow path connected to each said nozzle, said ink flow path including an ink supply portion and a pressure chamber, said ink flow path and said nozzle being formed between said first substrate and each said second substrate; means for selectively pressurizing said ink in each said flow path, said selective pressurizing causing the ejection of a droplet from the associated nozzle; and means for controlling the trajectories of said droplets ejected from said nozzles by providing a symmetry in said ink layer around said nozzle openings, said means for controlling the trajectories of said droplets being formed in said front face surface between said linear rows of nozzles, each said controlled trajectory being a linear extension of the respective longitudinal axis of the nozzle ejecting the droplet.

4,420,765

## MULTI-LAYER PASSIVANT SYSTEM

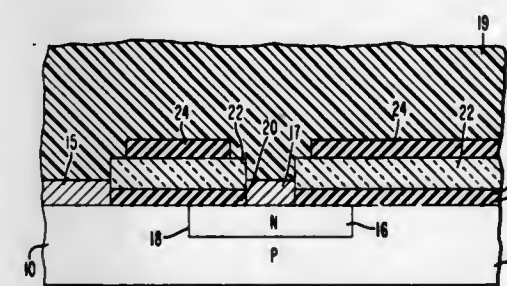
Ming L. Tarng, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,284

Int. Cl.<sup>3</sup> H01L 29/34

U.S. Cl. 357—54

10 Claims



1. A semiconductor device comprising a body of semiconductor material having at least two regions of opposite conductivity type forming a PN junction therebetween, said PN junction terminating in a surface of said body, a first layer of semi-insulating material over said surface and covering said PN junction, a layer of dielectric material over said first semi-insulating layer and a second layer of semi-insulating material over said dielectric layer.

4,420,766

## REVERSIBLY PROGRAMMABLE POLYCRYSTALLINE SILICON MEMORY ELEMENT

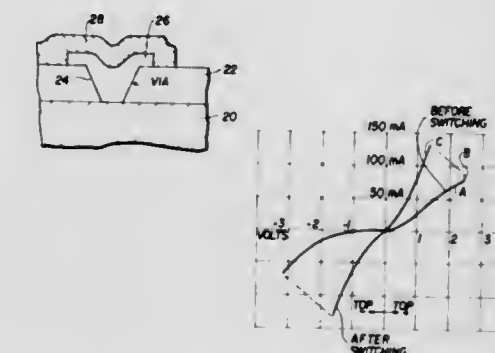
Alan J. Kasten, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 9, 1981, Ser. No. 232,520

Int. Cl.<sup>3</sup> H01L 45/00

U.S. Cl. 357—59

3 Claims



1. A reversibly programmable non-volatile memory element comprising a thin layer of polycrystalline silicon having an impurity concentration in the range of  $10^{17}$  to  $10^{20}$  atoms per cubic centimeter and a pair of electrode means connected to said thin layer for applying a voltage having a ramped trailing edge to switch said element from a high to a low resistance state and a voltage having a straight trailing edge to switch said element from a low to a high resistance state.

4,420,767

## THERMALLY BALANCED LEADLESS MICROELECTRONIC CIRCUIT CHIP CARRIER

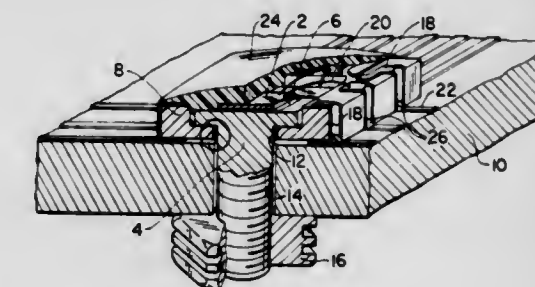
Robin H. Hodge, Menlo Park, and Mark A. Brodsky, Sunnyvale, both of Calif., assignors to Zilog, Inc., Calif.

Continuation of Ser. No. 959,345, Nov. 9, 1978, abandoned. This application Aug. 22, 1980, Ser. No. 181,159

Int. Cl.<sup>3</sup> H01L 23/02

U.S. Cl. 357—81

24 Claims



1. A heat sinking thermally balanced microelectronic circuit chip package, comprising: a high thermal conductivity member serving as a base for attachment of the chip thereto and for conducting heat from said chip, a heat conductive, thermal expansion stress relieving mounting material attaching said chip to said conductive member, and a substantially rigid electrically insulative carrier member attached to said conductive member adjacent said chip, but without any substantial contact with the chip or mounting material, said carrier extending outward of said conductive member and including a plurality of electrically conductive leads carried thereby for allowing electrical connection between said chip and a receiving surface.



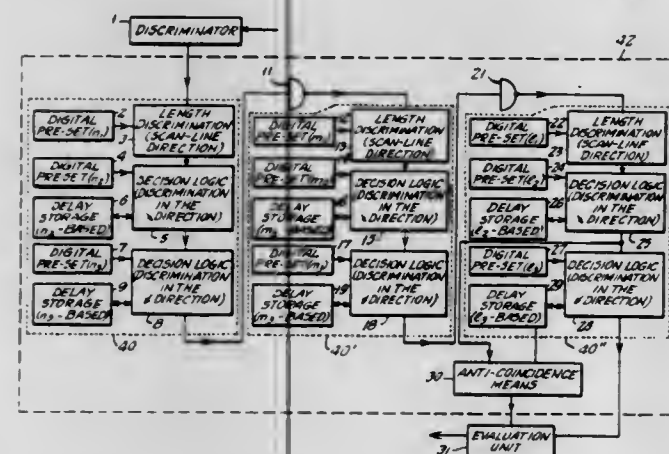
**4,420,768**  
**METHOD AND APPARATUS FOR THE DETECTION OF ACCUMULATIONS OF PARTICLES SUCH AS METAPHASE PLATES**

Rudolf Grosskopf, Konigsbrunn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany  
 Filed Nov. 24, 1981, Ser. No. 324,586

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044883

U.S. Cl. 358-107 Int. Cl.<sup>3</sup> H04N 7/18

18 Claims



1. A method of detecting accumulations of particles, for instance metaphase plates, in an image converted by a raster process into electrical signals in which the image is subdivided by a high-frequency signal into raster elements which have a fixed position with respect to each other in successive scanning lines and in which there are provided a discriminator for the selection of the objects to be evaluated in accordance with selectable criteria, an evaluation unit for the logical analysis and counting of the objects, delay storages for comparison of adjacent raster elements in successive scanning lines, said storages delaying the digital image signals fed by amounts of time which correspond to one raster element spacing and approximately one line length, and a decision logic in order to determine whether a structure element fits the object examined, characterized by the fact that an electronic image dilation is carried out in several directions, the parameters of the dilations being so selected that the images of the chromosomes of metaphase plates agglomerate to form uniform structures, and that thereupon an image erosion is effected in several directions the parameters of the erosion being so selected that images of cells disappear while images of the agglomerated metaphase plates, however, remain.

**4,420,769**  
**DEVICE FOR THE AUTOMATIC EDITING, AT THE RECEIVER, OF UNWANTED PROGRAM MATERIAL FROM BROADCAST ELECTRICAL SIGNALS**

Albert P. Novak, 96 Cypress St., Floral Park, N.Y. 11101  
 Filed Mar. 22, 1978, Ser. No. 889,049

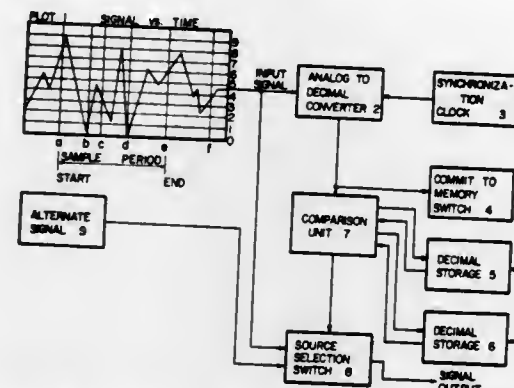
U.S. Cl. 358-139 Int. Cl.<sup>3</sup> H04M 7/02

31 Claims

1. A system for the elimination of predetermined video/audio program information from broadcast video/audio signals comprising, in combination:

- a video/audio signal source;
- a video/audio signal;
- a video/audio signal output normally connected to said video/audio source;
- a switch to disconnect said output from said source;
- and switch operation means to cause blanking of unwanted video/audio signal information from said video/audio signal output by providing the operation of said switch correlative to the information contained within said video/audio signal and wherein said switch operation means includes a video/audio signal sampling/conversion

means for sampling a content of the video/audio signal, and converting the video/audio signal samples into data bits representing digital words;  
 a memory means adapted to store digital words therein;  
 programming means for storing selected digital words within said memory means;



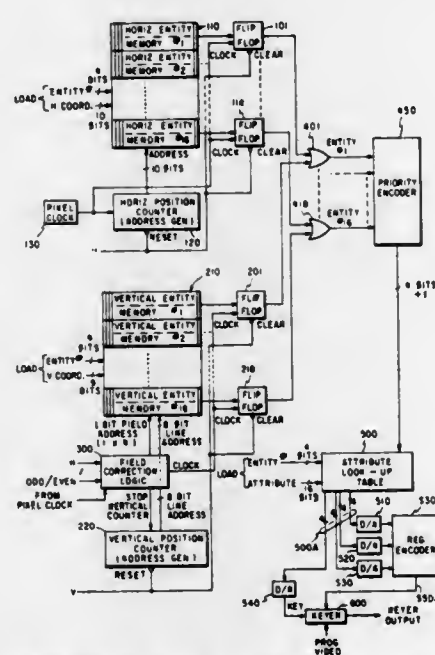
a comparator means for comparing the output of said video/audio signal sampling means with said memory to obtain an enabling output from said comparator means when said digital words generated by said video/audio signal sampling/conversion means match;  
 transmitting means for routing said enabling output to, and operating, said switch.

**4,420,770**  
**VIDEO BACKGROUND GENERATION SYSTEM**  
 Atlatf Rahman, Stamford, Conn., assignor to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Apr. 5, 1982, Ser. No. 365,775

U.S. Cl. 358-183 Int. Cl.<sup>3</sup> H04N 5/22

10 Claims



1. For use in conjunction with a video generating apparatus that includes means for producing vertical and horizontal synchronizing signals and clock signals, a system for producing video signals representative of video patterns having operator-selected video attributes, comprising:

- a vertical bit memory including a plurality of vertical entity memories, each vertical entity memory having a memory bit for each line of a video frame;
- a horizontal bit memory including a plurality of horizontal entity memories, each horizontal entity memory having a memory bit for each elemental horizontal reference position of a video frame;
- a vertical address generator for counting scanlines of a video frame and generating vertical entity memory addresses used to access the vertical entity memories in parallel;

a horizontal address generator responsive to clock signals for generating horizontal entity memory addresses used to access the horizontal entity memories in parallel;  
 means for entering, in the horizontal entity memories and vertical entity memories, respectively, binary indications of operator-selected horizontal and vertical coordinates defining diagonally opposite corners of operator-selected video patterns for one or more operator-selected entities;  
 a plurality of vertical start/stop detectors, each being responsive to the output of a respective vertical entity memory;  
 a plurality of horizontal start/stop detectors, each being responsive to the output of a respective horizontal entity memory;  
 a plurality of coincidence detectors, one for each entity, each generating an output for its respective entity as a function of coincident outputs from the vertical and horizontal start/stop detectors for the entity;  
 a priority encoder responsive to the outputs of the coincidence detectors for generating an output designating the highest priority entity that is on at a given time; and  
 an entity attribute look-up memory which is responsive to the output of said priority encoder to generate output video-representative signals having attributes that were previously stored in said attribute look-up memory in conjunction with each entity.

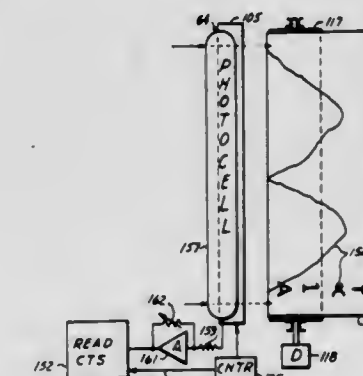
**4,420,772**  
**ILLUMINATION AND LIGHT GATE UTILIZATION METHODS AND APPARATUS**

John H. Jacobs, Altadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 24,486, Mar. 27, 1979, Pat. No. 4,316,196, which is a division of Ser. No. 925,132, Jul. 17, 1978, abandoned, which is a continuation of Ser. No. 776,157, Mar. 10, 1977, abandoned. This application Jul. 20, 1981, Ser. No. 284,751

U.S. Cl. 358-294 Int. Cl.<sup>3</sup> H04N 1/12

4 Claims



1. In a method of reading information from a record with the aid of a plurality of electrically controlled light gates, the improvement comprising in combination the steps of:

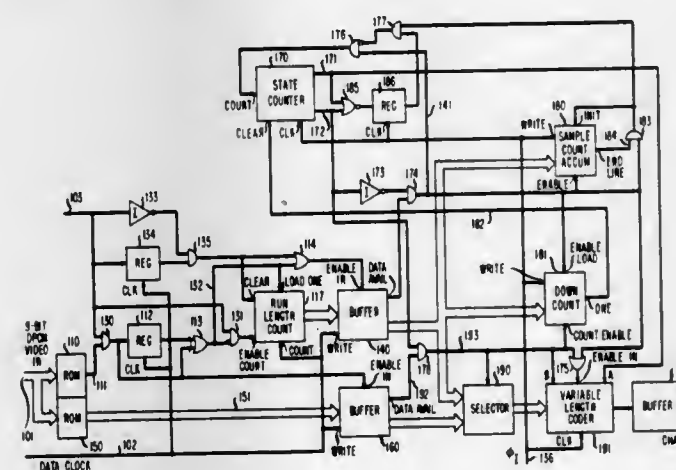
- illuminating said light gates with light of a first intensity above zero light intensity;
- preconditioning said light gates to subsequent opening in response to electric control signals by electrically biasing said light gates to an initially open condition wherein said gates pass light from said illumination at an intensity above zero light intensity and below a second intensity lower than said first intensity;
- subjecting said record to a first illumination by said light of an intensity above zero light intensity and below said second intensity as passed by said preconditioned gates in said initially open condition;
- subjecting said record to a second illumination by further opening said preconditioned light gates in response to electric control signals to pass light at at least said second light intensity and scanning said record with said passed light at at least said second intensity; and
- reading information from said record only in response to said second illumination as among said first and second illuminations.

**4,420,771**  
**TECHNIQUE FOR ENCODING MULTI-LEVEL SIGNALS**  
 Peter Pirsch, Hanover, Fed. Rep. of Germany, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1981, Ser. No. 232,701

U.S. Cl. 358-261 Int. Cl.<sup>3</sup> H04L 3/00; H04N 7/12

17 Claims



1. Apparatus for compressing samples of a multilevel communication signal, each sample having one of at least M ( $M \geq 3$ ) different values, wherein the statistical likelihood of occurrence of a particular one of said values is much greater than the statistical likelihood of occurrence of any other of said values, including  
 means for grouping said samples in runs of a first or a second type, wherein said first type runs include one or more samples of said particular value and said second type runs include one or more samples of said other values, and  
 means for encoding the lengths of said runs and a representation of said other values.

**4,420,773**  
**ELECTRONIC PHOTOGRAPHIC CAMERA**

Kenji Toyoda, Chigasaki; Takao Watanabe, Koshigaya; Hideya Inoue, Kawasaki; Atsumi Kasuya, Tokyo; Yutaka Ichihara, Yokohama, and Akira Miyaji, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 18, 1981, Ser. No. 275,403  
 Claims priority, application Japan, Jun. 30, 1980, 55-89506; Jul. 4, 1980, 55-91275; Jul. 7, 1980, 55-92350; Sep. 25, 1980, 55-133539; Nov. 29, 1980, 55-168170

U.S. Cl. 358-335 Int. Cl.<sup>3</sup> H04N 5/76

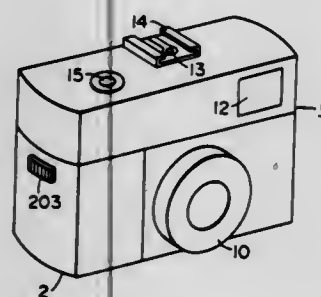
46 Claims

1. An electronic photographic camera comprising:  
 (a) an optical system forming an image of an object to be photographed;  
 (b) a solid state imaging sensing device including a plurality of light-receiving elements disposed in the imaging plane of said optical system and producing a charge corresponding to the quantity of incident light and accumulating the charge therein, first and second gate means for transferring the charge accumulated in said elements respectively, register means for putting out the charge transferred by the opening of said first gate means successively in time-



series fashion correspondingly to each of said elements, and drain means for receiving the charge accumulated in said elements beyond a predetermined amount during the closing of said second gate means and receiving the charge produced in said elements during the opening of said second gate means;

(c) first and second gate control means for executing in a time sequential order a first control where said first gate



means is closed and also said second gate means is opened, a second control where both said first and second gate means are closed for a predetermined period and a third control where said first gate means is opened and also said second gate means is closed; and

(d) means for metering the brightness of said object by the amount of charge drained from said drain means through said second gate means which is opened by said first control of said control means.

4,420,774

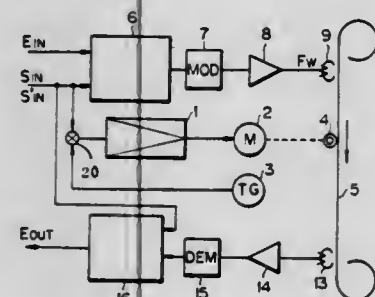
#### FM DATA RECORDING AND PLAYBACK METHOD AND APPARATUS

Hiroshi Sato, Fujisawa, Japan, assignor to Daiichi Electric Co., Ltd., Fujisawa, Japan

Continuation-in-part of Ser. No. 212,221, Dec. 2, 1980, abandoned. This application Mar. 29, 1983, Ser. No. 479,975  
Claims priority, application Japan, Dec. 26, 1979, 54-168268  
Int. Cl.<sup>3</sup> G11B 5/00, 5/02

U.S. Cl. 360—28

5 Claims



1. An FM data recorder, comprising:

(A) a recording means comprising:

(a) a recording operational amplifier having two inputs, the first input having a data signal from a miniature test model under test, and the second input having a recording speed control signal, said signals being operated on by said operational amplifier;

(b) a modulator, the input of which is connected to said recording operational amplifier, said operated signals modulating a frequency of the carrier wave in said modulator;

(c) a write amplifier, the input of which is connected to said modulator, said operated modulated carrier wave being amplified by said write amplifier;

(d) and a write means, the input of which is connected to said write amplifier, said amplified modulated carrier wave being written by said write means onto a record medium;

(B) a playback means comprising:

(a) a read means which reproduces the recorded modulated carrier wave from said record medium;

(b) a read amplifier, the input of which is connected to said read means, said reproduced modulated carrier wave being amplified by said read amplifier;

(c) a demodulator, the input of which is connected to said read amplifier, said amplified modulated carrier wave being demodulated into a data and recording speed control signal based on a playback speed;

(d) and a playback operational amplifier, the input of which is connected to said demodulator, said playback operational amplifier operating on said demodulated carrier wave which is said data and recording control signal, and a speed control signal based on a playback speed control signal, said playback operational amplifier outputting only the desired data signal;

(C) a speed control means which controls a recording speed and a playback speed by two different speed control signals which have a variable speed ratio between the recording speed and the playback speed, whereby said variable speed ratio is directly proportional to the size ratio between said miniature test model size and an actual physical size of a structure.

4,420,775

#### CIRCUIT AND METHOD FOR PROTECTING A HORIZONTAL SYNCHRONOUS SIGNAL

Shigeru Yamazaki; Takao Arai; Masaharu Kobayashi, all of Yokohama; Takashi Hoshino, Fujisawa; Chitoshi Hibino, and Harukuni Kobari, both of Yokohama, all of Japan, assignors to Nippon Victor Kabushiki Kaisha, Yokohama and Hitachi, Ltd., Tokyo, both of Japan

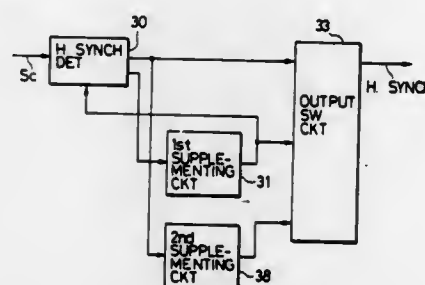
Filed Sep. 25, 1981, Ser. No. 305,779

Claims priority, application Japan, Sep. 26, 1980, 55-132876; Sep. 26, 1980, 55-133830

Int. Cl.<sup>3</sup> G11B 27/10, 5/43

U.S. Cl. 360—38.1

6 Claims



5. A method of protecting a horizontal synchronous signal of a pulse code modulated signal derived from a recording medium, which signal has been recorded in the form of a standard television signal with an interleaving technique by converting an analog signal into a pulse code modulated signal and by mixing the pulse code modulated signal with a synchronous signal based on a scanning standard of the standard television system, said method including a step of adding first and second supplementary horizontal synchronous pulses in such a manner that the first supplementary horizontal synchronous pulse is added when a horizontal pulse of the synchronous signal is not detected, and the second supplementary horizontal pulses are added when horizontal pulses of the synchronous signal are not detected continuously, said method comprising the steps of:

(a) determining whether the interval between adjacent horizontal synchronous pulses of said synchronous signal at the time of returning from a condition that horizontal synchronous pulses are added to a condition of synchronizing with the horizontal synchronous pulses of the synchronous signal is longer or shorter than a predetermined value and;

(b) removing an initial pulse of said second supplementary pulses, which initial pulse appears at the time of returning

to said condition, the initial pulse being removed in response to the results of the determining step when said initial pulse occurs within a predetermined time interval.

4,420,776

#### PSK MODULATION IN AC BIAS DATA RECORDING

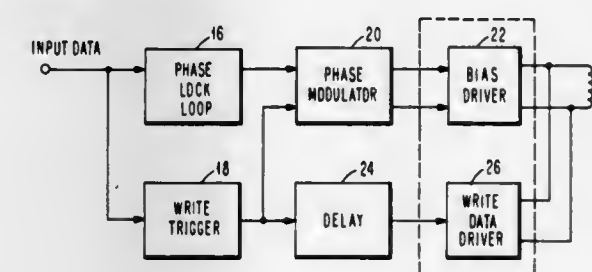
Stephen A. Jove, San Jose, and Julian E. Vaughn, Campbell, both of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,711

Int. Cl.<sup>3</sup> G11B 5/09

U.S. Cl. 360—45

6 Claims



1. An apparatus for recording a high frequency data signal having first and second signal processing channels, said first channel comprising a phase lock loop for receiving high frequency input data signals and for providing an AC bias signal having a frequency that is a multiple of the frequency of said data signal, wherein the ratio of said frequencies is no greater than 10:1; and

a phase modulator coupled to the output of said phase lock loop for modulating the phase of said AC bias signal; said second channel comprising a write trigger circuit for dividing said data frequency; and

driver means coupled to said phase modulator and said write trigger; and

a magnetic head coupled to the output of said driver means for receiving the combined data and bias signals, wherein said data and bias signals are phase locked such that bit shift error is eliminated.

4,420,777

#### TAPE RECORDER WITH CUE PROCESSOR

Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

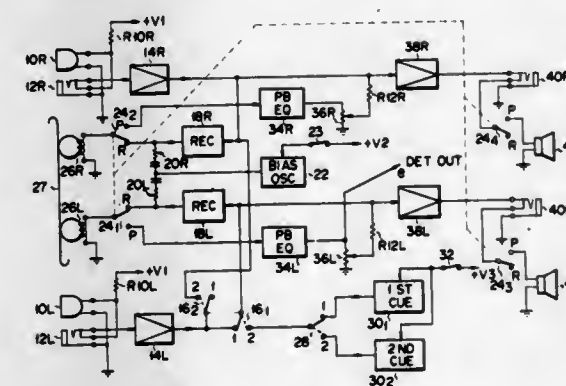
Filed Sep. 14, 1981, Ser. No. 302,232

Claims priority, application Japan, Sep. 22, 1980, 55-132187

Int. Cl.<sup>3</sup> G11B 15/12

U.S. Cl. 360—61

6 Claims



1. A tape recorder with a cue signal processor, comprising: first means for providing a first recording signal; second means for providing a second recording signal; third means for providing a predetermined cue signal; fourth means connected to said first means and said third means, for selecting said first recording signal or said cue signal to provide a selected signal;

fifth means connected to said second means and said fourth

means and including means for recording signals on a first recording channel and a second recording channel, for recording said selected signal on said first recording channel and for recording said second recording signal on said second recording channel; and

sixth means connected to said fifth means, for detecting said cue signal from said first recording channel.

4,420,778

#### HEAD TRACKING CONTROL SYSTEM FOR A HELICAL SCAN VTR

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

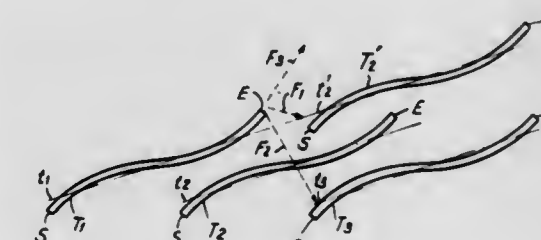
Filed Jul. 23, 1981, Ser. No. 286,267

Claims priority, application Japan, Jul. 23, 1980, 55-100816

Int. Cl.<sup>3</sup> G11B 21/10, 21/04; H04N 5/78

U.S. Cl. 360—77

15 Claims



1. Apparatus for reproducing information signals recorded in successive parallel tracks on a record medium comprising: transducer means adapted for movement along each of the tracks in a scanning path from a beginning end to a concluding end thereof for reproducing the signals recorded therein;

transducer deflecting means for deflecting said transducer means in a direction transverse to the direction along the tracks;

polarity detecting means for detecting the direction of any deviation between the scanning trace of said transducer means and the track then being scanned thereby at the beginning end of said scanned track; and

updating means for producing and storing a control signal in response to said polarity detecting means and for supplying said control signal to said transducer deflecting means so as to control the latter to deflect said transducer means to accurately scan the beginning ends of said tracks, said updating means being controlled by said polarity detecting means to change the value of said stored control signal by an incremental amount in accordance with the detected direction of said deviation.

4,420,779

#### AUTOMATIC CASSETTE CHANGER

Yoshikazu Takano; Tomohisa Kamimura, and Mitsunobu Fujikawa, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 279,732, Jul. 2, 1981, abandoned. This application Aug. 14, 1981, Ser. No. 292,912

Claims priority, application Japan, Jul. 2, 1980, 55-90176

Int. Cl.<sup>3</sup> G11B 15/68, 23/04

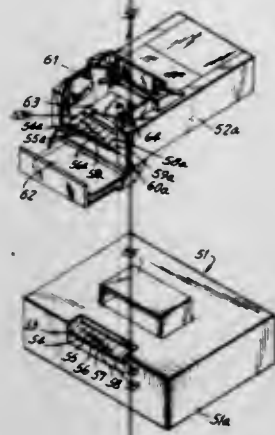
U.S. Cl. 360—92

22 Claims

1. An automatic cassette changer having a plurality of operating modes for automatically changing cassettes; comprising mode selecting means actuable for selecting said operating modes of the changer, a first motor for driving said mode



selecting means, actuator means adapted to be driven for causing operation of the changer in a selected one of said operating



modes determined by said mode selecting means, and a second motor for driving said actuator means.

#### 4,420,780 SELF-LOADING MAGNETIC HEAD AIR BEARING SLIDER

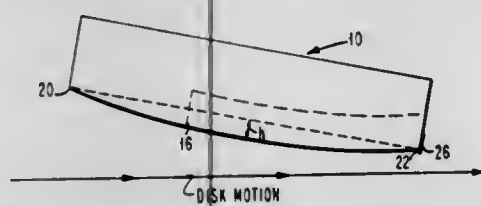
Kenneth L. Deckert, San Jose, Calif., assignor to International Business Machines, Armonk, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,813

Int. Cl.<sup>3</sup> G11B 5/60, 17/32

U.S. Cl. 360-103

8 Claims



1. A self-loading magnetic head slider assembly comprising: a support structure having leading and trailing ends and a front section extending across the support structure from the leading end thereof; side rails disposed longitudinally from the front section to the trailing end along the side edges of a surface of said support structure; a recessed section formed between said side rails behind said front section; at least one magnetic transducer deposited at the trailing end of one of said side rails; characterized in that said side rails and said front section have a continuously curved convex shape in longitudinal section between said leading and said trailing end; and said continuously curved convex shape of said front section and said side rails and said recessed section produce a combined pressure profile when said slider assembly is positioned adjacent a moving magnetic medium so that said slider assembly assumes an orientation with respect to said moving magnetic medium in which the minimum spacing between said slider assembly and said magnetic medium occurs at the trailing end of said slider assembly.

#### 4,420,781 MAGNETIC HEAD WITH AN AMORPHOUS HALL ELEMENT

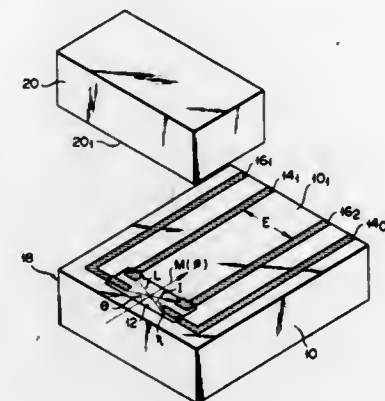
Yoshifumi Sakurai, Minoo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1981, Ser. No. 276,458

Claims priority, application Japan, Jul. 7, 1980, 55-92481  
Int. Cl.<sup>3</sup> G11B 5/38, 5/22

U.S. Cl. 360-112

22 Claims



1. A magnetic head which comprises: a support member having a plane to be faced by a magnetic recording medium; and an amorphous magnetic film which has an axis of easy magnetization along the plane thereof and being arranged on said support member such that a magnetic flux ( $\phi$ ) sent forth from said magnetic recording medium passes through said amorphous magnetic film along said axis of easy magnetization, said amorphous magnetic film being so biased by a bias current that a first angle ( $\theta$ ) defined by the direction of said axis of easy magnetization and the running direction of said bias current is larger than  $0^\circ$  and smaller than  $90^\circ$ .

#### 4,420,782 THERMAL COMPENSATION FOR MAGNETIC HEAD ASSEMBLY

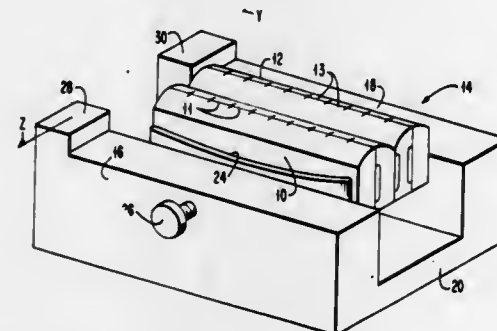
Armando J. Argumedo; William W. Chow, both of Tucson, Ariz.; Robert D. Freeman, Roy, and Stawomir P. Kleczkowski, Ogden, both of Utah, assignors to International Business Machines, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 278,956

Int. Cl.<sup>3</sup> G11B 5/10

U.S. Cl. 360-129

9 Claims



1. A magnetic head assembly comprising: an integral one piece housing two opposing walls, made of nonmagnetic material; head module means formed of a magnetic material positioned within said housing; said magnetic and nonmagnetic materials having different coefficients of thermal expansion; nonmagnetic leaf spring means disposed between one wall of said housing and said head module means for clamping said module means to an opposing wall of said housing

and for providing thermal compensation to said module means; and adjusting means to provide adjustment of the clamping force of said leaf spring means to a predetermined value.

#### 4,420,783 MODE SELECTOR ASSEMBLY FOR USE IN TAPE RECORDERS

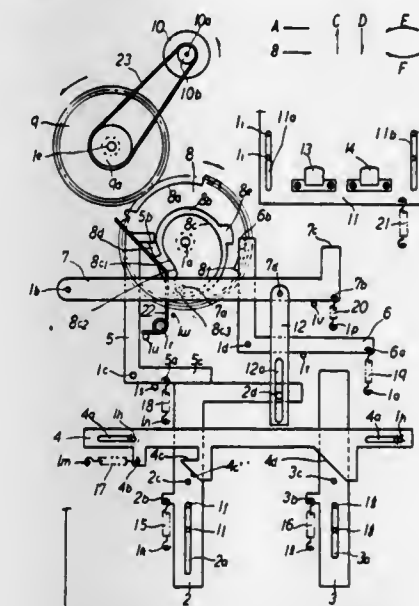
Takahiko Suezawa; Satoru Koizumi; Hiroaki Nakao, and Takashi Tsuchitani, all of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 7, 1981, Ser. No. 281,129

Claims priority, application Japan, Jul. 7, 1980, 55-96108[U]  
Int. Cl.<sup>3</sup> G11B 15/18, 19/02

U.S. Cl. 360-137

3 Claims



1. A mode selector assembly for use in a tape recorder for placing the tape recorder into a selected operating mode by means of a rotating member, upon the actuation of an actuator lever, said mode selector assembly comprising a rotating member having a cam surface, interlocking means provided between the actuator lever and the rotating member for achieving a sliding movement with the rotational movement of the cam surface, responsive to rotation of the rotating member and connecting means for connecting the actuator lever to the interlocking means, wherein upon the actuation of the actuator lever, the rotating member is rotated, and the actuator lever is shifted to its actuated position via the interlocking means, in response to the rotation of the cam surface.

#### 4,420,784 HYBRID D.C. POWER CONTROLLER

C. Gregory Chen, Brown Deer; Ping S. Lee, Milwaukee; Peter J. Theisen, West Bend, and Slobodan Krstic, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 4, 1981, Ser. No. 327,388

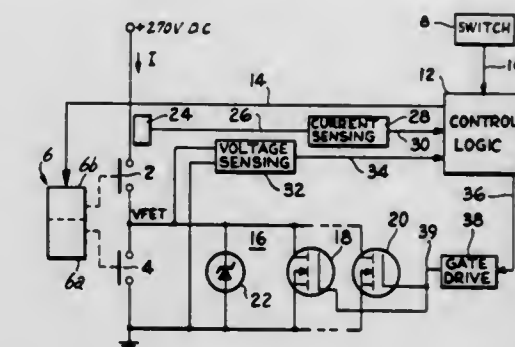
Int. Cl.<sup>3</sup> H01H 33/14

U.S. Cl. 361-7

19 Claims

1. A D.C. power controller for effectively interrupting a high voltage high current D.C. power line supplying a load from a D.C. power supply source comprising: power contacts in said power line; operating means for said power contacts; arc control means associated with said power contacts; and control means comprising: a plurality of arc-shunting solid state elements connected in parallel across said power contacts; means for controlling said operating means to open said power contacts; means for sampling the power line current and the voltage

across said open contacts to determine when said current has decreased to a value that can be conducted by said solid state elements and said voltage has increased to a value capable of effecting transfer of the arcing current from said power contacts to said solid state elements; means for allowing said power contacts to arc until said values of current and voltage are reached;



and means thereupon operable to gate said solid state elements to divert the arcing current from said contacts thereby to afford effective and repeated interruption of said power line by use of a minimum number of said solid state elements in combination with said power contacts for power interruption control.

#### 4,420,785 OVERVOLTAGE PROTECTION CIRCUIT FOR LINE AMPLIFIERS

Friedrich-Christian Tischer; Horst Kleinmann, and Herwig Klinger, all of Backnang, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

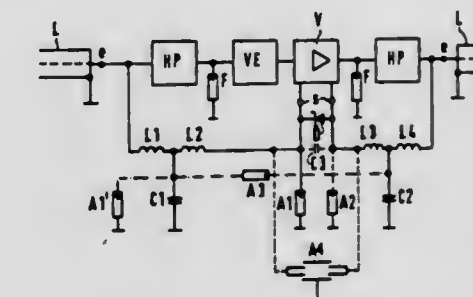
Filed Jun. 17, 1981, Ser. No. 274,443

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022677

Int. Cl.<sup>3</sup> H02H 3/20

U.S. Cl. 361-56

7 Claims



1. In an overvoltage protection circuit for an amplifier having signal input means and signal output means and being inserted in series between lengths of a signal transmission line, the line including a ground path and the amplifier being supplied with operating power via the transmission line and including power supply inputs conductively connected to the transmission line lengths via a current supply filter, the improvement comprising: an overvoltage arrester for providing coarse overvoltage protection connected between said ground path and a point located between one said line length and one of said power supply inputs; and two lowpass filters which form part of said current supply filter each connected between said arrester and a respective one of said transmission line lengths so that high frequency, high energy pulses which are generated if said arrester is fired cannot reach either the signal input or signal output means.



4,420,786

**POLARITY GUARD CIRCUIT**

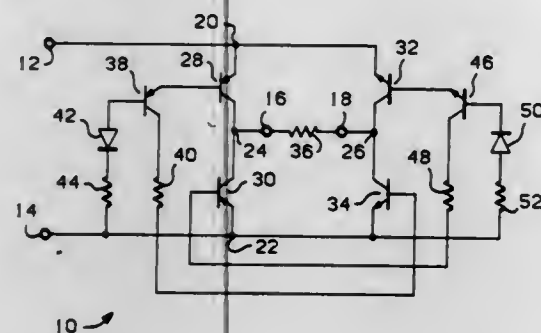
John J. Toney, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 16, 1981, Ser. No. 322,055

Int. Cl.<sup>3</sup> H02H 7/20

U.S. Cl. 361—77

3 Claims



1. A polarity guard circuit for providing an output voltage having a positive polarity regardless of the polarity of an input voltage, said circuit comprising:

- a first and a second input terminal receiving said input voltage;
- a first and a second output terminal;
- a first transistor having a base, collector and emitter, coupled between said first input terminal and said first output terminal;
- a second transistor having a base, collector and emitter, coupled between said first input terminal and said second output terminal;
- a third transistor having a base, collector and emitter, coupled between said second input terminal and said first output terminal;
- a fourth transistor having a base, collector and emitter, coupled between said second input terminal and said second output terminal;
- a fifth transistor having a base, collector and emitter, coupled between the bases of said first transistor and said fourth transistor, the base of said fifth transistor coupled to one of said input terminals; and
- a sixth transistor having a base, collector and emitter, coupled between the bases of said second transistor and said third transistor, the base of said sixth transistor coupled to one of said input terminals.

4,420,787

**WATER PUMP PROTECTOR**

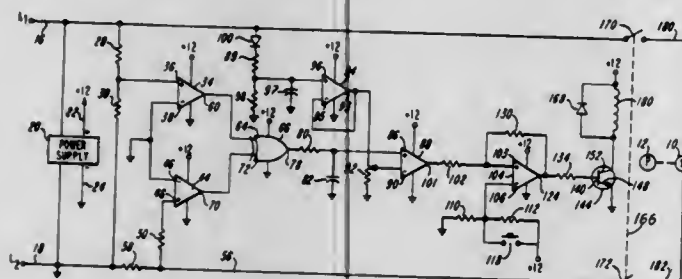
John L. Tibbitts, Centerville; Lamar D. Springer, Spring Valley, and John W. Sellers, Jr., Xenia, all of Ohio, assignors to Spring Valley Associates Inc., Centerville, Ohio

Filed Dec. 3, 1981, Ser. No. 327,269

Int. Cl.<sup>3</sup> H02H 3/26

U.S. Cl. 361—79

6 Claims



1. Protective circuitry for a liquid pump which is operated by an electric motor which is connected to a source of alternating current energy through a pair of electric conductors and switch means, comprising:

- voltage divider means joined to the electric conductors,

a first operational amplifier, the first operational amplifier having a pair of input terminals and an output terminal, means joining the input terminals of the first operational amplifier to the voltage divider means to provide a voltage representing the voltage between the electric conductors and in phase therewith,

a second operational amplifier, the second operational amplifier having a pair of input terminals and an output terminal,

means joining the input terminals of the second operational amplifier to at least one of the electric conductors to provide voltage representing the current flow through the electric conductor and in phase with the current flow through the electric conductor,

an exclusive-OR-gate provided with a pair of input terminals and an output terminal,

means joining the output terminals of the operational amplifiers to the input terminals of the exclusive-OR-gate,

a third operational amplifier, the third operational amplifier being provided with a pair of input terminals and an output terminal,

means joining the output terminal of the exclusive-OR-gate to one of the input terminals of the third operational amplifier,

means joining the other input terminal of the third operational amplifier to one of the electric conductors,

a fourth operational amplifier, the fourth operational amplifier having a pair of input terminals and an output terminal,

means joining the output terminal of the third operational amplifier to one of the input terminals of the fourth operational amplifier, and means joining said one input terminal of the fourth operational amplifier to the output terminal thereof,

means joining the other input terminal of the fourth operational amplifier to a source of direct current voltage,

a transistor provided with a base, a collector and an emitter, means joining the output terminal of the fourth operational amplifier to the base of the transistor,

an electrical actuator member for operation of the switch means,

means joining the collector of the transistor to the electrical actuator member,

means joining the emitter of the transistor to a source of direct current voltage,

the first and second operational amplifiers providing representative voltages to the exclusive-OR-gate in accordance with the voltage applied to the electric conductors and the current through said one conductor, the exclusive-OR-gate detecting the time sequence between said voltage at the output terminal of the first operational amplifier with respect to the voltage at the output terminal of the second operational amplifier, the exclusive-OR-gate emitting an average output voltage in accordance with the total time period that both of the operational amplifiers are emitting a voltage, the third operational amplifier emitting an output voltage when the average output voltage of the exclusive-OR-gate exceeds a given magnitude, the fourth operational amplifier emitting an output current to the base of the transistor when the output voltage of the third operational amplifier exceeds a given magnitude, the transistor emitting a current sufficient to energize the electric actuator member, the electric actuator member thus operating the switch means to deenergize the electric motor to protect the pump which is operated by the electric motor.

4,420,788

**PHASE RELAY FOR AC POWER TRANSMISSION LINE PROTECTION**

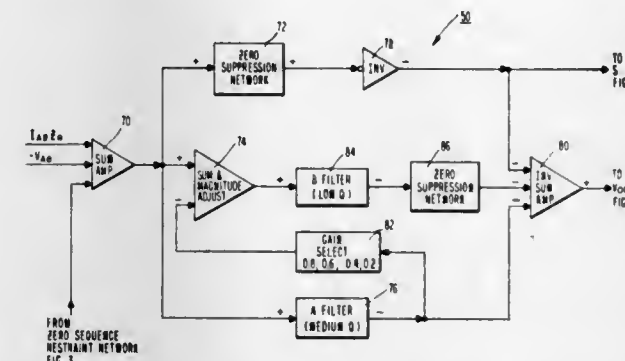
Stanley B. Wilkinson, Havertown, and George E. Alexander, Wallingford, both of Pa., assignors to General Electric Company, King of Prussia, Pa.

Filed Jul. 29, 1982, Ser. No. 403,273

Int. Cl.<sup>3</sup> H02H 3/26, 7/26

U.S. Cl. 361—85

20 Claims



1. In a protective relay for detecting faults in a three-phase AC power system, the relay being of a phase angle comparator type and including phase coincidence detecting means responsive to at least two input signals supplied thereto, one input signal being an operating signal and a second input signal being a polarizing signal, and timer circuit means responsive to an output signal from said phase coincidence detecting means when the phase coincidence of the input signals is of a predetermined duration, means for developing said operating signal upon detection of a fault by summing the following signals:

- a. a pre-fault signal comprising the pre-fault value of a first difference signal which is related to the difference between (1) the product of a signal proportional to a transmission line current and a replica impedance of the transmission line and (2) a signal proportional to a transmission line voltage; and
- b. that portion of a second difference signal which exceeds a predetermined threshold value, the second difference signal being related to the difference between (1) said first difference signal and (2) a preselected portion of the magnitude of said pre-fault signal.

4,420,789

**CHARACTERISTIC TIMER FOR A PROTECTIVE RELAY**

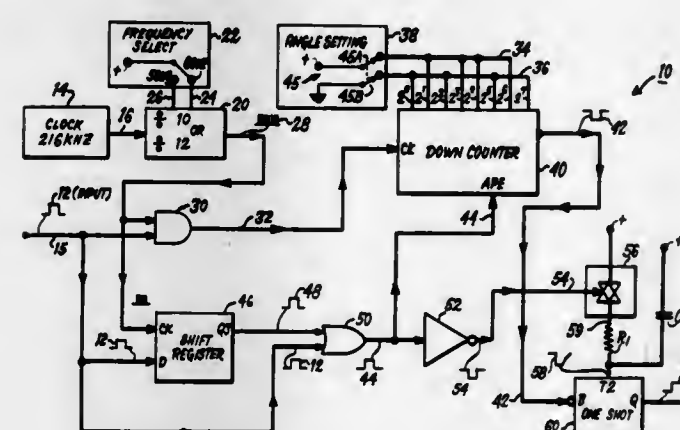
Thomas B. Breen, Lansdowne, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Apr. 19, 1982, Ser. No. 369,440

Int. Cl.<sup>3</sup> H02H 3/093

U.S. Cl. 361—94

4 Claims



1. A characteristic timer for a protective relay that measures the time duration of an applied signal which is representative of a normal or abnormal condition of a portion of a transmission line associated with said protective relay, said characteristic timer measuring the time duration of the applied signal

relative to the frequency of the power source supplying said transmission line, said characteristic timer comprising:

- (a) means including a clock source for developing a first output signal having a frequency proportional to the frequency of said power source;
- (b) means responsive to coincidence between the applied signal and the first output signal for generating a second output signal having a frequency equal to the frequency of the first output signal when there is coincidence between said applied signal and said first output signal;
- (c) selectable means for selecting a first digital signal representative of a desired angle within the range of 0 to 180 degrees of one cycle of the frequency of said power source;
- (d) means for developing a third output signal in response to the occurrence of a hole in said applied signal having a duration less than a predetermined amount;
- (e) a digital counter for receiving said second and third output signals and said first digital signal and having:
  - (1) an initial digital content established in response to said first digital signal,
  - (2) a digital content that is altered in response to said second output signal,
  - (3) a digital content that is unconditionally resettable to its initial digital content in response to the absence following the presence of said third output signal, and
  - (4) means for generating a fourth output signal upon the occurrence of its digital content being altered to a predetermined quantity; and,
- (f) means responsive to the fourth output signal for developing a fifth output signal that extends past termination of said fourth output signal.

4,420,790

**HIGH SENSITIVITY VARIABLE CAPACITANCE TRANSDUCER**

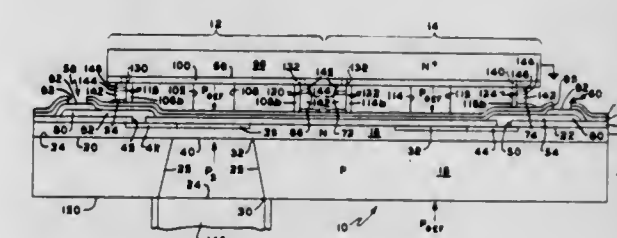
Keith W. Golke; Thomas E. Hendrickson, and Charles C. Huang, all of Hennepin County, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 2, 1982, Ser. No. 365,071

Int. Cl.<sup>3</sup> H01G 7/00; G01L 9/12

U.S. Cl. 361—283

39 Claims



1. A semiconductor device, comprising:

- a sensor transducer having a first portion adapted to deform upon application of forces due to first and second phenomena so that a first capacitance will vary in response to forces applied to the first portion due to both phenomena; and
- a reference transducer having a second portion adapted to deform upon application of forces due to the first phenomenon and the second portion being further adapted to remain substantially undeformed upon application of forces due to the second phenomenon, so that a second capacitance will vary in response to forces applied to the second portion due to the first phenomenon but will not vary in response to forces applied to the second portion due to the second phenomenon, and therefore variations of the first capacitance due to the first phenomenon can be distinguished from variations of the first capacitance due to the second phenomenon by comparing the variations of the first and second capacitances or electrical signals related thereto.



4,420,791

**DIELECTRIC FLUID**

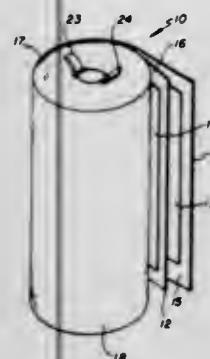
Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 28, 1981, Ser. No. 334,529

Int. Cl.<sup>3</sup> H01G 4/22

U.S. Cl. 361—319

5 Claims



1. A dielectric fluid comprising a mixture of about 70% by volume of a diarylethane compound and about 30% by volume of an epoxide additive effective to improve the dielectric constant of the fluid.

4,420,792

**PLUG-IN CONNECTOR WITH ARRESTERS FOR SEPARATING BLOCKS**

Gunter Hegner, and Hermann Herfort, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

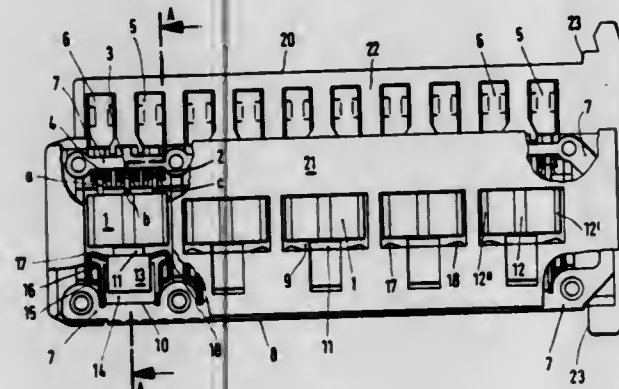
Filed Jun. 29, 1981, Ser. No. 278,046

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113759

Int. Cl.<sup>3</sup> H02B 1/10

U.S. Cl. 361—331

12 Claims



1. A plug-in connector with a plurality of arresters for separating blocks, said connector comprising:

- a cartridge-type housing made of insulating material, said housing being elongated and formed with a like plurality of said openings therethrough, said openings being adjacent one another in linear spaced arrangement;
- a group of three friction-type electrical clamping contacts adjacent each said side opening in said housing;
- a U-shaped earth strip substantially longitudinally coextensive with said housing, one longitudinal side of said earth strip comprising an earth bar positioned along one edge of said housing, the opposite longitudinal side of said earth strip being positioned on the opposite side of said side openings whereby said side openings are positioned within the open part of the U of said earth strip;
- a plurality of externally accessible tapping contacts in spaced adjacent relationship along the opposite longitudinal edge of said housing, two of said clamping contacts in each group being connected individually to two of said tapping

contacts adjacent thereto, another one of said clamping contacts in each group being connected to said earth strip; three spaced electrodes formed on each said arrester; a contact pin extending from each said arrester electrode, all three said contact pins being in spaced substantially parallel relationship;

said contact pins of one said arrester being pluggably and removably received by said clamping contacts in each said group, said arrester being removably externally accessible through said side openings, first and second ones of said electrodes being connected to respective said tapping contacts;

a compression spring assembly removably mounted between each said arrester and said earth bar;

a meltably fuse element positioned between said spring assembly and the third electrode of said arrester;

said spring assembly normally making electrical and mechanical contact between said earth bar and said third electrode through said fuse element and constantly biasing said arrester toward the plugged position, said third electrode being further connected to said earth strip by means of one of said contact pins said another one of said clamping contacts when said arrester is in the plugged position; and

a pair of electrical contacts fixed on opposite sides of said spring assembly and normally spaced from said first and second electrodes respectively.

4,420,793

**ELECTRICAL EQUIPMENT**

Lars Strandberg, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

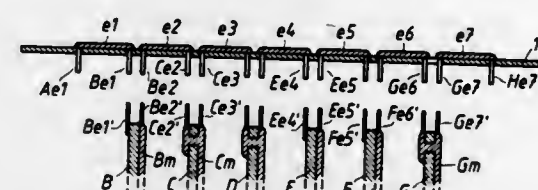
Filed Sep. 21, 1981, Ser. No. 304,441

Claims priority, application Sweden, Sep. 29, 1980, 8006798

Int. Cl.<sup>3</sup> H05K 1/14

U.S. Cl. 361—413

5 Claims



1. Electrical equipment comprising:

- a connection device including a plurality of mating contact devices, each of which receives a circuit card contact device, said connection device including a plurality of conductors, each beginning at one of said mating contact devices and ending at another of said mating contact devices; and
- a plurality of electronic functional units, each unit including a main circuit card and at least one slave circuit card, all of said circuit cards including a contact device inserted in said mating contact device providing a plurality of electrical connections to a respective circuit card, said slave circuit card including a contact bridge means for connecting one of said plurality of conductors to another of said conductors through said circuit card connection device and a respective mating connection device, whereby a functional unit is formed between a slave card and a main circuit card having a local bus formed by said plurality of conductors isolated from other functional units.

4,420,794

**INTEGRATED CIRCUIT SWITCH**

James R. Anderson, Minneapolis, Minn., assignor to Research, Incorporated, Eden Prairie, Minn.

Filed Sep. 10, 1981, Ser. No. 300,965

Int. Cl.<sup>3</sup> H05F 5/100

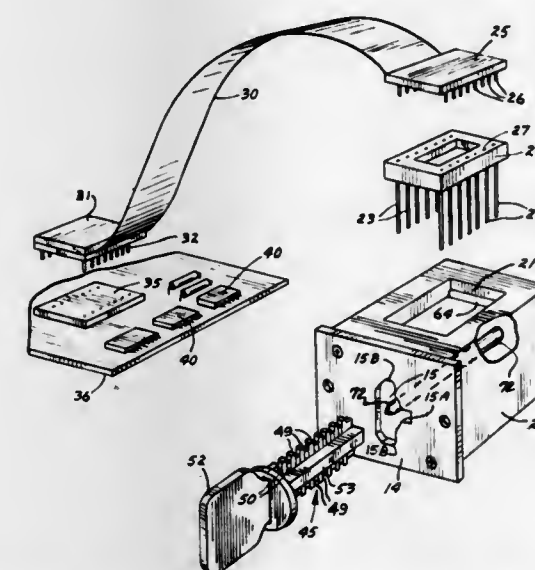
U.S. Cl. 361—419

10 Claims

1. An integrated circuit switch comprising a housing having

an opening therein, means in said housing for providing a plurality of individual first electrical contacts arranged in a pair of spaced rows of first contacts, a key assembly including a key base having a platform portion with an external surface forming a support and external side edge portions having grooves defined therein and spaced to correspond to the spacing of the first contacts in the respective rows, a dual in-line package supported on the external surface and having an electrical circuit coupled to elongated second circuit contacts which form the standard elongated leads of such dual in-line package extending externally from the opposite edges of the dual in-line package and which correspond in spacing to the first contacts in the housing, the key base having means on the platform for positioning the dual in-line package at a desired

location with the second circuit contacts along the opposite edge portions of the platform, the second circuit contacts being bent over the edge portions and each fitting into one groove, and being exposed along the edge portions, said key assembly fitting through said opening and being positioned between the rows of first contacts and being rotatable when inserted into the interior of said housing to bring the portions of the second circuit contacts of the dual in-line package carried by the key assembly and exposed at said edge portions into electrical connection with the corresponding first contacts in the housing, the rows of first contacts yielding resiliently as the key assembly is rotated and the exposed portions of the second circuit contacts are brought into electrical connection with the first contacts.



4,420,796

**DEVICE FOR DISPERSING LIGHT RAYS ISSUING FROM A LIGHT GUIDE**

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

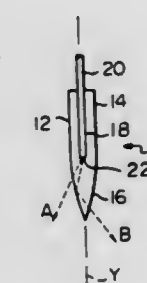
Filed Feb. 18, 1982, Ser. No. 350,058

Claims priority, application Japan, Feb. 24, 1981, 56-26291

Int. Cl.<sup>3</sup> F21V 7/04

U.S. Cl. 362—32

4 Claims



1. A device for dispersing light rays issuing from a light guide, which comprises: an elongated body of a rigid transparent material, said body having adjacent an end thereof a central opening for receiving therein an end of a light guide in a light transmitting relationship, the other end of said body being tapered to define a peripheral surface tapering toward a point located in alignment with the axis of the body remote from said opening, said peripheral surface is curved toward said tapered end, so that the angle formed between the axis of the body and the line tangential to said surface in a plane of said axis gradually increases toward said tapered end, so that those light rays, entering from said light guide into said body at a small angle of intersection with respect to the axis of the body, are reflected back into the body at least one time by the internal boundary of said peripheral surface, thereby to propagate through said body at a larger angle of intersection with respect to said axis, whereby light rays issuing from the light guide, are dispersed as they leave said body.

4,420,795

**ELECTRONIC COMPONENT MOUNTING**

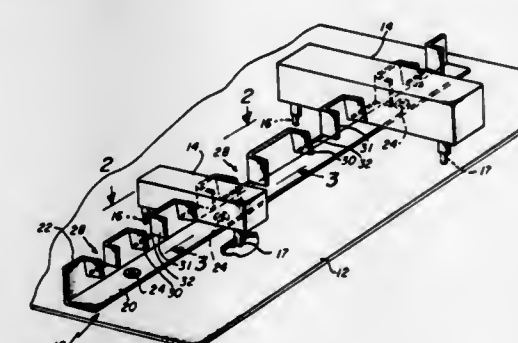
Donald T. Scholz, 13 Rich Valley Rd., Wayland, Mass. 01778

Filed Aug. 17, 1981, Ser. No. 293,361

Int. Cl.<sup>3</sup> H05K 7/12

U.S. Cl. 361—427

7 Claims



1. A mounting apparatus positioning and mounting electronic components such as high wattage resistors to a substrate board and comprising an elongated bracket having two elongated legs, means securing one of the legs to the substrate

**REAR LAMP CONSTRUCTION OF A HATCHBACK TYPE MOTOR VEHICLE**

Toru Tohata, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 6, 1981, Ser. No. 319,056

Claims priority, application Japan, Dec. 9, 1980, 55-177291[U]

Int. Cl.<sup>3</sup> B60Q 1/26, 1/44

U.S. Cl. 362—80

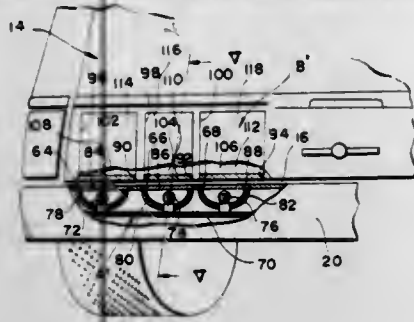
10 Claims

1. A rear lamp construction of a motor vehicle of a type having a hatchback door which is swingable relative to the vehicle body to open and close a door opening defined in a rear panel construction of the vehicle, said rear lamp construction comprising:

a first device mounted in said rear panel construction and



including a first electric bulb which, when energized, produces light which is directed toward the door opening; and a second device mounted in said hatchback door at a portion



where the light coming from said first device reaches when the door is in its closed position, said second device including a first light reflecting mirror for reflecting rearward of the vehicle the light coming from said first device.

4,420,798

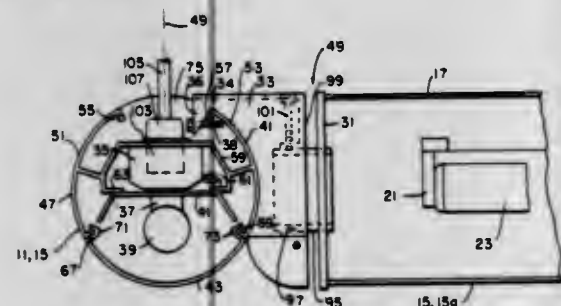
## ADJUSTABLE OVERHEAD LIGHTING SYSTEM

Douglas J. Herst, Ross, and Henry H. Iwahashi, El Cerrito, both of Calif., assignors to Herst Lighting Co., Berkeley, Calif.

Filed Dec. 7, 1981, Ser. No. 328,106  
Int. Cl.<sup>3</sup> F21S 1/02

U.S. Cl. 362-147

21 Claims



1. An adjustable overhead lighting system comprising a set of elongated support runners of a uniform cross-sectional shape suspended overhead in spaced parallel relation with other support runners, said set of support runners having electrical source means,
- a plurality of elongated hanger fixture elements, each hanger fixture element having an elongated lamp housing and end cap means projecting from the ends of said lamp housing, said end cap means being formed to releasably endwise engage the sides of said support runners along the length thereof whereby said hanger fixture element can be supported between adjacent parallel support runners substantially anywhere along the length of said support runners, said hanger fixture elements having electrical means including electrical path means for electrifying the lamps in said hanger fixture element lamp housing from the electrical source means of said support runners, when said hanger fixture elements are positioned on said support runners.

4,420,799

## CIRCULAR GAS DISCHARGE REFLECTOR LAMP

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024  
Filed Aug. 20, 1982, Ser. No. 409,999

Int. Cl.<sup>3</sup> F21S 5/00

U.S. Cl. 362-216

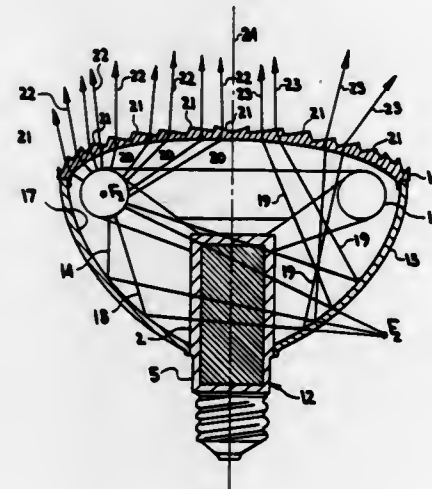
8 Claims

1. A circular gas discharge reflector lamp comprising: a ballast housing supporting and at least partially enclosing a current controlling ballast and having proximal and distal ends;
- a generally tubular member extending from the proximal end of the ballast housing and terminating in a male screw shell;
- a plurality of lamp engaging arms extending from the ballast

housing and adapted to retain a circular gas discharge lamp;

a circular gas discharge lamp retained by the lamp engaging arm and disposed coaxially with respect to the male screw shell and distally with respect to the ballast housing, and capable of emitting light, when energized, in the proximal and distal directions;

a plurality of electrical conductors connecting the male screw shell, the lamp and the ballast into an operative circuit to light the lamp with electrical power applied to the male screw shell;



a generally concave reflector partially enclosing the lamp and attached to the ballast housing, so contoured as to receive incident light from the lamp emitted in the proximal direction and to reflect the incident light generally in the distal direction; and

a lens attached at its perimeter to the perimeter of the reflector and completing the enclosure of the lamp, so oriented as to transmit incident light from the lamp emitted in the distal direction, and also to transmit incident light reflected in the distal direction by the reflector.

4,420,800

## REFLECTOR LAMP WITH SHAPED REFLECTOR AND LENS

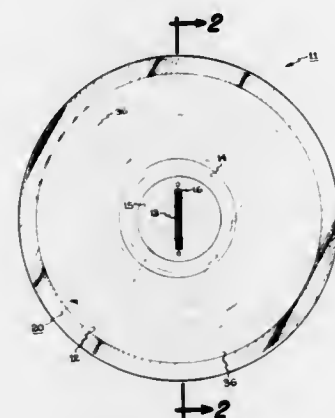
David D. Van Horn, East Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 218,932, Dec. 22, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,334

Int. Cl.<sup>3</sup> F21V 7/00

U.S. Cl. 362-297

18 Claims



1. A reflector lamp, comprising a finite light source positioned substantially at the focal point of a reflector, said reflector having a substantially parabolic front section as a primary reflecting surface, a substantially spherical intermediate section, and a substantially parabolic rear section, each of said sections having substantially the same common focal point,

said light source located at least three times as far from the front opening of said reflector as from the vertex of said primary reflective surface so that substantially more than half of the total light is reflected by the reflector, and a lens positioned over the front of said reflector and contoured at least near the outer edge thereof to refract in a more frontwardly direction at least some of the unreflected divergent light from said light source.

4,420,801

## REFLECTOR LAMP

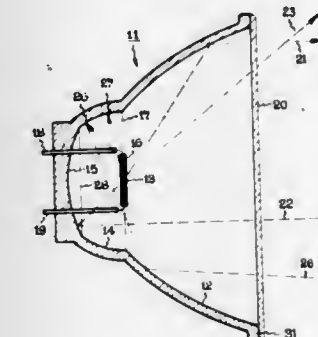
Gilbert H. Reiling, Chardon; John M. Putz, Twinsburg, and David D. Van Horn, East Cleveland, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 165,610, Jul. 3, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,741

Int. Cl.<sup>3</sup> F21V 7/00

U.S. Cl. 362-297

7 Claims



1. A lamp comprising a concave reflector having a front section substantially defined by the surface of revolution of a first parabolic curve whose focal point is relatively close to its vertex with the surface terminating essentially at its latus rectum,

an intermediate section of substantially spherical configuration having its center substantially at the focal point of said front section and a diameter essentially equal to the length of said latus rectum,

a rear section substantially defined by a surface of revolution of a second parabolic curve whose focal point is substantially farther from its vertex than said first parabolic curve with said two focal points being substantially coincident, and

a finite light source positioned substantially at said substantially coincident focal points wherein said rear section terminates at the circular junction with said spherical intermediate section so that substantially all light rays from said light source which are reflected by said spherical intermediate section are re-reflected by said parabolic front section.

4,420,802

## LIGHTING FIXTURE WITH THERMAL PROTECTOR BRACKET

Paul R. Smester, Mount Sinai, and Edison A. Price, New York, both of N.Y., assignors to Edison Price, Incorporated, New York, N.Y.

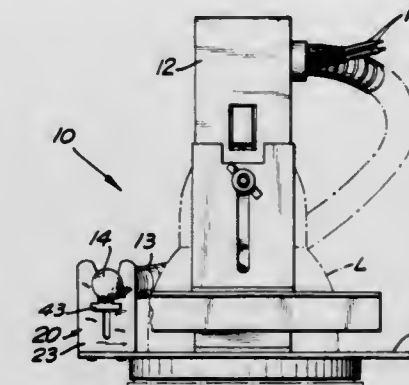
Filed Apr. 14, 1983, Ser. No. 484,890

Int. Cl.<sup>3</sup> F21S 1/06

U.S. Cl. 362-364

9 Claims

1. In a recessed incandescent lighting fixture having a faceplate and a wireway spaced from said faceplate for holding a bulb socket and for effecting the electrical connections to the fixture, the improvement comprising: a substantially cylindrical thermal protector connected to said wireway by a wireway extension comprising a flexible metallic conduit; and a bracket for releasably retaining the protector and cable on the rear surface of the faceplate, the bracket comprising a base member mounted on the rear surface of the faceplate, a first mounting member extending outwardly from the base member and hav-



ing means forming a first slot therein for releasably retaining the thermal protector, a second mounting member extending outwardly from the base member and spaced apart from the first mounting member, the second mounting member having means including two bendable arms forming a second slot for releasably receiving the minor root diameter of the conduit, and a spacing member having end portions disposed in the slots between the base member and the protector and conduit and having deflecting means disposed at the one end portion received in the second slot for deflecting the two arms relative to each other at an angle substantially equal to the pitch of the conduit thread.

4,420,803

## HOUSING FOR FORMING A VEHICLE LIGHT ASSEMBLY

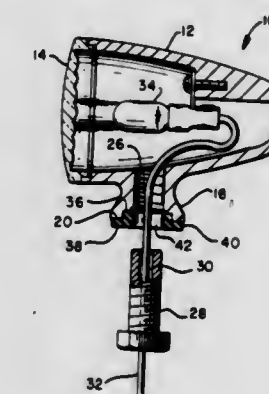
Alwin J. Stahel, St. Paul, and James M. Preisler, Mound, both of Minn., assignors to Drag Specialties, Inc., Minnetonka, Minn.

Filed Jun. 28, 1982, Ser. No. 392,874

Int. Cl.<sup>3</sup> F21V 15/04, 33/00; B60Q 1/04

U.S. Cl. 362-369

2 Claims



1. A vehicle light assembly comprising:

(a) an integral body having a top surface, a bottom surface, side surfaces, a closed back end, an open front end, an interior chamber, a mounting base with a flat mounting surface on the lower end extending downward from the bottom surface, and a single threaded orifice extending through the base to the chamber;

(b) a generally arcuate light transmitting lens mounted to the front end of the body to close the interior chamber;

(c) an electrical light source mounted to the body within the chamber and positioned so that light emitted by the electrical light source is directed out of the chamber through the lens;

(d) threaded mounting means constructed and arranged for engagement with the threaded orifice in the mounting base to permit mounting of the body to a vehicle, the bolt having a head, a threaded shank and an orifice extending longitudinally through the mounting means; and

(e) an electrical conductor connected at one end to the light source and extending out of the chamber through the



orifice in the mounting means for permitting electrical power to be provided to the light source.

#### 4,420,804 SWITCHING REGULATOR WITH BASE CHARGE REMOVAL CIRCUIT

Hisao Nishino, Sendai, Japan, assignor to Tohoku Metal Industries, Ltd., Sendai, Japan

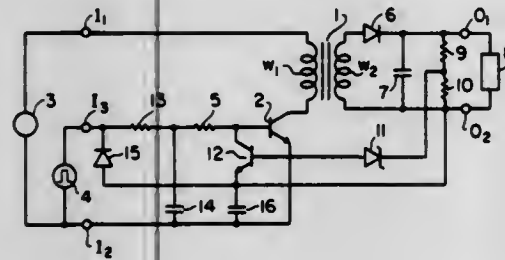
Filed Aug. 25, 1981, Ser. No. 296,113

Claims priority, application Japan, Aug. 26, 1980, 55-116412; Aug. 26, 1980, 55-116413

Int. Cl.<sup>3</sup> H02P 13/22, 13/30

U.S. Cl. 363—21

10 Claims



1. In a switching regulator wherein the on-off operation of a first switching transistor is controlled in response to an error signal detected in DC load voltage to regulate the load voltage at a constant level, the improvement comprising a circuit for controlling said first switching transistor, which comprises: square-wave pulse generating means for generating AC square-wave pulses at a constant repetition frequency; triangular-wave forming means for forming triangular-wave pulses from said square-wave pulses; means including diode means and capacitance means connected in series with one another between output terminals of said square-wave pulse generating means, for providing a voltage potential at a common connection point between said diode means and said capacitance means, said voltage potential being negative in relation to the output voltage of said triangular-wave forming means; and variable impedance means connected between the output of said triangular-wave forming means and said common connection point at the negative voltage potential so that the triangular-wave pulses are biased to be negative in voltage potential at each valley of the triangular-wave pulses, said variable impedance means being operative to vary its impedance in response to the error signal, the biased triangular-wave pulses produced by said variable impedance means providing a control signal coupled to said first switching transistor for controlling turn-on and off operation of said first switching transistor.

#### 4,420,805 PROTECTIVE RELAYING SYSTEM

Mitsuru Yamaura, Hachioji; Ryotaro Kondow, Tokyo, and Junichi Inagaki, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 20, 1981, Ser. No. 236,602

Claims priority, application Japan, May 20, 1980, 55-65882

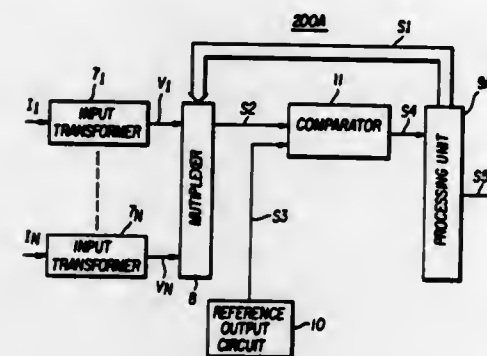
Int. Cl.<sup>3</sup> G06F 15/20

U.S. Cl. 364—184

25 Claims

1. A protective relaying system comprising: reference output circuit means for producing a digital signal; conversion means coupled to said reference output circuit means for receiving said digital signal and for converting said digital signal into a reference signal; processing means coupled to said conversion means for receiving said reference signal, for inverting said reference signal into an inverted reference signal, and for selecting one of said reference signal and said inverted reference signal to produce a digital reference output signal,

said processing means including means for producing a selection signal; selection means for receiving a plurality of input signals from a source, said selection means being coupled to said processing means for receiving said selection signal and for selecting one of said plurality of input signals to produce a selected input signal based on said selection signal; digital to analog converter means coupled to receive said digital reference output signal from said processing means for converting said digital reference output signal into an analog reference signal; and



comparison means coupled to receive said selected input signal from said selection means and coupled to receive said analog reference signal from said digital to analog converter means for comparing said selected input signal with said analog reference signal and for producing a decision signal in digital form according to the result of the comparison;

wherein said processing means is coupled to receive said decision signal from said comparison means for processing said decision signal to produce a relay output signal.

#### 4,420,806

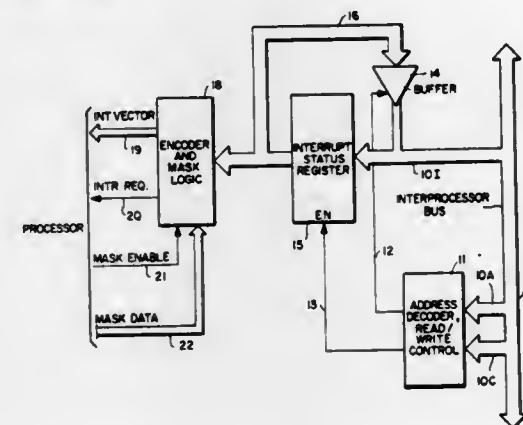
INTERRUPT COUPLING AND MONITORING SYSTEM  
Mize Johnson, Jr., West Melbourne, and Harold J. Miller, Brevard County, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 15, 1981, Ser. No. 225,270

Int. Cl.<sup>3</sup> G06F 11/30

U.S. Cl. 364—200

18 Claims





gate means responsive to said adjusted signal for changing to an enabled condition for a time period related to the period of said adjusted signal,

a clock pulse generator connected to said gate means for providing thereto stable clock pulses having a predetermined frequency, and

counter means connected to said gate means for receiving said clock pulses when said gate is enabled, counting the received clock pulses, deriving from the count of the pulses obtained during a time period when the gate is enabled a value for the frequency of said adjusted signal, and multiplying said value by said factor  $n$  to provide an output signal representing the frequency of said input signal,

said counter means having a predetermined upper and lower limit for said count and being responsive to said count falling below said lower limit to increase the factor  $n$  to the next larger value in a fixed ascending series of values and being responsive to said count exceeding said upper limit to decrease the factor  $n$  to the next smaller value in said series, for maintaining the count within said upper and lower limits and said adjusted signal within a predetermined range of frequencies.

4,420,810

# APPARATUS FOR OPERATING A MOTOR DRIVEN DEVICE AND TESTING STATE OF SERIES LIMIT SWITCH OVER SAME TWO-WIRE CIRCUIT

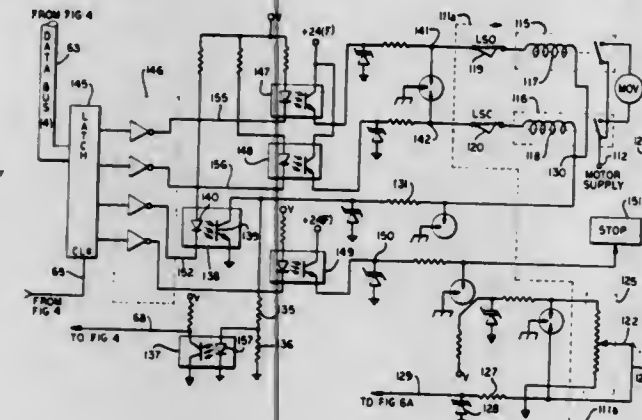
Rafael Hernandez, Jimenez, Mexico; Edmund E. Chow, Lilburn, Ga.; Marion L. Moncrief, Jr., and Frank S. Glass, both of Stone Mountain, Ga., assignors to Process Technologies, Inc., Tucker, Ga.

Division of Ser. No. 200,382, Oct. 24, 1980. This application Sep. 22, 1982, Ser. No. 421,141

Int. Cl.<sup>3</sup> G01F 23/00

U.S. Cl. 364—509

1 Claim



1. In a fluid storage tank including an electrically operated fluid control device including at least one operating means for activating said device in a particular direction in response to application of an operating voltage to a two wire circuit through said operating means, said operating means being in series with a limit switch for breaking continuity of said two wire circuit in response to said device reaching a predetermined operational state, the improvement of a control and testing apparatus for both operating said device and determining the state of said limit switch through said two wire circuit comprising:

switching means selectively operable for providing a first impedance state in said two wire circuit wherein said operating means will activate said device in response to said application of said operating voltage when said limit switch is closed, and alternately for providing a second impedance state in said two wire circuit wherein said operating means is inhibited from activating said device in response to said application of said operating voltage; and testing means responsive to said switching means being in said second state and said application of said operating

voltage for providing an output signal indicative of said state of said limit switch.

4,420,811

# WATER TEMPERATURE AND FLOW RATE SELECTION DISPLAY AND CONTROL SYSTEM AND METHOD

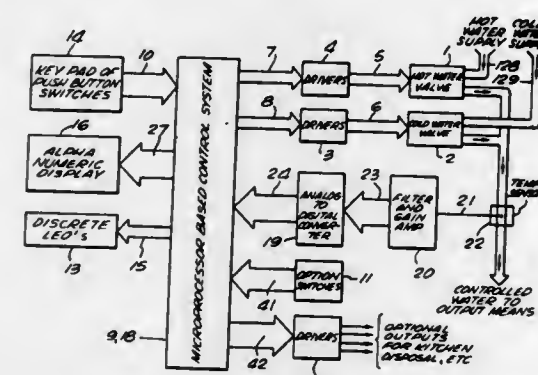
Matthew G. Tarnay, Pasadena, and John T. LaBelle, Long Beach, both of Calif., assignors to Price-Pfister Brass Mfg. Co., Pacoima, Calif.

Continuation-in-part of Ser. No. 126,325, Mar. 3, 1980, abandoned. This application Feb. 5, 1981, Ser. No. 231,727

Int. Cl.<sup>3</sup> G06F 15/46

U.S. Cl. 364—510

10 Claims



1. A system for use with a water delivery channel forming a part of a plumbing system for a building or housing structure for delivering water at a selected temperature and flow rate with separate hot and cold water source means through the water delivery channel, the system comprising:

mechanically independent valve means for controlling the flow of hot and cold water to said water delivery channel; temperature sensing means located in said delivery channel; command input means including means for turning said valves on, means for turning said valves off, and means for selecting output water temperatures ranging from a predetermined minimum to a predetermined maximum; data processing means having outputs connected to means for controlling said valve means and having inputs connected to said temperature sensing means, and to said common input means, said data processing means responding to said input means to:

- produce a predetermined output water volume at said delivery channel upon operation of said command input means; and
- bring the actual output water temperature to the selected output water temperature at said delivery channel while maintaining the output water flow rate at a preselected level.

4,420,812

# TEACHING-PLAYBACK ROBOT

Yoshimasa Ito; Junji Hashizume, both of Yokohama; Junichi Ikeda, Tokyo; Noriyuki Utsumi, and Teasyu Naka, both of Yokohama, all of Japan, assignors to Tokico, Ltd., Kawasaki, Japan

Filed Sep. 8, 1980, Ser. No. 185,023

Claims priority, application Japan, Sep. 14, 1979, 54-118510; Oct. 19, 1979, 54-135006

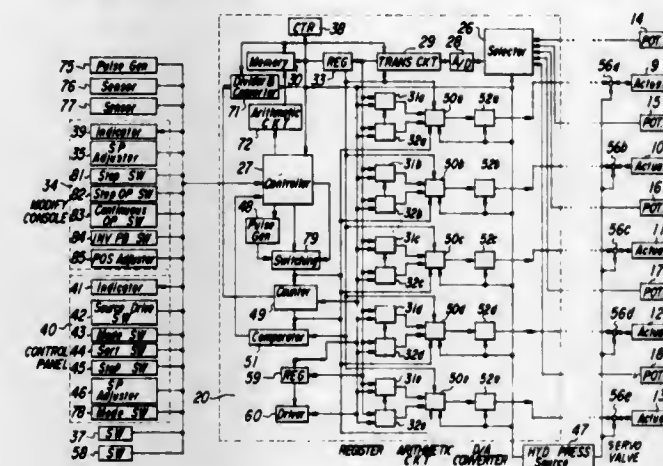
Int. Cl.<sup>3</sup> G05B 19/42; G06F 15/46

U.S. Cl. 364—513

24 Claims

1. A robot, comprising:  
a manipulator having a plurality of movable members, each member connected to its adjacent member with a joint;  
means for detecting the relative positions of adjacent movable members with respect to each other at each of the joints;  
means for generating positional signals from the detecting means upon teaching operations;

memory means for successively storing positional data produced from said positional signals;  
means for determining the number of interpolative positions between two of said positions based on two stored positional data entries which are read out from said memory means and for interpolating said determined number of positions between said successive two positions; and



means for positioning each of the movable members of the manipulator referring to resulting values of the determining means and interpolating means as command values and based on the positional signals from the detecting means as present values.

4,420,813

# OPERATION SEQUENCE INSTRUCTION BY SYNTHETIC SPEECH

Tomohiro Inoue, Nara, and Mituhiko Saiz, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

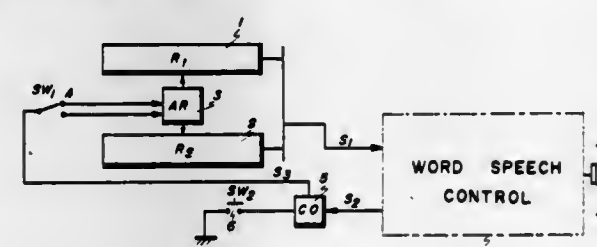
Continuation of Ser. No. 10,323, Feb. 7, 1979. This application Sep. 22, 1980, Ser. No. 189,046

Claims priority, application Japan, Feb. 8, 1978, 53-13761

Int. Cl.<sup>3</sup> G10L 1/00

U.S. Cl. 364—513

9 Claims



1. A system for automatically instructing an operator by audibly presenting step by step instructions comprising:  
first storage means for holding synthetic speech data in a plurality of locations;

second storage means for holding position data representative of the locations of said synthetic speech data, said position data being stored in a plurality of locations, each representative of an instruction;

advance means for sequentially selecting locations in said second storage means, thereby selecting instructions to be audibly reproduced in a step by step fashion;

selection means for recalling synthetic speech data from said first storage means in correspondence to the position data produced by said second storage means;

synthetic speech generation means for producing an audible instruction derived from said synthetic speech data, said instruction corresponding to the data present in the location of said second storage means selected by said advance means; and

an instruction request switch generating an instruction sequence signal when actuated;  
instruction completion indication means for producing a

completion signal representative of the completed generation of an audible instruction by said synthetic speech generation means;

said advance means in sequence selecting the next location in said second storage means corresponding to the next instruction to be generated upon receipt of the signal produced by said instruction request switch, said advance means inhibiting the selection of the next location in said second storage means until receipt of the completion signal produced by said instruction completion indicator means.

4,420,814

# WHEEL SPEED MEASURING CIRCUIT

Tetsuro Arikawa; Teruo Inoue, and Yukihiko Takiue, all of Yokosuka, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

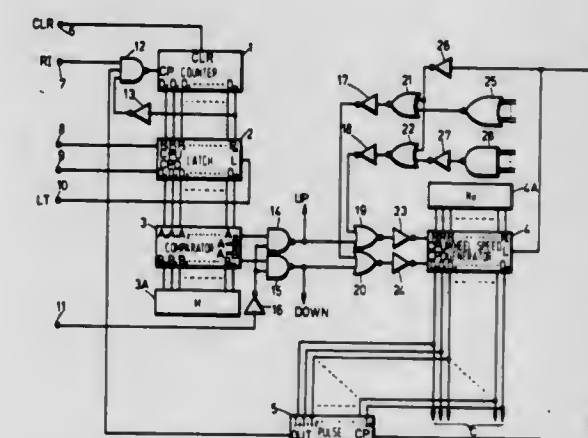
Filed Jun. 22, 1981, Ser. No. 275,974

Claims priority, application Japan, Jun. 27, 1980, 55-88193; Jun. 13, 1981, 56-91210

Int. Cl.<sup>3</sup> G01P 3/56

U.S. Cl. 364—565

15 Claims



1. A wheel speed measuring circuit comprising:

(A) a counter controlled by a wheel speed signal having a frequency proportional to the rotational speed of the wheel, sensed by a wheel speed sensor associated with a wheel;

(B) a comparator for comparing the digital output of said counter with a predetermined digital value  $M$ , said comparator generates a first output signal when the output of said counter is less than the value  $M$  and a second output signal when the output of said counter is greater than the value  $M$ ;

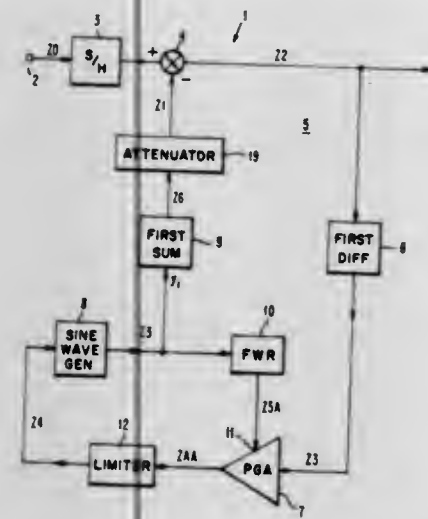
(C) a wheel speed generating circuit operatively connected to said comparator for generating a digital output corresponding to the rotational speed of the wheel, wherein said digital output of the wheel speed generating circuit is increased from a pre-existing digital output of said wheel speed generating circuit in response to said first comparator output signal and decreased from said pre-existing digital output in response to said second comparator output signal; and

(D) a pulse generator for generating pulses of a frequency proportional to said digital output of the wheel speed generating circuit, said pulse generator receiving said digital output of the wheel speed generating circuit, wherein said counter receives the output pulses of said pulse generator to count said output pulses for each period of the wheel speed signal or for a time interval relating to each period of the wheel speed signal, and the digital output of said counter is compared when said predetermined digital value in said comparator.



**4,420,815**  
**APPARATUS AND METHOD FOR REMOVAL OF SINUSOIDAL NOISE FROM A SAMPLED SIGNAL**  
 David B. Francis, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
 Filed May 18, 1981, Ser. No. 264,510  
 Int. Cl.<sup>3</sup> G06F 15/31  
 U.S. Cl. 364—724

19 Claims



1. Digital filtering apparatus for filtering noise of a single frequency from an analog signal comprising:  
 means for generating a plurality of samples of said analog signal at a given sampling rate,  
 means connected to said generating means for cancelling said noise to provide at an output terminal samples from which said noise has been removed, and,  
 feedback means connected between said output terminal and said means for cancelling including means connected to said output terminal for removing DC, means connected to said means for cancelling for compensating for the effect of said means for removing, a discrete sine wave generator operating at said given sampling rate electrically connected to said means of compensating, means electrically connected to sine wave generator for applying at least a minimum value of input signal to said sine wave generator, means electrically connected via said last mentioned means to said wave generator for adjusting the amplitude of said signals from said sine wave generator such that their amplitude is increased when the amplitude of the output samples of said sine wave generator is relatively large and their amplitude is decreased when the amplitude of the output samples of said sine wave generator is relatively small, said means for adjusting further including means for applying control signals to said means for adjusting to provide an output from the latter which is directly related to the absolute value of said control signals.

**4,420,816**  
**ELECTRONIC WORD RETRIEVAL DEVICE FOR SEARCHING AND DISPLAYING ONE OF DIFFERENT FORMS OF A WORD ENTERED**  
 Kunio Yoshida, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan  
 Filed Oct. 29, 1979, Ser. No. 89,236  
 Claims priority, application Japan, Oct. 31, 1978, 53-150556[U]

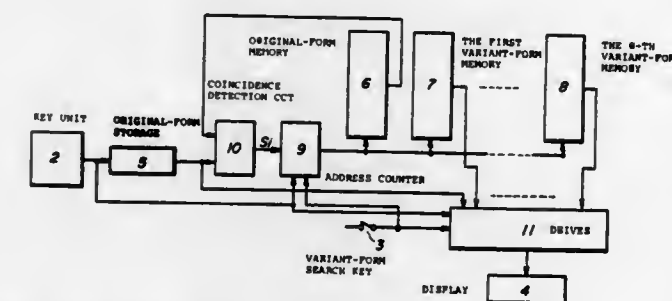
Int. Cl.<sup>3</sup> G06F 15/38

U.S. Cl. 364—900

7 Claims

1. A word information storage and retrieval apparatus comprising:  
 a plurality of character keys for entering first word information representing a desired word in original form;  
 search means responsive to said plurality of character keys for searching second word information representing said

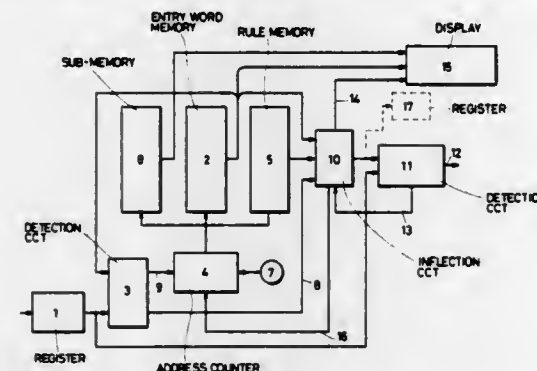
desired word in a variant form, said search means including:  
 an original form memory for containing original forms of a plurality of words;  
 at least one variant form memory for containing variant forms corresponding to said plurality of words;  
 a counter for producing an incremental count upon the initiation of searching;  
 a coincidence detector for sequentially comparing said desired word with the original forms of said plurality of words stored in said original form memory;



said coincidence detector comparing said desired word with the original form of a new one of said plurality of words with each increment of said counter, a detected coincidence stopping the incremental count of said counter to thereby allow said counter to produce a signal representative of the original form of the word corresponding to said desired word;  
 said signal generated by said counter being used to address and recall the variant form of said desired word from one of said at least one variant form memories; and  
 a display responsive to said variant form of said desired word for indicating said second word information.

**4,420,817**  
**WORD ENDINGS INFLECTION MEANS FOR USE WITH ELECTRONIC TRANSLATION DEVICE**  
 Kunio Yoshida, Tsuge, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan  
 Filed May 23, 1980, Ser. No. 152,846  
 Claims priority, application Japan, May 25, 1979, 54-65377; Jun. 19, 1979, 54-77738  
 Int. Cl.<sup>3</sup> G06F 15/38  
 U.S. Cl. 364—900

12 Claims

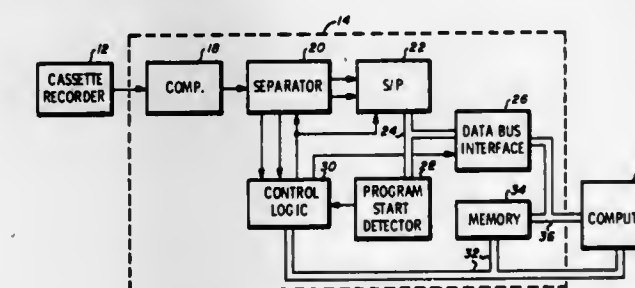


1. An electronic dictionary and language interpreter device wherein a first word represented in a first language is entered to obtain a second word represented in a second language equivalent to the first word,  
 input means for entering first words, said first words having a first uninflected portion and a second inflected portion;  
 first memory means provided for storing a plurality of entry words composed of the first uninflected portions of said first words;  
 second memory means provided for storing a certain number of rule patterns according to which inflected forms of said first words may be constructed from one of the entry words;

means responsive to the input means for addressing the first memory means and the second memory means to subsequently retrieve the entry words and the rule patterns associated therewith;  
 inflection control means responsive to the addressing means for inflecting the entry words according to the rule pattern; and  
 means responsive to the inflection control means for determining the equivalency between the first word, entered and the inflected word formed from the entry words by the inflection control means.

**4,420,818**  
**FAST LOAD CASSETTE TAPE RECORDER INTERFACE**  
 Lester H. Lee, Los Altos, and George Wussow, San Jose, both of Calif., assignors to Recortec, Inc., Mountain View, Calif.  
 Filed Mar. 12, 1981, Ser. No. 243,078  
 Int. Cl.<sup>3</sup> G06F 3/00  
 U.S. Cl. 364—900

9 Claims

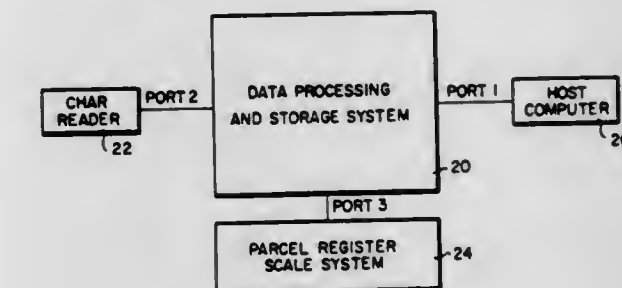


1. A cassette tape recorder interface for receiving electrical signals from a cassette tape played on a cassette tape recorder adapted to have the play head engaged while in the fast forward wind mode, comprising in combination:  
 a connector means for receiving electrical signals from an output of a cassette tape recorder;  
 a comparator means responsive to said electrical signals from said cassette tape recorder for comparing the magnitude of said electrical signals with a predetermined reference level, and generating data and clock pulses in response to those of said electrical signals which exceed said reference level, at a baud rate exceeding 8,000, whereby high speed data transfer may be accomplished with substantial rejection of noise;  
 a separator means responsive to said data and clock pulses for generating a separate data signal and clock signal;  
 a serial to parallel converter means responsive to said data signal and said clock signal for generating parallel data signals;  
 a data bus interface responsive to control signals for transmitting said parallel data signals;  
 a control means for generating said control signals;  
 a program start detector means responsive to said parallel data signals for detecting the start of a program stored on said cassette tape and enabling the transmission of said parallel data signals by said data bus interface, whereby the data bus interface will not transmit said parallel data signals until the start of a program is detected;  
 an address bus, comprising a plurality of address signals, connected to the control means and to a computer; and  
 an interface program memory means comprising non-volatile memory connected to the address bus for providing a plurality of pre-programmed program instructions to the computer via a data bus in response to address signals from the computer, with the control means being responsive to address signals transmitted on said address bus by said computer in response to said program instructions provided to the computer from the memory means via said data bus;  
 whereby parallel data signals are generated and transmitted in response to electrical signals received from the cassette tape recorded at high speed, and in accordance with pre-

programmed instructions contained in the interface program memory means.

**4,420,819**  
**SYSTEM FOR PROCESSING AND STORING TRANSACTION DATA AND FOR TRANSMITTING THE TRANSACTION DATA TO A REMOTE HOST COMPUTER**  
 Robert J. Price, and Bruce E. Taber, both of El Cajon, Calif., assignors to Data Card Corporation, Minnetonka, Minn.  
 Filed Mar. 13, 1981, Ser. No. 243,541  
 Int. Cl.<sup>3</sup> G06F 15/20  
 U.S. Cl. 364—900

18 Claims



1. A data processing and storage system for processing and storing transaction data relating to a plurality of parcels and for transmitting the transaction data to a remote host computer, comprising:  
 means for providing a character information signal including character data;  
 means for providing a scale data signal including scale data;  
 a programmable communications interface unit, operatively connected to said means for providing a character information signal, said means for providing a scale data signal, and to the remote host computer, for receiving said character information signal and said scale data signal, and for providing, as an output, said character data and said scale data;  
 a central processing unit, operatively connected to said programmable communications interface unit, for providing an I/O control signal to said programmable communications interface unit, for processing the transaction data comprising said character data and said scale data, for sorting the transaction data, for providing, as an output to be stored, the transaction data, and for generating a read signal;  
 a dynamic memory, operatively connected to said central processing unit, for use as temporary storage by said central processing unit when said central processing unit is sorting the transaction data; and  
 semi-permanent memory means, operatively connected to said central processing unit, for storing the transaction data processed by said central processing unit and for reading out the stored transaction data to said central processing unit in dependence upon said read signal, whereupon said central processing unit provides the transaction data to said programmable communications interface unit for transmission to the remote host computer.

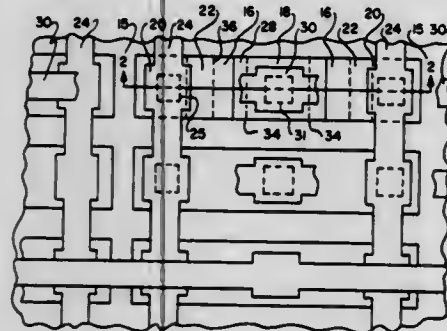
**4,420,820**  
**PROGRAMMABLE READ-ONLY MEMORY**  
 David R. Freedy, Colorado Springs, Colo., assignor to Signetics Corporation, Sunnyvale, Calif.  
 Continuation of Ser. No. 220,459, Dec. 29, 1980, abandoned.  
 This application Mar. 30, 1983, Ser. No. 479,344  
 Int. Cl.<sup>3</sup> G11C 11/36  
 U.S. Cl. 365—105

17 Claims

1. A semiconductor memory cell, comprising: (a) a semiconductor body; (b) a layer of insulating material on a surface of said body; (c) a layer of polysilicon on said insulating layer and

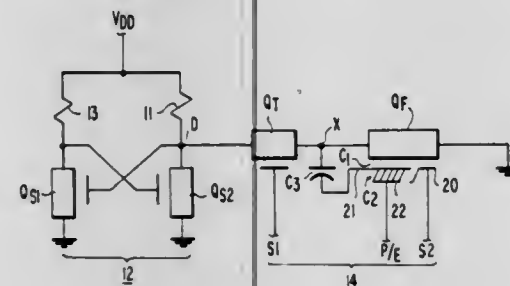


including a first region of first type conductivity, a second region of first type conductivity spaced laterally from said first region, a third region of second type conductivity between said first and second regions and forming a first semiconductive junction with said first region, said third region differing in impurity concentration from said first region, and a fourth region of second type conductivity between said first and second regions and forming a second semiconductive junction with said second region, said fourth region at least adjoining said third region and differing in impurity concentration from said second region, said first semiconductive junction having a lower reverse bias breakdown voltage than said second semi-



conductive junction; (d) a first metal contact forming one terminal of said memory cell and contacting said first region on one side of said first semiconductive junction; (e) a second metal contact forming another terminal of said memory cell and contacting said polysilicon layer on the other side of both said first and second semiconductive junctions and conductively coupled to said second region; (f) the surfaces of said third and fourth regions being free of any metal contact; (g) said first semiconductive junction serving as a programming diode when a voltage is applied across said first and second metal contacts with polarity and magnitude to cause reverse-bias breakdown of said first semiconductive junction.

**4,420,821**  
**STATIC RAM WITH NON-VOLATILE BACK-UP STORAGE AND METHOD OF OPERATION THEREOF**  
Charles R. Hoffman, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Feb. 19, 1982, Ser. No. 350,480  
Int. Cl.<sup>3</sup> G11C 11/40  
U.S. Cl. 365-154



**1. A semiconductor memory array having a plurality of memory cells, each of said cells comprising:**  
a static volatile memory element including at least one data node; and  
a non-volatile memory element coupled to said static memory element for storing data from said static memory unit and transferring data to said static memory unit in a non-volatile manner, said non-volatile memory unit comprising switch means for coupling said data node to a second node in response to a first control signal, and a dual gate FET having a channel connected to said second node, said dual gate FET having first and second gates for controlling a channel conductivity of said dual gate FET with

said first gate being connected to receive a second control signal and said second gate being a floating gate, a control electrode connected to receive a third control signal, and a segment of DEIS material disposed between said control electrode and said second gate, said first and second gates being separated from said channel of said dual gate FET by a gate oxide layer.

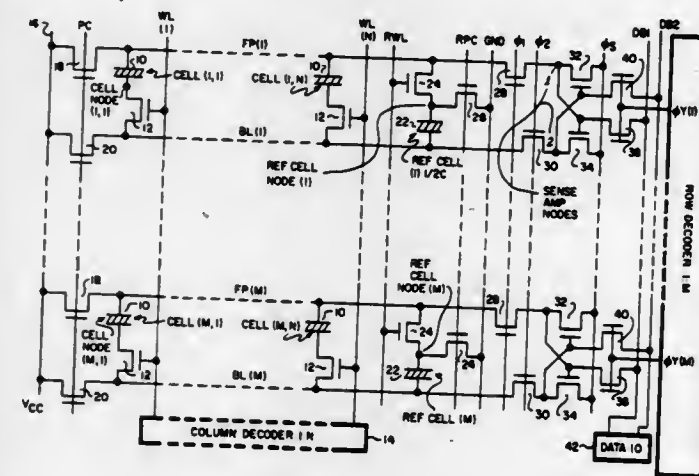
**4,420,822**  
**FIELD PLATE SENSING IN SINGLE TRANSISTOR, SINGLE CAPACITOR MOS RANDOM ACCESS MEMORY**

Joannes J. M. Koomen, Waalre, and Roelof H. W. Salters, Geldrop, both of Netherlands, assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 19, 1982, Ser. No. 360,088  
Int. Cl.<sup>3</sup> G11C 11/40

U.S. Cl. 365-182

6 Claims



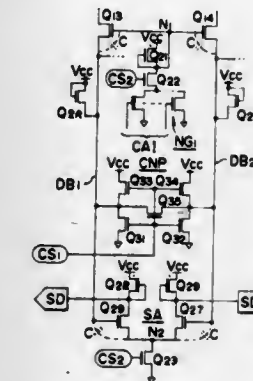
**1. A memory array, comprising:**  
(a) a plurality of memory cells arrayed in rows and columns;  
(b) a bit line and a field plate line for each row;  
(c) a word line for each column;  
(d) each memory cell including a memory cell transistor and a memory cell capacitor coupled in series between a bit line and a field plate line respectively, with the gates of the memory cell transistors in the same column coupled to a common word line;  
(e) a column including a reference cell capacitor and a reference cell transistor in each row coupled in series between the field plate line and the bit line, respectively, of the corresponding row;  
(f) a reference word line for said column in (e) coupled to the gates of said reference cell transistors;  
(g) a column including a sense amplifier in each row having means for coupling one input to the field plate line and the other input to the bit line of the corresponding row; and  
(h) means for connecting and disconnecting said field plate lines and said bit lines to and from a voltage supply for precharging them to the same d.c. potential.

**4,420,823**  
**SEMICONDUCTOR MEMORY**  
Hiroshi Shimada, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan  
Filed Dec. 24, 1980, Ser. No. 219,949  
Claims priority, application Japan, Dec. 25, 1979, 54-169067  
Int. Cl.<sup>3</sup> G11C 7/02  
U.S. Cl. 365-206

11 Claims

**1. A static semiconductor memory operatively connected to receive a first power supply voltage and a second power supply voltage lower than the first power supply voltage, and having a power-down mode, comprising:**  
memory cells;  
word lines respectively, operatively connected to a corresponding one of said memory cells;

bit line pairs respectively, operatively connected in parallel to a corresponding one of said memory cells;  
data bus pairs, each having a first and a second end and operatively connected in series to at least a respective one of said bit line pairs;  
sense amplifiers, each operatively connected to a respective one of said data bus pairs;  
transfer gates, each operatively connected in series between a respective one of said bit lines and a respective one of said data bus pairs;



coupling noise cancellers each connected to a respective one of said data bus pairs and to receive said second supply voltage, said data bus pairs being connected at said first end to a respective one of said bit line pairs via a respective one of said transfer gates and the second end to a respective one of said sense amplifiers, for clamping the data bus pairs to a predetermined potential when the static semiconductor memory is switched to the power-down mode, and for discharging said data bus pairs to said second power supply voltage.

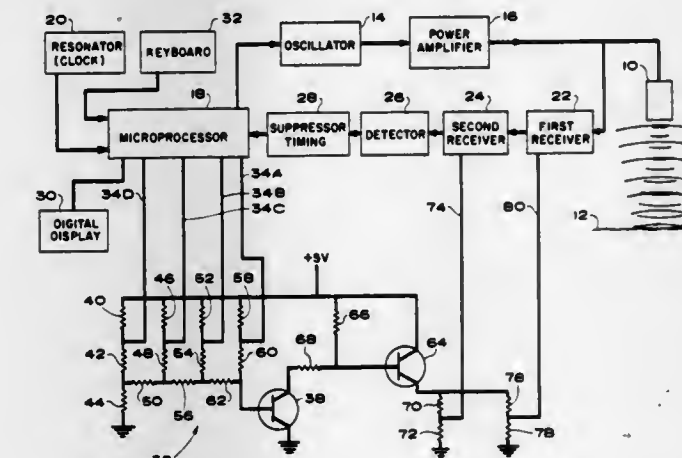
**4,420,824**  
**SONAR APPARATUS HAVING IMPROVED GAIN CONTROL**

Ronald G. Weber, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Continuation of Ser. No. 253,216, Apr. 13, 1981, abandoned.  
This application Feb. 7, 1983, Ser. No. 464,414  
Int. Cl.<sup>3</sup> G01S 15/08, 7/52

U.S. Cl. 367-98

7 Claims



**1. A sonar device for use on a boat to indicate the depth of water on a digital display including a transducer positioned in the water to transmit bursts of sound energy and for receiving echo energy reflected from the bottom, at least one variable gain receiver stage for amplifying the echo signals received by the transducer, the gain of said variable gain receiver stage being a function of an analog gain control voltage applied to said receiver; means for controlling the gain of said receiver stage comprising:**

(a) a microprocessor means for processing the amplified received signals to determine the time of travel of said

transmitted and reflected signals, and to supply appropriate control signals to the digital display to indicate depth of the reflector as a function of time required to receive the echo signals;

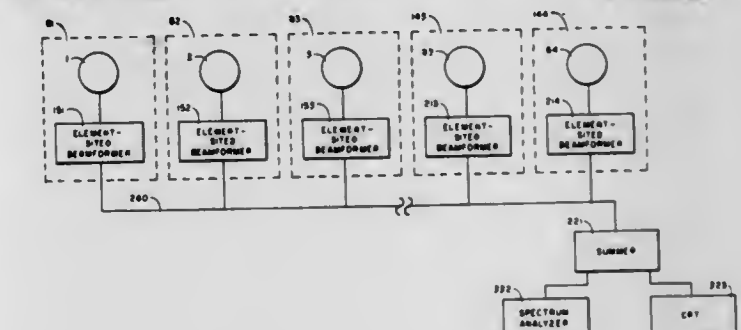
(b) said microprocessor means supplying also binary control signals to at least four parallel inputs to a ladder type resistive network means;  
(c) said ladder type resistive network means in cooperation with at least one stage of emitter following providing a variable d.c. analog gain control signal to said variable gain receiver stage.

**4,420,825**  
**ELEMENT-SITED BEAMFORMER**  
Robert L. Maynard, Manchester; Samuel S. Ballard, Hollis, and Robert L. Townsend, Amherst, all of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed May 15, 1981, Ser. No. 263,455  
Int. Cl.<sup>3</sup> G01S 3/80

U.S. Cl. 367-122

5 Claims



**1. A system for the direct formation of directional beams from individual hydrophones of a hydrophone array in which the hydrophones are coupled to an array cable, the system comprising:**

(a) a plurality of amplifying means located at the site of respective ones of the individual hydrophones for converting hydrophone signal voltages into data that may be sampled, the input of each of said amplifying means being coupled to the output of a particular hydrophone in said array;

(b) a plurality of delaying means located at the site of respective ones of the individual hydrophones for receiving, storing and delaying the output data from the associated one of said amplifying means, the input of each of said delaying means being coupled to the output of said amplifying means which is located at the same hydrophone as said delaying means;

(c) a plurality of controlling means located at the site of respective ones of the individual hydrophones for controlling the output of said delaying means so that only data samples that represent the beam currently being formed will be output by said delaying means at a specified time, the input of each of said controlling means being coupled to the output of said delaying means which is located at the same hydrophone as said controlling means;

(d) a plurality of coupling means located at the site of respective ones of the individual hydrophones for coupling the output data of said delaying means to said array cable at the time specified by said controlling means, the input of each of said coupling means being connected to the output of said delaying means which is located at the same hydrophone as said coupling means, and the output of each of said coupling means being coupled to said array cable; and

(e) a summer which is coupled to said array cable, said summer being adapted to sum the data placed on said cable, whereby the beams detected by each of said hydrophones will be obtained in sequence from said array cable.



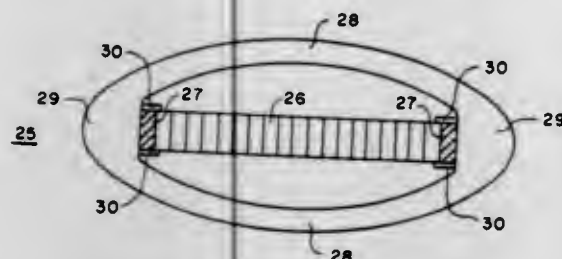
4,420,826

**STRESS RELIEF FOR FLEXENSIONAL TRANSDUCER**  
William J. Marshall, Jr., Nashua, and Ronald P. White, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 6, 1981, Ser. No. 280,637  
Int. Cl.<sup>3</sup> H04R 17/00

U.S. Cl. 367-167

5 Claims



1. In an underwater flexensional acoustical transducer comprising a cylindrical shell with an extendable driver stack disposed in an operable position between opposed sides of the shell in a longitudinally prestressed state, the improvement to prevent damage to the driver stack from negative stress resulting from overpressurization of the transducer comprising:

- (a) one of the ends of the driver stack being adapted to move longitudinally away from its respective side of the shell during an overpressurization condition of the transducer; and  
(b) guide means operably disposed adjacent said end and its respective side for guiding said end back into its operable position as said overpressurization condition is removed.

4,420,827

**DISC REPRODUCING SYSTEM**

Yoshiyo Wada; Hisao Kinjo, both of Yokohama, and Ichiro Ueno, Isehara, all of Japan, assignors to Victor Company of Japan Ltd., Yokohama, Japan

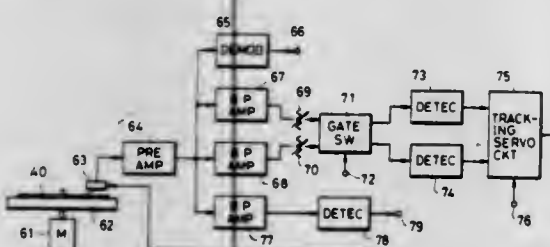
Continuation of Ser. No. 876,559, Feb. 9, 1978, abandoned. This application Sep. 11, 1980, Ser. No. 186,297

Claims priority, application Japan, Feb. 9, 1977, 52-13322; Feb. 12, 1977, 52-14438; Feb. 14, 1977, 52-14870; Feb. 23, 1977, 52-18056; Feb. 23, 1977, 52-18057

Int. Cl.<sup>3</sup> H04N 5/83; G11B 11/00, 21/10

U.S. Cl. 369-43

4 Claims



1. An information reproducing system comprising an information signal recording medium of the rotary type and a reproducing apparatus for reproducing information recorded on said medium, said reproducing apparatus having a reproducing transducer provided with an electrode, said recording medium comprising an electroconductive member which has a flat surface with a first succession of pits formed therein as respective concavities in accordance with an information signal, said first succession defining a track and with a second succession of pits formed therein as respective concavities in accordance with a reference signal, said second succession of pits being formed at positions substantially intermediate between the centerlines of adjacent tracks formed by the first succession of pits, the electroconductive material of said recording medium and the electrode of said transducer forming a capacitive structure, said information and reference signals of the first and second succession of pits being reproduced simultaneously by the reproducing transducer in response to variations of capaci-

tance between the surface of said electroconductive member and the electrode of the transducer, each pit of said first succession of pits respectively having widths W1 and W2 and depths D1 and D2, and the relationships between said widths and said depths being so selected that the pit width W1 is greater than the pit width W2, and the pit depth D1 is greater than the pit depth D2 so that the levels L1 and L2 of said information and reference signals which are reproduced when said first and second succession of pits are reproduced by the reproducing transducer will be such that the level L1 is greater than the level L2, and the difference between the levels L1 and L2 will be greater than a specific level difference.

4,420,828

**OPTICAL RECORDING AND/OR REPRODUCING DEVICE**

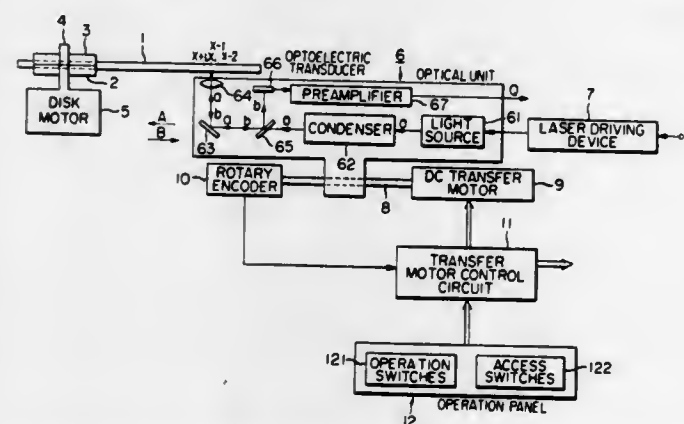
Tomio Yoshida, Katano; Michiyoshi Nagashima, Ikoma; Shunji Harigae, Neyagawa; Makoto Ichinose, Moriguchi, and Noboru Wakami, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 15, 1980, Ser. No. 216,272

Claims priority, application Japan, Dec. 14, 1979, 54-163418  
Int. Cl.<sup>3</sup> G11B 21/02, 7/12

U.S. Cl. 369-47

1 Claim



1. An optical reproducing device utilizing an optical record disk having concentric circular guide tracks and spiral guide tracks intermingled thereon, each of said circular tracks and portions of each spiral track with different radii having optically readable information signals therein and an address sector containing an optically readable address signal, said sectors being aligned along a diameter of said disk and subtending the same radial angle, said device comprising:

an optical transducer head;  
a disk carrier for supporting and rotating said optical record disk;

transport means for providing relative radial movement between said optical transducer head and said disk carrier;  
address reading means coupled to said optical transducer head for reading out the address signal from each address sector of said disk;

track address change detection means coupled to said address reading means for providing a circular track indication signal when successive address signals read out by said address reading means have identical values, and for providing a spiral track indication signal when said successive address signals have different values from each other;

transport control means coupled to said track address change detection means and to said transport means for (i) causing said transport means to provide continuous relative movement between said optical transducer head and said disk carrier in response to said spiral track indication signal, and (ii) interrupting the operation of said transport means to halt said relative radial movement in response to said circular track indication signal; and  
reproduce control means responsive to said address signals for reproducing said information signals,

whereby said device may reproduce signals recorded on intermingled circular and spiral tracks of an optical record disk.

4,420,829

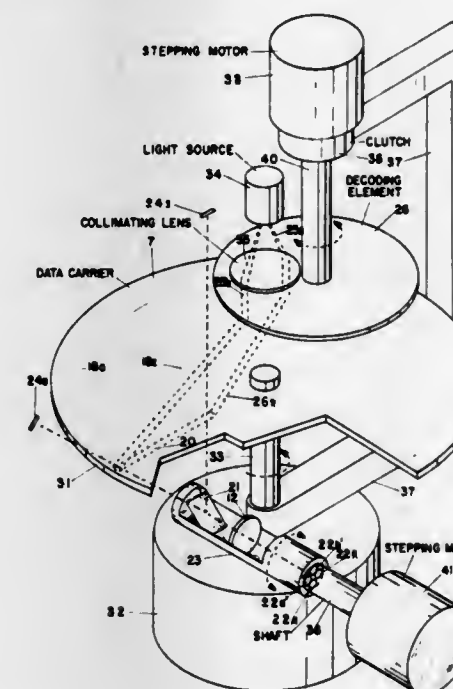
**HOLOGRAPHIC SYSTEM FOR THE STORAGE OF AUDIO, VIDEO AND COMPUTER DATA**

John E. Carlson, 3440 E. Pontaluna, Fruitport, Mich. 49415  
Filed Jan. 8, 1981, Ser. No. 223,284

Int. Cl.<sup>3</sup> G11B 7/00

U.S. Cl. 369-103

24 Claims



1. Apparatus for playback from holographic storage on a data carrier in which holographic data is arranged in a predetermined pattern of linear arrays comprising:

a data carrier receiver for receiving such a data carrier;  
a source of coherent radiation positioned relative to said data carrier receiver to illuminate such a data carrier thereon with an illumination pattern which is effective to illuminate any given linear array of holograms when that linear array is disposed within the illumination pattern and to form a signal beam comprising as constituents individual signals each corresponding to a corresponding hologram in that linear array,

a reflector disposed in the path of said signal beam for altering the direction of said signal beam,  
photodetector means disposed in the path of the directionally altered signal beam,

a lens disposed between said photodetector means and said reflector in the path of said directionally altered signal beam whereby said directionally altered signal beam is focused upon said photodetector means,

means for selectively positioning said data carrier receiver and such a data carrier thereon relative to said source of coherent radiation to selectively position a selected one of said linear arrays of holograms on such data carrier into said illumination pattern;

and means for selectively positioning said reflector to cause a selected one of the holograms in such selected one of said linear arrays to impinge upon said photodetector means.

4,420,830

**DISC MOUNTING AND CENTERING DEVICE**

Keith Green, Kinross-Shire, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

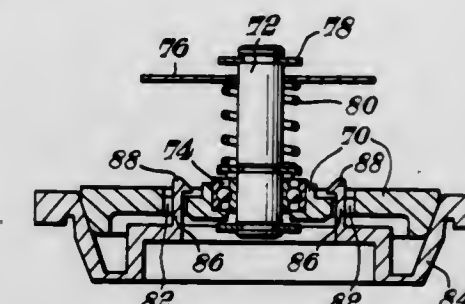
Filed Jun. 3, 1981, Ser. No. 270,198

Claims priority, application United Kingdom, Jul. 1, 1980, 8021514

Int. Cl.<sup>3</sup> A63D 7/00

U.S. Cl. 369-261

11 Claims



1. In an assembly for centering a flexible disc with a central locating hole, the assembly having a rotatable spindle with a face and apparatus for centering the flexible disc on the face, the rotatable spindle having a circular coaxial opening in the face, the disc central locating holes being centered about the spindle opening, the apparatus for centering including an expandable circular shell and a rigid expander, the shell insertable through the central locating hole into the spindle opening, the expander insertable into the shell to expand the shell to engage both the inside of the hole in the disc and the inside of the opening to center the disc, the improvement comprising: coupling means including fingers on said shell intermediate between said shell and expander and including engaging means for said fingers on said expander, said coupling means being intermediate between said expander and said shell, said engaging means on said expander mechanically engaging said fingers on said shell to withdraw said shell from said opening whenever said expander is withdrawn more than a predetermined distance from said opening.

4,420,831

**METHOD AND DEVICE FOR FREQUENCY TRANSLATION**

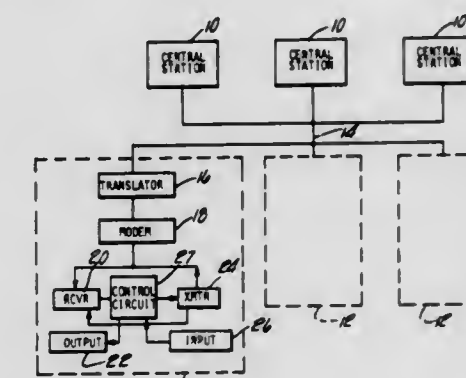
Brian K. Hackett, Ypsilanti, Mich., assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Division of Ser. No. 191,208, Sep. 26, 1980, Pat. No. 4,375,691.  
This application Sep. 27, 1982, Ser. No. 424,701

Int. Cl.<sup>3</sup> H04J 4/00, 6/00

U.S. Cl. 370-50

4 Claims



1. A digital communication system comprising:  
a plurality of terminals;  
a plurality of master stations connected to all of the terminals by a communication line carrying a plurality of duplex communication channels each associated with one of said master stations;



means for storing a unique address at each of the terminals; counters associated with each of the master stations and with each of the terminals;

means at each terminal for detecting the coincidence between the status of its counter and its address storage means;

means at each of the master stations for sending digital words to all of the terminals on that master station's channel, said words including an address of one of the terminals followed by data to be received by that terminal;

means for advancing the master counter and each of the remote counters each time a digital word is sent from the master station to any of the terminals on that master station's channel;

means at each terminal allowing the terminal to send a message to one of the master stations upon occurrence of coincidence between the terminal's counters and its address memory;

means at each of the master stations for periodically transmitting a resynchronizing word to all of the terminals on the channel corresponding to the master station transmitting said word; and

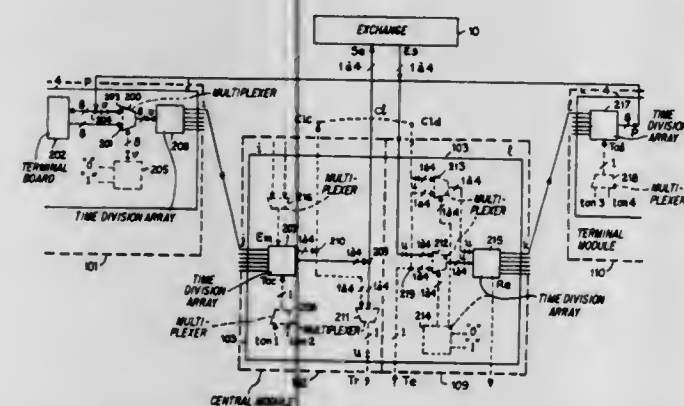
means operably coupled between each of the terminals and the communications line for selecting the channel over which a terminal may communicate with the corresponding master station.

4,420,832

**CONCENTRATOR-DECONCENTRATOR DEVICES**  
Jacques E. Salle; Jean A. M. Jossif; Gilbert J. M. Rathier, and Jean-Pierre Vales, all of Colombes, France, assignors to Le Materiel Telephonique Thomson-CSF, Paris, France  
Filed Apr. 21, 1980, Ser. No. 141,904  
Claims priority, application France, Apr. 25, 1979, 79 10471  
Int. Cl.<sup>3</sup> H04Q 11/04

U.S. Cl. 370-56

7 Claims



1. A concentrator-deconcentrator device for association with a time-division telephone exchange and for establishing space-time paths between subscriber PCM trunks connected to a group of subscriber and line connecting units and exchange PCM trunks connected to the exchange, comprising:

a concentrator including a first decentralized part having an output section and a first centralized part;

a deconcentrator including a second decentralized and a second centralized part;

wherein said first centralized part and said second centralized part make up a centralized unit having an input section and outputs, said centralized unit being comprised of a plurality of central modules;

wherein each of said central modules includes symmetrical time-division arrays inserted between the exchange PCM trunks and the subscriber PCM trunks;

wherein said first decentralized part and said second decentralized part make up a decentralized unit, said decentralized unit being composed of a plurality of terminal modules;

wherein each of said terminal modules include symmetrical

time-division arrays inserted between the subscriber PCM trunks and the subscriber and line connecting unit;

wherein each of said plurality of central modules is connected to each of said plurality of terminal modules; and

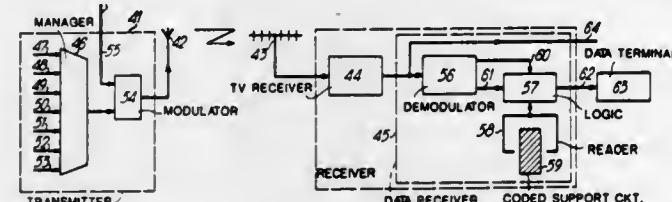
wherein said first centralized part of said concentrator is connected to said second centralized part of said deconcentrator by means of the exchange PCM trunks wherein each central module comprises a third symmetrical time-division array connected by at least one input to the output of a first symmetrical time-division array and by at least one output to exchange and local connection PCM trunks, and a fourth symmetrical time-division array connected by at least one input to exchange PCM trunks via a second group of multiplexers and to local connection PCM trunks via a third group of multiplexers whose outputs are connected to the inputs of the second symmetrical time-division arrays.

4,420,833

**UNIDIRECTIONAL DATA TRANSMISSION SYSTEM**  
Yves M. Noirel, Montfort, France, assignor to Etablissement Public de Diffusion dit "Telediffusion de France" and L'Etat Francais, represente par le Secretaire d'Etat aux Postes et Telecommunications et a la Telediffusion  
Filed Sep. 22, 1980, Ser. No. 189,080  
Claims priority, application France, Sep. 27, 1979, 79 24570  
Int. Cl.<sup>3</sup> H04J 3/16

U.S. Cl. 370-83

2 Claims



1. A system for broadcasting data in the form of data packets sent from a transmitting station; said data packets including numerical data received from at least one of a plurality of incoming paths and combining such data into a format comprising a prefix containing synchronization and path identification code signals, said packet also including a format signal indicating the length of the successive data words which follow the prefix; said system comprising:

a transmitting station having a plurality coupling means, one coupling means being individually associated with each of said incoming paths;

common governing means for controlling all of said plurality of coupling means, each of said coupling means having an individual input circuit means coupled to receive data over the incoming path which is individually associated with the coupling device;

multiplexing means for preparing said data packets for transmission;

data memory means individually associated with each of said input circuit means for driving said multiplexing means under control of said common governing means;

counter means operated at a pre-determined bit clock rate for retaining a memory of the amount of data stored in said data memory;

means responsive to at least a partial filling of said data memory means as indicated by said counter means for inhibiting the input circuit means associated therewith;

means responsive to said inhibiting of said input circuit means for connecting said data memory means to the multiplexing means and emptying the data memory means, and for resetting the counter means, the inhibition being removed on the emptying of said memory means;

a register means having an adjustable maximum capacity for causing said inhibition order to be given when the count of said data again reaches a pre-determined value; and

a small capacity buffer memory means interposed between said input circuit means and its individually associated data memory means for smoothing the flow of said data into said data memory means, the reading of the data into and out of the buffer memory being governed by a programmer means associated with said coupling means.

4,420,834

**FLOW ATTENUATOR FOR USE WITH LIQUID COOLED LASER MIRRORS**

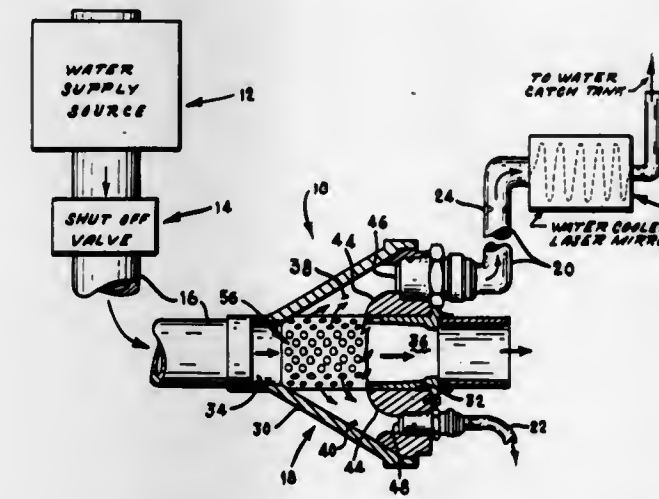
Walter H. Wiley, III, Palm Beach Gardens, Fla., and John A. Gunn, Norcross, Ga., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 10, 1981, Ser. No. 272,441

Int. Cl.<sup>3</sup> H01S 3/04

U.S. Cl. 372-35

12 Claims



1. In a laser system having at least one liquid cooled laser mirror, a liquid coolant supply source and a supply line to feed said liquid coolant to said laser mirror, the improvement comprising a flow attenuator operably connected to said supply line, said flow attenuator comprising a housing, said housing being open at one end thereof, said open end being connected to said supply line, a centrally located passageway extending longitudinally from said open end, at least one chamber extending from said passageway, said chamber having an entrance opening at one end thereof connected to said passageway, said chamber having an exit opening at the other end thereof connected to said liquid cooled mirror, and a distribution screen having a plurality of openings therein being secured within said passageway adjacent said entrance opening of said chamber whereby liquid flow induced jitter in said laser mirror is substantially eliminated as said coolant flows from said supply source to said laser mirror.

4,420,835

**HOLLOW CATHODE LASER**

Shuzo Hattori, Nagoya; Noboru Kamide, Tokyo; Katsumi Tokudome, Hidakamachi; Michio Ishikawa, and Yuji Hayashi, both of Kawagoe, all of Japan, assignors to Kimmon Electric Co., Ltd., Tokyo, Japan

Filed May 28, 1981, Ser. No. 268,063

Int. Cl.<sup>3</sup> H01S 3/097

U.S. Cl. 372-88

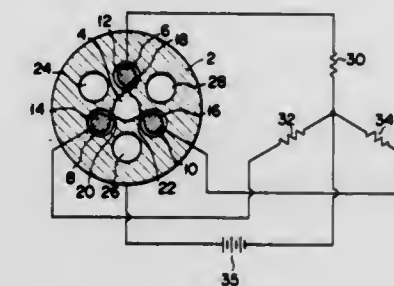
9 Claims

1. A hollow cathode laser system comprising:

an elongated hollow cathode body (2) having a cathode hole (4) extending coaxially within said cathode body (2); a plurality of anode holes (6, 8, 10) formed in said cathode body (2) around said cathode hole (4) and extending in the same direction as said cathode hole (4); and a plurality of elongated slits extending along said anode holes (6, 8, 10) through which said anode holes (6, 8, 10) communicate with said cathode hole (4); said cathode hole (4) and anode holes (6, 8, 10) being filled with discharge gas for produc-

ing a laser active medium, said discharge gas being capable of emitting coherent radiation;

a plurality of elongated anodes (12, 14, 16) extending through said anode holes (6, 8, 10), respectively, each anode having an elongated producing portion (18, 20, 22) protruding in said slit of the respective anode hole, and each anode having an outer surface spaced by a predetermined distance from the inner surface of said cathode body (2) defining the respective anode hole (6, 8, 10) so that the outer surface of each anode is substantially equidistant at substantially all points from the inner surface of its respective anode hole, even at their protruding portions;



a voltage source (35) coupled to said anodes and to said cathode body for applying a voltage between said cathode body (2) and said anodes (12, 14, 16) to produce negative glow discharge in said cathode hole (4), thereby exciting said laser active medium;

a pair of mirrors (50) forming an optical cavity in said cathode hole (4), for amplifying stimulated emissions from said laser active medium; and

means (38, 40, 48, 52) coupled to said cathode body (3) for sealing said cathode hole (4) and said anode holes (6, 8, 10).

4,420,836

**LASER RESONATOR**

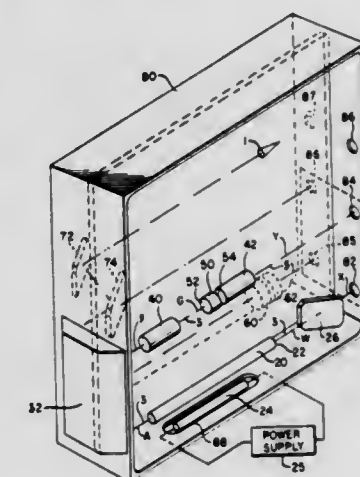
Lawrence L. Harper, Monroe, La., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 5, 1981, Ser. No. 270,763

Int. Cl.<sup>3</sup> H01S 3/08

U.S. Cl. 372-98

18 Claims



1. A feedback configuration in an optical instrument, comprising:



a plurality of oppositely disposed means for folding opposite ends of a beam of electro-magnetic energy into a plurality of spaced apart paths, each of said folding means in a terminal relation with all of said paths; and unitary means interposed into one of said paths, for concertedly reversing the directions of the opposite ends of said beam along said paths.

4,420,837

Patent Not Issued For This Number

threadedly connected to the upper threaded end of the next lower electrode section, the improvements of a vertically oriented feed screw having its axis generally vertically aligned with the axis of said electrode;

means for both rotating said screw about said axis and axially displacing the screw vertically at the pitch of the screw threads, a drive train depending from said screw to be both co-rotatable and axially displaceable therewith; an electrode-engaging means at the lower end of said drive train for securing a replacement electrode to the drive train for both vertical and rotational displacement with the screw; the pitch of the screw thread being greater than the pitch of the electrode threads, such that the drive train is lowered by rotation of said screw at a rate faster than said replacement electrode is threaded into the working electrode, and means interposed in said drive train to accommodate relative vertical displacement of said electrode-engaging means and said screw to compensate for such faster lowering of said drive train.

4,420,839

#### HYBRID RING HAVING IMPROVED BANDWIDTH CHARACTERISTIC

John Hogerheiden, Jr., Camarillo, Calif., assignor to Bunker Ramo-Eltra Corporation, Westlake Village, Calif.  
Filed Mar. 30, 1982, Ser. No. 363,634  
Int. Cl.<sup>3</sup> H04B 1/26; H01P 5/22

U.S. Cl. 455—327

8 Claims

4,420,838

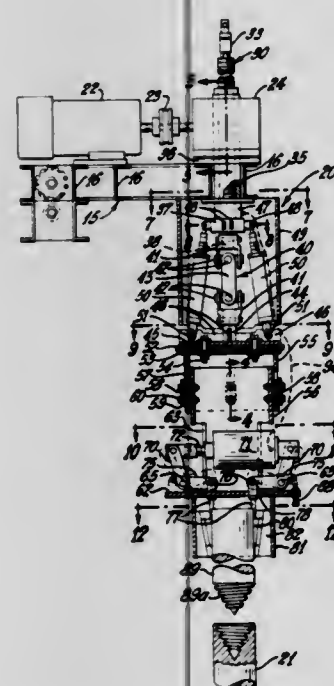
#### ELECTRODE REPLACEMENT APPARATUS

Charles S. Dunn, Pataskala, and Stephen Seng, Bladensburg, both of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Jan. 24, 1982, Ser. No. 342,672  
Int. Cl.<sup>3</sup> H05B 7/14

U.S. Cl. 373—92

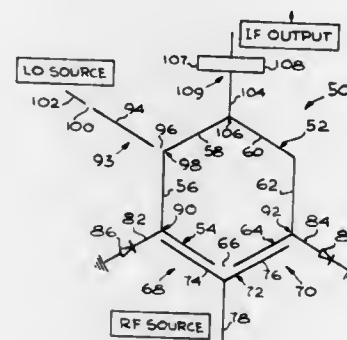
14 Claims



1. In an electrode replacement apparatus wherein successive, vertically aligned electrode sections are inter-connected by relative rotation, each electrode section having complementary male and female threads at its respective ends, and the lower threaded end of a replacement electrode section being

1. A hybrid ring suitable for use as a mixer to develop an intermediate frequency (IF) output signal in response to a radio frequency (RF) input signal and a local oscillator (LO) input signal, said hybrid ring comprising:

a transmission line in the form of a ring having a length substantially equal to six quarter wavelengths at the frequency of said LO signal; diode means connected to said ring at first and second points spaced by substantially two quarter wavelengths; said ring comprising first and second quarter wavelength coupled line sections between said first and second points; each of said first and second coupled line sections including first and second spaced transmission line elements; said first and second coupled line section first elements having first ends respectively directly connected to said first and second points and having second ends unconnected; and said first and second coupled line section second elements



having first ends unconnected and second ends directly interconnected to define an RF input signal port.

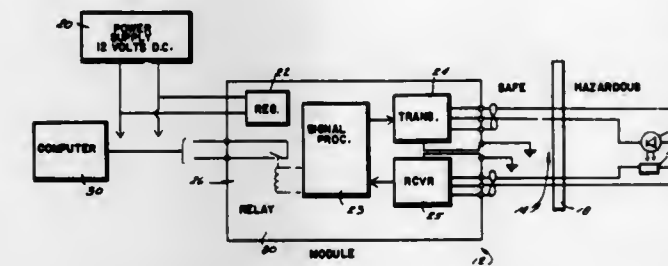
4,420,840

#### INTRINSICALLY SAFE PHOTOELECTRIC SENSING

Thomas R. Livermore, 2283 Manor Ct., Clearwater, Fla. 33515  
Filed Aug. 17, 1981, Ser. No. 293,339  
Int. Cl.<sup>3</sup> H04B 9/00

U.S. Cl. 455—606

14 Claims



1. An intrinsically safe sensing system comprising: a photoelectric sensing means including a photoelectric transmitter and a photoelectric receiver; circuitry means for operatively interconnecting said photoelectric sensing means to a power source, said circuitry means including electrical barrier means for limiting the energy to said sensing means to a safe level; electrical cable interconnecting means extending between said photoelectric sensing means and said circuitry means, said interconnecting means being long enough to provide for positioning of said sensing means in a hazardous area, and positioning of said circuitry means in a safe area; and wherein said circuitry means is provided in a single module located in a safe area.

4,420,841

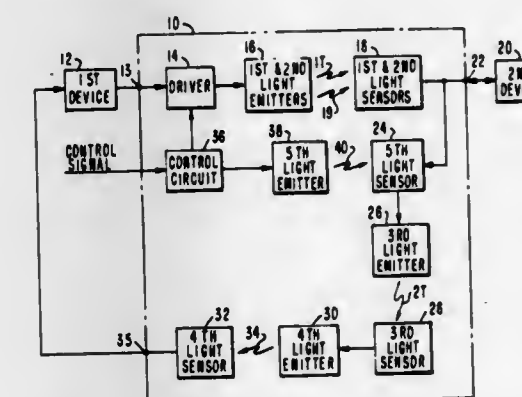
#### OPTICALLY COUPLED BIDIRECTIONAL TRANSCEIVER

Allan A. Dudash, Raleigh, NC, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,223  
Int. Cl.<sup>3</sup> H04B 9/00

U.S. Cl. 455—607

10 Claims



1. A transceiver providing bidirectional optically isolated communication between a first device having input and output means for producing a first signal at the output means thereof, and a second device having input and output means for producing a second signal at the output means thereof, said transceiver comprising:

driver means having first and second input terminals and an output terminal, and wherein said first input terminal is responsive to said first signal; first and second light emitter devices, said first and said second light emitter devices connected to said output terminal of said driver means; first and second light sensor devices in optical communication with said first and said second light emitter devices respectively, wherein said input means of said second

device is connected to said first and said second light sensor devices, such that said first and said second light emitter devices and said first and said second light sensor devices provide parallel optical data links for transmitting said first signal from said first device to said second device;

a third light emitter device having an input terminal; a third light sensor device in optical communication with said third light emitter device; a fourth light emitter device electrically connected to said third light sensor device; a fourth light sensor device in optical communication with said fourth light emitter device, wherein said input means of said first device is connected to said fourth light sensor device, such that said third and said fourth light emitter devices and said third and said fourth light sensor devices provide series optical data links for transmitting said second signal from said second device to said first device; means for producing a control signal having a first and a second state;

and switching control means having first and second input terminals and first and second output terminals, wherein said first input terminal of said switching control means is responsive to said control signal, and wherein said second input terminal of said switching control means is responsive to said second signal, and wherein said first output terminal of said switching control means is connected to said second input terminal of said driver means, and wherein said second output terminal of said switching control means is connected to said input terminal of said third light emitter device, such that when said control signal is in said first state said first and said second light emitter devices are enabled, via said driver means, to transmit said first signal from said first device to said second device and said third light emitter device is disabled to prevent transmission of said second signal from said second device to said first device, and such that when said control signal is in said second state said first and said second light emitter devices are disabled to prevent transmission of said first signal from said first device to said second device and said third light emitter device is enabled and said second signal is coupled from said second input terminal of said switching control means to said input terminal of said third light emitter device, via said second output terminal of said switching control means, to transmit said second signal from said second device to said first device, thereby providing bidirectional optically isolated communication between said first and said second devices.

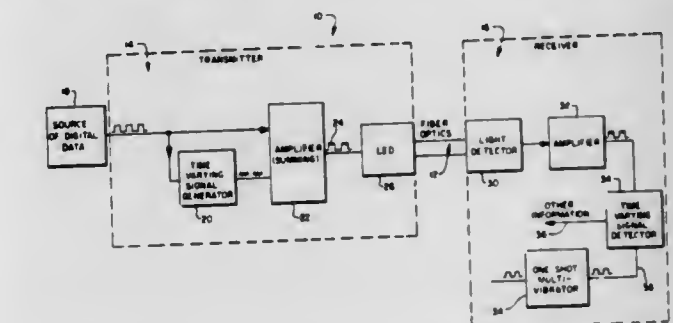
4,420,842

#### FIBER OPTIC DIGITAL DATA TRANSMITTING SYSTEM

Loughrey R. Kuhn, 950 Norwood Rd., Silver Spring, Md. 20904  
Filed Jul. 29, 1981, Ser. No. 288,111  
Int. Cl.<sup>3</sup> H04B 9/00

U.S. Cl. 455—608

4 Claims



1. A transmitter for use in a digital data transmitting system



having a transmitter, an optical transmission medium and a receiver comprising:

- (a) means for producing a time varying signal which is time coincident with the non-zero amplitude levels of a digital signal having zero and non-zero amplitudes, the time varying signal being used to encode at least the occurrence of the non-zero digital amplitudes of the digital signal;
- (b) means for combining two input signals into a time coincident composite output signal, the first input signal being from a source of a digital signal which is to be transmitted, and the second input signal being from the means for producing the time varying signal;
- (c) means coupled to the means for combining for producing an optical signal varying in amplitude in accordance with the composite signal;
- (d) means by which the time varying signal encodes the occurrence of the non-zero digital amplitudes and additional information; and
- (e) wherein the time varying signal is a series of time varying signals of a single frequency which are separated by zero amplitude levels, at the non-zero amplitude level of the digital signal.

## DESIGNS

DECEMBER 13, 1983

271,724  
BELT

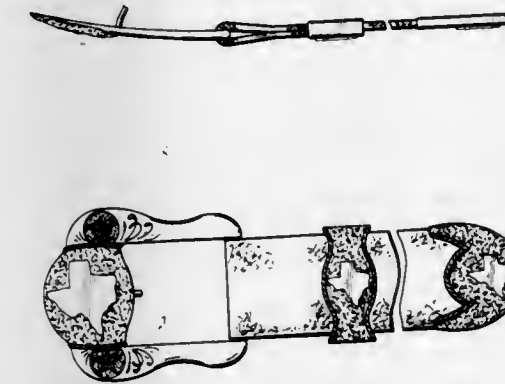
Quenton T. Elliott, 3218 Sackett, Houston, Tex. 77098, and  
Quenton T. Elliott, Jr., 4516 Holt, Bellaire, Tex. 77401

Filed Jul. 27, 1981, Ser. No. 287,280

Term of patent 14 years

Int. Cl. D02—07

U.S. Cl. D2—385



271,726

STORAGE TRAY FOR PRINTWHEELS

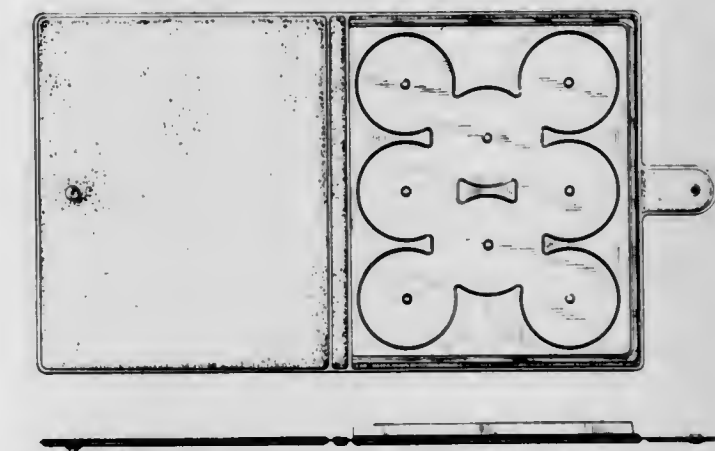
Craig D. Drake, Muscatine, Iowa, assignor to Ring King Visibles, Inc., Muscatine, Iowa

Filed Feb. 19, 1982, Ser. No. 350,340

Term of patent 14 years

Int. Cl. D3—02

U.S. Cl. D3—74



271,727  
CHAIR

Peter Opsvik, Hoegtunveien 12, 1370 Asker, Norway

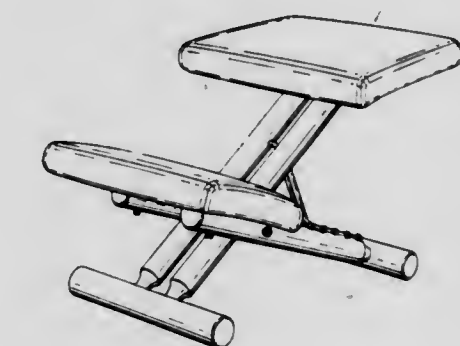
Filed Sep. 1, 1981, Ser. No. 298,480

Claims priority, application Norway, Mar. 2, 1981, 61776

Term of patent 14 years

Int. Cl. D6—01

U.S. Cl. D6—17



271,725

BRIEF CASE WITH RECESSED HANDLE

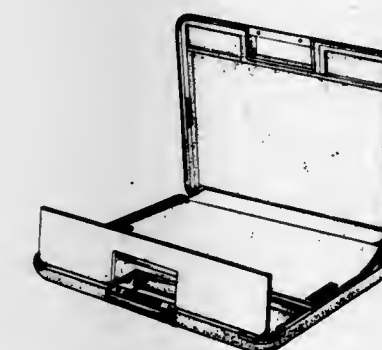
Stephen M. Sherer, 71-519 Biskra Rd., Rancho Mirage, Calif. 92270

Filed Feb. 4, 1980, Ser. No. 118,565

Term of patent 7 years

Int. Cl. D3—01

U.S. Cl. D3—73



271,728

ROCKING CHAIR

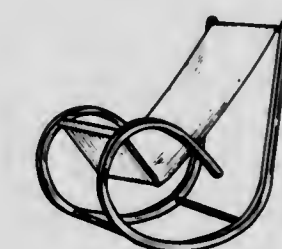
David W. Burns, Rte. 2, Box 370, Charles City, Va. 23030

Filed Oct. 5, 1981, Ser. No. 308,605

Term of patent 14 years

Int. Cl. D6—01

U.S. Cl. D6—49

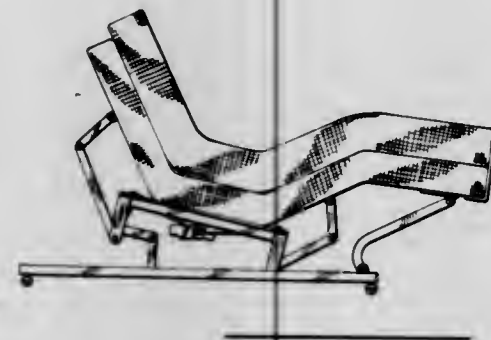




271,729  
**ADJUSTABLE BED**  
 Richard W. Dodrill, 4235 Country Club Dr., Long Beach, Calif. 90807

Filed Jun. 2, 1981, Ser. No. 269,481  
 Term of patent 14 years  
 Int. Cl. D6-01

U.S. Cl. D6-84



271,730  
**SUPPORT FOR POTS OR THE LIKE**  
 Richard J. Wall, 3155 Durham Rd., Hamburg, N.Y. 14075  
 Filed Sep. 22, 1980, Ser. No. 189,225  
 Term of patent 14 years  
 Int. Cl. D6-06

U.S. Cl. D6-113



271,731  
**FOLDING WALL-MOUNTED SEAT**  
 Michael J. Chamberlain, Lynnwood; David R. Myers, and Donald R. Furlong, both of Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.  
 Filed Sep. 30, 1981, Ser. No. 307,175  
 Term of patent 14 years  
 Int. Cl. D6-01

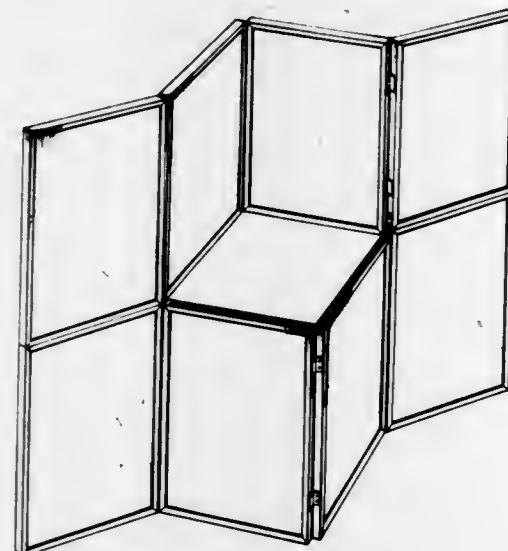
U.S. Cl. D6-114



271,732  
**FOLDABLE DISPLAY PANEL**  
 Willy Ytter, Stockholm, Sweden, assignor to Extraversion, Inc., Del.

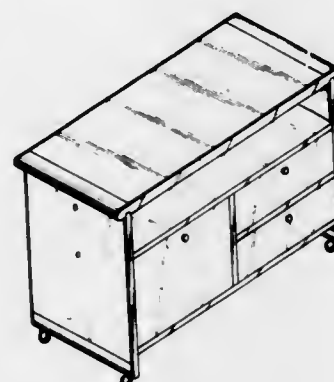
Filed Jul. 9, 1979, Ser. No. 55,997  
 The portion of the term of this patent subsequent to Apr. 3, 1996, has been disclaimed.  
 Term of patent 14 years  
 Int. Cl. D6-06

U.S. Cl. D6-139



271,733  
**MOBILE STORAGE UNIT**  
 Roger Daventry, Unit 13, 531 Hay St., Subiaco, 6008, Western Australia, Australia  
 Filed Nov. 6, 1980, Ser. No. 206,942  
 Term of patent 14 years  
 Int. Cl. D06-04

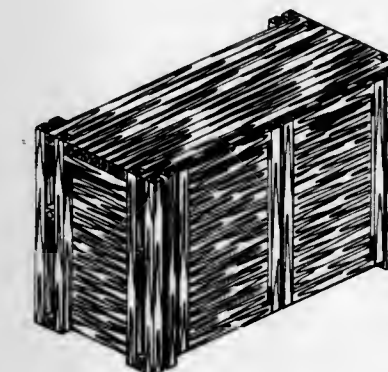
U.S. Cl. D6-166



271,734  
**CABINET**  
 Robert V. Thompson, 75th Ave. North, Myrtle Beach, Calif. 29577

Filed Apr. 23, 1981, Ser. No. 256,800  
 Term of patent 14 years  
 Int. Cl. D06-04

U.S. Cl. D6-167



271,736  
**COMBINED BOOKRACK AND HOLDER FOR WRITING IMPLEMENTS AND COINS**  
 Bruce A. Hehn, St. Clairsville, Ohio, assignor to Alpha Enterprises, Inc., Canton, Ohio

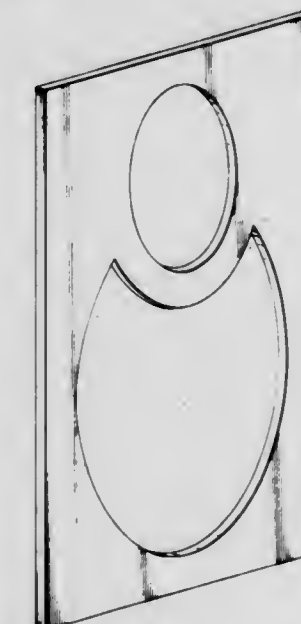
Filed Jul. 9, 1981, Ser. No. 281,664  
 Term of patent 14 years  
 Int. Cl. D06-04

U.S. Cl. D6-184



271,737  
**IMAGE FRAME**  
 Joel C. Huck, P.O. Box 42230, Houston, Tex. 77042  
 Filed Dec. 21, 1981, Ser. No. 332,805  
 Term of patent 14 years  
 Int. Cl. D6-07

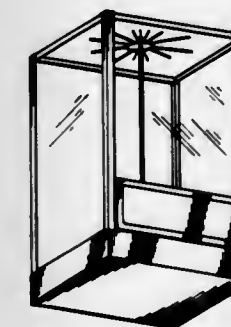
U.S. Cl. D6-234



271,735  
**DISPLAY CASE**  
 Frank W. Brittner, Pittsburgh, Pa., assignor to J & J Snack Food Corp., Pennsauken, N.J.

Filed May 21, 1981, Ser. No. 265,729  
 Term of patent 14 years  
 Int. Cl. D06-04

U.S. Cl. D6-172





**271,738**  
**FORK OR SIMILAR ARTICLE OF FLATWARE**  
 Richard Cragin, Warwick, R.I., assignor to Textron Inc., Providence, R.I.

Filed Nov. 20, 1981, Ser. No. 323,270  
 Term of patent 14 years  
 Int. Cl. D07—03

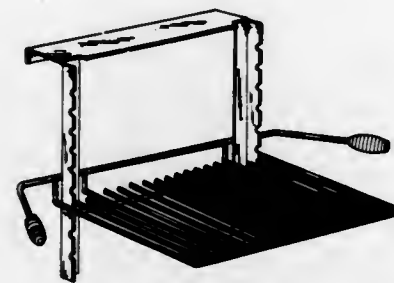
U.S. Cl. D7—137



**271,740**  
**VERTICALLY ADJUSTABLE CANTILEVERED GRILL**  
 Keith B. Borglum, 218 Loma, Waterloo, Iowa 50701

Filed Aug. 24, 1981, Ser. No. 295,865  
 Term of patent 14 years  
 Int. Cl. D7—02

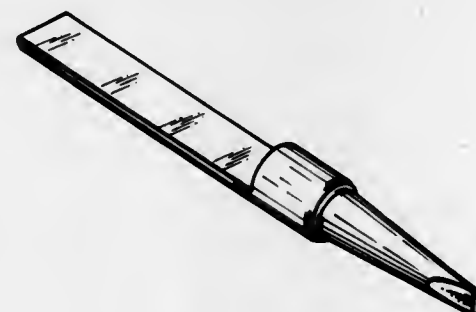
U.S. Cl. D7—332



**271,741**  
**SOLDERING IRON TIP**  
 Ronald Riccio, Hermosa Beach, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.

Filed Feb. 2, 1981, Ser. No. 230,641  
 Term of patent 14 years  
 Int. Cl. D8—05

U.S. Cl. D8—30

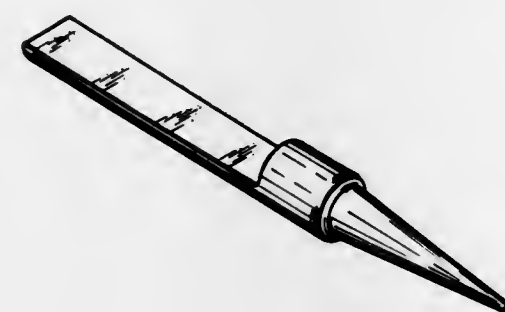


**271,739**  
**SPOON**  
 Vivienne D. Jagger, St. Ives, Australia, assignor to Little People Limited, Hong Kong, Hong Kong

Filed Aug. 27, 1981, Ser. No. 296,916  
 Claims priority, application United Kingdom, Mar. 18, 1981, 999511

Term of patent 14 years  
 Int. Cl. D07—03

U.S. Cl. D7—151



**271,742**  
**STAPLE EXTRACTING INSTRUMENT**  
 Lehmann K. Li, Fairfield, Conn., and Reinhart Butter, Columbus, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 9, 1981, Ser. No. 241,864  
 Term of patent 14 years  
 Int. Cl. D8—05; D24—02

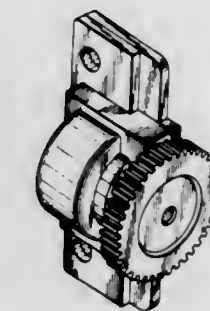
U.S. Cl. D8—48



**271,745**  
**LID MOVEMENT DAMPING DEVICE OR THE LIKE**  
 Nobuaki Omata, Hiroshima, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Aug. 18, 1981, Ser. No. 294,076  
 Claims priority, application Japan, Mar. 5, 1981, 56-8637  
 Term of patent 14 years  
 Int. Cl. D8—99

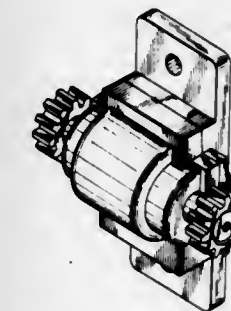
U.S. Cl. D8—400



**271,743**  
**LID MOVEMENT DAMPING DEVICE OR THE LIKE**  
 Nobuaki Omata, Hiroshima, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Aug. 17, 1981, Ser. No. 293,532  
 Claims priority, application Japan, Mar. 5, 1981, 56-8638  
 Term of patent 14 years  
 Int. Cl. D8—99

U.S. Cl. D8—400



**271,746**  
**CONTAINER FOR LIQUIDS**  
 Toby L. Pieri, Chaska, Minn., assignor to Minnetonka, Inc., Minnetonka, Minn.

Filed Mar. 24, 1981, Ser. No. 247,164  
 Term of patent 14 years  
 Int. Cl. D9—01

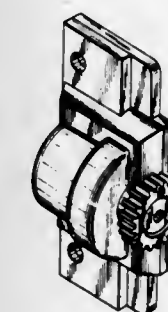
U.S. Cl. D9—337



**271,744**  
**LID MOVEMENT DAMPING DEVICE OR THE LIKE**  
 Nobuaki Omata, Hiroshima, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Aug. 18, 1981, Ser. No. 294,075  
 Claims priority, application Japan, Mar. 5, 1981, 56-8636  
 Term of patent 14 years  
 Int. Cl. D8—99

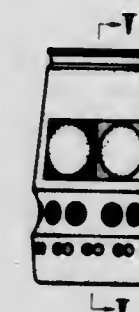
U.S. Cl. D8—400



**271,747**  
**BOTTLE**  
 Yukio Kanise, Tokyo, Japan, assignor to Yakult Honsha Co., Ltd., Japan

Filed Apr. 30, 1981, Ser. No. 259,147  
 Term of patent 14 years  
 Int. Cl. D9—01

U.S. Cl. D9—349





271,748

## DISPENSING CONTAINER FOR LIQUIDS

John W. McDonald, Parkville, and John M. B. Ford, Lee's Summit, both of Mo., assignors to Realex Corporation, Kansas City, Mo.

Division of Ser. No. 245,634, Mar. 19, 1981. This application  
Feb. 16, 1983, Ser. No. 467,142  
Term of patent 14 years  
Int. Cl. D9—07

U.S. Cl. D9—376



271,750

## JAR CAP

Ernest J. Karosi, Ashford, Conn., assignor to Textron Inc., Providence, R.I.

Filed Jul. 6, 1981, Ser. No. 280,810  
Term of patent 14 years  
Int. Cl. D7—07

U.S. Cl. D9—436



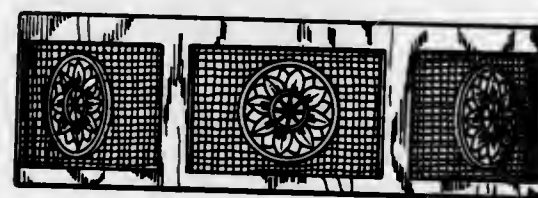
271,751

## FLORAL CONTAINER

Alfred Campana, Bal Harbour, Fla., assignor to Florists' Transworld Delivery Association, Southfield, Mich.

Filed Sep. 25, 1981, Ser. No. 305,708  
Term of patent 14 years  
Int. Cl. D11—02; D7—01

U.S. Cl. D11—151



271,749

## ARTICLE CARRIER BLANK

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 28, 1981, Ser. No. 297,150  
Term of patent 14 years  
Int. Cl. D9—03

U.S. Cl. D9—433



271,752

## FIGURINE OF A COLLIE PUP

Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.

Filed Dec. 17, 1979, Ser. No. 104,697  
Term of patent 14 years  
Int. Cl. D11—02

U.S. Cl. D11—158



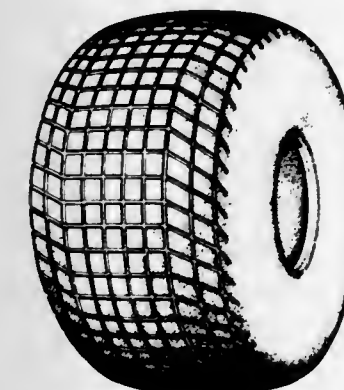
271,753

## TIRE

Robert L. Newton, Lakeville, Ind., assignor to Hoosier Racing Tire Corporation, Lakeville, Ind.

Filed Dec. 28, 1981, Ser. No. 334,578  
Term of patent 14 years  
Int. Cl. D12—15

U.S. Cl. D12—140



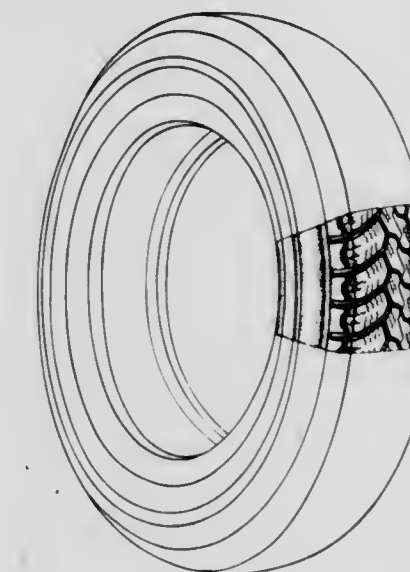
271,755

## TIRE

Joel Ricquet, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Nov. 10, 1981, Ser. No. 319,883  
Claims priority, application France, May 12, 1981, 51  
Term of patent 14 years  
Int. Cl. D12—15

U.S. Cl. D12—147



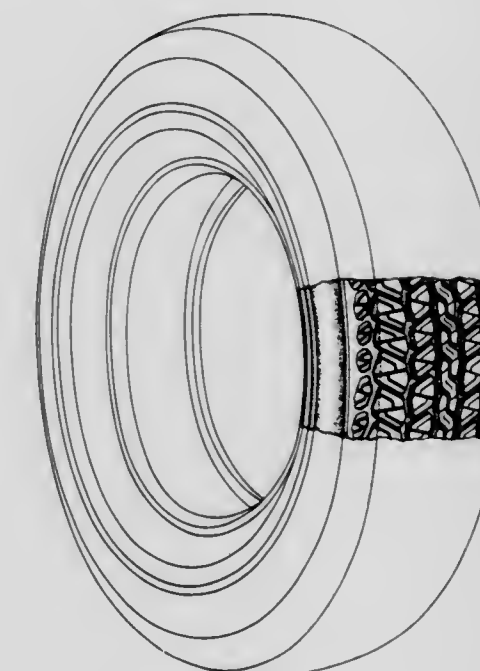
271,756

## TIRE

Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jan. 27, 1982, Ser. No. 343,195  
Term of patent 14 years  
Int. Cl. D12—15

U.S. Cl. D12—147



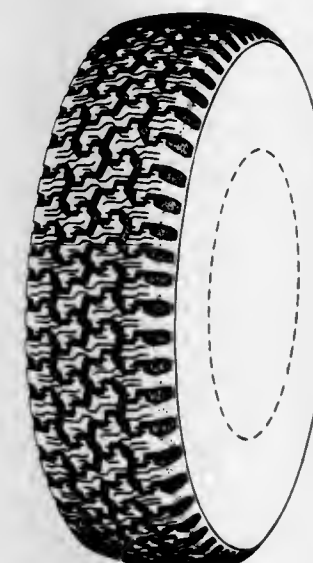
271,754

## TIRE TREAD AND BUTTRESS

Lawrence G. Jansen, Akron; Beale A. Robinson, North Canton; Terrence M. Rupp, Uniontown, and John C. Struhsaker, Barberton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 2, 1981, Ser. No. 316,723  
Term of patent 14 years  
Int. Cl. D12—15

U.S. Cl. D12—146





271,757

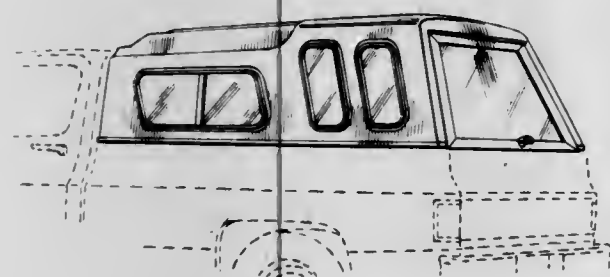
**CAP FOR THE BED OF A PICKUP TRUCK**  
William A. Miller, Rogersville, Mo., assignor to Custom Craft  
Pickup Covers Corporation, Rogersville, Mo.

Filed Aug. 13, 1981, Ser. No. 292,722

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-156



271,759

**CARRIER RACK FOR BICYCLES**

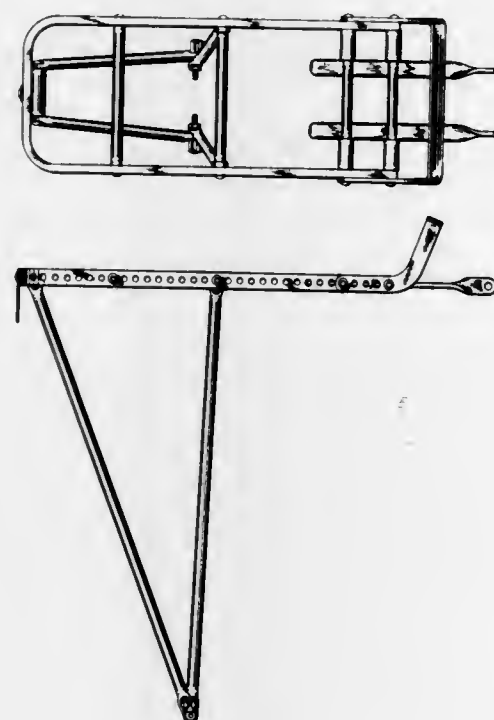
Thomas C. Patterson, Westport, and David L. Campbell, Norwalk, both of Conn., assignors to Cannondale Corporation, Georgetown, Conn.

Filed Oct. 13, 1981, Ser. No. 310,762

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-158



271,758

**BICYCLE MOUNTED CARRYING CASE**

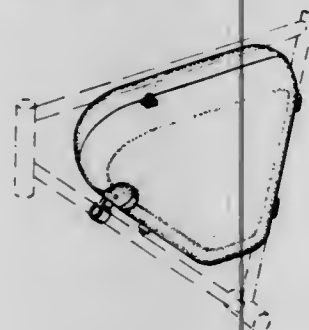
Dennis L. Ervin, 130 Eastwind St., #6, Marina del Rey, Calif. 90291

Filed Aug. 17, 1981, Ser. No. 293,601

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-158



271,760

**FRONT FACE OF A VEHICLE WHEEL**

Gert Zimmermann, and Andreas Langenbeck, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

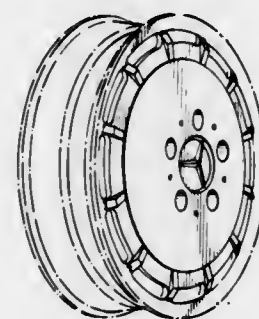
Filed Feb. 18, 1981, Ser. No. 235,600

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1980, 5178

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-209



271,761

**VIDEO DISC PLAYER**

Minoru Hashimoto, Ibaraki; Yoshiyuki Nomura, Hirakata, and Masayoshi Kubo, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

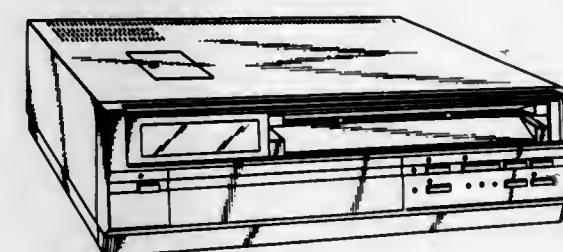
Filed Jun. 15, 1981, Ser. No. 274,003

Claims priority, application Japan, Dec. 17, 1980, 55-52893

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D14-1



271,763

**DIRECT STATION SELECTION CONSOLE**

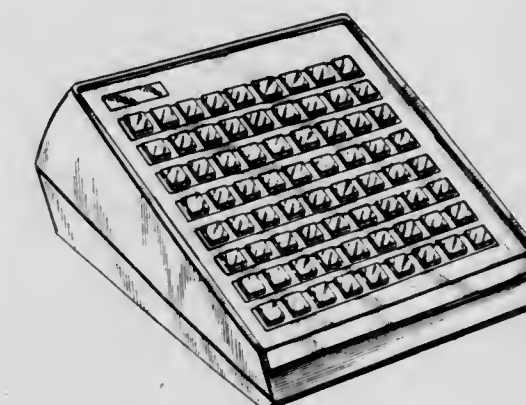
Wilbert C. Brown, Fairfield, and Roman F. Pomponi, Norwalk, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.

Filed Jan. 21, 1980, Ser. No. 113,999

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-66



271,762

**TELEPHONE SWITCH-CONNECTOR ASSEMBLY**

Frank B. Manning, Boston; Peter R. Kramer, Cambridge, both of Mass., and T. Pat Manning, St. Peters, Mo., assignors to Zoom Telephonics, Inc., Boston, Mass.

Filed Jan. 14, 1981, Ser. No. 224,913

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-59



271,764

**PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE**

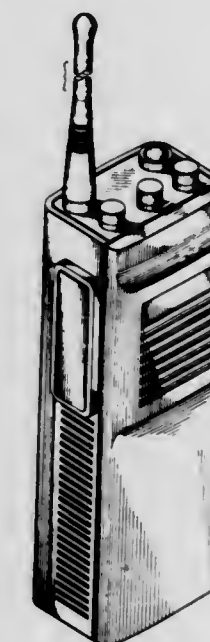
Richard J. Toth, Boca Raton, and John A. Eckmann, Pompano Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1981, Ser. No. 292,307

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-68





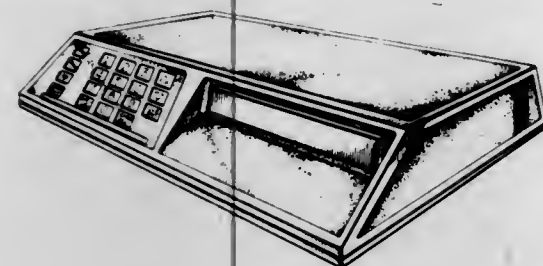
271,765  
CABLE TELEVISION SET TOP CONVERTER CONTROL  
TERMINAL OR THE LIKE  
Svein T. Nordberg, El Paso, Tex., assignor to GTE Products  
Corporation, Stamford, Conn.

Filed Sep. 11, 1981, Ser. No. 301,173

Term of patent 14 years

Int. Cl. D14—03

U.S. Cl. D14—77



271,766  
PORTABLE RADIO WHIP ANTENNA OR SIMILAR  
ARTICLE  
John A. Eckmann, Pompano Beach, and Bruce A. Claxton,  
Coral Springs, both of Fla., assignors to Motorola, Inc.,  
Schaumburg, Ill.

Filed Jun. 19, 1981, Ser. No. 275,095

Term of patent 14 years

Int. Cl. D14—03

U.S. Cl. D14—86



271,767  
ELECTRONIC KEYBOARD  
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Corporation,  
Osaka, Japan

Filed Aug. 20, 1981, Ser. No. 294,427

Claims priority, application Japan, Feb. 24, 1981, 56-7577

Term of patent 14 years

Int. Cl. D14—02

U.S. Cl. D14—100



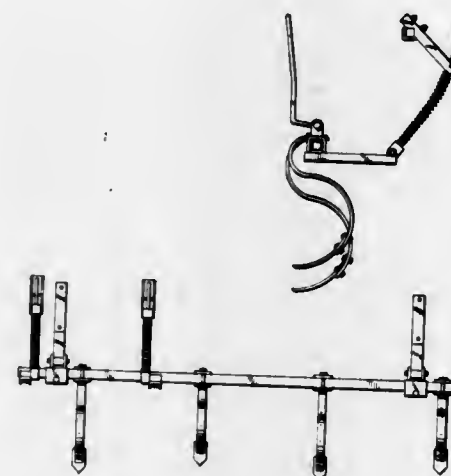
271,768  
CULTIVATOR  
John E. Sommerfeld, Litchfield, Minn., assignor to Fabridyne,  
Inc., Litchfield, Minn.

Filed Jun. 15, 1981, Ser. No. 273,402

Term of patent 14 years

Int. Cl. D15—03

U.S. Cl. D15—27



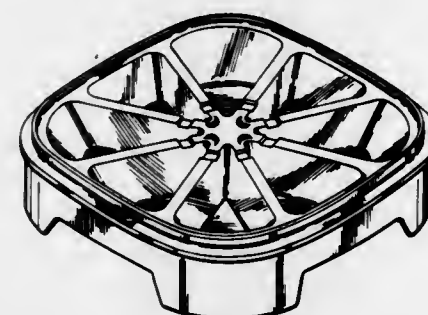
271,769  
ICE CUBE TRAY  
Robert H. C. M. Daenen, Hekelegem, Belgium, and Erik Herlow,  
Tikob, Denmark, assignors to Dart Industries Inc., North-  
brook, Ill.

Filed Sep. 17, 1981, Ser. No. 280,855

Term of patent 14 years

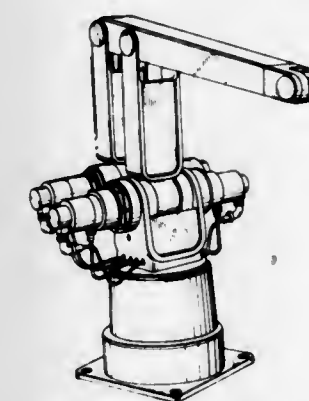
Int. Cl. D15—07

U.S. Cl. D15—90



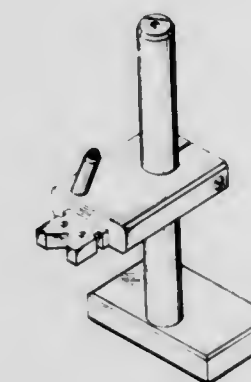
271,770  
INDUSTRIAL ROBOT  
Michinaga Kono; Yoshio Matsumoto, both of Yokohama; Hiro-  
suke Katsumi, Tokyo, and Fumio Fukuchi, Funabashi, all of  
Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Division of Ser. No. 137,492, Apr. 4, 1980, Pat. No. Des.  
268,587. This application Sep. 30, 1982, Ser. No. 428,977  
Claims priority, application Japan, Oct. 5, 1979, 54-41673;  
Feb. 12, 1980, 55-4391; Mar. 26, 1980, 55-11412  
Term of patent 14 years  
Int. Cl. D15—99

U.S. Cl. D15—122



271,772  
GRINDING FIXTURE  
Timothy E. Grohowski, R.F.D. #1, George Washington Turn-  
pike, Burlington, Conn. 06013, and Randall W. Wheeler, 20  
Walnut Dr., Hebron, Conn. 06248  
Filed Mar. 20, 1981, Ser. No. 245,951  
Term of patent 14 years  
Int. Cl. D15—09

U.S. Cl. D15—140

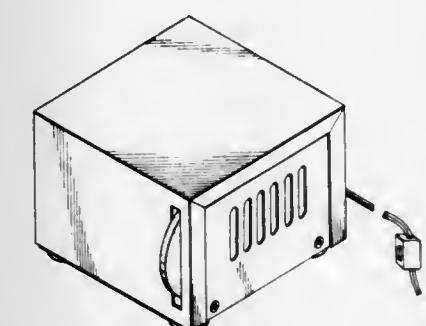


271,771  
FISH HOOK SHARPENER  
Darrell J. Lehmann, 2033 Cap Rock, Richardson, Tex. 75080  
Filed Mar. 12, 1981, Ser. No. 243,186

Term of patent 14 years

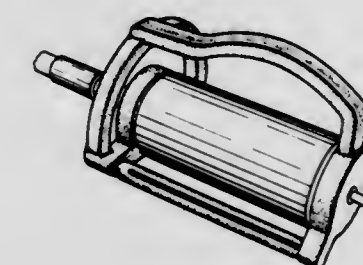
Int. Cl. D15—99

U.S. Cl. D15—125



271,773  
POKER VIBRATOR ELECTRIC DRIVE UNIT  
Bo Ekelund, Enebyberg, Sweden, assignor to Dynapac Maskin  
AB, Soina, Sweden  
Filed Jul. 17, 1981, Ser. No. 284,338  
Claims priority, application Sweden, Jan. 19, 1981, 81-0088  
Term of patent 14 years  
Int. Cl. D15—99

U.S. Cl. D15—147





271,774

**PHOTOGRAPHIC ENLARGING APPARATUS**

Florian Vikoler, Brixen, Italy, assignor to Durst A.G. Fabrik Fototechnischer Apparate, Bozen, Italy

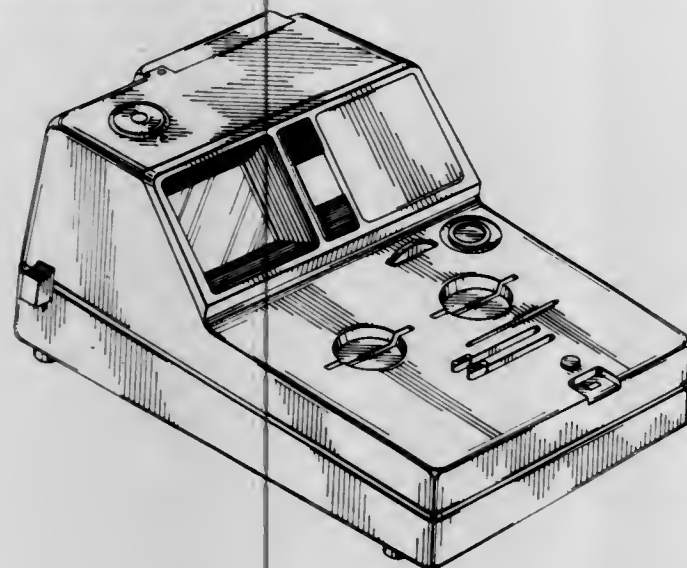
Filed Dec. 14, 1981, Ser. No. 330,394

Claims priority, application Italy, Jul. 15, 1981, 6713/81[U]

Term of patent 14 years

Int. Cl. D16-03

U.S. Cl. D16-25



271,775

**COPYING AND SORTING APPARATUS**

R. Clark DuBois, Fairfield, and John C. Hamma, Bridgeport, both of Conn., assignors to Gradco/Dendoki, Inc., Santa Ana, Calif.

Filed Feb. 5, 1981, Ser. No. 231,803

Term of patent 14 years

Int. Cl. D16-03

U.S. Cl. D16-31



271,776

**EXPOSURE UNIT FOR LITHOGRAPHIC PLATES**

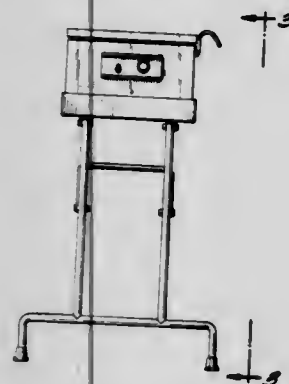
Gerold Litschi, Lansdale, Pa., assignor to Master Etching Machine Company, Ambler, Pa.

Filed Sep. 14, 1981, Ser. No. 302,206

Term of patent 14 years

Int. Cl. D16-04

U.S. Cl. D16-33



271,777

**X-RAY FILM CASSETTE**

Norbert Schlagheck, Fuerstenfeldbruck, and Lutz Rabold, Soecking, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

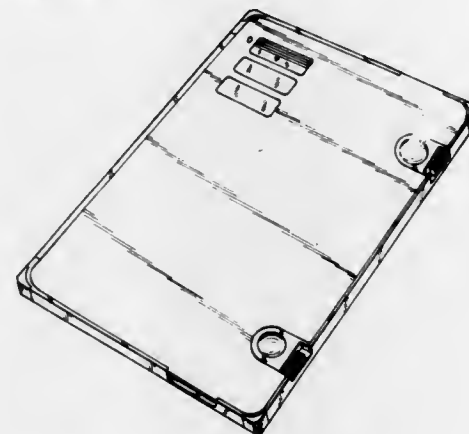
Filed Sep. 8, 1980, Ser. No. 184,894

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 5MR582

Term of patent 14 years

Int. Cl. D16-03

U.S. Cl. D16-34



271,778

**VISUALIZATION DISC FOR SELECTING ELEMENTS OF DISPLAY STANDS**

Pierre H. G. Mabilie, and Yannick A. R. Perrin, both of Paris, France, assignors to Applications Industrielles et Artistiques des Matieres Plastiques Apia, Paris, France; Formtechnik, Furth, Fed. Rep. of Germany and Pop Crafts, Hertfordshire, England

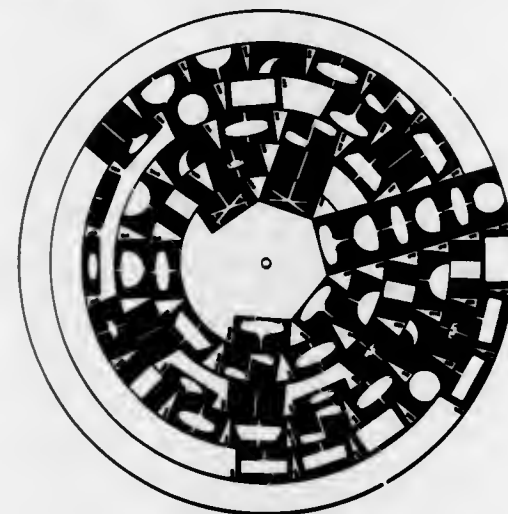
Filed Aug. 28, 1981, Ser. No. 297,202

Claims priority, application France, Mar. 2, 1981, 810753

Term of patent 14 years

Int. Cl. D19-99

U.S. Cl. D19-64



271,779

**NEWSPAPER VENDOR**

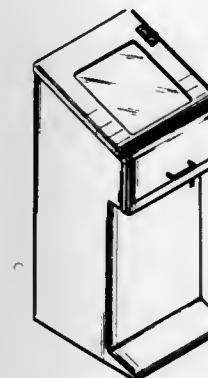
Peter Ostermann, 1111 Polk Ave., Sunnyvale, Calif. 94086

Filed Aug. 17, 1981, Ser. No. 293,487

Term of patent 14 years

Int. Cl. D20-01

U.S. Cl. D20-6



271,780

**TOY SPACE VEHICLE**

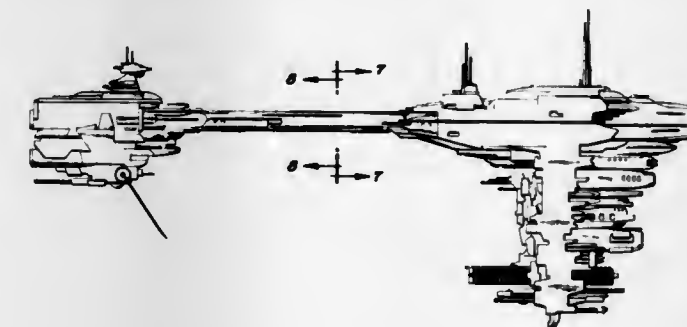
George W. Lucas, Jr., San Anselmo; Joseph E. Johnston, Fairfax, and Nilo Rodis-Janero, San Jose, all of Calif., assignors to Lucasfilm, Ltd., North Hollywood, Calif.

Filed May 4, 1981, Ser. No. 260,469

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-87



271,781

**GUM MACHINE**

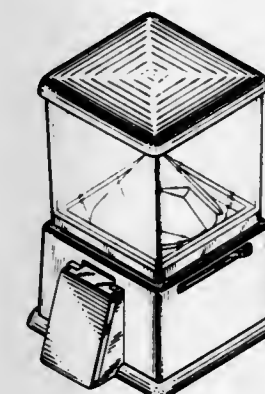
David Galoob, 90 Beachmont Dr., San Francisco, Calif. 94132

Filed Nov. 23, 1981, Ser. No. 324,069

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-109



271,782

**TOY CRANE**

Akira Takasaka, and Tetsuo Ohkado, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

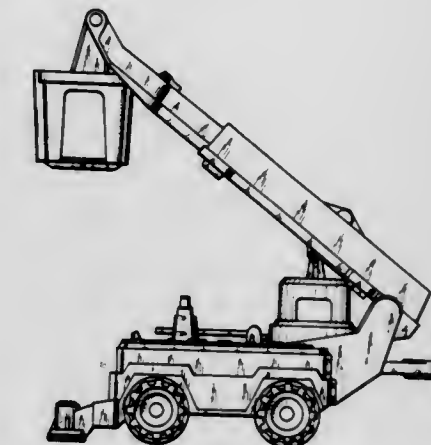
Filed Jun. 19, 1981, Ser. No. 275,581

Claims priority, application Japan, Sep. 9, 1980, 55-37160

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-135



271,783

**GOLF CLUB PUTTER HEAD**

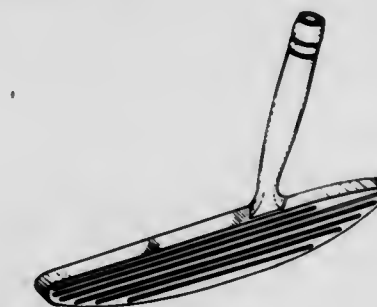
Samuel P. Simmons, Torrance, Calif., assignor to Sigma Diversified Sports, Inc., Torrance, Calif.

Filed Aug. 27, 1981, Ser. No. 296,622

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-217



271,784

**GOLF CLUB HEAD**

Margaret Caskey, and Doyle D. Jernigan, both of Temple, Tex., assignors to Wood-Arts Company, Inc., Temple, Tex.

Filed Mar. 27, 1980, Ser. No. 248,521

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D21-220





271,785

**PLAYGROUND EQUIPMENT LADDER**  
Gerald Beekenkamp, 4115 Rolling Valley Dr., Erin Mills, Ontario, and Donald Curtis, R.R. #2, Paris, Ontario, both of Canada

Filed Mar. 11, 1982, Ser. No. 357,321  
Term of patent 14 years  
Int. Cl. D21-03

U.S. Cl. D21-244



271,787

**AMMO POUCH**

Randall B. Finley, 362 S. 100 W., Orem, Utah 84057  
Filed Oct. 5, 1981, Ser. No. 308,352  
Term of patent 14 years  
Int. Cl. D22-05

U.S. Cl. D22-14

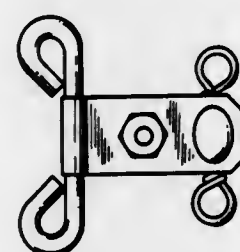


271,788

**LEAD RELEASE FOR FISHING WITH FLY ROD**

Harry W. Hite, P.O. Box 961, Puyallup, Wash. 98371  
Filed Jun. 10, 1980, Ser. No. 158,115  
Term of patent 14 years  
Int. Cl. D22-05

U.S. Cl. D22-23



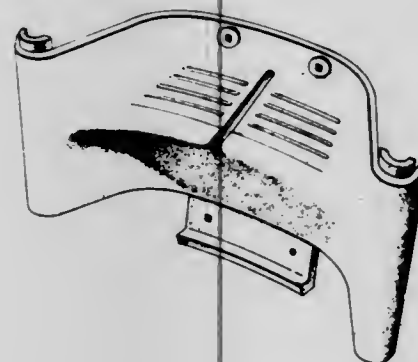
271,786

**PLAYGROUND EQUIPMENT STEP**

Gerald Beekenkamp, 4115 Rolling Valley Dr., Erin Mills, Ontario, and Donald Curtis, R.R. #2, Paris, Ontario, both of Canada

Filed Oct. 28, 1981, Ser. No. 316,066  
Term of patent 14 years  
Int. Cl. D21-03

U.S. Cl. D21-245



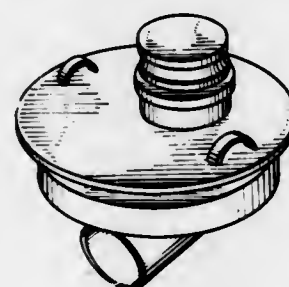
271,789

**HATCH COVER WITH PNEUMATIC SEAL FOR MOBILE OR STATIONARY STORAGE TANKS**

Carl L. Hardee, and Robert E. Wagner, both of Ottawa, Ill., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Jun. 2, 1981, Ser. No. 269,928  
Term of patent 14 years  
Int. Cl. D23-01; D12-03

U.S. Cl. D23-2



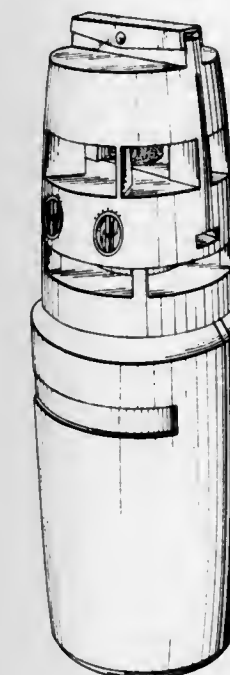
271,790

**WIND CONTROLLED SPRAYER UNIT**

Thomas Aldrich, Spring Valley, N.Y., assignor to Thermo-Tech Corp., Manchester, N.H.

Filed Jan. 16, 1981, Ser. No. 225,619  
Term of patent 14 years  
Int. Cl. D23-01

U.S. Cl. D23-18



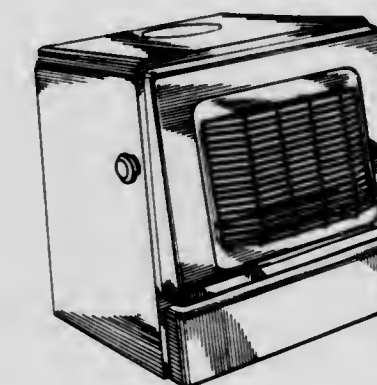
271,792

**SOLID FUEL HEATER**

John N. Stanciliffe, Allestree, England, assignor to T. I. Domestic Appliances Limited, London, England

Filed May 23, 1980, Ser. No. 152,777  
Term of patent 14 years  
Int. Cl. D23-03

U.S. Cl. D23-97



271,793

**AIR CONTROL CHECK UNIT FOR FIREPLACES AND THE LIKE**

Byron D. Lane, 212 16th Ave. S.W., Minot, N. Dak. 58701  
Filed May 8, 1981, Ser. No. 262,023  
Term of patent 14 years  
Int. Cl. D23-03

U.S. Cl. D23-127



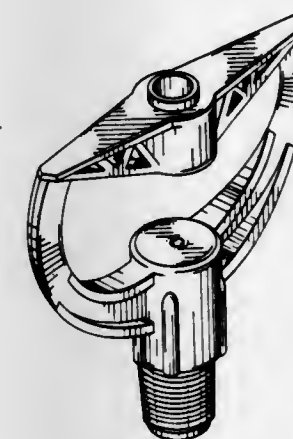
271,791

**IRRIGATION SPRAY NOZZLE**

Mark Healy, Orange County, Fla., assignor to Senninger Irrigation, Inc., Orlando, Fla.

Filed Feb. 11, 1981, Ser. No. 233,504  
Term of patent 14 years  
Int. Cl. D23-01

U.S. Cl. D23-35



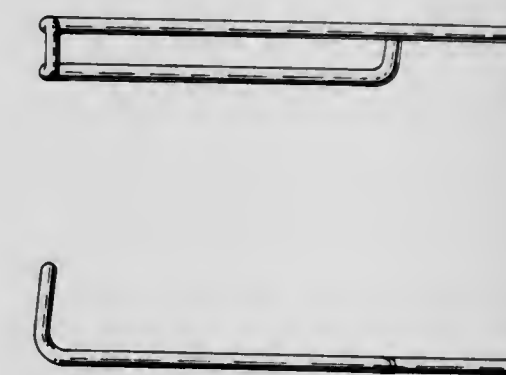
271,794

**HANDLE AND COAL GRATE SHAKER**

Thomas C. Wenzel, 34 Smith St., Greenlawn, N.Y. 11740  
Filed Oct. 9, 1981, Ser. No. 309,993

Term of patent 14 years  
Int. Cl. D7-08

U.S. Cl. D23-138.2





271,795  
VAPORIZER

Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kazuo Nagata, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,278  
Claims priority, application Japan, Feb. 27, 1981, 56-7857  
Term of patent 14 years  
Int. Cl. D23—04

U.S. Cl. D23—148



271,797

NIPPLE FOR A SCREW CAP BOTTLE

Anthony Chrones, Warwick, R.I., assignor to Gerber Products Company, Fremont, Mich.

Filed Dec. 12, 1980, Ser. No. 215,746  
The portion of the term of this patent subsequent to May 11, 1996, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D24—04

U.S. Cl. D24—46



271,796

DISPOSABLE STAPLE CARTRIDGE FOR LINEAR CLOSURE SURGICAL STAPLER

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jul. 2, 1981, Ser. No. 279,682  
Term of patent 14 years  
Int. Cl. D24—02

U.S. Cl. D24—27



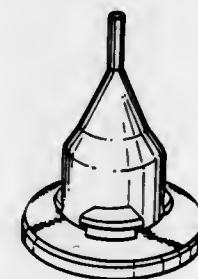
271,798

PREMATURE NIPPLE OR THE LIKE

Antonino Araujo, Jr., Columbus, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 4, 1981, Ser. No. 240,527  
Term of patent 14 years  
Int. Cl. D24—05

U.S. Cl. D24—46



271,799

URINE COLLECTING DEVICE FOR MEN

Ian Atkins, Båstad, Sweden, assignor to Nolato AB, Torekov, Sweden

Filed Feb. 27, 1981, Ser. No. 238,714  
Claims priority, application Sweden, Sep. 4, 1980, 80-1658  
Term of patent 14 years  
Int. Cl. D24—02

U.S. Cl. D24—51



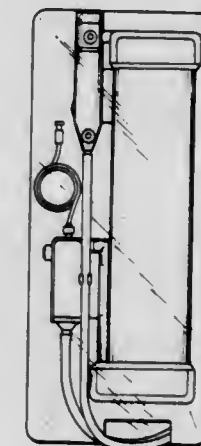
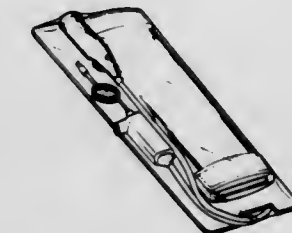
271,801

ARTIFICIAL KIDNEY ASSEMBLY PACKAGE WITH ATTACHED BLOOD PUMP AND MULTIFUNCTIONAL SUBASSEMBLY

Andreas Preussner, Berkeley, Calif., assignor to Cordis Dow Corp., Miami, Fla.

Filed May 26, 1981, Ser. No. 266,695  
Term of patent 14 years  
Int. Cl. D24—02

U.S. Cl. D24—51



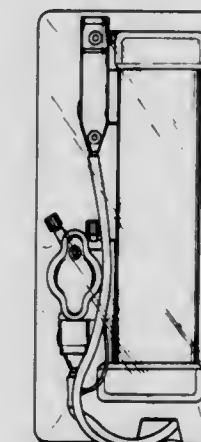
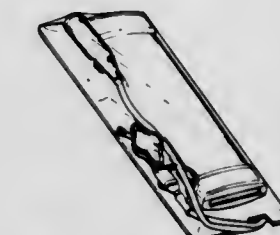
271,802

ARTIFICIAL KIDNEY ASSEMBLY PACKAGE WITH ATTACHED BLOOD PUMP AND MULTIFUNCTIONAL SUBASSEMBLY

Andreas Preussner, Berkeley, Calif., assignor to Cordis Dow Corp., Miami, Fla.

Filed May 26, 1981, Ser. No. 266,868  
Term of patent 14 years  
Int. Cl. D24—02

U.S. Cl. D24—51



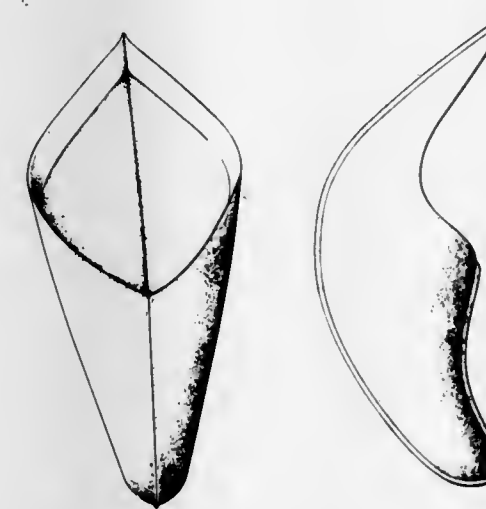
271,800

MALE INCONTINENCE PAD

Lennart I. Brendling, Järfälla, Sweden, assignor to Landstingens Inkopscentral, Lic. Solna, Sweden

Filed Apr. 8, 1981, Ser. No. 252,256  
Term of patent 14 years  
Int. Cl. D24—04

U.S. Cl. D24—51





271,803

## CONTAINER FOR MEDICAL LIQUIDS

Mark E. Larkin, Lindenhurst; Edward S. Tripp, Grayslake, and John S. Ziegler, Arlington Heights, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 12, 1980, Ser. No. 215,942

Term of patent 14 years

Int. Cl. D24-04

U.S. Cl. D24-58



271,805

## CONTAINER FOR MEDICAL LIQUIDS

Mark E. Larkin, Lindenhurst; Edward S. Tripp, Grayslake, and John S. Ziegler, Arlington Heights, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 12, 1980, Ser. No. 215,943

Term of patent 14 years

Int. Cl. D24-04

U.S. Cl. D24-58



271,806

## FOG LIGHT

Hisao Yabata, Tamamura, Japan, assignor to Ichikawa Press Industry Co., Ltd., Takasaki, Japan

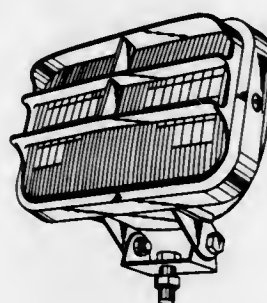
Filed Aug. 27, 1981, Ser. No. 296,707

Claims priority, application Japan, May 27, 1981, 56-22633

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D26-29



271,804

## BOTTLE FOR RETAINING BLOOD

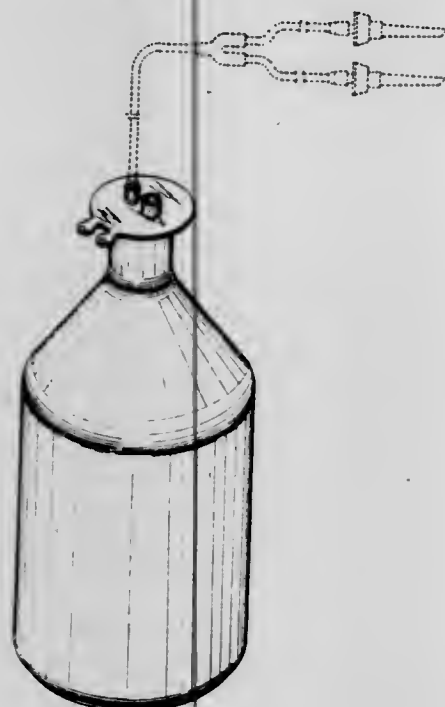
George S. Momoda, Mission Viejo, Calif., assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1981, Ser. No. 254,217

Term of patent 14 years

Int. Cl. D24-99; D9-01

U.S. Cl. D24-56



271,807

## FLASHLIGHT HEAD

Knut O. Sassmannshausen, Rothenbach St., D6580 Idar-Oberstein, Fed. Rep. of Germany

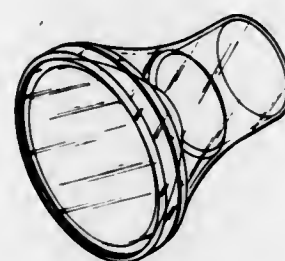
Division of Ser. No. 917,012, Jun. 16, 1978, Pat. No. Des. 259,962. This application Mar. 10, 1981, Ser. No. 242,382

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 1460

Term of patent 14 years

Int. Cl. D26-02

U.S. Cl. D26-37



271,808

## FLASHLIGHT

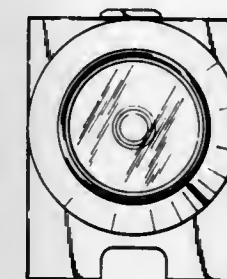
Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.

Filed Jun. 15, 1981, Ser. No. 273,453

Term of patent 14 years

Int. Cl. D26-02

U.S. Cl. D26-37



271,809

## FLASHLIGHT

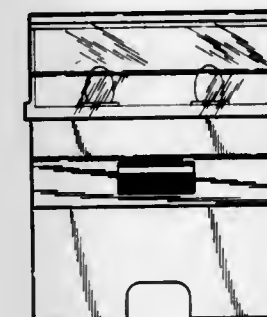
Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.

Filed Jun. 15, 1981, Ser. No. 273,483

Term of patent 14 years

Int. Cl. D26-02

U.S. Cl. D26-37



271,810

## FLASHLIGHT

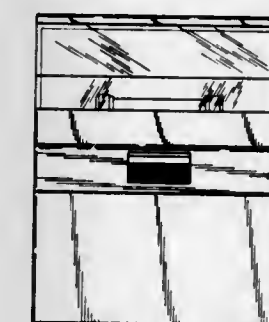
Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.

Filed Jun. 15, 1981, Ser. No. 273,990

Term of patent 14 years

Int. Cl. D26-02

U.S. Cl. D26-37



271,811

## SIGNAL LAMP LENS FOR AUTOMOBILE

Claus Luthe, Munich; Manfred Rennen, Ingolstadt, and Hans Braun, Lohhof, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

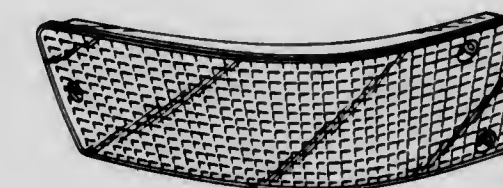
Filed Mar. 27, 1981, Ser. No. 248,364

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, MR 12 271

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D26-122



271,812

## COMBINATION SLIDING DOOR AND RAIL COVER

Jan J. G. Markus, Krimpen, Netherlands, assignor to Markus Hermetische Deuren B.V., Netherlands

Filed Feb. 23, 1981, Ser. No. 238,218

Claims priority, application Benelux, Aug. 21, 1980, 54934-02

Term of patent 14 years

Int. Cl. D25-02

U.S. Cl. D25-48





271,813  
RAZOR

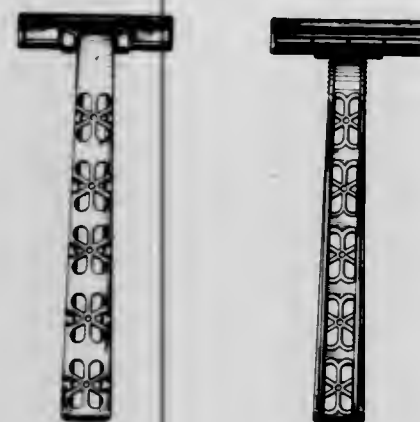
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Mar. 8, 1982, Ser. No. 356,136

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D28—46



271,815  
COMBINED ELECTRIC WASHER AND CLOTHES  
DRYER

Takao Oosawa, Tokyo; Joji Nishiyama, Kodaira; Hajime Kasai, Funabashi, and Etsuro Hirose, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

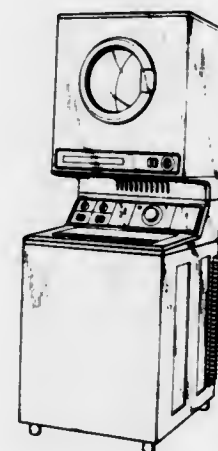
Filed Dec. 21, 1981, Ser. No. 332,936

Claims priority, application Japan, Jun. 26, 1981, 56-27704; Jun. 26, 1981, 56-27705

Term of patent 14 years

Int. Cl. D5—05

U.S. Cl. D32—6



271,814  
ELECTRIC SHAVER

Takeshi Takagi, Neyagawa; Shinji Yamamoto, and Keiji Kuribayashi, both of Hirakata, all of Japan, assignors to Matsushita Electric Works, Osaka, Japan

Filed Oct. 15, 1981, Ser. No. 311,602

Claims priority, application Japan, Apr. 30, 1981, 56-19038

Term of patent 14 years

Int. Cl. D28—03

U.S. Cl. D28—50



271,816  
VACUUM HEAD FOR CLEANING UNDERWATER  
SURFACES

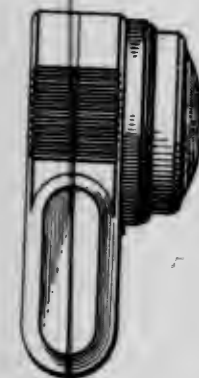
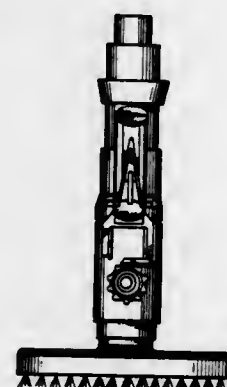
Kenneth E. Price, 1534 Channelwood Dr., Whittier, Calif. 90601

Filed Nov. 10, 1980, Ser. No. 205,873

Term of patent 14 years

Int. Cl. D15—05

U.S. Cl. D32—32



271,817  
SPONGE

Pierre Collin, Paris, France, assignor to Spontex Société Anonyme, Paris, France

Filed Jun. 4, 1980, Ser. No. 156,383

Claims priority, application France, Dec. 11, 1979, 78 103

Term of patent 14 years

Int. Cl. D7—05

U.S. Cl. D32—40

271,818  
TRASH CAN COVER

Robert G. Hartman, Greensboro, N.C., assignor to Zarn, Inc., Reidsville, N.C.

Filed Feb. 4, 1981, Ser. No. 231,435

Term of patent 14 years

Int. Cl. D7—07

U.S. Cl. D34—11



# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF DECEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A P Products Incorporated: *See—*  
Tengler, John N., 4,420,215., Cl. 339-176.00R.
- Abbott Laboratories: *See—*  
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,420,568., Cl. 436-536.000.
- Abe, Mitsuo: *See—*  
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- Abe, Yoshio: *See—*  
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- Abidin, Anwar: *See—*  
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- Achtnig, Klaus-Peter: *See—*  
Forberg, Horst; Radelow, Wolfgang; Achtnig, Klaus-Peter; and Muller, Manfred, 4,420,200., Cl. 339-13.000.
- Ackermann, Rolf; Jung, Friedrich; Mauer, Egon; and Rupertinger, Hermann, to Triumph-Adler A.G. fur Büro- und Informationstechnik. Device for lifting the printing head off the platen. 4,420,269., Cl. 400-356.000.
- Acrian, Inc.: *See—*  
Rice, Edward J., 4,419,811., Cl. 29-571.000.
- ACS Communications, Inc.: *See—*  
Larkin, Wallace K., 4,420,657., Cl. 179-156.00A.
- Adachi, Kuniomi: *See—*  
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- Adam, Peter; Seuffert, Werner; and Saeed, Abdul R., to Siemens Aktiengesellschaft. Permanent magnet motor driven window lifter. 4,420,703., Cl. 310-154.000.
- Agfa-Gevaert AG: *See—*  
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- Agfa-Gevaert Aktiengesellschaft: *See—*  
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- AGFA-GEVAERT N.V.: *See—*  
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- Aglietti, Giancarlo: *See—*  
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- Ahlstedt, Ulf L.: *See—*  
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- Aiba, Seiichi; Hiratani, Kazuhisa; and Nakagawa, Tsutomu, to Director General of Agency of Industrial Science & Technology. Catalyst membrane. 4,420,612., Cl. 536-102.000.
- Aikawa, Kazuo: *See—*  
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- Air Products and Chemicals, Inc.: *See—*  
Wempe, Lawrence K.; and Bauman, Bernard D., 4,420,591., Cl. 526-62.000.
- Aisin Kako Kabushiki Kaisha: *See—*  
Yamamoto, Yasunobu; Tomikawa, Ryoichi; and Ishii, Masami, 4,420,067., Cl. 188-251.00A.
- Aisin Seiki Kabushiki Kaisha: *See—*  
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- Aisin-Warner Kabushiki Kaisha: *See—*  
Miki, Nobuaki; and Yokoyama, Shoji, 4,419,910., Cl. 74-867.000.
- Aiuchi, Susumu: *See—*  
Nomoto, Mineo; Iwashita, Katsuhiko; Otsubo, Toru; and Aiuchi, Susumu, 4,420,233., Cl. 353-122.000.
- Aizawa, Hidekuni: *See—*  
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- Aktiebolaget Electrolux: *See—*  
Steffen, Cennert O., 4,419,783., Cl. 15-339.000.
- Akutagawa, Keichi: *See—*  
Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, 4,419,972., Cl. 123-337.000.
- Albagnac, Rene D. M.; and Silly, Didier Jean-Pierre, to Societe Anonyme de Telecommunications. Device for regulating a Joule-Thomson effect refrigerator. 4,419,867., Cl. 62-514.0JT.
- Albany International Corp.: *See—*  
Bolton, Joseph A.; and Dufresne, Louis L., 4,420,402., Cl. 210-783.000.
- Albers-Schonberg, George; Joshua, Henry; and Lopez, Maria B., to Merck & Co., Inc. Hypocholesteremic fermentation products and process of preparation. 4,420,491., Cl. 424-311.000.
- Albrechtson, Loren R.: *See—*  
Peck, Richard M.; Reif, Robert B.; and Albrechtson, Loren R., 4,420,552., Cl. 430-252.000.
- Albury, Randolph R. Reciprocating device. 4,419,904., Cl. 74-44.000.
- Alcan International Limited: *See—*  
Riedl, George, 4,420,382., Cl. 204-147.000.
- Silvilotti, Olivo G.; and Iseki, Junkichi, 4,420,381., Cl. 204-70.000.
- Alexander, George E.: *See—*  
Wilkinson, Stanley B.; and Alexander, George E., 4,420,788., Cl. 361-85.000.
- Alfano, Carmel, to Societe Anonyme DBA. Method of manufacturing a cylindrical sleeve provided with internal grooves, and tool for carrying out this method. 4,419,877., Cl. 72-325.000.
- Alfred, Phillip L.: *See—*  
Sopko, Riley M., 4,419,873., Cl. 70-38.00A.
- Ali, Keramat, to Becton Dickinson and Company. Methods for improving uniformity of silica films on substrates. 4,420,517., Cl. 428-35.000.
- Allis-Chalmers Corporation: *See—*  
Nolt, James R., Jr., 4,420,672., Cl. 219-73.100.
- Alliston, Michael G.: *See—*  
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- Alonte, Antonio D.: *See—*  
Protacio, Alfredo C.; Navarro, Ramon V.; Rio, Eliseo M., Jr.; Alonte, Antonio D.; and Pascual, Felix J., 4,419,967., Cl. 123-1.00A.
- Alps Electric Co., Ltd.: *See—*  
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- AM International, Inc.: *See—*  
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- Amano Corporation: *See—*  
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- Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, to Taisho Pharmaceutical Co., Ltd. Esters of the carboxylic acid. 4,420,631., Cl. 560-104.000.
- American Cyanamid Company: *See—*  
Savides, Christos; and Bright, John H., 4,420,643., Cl. 568-753.000.
- Zavisza, Daniel M., 4,420,600., Cl. 528-60.000.
- American National Red Cross: *See—*  
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- American Sunroof Corporation: *See—*  
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- AMF Incorporated: *See—*  
Palandri, Fabio V., 4,420,733., Cl. 335-202.000.
- Amon, Maurice A.; and Bretler, Haim, to Sicpa Holding, S.A. Metallization process for protecting documents of value. 4,420,515., Cl. 428-29.000.
- AMP, Incorporated: *See—*  
Dehoff, Robert E., 4,420,281., Cl. 411-392.000.
- Grabbe, Dmitry G., 4,419,818., Cl. 29-832.000.
- McGeary, James E.; and Shatto, Walter C., Jr., 4,420,020., Cl. 140-147.000.
- Stephenson, Brian D., 4,420,201., Cl. 339-14.00R.
- Amtrol Inc.: *See—*  
Becker, Bernard B.; Bowman, John K.; and Randall, Cyril A., 4,420,010., Cl. 137-116.000.
- Andermo, Nils I., to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan. Measuring device for capacitive determination of the relative position of two with respect to one another moveable parts. 4,420,754., Cl. 340-870.370.
- Anderson, Colin C. Shearing unit. 4,419,821., Cl. 30-276.000.
- Anderson, Gerald: *See—*  
Zanker, Klaus J.; and Anderson, Gerald, 4,419,898., Cl. 73-861.020.
- Anderson, James R., to Research, Incorporated. Integrated circuit switch. 4,420,794., Cl. 361-419.000.
- Anderson, Michael P., to Kovan Engineering Pty. Ltd. Closure assembly. 4,420,296., Cl. 425-444.000.
- Ando, Akio: *See—*  
Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, 4,419,971., Cl. 123-193.00C.
- Ando, Takayuki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing lock device. 4,420,126., Cl. 242-107.200.
- Andrews, Wayne S., to Techsonic Industries, Inc. Chart recorder. 4,420,762., Cl. 346-136.000.
- Antos, George J., to UOP Inc. Hydrocarbon dehydrogenation with a multimetallic catalytic composite. 4,420,649., Cl. 585-434.000.



- Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument employing keyboard tonality designation system. 4,419,916, Cl. 84-1.010.
- Apotheloz, Robert, to Werkzeugmaschinenfabrik Oerlikon-Bührle AG. Safety apparatus for a spinning projectile fuse. 4,419,934, Cl. 102-233.000.
- Applied Chromatograph Systems Limited: See—  
Smith, Sydney W., 4,420,393, Cl. 210-101.000.
- Arai, Naoto: See—  
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- Arai, Takao: See—  
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- Arai, Yasunori: See—  
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- Arakawa, Masazumi: See—  
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- Arbasak, David P.; and Blake, David L., to Halliburton Company. Ball catcher. 4,420,040, Cl. 166-70.000.
- Archer, Robert G.: See—  
Dolejsi, Edward; and Archer, Robert G., 4,420,234, Cl. 353-122.000.
- Argumedo, Armando J.; Chow, William W.; Freeman, Robert D.; and Kleczkowski, Stawomir P., to International Business Machines. Thermal compensation for magnetic head assembly. 4,420,782, Cl. 360-129.000.
- Arichika, Kenji: See—  
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- Arikawa, Tetsuro; and Inoue, Teruo, to Nippon Air Brake Co., Ltd. Skid control system. 4,420,191, Cl. 303-103.000.
- Arikawa, Tetsuro; Inoue, Teruo; and Takiue, Yukihiko, to Nippon Air Brake Co., Ltd. Wheel speed measuring circuit. 4,420,814, Cl. 364-565.000.
- Aristo Graphic Systeme GmbH & Co., KG: See—  
Schutt, Eduard; and Hill, Gunter, 4,419,913, Cl. 83-27.000.
- Aristoff, Paul A., to Upjohn Company. The Composition and process. 4,420,632, Cl. 560-119.000.
- Armstrong, Daniel. Water powered dishwasher. 4,420,005, Cl. 134-100.000.
- Armstrong World Industries, Inc.: See—  
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- Arnold, Howard M. Golf ball warmer. 4,420,681, Cl. 219-521.000.
- Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
Ogawa, Ryota; Negoro, Ikuo; Iwanade, Hisao; and Arai, Yasunori, 4,420,248, Cl. 355-57.000.
- Yasuyuki, Haneishi; and Komoto, Shinsuke, 4,420,239, Cl. 354-286.000.
- Asami, Kanji, to Hephaest Seiko Co. Ball slideway. 4,420,194, Cl. 308-6.000.
- ASEA Aktiebolag: See—  
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- Ashcombe Products Company: See—  
Thornton, Henry M.; and Thornton, John S., 4,419,803, Cl. 29-428.000.
- Ashforth, John V., to Ferranti plc. Microwave phase-shifting apparatus. 4,420,729, Cl. 333-159.000.
- Associated Equipment Corporation: See—  
Wright, Bruce R., 4,420,212, Cl. 339-113.000.
- Astrom, Erik J. H., to Tekno-Detaljer Sture Carlsson AB. Device for use in connection with tapping off fluid from or filling fluid into a container. 4,420,012, Cl. 137-319.000.
- Ataka, Namik O., to Pemco Corporation. Plural phase cable couplers. 4,420,202, Cl. 339-14.000.
- Ateliers des Charmilles S.A.: See—  
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- Atlantic Richfield Company: See—  
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- Atlas Copco Aktiebolag: See—  
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- Aug, Conrad J.; Guenther, Charles J.; and Randolph, James B., to International Business Machines Corporation. Semiconductor module circuit interconnection system. 4,420,203, Cl. 339-17.000.
- Augat Inc.: See—  
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- Augenstein, Reiner: See—  
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- August, Rudolf R.: See—  
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- Axelrod, Herbert R., to Permatek, Inc. Method for binding books. 4,420,282, Cl. 412-4.000.
- Axthammer, Ludwig, to Fichtel & Sachs AG. Method for manufacturing a piston rod unit. 4,419,804, Cl. 29-434.000.
- Ayers, Myron T., to General Tire & Rubber Company. The Method of making polyester cord radial tires. 4,420,453, Cl. 264-502.000.
- B. F. Goodrich Company, The: See—  
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- Sehm, Eugene J., 4,420,610, Cl. 528-501.000.
- Baba, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Synchronized drive mechanism for a loader and a destacker of a press. 4,419,955, Cl. 118-227.000.
- Baba, Nobuyuki: See—  
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- Bahr, Theodor: See—  
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- Bailey, Wilber H., to Camino Laboratories, Inc. Method and apparatus for measuring heartbeat rate. 4,420,000, Cl. 128-706.000.
- Baillie, Lloyd A.; and Uhl, George A., to Atlantic Richfield Company. Method for determining specific gravity of a liquid. 4,419,893, Cl. 73-439.000.
- Baker, Daniel A.: See—  
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- Baker International Corporation: See—  
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- Baker, James M.; and Vermaat, David L., to Savin Corporation. Hold-down arrangement for copy sheet pick-off system. 4,420,243, Cl. 355-3.0TR.
- Ballard, Samuel S.: See—  
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- Ballweber, Edward G.: See—  
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- Bampffield, Howard A., to C-I-L Inc. Emulsion explosive compositions and method of preparation. 4,420,349, Cl. 149-2.000.
- Barclay, Kenneth M., to Rockwell International Corporation. Recovery of vanadium from carbonaceous materials. 4,420,464, Cl. 423-65.000.
- Bardes, Peter G., to Bardes Products, Inc. Filing hanger. 4,420,086, Cl. 211-46.000.
- Bardes Products, Inc.: See—  
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- Bardsley, Harold B.; Mosby, Brian J.; Barlow, John M.; and Walton, Brian, to Spencer Wright Industries, Inc. Carpet rolling machine. 4,420,124, Cl. 242-66.000.
- Bareis, Alfred: See—  
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- Barlow, Gordon A.; Tutt, Timothy T.; Karlin, Richard A.; and Krutsch, John R., to Lowbar, Inc. Optical position location apparatus. 4,420,261, Cl. 356-375.000.
- Barlow, John M.: See—  
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- Barnett, Allan E.: See—  
Carter, James L.; and Barnett, Allan E., 4,420,648, Cl. 585-269.000.
- Barrash, Marshall J., to Coca-Cola Company. The Adjustable folding, springback shelf bracket. 4,420,137, Cl. 248-240.400.
- Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., to Glasteel Tennessee, Inc. Copper-clad polyester-glass fiber laminates. 4,420,509, Cl. 427-206.000.
- Barron, Alvah V., Jr., to Barron Industries, Inc. Gas-solids separator. 4,420,314, Cl. 55-436.000.
- Barron Industries, Inc.: See—  
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- Baschang, Gerhard: See—  
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- BASF Aktiengesellschaft: See—  
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- Gettert, Hans; and Kaempfer, Knut, 4,420,342, Cl. 134-3.000.
- Gliniorz, Lothar; Dobler, Peter; Schoettle, Klaus; Flohr, Joachim; and Maerthesheimer, Rolf, 4,420,079, Cl. 206-387.000.
- Jakusch, Helmut; Loeser, Werner; Koester, Eberhard; Rudolf, Peter; Senkpiel, Werner; and Steck, Werner, 4,420,330, Cl. 75-0.5AA.
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- Batise, Claude, to Flocord S.A. Apparatus for the industrial production of flock coated electrical wire. 4,420,360, Cl. 156-390.000.
- Bauman, Bernard D.: See—  
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- Bausch & Lomb Incorporated: See—  
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- Baustin, Michel M. Pill bottles. 4,420,083, Cl. 206-538.000.

- Baxter, Kenneth D.; Bluem, Gary R.; Humphrey, Dallas R.; Kittle, Carl E.; and Kluge, Douglas J., to Deere & Company. Multiple mode control lever assembly. 4,419,907, Cl. 74-531.000.
- Bayer Aktiengesellschaft: See—  
Bomer, Bruno; Suling, Carlhans; Konig, Joachim; Hespe, Hans; Heynemann, Carl; and Weber, Raimund, 4,420,225, Cl. 350-409.000.
- Braden, Rudolf; and Klauke, Erich, 4,420,433, Cl. 260-544.00D.
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- Uhrhan, Paul; Krauthausen, Edmund; Stahlke, Kurt-Rainer; Quass, Gerwolf; and Ruetz, Lothar, 4,420,613, Cl. 544-51.000.
- Bayless, John P., to Lucas Industries Limited. Railway brakes. 4,420,065, Cl. 188-56.000.
- BBC Brown, Boveri & Company Limited: See—  
Kaufmann, Meinolph, 4,420,224, Cl. 350-338.000.
- Niemeyer, Lutz; and Ragaller, Klaus, 4,420,662, Cl. 200-148.00R.
- Zerlik, Willibald, 4,420,198, Cl. 339-5.00R.
- Beaujard, Bernard: See—  
Dupont, Andre; Laurent, Paul; and Beaujard, Bernard, 4,420,180, Cl. 296-1.00F.
- Becker, Bernard B.; Bowman, John K.; and Randall, Cyril A., to Amrol Inc. In-line back flow preventer. 4,420,010, Cl. 137-116.000.
- Becker, Henning; and Jauss, Fritz, to Centra-Burkle GmbH & Co. Load-control system with two-conductor supply circuit. 4,420,693, Cl. 307-66.000.
- Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, to W. Schlafhorst & Co. Splicing head. 4,419,860, Cl. 57-22.000.
- Beckman Instruments, Inc.: See—  
Jackson, Delbert D., 4,419,903, Cl. 73-864.010.
- Beckworth, Alden E.; Howell, Jerald A.; and Tabler, Donald C., to Phillips Petroleum Company. De-ashing lubricating oils. 4,420,389, Cl. 208-251.00R.
- Becton Dickinson and Company: See—  
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- Bedford Industries, Inc.: See—  
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- Beecham Group Limited: See—  
Lake, Anthony W.; and Rose, Carl J., 4,420,639, Cl. 568-328.000.
- Belden Corporation: See—  
Ledbetter, James A., 4,420,211, Cl. 339-98.000.
- Belikov, Viktor I.; Ivlev, Anatoly D.; Sitnichenko, Valentin M.; Shvets, Vladimir I.; and Bushtian, Leonid V., to Odessky Ordna Trudovogo Kraskogo. Electric drive for synchronous displacement of mechanically independent machine assemblies moving along equidistant trajectories. 4,420,712, Cl. 318-41.000.
- Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Korneev, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A. Method of preparing contacts and electrodes of electric vacuum apparatuses. 4,420,346, Cl. 148-4.000.
- Bell, Allyn R., to Uniroyal, Inc. Synergistic herbicidal composition. 4,420,326, Cl. 71-93.000.
- Bell & Howell Company: See—  
Jacobs, John H., 4,420,772, Cl. 358-294.000.
- Mischenko, Nicholas, 4,420,232, Cl. 353-25.000.
- Bell Telephone Laboratories, Incorporated: See—  
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- Owen, Brian, 4,420,724, Cl. 330-277.000.
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- Beloit Corporation: See—  
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- Belov, Valentin V.; and Verkevich, Vsevolod I. Device for remote control an actuator of a shut-off member. 4,420,139, Cl. 251-28.000.
- Belt, Kenneth W.; and Mattson, John S., to Norland Corporation. Carrying case for a cardiac pacer. 4,420,078, Cl. 206-305.000.
- Bendix Corporation, The: See—  
Karol, James J.; and Young, Thornton J., 4,420,210, Cl. 339-94.00M.
- Riggs, Robert R.; and Hunt, Paulmer D., 4,420,014, Cl. 137-468.000.
- Bennett, Robert A. Bellows actuated foam dispenser. 4,420,098, Cl. 222-190.000.
- Bergman, Roger M.; Bielecki, Edwin J.; and Nippert, Charles R., Jr., to Cabot Corporation. Pyrohydrolysis of columbium oxyfluoride to columbium oxide. 4,420,469, Cl. 423-592.000.
- Bergmann, Ewald: See—  
Dommer, Hans-Martin; Bareis, Alfred; and Bergmann, Ewald, 4,419,929, Cl. 100-257.000.
- Bergner, Dieter; Hannesen, Kurt; Schulte, Wilfried; and Steinmetz, Peter, to Hoechst Aktiengesellschaft. Electrolysis apparatus. 4,420,387, Cl. 204-263.000.
- Bernhard, Heinz D.: See—  
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- Bernie, Jack, to Process Displays Company. Tab mounted dispenser. 4,420,082, Cl. 206-526.000.
- Bertelli, Guido; and Locatelli, Renato, to Montedison S.p.A. Self-extinguishing polyolefin compositions. 4,420,577, Cl. 524-83.000.
- Bertolacini, Ralph J.; Mosby, James F.; and Schwartz, John G., to Standard Oil Company (Indiana). Hydrotreating vacuum gas oils with catalyst and added organic fluorine compound. 4,420,388, Cl. 208-112.000.
- Bertrams, Josef: See—  
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- Besson, Rene; and Bron, Alphonse, to ETA S.A., Fabriques d'Electroniques. Electronic watch with means for detecting the movement of a hand through a reference position. 4,420,263, Cl. 368-80.000.
- Beveridge, Lois M.; and LaCoste, Harry. Moisture resistant, quick release pill container. 4,420,076, Cl. 206-37.000.
- Beyer, Richard A.: See—  
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- Bezchastnov, Gennady A.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexander I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
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- BICC Public Limited Company: See—  
Dean, Noel S.; Lawton, Kenneth L.; and Yates, Vincent A., 4,420,220, Cl. 350-96.230.
- Bielecki, Edwin J.: See—  
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- Bienert, Horst; and Pfisterer, Hermann, to Webasto-Werk W. Baier GmbH & Co. Drive arrangement for a motor-vehicle top with outward-moving sliding cover. 4,420,185, Cl. 296-223.000.
- Bihler, Otto; and Augenstein, Reiner, to Otto Bihler Maschinenfabrik GmbH & Co. K.G. Method of forming a cage for frusto-conical roller bearings. 4,419,800, Cl. 29-148.40C.
- Bio-Rad Laboratories, Inc.: See—  
Kuehl, Donald, 4,420,690, Cl. 250-428.000.
- Biondi, Dennis P.: See—  
Leung, Chung W.; Dawson, Robert H.; Blumenfeld, Martin A.; and Biondi, Dennis P., 4,420,503, Cl. 427-85.000.
- Bischoff, Hans, to MTU Motoren- und Turbinen-Union GmbH. Device for the reduction of secondary losses in a bladed flow duct. 4,420,288, Cl. 416-244.00A.
- Bison-Werke Bahre & Greden GmbH & Co. KG: See—  
Neubauer, Harry; Greden, Berndt; and Seeger, Gunter, 4,420,357, Cl. 156-274.600.
- Black & Decker Inc.: See—  
Harris, David, 4,419,822, Cl. 30-276.000.
- Blake, David L.: See—  
Arbasak, David P.; and Blake, David L., 4,420,040, Cl. 166-70.000.
- Blaser, Hans U., to SIG-Schweizerische Industrie-Gesellschaft. Installation of an excess pressure valve in a hermetically sealed flexible container. 4,420,015, Cl. 137-852.000.
- Blaser, Lee B. Energy efficient housing structure. 4,420,036, Cl. 165-45.000.
- Blendax-Werke R. Schneider GmbH & Co.: See—  
Orlowski, Jan A.; Wagner, Helmar; and Butler, David V., 4,420,306, Cl. 433-228.000.
- Blessing, Fritz; Margitics, Gabor; and Brauer, Gerhard, to Novotechnik KG Offertinger GmbH & Co., Firma. Coupling device for the play-free connection of a precision potentiometer with a movable machine part. 4,420,273, Cl. 403-24.000.
- Blickensderfer, John R.; and Pacala, Luba A., to Union Carbide Corporation. Phenolic friction particles. 4,420,571, Cl. 523-149.000.
- Bluem, Gary R.: See—  
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- Blumenfeld, Martin A.: See—  
Leung, Chung W.; Dawson, Robert H.; Blumenfeld, Martin A.; and Biondi, Dennis P., 4,420,503, Cl. 427-85.000.
- Boart International, Ltd.: See—  
Hughes, Robert B., 4,419,979, Cl. 125-11.00R.
- BOC Limited: See—  
Sharp, Derek J.; and Watts, Robert C., 4,420,009, Cl. 137-98.000.
- Boden, Richard M.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Process for augmenting or enhancing the aroma of detergents using unsaturated branch chain ketones. 4,420,411, Cl. 252-174.110.
- Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Methyl substituted-2-oxohexane derivatives and process for preparing and using same. 4,420,423, Cl. 252-522.00R.
- Boden, Richard M.; Vock, Manfred H.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Prenyl methyl carbonate and organoleptic uses thereof. 4,420,472, Cl. 424-58.000.
- Boge GmbH: See—  
Husch, Bruno, 4,420,274, Cl. 403-227.000.
- Bogenschutz, Thomas M., to General Signal Corporation. Cam lock slack adjuster. 4,420,066, Cl. 188-107.000.
- Bohlmann, Volker; and Kania, Norbert, to Sachs-Dolmar GmbH. Arrangement for reducing the suction and/or exhaust noises for rapid speed combustion machines. 4,420,063, Cl. 181-229.000.



- Bolgiano, Nicholas C.; and Sigman, William T., to Armstrong World Industries, Inc. Process for providing improved radiation-curable surface coverings and products produced thereby. 4,420,499, Cl. 427-53.100.
- Bolhofer, William A.; Crago, Edward J.; and Hoffman, Jacob M., Jr. to Merck & Co., Inc. Substituted pyridopyrimidines as gastric secretion inhibitors. 4,420,615, Cl. 544-279.000.
- Bolton, Joseph A.; and Dufresne, Louis L., to Albany International Corp. Method and apparatus with couch press for dewatering a slurry of fine particles. 4,420,402, Cl. 210-783.000.
- Bomer, Bruno; Suling, Carlhans; Konig, Joachim; Hesse, Hans; Heynemann, Carl; and Weber, Raimund, to Bayer Aktiengesellschaft. Lens of a homo- or copolymer of a fluorine containing styrene polymer. 4,420,225, Cl. 350-409.000.
- Bommer Industries, Inc.: See—  
Prout, Addison S., 4,419,788, Cl. 16-300.000.
- Bonga, Benno I., to Ateliers des Charmilles S.A. Helicoidal guide for wire electrode of an EDM apparatus. 4,420,671, Cl. 219-69.00W.
- Bonk, Henry W.; Nelb, Robert G., II; and Oertel, Richard W., III, to Upjohn Company, The. Melt-polymerization process for the preparation of thermoplastic polyamides and polyesteramides. 4,420,602, Cl. 528-80.000.
- Bonnet, Jean: See—  
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- Booms, Robert E.; and Holstead, Colin, to Eastman Kodak Company. Photographic silver halide materials. 4,420,556, Cl. 430-549.000.
- Borg-Warner Corporation: See—  
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- Bosch & Pierrig System oHG: See—  
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- Bouquigny, Jean-Claude: See—  
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- Bower, David E., to U.S. Philips Corporation. Acoustic wave devices. 4,420,728, Cl. 333-151.000.
- Bowman, John K.: See—  
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- Braden, Rudolf; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of fluorine-substituted carboxylic acid chlorides and their use. 4,420,433, Cl. 260-544.00D.
- Brader, Walter H., Jr.: See—  
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- Braid, Milton, to Mobil Oil Corporation. Antioxidant compositions. 4,420,579, Cl. 524-328.000.
- Brandt, Inc.: See—  
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- Brauer, Gerhard: See—  
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- Brauer, Hans-Martin, to Schwabische Huttenwerke Gesellschaft mit beschränkter Haftung. Railway car wheel. 4,420,179, Cl. 295-15.000.
- Breen, Thomas B., to General Electric Company. Characteristic timer for a protective relay. 4,420,789, Cl. 361-94.000.
- Brenner, Robert A., to Whirlpool Corporation. Valveless liquid pumping agitator for automatic washers. 4,419,870, Cl. 68-18.0FA.
- Brentini, Attilio. Fastener device. 4,419,874, Cl. 70-459.000.
- Bret, Georges; and Michelet, Guy, to Quantel S.A. Mirror having a variable focal length. 4,420,222, Cl. 350-295.000.
- Bretler, Haim: See—  
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- Bridgestone Australia Pty. Ltd.: See—  
Kreissfeld, Rudolf P., 4,419,844, Cl. 49-475.000.
- Briehl, Gerhard, to WGW Westdeutsche Getriebe- und Kupplungswerke GmbH. Torque division gearing connection assembly. 4,419,906, Cl. 74-413.000.
- Bright, John H.: See—  
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- British Petroleum Company Limited, The: See—  
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- British Petroleum Company p.l.c., The: See—  
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- Brock Manufacturing, Inc.: See—  
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- Broden, David E.; and Martwick, Wilford E., to Honeywell Inc. Method of making spin stabilized discarding sabot projectile. 4,419,796, Cl. 29-1.230.
- Brodsky, Mark A.: See—  
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- Bron, Alphonse: See—  
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- Brooks, Robert T., to Baker International Corporation. Valving apparatus for selectively sealing an annulus defined between a work string and the bore of an element of a production string of a subterranean well. 4,420,043, Cl. 166-319.000.
- Browleit, Randall J.: See—  
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- Brown, Herbert L.; and Mayer, Frederick J. Obstruction warning system. 4,420,740, Cl. 340-28.000.
- Brown, James W., III: See—  
Krueger, Spencer M.; and Brown, James W., III, 4,420,555, Cl. 430-507.000.
- Brown, Thomas C., Jr. Polyphase braid reinforced hose. 4,420,018, Cl. 138-124.000.
- Browning, Alva L. Support gravity measurement instrument. 4,419,891, Cl. 73-382.00G.
- Bruenicke, Wilhelm A., to Lockheed Corporation. Stowable fire suppression system for aircraft cabins and the like. 4,420,047, Cl. 169-53.000.
- Bryce, Kenneth L.: See—  
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- BSL Corporation: See—  
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- Buchanan, William T.: See—  
Pocius, Frances C.; and Buchanan, William T., 4,420,463, Cl. 422-266.000.
- Bugaut, Andree; and Vandenbossche, Jean-Jacques, to L'Oreal. Metaphenylenediamines. 4,420,637, Cl. 364-443.000.
- Buhler, Ulrich; Kindler, Horst; Kuhlein, Klaus; Kallay, Maria; Kosubek, Uwe; Lowenfeld, Rudolf; and Roth, Kurt, to Cassella Aktiengesellschaft. Process for the production of reserve effects on polyester textiles and polyester/cellulose mixed fibre textiles: discharge printing with disperse azo dye with alkyl or alkoxy carbonyl, cyand and hydroxy phenyl group. 4,420,308, Cl. 8-464.000.
- Bulenda, Andrzej: See—  
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- Bundrick, Benjamin, Jr. Flexible cylinder-head internal combustion engine with cylinder compression adjustable for use with available fluid fuels. 4,419,969, Cl. 123-48.00R.
- Bunker Ramo-Eltra Corporation: See—  
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- Burkholder, Ward J., to Goodyear Tire & Rubber Company, The. Separation of resorcinol from non-extractable impurities. 4,420,376, Cl. 203-29.000.
- Burns, William K.; and Rashleigh, Scott C., to United States of America, Navy. Dual input gyroscope. 4,420,258, Cl. 356-350.000.
- Burroughs Corporation: See—  
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- Mowry, William H., Jr., 4,420,175, Cl. 283-93.000.
- Rau, William G., 4,420,727, Cl. 331-65.000.
- Bursky, Vyacheslav A.: See—  
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- Bush, Darrell C.; and Jenkins, Ralph E., to Core Laboratories, Inc. Particle measuring apparatus. 4,419,879, Cl. 73-432.0PS.
- Bushtian, Leonid V.: See—  
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- Butler, David V.: See—  
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- Butzen, William J., to Metal Era, Inc. Gravel curb. 4,419,850, Cl. 52-60.000.
- Buxton, Inc.: See—  
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- C-I-L Inc.: See—  
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- Marz, Horst F., 4,420,440, Cl. 264-3.00B.
- Cabot Corporation: See—  
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- Cachat, Francis J.: See—  
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- Cadwell, Donald E., to Minnesota Mining and Manufacturing Company. Lithographic substrate and its process of manufacture. 4,420,549, Cl. 430-158.000.
- Calandra, Frank, Jr., to Jennmar Corporation. Method for combining resin bonding and mechanical anchoring of a bolt in a rock formation. 4,419,805, Cl. 29-458.000.
- Calhoun, Leslie O.: See—  
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- Thorpe, Frank P.; and Calhoun, Leslie O., 4,420,091, Cl. 220-3.700.
- California Institute of Technology: See—  
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- California Interface and Software Limited Partnership: See—  
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- Calor Agriculture Research, Inc.: See—  
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- Camino Laboratories, Inc.: See—  
Bailey, Wilber H., 4,420,000, Cl. 128-706.000.
- Camp, Albert T.; and Csanady, Elmer R., to United States of America, Navy. Doublebase ballistic modifiers. 4,420,350, Cl. 149-98.000.
- Campau, Daniel N., to Pepsico, Inc. Iron-type golf clubs. 4,420,156, Cl. 273-77.00A.
- Canadian General Electric Company Limited: See—  
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- Canard, Pierre; Latourrette, Bertrand; and Schorsch, Gilbert, to Rhone-Poulenc Industries. Polymeric matrices reinforced with highly dispersed synthetic zeolitic particulates. 4,420,582, Cl. 524-450.000.
- Canavesi, Roberto; Aglietti, Giancarlo; and Ghezzi, Roberto, to Euteco Impianti S.p.A. Process for the preparation of catalysts based on iron and molybdenum oxides. 4,420,421, Cl. 502-316.000.
- Canobbio, Paul P.: See—  
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- Canon Kabushiki Kaisha: See—  
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- Katsuma, Makoto; Mizogui, Toyokazu; Isobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, 4,420,240, Cl. 354-288.000.
- Kitagishi, Nozomu, 4,420,226, Cl. 350-427.000.
- Kitamura, Takashi, 4,420,761, Cl. 346-108.000.
- Ogawa, Yukio; Harigaya, Isao; Yamada, Tateo; and Hirohata, Michio, 4,420,237, Cl. 354-458.000.
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- Carr, George S. Thermal garment design. 4,420,521, Cl. 428-74.000.
- Carr, Ronald. Magnetic separator for particulates. 4,420,390, Cl. 209-216.000.
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- Chapman, Lloyd. Postage scale. 4,420,056, Cl. 177-245.000.
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- Chopin, Jean-Pierre R. Protection devices for horse shoes. 4,420,046, Cl. 168-14.000.
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- Maier, Ludwig; and Durr, Dieter, 4,420,436, Cl. 260-944.000.
- Marxer, Adrian, 4,420,619, Cl. 548-352.000.
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Lecourtier, Georges; and Bouquigny, Jean-Claude, 4,420,715, Cl. 318-301.000.
- Cincinnati Milacron Industries, Inc.: See—  
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- Claudy, Steven A. Socket drive wrench and pawl and ratchet assembly therefor. 4,419,911, Cl. 81-62.000.
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- Clayton, Charles R. Golf club bag. 4,420,024, Cl. 206-315.400.
- Clear, Theodore E.; and Dinkel, Paul E. Apparatus for manufacturing cementitious reinforced panels. 4,420,295, Cl. 425-92.000.
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Schmitt, Walter, 4,420,699, Cl. 307-519.000.  
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Walker, Andrew J.; and Watt, John C., 4,420,278, Cl. 405-301.000.  
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Stahel, Alwin J.; and Preisler, James M., 4,420,803, Cl. 362-369.000.  
Drake, Jerry W.; See—  
Cooper, Kersi F.; and Drake, Jerry W., 4,420,504, Cl. 427-90.000.  
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Coate, David W.; and Selmecci, Joseph G., 4,420,404, Cl. 210-808.000.  
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Druchas, Gilbert H., to TRW Inc. Power steering pump. 4,420,290, Cl. 417-283.000.  
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Ferretti, August, 4,420,422, Cl. 252-518.000.  
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- McFarlane, Finley E.; and Taylor, Robert B., 4,420,581, Cl. 524-431.000.
- Meckel, Benjamin B., 4,420,505, Cl. 427-131.000.
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- Yacobucci, Paul D.; and Wilson, John C., 4,420,630, Cl. 560-104.000.
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- Eberle, William J., to General Battery Corporation. Electrodes for use in the extrusion-fusion welding of lead parts through an aperture in a battery case and method of extruding, fusing and forging lead connections in battery cases, 4,420,673, Cl. 219-78.160.
- Eberlein, Dietmar: See—  
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- Ebert, Thomas P. Whirlpool bath, 4,419,775, Cl. 4-542.000.
- Ebneth, Harold; and Fitzky, Hans-Georg, to Bayer Aktiengesellschaft. Metallized sheet form textile material and method of making same, 4,420,757, Cl. 343-912.000.
- Eckels, Robert E. Magnetic edge seal for solar collector film, 4,419,982, Cl. 126-426.000.
- Ecker, Ernest L.: See—  
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- Eckhardt, Roger S.: See—  
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- Edison Price, Incorporated: See—  
Smester, Paul R.; and Price, Edison A., 4,420,802, Cl. 362-364.000.
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- Egosi, Dan. Energy conversion method and system, 4,420,373, Cl. 202-173.000.
- Eichhorn, Friedrich: See—  
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- Eicken, Karl; Plath, Peter; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 5-Amino-1-di- or tri-substituted phenylpyrazole-4-carboxylic acid methyl esters, 4,420,324, Cl. 71-92.000.
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- Eketorp, Sven: See—  
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- Eli Lilly and Company: See—  
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- Elkem Metals Company: See—  
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- Ellis, John C., Jr. Water degasification and distillation apparatus, 4,420,374, Cl. 202-176.000.
- Ellis, Robert L.: See—  
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- Elton, Craig T.; and Reynolds, Stephen, to Lever Brothers Company. Citrus flavored mouthwash formulation method, 4,420,471, Cl. 424-49.000.
- Elwood, James K.: See—  
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- Emhart Industries, Inc.: See—  
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- Surko, Walter E., Jr., 4,419,786, Cl. 16-51.000.
- Emms, Norman R.: See—  
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- EMS Thermaplant Limited: See—  
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- Endoh, Koichi: See—  
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- Endress u. Hauser GmbH u. Co.: See—  
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- English Electric Valve Company Limited: See—  
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- Enkegaard, Torben, to F. L. Smith & Co. Combustion plant, 4,419,964, Cl. 122-4.00D.
- Epson Corporation: See—  
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- Epstein, Peter F.; Peveler, Richard D.; and Fisch, Michael H., to Witco Chemical Corporation. Preparation of a 2-alkyl-5,5-dialkyl-1,3,2-dioxaphosphorinan-2-one from 2-alkoxy-5,5-dialkyl-1,3,2-dioxaphosphorinan, 4,420,437, Cl. 260-969.000.
- Ericson, Hans G.: See—  
Oppert, Hans-Jorgen; Carlsson, Sven A. L.; and Ericson, Hans G., 4,419,909, Cl. 74-856.000.
- Ermert, Wolfgang; Funk, Hans W.; and Klein, Rudi, to Wolff Walsrode Aktiengesellschaft. Composite films for deep-drawn packings, 4,420,516, Cl. 428-35.000.
- Ernst Thielenhaus KG: See—  
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- Esselte Pendaflax Corporation: See—  
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- Esser, Karl-Josef, to Scharmann GmbH & Co. Tool changing device on machine tools, particularly on horizontal boring and milling machines, 4,419,806, Cl. 29-568.000.
- Essex Group, Inc.: See—  
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- ETA S.A., Fabriques d'Ebauches: See—  
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- Etablissement Public de Diffusion dit "Telediffusion de France": See—  
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- Ethyl Corporation: See—  
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- Ethyl Products Company: See—  
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- Eurometal N.V.: See—  
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- Euteco Impianti S.p.A.: See—  
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- Evans, Steven; and Elwood, James K., to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible magenta dye-releasing compounds and precursors thereof, 4,420,550, Cl. 430-223.000.
- Evans, Tony L. Cant production, 4,419,914, Cl. 83-407.000.
- Evens, Georges G., to Stamcarbon B.V. Process for the preparation of copolymers of ethylene with at least one other 1-alkene, 4,420,595, Cl. 526-141.000.
- Everest, Charles E.; and Walker, Graham K. Infrared temperature monitoring apparatus having means for sky radiation compensation, 4,420,265, Cl. 374-133.000.
- Excello Specialty Company, The: See—  
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- Exxon Research and Engineering Co.: See—  
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- F. L. Smith & Co.: See—  
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- Knudsen, Hans B., 4,420,302, Cl. 432-14.000.
- Knudsen, Hans B., 4,420,303, Cl. 432-14.000.
- Failmezer, Friedrich; and Lat, Geronimo E., to United States Gypsum Company. Method for treating the surface of a metal to improve the adhesion of a cementitious joint compound thereto, 4,419,853, Cl. 52-741.000.
- Fairchild Camera and Instrument Corporation: See—  
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- Tickle, Andrew C., 4,420,497, Cl. 427-8.000.
- Fairchild, Wayne K. Automatic flexible tube cutter, 4,419,798, Cl. 29-33.00T.
- Falk, Gerhard: See—  
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- Falk, Robert A., to Ciba-Geigy Corporation. Perfluoralkyl anion/perfluoralkyl cation ion pair complexes, 4,420,434, Cl. 260-501.120.
- Farr, Glyn P. R., to Lucas Industries Limited. Hydraulic master cylinders, 4,419,862, Cl. 60-562.000.
- Farris, David L. Apparatus for establishing the junction contour for intersecting pipes, 4,419,828, Cl. 33-175.000.
- Faurholdt, Bent. Incinerator for chemical waste material stored in barrels, 4,419,943, Cl. 110-237.000.
- Fay, Gary V.; and Pshaenich, Alvin, to Motorola Inc. Semiconductor current regulator and switch, 4,420,700, Cl. 307-571.000.
- Federal Products Corporation: See—  
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- Miller, Mark H., 4,419,830, Cl. 33-178.00R.
- Feldmuhle Aktiengesellschaft: See—  
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- Felix, Larry L. Apparatus for enabling concealing surveillance by use of a camera in a vehicle, 4,420,238, Cl. 354-81.000.
- Ferag AG: See—  
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- Ferranti plc: See—  
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- Ferretti, August, to Du Pont de Nemours, E. I., and Company. Method for making high surface area bismuth-containing pyrochlores, 4,420,422, Cl. 252-518.000.
- Ferrigno, Thomas H. Stabilized surface modified fillers, 4,420,341, Cl. 106-308.00Q.
- Fichtel & Sachs AG: See—  
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- Fiedler, Gerhard; Fritzsche, Werner; Herold, Frank; and Tolkmitt, Uwe, to VEB Kombinat Wolle und Seide. Process and apparatus for monitoring thread breakage by the use of a threshold device, 4,420,697, Cl. 307-308.000.

- Filimonov, Evgeny F.: See—  
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- Fillenwarth, Dale R.: See—  
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- Fingerle, Dieter: See—  
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- Finkelstein, Sam D., to MPL Inc. Tamper-resistant pharmaceutical vial and cap assembly, 4,420,092, Cl. 220-254.000.
- Fiorese, Franco F.: See—  
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- Fisch, Michael H.: See—  
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- Fischer, Jochem; and Scholl, Hans, to Kochs Adler AG. Feeding device for an automatic sewing arrangement, 4,419,946, Cl. 112-121.120.
- Fisher, Amnon, to National Semiconductor Corporation. Synchronous priority circuit, 4,420,695, Cl. 307-242.000.
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- Fives-Cail Babcock: See—  
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- Fladda, Gerd; and Pettersson, Thorulf, to Svenska Traforskningsinstitutet. Dust measurement, 4,420,256, Cl. 356-336.000.
- Flannelly, William G., to Kaman Aerospace Corporation. Vibration isolator with crank driven inertia bar, 4,420,134, Cl. 248-559.000.
- Floord S.A.: See—  
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- Flohr, Joachim: See—  
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- FMC Corporation: See—  
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- Fogg, Sidney G.; Robertson, Frank C.; and Wilson, Douglas, to British Petroleum Company p.l.c. The Method of treating water-in-oil dispersions, 4,420,573, Cl. 523-333.000.
- Folta, Werner: See—  
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- Forberg, Horst; Radelow, Wolfgang; Achtnig, Klaus-Peter; and Muller, Manfred, to Krone GmbH. Surge-protected cable joint, 4,420,200, Cl. 339-13.000.
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- Forster, Helmut. Apparatus for relieving the spinal column, 4,419,990, Cl. 128-75.000.
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- Fowler, David P., to Frito-Lay, Inc. Apparatus for applying seasoning, 4,419,953, Cl. 118-16.000.
- Fox, David S.; and Cawelti, Donald G., to United States of America, Army. Force rate sensor assembly, 4,420,123, Cl. 242-147.00R.
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- Le Pargneux, Jacques, 4,420,457, Cl. 376-446.000.
- Francis, David B., to International Business Machines Corporation. Apparatus and method for removal of sinusoidal noise from a sampled signal, 4,420,815, Cl. 364-724.000.
- Franko-Filipasic, Borivoj R.; and Snyder, James, to FMC Corporation. Selective removal and recovery of catechol mixed with 2-methyl-lyloxyphenol, 4,420,642, Cl. 568-753.000.
- Franz, Rudolph J., to Eaton Corporation. System for automatically controlling vehicle compartment temperature and transducer therefor, 4,420,033, Cl. 165-26.000.
- Frase, Dietmar: See—  
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- Freeman, Michael. Interactive telephone answering system, 4,420,656, Cl. 179-6.040.
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- Frolova, Irina B.: See—  
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- Frost, Rodney I.; and Pitcher, Wayne H., Jr., to Corning Glass Works. Filter apparatus and method of making it, 4,420,316, Cl. 55-523.000.
- Frykendale, Bjorn, to Eketorp, Sven; Fredriksson, Hasse; Strandell, Per Olof; and Frykendale, Bjorn. Method of casting metal including disintegration of molten metal, 4,420,031, Cl. 164-473.000.
- Frymaster Corporation, The: See—  
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- Fuji Electric Company, Ltd.: See—  
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- Fuji Jukogyo Kabushiki Kaisha: See—  
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- Fuji Oil Company, Limited: See—  
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- Fuji Photo Film Co., Ltd.: See—  
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- Ogawa, Hiroshi; and Tamai, Yasuo, 4,420,540, Cl. 428-457.000.
- Okiyama, Toshiaki, 4,420,528, Cl. 428-220.000.
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- Fujikawa, Mitsunobu: See—  
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- Fujisawa Pharmaceutical Co., Ltd.: See—  
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- Wakatsuki, Noboru; Kojima, Yuji; and Ono, Masaaki, 4,420,730, Cl. 333-195.000.
- Watanabe, Yoshio; and Iijima, Nobuo, 4,420,223, Cl. 350-310.000.
- Zasio, John J., 4,420,691, Cl. 250-491.100.
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- Fukuda, Mitsutoshi; Baba, Nobuyuki; and Arichika, Kenji, to Toyo Soda Manufacturing Co., Ltd. Laser light scattering photometer, 4,420,257, Cl. 356-341.000.
- Fukuda, Sunichi; and Muto, Masaaki, to Rogers Corporation. High capacitance bus bar and method of manufacture thereof, 4,420,653, Cl. 174-72.00B.
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- Fukushima, Masao, to Nissan Motor Co., Ltd. Automotive vehicle noise reduction device, 4,420,062, Cl. 181-204.000.
- Fuller, Harrison W., to Sanders Associates, Inc. Cantilevered-beam, fiber-optic angular accelerometer, 4,419,895, Cl. 73-517.00A.
- Fuller, John M. Rotary filing device, 4,420,196, Cl. 312-186.000.
- Funcik, Jack F.; and Kolanowski, Clarence, to Molex Incorporated. Electrical harness fabrication apparatus, 4,419,817, Cl. 29-749.000.
- Funk, Hans W.: See—  
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- Furukawa Electric Company, Ltd., The: See—  
Shiga, Shoji; Suzuki, Akitoshi; Goma, Yasuo; and Kawada, Kenji, 4,420,377, Cl. 204-28.000.
- Furusaki, Shinichi; Manada, Noriaki; Yamashina, Hisao; and Matsuda, Masaaki, to Ube Industries, Ltd. Process for the preparation of an ester of formic acid, 4,420,633, Cl. 560-232.000.
- Furuta, Kenji, to Olympus Optical Co., Ltd. Tape recorder with cue processor, 4,420,777, Cl. 360-61.000.



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- Fusser, Hermann, to SMS Schloemann Siemens Aktiengesellschaft. Hydraulic drop forging press of above-construction with prestressed press frame. 4,419,878, Cl. 72-455.000.
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- Galood, David. Miniature gum machine. 4,420,095, Cl. 221-265.000.
- GAO Gesellschaft fur Automation und Organisation mbH: See—  
Hoppe, Joachim; and Haghir-Tehrani, Yahya, 4,420,683, Cl. 235-492.000.
- Garcia, John C.: See—  
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- Garcia-Mallol, Juan A.; and Alliston, Michael G., to Foster Wheeler Energy Corporation. Fluidized reinjection of carryover in a fluidized bed combustor. 4,419,965, Cl. 122-4.00D.
- Garrett Corporation, The: See—  
Laham, Herman C., 4,420,160, Cl. 277-40.000.
- Gartner, William J., to Halek, Inc. Bacteriocidal resins and disinfection of water therewith. 4,420,590, Cl. 525-357.000.
- Gaughan, Edmund J., to Stauffer Chemical Company. Thiophosphoryl carbamate herbicide antidotes. 4,420,323, Cl. 71-87.000.
- Gauthier, Andre, to Societe Anonyme de Telecommunications. Large-surface fast photodetector sensitive in the 0.8-1.1  $\mu$ m range. 4,420,684, Cl. 250-211.001.
- Gehlen, Gary N., to Stayton Canning Company Cooperative. Cauliflower size cutter. 4,420,118, Cl. 241-101.200.
- Geiger, Rolf; Konig, Wolfgang; and Johnschner, Gerd, to Hoechst Aktiengesellschaft. New peptides and a process for their preparation. 4,420,424, Cl. 260-112.50R.
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- Gelston, N. E., II. Leak detector. 4,419,883, Cl. 73-49.300.
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- General Battery Corporation: See—  
Eberle, William J., 4,420,673, Cl. 219-78.160.
- General Electric Company: See—  
Breen, Thomas B., 4,420,789, Cl. 361-94.000.
- Chandran, Prem G. N.; and Matulevich, Edward S., 4,420,713, Cl. 318-71.000.
- D'Atre, John D.; and Walker, Loren H., 4,420,719, Cl. 318-803.000.
- Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458, Cl. 376-447.000.
- Kimberlin, Dan W., 4,420,705, Cl. 310-242.000.
- Miller, Edward H., 4,420,161, Cl. 277-56.000.
- Qurnell, Frank D.; and Skarshaug, Nordahl H., 4,420,455, Cl. 376-245.000.
- Reiling, Gilbert H.; Putz, John M.; and Van Horn, David D., 4,420,801, Cl. 362-297.000.
- Van Horn, David D., 4,420,800, Cl. 362-297.000.
- Wilkinson, Stanley B.; and Alexander, George E., 4,420,788, Cl. 361-85.000.
- General Equipment Co.: See—  
von Ruden, Dennis, 4,420,189, Cl. 299-40.000.
- General Motors Corporation: See—  
Christen, Eugene W., 4,420,195, Cl. 308-201.000.
- Kondziola, Joseph D.; and Sobieski, Donald C., 4,420,127, Cl. 242-107.40A.
- Lee, Michael C. H.; and Nelson, Darrel S., 4,420,585, Cl. 524-548.000.
- Wysocki, Thomas J., 4,420,170, Cl. 280-661.000.
- General Research of Electronics, Inc.: See—  
Imazeki, Kazuyoshi; and Nakano, Masao, 4,420,716, Cl. 318-379.000.
- General Signal Corporation: See—  
Bogenschutz, Thomas M., 4,420,066, Cl. 188-107.000.
- Hasslerjian, Simon, 4,419,814, Cl. 29-605.000.
- General Technology Applications, Inc.: See—  
Weitzen, William, 4,420,400, Cl. 210-710.000.
- General Tire & Rubber Company, The: See—  
Ayers, Myron T., 4,420,453, Cl. 264-502.000.
- Gentiluomo, Joseph A., to United States of America, Army. Hydrodynamic pressurizing apparatus. 4,419,881, Cl. 73-37.000.
- George Fischer Ltd.: See—  
Rohr, Jakob, 4,420,190, Cl. 301-63.00R.
- Gerberich, H. Robert; and Smith, Eldred T., to Celanese Corporation. Formaldehyde production. 4,420,641, Cl. 568-473.000.
- Gerch, Edward L., to Kingsport, Ltd. Combination carrying case and detachable garment carrier. 4,420,068, Cl. 190-102.000.
- Gerhartz, Reinhold, to United States of America, Army. Switchable on-axis optical bandstop filter. 4,420,217, Cl. 350-362.000.
- Gettert, Hans; and Kaempfer, Knut, to BASF Aktiengesellschaft. Method of prevention of deposits in the pipes of waste heat boilers. 4,420,342, Cl. 134-3.000.
- Ghezzi, Roberto: See—  
Canavesi, Roberto; Aglietti, Giancarlo; and Ghezzi, Roberto, 4,420,421, Cl. 502-316.000.
- Ghilardi, Giuliano; and Maiocchi, Luigi, to Industrie Pirelli S.p.A. Annular reinforcing structure of radial tires. 4,420,025, Cl. 152-361.0DM.
- Gibson, Jack E. Powder coating the interior of pipe. 4,420,508, Cl. 427-183.000.
- Gidge, Kenneth N.; and Richard, Henry J., to BSL Corporation. Transparent access curtain for coolers and the like. 4,420,027, Cl. 160-328.000.
- Gill, Gary W.: See—  
Coke, Harry E.; and Gill, Gary W., 4,420,513, Cl. 427-407.100.
- GKN Technology Limited: See—  
Marsh, Barry J., 4,420,450, Cl. 264-118.000.
- Glacier GmbH-DEVA Werke: See—  
Lichtinghagen, Klaus, 4,420,294, Cl. 425-79.000.
- Glantz, Jerome J., to Lamb-Weston, Inc. Process for making skin-on potato boats. 4,420,494, Cl. 426-441.000.
- Glass, Frank S.: See—  
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,420,810, Cl. 364-509.000.
- Glaesteel Tennessee, Inc.: See—  
Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., 4,420,509, Cl. 427-206.000.
- Gliniorz, Lothar; Dobler, Peter; Schoettle, Klaus; Flohr, Joachim; and Maerthesheimer, Rolf, to BASF Aktiengesellschaft. Container for tape-like material. 4,420,079, Cl. 206-387.000.
- Glory Kogyo Kabushiki Kaisha: See—  
Kobayashi, Tetsuji, 4,420,151, Cl. 271-263.000.
- Gluz, Roland, to Regie Nationale Des Usines Renault. Modular device for automatic dimensional gauging of rotation parts. 4,419,827, Cl. 33-174.00L.
- Goiseau, Pierre A., to Societe de Mecanique General - Goiseau Guittot. Machine for automatically fitting tires to rims. 4,420,026, Cl. 157-1.240.
- Goldsworthy Engineering, Inc.: See—  
Goldsworthy, William B., 4,420,359, Cl. 156-379.800.
- Goldsworthy, William B., to Goldsworthy Engineering, Inc. Apparatus for producing fiber-reinforced plastic sheet structures. 4,420,359, Cl. 156-379.800.
- Golke, Keith W.; Hendrickson, Thomas E.; and Huang, Charles C., to Honeywell Inc. High sensitivity variable capacitance transducer. 4,420,790, Cl. 361-283.000.
- Goloff, Alexander, to Caterpillar Tractor Co. Variable rate valve spring. 4,420,141, Cl. 251-337.000.
- Goma, Yasuo: See—  
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- Goodin, William K. Multi-trailer assembly. 4,420,165, Cl. 280-414.100.
- Goodman, Thomas P.; Yin, Chieh-Kung; and Kosrow, Robert L., to Union Special Corporation. Fabric aligning method and apparatus. 4,419,949, Cl. 112-262.100.
- Goodyear Tire & Rubber Company, The: See—  
Burkholder, Ward J., 4,420,376, Cl. 203-29.000.
- Goolsby, Alvin D.; and Hesselman, Ignatius A. M., to Shell Oil Company. Method for determination of internal pipeline or tubing corrosion. 4,419,892, Cl. 73-432.00R.
- Goosen, Carl C. Carburetor throttle valve method and apparatus. 4,420,438, Cl. 261-65.000.
- Gorgati, Romolo, to Owens-Corning Fiberglas Corporation. Bitumen, atactic polypropylene and propylene/ethylene copolymer compositions and water-proofing membranes using the same. 4,420,524, Cl. 428-110.000.
- Gorman, William G.; and Popp, Karl F., to Sterling Drug Inc. Basic amino or ammonium antimicrobial agent-polyethylene glycol ester surfactant-betaine and/or amine oxide surfactant compositions and method of use thereof. 4,420,484, Cl. 424-326.000.
- Gorondy, Emery J., to Du Pont de Nemours, E. I., and Company. Printing process. 4,420,307, Cl. 8-444.000.
- Gortat, Zenon: See—  
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- Goryaev, German A.: See—  
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornev, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346, Cl. 148-4.000.
- Goto, Kunio: See—  
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, 4,420,419, Cl. 252-455.00Z.
- Goto, Tokuju: See—  
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869, Cl. 68-5.00D.
- Gottschalk, Robert E., to Panavision, Incorporated. Motion picture camera. 4,420,231, Cl. 352-142.000.
- Gougeon Brothers, Inc.: See—  
Gougeon, Meade A.; and Gougeon, Jan C., 4,420,354, Cl. 156-242.000.

- Gougeon, Jan C.: See—  
Gougeon, Meade A.; and Gougeon, Jan C., 4,420,354, Cl. 156-242.000.
- Gougeon, Meade A.; and Gougeon, Jan C., to Gougeon Brothers, Inc. Process for securing projecting studs in the ends of wood resin composite bodies and the like and the structure formed thereby. 4,420,354, Cl. 156-242.000.
- Gournay, Luke S., to Mobil Oil Corporation. Distinguishing true basement from dikes and sills encountered in drilling of a borehole through the earth. 4,419,887, Cl. 73-152.000.
- Grabatsch, Franz: See—  
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumbeld, Heinz, 4,419,860, Cl. 57-22.000.
- Grabbe, Dmitry G., to AMP Incorporated. Method for manufacturing substrate with selectively trimmable resistors between signal leads and ground structure. 4,419,818, Cl. 29-832.000.
- Graham, Marshall D.: See—  
Newton, William A.; and Graham, Marshall D., 4,420,720, Cl. 324-71.400.
- Gray, Reed A., to Stauffer Chemical Company. Herbicidal antidotes. 4,420,322, Cl. 71-82.000.
- Greck, Edward T.; and Neat Products, Inc. Meat support and method of use. 4,420,493, Cl. 426-420.000.
- Green, Keith, to Burroughs Corporation. Disc mounting and centering device. 4,420,830, Cl. 369-261.000.
- Green, William R.: See—  
Schiebold, Christopher F.; and Green, William R., 4,420,731, Cl. 333-219.000.
- Grenci, Carl A., deceased; and by Jordan, William C., executor, to La Nora J. Grenco. Test head for compressed gas cylinders. 4,419,884, Cl. 73-49.800.
- Greten, Berndt: See—  
Neubauer, Harry; Greten, Berndt; and Seeger, Gunter, 4,420,357, Cl. 156-274.600.
- Griffin, Gerald J. L., to Coloroll Limited. Plastics based composition containing a polyester resin and alkaline modified starch granules. 4,420,576, Cl. 524-47.000.
- Griffith, Harold, to Griffith, Harold. Furniture suspension system. 4,419,778, Cl. 5-244.000.
- Gronchi, Paolo: See—  
Codignola, Franco; Gronchi, Paolo; del Rosso, Renato; and Centola, Paolo, 4,420,634, Cl. 562-512.200.
- Grosskopf, Rudolf, to Carl-Zeiss-Stiftung. Method and apparatus for the detection of accumulations of particles such as metaphase plates. 4,420,768, Cl. 358-107.000.
- Grosskuchenanlagen Ing. Josef Hammer: See—  
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- Grossmann, Max: See—  
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- Gruber, Werner, to Henkel Kommanditgesellschaft auf Aktien. (Meth)acrylates of isocyanuric acid derivatives containing hydroxyl groups and their use as adhesives. 4,420,597, Cl. 526-261.000.
- Gruzdzek, Hartmut; Scheerer, Joachim; Knothe, Erich; and Melcher, Franz-Josef. Apparatus for measuring weight and force. 4,420,055, Cl. 177-212.000.
- Gryphon Products: See—  
Hartsough, Larry D., 4,420,385, Cl. 204-192.00R.
- GTE Products Corporation: See—  
Leong, Henry, 4,420,204, Cl. 339-63.00R.
- Mizuhara, Howard, 4,420,459, Cl. 419-61.000.
- Rattray, Kendrick D., 4,420,709, Cl. 313-486.000.
- Shaffer, John W., 4,420,301, Cl. 431-359.000.
- Guenther, Charles J.: See—  
Aug, Conrad J.; Guenther, Charles J.; and Randolph, James B., 4,420,203, Cl. 339-17.0CF.
- Gunn, John A.: See—  
Wiley, Walter H., III; and Gunn, John A., 4,420,834, Cl. 372-35.000.
- Gustafson, Manfred, to Seco Tools Aktiebolag. Tool block. 4,420,280, Cl. 407-109.000.
- Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Preparation of polycarboxylic compounds. 4,420,621, Cl. 549-322.000.
- Gutmanis, Feliks: See—  
Chen, Shao L.; and Gutmanis, Feliks, 4,420,563, Cl. 435-245.000.
- H.D. Research Company: See—  
Strain, Don R., 4,419,835, Cl. 34-80.000.
- Haas, John F.: See—  
Jones, Wallace R.; Krieger, Paul A.; and Haas, John F., 4,420,520, Cl. 428-42.000.
- Haberkorn, Joseph: See—  
Wieder, Horst K.; Wieder, Klaus A.; and Haberkorn, Joseph, 4,420,446, Cl. 264-40.600.
- Hackett, Brian K., to Minnesota Mining & Manufacturing Co. Method and device for frequency translation. 4,420,831, Cl. 370-50.000.
- Hada, Michio; Shiraiishi, Yoshihiro; Hino, Masao; and Seto, Toru, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for dust removal from solid-gas contact reactor. 4,420,313, Cl. 55-96.000.
- Haga, Takahiro: See—  
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- Hagens, Rodger G.; and Hui, Dominic K., to Diverser Corporation. Surface treatment of glass containers. 4,420,578, Cl. 524-322.000.
- Haghir-Tehrani, Yahya: See—  
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- Hagiwara, Muneaki: See—  
Makabe, Hachiro; Hagiwara, Muneaki; and Tanaka, Haruhiko, 4,419,947, Cl. 112-158.00E.
- Hajek, Rosemary T. Disposable shampoo basin. 4,419,774, Cl. 4-516.000.
- Hale, David C., to Scale-Tronix, Inc. Patient weighing scale. 4,420,052, Cl. 177-132.000.
- Hale, William J.: See—  
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- Halex, Inc.: See—  
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- Hall, Byron C.: See—  
Knox, William J.; and Hall, Byron C., 4,420,147, Cl. 270-37.000.
- Hall, John S.: See—  
Phelps, Barry C.; and Hall, John S., 4,420,174, Cl. 283-75.000.
- Hallburg, Wayne A. Boat-canopy for truck beds. 4,420,181, Cl. 296-157.000.
- Halliburton Company: See—  
Arbasak, David P.; and Blake, David L., 4,420,040, Cl. 166-70.000.
- McMahan, Michael E., 4,420,045, Cl. 166-334.000.
- Hamada, Hiroshi: See—  
Koyanagi, Katubumi; Hamada, Hiroshi; Yano, Kohzo; Take, Hiroshi; and Inami, Yasuhiko, 4,420,749, Cl. 340-763.000.
- Hamada, Masa: See—  
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, 4,420,473, Cl. 424-118.000.
- Hamada, Shinobu J.; and Yodokawa, Taro, to TRW Inc. Multi-mode tracking antenna feed system. 4,420,756, Cl. 343-16.00M.
- Hamada, Toshiyoshi: See—  
Tsuiji, Nobuhiko; Nakamura, Keijiro; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,420,564, Cl. 435-288.000.
- Hament, Erwin. Cup and cover combination. 4,420,111, Cl. 229-7.0SC.
- Hammer, Josef; Schiel, Lothar; and Kratt, Hans, to Grosskuchenanlagen Ing. Josef Hammer. Method and apparatus for preparing foamy sauces or the like. 4,420,495, Cl. 426-564.000.
- Hammond, Kenneth G.; Sendra, Joseph C.; Watts, Lewis W., Jr.; Marquis, Edward T.; and Larkin, John M., to Texaco Inc. Semi-synthetic lubricating oil composition. 4,420,647, Cl. 585-10.000.
- Hamunen, Antti, to OY Kaukus AB. Process for the separation of sterols or mixtures of sterols. 4,420,427, Cl. 260-397.250.
- Hanari, Tohru: See—  
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,420,593, Cl. 526-128.000.
- Hannesen, Kurt: See—  
Bergner, Dieter; Hannesen, Kurt; Schulte, Wilfried; and Steinmetz, Peter, 4,420,387, Cl. 204-263.000.
- Hanowich, Peter J., to Rockwell International Corporation. Apparatus for calibrating fluid flow meters utilizing digital techniques. 4,419,880, Cl. 73-3.000.
- Hans Kaufeld GmbH & Co.: See—  
Vogt, Wilhelm, 4,420,186, Cl. 297-284.000.
- Hansen, Herbert: See—  
Hoffmann, Rudolf; Zajber, Adolf G.; and Hansen, Herbert, 4,420,837, Cl. 373-78.000.
- Hanson, Harold W., Jr.; and Munhofen, Cody, to Par Way Manufacturing Co. Low temperature release agent compositions particularly useful for frozen food products. 4,420,496, Cl. 426-609.000.
- Hanson, James M.; and Schlichting, Robert, to Wide One Corporation. Invalid lift apparatus. 4,420,286, Cl. 414-539.000.
- Harayama, Akira: See—  
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- Hardin, Jasper E.: See—  
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- Harigae, Makoto: See—  
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- Harigae, Shunji: See—  
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- Harigaya, Isao: See—  
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- Harima, Hiroshi: See—  
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- Harner, Kermit L.: See—  
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- Harper, Lawrence L., to United States of America, National Aeronautics and Space Administration. Laser resonator. 4,420,836, Cl. 372-98.000.
- Harris Corporation: See—  
Johnson, Mize, Jr.; and Miller, Harold J., 4,420,806, Cl. 364-200.000.
- Kasten, Alan J., 4,420,766, Cl. 357-59.000.
- Harris, David, to Black & Decker Inc. Bump-feed trimmer. 4,419,822, Cl. 30-276.000.



- Harris, Joanne L.: See—  
Reckel, Rudolph P.; and Harris, Joanne L., 4,420,461., Cl. 422-61.000.
- Harris, Robert S., to Stant Inc. Fuel-water separator with flow-reduction feature. 4,420,392, Cl. 210-86.000.
- Harris, William J. Line string block attachment. 4,420,143., Cl. 254-134.3PA.
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- Diery, Helmut; and Hille, Martin, 4,420,413., Cl. 252-331.000.
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- Horoldt, Ernst; Vollmuller, Helmut; Bernhard, Heinz D.; and Strobel, Harald M., 4,420,572., Cl. 523-322.000.
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- Hoffman, Jacob M., Jr.: See—  
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- Holt, Walter L., Sr.: See—  
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- Hostetler, Ronald E., to Crown Zellerbach Corporation. High bulk papermaking system. 4,420,372., Cl. 162-280.000.
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- Huang, Chan-Shiung. Alternately swinging and twisting toy. 4,419,841., Cl. 46-105.000.
- Huang, Charles C.: See—  
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- Huber, William A., to United States of America, Army. Interactive map information exchange system. 4,420,682., Cl. 235-472.000.
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- Humphrey, Dallas R.: See—  
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- Humphrey Instruments, Inc.: See—  
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- Hunt, Paulmer D.: See—  
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- Husch, Bruno, to Boge GmbH. Elastic articulation, coupling or the like. 4,420,274, Cl. 403-227.000.
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- Hutton, Thomas W., to Rohm and Haas Company. Acid containing emulsion copolymer crosslinked by a halohydroxypropyl ammonium salt solution polymer. 4,420,583, Cl. 524-501.000.
- Hyatt, Charles J., to PPG Industries, Inc. Method of and apparatus for damage-free scoring of refractory material. 4,420,106, Cl. 225-2.000.
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- Icarus, Inc.: See—
- McCrory, Jack L., 4,420,405, Cl. 252-8.50A.
- Ichihara, Yutaka: See—
- Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, 4,420,773, Cl. 358-335.000.
- Ichinose, Makoto: See—
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- ICI Australia Limited: See—
- Wilshire, Colin; and Jongen, Rene, 4,420,614, Cl. 544-163.000.
- Idemitsu Kosan Company Limited: See—
- Seki, Kenji; and Terada, Eiichi, 4,420,599, Cl. 526-318.000.
- Iijima, Nobuo: See—
- Watanabe, Yoshio; and Iijima, Nobuo, 4,420,223, Cl. 350-310.000.
- Ijiri, Ryuzo: See—
- Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Densiro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332, Cl. 75-26.000.
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- Imperial Chemical Industries PLC: See—
- Whittam, Thomas V., 4,420,467, Cl. 423-328.000.
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- Inami, Yasuhiko: See—
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- Chang, Ching-Te; Lee, Lian-Tze; and Su, Hsueh-Ling, 4,420,430, Cl. 260-429.00R.
- Industrie Pirelli S.p.A.: See—
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- Industrie-Werke Karlsruhe Aalsburg Aktiengesellschaft: See—
- Hartmann, Randolph; and Schriewer, Helmut, 4,420,320, Cl. 71-13.000.
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- Inoue, Masanobu: See—
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- Inoue, Teruo: See—
- Arikawa, Tetsuro; and Inoue, Teruo, 4,420,191, Cl. 303-103.000.
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- Interface, Inc.: See—
- Caris, Richard F., 4,420,054, Cl. 177-154.000.
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- Argumedo, Armando J.; Chow, William W.; Freeman, Robert D.; and Kleczkowski, Stawomir P., 4,420,782, Cl. 360-129.000.
- Deckert, Kenneth L., 4,420,780, Cl. 360-103.000.
- Jove, Stephen A.; and Vaughn, Julian E., 4,420,776, Cl. 360-45.000.
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- Francis, David B., 4,420,815, Cl. 364-724.000.
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- Nolta, Arthur H.; and Reed, David G., 4,420,807, Cl. 364-200.000.
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- Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,420,423, Cl. 252-522.00R.
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- Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, 4,419,997, Cl. 128-489.000.
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- McWhirter, Carson H., 4,419,785, Cl. 16-1.00R.
- Ireland, Irving R.: See—
- Kretas, George A.; and Ireland, Irving R., 4,420,401, Cl. 210-714.000.
- Isartaler Schraubenkompressoren GmbH: See—
- Hofmann, Rudolf, 4,420,293, Cl. 418-47.000.
- Iseki, Junkichi: See—
- Silvillotti, Olivo G.; and Iseki, Junkichi, 4,420,381, Cl. 204-70.000.
- Ishida, Keiichi: See—
- Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,420,564, Cl. 435-288.000.
- Ishida, Toyoki: See—
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- Ishidoshiro, Hiroshi: See—
- Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869, Cl. 68-5.00D.
- Ishihara Sangyo Kaisha Ltd.: See—
- Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618, Cl. 546-345.000.
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- Ishii, Masami: See—
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- Ishikawa, Hiromichi: See—
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- Sueyoshi, Susumu; and Ishikawa, Kikuo, 4,420,725, Cl. 330-288.000.
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- Hattori, Shuzo; Kamide, Noboru; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, 4,420,835, Cl. 372-88.000.
- Ishikawa, Shozo: See—
- Sakai, Kiyoshi; Mabuchi, Minoru; Suzuki, Toshiko; Egarashi, Yuji; and Ishikawa, Shozo, 4,420,548, Cl. 430-59.000.
- Ishino, Kunihiro: See—
- Ishiwata, Hideyuki; and Ishino, Kunihiro, 4,420,069, Cl. 192-35.000.
- Ishiwata, Hideyuki; and Ishino, Kunihiro, to Automobile Parts Manufacturing Company Limited. Automatic clutch. 4,420,069, Cl. 192-35.000.
- Ishizaka, Hiroyuki: See—
- Takahashi, Atsushi; Muratsubaki, Yoshiharu; and Ishizaka, Hiroyuki, 4,420,333, Cl. 75-55.000.
- Isobe, Takashi: See—
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- Italmimpianti Societa Italiana impianti, p.A.: See—
- Martini, Iacopo, 4,420,145, Cl. 266-90.000.
- Item Products Limited: See—
- Taylor, Gerald M.; and Emms, Norman R., 4,420,178, Cl. 294-158.000.
- Ito, Hiroshi: See—
- Chibata, Ichiro; Sumi, Akihiko; Ito, Hiroshi; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,420,432, Cl. 260-501.110.

- Ito, Shichinosuke: See—
- Kuroda, Yoshimi; Ito, Shichinosuke; Midorikawa, Akio; and Tera-shima, Kuniomi, 4,420,601, Cl. 528-76.000.
- Ito, Shoichi: See—
- Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631, Cl. 560-104.000.
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- Ito, Yoshimasa; Hashizume, Junji; Ikeda, Junichi; Utsumi, Noriyuki; and Naka, Tetsu, to Tokico, Ltd. Teaching- playback robot. 4,420,812, Cl. 364-513.000.
- Ito, Yuusuke: See—
- Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuusuke, 4,420,470, Cl. 424-28.000.
- Itoh, Haruo: See—
- Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuo; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304, Cl. 432-83.000.
- Itoh, Masao: See—
- Kaneko, Yasuyuki; Itoh, Masao; and Takahashi, Shinji, 4,420,397, Cl. 210-611.000.
- Itoh, Takashi, to Konishiroku Photo Industry Co., Ltd. Heat roller type fixing means. 4,420,680, Cl. 219-469.000.
- Ivlev, Anatoly D.: See—
- Belikov, Viktor T.; Ivlev, Anatoly D.; Sitnichenko, Valentin M.; Shvets, Vladimir I.; and Bushtian, Leonid V., 4,420,712, Cl. 318-41.000.
- Iwahashi, Henry H.: See—
- Herst, Douglas J.; and Iwahashi, Henry H., 4,420,798, Cl. 362-147.000.
- Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for fabricating semiconductor device. 4,419,813, Cl. 29-576.00W.
- Iwanade, Hisao: See—
- Ogawa, Ryota; Negoro, Ikuo; Iwanade, Hisao; and Arai, Yasunori, 4,420,248, Cl. 355-57.000.
- Iwane, Yasuhiko, to Alps Electric Co., Ltd. Serial printer. 4,420,267, Cl. 400-149.000.
- Iwao, Katsuaki: See—
- Ohashi, Minoru; Futaki, Kiyoshi; and Iwao, Katsuaki, 4,420,554, Cl. 430-446.000.
- Iwasaki, Masaru: See—
- Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katsunobu, 4,420,364, Cl. 156-631.000.
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- Iwashita, Katsuhiro: See—
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- Izutsu, Nozomu: See—
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- J. M. Huber Corporation: See—
- Wason, Satish K., 4,420,312, Cl. 51-308.000.
- J. M. Voith GmbH: See—
- Peroutka, Fritz; Thumm, Helmut; Bahr, Theodor; and Stricker, Walter, 4,420,117, Cl. 241-46.170.
- Jackson, Delbert D., to Beckman Instruments, Inc. Method and apparatus for detecting insufficient liquid levels. 4,419,903, Cl. 73-864.010.
- Jackson, Winston J., Jr.: See—
- Morris, John C.; and Jackson, Winston J., Jr., 4,420,607, Cl. 528-298.000.
- Jacobs, Cornelis A. J.; and Tieleman, Peter A. W., to U.S. Philips Corporation. High-pressure sodium vapor discharge lamp. 4,420,708, Cl. 313-628.000.
- Jacobs, John H., to Bell & Howell Company. Illumination and light gate utilization methods and apparatus. 4,420,772, Cl. 358-294.000.
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- Jameson, William G., Jr.: See—
- Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458, Cl. 376-447.000.
- Janesh, Larry. Pillow construction and method. 4,419,779, Cl. 5-490.000.
- Janome Sewing Machine Co., Ltd.: See—
- Makabe, Hachiro; Hagiwara, Muneaki; and Tanaka, Haruhiko, 4,419,947, Cl. 112-158.00E.
- Janssen, Petrus H. J.: See—
- van de Moedijk, Cornelis; and Janssen, Petrus H. J., 4,420,622, Cl. 549-326.000.
- Janssen Pharmaceutica N.V.: See—
- De Mey, Jan R.; and Moeremans, Marc K. J. J., 4,420,558, Cl. 435-7.000.
- Jauss, Fritz: See—
- Becker, Henning; and Jauss, Fritz, 4,420,693, Cl. 307-66.000.
- Jenkins, Francis J.; and Jenkins, Michael J., to EMS Thermplant Limited. Fluidized bed combustion. 4,419,966, Cl. 122-4.00D.
- Jenkins, Michael J.: See—
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- Jenkins, Ralph E.: See—
- Bush, Darrell C.; and Jenkins, Ralph E., 4,419,879, Cl. 73-432.0PS.
- Jennmar Corporation: See—
- Calandra, Frank, Jr., 4,419,805, Cl. 29-458.000.
- Jensen, Sverre. Apparatus for use in cleaning of silk screen printing frames. 4,420,004, Cl. 134-96.000.
- Jesson, Joseph E., to Oak Industries Inc. Keyboard crosspoint encoder having N-key rollover. 4,420,744, Cl. 340-365.00E.
- Jessop, Thomas C.; and De Jager, Donald, to Eastman Kodak Company. Method and apparatus for detecting sample fluid on an analysis slide. 4,420,566, Cl. 436-46.000.
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- Dietrich, Michel J., 4,420,133, Cl. 246-167.00R.
- Jidosha Denki Kogyo Kabushiki Kaisha: See—
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- Jirkovsky, Ivo: See—
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- Jobst Institute, Inc.: See—
- Mummert, Thomas A., 4,419,988, Cl. 128-24.00R.
- Johns, Robert L. Article display devices. 4,420,087, Cl. 211-189.000.
- Johnscher, Gerd: See—
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- Johnson, Charles A. Stove. 4,419,942, Cl. 110-234.000.
- Johnson, Hugh A., Sr. Self-irrigating, multi-tier vertical planter. 4,419,843, Cl. 47-82.000.
- Johnson, Mize, Jr.; and Miller, Harold J., to Harris Corporation. Interrupt coupling and monitoring system. 4,420,806, Cl. 364-200.000.
- Johnson, Vernon V. Horizontal silage unloader. 4,420,119, Cl. 241-101.700.
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- Yokota, Teppei; and Joichi, Yoshiro, 4,420,694, Cl. 307-130.000.
- Jolley, Michael E.: See—
- Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,420,568, Cl. 436-536.000.
- Jones, James H., to Merck & Co., Inc. Hexahydronaphth[1,2-b]-1,4-oxazines. 4,420,480, Cl. 424-248.400.
- Jones, Kenneth W., to Reed Rock Bit Company. Oil well drilling bit. 4,420,050, Cl. 175-374.000.
- Jones, Wallace R.; Krieger, Paul A.; and Haas, John F., to Excello Specialty Company, The. Area coated paint mask and method. 4,420,520, Cl. 428-42.000.
- Jongen, Rene: See—
- Wilshire, Colin; and Jongen, Rene, 4,420,614, Cl. 544-163.000.
- Jordan, Ernst G., to OBO Bettermann OHG. Procedure and device for welding studs and similar parts to a work piece. 4,420,674, Cl. 219-99.000.
- Jordan, William C., executor: See—
- Grenci, Carl A.; deceased; and Jordan, William C., executor, 4,419,884, Cl. 73-49.800.
- Joshua, Henry: See—
- Albers-Schonberg, George; Joshua, Henry; and Lopez, Maria B., 4,420,491, Cl. 424-311.000.
- Jossif, Jean A. M.: See—
- Salle, Jacques E.; Jossif, Jean A. M.; Rathier, Gilbert J. M.; and Vales, Jean-Pierre, 4,420,832, Cl. 370-56.000.
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- Joy Manufacturing Company: See—
- Hibbard, George A.; Morrison, Ward D.; and Lumbra, Ralph C., 4,420,277, Cl. 405-260.000.
- Jud, Hans: See—
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- Juengst, Fred W., Jr.; and Dika, John A., to Calor Agriculture Research, Inc. Calcium ammonium lactate. 4,420,636, Cl. 562-589.000.
- Julian, Kenneth A.: See—
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- JWI Ltd.: See—
- Saad, Nabil R., 4,420,370, Cl. 162-209.000.
- Kabanov, Pavel S.: See—
- Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor



- M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
- Kabelschlepp Gesellschaft mit beschränkter Haftung: See—  
Moritz, Werner, 4,420,017, Cl. 138-120.000.
- Kablaoui, Mahmoud S.: See—  
Sung, Rodney L.; Zolotki, Benjamin H.; Cullen, William P.; and Kablaoui, Mahmoud S., 4,420,407, Cl. 252-33.400.
- Kabushiki Kaisha Akashi Seisakusho: See—  
Onoguchi, Akira; Miyazawa, Mitsuhsa; Yamazaki, Shigetomo; and Inoue, Masahiro, 4,420,686, Cl. 250-310.000.
- Kabushiki Kaisha Ishida Koki Seisakusho: See—  
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- Kabushiki Kaisha Komatsu Seisakusho: See—  
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- Sato, Yoshito; Chiba, Kazuyuki; and Matsumoto, Minoru, 4,420,058, Cl. 180-68.00P.
- Kabushiki Kaisha Mitutoyo Seisakusho: See—  
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- Kabushiki Kaisha Suwa Seikosha: See—  
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Ando, Takayuki, 4,420,116, Cl. 242-107.200.
- Kojima, Ikuzo, 4,420,172, Cl. 280-802.000.
- Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, 4,420,173, Cl. 280-804.000.
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- Kaempfer, Knut: See—  
Gettert, Hans; and Kaempfer, Knut, 4,420,342, Cl. 134-3.000.
- Kaji, Hisatsugu; and Watanabe, Kazuhiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for producing spherical particles of carbon and of activated carbon, 4,420,443, Cl. 264-15.000.
- Kajimoto, Norifumi; and Sasaki, Kinji, to TDK Electronics Co., Ltd. Magnetic recording medium, 4,420,408, Cl. 256-62.540.
- Kakimoto, Toshihiko, to Nissan Motor Co., Ltd. Engine mount arrangement, 4,420,060, Cl. 180-300.000.
- Kalb, Frank H. Lunch bucket, 4,420,678, Cl. 219-387.000.
- Kalinin, Anatoly N.: See—  
Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., 4,420,218, Cl. 350-3.850.
- Kallay, Maria: See—  
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- Kallmann, Jürgen, to Palitex Project-Company GmbH. Apparatus for the controlled feeding and taking-off of a thread into and out of a thread treatment section, 4,420,108, Cl. 226-34.000.
- Kaltz, Milton C., to American Sunroof Corporation. Pivotal-sliding roof panel apparatus, 4,420,184, Cl. 296-221.000.
- Kamachi, Shinichi: See—  
Fujiwara, Toshihide; and Kamachi, Shinichi, 4,420,383, Cl. 204-180.000.
- Kaman Aerospace Corporation: See—  
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- Kameoka, Yoshifumi: See—  
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dataro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332, Cl. 75-26.000.
- Kameyama, Kazuhide; and Kiyofuji, Takahiro, to Nippon Steel Corporation. Apparatus for blocking escape of heat in hot slabs manufactured on continuous casting machines, 4,420,029, Cl. 164-448.000.
- Kameyama, Yoshio: See—  
Yanai, Tadamasu; Sagehashi, Risaburo; Kameyama, Yoshio; and Shimomura, Takao, 4,420,162, Cl. 277-96.100.
- Kamide, Noboru: See—  
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- Kamimura, Tomohisa: See—  
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- Kammerer, Gerd, to Dieter Graesslin Feinwerktechnik. Electrical key contact, 4,420,666, Cl. 200-340.000.
- Kanai, Kazuo: See—  
Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304, Cl. 432-83.000.
- Kanaya, Yasuhiko: See—  
Ohtani, Tamio; and Kanaya, Yasuhiko, 4,420,685, Cl. 250-222.200.
- Kanbe, Junichiro; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Member for electrophotography with a-Si and c-Si layers, 4,420,546, Cl. 430-57.000.
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- Kanebo, Ltd.: See—  
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,420,534, Cl. 428-372.000.
- Kanebo Synthetic Fibers Ltd.: See—  
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,420,534, Cl. 428-372.000.
- Kaneko, Dataro: See—  
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- Kaneko, Kimiyoshi: See—  
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- Kaneko, Yasuyuki; Itoh, Masao; and Takahashi, Shinji, to Nagoya University. Method of treating waste liquors containing phenol, 4,420,397, Cl. 210-611.000.
- Kaneshiro, Edward S. Collapsible trailer, 4,420,182, Cl. 296-158.000.
- Kania, Norbert: See—  
Bohlmann, Volker; and Kania, Norbert, 4,420,063, Cl. 181-229.000.
- Kanno, Toshiyuki: See—  
Ueda, Kazuo; Horio, Yoshio; Kanno, Toshiyuki; and Abe, Yoshio, 4,420,501, Cl. 427-54.100.
- Kanou, Fumio: See—  
Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, 4,420,454, Cl. 264-512.000.
- Kapaan, Hendrikus J.; and Verburgh, Martin B., to SKF Industrial Trading & Development Company B.V. Device for producing an object consisting of at least two parts movable relative to one another one of which is substantially enclosed within the other, 4,419,816, Cl. 29-724.000.
- Karlin, Richard A.: See—  
Barlow, Gordon A.; Tutt, Timothy T.; Karlin, Richard A.; and Krusch, John R., 4,420,261, Cl. 356-375.000.
- Karol, James J.; and Young, Thornton J., to Bendix Corporation. The Hermetic through bulkhead electrical connector, 4,420,210, Cl. 339-94.00M.
- Karymov, Anatoly A.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
- Kasahara, Hiroshi, to Nissin Kogyo Kabushiki Kaisha. Toggle assembly for vehicles or cars, 4,419,923, Cl. 91-460.000.
- Kashio, Toshio, to Casio Computer Co., Ltd. Electronic musical instrument, 4,419,919, Cl. 84-1.270.
- Kasten, Alan J., to Harris Corporation. Reversibly programmable polycrystalline silicon memory element, 4,420,766, Cl. 357-59.000.
- Kastl, Alfons; Lehnert, Klaus; Koninger, Horst; and Schirk, Güter, to Agfa-Gevaert AG. Mounting assembly for film-squeezing rollers, 4,420,241, Cl. 354-319.000.
- Kasuya, Atsumi: See—  
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, 4,420,773, Cl. 358-335.000.
- Katao, Hisashi, to Olympus Optical Company Limited. Electrophotographic copier having movable optical elements for changing the magnification of an original document, 4,420,245, Cl. 355-11.000.
- Kathke, Gregor: See—  
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860, Cl. 57-22.000.
- Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, to Mitsui Petrochemical Industries Ltd. Process for multi-step gaseous phase polymerization of olefins, 4,420,592, Cl. 526-65.000.
- Kato, Nobuyuki: See—  
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- Kato, Tadaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Collagen fibers for use in medical treatments, 4,420,339, Cl. 106-124.000.
- Katsuma, Makoto; Mizoguchi, Toyokazu; Isobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, to Canon Kabushiki Kaisha. Tripartite camera with releasable coupling between each part, 4,420,240, Cl. 354-288.000.
- Katsuno, Mitsuaki: See—  
Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, 4,420,173, Cl. 280-804.000.
- Katsuta, Tetsuro: See—  
Tachibana, Eiichi; and Katsuta, Tetsuro, 4,420,363, Cl. 156-627.000.
- Kaufman, Marvin L., to Mobil Oil Corporation. Coating compositions having dual curing mechanisms, 4,420,605, Cl. 528-94.000.
- Kaufmann, Meinolph, to BBC Brown, Boveri & Company Limited. Liquid crystal display cell, process for its production and cell plate, 4,420,224, Cl. 350-338.000.
- Kaut, Albin. Plug-assembled sectional display rack, 4,419,938, Cl. 108-111.000.
- Kawada, Kenji: See—  
Shiga, Shoji; Suzuki, Akitoshi; Goma, Yasuo; and Kawada, Kenji, 4,420,377, Cl. 204-28.000.
- Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, to Toyo Seikan Kaisha, Limited. Method of making a plastic hollow article, 4,420,454, Cl. 264-512.000.
- Kawanishi, Toshiyuki: See—  
Tabata, Yukio; and Kawanishi, Toshiyuki, 4,420,758, Cl. 346-76.00P.
- Kawasaki Steel Corporation: See—  
Yoshiei, Kato; Kyoji, Nakanishi; and Tsutomu, Nozaki, 4,420,334, Cl. 75-60.000.
- Keeton, John H. Hot wire cutter for automatic sleeve making machine, 4,419,950, Cl. 112-290.000.

- Kelsey-Hayes Co.: See—  
Reikowski, Harold J., 4,419,908, Cl. 74-552.000.
- Kendall Company, The: See—  
Wilson, Earl D.; and Holmes, Martin J., 4,420,085, Cl. 206-571.000.
- Kennedy, Donald E.: See—  
Barrell, David; Kennedy, Donald E.; Marino, James J., Jr.; and Rollen, Donald C., 4,420,509, Cl. 427-206.000.
- Kennedy, Raymond: See—  
Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, 4,419,997, Cl. 128-489.000.
- Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung: See—  
Zimmermann, Ulrich, 4,420,559, Cl. 435-99.000.
- Kershaw, Eli J. Nesting air filters, 4,420,315, Cl. 55-501.000.
- Khomenko, Alexandr A.: See—  
Kostikov, Valery I.; Koshelev, Jury I.; Tegin, Vasily D.; Khomenko, Alexandr A.; and Filimonov, Evgeny F., 4,420,539, Cl. 428-450.000.
- Kienzle Apparate GmbH: See—  
Jürgen, Appenrodt, 4,420,748, Cl. 340-715.000.
- Kiesewetter, Wolfgang: See—  
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860, Cl. 57-22.000.
- Kikuta, Kazutsune: See—  
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,420,593, Cl. 526-128.000.
- Kimberlin, Dan W., to General Electric Company. Contact and terminal assembly for a brush wear indicator, 4,420,705, Cl. 310-242.000.
- Kimmon Electric Co., Ltd.: See—  
Hattori, Shuzo; Kamide, Noboru; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, 4,420,835, Cl. 372-88.000.
- Kindler, Horst: See—  
Buhler, Ulrich; Kindler, Horst; Kuhlein, Klaus; Kallay, Maria; Kosubek, Uwe; Lowenfeld, Rudolf; and Roth, Kurt, 4,420,308, Cl. 8-464.000.
- Kindt, Emanuel; and Sautter, Joachim, to E. Kindt AG. Apparatus for the production of a glued wood joint, 4,420,358, Cl. 156-356.000.
- Kingport, Ltd.: See—  
Gerch, Edward L., 4,420,068, Cl. 190-102.000.
- Kingston, Leo: See—  
Diamond, Edmond D.; Maciolek, Joseph R.; and Kingston, Leo, 4,420,808, Cl. 364-434.000.
- Kinjo, Hisao: See—  
Wada, Yoshiyo; Kinjo, Hisao; and Ueno, Ichiro, 4,420,827, Cl. 369-43.000.
- Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, to Imperial Chemical Industries Limited. Apparatus and method for selectively activating plural electrical loads at predetermined relative times, 4,419,933, Cl. 102-206.000.
- Kirk, Donald C., Jr., to Ethyl Products Company. Child-resistant actuator cover, 4,420,096, Cl. 222-44.000.
- Kirk, Thomas K.: See—  
Eaton, David C.; Kirk, Thomas K.; and Chang, Hou-min, 4,420,369, Cl. 162-29.000.
- Kirkman, Michael, to Augat Inc. Low insertion force electronic component socket, 4,420,205, Cl. 339-74.00R.
- Kiselev, Viktor Y.: See—  
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornev, Lev I.; Chervonenkis, Raiza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346, Cl. 148-4.000.
- Kistner, Werner, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet feed monitoring system, 4,420,747, Cl. 340-674.000.
- Kitagawa, Hiroshi: See—  
Yuki, Nakaji; and Kitagawa, Hiroshi, 4,420,415, Cl. 568-180.000.
- Kitagishi, Nozomu, to Canon Kabushiki Kaisha. Zoom lens of short total length, 4,420,226, Cl. 350-427.000.
- Kitamura, Kenzo; Miura, Tetsuo; Ookubo, Satoshi; and Nagata, Hideyuki, to Kabushiki Kaisha Shibaura Denki Seisakusho. Humidity measuring method, 4,419,888, Cl. 73-336.500.
- Kitamura, Takashi, to Canon Kabushiki Kaisha. Scanning recording apparatus, 4,420,761, Cl. 346-108.000.
- Kittle, Carl E.: See—  
Baxter, Kenneth D.; Bluem, Gary R.; Humphrey, Dallas R.; Kittle, Carl E.; and Kluge, Douglas J., 4,419,907, Cl. 74-531.000.
- Kiwi Coders Corporation: See—  
Siegal, Burton L., 4,419,931, Cl. 101-333.000.
- Kiyofuji, Takahiro: See—  
Kameyama, Kazuhide; and Kiyofuji, Takahiro, 4,420,029, Cl. 164-448.000.
- Klapatch, Robert D.: See—  
Dvorak, Herman G.; Klapatch, Robert D.; Russell, Sid; and Spadaccini, Louis J., 4,419,863, Cl. 60-748.000.
- Klar, Erhard; and Pao, Mary A., to SCM Corporation. Process of improving corrosion resistance in porous stainless steel bodies and article, 4,420,336, Cl. 75-246.000.
- Klauke, Erich: See—  
Braden, Rudolf; and Klauke, Erich, 4,420,433, Cl. 260-544.00D.
- Kleczkowski, Stawomir P.: See—  
Argumedo, Armando J.; Chow, William W.; Freeman, Robert D.; and Kleczkowski, Stawomir P., 4,420,782, Cl. 360-129.000.
- Klein, Rudi: See—  
Ermer, Wolfgang; Funk, Hans W.; and Klein, Rudi, 4,420,516, Cl. 428-35.000.
- Kleinmann, Horst: See—  
Tischer, Friedrich-Christian; Kleinmann, Horst; and Klinger, Herwig, 4,420,785, Cl. 361-56.000.
- Klinger, Herwig: See—  
Tischer, Friedrich-Christian; Kleinmann, Horst; and Klinger, Herwig, 4,420,785, Cl. 361-56.000.
- Klock, Lawrence E.; and Browleit, Randall J., to Soccer Stuff, Inc. Portable sports field goal assembly, 4,420,158, Cl. 273-400.000.
- Klockner-Humboldt-Deutz AG: See—  
Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., 4,420,114, Cl. 237-1.00R.
- Kluge, Douglas J.: See—  
Baxter, Kenneth D.; Bluem, Gary R.; Humphrey, Dallas R.; Kittle, Carl E.; and Kluge, Douglas J., 4,419,907, Cl. 74-531.000.
- Klumsier, Kenneth L., to Morgan Construction Company. Bundling and stacking apparatus, 4,419,928, Cl. 100-7.000.
- Knapp, Robert F.: See—  
Davis, Murray W.; Diedzic, Matthew J.; Knapp, Robert F.; and Whitney, Bruce F., 4,420,752, Cl. 340-870.170.
- Knors, Herbert: See—  
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860, Cl. 57-22.000.
- Knothe, Erich: See—  
Grutzediek, Hartmut; Scheerer, Joachim; Knothe, Erich; and Melcher, Franz-Josef, 4,420,055, Cl. 177-212.000.
- Knox, William J.; and Hall, Byron C., to Standard Register Company. The Web folding and sealing machine, 4,420,147, Cl. 270-37.000.
- Knudsen, Hans B., to F. L. Smith & Co. Method and apparatus for thermally treating pulverulent materials, 4,420,302, Cl. 432-14.000.
- Knudsen, Hans B., to F. L. Smith & Co. Method and apparatus for thermally treating pulverulent materials, 4,420,303, Cl. 432-14.000.
- Kobari, Harukuni: See—  
Yamazaki, Shigeru; Arai, Takao; Kobayashi, Masaharu; Hoshino, Takashi; Hibino, Chitoshi; and Kobari, Harukuni, 4,420,775, Cl. 360-38.100.
- Kobayashi, Masaharu: See—  
Yamazaki, Shigeru; Arai, Takao; Kobayashi, Masaharu; Hoshino, Takashi; Hibino, Chitoshi; and Kobari, Harukuni, 4,420,775, Cl. 360-38.100.
- Kobayashi, Susumu: See—  
Takahashi, Soichi; and Kobayashi, Susumu, 4,420,711, Cl. 315-296.000.
- Kobayashi, Tetsuji, to Glory Kogyo Kabushiki Kaisha. Overlapping feed detection device in sheet-processing machine, 4,420,151, Cl. 271-263.000.
- Kobayashi, Yuichi: See—  
Nonaka, Mitsuhiro; and Kobayashi, Yuichi, 4,420,246, Cl. 355-14.00R.
- Koberlein, James H.: See—  
Scalf, Gerald W.; and Koberlein, James H., 4,420,669, Cl. 219-10.55B.
- Kochs Adler AG: See—  
Fischer, Jochen; and Scholl, Hans, 4,419,946, Cl. 112-121.120.
- Koester, Eberhard: See—  
Jakusch, Helmut; Loeser, Werner; Koester, Eberhard; Rudolf, Peter; Senkpiel, Werner; and Steck, Werner, 4,420,330, Cl. 75-0.5AA.
- Kohli, Jerry L., to Buxton, Inc. Reversible belt and buckle mechanism, 4,419,792, Cl. 24-170.000.
- Kohno, Hideki: See—  
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, 4,420,444, Cl. 264-21.000.
- Koizumi, Satoru: See—  
Suezawa, Takahiko; Koizumi, Satoru; Nakao, Hiroaki; and Tsuchitani, Takashi, 4,420,783, Cl. 360-137.000.
- Kojima, Ikuzo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Ring joint for seatbelt system, 4,420,172, Cl. 280-802.000.
- Kojima, Yuji: See—  
Wakatsuki, Noboru; Kojima, Yuji; and Ono, Masaaki, 4,420,730, Cl. 333-195.000.
- Kokelenberg, Hendrik E.: See—  
Van Besauw, Jan F.; Leenders, Luc H.; D'hont, Dirk M.; Kokelenberg, Hendrik E.; and Samijn, Rafael P., 4,420,553, Cl. 430-275.000.
- Kokusai Company, Ltd.: See—  
Matumoto, Sigeru, 4,419,894, Cl. 73-462.000.
- Kolanowski, Clarence: See—  
Funcic, Jack F.; and Kolanowski, Clarence, 4,419,817, Cl. 29-749.000.
- Kolm, Eric A.: See—  
Kolm, Henry H.; and Kolm, Eric A., 4,420,266, Cl. 400-124.000.
- Kolm, Henry H.; and Kolm, Eric A., to Piezo Electric Products, Inc. Piezoelectric printer and piezoelectric multilam actuator used therein, 4,420,266, Cl. 400-124.000.
- Komine, Yoshiharu: See—  
Muto, Katsutoshi; Sawada, Takao; and Komine, Yoshiharu, 4,419,889, Cl. 73-336.500.



- Komoto, Shinsuke: See—  
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- Kompa, Gunter, to Endress u. Hauser GmbH u. Co. Arrangement for measuring the bath level in a continuous casting apparatus. 4,420,250, Cl. 356-5.000.
- Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahara, Toru, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Teikoku Piston Ring Co., Ltd. Bearing member of an internal combustion engine, having a flame sprayed surface. 4,420,543, Cl. 428-564.000.
- Kondo, Shinichi: See—  
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, 4,420,473, Cl. 424-118.000.
- Kondow, Ryotaro: See—  
Yamaura, Mitsuru; Kondow, Ryotaro; and Inagaki, Junichi, 4,420,805, Cl. 364-184.000.
- Konziola, Joseph D.; and Sobieski, Donald C., to General Motors Corporation. Pawl actuator for dual reel retractor. 4,420,127, Cl. 242-107.40A.
- Konig, Joachim: See—  
Bomer, Bruno; Suling, Carlhans; Konig, Joachim; Hesse, Hans; Heynemann, Carl; and Weber, Raimund, 4,420,225, Cl. 350-409.000.
- Konig, Wolfgang: See—  
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- Koninger, Horst: See—  
Kastl, Alfons; Lehnert, Klaus; Koninger, Horst; and Schirk, Guter, 4,420,241, Cl. 354-319.000.
- Konishiroku Photo Industry Co., Ltd.: See—  
Itoh, Takashi, 4,420,680, Cl. 219-469.000.
- Kool-Fire Limited: See—  
VanderVaart, Gerry, 4,420,034, Cl. 165-29.000.
- Koomen, Joannes J. M.; and Salters, Roelof H. W., to Signetics Corporation. Field plate sensing in single transistor, single capacitor MOS random access memory. 4,420,822, Cl. 365-182.000.
- Kornev, Lev I.: See—  
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornev, Lev I.; Chervonenkis, Razu A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346, Cl. 148-4.000.
- Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., to United Technologies Corporation. Motion responsive wind turbine tower damping. 4,420,692, Cl. 290-44.000.
- Kosek, Jiri: See—  
Spacek, Jindrich; Smrdek, Vaclav; Voda, Karel; Kosek, Jiri; Hrdina, Jan; and Penaz, Vaclav, 4,419,876, Cl. 72-57.000.
- Koshelev, Yuri I.: See—  
Kostikov, Valery I.; Koshelev, Yuri I.; Telegin, Vasily D.; Khomenko, Alexandr A.; and Filimonov, Evgeny F., 4,420,539, Cl. 428-450.000.
- Kosrow, Robert L.: See—  
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- Kost, Erwin; and Foltz, Werner, to SMS Schloemann-Siemag Aktiengesellschaft. Gripper feed and gripper resilience cylinders on forging manipulators. 4,420,287, Cl. 414-729.000.
- Kostikov, Valery I.; Koshelev, Yuri I.; Telegin, Vasily D.; Khomenko, Alexandr A.; and Filimonov, Evgeny F. Process for producing antifirction materials. 4,420,539, Cl. 428-450.000.
- Kosubek, Uwe: See—  
Buhler, Ulrich; Kindler, Horst; Kuhlein, Klaus; Kallay, Maria; Kosubek, Uwe; Lowenfeld, Rudolf; and Roth, Kurt, 4,420,308, Cl. 8-464.000.
- Kotamaki, Esko, to Tunturi Oy. Bicycle ergometer. 4,419,890, Cl. 73-379.000.
- Kovan Engineering Pty. Ltd.: See—  
Anderson, Michael P., 4,420,296, Cl. 425-444.000.
- Koyanagi, Katsumi; Hamada, Hiroshi; Yano, Kohzo; Take, Hiroshi; and Inami, Yasuhiko, to Sharp Kabushiki Kaisha. Charge transfer type electrochromic display devices. 4,420,749, Cl. 340-763.000.
- Kratt, Hans: See—  
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- Kraus, Guido: See—  
Eisinger, Hans; and Kraus, Guido, 4,420,284, Cl. 414-17.000.
- Krauthausen, Edmund: See—  
Uhrhan, Paul; Krauthausen, Edmund; Stahlke, Kurt-Rainer; Quas, Gerwolf; and Ruetz, Lothar, 4,420,613, Cl. 544-51.000.
- Kreisfeld, Rudolf P., to Bridgestone Australia Pty. Ltd. Weatherstrip. 4,419,844, Cl. 49-475.000.
- Kretas, George A.; and Ireland, Irving R., to Shipley Company Inc. Solution waste treatment. 4,420,401, Cl. 210-714.000.
- Krieger, Paul A.: See—  
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- Krohn, Ulrich: See—  
Dworak, Ulf; Jud, Hans; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,420,142, Cl. 251-368.000.
- Krone GmbH: See—  
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- Hegner, Gunter; and Herfort, Hermann, 4,420,792, Cl. 361-331.000.
- Krstic, Slobodan: See—  
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- Krueger, James H., to Honeywell Inc. Heating and cooling thermostat with limiting action selected by a single lever changeover switching apparatus. 4,420,736, Cl. 337-340.000.
- Krueger, Spencer M.; and Brown, James W., III, to Eastman Kodak Company. Photographic materials containing yellow filter dyes. 4,420,555, Cl. 430-507.000.
- Kruger, Joseph A., to Brock Manufacturing, Inc. Stair structure for storage bins. 4,419,851, Cl. 52-184.000.
- Krupp Polysius AG: See—  
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- Kruse, Hurbert: See—  
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- Krutch, Charles M., to Mobil Oil Corporation. Polymer foam process. 4,420,448, Cl. 264-53.000.
- Krutsch, John R.: See—  
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- Kubota, Masaharu; Kudo, Ichiro; and Ohgami, Masaaki, to Fuji Jukogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. Air-fuel ratio control system. 4,419,975, Cl. 123-440.000.
- Kubota, Tatsushi: See—  
Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuki, 4,420,173, Cl. 280-804.000.
- Kudo, Ichiro: See—  
Kubota, Masaharu; Kudo, Ichiro; and Ohgami, Masaaki, 4,419,975, Cl. 123-440.000.
- Kudo, Mitsuhiro: See—  
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; and Abe, Mitsu, 4,420,348, Cl. 148-403.000.
- Kuehl, Donald, to Bio-Rad Laboratories, Inc. Spectrometric microsampling gas cells. 4,420,690, Cl. 250-428.000.
- Kuhlein, Klaus: See—  
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- Kuhn, Loughrey R. Fiber optic digital data transmitting system. 4,420,842, Cl. 455-608.000.
- Kunkel, Arden L.; and Pierson, Darrell E., to Weyerhaeuser Company. Method for applying a foamed adhesive under start-stop conditions. 4,420,510, Cl. 427-208.200.
- Kuraray Co., Ltd.: See—  
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- Tanihara, Masao; Nakashima, Toshihide; and Takakura, Koichi, 4,420,395, Cl. 210-263.000.
- Yoshioka, Yoshihiro; and Harima, Hiroshi, 4,420,588, Cl. 525-93.000.
- Kureha Kagaku Kogyo Kabushiki Kaisha: See—  
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- Kato, Tadaaki, 4,420,339, Cl. 106-124.000.
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Matsumoto, Syuzo: See—  
Shimizu, Toshiharu; Okuyama, Nobutaka; Naito, Yoshikazu; and Matsumoto, Syuzo, 4,420,734, Cl. 335-213.000.  
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, to Fuji Oil Company, Limited. Method for modification of fats and oils, 4,420,560, Cl. 435-134.000.  
Matsuoka, Katsutoshi, to Nippon Seiko Kabushiki Kaisha. Apparatus for harmonic oscillation analysis, 4,419,897, Cl. 73-660.000.  
Matsushima, Katsushi; and Uchida, Goro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automotive air conditioner, 4,420,115, Cl. 237-12.30A.  
Matsushita Electric Industrial Co., Ltd.: See—  
Yoshida, Tomio; Nagashima, Michiyoshi; Harigae, Shunji; Ichinose, Makoto; and Wakami, Noboru, 4,420,828, Cl. 369-47.000.  
Matsuura, Kazuo: See—  
Ikuta, Shigeru; Matsuura, Kazuo; and Misaki, Hideo, 4,420,562, Cl. 435-227.000.  
Mattson, John S.: See—  
Belt, Kenneth W.; and Mattson, John S., 4,420,078, Cl. 206-305.000.  
Matulevich, Edward S.: See—  
Chandran, Prem G. N.; and Matulevich, Edward S., 4,420,713, Cl. 318-71.000.  
Matumoto, Sigeru, to Kokusai Company, Ltd. Detection of angular location of unbalance of a rotor and positioning of the location to a predetermined angular position, 4,419,894, Cl. 73-462.000.  
Maucher, Paul; and Friedman, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch unit, 4,420,070, Cl. 192-48.800.  
Mauer, Egon: See—  
Ackermann, Rolf; Jung, Friedrich; Mauer, Egon; and Rupertinger, Hermann, 4,420,269, Cl. 400-356.000.  
Maurer, Fritz: See—  
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,420,435, Cl. 260-940.000.  
Maurer, Klemens: See—  
Taylor, Frank; and Maurer, Klemens, 4,419,838, Cl. 40-605.000.  
Mauries, Reinhard: See—  
Rohner, Joachim; Zumfeld, Heinz; Mauries, Reinhard; and Preuhs, Hans-Jurgen, 4,419,858, Cl. 57-22.000.  
May, James W., Jr.; Lukash, Frederick N.; and Cohn, Kenneth H. Method and apparatus for monitoring vascular flow, 4,419,999, Cl. 128-691.000.  
Mayer, Frederick J.: See—  
Brown, Herbert L.; and Mayer, Frederick J., 4,420,740, Cl. 340-28.000.  
Maynard, Robert L.; Ballard, Samuel S.; and Townsend, Robert L., to Sanders Associates, Inc. Element-sited beamformer, 4,420,825, Cl. 367-122.000.  
McCaskey, Emmett S., to Polaroid Corporation. Novel benzotriazine developers and photographic product and method, 4,420,551, Cl. 430-234.000.  
McCluskey, Lincoln: See—  
Cole, Raymond; Kennedy, Raymond; and McCluskey, Lincoln, 4,419,997, Cl. 128-489.000.  
McCrary, Jack L., to Icarus, Inc. Water based drilling mud additive, 4,420,405, Cl. 252-8.50A.  
McCullough, Allan W.; and Springer, Richard A., to Materials Technology Corporation. Non-wetting articles and method for soldering operations, 4,420,110, Cl. 228-54.000.  
McDonnell Douglas Corporation: See—  
Rossello, Henry S., 4,420,270, Cl. 402-76.000.  
McElveen, Robert H. Production of three dimensional motion pictures, 4,420,230, Cl. 352-43.000.  
McFadden, Arthur: See—  
Shetty, Bola V.; and McFadden, Arthur, 4,420,487, Cl. 424-273.00B.  
McFarlan, Alden I. Air conditioning system and method, 4,419,864, Cl. 62-98.000.  
McFarlane, Finley E.; and Taylor, Robert B., to Eastman Kodak Company. Thermoplastic polyester molding compositions, 4,420,581, Cl. 524-431.000.  
McGeary, James E.; and Shatto, Walter C., Jr., to AMP Incorporated. Wire combing device, 4,420,020, Cl. 140-147.000.  
McIntire, William R., to University Patents, Inc. Radiant energy collector, 4,419,984, Cl. 126-439.000.  
McMahan, Michael E., to Halliburton Company. Drill pipe tester and safety valve, 4,420,045, Cl. 166-334.000.  
McMahon, Roberta; and Fiorese, Franco F., to MDA Scientific, Inc. Hydride gas detecting tape, 4,420,567, Cl. 436-169.000.  
McWhirter, Carson H., to Interpace Corporation. Bolt eyelet with bolt-engaging shoulder for electrical transmission lines, 4,419,785, Cl. 16-1.00R.  
MDA Scientific, Inc.: See—  
McMahon, Roberta; and Fiorese, Franco F., 4,420,567, Cl. 436-169.000.  
Meadows, Clayton D., to Wessel Company, Inc., The. Method and apparatus for folding a cover strip over a multi-ply inner strip, 4,420,148, Cl. 270-41.000.  
Meckel, Benjamin B., to Eastman Kodak Company. Method of making a thin film magnetic head having good low frequency response, 4,420,505, Cl. 427-131.000.  
Medical Engineering Corporation: See—  
Trick, Robert E., 4,419,985, Cl. 128-1.00R.  
Medical and Scientific Designs Inc.: See—  
Rogers, Arthur H.; Sullivan, Kevin J.; and Mansfield, Gerald R., 4,420,689, Cl. 250-385.000.  
Medtronic, Inc.: See—  
Dickhut, Eugene A.; and Paulson, Roger A., 4,419,819, Cl. 29-857.000.  
Meegan, Dennis J. Dipstick wiper apparatus, 4,419,781, Cl. 15-210.00B.  
Meeker, David M., to Champion International Corporation. Apparatus for displaying advertising material, 4,419,837, Cl. 40-359.000.  
Mefford, Carl R.: See—  
Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458, Cl. 376-447.000.  
Melcher, Franz-Josef: See—  
Grutzediek, Hartmut; Scheerer, Joachim; Knothe, Erich; and Melcher, Franz-Josef, 4,420,055, Cl. 177-212.000.  
Merck & Co., Inc.: See—  
Albers-Schonberg, George; Joshua, Henry; and Lopez, Maria B., 4,420,491, Cl. 424-311.000.  
Bolhofer, William A.; Cragoe, Edward J.; and Hoffman, Jacob M., Jr., 4,420,615, Cl. 544-279.000.  
Jones, James H., 4,420,480, Cl. 424-248.400.  
Messerschmitt-Boelkow-Blohm GmbH: See—  
Steinmetz, Guenter; Steenbeck, Ulf; and Reismayr, Dieter, 4,419,937, Cl. 104-281.000.  
Messerschmitt-Boelkow-Blohm-Gesellschaft mit Beschränkter Haftung: See—  
Stetter, Gunter, 4,420,129, Cl. 244-3.150.  
Metal Era, Inc.: See—  
Butzen, William J., 4,419,850, Cl. 52-60.000.  
Metzger, William J., to Midland-Ross Corporation. Rotary railroad car coupler assembly with a horizontal key/slot arrangement, 4,420,088, Cl. 213-50.500.  
Meyer-Ebrecht, Dietrich, to U.S. Philips Corporation. Circuit arrangement for the transmission of measurement value signals, 4,420,753, Cl. 340-870.260.  
Meyer, Theodore O.; and Hickman, Thomas E., to Ford Aerospace & Communications Corporation. Lightweight metal-gas battery, 4,420,545, Cl. 429-101.000.  
Miale, Joseph N.: See—  
Chen, Nai Y.; and Miale, Joseph N., 4,420,561, Cl. 435-161.000.  
Michelet, Guy: See—  
Bret, Georges; and Michelet, Guy, 4,420,222, Cl. 350-295.000.  
Middleton, Martin J., to Westland Aircraft Limited. Mooring devices, 4,420,131, Cl. 244-115.000.  
Midland-Ross Corporation: See—  
Metzger, William J., 4,420,088, Cl. 213-50.500.  
Midonikawa, Akio: See—  
Kuroda, Yoshimi; Ito, Shichinosuke; Midonikawa, Akio; and Tera-shima, Kuniomi, 4,420,601, Cl. 528-76.000.  
Miki, Nobuaki; and Yokoyama, Shoji, to Aisin-Warner Kabushiki Kaisha. Shift control mechanism in an automatic transmission for vehicles, 4,419,910, Cl. 74-867.000.  
Milani, Carlo; Carminati, Giovanni M.; and Sovera, Attilio, to Selvi & C. S.p.A. 1,4-Bis(acetylsalicyloyloxy)piperazine derivatives, 4,420,482, Cl. 424-250.000.  
Miller, Edward H., to General Electric Company. Rotor stabilizing labyrinth seals for steam turbines, 4,420,161, Cl. 277-56.000.  
Miller, Harold J.: See—  
Johnson, Mize, Jr.; and Miller, Harold J., 4,420,806, Cl. 364-200.000.  
Miller, Jack V. Circular gas discharge reflector lamp, 4,420,799, Cl. 362-216.000.  
Miller, Mark H., to Federal Products Corporation. Head for bore gauge, 4,419,829, Cl. 33-178.00R.  
Miller, Mark H., to Federal Products Corporation. Bore gauge head assembly, 4,419,830, Cl. 33-178.00R.  
Milliken Research Corporation: See—  
Marco, Francis W., 4,420,507, Cl. 427-170.000.  
Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Splicing apparatus for spun yarns, 4,419,859, Cl. 57-22.000.



- Minakata, Matsuo: See—  
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869, Cl. 68-5.00D.
- Minnesota Mining and Manufacturing Company: See—  
Cadwell, Donald E., 4,420,549, Cl. 430-158.000.  
Hackett, Brian K., 4,420,831, Cl. 370-50.000.  
Petersen, Neil E., 4,419,993, Cl. 128-201.150.
- Minolta Camera Kabushiki Kaisha: See—  
Taniguchi, Nobuyuki; Hoda, Takeo; Oyokota, Shigeru; and Seigenji, Koyoshi, 4,420,236, Cl. 354-21.000.
- Misaki, Hideo: See—  
Ikuta, Shigeru; Matsuura, Kazuo; and Misaki, Hideo, 4,420,562, Cl. 435-227.000.
- Mischenko, Nicholas, to Bell & Howell Company. Selectively positionable slide tray position sensing arrangement for slide projector apparatus. 4,420,232, Cl. 353-25.000.
- Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, to Showa Denko Kabushiki Kaisha. Rhodium catalyst and method for preparing the same. 4,420,420, Cl. 502-261.000.
- Mitchell, Mark T. Stand for dirt bikes. 4,420,164, Cl. 280-293.000.
- Mitchell, Michael I.: See—  
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, 4,419,933, Cl. 102-206.000.
- Mitsubishi Chemical Industries Ltd.: See—  
Jikihara, Tetsuo; Oda, Masatsugu; Ushinohama, Kazuyuki; Watanabe, Hisao; and Suzuki, Seiichi, 4,420,327, Cl. 71-96.000.
- Mitsubishi Denki Kabushiki Kaisha: See—  
Hisatsune, Fumiyo; Yamagata, Shinji; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,420,660, Cl. 200-144.00R.
- Muto, Katsutoshi; Sawada, Takao; and Komine, Yoshiharu, 4,419,889, Cl. 73-336.500.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—  
Hada, Michio; Shiraiishi, Yoshihiro; Hino, Masao; and Seto, Toru, 4,420,313, Cl. 55-96.000.
- Shinoda, Naoharu; Tani, Atsushi; Ukawa, Naohiko; Oshima, Michio; Okino, Susumu; and Shigeta, Sadaichi, 4,420,465, Cl. 423-242.000.
- Mitsubishi Paper Mills, Ltd.: See—  
Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, 4,420,554, Cl. 430-446.000.
- Mitsuhashi, Minoru: See—  
Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, 4,420,454, Cl. 264-512.000.
- Mitsui Engineering & Shipbuilding Co., Ltd.: See—  
Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, 4,420,445, Cl. 264-40.400.
- Mitsui Petrochemical Industries Ltd.: See—  
Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, 4,420,592, Cl. 526-65.000.
- Mitsuiotsu Chemicals Inc.: See—  
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,420,481, Cl. 424-250.000.
- Mitutoyo Mfg. Co., Ltd.: See—  
Kanda, Yoshiro, 4,419,826, Cl. 33-172.00R.
- Miura, Tetsuo: See—  
Kitamura, Kenzo; Miura, Tetsuo; Ookubo, Satoshi; and Nagata, Hideyuki, 4,419,888, Cl. 73-336.500.
- Mixer, Ingomar, to U.S. Philips Corporation. Resilient motor mounting for an electric dry shaver or the like. 4,420,702, Cl. 310-50.000.
- Miyagi, Hideo: See—  
Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, 4,419,974, Cl. 123-418.000.
- Miyahara, Masahiko: See—  
Ohya, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486, Cl. 424-272.000.
- Miyahara, Shiyoichiro: See—  
Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shiyoichiro; and Yamada, Yoshitsugu, 4,420,481, Cl. 424-250.000.
- Miyai, Masahiko: See—  
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038, Cl. 165-95.000.
- Miyaji, Akira: See—  
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, 4,420,773, Cl. 358-335.000.
- Miyamoto, Shigeo, to Kabushiki Kaisha Mitutoyo Seisakusho. Height gauge. 4,419,825, Cl. 33-169.00R.
- Miyashita, Kiyoshi, to Olympus Optical Company Limited. Apparatus for peeling or separating a record paper from a photosensitive drum of an electrophotographic copying machine. 4,420,152, Cl. 271-309.000.
- Miyazawa, Mitsuhiro: See—  
Onoguchi, Akira; Miyazawa, Mitsuhiro; Yamazaki, Shigetomo; and Inoue, Masahiro, 4,420,686, Cl. 250-310.000.
- Miyoshi, Tadahiko; Yamazaki, Takeo; and Maeda, Kunihiro, to Hitachi, Ltd. Potentially non-linear resistor and process for producing the same. 4,420,737, Cl. 338-21.000.
- Mizogui, Toyokazu: See—  
Katsuma, Makoto; Mizogui, Toyokazu; Isobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, 4,420,240, Cl. 354-288.000.
- Mizuhara, Howard, to GTE Products Corporation. Method of making preforms for brazing and hardfacing. 4,420,459, Cl. 419-61.000.
- Mizusawa Kagaku Kogyo Kabushiki Kaisha: See—  
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, 4,420,419, Cl. 252-455.00Z.
- Mobay Chemical Corporation: See—  
Rawlings, Herbert L.; and Reinert, Gerard E., 4,420,584, Cl. 524-502.000.
- Mobil Oil Corporation: See—  
Braid, Milton, 4,420,579, Cl. 524-328.000.  
Chen, Nai Y.; and Miale, Joseph N., 4,420,561, Cl. 435-161.000.  
Chu, Chin-Chiun, 4,420,418, Cl. 502-77.000.  
Gournay, Luke S., 4,419,887, Cl. 73-152.000.  
Hungerford, Gordon P., 4,420,514, Cl. 427-430.100.  
Kaufman, Marvin L., 4,420,605, Cl. 528-94.000.  
Krutchen, Charles M., 4,420,448, Cl. 264-53.000.  
Schmitt, Kirk D., 4,420,565, Cl. 436-27.000.  
Shu, Winston R., 4,420,008, Cl. 137-4.000.
- Moeremans, Marc K. J. J.: See—  
De Mey, Jan R.; and Moeremans, Marc K. J. J., 4,420,558, Cl. 435-7.000.
- Moertel, George B., to Talon, Inc. Continuous filament slide fastener with cutaway heels. 4,419,793, Cl. 24-413.000.
- Mohr, Bernard; Pappas, Nicholas J.; Chopra, Kuldeep S.; and Salensky, George A., to Elkem Metals Company. Color retention pigment for paint compositions using latex vehicles. 4,420,340, Cl. 106-288.00B.
- Molox Incorporated: See—  
Funcik, Jack F.; and Kolanowski, Clarence, 4,419,817, Cl. 29-749.000.
- Siebold, Donald J.; Troy, Michael K.; and Lenz, William R., 4,420,706, Cl. 310-324.000.
- Molins Limited: See—  
Thomas, Eric R., 4,420,074, Cl. 198-128.000.
- Moncrief, Marion L., Jr.: See—  
Hernandez, Rafael; Chow, Edmund E.; Moncrief, Marion L., Jr.; and Glass, Frank S., 4,420,810, Cl. 364-509.000.
- Monitronik Ltee: See—  
Taylor, Frank; and Maurer, Klemens, 4,419,838, Cl. 40-605.000.
- Monsanto Company: See—  
Vaidyanathan, Kumbakonam R., 4,420,645, Cl. 568-937.000.
- Montedison S.p.A.: See—  
Bertelli, Guido; and Locatelli, Renato, 4,420,577, Cl. 524-83.000.
- Montgomery, Glenn E.: See—  
Lee, Quarterman; Watson, Larry E.; and Montgomery, Glenn E., 4,420,003, Cl. 134-80.000.
- Moore, Bernard S., to Pfizer Inc. 6-Alpha-halopenicillanic acid 1,1-dioxides. 4,420,426, Cl. 260-245.20R.
- Moore, L. Frank; and Price, George M., to Frymaster Corporation. The Spray cleaning system for frying apparatus. 4,420,006, Cl. 134-167.00R.
- Morduchowitz, Abraham, to Texaco Inc. Secondary recovery process using brine soluble terpolymers. 4,420,598, Cl. 526-307.500.
- Morello, Edwin F., to Standard Oil Company (Indiana). Polyamides from itaconic acid and diamines. 4,420,608, Cl. 528-324.000.
- Morgan Construction Company: See—  
Klusmier, Kenneth L., 4,419,928, Cl. 100-7.000.
- Mori, Kei. Sun tracking apparatus. 4,419,981, Cl. 126-425.000.
- Mori, Kei. Device for dispersing light rays issuing from a light guide. 4,420,796, Cl. 362-32.000.
- Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, to Research Association for Residual Oil Processing. Process for the production of reduced iron and thermal cracking of heavy oils. 4,420,332, Cl. 75-26.000.
- Moriarty, Thomas C.; and Geiger, William J., to PPG Industries, Inc. Ungelled polyepoxide-polyoxyalkylenepolyamine resins, aqueous dispersions thereof, and their use in cationic electrodeposition. 4,420,574, Cl. 523-404.000.
- Morimitsu, Tsuneo: See—  
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332, Cl. 75-26.000.
- Morin, Jury E.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
- Morishita, Hiroshi: See—  
Ishii, Hiroshi; Seki, Kohji; Morishita, Hiroshi; and Yamazaki, Toshiaki, 4,419,882, Cl. 73-40.700.
- Morita, Ken: See—  
Ohya, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486, Cl. 424-272.000.
- Moritz, Werner, to Kabelschlepp Gesellschaft mit beschränkter Haftung. Energy conduit support. 4,420,017, Cl. 138-120.000.
- Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsushi; and Katsuno, Mitsuaki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Automatic seatbelt system. 4,420,173, Cl. 280-804.000.
- Morris, John C.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Polyesters of trans-4,4-stilbenedicarboxylic acid, terephthalic acid or 2,6-naphthalenedicarboxylic acid, and 1,2-propanediol. 4,420,607, Cl. 528-298.000.
- Morrison, Ward D.: See—  
Hibbard, George A.; Morrison, Ward D.; and Lumbr, Ralph C., 4,420,277, Cl. 405-260.000.

- Mortenson, Carl N.: See—  
Law, Don C.; Mortenson, Carl N.; Ripple, Paul; and Eckhardt, Roger S., 4,420,166, Cl. 280-5.240.
- Morwick, Tina M.; Paget, Charles J.; and Wikel, James H., to Eli Lilly and Company. Olefinic benzimidazoles, formulations, and antiviral methods. 4,420,479, Cl. 424-246.000.
- Mosby, Brian J.: See—  
Bardsley, Harold B.; Mosby, Brian J.; Barlow, John M.; and Walton, Brian, 4,420,124, Cl. 242-66.000.
- Mosby, James F.: See—  
Bertolacini, Ralph J.; Mosby, James F.; and Schwartz, John G., 4,420,388, Cl. 208-112.000.
- Moser, Erwin: See—  
Efinger, Arnold; and Moser, Erwin, 4,420,661, Cl. 200-144.00B.
- Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., to Klockner-Humboldt-Deutz AG. Liquid heating system. 4,420,114, Cl. 237-1.00R.
- Motorola Inc.: See—  
Fay, Gary V.; and Pshaenich, Alvin, 4,420,700, Cl. 307-571.000.  
Toney, John J., 4,420,786, Cl. 361-77.000.
- Motoyama, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, to Olympus Optical Company Limited. Connecting device. 4,420,216, Cl. 339-183.000.
- Motsenbocker, Gregg A. Portable liquid dispenser with carrying case. 4,420,097, Cl. 222-131.000.
- Moulin, Georges. Tool change device. 4,419,807, Cl. 29-568.000.
- Mowry, William H., Jr., to Burroughs Corporation. Color copy resistant document using irregular outline letters in a multi-void background. 4,420,175, Cl. 283-93.000.
- MPL Inc.: See—  
Finkelstein, Sam D., 4,420,092, Cl. 220-254.000.
- MTU Motoren- und Turbinen-Union GmbH: See—  
Bischoff, Hans, 4,420,288, Cl. 416-244.00A.
- Mu, Jacob J.: See—  
Park, Won C.; and Mu, Jacob J., 4,420,466, Cl. 423-304.000.
- Muchel, Franz, to Carl-Zeiss-Stiftung. Optical waveguide connector using aspheric lenses. 4,420,219, Cl. 350-96.180.
- Mueller, John J., to Containaire, Inc. Dispensing apparatus. 4,420,100, Cl. 222-205.000.
- Muench, Frank J., Jr., to RTE Corporation. Low current clearing back up fuse. 4,420,735, Cl. 337-244.000.
- Mukai, Yasuteru: See—  
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038, Cl. 165-95.000.
- Muller, Manfred: See—  
Forberg, Horst; Radelow, Wolfgang; Achtnig, Klaus-Peter; and Muller, Manfred, 4,420,200, Cl. 339-13.000.
- Muller, Siegfried. Cable sleeve sealing assembly. 4,420,654, Cl. 174-92.000.
- Muller, Wolfgang H. E.; and Hofmann, Peter, to Chemische Werke Huls A.G. Production of alkyl esters of saturated aliphatic carboxylic acids. 4,420,429, Cl. 260-410.90R.
- Mummert, Thomas A., to Jobst Institute, Inc. Electronic circuit for a dynamic pressure wave pneumatic control system. 4,419,988, Cl. 128-24.00R.
- Munhofen, Cody: See—  
Hanson, Harold W., Jr.; and Munhofen, Cody, 4,420,496, Cl. 426-609.000.
- Munro, James A.; and Vansteelant, Marc G., to Sperry Corporation. Knotters. 4,420,177, Cl. 289-14.000.
- Munz, Erich. Support plate. 4,420,135, Cl. 248-633.000.
- Murakami, Hiroyasu: See—  
Katsuma, Makoto; Mizogui, Toyokazu; Isobe, Takashi; Hiramatsu, Akira; Murakami, Hiroyasu; and Ishida, Toyoki, 4,420,240, Cl. 354-288.000.
- Murata Kikai Kabushiki Kaisha: See—  
Fujiwara, Michiaki; and Uramoto, Makoto, 4,419,861, Cl. 57-261.000.
- Mima, Hiroshi, 4,419,859, Cl. 57-22.000.
- Murata Manufacturing Co., Ltd.: See—  
Nakamura, Teruo; and Arai, Naoto, 4,420,538, Cl. 428-411.000.
- Murata, Masayoshi: See—  
Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, 4,420,477, Cl. 424-246.000.
- Murata, Toshio, to Citizen Watch Co., Ltd. Structure for preventing the rotating of a register ring of a diver's watch. 4,420,264, Cl. 368-223.000.
- Muratsubaki, Yoshiharu: See—  
Takahashi, Atsushi; Muratsubaki, Yoshiharu; and Ishizaka, Hiroyuki, 4,420,333, Cl. 75-55.000.
- Murib, Jawad H., to National Distillers and Chemical Corporation. Preparation of 2-pyrrolidones. 4,420,620, Cl. 548-554.000.
- Muto, Katsutoshi; Sawada, Takao; and Komine, Yoshiharu, to Mitsubishi Denki Kabushiki Kaisha. Moisture sensitive device. 4,419,889, Cl. 73-336.500.
- Muto, Masaaki: See—  
Fukuda, Sunichi; and Muto, Masaaki, 4,420,653, Cl. 174-72.00B.
- N. V. Bekeert S.A.: See—  
Wieme, Andre, 4,420,523, Cl. 428-109.000.
- Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling the ignition timing of an internal combustion engine. 4,419,974, Cl. 123-418.000.
- Nagashima, Michiyoshi: See—  
Yoshida, Tomio; Nagashima, Michiyoshi; Harigae, Shunji; Ichinose, Makoto; and Wakami, Noboru, 4,420,828, Cl. 369-47.000.
- Nagashima, Nao: See—  
Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, 4,420,247, Cl. 355-14.00C.
- Nagata, Hideyuki: See—  
Kitamura, Kenzo; Miura, Tetsuo; Ookubo, Satoshi; and Nagata, Hideyuki, 4,419,888, Cl. 73-336.500.
- Nagata, Kenichi: See—  
Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, 4,420,445, Cl. 264-40.400.
- Nagatani, Kuniaki: See—  
Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618, Cl. 546-345.000.
- Nagoya University: See—  
Kaneko, Yasuyuki; Itoh, Masao; and Takahashi, Shinji, 4,420,397, Cl. 210-611.000.
- Naito, Hiroshi: See—  
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,420,534, Cl. 428-372.000.
- Naito, Yoshikazu: See—  
Shimizu, Toshiharu; Okuyama, Nobutaka; Naito, Yoshikazu; and Matsumoto, Syuzo, 4,420,734, Cl. 335-213.000.
- Naka, Tetsu: See—  
Ito, Yoshimasa; Hashizume, Junji; Ikeda, Junichi; Utsumi, Noriyuki; and Naka, Tetsu, 4,420,812, Cl. 364-513.000.
- Nakabu, Shigeo: See—  
Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katsunobu, 4,420,364, Cl. 156-631.000.
- Nakagawa, Masatoshi: See—  
Hirose, Masahiko; Yasui, Tsuyoshi; Ochi, Yoshiharu; and Nakagawa, Masatoshi, 4,420,498, Cl. 427-39.000.
- Nakagawa, Tsutomu: See—  
Aiba, Seiichi; Hiratani, Kazuhisa; and Nakagawa, Tsutomu, 4,420,612, Cl. 536-102.000.
- Nakahira, Joji: See—  
Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, 4,420,247, Cl. 355-14.00C.
- Nakahora, Toru: See—  
Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahora, Toru, 4,420,543, Cl. 428-564.000.
- Nakajima, Toshio: See—  
Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618, Cl. 546-345.000.
- Nakajo, Tetsuo: See—  
Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, 4,420,420, Cl. 502-261.000.
- Nakamura, Keijiro: See—  
Tsuiji, Nobuhiko; Nakamura, Keijiro; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,420,564, Cl. 435-288.000.
- Nakamura, Kenji. Re-sealable dispenser-container. 4,420,080, Cl. 206-449.000.
- Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Cylinder liner for an internal combustion engine. 4,419,971, Cl. 123-193.00C.
- Nakamura, Teruo; and Arai, Naoto, to Murata Manufacturing Co., Ltd. Heat-sensitive recording materials. 4,420,538, Cl. 428-411.000.
- Nakano, Jiro: See—  
Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, 4,419,974, Cl. 123-418.000.
- Nakano, Masao: See—  
Imazeki, Kazuyoshi; and Nakano, Masao, 4,420,716, Cl. 318-379.000.
- Nakano, Taizoh: See—  
Tadauchi, Masaharu; Tanno, Kiyohiko; and Nakano, Taizoh, 4,420,742, Cl. 340-347.0AD.
- Nakao, Hiroaki: See—  
Suezawa, Takahiko; Koizumi, Satoru; Nakao, Hiroaki; and Tsuchitani, Takashi, 4,420,783, Cl. 360-137.000.
- Nakao, Toshihiro: See—  
Motoyama, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, 4,420,216, Cl. 339-183.000.
- Nakashima, Akira, to Tokai Chemical Industries, Ltd. Process for producing foam moldings with an insert. 4,420,447, Cl. 264-46.400.
- Nakashima, Toshihide: See—  
Tanihara, Masao; Nakashima, Toshihide; and Takakura, Koichi, 4,420,395, Cl. 210-263.000.
- Nakashimizu, Takeo: See—  
Furuta, Mitsuru; and Nakashimizu, Takeo, 4,420,051, Cl. 177-25.000.
- Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuo; Ohkoshi, Kenji; and Yanagida, Yoshinobu, to Nippon Kokan Kabushiki Kaisha. Apparatus for manufacturing rapidly cooled solidified slag. 4,420,304, Cl. 432-83.000.
- Nakatani, Mitsuo; Yamazaki, Mitsuo; Okunaka, Masaaki; Sudo, Ryoichi; Tochigi, Kenji; and Yokono, Hitoshi, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Composition and process for preparing transparent conducting film. 4,420,500, Cl. 427-54.100.
- Nakauchi, Kenji, to Fuji Photo Film Co., Ltd. Light measuring device for controlling exposure. 4,420,252, Cl. 356-225.000.
- Naku, Virgil: See—  
Pizzurro, Joseph C.; and Naku, Virgil, 4,420,099, Cl. 222-205.000.



- Nalco Chemical Company: See—  
Bhattacharyya, Bhupati R.; and Ballweber, Edward G., 4,420,586, Cl. 524-769.000.
- Pocius, Frances C.; and Buchanan, William T., 4,420,463, Cl. 422-266.000.
- Narita, Kiichi: See—  
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332, Cl. 75-26.000.
- Nashua Control Instruments, Inc.: See—  
Trump, Dennis H., 4,420,249, Cl. 355-84.000.
- Nasu, Mitsuo: See—  
Motoyama, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, 4,420,216, Cl. 339-183.000.
- Nasu, Norio: See—  
Yamaguchi, Nobutaka; Fujiyama, Masaaki; and Nasu, Norio, 4,420,532, Cl. 428-329.000.
- Nasu, Rikuo: See—  
Yokomichi, Isao; Hagi, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, 4,420,618, Cl. 546-345.000.
- National Distillers and Chemical Corporation: See—  
Murib, Jawad H., 4,420,620, Cl. 548-554.000.
- National Research Development Corp.: See—  
Singer, Alfred R. E., 4,420,441, Cl. 264-7.000.
- National Semiconductor Corporation: See—  
Fisher, Amnon, 4,420,695, Cl. 307-242.000.
- Seyffert, Michael; and d'Entremont, Alan F., 4,420,107, Cl. 226-32.000.
- Nau, Walter: See—  
Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., 4,420,114, Cl. 237-1.00R.
- Nauchno-Issledovatel'skiy Sektor Vsesojuznogo Proektiro-Izyskatel'skogo I Nauchno-Issledovatel'skogo Instituta "Gidroproekt" Imeni S.Ya. Zhuka: See—  
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
- Navarro, Ramon V.: See—  
Protacio, Alfredo C.; Navarro, Ramon V.; Rio, Eliseo M., Jr.; Alonte, Antonio D.; and Pascual, Felix J., 4,419,967, Cl. 123-1.00A.
- NCR Corporation: See—  
Paganini, Bruno J.; and Hale, William J., 4,420,751, Cl. 340-825.330.
- Topich, James A., 4,419,812, Cl. 29-571.000.
- Neat Products, Inc.: See—  
Greck, Edward T.; and Neat Products, Inc., 4,420,493, Cl. 426-420.000.
- Negoro, Ikuo: See—  
Ogawa, Ryota; Negoro, Ikuo; Iwanade, Hisao; and Arai, Yasunori, 4,420,248, Cl. 355-57.000.
- Nelb, Robert G., II; and Oertel, Richard W., III, to Upjohn Company, The. Continuous, solvent-free process for preparing thermoplastic polyamides and polyesteramides, 4,420,603, Cl. 528-80.000.
- Nelb, Robert G., II: See—  
Bonk, Henry W.; Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,602, Cl. 528-80.000.
- Nelissen, Johann W. A.; Ponnee, Johannes J.; Legierse, Petrus E. J.; and Van Ruler, Johannes, to U.S. Philips Corporation. Method of manufacturing an article of a synthetic resin which has a metal layer, 4,420,506, Cl. 427-162.000.
- Nelson, Darrel S.: See—  
Lee, Michael C. H.; and Nelson, Darrel S., 4,420,585, Cl. 524-548.000.
- Nelson, Edward M., to Outboard Marine Corporation. Lubrication system for a die casting machine, 4,420,028, Cl. 164-149.000.
- Nelson, Harold L.: See—  
Dunlap, Thomas G.; Jameson, William G., Jr.; Mefford, Carl R.; Nelson, Harold L.; and Cearley, James E., 4,420,458, Cl. 376-447.000.
- Nemeni, Tibor M.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
- Nepper, John P. Flexible hinge and closure member for a luggage carrier, 4,420,105, Cl. 224-328.000.
- Neubauer, Harry; Greten, Berndt; and Seeger, Gunter, to Bison-Werke Behre & Greten GmbH & Co. KG. Apparatus and method for the manufacture of particleboard, 4,420,357, Cl. 156-274.600.
- Neumann, Ernst D.: See—  
Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., 4,420,114, Cl. 237-1.00R.
- Newton, William A.; and Graham, Marshall D., to Coulter Electronics, Inc. Field focused particle sensing zone, 4,420,720, Cl. 324-71.400.
- Neyret, Guy, to Sodex Magister, Societe d'Exploitation des Brevets. Neiman. Bi-stable mechanism and anti-theft device for a motor vehicle comprising such mechanism, 4,420,659, Cl. 200-67.00A.
- Nichols, Ralph A. Kink-preventing spine for aquarium air hoses, 4,420,016, Cl. 138-103.000.
- Nickel, Walter; Schoening, Josef; and Schwiens, Hans-Georg, to Hochtemperatur-Reaktorbau GmbH. Mounting of power conductor and instrument lead penetrations for nuclear reactor installations, 4,420,456, Cl. 376-245.000.
- Niedecker, Herbert. Filling tube for filling tubular casings with pasty material, 4,419,790, Cl. 17-35.000.
- Niemeyer, Lutz; and Ragaller, Klaus, to BBC Brown, Boveri & Company Ltd. Compressed-gas circuit breaker, 4,420,662, Cl. 200-148.00R.
- Nieuwhof, Arjen: See—  
van't Sant, Jan P.; and Nieuwhof, Arjen, 4,420,331, Cl. 75-6.000.
- Nifco Inc.: See—  
Yamamoto, Kiyokazu; Hiratsuka, Ko; Tanaka, Toshie; and Iwasaki, Shigeyuki, 4,420,396, Cl. 210-416.400.
- Nihonsanso Kabushiki Kaisha: See—  
Ishii, Hiroshi; Seki, Kohji; Morishita, Hiroshi; and Yamazaki, Toshiaki, 4,419,882, Cl. 73-40.700.
- Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
- Nikitin, Pavel Z.; Danilevich, Yanush; B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
- Nippert, Charles R., Jr.: See—  
Bergman, Roger M.; Bielecki, Edwin J.; and Nippert, Charles R., Jr., 4,420,469, Cl. 423-592.000.
- Nippon Air Brake Co., Ltd.: See—  
Arikawa, Tetsuro; and Inoue, Teruo, 4,420,191, Cl. 303-103.000.
- Arikawa, Tetsuro; Inoue, Teruo; and Takiue, Yukihiko, 4,420,814, Cl. 364-565.000.
- Nippon Carbide Kogyo Kabushiki Kaisha: See—  
Takahashi, Atsushi; Muratsubaki, Yoshiharu; and Ishizaka, Hiroyuki, 4,420,333, Cl. 75-55.000.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
Aoki, Eiichiro, 4,419,916, Cl. 84-1.010.
- Ohe, Ichiro, 4,419,920, Cl. 84-115.000.
- Suzuki, Takuya, 4,420,655, Cl. 381-94.000.
- Nippon Kogaku K.K.: See—  
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, 4,420,773, Cl. 358-335.000.
- Nippon Kokan Kabushiki Kaisha: See—  
Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304, Cl. 432-83.000.
- Nippon Light Metal Company Limited: See—  
Ito, Tadao; and Hashimoto, Akio, 4,420,345, Cl. 148-3.000.
- Nippon Seiko Kabushiki Kaisha: See—  
Matsuoka, Katsutoshi, 4,419,897, Cl. 73-660.000.
- Nippon Soken, Inc.: See—  
Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, 4,419,972, Cl. 123-337.000.
- Nippon Steel Corporation: See—  
Kameyama, Kazuhide; and Kiyofuji, Takahiro, 4,420,029, Cl. 164-448.000.
- Ueda, Masanori; Sumitomo, Hidehiko; and Yoshimura, Hirofumi, 4,420,347, Cl. 148-12.00E.
- Nippon Telegraph & Telephone Public Corporation: See—  
Tadauchi, Masaharu; Tanno, Kiyohiko; and Nakano, Taizoh, 4,420,742, Cl. 340-347.0AD.
- Nippon Victor Kabushiki Kaisha: See—  
Yamazaki, Shigeru; Arai, Takao; Kobayashi, Masaharu; Hoshino, Takashi; Hibino, Chitoshi; and Kobari, Harukuni, 4,420,775, Cl. 360-38.100.
- Nishida, Katsutoshi: See—  
Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, 4,419,971, Cl. 123-193.00C.
- Nishikawa, Kinichi, to Yamaichi Electric Mfg. Co., Ltd. Socket having means of no-load engaging with and releasing from electronic unit, 4,420,207, Cl. 339-75.00M.
- Nishikawa, Masaji, to Olympus Optical Company Ltd. Photosensitive member for electrophotography having ultraviolet absorption layer, 4,420,547, Cl. 430-57.000.
- Nishimura, Koji, to Vital Kogyo Kabushiki Kaisha. Manual hoisting and pulling apparatus, 4,420,144, Cl. 254-345.000.
- Nishina, Mitsuo, to Maruzen Sewing Machine Co., Ltd. Embroidering apparatus for use with sewing machines, 4,419,945, Cl. 112-103.000.
- Nishino, Hisao, to Tohoku Metal Industries, Ltd. Switching regulator with base charge removal circuit, 4,420,804, Cl. 363-21.000.
- Nissan Motor Co., Ltd.: See—  
Fukushima, Masao, 4,420,062, Cl. 181-204.000.
- Hosaka, Akio, 4,419,976, Cl. 123-458.000.
- Kakimoto, Toshihiko, 4,420,060, Cl. 180-300.000.
- Kubota, Masaharu; Kudo, Ichiro; and Ohgami, Masaaki, 4,419,975, Cl. 123-440.000.
- Matsui, Tatsuhiko; Okada, Yasumasa; and Shimatsu, Minoru, 4,419,789, Cl. 16-308.000.
- Omote, Kazuaki; and Hayashida, Masayoshi, 4,420,057, Cl. 180-54.00A.
- Suzuki, Kunihiko, 4,420,059, Cl. 180-248.000.
- Tohata, Toru, 4,420,797, Cl. 362-80.000.

- Nissin Kogyo Kabushiki Kaisha: See—  
Kasahara, Hiroshi, 4,419,923, Cl. 91-460.000.
- Nitto Electric Industrial Co., Ltd.: See—  
Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuusuke, 4,420,470, Cl. 424-28.000.
- NL Industries, Inc.: See—  
House, Roy F.; and Hoover, Lonnie D., 4,420,406, Cl. 252-8.55R.
- Noirel, Yves M., to Etablissement Public de Diffusion dit "Telediffusion de France"; and L'Etat Francais, represente par le Secretaire d'Etat aux Postes et Telecommunications et a la Telediffusion. Unidirectional data transmission system, 4,420,833, Cl. 370-83.000.
- Nolt, James R., Jr., to Allis-Chalmers Corporation. Method and apparatus to produce electroslag T-joints where fillets are required, 4,420,672, Cl. 219-73.100.
- Nolta, Arthur H.; and Reed, David G., to International Business Machines Corporation. Selectively holding data in a buffer for defective backing store tracks, 4,420,807, Cl. 364-200.000.
- Nonoto, Mineo; Iwashita, Katsuhiko; Otsubo, Toru; and Aiuchi, Susumu, to Hitachi, Ltd. Projecting apparatus, 4,420,233, Cl. 353-122.000.
- Nonaka, Mitsuhiko; and Kobayashi, Yuichi, to Ricoh Company, Ltd. Multiple reproduction apparatus, 4,420,246, Cl. 355-14.00R.
- Norland Corporation: See—  
Belt, Kenneth W.; and Mattson, John S., 4,420,078, Cl. 206-305.000.
- Norsk Hydro A/S: See—  
Strand, Olaf; Omdal, Bjarne; and Svendsen, Jens, 4,420,021, Cl. 141-10.000.
- Novak, Albert P. Device for the automatic editing, at the receiver, of unwanted program material from broadcast electrical signals, 4,420,769, Cl. 358-139.000.
- Novotekhnich KG Offertender GmbH & Co., Firma: See—  
Blessing, Fritz; Margitics, Gabor; and Brauer, Gerhard, 4,420,273, Cl. 403-24.000.
- Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katsunobu, to Sharp Kabushiki Kaisha. High-insulation multi-layer device formed on a metal substrate, 4,420,364, Cl. 156-631.000.
- Oak Industries Inc.: See—  
Jesson, Joseph E., 4,420,744, Cl. 340-365.00E.
- Larson, Willis A.; and Dulen, Edwina K., 4,420,663, Cl. 200-159.00B.
- Oakes, Billy D.; Dupart, Michael S.; and Cringle, David C., to Dow Chemical Company, The. Bismuth inhibitors for acid gas conditioning solutions, 4,420,337, Cl. 106-14.150.
- Oakland Corporation, The: See—  
Wallace, Richard B., 4,420,604, Cl. 528-93.000.
- Oba, Yoichi: See—  
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, 4,420,444, Cl. 264-21.000.
- Oberhans, Johann, to Dr. Johannes Heidenhain GmbH. Digital electrical length measuring instrument, 4,419,824, Cl. 33-143.00L.
- OBO Bettermann OHG: See—  
Jordan, Ernst G., 4,420,674, Cl. 219-99.000.
- Occidental Research Corporation: See—  
Park, Won C.; and Mu, Jacob J., 4,420,466, Cl. 423-304.000.
- Ochi, Yoshiharu: See—  
Hirose, Masahiko; Yasui, Tsuyoshi; Ochi, Yoshiharu; and Nakagawa, Masatoshi, 4,420,498, Cl. 427-39.000.
- Ochiai, Toshihiko: See—  
Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, 4,419,971, Cl. 123-193.00C.
- Oda, Masatsugu: See—  
Jikihara, Tetsuo; Oda, Masatsugu; Ushinohama, Kazuyuki; Watanabe, Hisao; and Suzuki, Seichi, 4,420,327, Cl. 71-96.000.
- Odenwalder, Heinrich; and Marx, Paul, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material containing a non-diffusible electron donor precursor compound, 4,420,557, Cl. 430-559.000.
- Odessky Ordena Trudovogo Kraskogo: See—  
Belikov, Viktor T.; Ivlev, Anatoly D.; Sitnichenko, Valentin M.; Shvets, Vladimir I.; and Bushtian, Leonid V., 4,420,712, Cl. 318-41.000.
- Oertel, Richard W., III: See—  
Bonk, Henry W.; Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,602, Cl. 528-80.000.
- Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,603, Cl. 528-80.000.
- Ogawa, Hiroshi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium, 4,420,540, Cl. 428-457.000.
- Ogawa, Hiroyasu; and Shima, Mikio, to Toho Belson Co., Ltd. Emulsion type sizing agent for carbon fibers, process for its preparation, and method for using same, 4,420,512, Cl. 427-386.000.
- Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Abrasion-resistant granular zeolite and process for preparation thereof, 4,420,419, Cl. 252-455.00Z.
- Ogawa, Ryota; Negoro, Ikuo; Iwanade, Hisao; and Arai, Yasunori, to Asahi Kogyo Kogyo Kabushiki Kaisha. Variable magnification copying device, 4,420,248, Cl. 355-57.000.
- Ogawa, Toshihisa: See—  
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kenji; Shiohara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631, Cl. 560-104.000.
- Ogawa, Yukio; Harigaya, Isao; Yamada, Tateo; and Hirohata, Michio, to Canon Kabushiki Kaisha. Exposure control system, 4,420,237, Cl. 354-458.000.
- Ogiu, Hisao, to Olympus Optical Co., Ltd. Laser endoscope, 4,419,987, Cl. 128-4.000.
- Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, to Mitsubishi Paper Mills, Ltd. Silver halide photosensitive materials, 4,420,554, Cl. 430-446.000.
- Ohba, Yozo: See—  
Toyoda, Takashi; Ohba, Yozo; Yamanaka, Masaaki; and Shirai, Kanji, 4,420,530, Cl. 428-323.000.
- Ohe, Ichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Apparatus for recording and reproducing musical performance, 4,419,920, Cl. 84-115.000.
- Ohgami, Masaaki: See—  
Kubota, Masaharu; Kudo, Ichiro; and Ohgami, Masaaki, 4,419,975, Cl. 123-440.000.
- Ohkoshi, Kenji: See—  
Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304, Cl. 432-83.000.
- Ohta, Keiichi: See—  
Tsukamura, Yoshihiro; Aizawa, Hidekuni; and Ohta, Keiichi, 4,420,268, Cl. 400-233.000.
- Ohtani, Tamio; and Kanaya, Yasuhiko, to Hitachi Seiko, Ltd. Method and equipment for detecting tool failure, 4,420,685, Cl. 250-222.200.
- Ohtsuki, Osamu: See—  
Chibata, Ichiro; Sumi, Akihiko; Ito, Hiroshi; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,420,432, Cl. 260-501.110.
- Ohuchi, Yutaka: See—  
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- Oji Yuka Goseishi Kabushiki Kaisha: See—  
Toyoda, Takashi; Ohba, Yozo; Yamanaka, Masaaki; and Shirai, Kanji, 4,420,530, Cl. 428-323.000.
- Oka, Koichiro; Tanaka, Hiroshi; and Harigae, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing shadow mask, 4,420,366, Cl. 156-644.000.
- Okabayashi, Naonori, to Sharp Kabushiki Kaisha. Alphanumeric visual display of the matrix type, 4,420,750, Cl. 340-791.000.
- Okada, Junichi, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Ink jet printer head, 4,420,764, Cl. 346-140.00R.
- Okada, Shingo; Sawa, Yuji; and Adachi, Kuniomi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Automatic continuous vacuum packaging method and apparatus, 4,419,854, Cl. 53-434.000.
- Okada, Syoji: See—  
Nakamura, Kiyoshi; Nishida, Katsutoshi; Ochiai, Toshihiko; Ando, Akio; and Okada, Syoji, 4,419,971, Cl. 123-193.00C.
- Okada, Yasumasa: See—  
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- Okamoto, Kazuo: See—  
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- Okamura, Akio; Tanaka, Shuji; and Sakamoto, Tamotsu, to Fuji Xerox Co., Ltd. Developing agent density controlling device, 4,419,960, Cl. 118-712.000.
- Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics Co., Ltd. Magnetic tape cassette, 4,420,128, Cl. 242-199.000.
- Okazaki, Yutaka; Tokuda, Hiroshi; Miyahara, Shioichiro; and Yamada, Yoshitsugu, to Mitsutoatsu Chemicals Inc. Use of piperazine compounds as immunopotentiating agents, 4,420,481, Cl. 424-250.000.
- Okino, Susumu: See—  
Shinoda, Naoharu; Tanai, Atsushi; Ukawa, Naohiko; Oshima, Michio; Okino, Susumu; and Shigeta, Sadaichi, 4,420,465, Cl. 423-242.000.
- Okiyama, Toshiaki, to Fuji Photo Film Co., Ltd. Transfer film for electrophotographic copier, 4,420,528, Cl. 428-220.000.
- Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, to Hitachi, Ltd. Cleaning system for heat conductive conduits of a heat exchanger, 4,420,038, Cl. 165-95.000.
- Okunaka, Masaaki: See—  
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- Okuyama, Nobutaka: See—  
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- Olin Corp.: See—  
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- Pryor, Michael J.; and Tyler, Derek E., 4,420,030, Cl. 164-472.000.
- Olson, Carl O., Jr. Force or vibration indicating device utilizing micro-wave resonance ferramic gyrators, 4,419,896, Cl. 73-652.000.



- Olympus Optical Co., Ltd.: See—  
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- Fujiwara, Toshihide, 4,420,384, Cl. 204-180.00G.
- Furuta, Kenji, 4,420,777, Cl. 360-61.000.
- Katao, Hisashi, 4,420,245, Cl. 355-11.000.
- Miyashita, Kiyoshi, 4,420,152, Cl. 271-309.000.
- Motomura, Kazuyasu; Nakao, Toshihiro; Nasu, Mitsuo; and Tomizawa, Yoshio, 4,420,216, Cl. 339-183.000.
- Nishikawa, Masaji, 4,420,547, Cl. 430-57.000.
- Ogiu, Hisao, 4,419,987, Cl. 128-4.000.
- Sakurai, Yoshifumi, 4,420,781, Cl. 360-112.000.
- Terada, Katumi, 4,420,235, Cl. 354-266.000.
- Omdal, Bjarne: See—  
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- Omote, Kazuaki; and Hayashida, Masayoshi, to Nissan Motor Company, Limited. Air induction structure for an automobile air cleaner, 4,420,057, Cl. 180-54.00A.
- O'Neill, Richard K., to Diamond International Corp. Squeeze bottle with self-venting dispensing closure, 4,420,101, Cl. 222-212.000.
- Ono, Hironobu: See—  
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- Ono, Masaaki: See—  
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- Onoguchi, Akira; Miyazawa, Mitsuhiro; Yamazaki, Shigetomo; and Inoue, Masahiro, to Kabushiki Kaisha Seisakusho. Scanning electron microscope or similar equipment capable of displaying simultaneously a plurality of images of specimen, 4,420,686, Cl. 250-310.000.
- Ookubo, Satoshi: See—  
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- Opalka, Chester J., Jr.: See—  
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- Opitz, Konrad; Grossmann, Max; Kruse, Hurbert; Schneider, Manfred; and Uhrig, Heinz, to Hoechst Aktiengesellschaft. Use of oxyalkylated novolaks as preparation agents for disperse dyestuffs and preparations made with said agents, 4,420,310, Cl. 8-560.000.
- Opperd, Hans-Jorgen; Carlsson, Sven A. L.; and Ericson, Hans G., to Volvo BM AB. Method of controlling a power transmission device and control system for carrying out said method, 4,419,909, Cl. 74-856.000.
- Orlowski, Jan A.; Wagner, Helmar; and Butler, David V., to Blendax-Werke R. Schneider GmbH & Co. Tetraacrylic and tetramethacrylic esters and dental materials containing same, 4,420,306, Cl. 433-228.000.
- O'Rourke, Thomas W.: See—  
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- Ortega, Francis, to U.S. Philips Corporation. Screen-printing ink, 4,420,338, Cl. 106-20.000.
- Ortho Diagnostic Systems Inc.: See—  
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- Oshima, Michio: See—  
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- Otake, Katsumoto: See—  
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- Otis Engineering Corporation: See—  
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- Pullin, William H.; and Long, Olen R., 4,420,044, Cl. 166-322.000.
- Tunstall, Karl N., 4,420,042, Cl. 166-297.000.
- Otomo, Shigekazu: See—  
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- Otsubo, Toru: See—  
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- Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuuseke, to Nitto Electric Industrial Co., Ltd.; and Toa Eiyo Ltd. Percutaneous absorption type pharmaceutical preparation of isosorbide dinitrate or pentaerythritol tetranitrate in pressure-sensitive laminate, 4,420,470, Cl. 424-28.000.
- Otto Bihler Maschinenfabrik GmbH & Co. K.G.: See—  
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- Oussani, James J., to Staples Company, Inc., The. Envelope opener device, 4,419,915, Cl. 83-887.000.
- Outboard Marine Corporation: See—  
Nelson, Edward M., 4,420,028, Cl. 164-149.000.
- Smith, LaVerne D., 4,419,857, Cl. 56-11.300.
- Owen, Brian, to Bell Telephone Laboratories, Incorporated. FET Amplifier with wide dynamic range, 4,420,724, Cl. 330-277.000.
- Owens-Corning Fiberglass Corporation: See—  
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- Gorgati, Romolo, 4,420,324, Cl. 428-110.000.
- OY Kaukus AB: See—  
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- Oyokota, Shigeru: See—  
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- Pacala, Luba A.: See—  
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- Paganini, Bruno J.; and Hale, William J., to NCR Corporation. Detection method and apparatus for a user device or automatic teller bank machine, 4,420,751, Cl. 340-825.330.
- Page, Donald F.: See—  
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- Paget, Charles J.: See—  
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- Palandri, Fabio V., to AMF Incorporated. Miniaturized electromagnet relay, 4,420,733, Cl. 335-202.000.
- Palitex Project-Company GmbH: See—  
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- Paloian, Michael. Hydroponic planter, 4,419,842, Cl. 47-62.000.
- Panavision, Incorporated: See—  
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- Pao, Mary A.: See—  
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- Pappas, Nicholas J.: See—  
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- Par Way Manufacturing Co.: See—  
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- Park-Ohio Industries, Inc.: See—  
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- Park, Won C.; and Mu, Jacob J., to Occidental Research Corporation. Process for producing phosphorus pentoxide, 4,420,466, Cl. 423-304.000.
- Parker, Harold P.: See—  
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- Parker, Parake, to Parker, Harold P. Baby bed rocking mechanism, 4,419,777, Cl. 5-108.000.
- Parkhurst, Hugh J., Jr.: See—  
Huibers, Derk T. A.; and Parkhurst, Hugh J., Jr., 4,420,644, Cl. 568-806.000.
- Parks, David M. Thin decorative cementitious veneers and a method for making same, 4,420,525, Cl. 428-156.000.
- Partington, Everett J. Heating system, 4,420,677, Cl. 219-341.000.
- Pascual, Felix J.: See—  
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- Passons, William E.; Card, Joseph L.; and Card, Roy T. Multiple stroke looper mechanism for stitching machine, 4,419,944, Cl. 112-79.00R.
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- Paulson, Roger A.: See—  
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- Payette, Lionel J.: See—  
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- Peck, Richard M.; Reif, Robert B.; and Albrechtson, Loren R., to Peck, Richard M. Method of producing printed images with a color facsimile printing device, 4,420,552, Cl. 430-252.000.
- Pemco Corporation: See—  
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- Penaz, Vaclav: See—  
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- Pepsico, Inc.: See—  
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- Permatek, Inc.: See—  
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- Peroutka, Fritz; Thumm, Helmut; Bahr, Theodor; and Stricker, Walter, to J. M. Voith GmbH. Waste paper disintegrating, sorting and fiber recovery apparatus, 4,420,117, Cl. 241-46.170.
- Peter, Oskar; and Stahr, Anton. Brake assembly for fluid operated piston and cylinder device, 4,419,924, Cl. 92-27.000.
- Petersen, Christian C.; and Westgate, Bernard C., Jr., to Polaroid Corporation. Apparatus for continuously incrementing an output member, 4,420,714, Cl. 318-135.000.
- Petersen, Neil E., to Minnesota Mining & Manufacturing Company. Anti-fogging surgical mask, 4,419,993, Cl. 128-201.150.
- Peterson, Leslie D., to Cooper Industries, Inc. Rate of penetration sensor for oil drilling rigs, 4,419,886, Cl. 73-151.500.
- Peterson, Willard E., to Deere & Company. Disk gang assembly, 4,420,048, Cl. 172-568.000.
- Petrolite Corporation: See—  
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- Peveler, Richard D.: See—  
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- Pfisterer, Hermann: See—  
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- Pfizer Inc.: See—  
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- Phares, Hershel L.: See—  
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- Phelps, Barry C.; and Hall, John S., to California Interface and Software Limited Partnership. Identification card bearing latent image perceptible in the presence of background light, 4,420,174, Cl. 283-75.000.
- Philip Morris Inc.: See—  
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- Philipp, Adolf; Jirkovsky, Ivo; and Martel, Rene, to Averst McKenna & Harrison, Inc. Benzofuro[3,2-c]pyrazol-3-amine derivatives, 4,420,476, Cl. 424-232.000.
- Phillips, Edwin R., to Sperry Corporation. Printer beam position feedback sensor, 4,420,760, Cl. 346-108.000.
- Phillips Petroleum Company: See—  
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- Cobb, Raymond L., 4,420,431, Cl. 260-465.900.
- Lee, Roy C., 4,419,968, Cl. 123-3.000.
- Wilson, Joseph F., 4,420,321, Cl. 71-43.000.
- Pickering, Alan H., to English Electric Valve Company Limited. Co-axial magnetrons, 4,420,710, Cl. 315-39.770.
- Pierce, Gordon F., to Canadian General Electric Company Limited. Frequency determining apparatus, 4,420,809, Cl. 364-484.000.
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- Pierson, Darrell E.: See—  
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- Piezo Electric Products, Inc.: See—  
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- Pilot Man-Nen-Hitsu Kabushiki Kaisha: See—  
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- Pioneer Electronic Corporation: See—  
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- Pirsch, Peter, to Bell Telephone Laboratories, Incorporated. Technique for encoding multi-level signals, 4,420,771, Cl. 358-261.000.
- Pitcher, Wayne H., Jr.: See—  
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- Plath, Peter: See—  
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- Plifka, John W. Locking device for skiers use, 4,419,872, Cl. 70-18.000.
- Pocius, Frances C.; and Buchanan, William T., to Nalco Chemical Company. Dry chemical feed system, 4,420,463, Cl. 422-266.000.
- Polaroid Corporation: See—  
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- Petersen, Christian C.; and Westgate, Bernard C., Jr., 4,420,714, Cl. 318-135.000.
- Widiger, Gary N., 4,420,627, Cl. 549-394.000.
- Ponnee, Johannes J.: See—  
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- Pope, Benjamin D. Modular model structure, 4,419,840, Cl. 46-19.000.
- Popp, Karl F.: See—  
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- Post, Willem P., to Thomassen & Drijver-Verblif N.V. Method of forming an outwardly inverted peripheral edge on a preformed metal lid, 4,420,283, Cl. 413-8.000.
- Potekhin, Konstantin F.: See—  
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- Moriarty, Thomas C.; and Geiger, William J., 4,420,574, Cl. 523-404.000.
- Valimont, James L.; and Shadle, Barry L., 4,420,361, Cl. 156-556.000.
- Valimont, James L.; and Phares, Hershel L., 4,420,362, Cl. 156-563.000.
- PQ Corporation: See—  
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- Preedy, David R., to Signetics Corporation. Programmable read-only memory, 4,420,820, Cl. 365-105.000.
- Preiser, Herman S.; Ticker, Arthur; and Hatley, Kenneth J. Method and apparatus for coating submerged portions of floating structures, 4,420,533, Cl. 428-351.000.
- Preisler, James M.: See—  
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- Price, Edison A.: See—  
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- Price-Pfister Brass Mfg. Co.: See—  
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- Price, Robert J.; and Taber, Bruce E., to Data Card Corporation. System for processing and storing transaction data and for transmitting the transaction data to a remote host computer, 4,420,819, Cl. 364-900.000.
- Priesnitz, Uwe: See—  
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- Primbs, Robert J., Jr., to United States of America, Air Force. Telemetry load link assembly, 4,420,755, Cl. 340-870.380.
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- Wong, Louis F., 4,420,412, Cl. 252-186.380.
- Proctor & Schwartz: See—  
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- Progar, Donald J., to United States of America, National Aeronautics and Space Administration. Hot melt recharge system, 4,420,518, Cl. 428-40.000.
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- Protacio, Alfredo C.; Navarro, Ramon V.; Rio, Eliseo M., Jr.; Alonte, Antonio D.; and Pascual, Felix J., to Protacio, Alfredo C. Method and apparatus for utilizing ethanol of any purity as a fuel in 4-stroke internal combustion engines, 4,419,967, Cl. 123-1.00A.
- Prout, Addison S., to Bommer Industries, Inc. Adjustable spring hinge, 4,419,788, Cl. 16-300.000.
- Pryor, Michael J.; and Tyler, Derek E., to Olin Corporation. Continuous lubrication casting molds, 4,420,030, Cl. 164-472.000.
- Pryor, Timothy R., to Diffracto Ltd. Method and apparatus for detecting wear or breakage of tools and other objects, 4,420,253, Cl. 356-237.000.
- Pshaenich, Alvin: See—  
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- Pust, Harold W.: See—  
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- Quick, William H.: See—  
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- Qurnell, Frank D.; and Skarshaug, Nordahl H., to General Electric Company. End plug gauging device and method, 4,420,455, Cl. 376-245.000.
- Raadsen, Johannes F. A., to U.S. Philips Corporation. Peak detector, 4,420,698, Cl. 307-351.000.
- Rabinovich, Efim M.: See—  
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornev, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346, Cl. 148-4.000.
- Racal Safety Limited: See—  
Hilton, Joseph R., 4,419,994, Cl. 128-206.190.
- Radelow, Wolfgang: See—  
Forberg, Horst; Radelow, Wolfgang; Achtnig, Klaus-Peter; and Muller, Manfred, 4,420,200, Cl. 339-13.000.



- Rademaker, Onno: See—  
Van Koppen, Christianus W. J.; Rademaker, Onno; and De Ron, Adriaan J., 4,420,032, Cl. 165-1.000.
- Ragaller, Klaus: See—  
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- Rahman, Atif, to Thomson-CSF Broadcast, Inc. Video background generation system, 4,420,770, Cl. 358-183.000.
- Raidel, John E. Heavy vehicle suspension assembly with free floating springs and axle stabilizing torque rod, 4,420,171, Cl. 280-682.000.
- Rakaczky, John A.: See—  
Coates, Arthur D.; Donovan, William F.; Rakaczky, John A.; and Scott, Wayman E., 4,419,936, Cl. 102-364.000.
- Rambaldini, Gianfranco: See—  
Ducati, Umberto, 4,420,380, Cl. 204-66.000.
- Ramsey, Frederick J.: See—  
Shawcross, Alfred L.; Ramsey, Frederick J.; and Raymond, Arnold A., 4,420,121, Cl. 242-181.000.
- Ramsey, John T.; and Ramsey, William J. Weightlifting apparatus, 4,420,154, Cl. 272-118.000.
- Ramsey, William J.: See—  
Ramsey, John T.; and Ramsey, William J., 4,420,154, Cl. 272-118.000.
- Randall, Cyril A.: See—  
Becker, Bernard B.; Bowman, John K.; and Randall, Cyril A., 4,420,010, Cl. 137-116.000.
- Randolph, James B.: See—  
Aug, Conrad J.; Guenther, Charles J.; and Randolph, James B., 4,420,203, Cl. 339-17.0CF.
- Rapaport, Stanley; and Cachat, Francis J., to Plasti-Kote Company, Inc. Water reducible aerosol paints, 4,420,575, Cl. 523-504.000.
- Rashleigh, Scott C.: See—  
Burns, William K.; and Rashleigh, Scott C., 4,420,258, Cl. 356-350.000.
- Rasmussen, Ole-Bendt. Method for film extrusion comprising rotary die parts, 4,420,451, Cl. 264-173.000.
- Rathier, Gilbert J. M.: See—  
Salle, Jacques E.; Jossif, Jean A. M.; Rathier, Gilbert J. M.; and Vales, Jean-Pierre, 4,420,832, Cl. 370-56.000.
- Rattray, Kendrick D., to GTE Products Corporation. Fluorescent lamp employing means for controlling emission of short wavelength ultraviolet radiation, 4,420,704, Cl. 313-486.000.
- Rau, William G., to Burroughs Corporation. Self oscillating acoustic displacement detector, 4,420,727, Cl. 331-65.000.
- Rautenberg, Klaus: See—  
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- Rawlings, Herbert L.; and Reinert, Gerard E., to Mobay Chemical Corporation. Glass-filled polycarbonate of improved impact strength, 4,420,584, Cl. 524-502.000.
- Raymond, Arnold A.: See—  
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- Raymond, Gary E. Cassette, for sheet photographic materials, 4,420,120, Cl. 242-71.700.
- Raytheon Company: See—  
Cooper, Kersi F.; and Drake, Jerry W., 4,420,504, Cl. 427-90.000.
- RCA Corporation: See—  
Dischert, William A., 4,419,848, Cl. 51-229.000.
- Leung, Chung W.; Dawson, Robert H.; Blumenfeld, Martin A.; and Biondi, Dennis P., 4,420,503, Cl. 427-85.000.
- Limberg, Allen L., 4,420,726, Cl. 330-288.000.
- Tam, Ming L., 4,420,765, Cl. 357-54.000.
- Todd, Albert A., 4,420,122, Cl. 324-158.00R.
- Upadhyayula, Lakshminarasimha C., 4,420,743, Cl. 340-347.0AD.
- Reactor Services International, Inc.: See—  
Easley, Othel D., Jr., 4,420,279, Cl. 406-14.000.
- Reckel, Rudolph P.; and Harris, Joanne L., to Ortho Diagnostic Systems Inc. Agglutination-inhibition test kit for detecting immune complexes, 4,420,461, Cl. 422-61.000.
- Recortec, Inc.: See—  
Lee, Lester H.; and Wussow, George, 4,420,818, Cl. 364-900.000.
- Redmore, Derek, to Petrolite Corporation. Quaternary aminomethyl phosphonates as scale inhibitors, 4,420,399, Cl. 210-700.000.
- Reed, David G.: See—  
Nolta, Arthur H.; and Reed, David G., 4,420,807, Cl. 364-200.000.
- Reed, Frank J.: See—  
Winkler, Theodore; and Reed, Frank J., 4,420,153, Cl. 271-304.000.
- Reed Rock Bit Company: See—  
Jones, Kenneth W., 4,420,050, Cl. 175-374.000.
- Regie Nationale Des Usines Renault: See—  
Gluz, Roland, 4,419,821, Cl. 33-174.00L.
- Regipa, Robert, to Centre National d'Etudes Spatiales. Fabrication process for an envelope, in particular for space balloons, envelope thus made, and its application to the aerospace domain, 4,420,130, Cl. 244-31.000.
- Rehmann, Wolfgang; and Sauer, Rudolf, to Robert Bosch GmbH. Temperature sensor, 4,420,738, Cl. 338-28.000.
- Reiche, Horst: See—  
Schmitz, Gunter; and Reiche, Horst, 4,419,846, Cl. 51-55.000.
- Reif, Robert B.: See—  
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- Reikowski, Harold J., to Kelsey-Hayes Co. Mold and method of making spoked wheels and product of same, 4,419,908, Cl. 74-552.000.
- Reiling, Gilbert H.; Putz, John M.; and Van Horn, David D., to General Electric Company. Reflector lamp, 4,420,801, Cl. 362-297.000.
- Reilly Tar & Chemical Corp.: See—  
Sowers, Edward E., 4,420,542, Cl. 428-541.000.
- Reimold, Gunther: See—  
Treffinger, Karl; and Reimold, Gunther, 4,420,072, Cl. 192-139.000.
- Reinert, Gerard E.: See—  
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- Reis, Edmund; and Wondra, Arthur, to Siemens Aktiengesellschaft. Plug contact, 4,420,209, Cl. 339-91.00R.
- Reismayr, Dieter: See—  
Steinmetz, Guenter; Steenbeck, Ulf; and Reismayr, Dieter, 4,419,937, Cl. 104-281.000.
- Reist, Walter, to Ferag AG. Apparatus for opening folded, bound or stitched multi-sheet products, especially printed products, 4,420,146, Cl. 270-55.000.
- Remon, Francis O., to USM Corporation. Retractable apparatus for shoe sole molds, 4,420,297, Cl. 425-577.000.
- Rempfler, Hermann, to Ciba-Geigy Corporation. Derivatives of 5-(pyridyl-2-oxy)-2-nitrobenzoic acid, and herbicidal compositions containing them, 4,420,328, Cl. 71-94.000.
- Repcor Incorporated: See—  
Horton, Harold O., Jr.; and Thompson, William B., 4,419,794, Cl. 24-667.000.
- Research Association for Residual Oil Processing: See—  
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332, Cl. 75-26.000.
- Research Development Corporation of Japan: See—  
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; and Abe, Mitsu, 4,420,348, Cl. 148-403.000.
- Research, Incorporated: See—  
Anderson, James R., 4,420,794, Cl. 361-419.000.
- Reverte, Tomas M. Concealed safe, 4,419,939, Cl. 109-54.000.
- Rexham Corporation: See—  
Conley, Kenneth E., 4,420,527, Cl. 428-172.000.
- Reynolds, Stephen: See—  
Elton, Craig T.; and Reynolds, Stephen, 4,420,471, Cl. 424-49.000.
- Rhoades, Thomas S.: See—  
Scott, David R.; and Rhoades, Thomas S., 4,419,900, Cl. 73-862.060.
- Rhone-Poulenc Industries: See—  
Canard, Pierre; Latourrette, Bertrand; and Schorsch, Gilbert, 4,420,582, Cl. 524-450.000.
- Rice, Edward J., to Acrian, Inc. Method of fabricating mesa MOSFET using overhang mask, 4,419,811, Cl. 29-571.000.
- Richard, Henry J.: See—  
Gidge, Kenneth N.; and Richard, Henry J., 4,420,027, Cl. 160-328.000.
- Richards, Randall G., to Drackett Company, The. Passive dispenser, 4,419,771, Cl. 4-228.000.
- Richardson-Vicks, Inc.: See—  
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,420,483, Cl. 424-253.000.
- Ricoh Company, Ltd.: See—  
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- Tabata, Yukio; and Kawanishi, Toshiyuki, 4,420,758, Cl. 346-76.0PH.
- Umezawa, Michio, 4,420,150, Cl. 271-11.000.
- Riebel, Hans-Jochem: See—  
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,420,435, Cl. 260-940.000.
- Riedl, George, to Alcan International Limited. Method for controlling end effect on anodes used for cathodic protection and other applications, 4,420,382, Cl. 204-147.000.
- Riese, W. A. Method of forming a heat exchanger tube, 4,419,802, Cl. 29-157.30A.
- Rieter Machine Works Limited: See—  
Schar, Hugo, 4,419,791, Cl. 19-215.000.
- Riggs, Robert R.; and Hunt, Paulmer D., to Bendix Corporation, The. Pressure regulator for a fluid motor, 4,420,014, Cl. 137-468.000.
- Rio, Eliseo M., Jr.: See—  
Protacio, Alfredo C.; Navarro, Ramon V.; Rio, Eliseo M., Jr.; Alonte, Antonio D.; and Pascual, Felix J., 4,419,967, Cl. 123-1.00A.
- Rio Vista International, Inc.: See—  
Leibo, Stanley P., 4,419,986, Cl. 128-1.00R.
- Ripple, Paul: See—  
Law, Don C.; Mortenson, Carl N.; Ripple, Paul; and Eckhardt, Roger S., 4,420,166, Cl. 280-5240.
- Riseman, Jacob; and Tsang, Paul J., to International Business Machines Corporation. Fabrication process of sub-micrometer channel length MOSFETs, 4,419,809, Cl. 29-571.000.
- Riseman, Jacob, to International Business Machines Corporation. Self-aligned field effect transistor process, 4,419,810, Cl. 29-571.000.
- Roba, Giacomo, to Csele Centro Studi e Laboratori Telecomunicazioni S.p.A. Nozzle for coating optical fibers, 4,419,958, Cl. 118-405.000.
- Robbins Company, The: See—  
Robbins, Richard J.; and Cass, David T., 4,420,188, Cl. 299-31.000.
- Robbins, Richard J.; and Cass, David T., to Robbins Company, The. Double shield tunnel boring machine, 4,420,188, Cl. 299-31.000.
- Robert Bosch GmbH: See—  
Rehmann, Wolfgang; and Sauer, Rudolf, 4,420,738, Cl. 338-28.000.

- Saur, Walter, 4,420,355, Cl. 156-250.000.
- Zahn, Heinrich; and Falk, Gerhard, 4,420,109, Cl. 226-181.000.
- Roberts, Roy G., to British Petroleum Company Limited, The. Bearing assembly for a tethered buoyant platform, 4,420,276, Cl. 405-224.000.
- Robertson, Frank C.: See—  
Fogg, Sidney G.; Robertson, Frank C.; and Wilson, Douglas, 4,420,573, Cl. 523-333.000.
- Roccaforte, Harry I., to Champion International Corporation. Display card with concave panel, 4,420,077, Cl. 206-45.140.
- Rockwell International Corporation: See—  
Barclay, Kenneth M., 4,420,464, Cl. 423-65.000.
- Hanowich, Peter J., 4,419,880, Cl. 73-3.000.
- Holmstrom, Roy C.; and Liggett, John V., 4,419,885, Cl. 73-78.000.
- James, Kenneth A.; Quick, William H.; August, Rudolf R.; and Strahan, Virgil H., 4,420,251, Cl. 356-32.000.
- Schmidt, Donald F., 4,419,832, Cl. 33-329.000.
- Tam, Matthias L.; and Custode, Frank Z., 4,419,808, Cl. 29-571.000.
- Rodionov, Valery V.: See—  
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornev, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatiana P.; and Goryaev, German A., 4,420,346, Cl. 148-4.000.
- Roger, Harry. Dual piston sensing mechanism, 4,420,011, Cl. 137-269.000.
- Rogers, Arthur H.; Sullivan, Kevin J.; and Mansfield, Gerald R., to Medical and Scientific Designs Inc. Multi-anode deep well radiation detector, 4,420,689, Cl. 250-385.000.
- Rogers Corporation: See—  
Fukuda, Sunichi; and Muto, Masaaki, 4,420,653, Cl. 174-72.00B.
- Rohm and Haas Company: See—  
Hutton, Thomas W., 4,420,583, Cl. 524-501.000.
- Rohner, Joachim; Zumfeld, Heinz; Mauries, Reinhard; and Preuhs, Hans-Jurgen, to W. Schlafhorst & Co. Thread splicing device, 4,419,858, Cl. 57-22.000.
- Rohner, Joachim: See—  
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860, Cl. 57-22.000.
- Rohr, Jakob, to George Fischer Ltd. Cast vehicle wheel, 4,420,190, Cl. 301-63.00R.
- Roland Corporation: See—  
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- Rollen, Donald C.: See—  
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- Rorer, David L.; and Hardin, Jasper E., to Teledyne Industries, Inc. Method of making an aircraft battery, 4,419,815, Cl. 29-623.200.
- Rose, Carl J.: See—  
Lake, Anthony W.; and Rose, Carl J., 4,420,639, Cl. 568-328.000.
- Rosen, Klaus: See—  
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860, Cl. 57-22.000.
- Rossello, Henry S., to McDonnell Douglas Corporation. Visual display presentation box, 4,420,270, Cl. 402-76.000.
- Roth, Kurt: See—  
Buhler, Ulrich; Kindler, Horst; Kuhlein, Klaus; Kallay, Maria; Kosubek, Uwe; Lowenfeld, Rudolf; and Roth, Kurt, 4,420,308, Cl. 8-464.000.
- Roussel Uclaf: See—  
Heymes, Rene; and Lutz, Andre, 4,420,478, Cl. 424-246.000.
- RTE Corporation: See—  
Muench, Frank J., Jr., 4,420,735, Cl. 337-244.000.
- Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., to Institut Fiziki an Bssr. Method of object imaging, 4,420,218, Cl. 350-3.850.
- Ruch, Urs; and Dreier, Ernst, to Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik. Feeder device for a sewing machine, 4,419,951, Cl. 112-323.000.
- Rudolf, Peter: See—  
Jakusch, Helmut; Loeser, Werner; Koester, Eberhard; Rudolf, Peter; Senkpiel, Werner; and Steck, Werner, 4,420,330, Cl. 75-0.5AA.
- Ruetz, Lothar: See—  
Uhrhan, Paul; Krauthausen, Edmund; Stahlke, Kurt-Rainer; Quaas, Gerwolf; and Ruetz, Lothar, 4,420,613, Cl. 544-51.000.
- Rupertinger, Hermann: See—  
Ackermann, Rolf; Jung, Friedrich; Mauer, Egon; and Rupertinger, Hermann, 4,420,269, Cl. 400-356.000.
- Ruppert, Helmut; and Frase, Dietmar, to Thyssen Industrie AG; and SKF Kugellagerfabriken GmbH. Device for measuring the axial force in a shaft journalled by roller bearings, 4,419,901, Cl. 73-862.490.
- Ruser, John R., to Shell Oil Company. Alaskan offshore drilling base, 4,420,275, Cl. 405-217.000.
- Russell, Sid: See—  
Dvorak, Herman G.; Klapatch, Robert D.; Russell, Sid; and Spadaccini, Louis J., 4,419,863, Cl. 60-748.000.
- Russo, Frank J., to Litco International Inc. Fork lift weighing apparatus, 4,420,053, Cl. 177-139.000.
- Rybnicka Fabryka Maszyn Ryfama Przedsiębiorstwo Panstwowe: See—  
Skolik, Wojciech; Wodecki, Jozef; Gortat, Zenon; Szyngiel, Stanislaw; Bulenda, Andrzej; and Sopora, Piotr, 4,420,075, Cl. 198-735.000.
- Ryden, Sven A.: See—  
Lussi, Eduard; Ahlstedt, Ulf L.; and Ryden, Sven A., 4,420,351, Cl. 156-62.400.
- R2 Corporation: See—  
Heath, Roger L., 4,419,998, Cl. 128-639.000.
- Saad, Nabil R., to JWI Ltd. Pulp agitating device and method having multiple protruding inserts, 4,420,370, Cl. 162-209.000.
- Sachs-Dolmar GmbH: See—  
Bohlmann, Volker; and Kania, Norbert, 4,420,063, Cl. 181-229.000.
- Saeed, Abdul R.: See—  
Adam, Peter; Seuffert, Werner; and Saeed, Abdul R., 4,420,703, Cl. 310-154.000.
- Sagehashi, Risaburo: See—  
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- Saguchi, Hiroto: See—  
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- Saizi, Mitsuhiro: See—  
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- Sakai, Keiichi; Matsuda, Yasuo; and Honbu, Mitsuyuki, to Hitachi, Ltd. Control system for induction motor using inverter for AC power supply, 4,420,718, Cl. 318-729.000.
- Sakai, Kiyoshi; Mabuchi, Minoru; Suzuki, Toshiko; Egarashi, Yuji; and Ishikawa, Shozo, to Canon Kabushiki Kaisha. Electrophotographic member with hydrazone or ketazine compounds, 4,420,548, Cl. 430-59.000.
- Sakamoto, Akira: See—  
Kawaguchi, Kiyoshi; Yamada, Muneki; Kato, Nobuyuki; Kanou, Fumio; Sakamoto, Akira; and Mitsuhashi, Minoru, 4,420,454, Cl. 264-512.000.
- Sakamoto, Hitoshi, to Sony Corporation. Head tracking control system for a helical scan VTR, 4,420,778, Cl. 360-77.000.
- Sakamoto, Tamotsu: See—  
Okamura, Akio; Tanaka, Shuji; and Sakamoto, Tamotsu, 4,419,960, Cl. 118-712.000.
- Sakurai, Yoshifumi, to Olympus Optical Co., Ltd. Magnetic head with an amorphous Hall element, 4,420,781, Cl. 360-112.000.
- Salensky, George A.: See—  
Mohr, Bernard; Pappas, Nicholas J.; Chopra, Kuldip S.; and Salensky, George A., 4,420,340, Cl. 106-288.00B.
- Salle, Jacques E.; Jossif, Jean A. M.; Rathier, Gilbert J. M.; and Vales, Jean-Pierre, to Le Materiel Telephonique Thomson-CSF. Concentrator-deconcentrator devices, 4,420,832, Cl. 370-56.000.
- Sallmann, Alfred; and Baschang, Gerhard, to Ciba-Geigy Corporation. Substituted phenylacetic acid amide compounds, 4,420,490, Cl. 424-309.000.
- Salters, Roelof H. W.: See—  
Koomen, Joannes J. M.; and Salters, Roelof H. W., 4,420,822, Cl. 365-182.000.
- Samijn, Rafael P.: See—  
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- Sanders Associates, Inc.: See—  
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- Marshall, William J., Jr.; and White, Ronald P., 4,420,826, Cl. 367-167.000.
- Maynard, Robert L.; Ballard, Samuel S.; and Townsend, Robert L., 4,420,825, Cl. 367-122.000.
- Sanderson, John R.; Brader, Walter H., Jr.; and Watts, Lewis W., Jr., to Texaco, Inc. Alkylene oxides produced by direct oxidation of olefins over transition metal borates in the presence of a non-polar, aromatic organic solvent, 4,420,625, Cl. 549-533.000.
- Sando Iron Works Co., Ltd.: See—  
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869, Cl. 68-5.00D.
- Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, to Sando Iron Works Co., Ltd. Apparatus for treating a cloth with the use of low-temperature plasma, 4,419,869, Cl. 68-5.00D.
- Sandoz, Inc.: See—  
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- Sands, Bruce W., to PQ Corporation. Manufacturing process for hollow microspheres, 4,420,442, Cl. 264-13.000.
- Sangamo Weston Limited: See—  
Dorey, Howard A.; and Ley, Anthony J., 4,420,721, Cl. 324-110.000.
- Sano, Ken-ichi: See—  
Mita, Yukimitsu; Sano, Ken-ichi; Matsuhira, Shinya; and Nakajo, Tetsuo, 4,420,420, Cl. 502-261.000.
- Sano, Tatsuhiko: See—  
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- Santalla, Richard W., to Combustion Engineering, Inc. Supplying pulverized coal to a coal-fired furnace, 4,419,941, Cl. 110-232.000.
- Sarafian, Karl: See—  
Vis, Arthur D.; and Sarafian, Karl, 4,420,199, Cl. 339-8.00R.



- Sarasota Automation Limited: See—  
Zanker, Klaus J.; and Anderson, Gerald, 4,419,898, Cl. 73-861.020.
- Sasaki, Kinji: See—  
Kajimoto, Norifumi; and Sasaki, Kinji, 4,420,408, Cl. 256-62.540.
- Sasaki, Takuya: See—  
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038, Cl. 165-95.000.
- Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, to Chisso Corporation. Process for producing  $\alpha$ -olefin polymers, 4,420,593, Cl. 526-128.000.
- Sato, Hiroshi, to Daiichi Electric Co., Ltd. FM Data recording and playback method and apparatus, 4,420,774, Cl. 360-28.000.
- Sato, Kunio, to Casio Computer Co., Ltd. Power saving device for an electronic musical instrument, 4,419,917, Cl. 84-1.010.
- Sato, Yoshito; Chiba, Kazukiyo; and Matsumoto, Minoru, to Kabushiki Kaisha Komatsu Seisakusho. Radiator guard structure for vehicles, 4,420,058, Cl. 180-68.00P.
- Sauer, Rudolf: See—  
Rehmann, Wolfgang; and Sauer, Rudolf, 4,420,738, Cl. 338-28.000.
- Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides, 4,420,325, Cl. 71-92.000.
- Saunders, Hollis S.; and Payette, Lionel J., to Essex Group, Inc. Self-bonding magnet wire, 4,420,536, Cl. 428-383.000.
- Saur, Walter, to Bedford Industries, Inc.; and Robert Bosch GmbH. Ribbon applicator head, 4,420,355, Cl. 156-250.000.
- Sautter, Joachim: See—  
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- Savides, Christos; and Bright, John H., to American Cyanamid Company. Extraction of phenols from aqueous solutions, 4,420,643, Cl. 568-753.000.
- Savin Corporation: See—  
Baker, James M.; and Vermaat, David L., 4,420,243, Cl. 355-3.0TR.
- Landa, Benzion, 4,420,244, Cl. 355-3.0TR.
- Schultes, Max; and Eberlein, Dietmar, 4,420,149, Cl. 271-10.000.
- Sawa, Yuji: See—  
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- Sawada, Jiro: See—  
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- Sawamura, Norio: See—  
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- Scalf, Gerald W.; and Koberlein, James H., to Texas Instruments Incorporated. Data input apparatus for microwave oven controllers, 4,420,669, Cl. 219-10.55B.
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- Schar, Hugo, to Rieter Machine Works Limited. Method of unrolling and piecing a lap, 4,419,791, Cl. 19-215.000.
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- Schmidt, Peter. Bathing assembly for handicapped persons, 4,419,776, Cl. 4-564.000.
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- Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. Frequency to voltage converter for a digital tachometer, 4,420,699, Cl. 307-519.000.
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- Schoening, Josef: See—  
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- Scott, David B.: See—  
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- Scott, David R.; and Rhoades, Thomas S., to Machine Monitoring Research & Development Program. Machine health monitoring system, 4,419,900, Cl. 73-862.060.
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- Scott Paper Company: See—  
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- Scott, Wayman E.: See—  
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- Seid, Gordon: See—  
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- Seikosha Co., Ltd.: See—  
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- Seki, Fumio, to Yoshida Kogyo K.K. Safety device for machine having forceful reciprocation, 4,420,071, Cl. 192-134.000.
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- Selmeczi, Joseph G.: See—  
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- Shadle, Barry L.: See—  
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- Shaffer, John W., to GTE Products Corporation. Miniature multilamp photoflash array, 4,420,301, Cl. 431-359.000.
- Shanklin, Frank G. Low drag static seamer, 4,419,855, Cl. 53-450.000.
- Shaparew, Vladimir. Honey drying ventilator for beehives, 4,419,780, Cl. 6-1.000.
- Sharki, Martin J., to Dresser Industries, Inc. Screen tensioning arrangement, 4,420,391, Cl. 209-403.000.
- Sharp, Derek J.; and Watts, Robert C., to BOC Limited. Apparatus for mixing fluids, 4,420,009, Cl. 137-98.000.
- Sharp Kabushiki Kaisha: See—  
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- Shawcross, Alfred L.; Ramsey, Frederick J.; and Raymond, Arnold A., to Bausch & Lomb Incorporated. Roll film looping and guiding apparatus, 4,420,121, Cl. 242-181.000.
- Shay, Gregory D., to Sherwin-Williams Company, The. Radiation polymerizable compounds and conductive coatings from same, 4,420,541, Cl. 428-523.000.
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- Sheinberg, Zena; and Wortman, Alex. Convertible bowling alley, 4,420,155, Cl. 273-51.000.
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van't Sant, Jan P.; and Nieuwhof, Arjen, 4,420,331, Cl. 75-6.000.
- Shell Oil Company: See—  
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- Ruser, John R., 4,420,275, Cl. 405-217.000.
- Sherman, Robert C. Body liner assembly, 4,420,183, Cl. 296-181.000.
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- Shigeta, Sadaichi: See—  
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- Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; and Abe, Mitsuo, to Hitachi, Ltd.; Hitachi Metals, Ltd.; and Research Development Corporation of Japan. Amorphous alloy for magnetic head core, 4,420,348, Cl. 148-403.000.
- Shima, Mikio: See—  
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- Shimada, Hiroshi, to Fujitsu Limited. Semiconductor memory, 4,420,823, Cl. 365-206.000.
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- Siegel, Burton L., to Kiwi Coders Corporation. Reciprocal imprinting apparatus, 4,419,931, Cl. 101-333.000.
- Siegel, Carole E.: See—  
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- Locher, Gunter, 4,420,367, Cl. 156-651.000.
- Reis, Edmund; and Wondra, Arthur, 4,420,209, Cl. 339-91.00R.
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- Sigloch, K. Eugen; and Stark, Gerhard. Machining center, 4,419,797, Cl. 29-26.00A.
- Sigman, William T.: See—  
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- Preedy, David R., 4,420,820, Cl. 365-105.000.
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- Skarshaug, Nordahl H.: See—  
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- SKF Kugellagerfabriken GmbH: See—  
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Coke, Harry E.; and Gill, Gary W., 4,420,513, Cl. 427-407.100.  
Sovera, Attilio: See—  
Milani, Carlo; Carminati, Giovanni M.; and Sovera, Attilio, 4,420,482, Cl. 424-250.000.  
Sowers, Edward E., to Reilly Tar & Chemical Corp. Article and method for wood preservation. 4,420,542, Cl. 428-541.000.  
Spacek, Jindrich; Smrcek, Vaclav; Voda, Karel; Kosek, Jiri; Hrdina, Jan; and Penaz, Vaclav, to Tovarny strojirenske techniky, koncern. Pressure control apparatus for hydromechanical drawing. 4,419,876, Cl. 72-57.000.  
Spadaccini, Louis J.: See—  
Dvorak, Herman G.; Klapatch, Robert D.; Russell, Sid; and Spadaccini, Louis J., 4,419,863, Cl. 60-748.000.  
Sparks, Lawrence N. Passive animated, or pattern changing sign. 4,420,221, Cl. 350-167.000.  
Spawn Mate, Inc.: See—  
Holtz, R. Barry, 4,420,319, Cl. 71-5.000.  
Speer, Herbert. Bridge pad assembly for metal spectacle frames. 4,420,227, Cl. 351-138.000.  
Spencer Wright Industries, Inc.: See—  
Bardsley, Harold B.; Mosby, Brian J.; Barlow, John M.; and Walton, Brian, 4,420,124, Cl. 242-66.000.  
Sperry Corporation: See—  
Munro, James A.; and Vansteelant, Marc G., 4,420,177, Cl. 289-14.000.  
Phillips, Edwin R., 4,420,760, Cl. 346-108.000.  
Sprague, Peter W.: See—  
Haslanger, Martin F.; and Sprague, Peter W., 4,420,626, Cl. 549-386.000.  
Spring Valley Associates Inc.: See—  
Tibbitts, John L.; Springer, Lamar D.; and Sellers, John W., Jr., 4,420,787, Cl. 361-79.000.  
Springer, Lamar D.: See—  
Tibbitts, John L.; Springer, Lamar D.; and Sellers, John W., Jr., 4,420,787, Cl. 361-79.000.  
Springer, Richard A.: See—  
McCullough, Allan W.; and Springer, Richard A., 4,420,110, Cl. 228-54.000.  
Stahel, Alwin J.; and Preisler, James M., to Drag Specialties, Inc. Housing for forming a vehicle light assembly. 4,420,803, Cl. 362-369.000.  
Stahlke, Kurt-Rainer: See—  
Uhrhan, Paul; Krauthausen, Edmund; Stahlke, Kurt-Rainer; Quaas, Gerwolf; and Ruetz, Lothar, 4,420,613, Cl. 544-51.000.  
Stahr, Anton: See—  
Peter, Oskar; and Stahr, Anton, 4,419,924, Cl. 92-27.000.  
Stamcarbon B.V.: See—  
Evans, Georges G., 4,420,595, Cl. 526-141.000.  
van Dalen, Hendrik; and Schlosser, Willem, 4,420,452, Cl. 264-328.800.  
van de Moedijk, Cornelis; and Janssen, Petrus H. J., 4,420,622, Cl. 549-326.000.  
Standard Oil Company (Indiana): See—  
Bertolacini, Ralph J.; Mosby, James F.; and Schwartz, John G., 4,420,388, Cl. 208-112.000.  
Lin, Chi-Hung, 4,420,609, Cl. 528-486.000.  
Morello, Edwin F., 4,420,608, Cl. 528-324.000.  
Standard Register Company, The: See—  
Knox, William J.; and Hall, Byron C., 4,420,147, Cl. 270-37.000.  
Stant Inc.: See—  
Harris, Robert S., 4,420,392, Cl. 210-86.000.  
Staplex Company, Inc., The: See—  
Oussani, James J., 4,419,915, Cl. 63-887.000.  
Stark, Gerhard: See—  
Sigloch, K. Eugen; and Stark, Gerhard, 4,419,797, Cl. 29-26.00A.  
Stauffer Chemical Company: See—  
Gaghan, Edmund J., 4,420,323, Cl. 71-87.000.  
Gray, Reed A., 4,420,322, Cl. 71-82.000.  
Stayton Canning Company Cooperative: See—  
Gehlen, Gary N., 4,420,118, Cl. 241-101.200.  
Steck, Werner: See—  
Jakusch, Helmut; Loeser, Werner; Koester, Eberhard; Rudolf, Peter; Senkpiel, Werner; and Steck, Werner, 4,420,330, Cl. 75-0.5AA.  
Steenbeck, Ulf: See—  
Steinmetz, Guenter; Steenbeck, Ulf; and Reismayr, Dieter, 4,419,937, Cl. 104-281.000.  
Steffen, Cennert O., to Aktiebolaget Electrolux. Remote control for a vacuum cleaner motor. 4,419,783, Cl. 15-339.000.  
Steinmetz, Guenter; Steenbeck, Ulf; and Reismayr, Dieter, to Messerschmitt-Boelkow-Blohm GmbH. Magnet supporting frame for a magnetically levitated vehicle. 4,419,937, Cl. 104-281.000.  
Steinmetz, Peter: See—  
Bergner, Dieter; Hannesen, Kurt; Schulte, Wilfried; and Steinmetz, Peter, 4,420,387, Cl. 204-263.000.  
Stephenson, Brian D., to AMP Incorporated. Shielding assembly enclosing an electrical connector terminating shielded cable. 4,420,201, Cl. 339-14.00R.  
Sterling Drug Inc.: See—  
Gorman, William G.; and Popp, Karl F., 4,420,484, Cl. 424-326.000.  
Leshner, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,420,617, Cl. 546-257.000.  
Sterrenberg, John W. Apparatus for utilizing hand-held power drill for shaking paint containers and the like. 4,420,262, Cl. 366-110.000.

- Stetter, Gunter, to Messerschmitt-Boelkow-Blohm-Gesellschaft mit Beschränkter Haftung. Guided missile and fuze system therefor. 4,420,129, Cl. 244-3.150.  
Stewart, Nelson. Process for recovering vaporized solvent which eliminates heat exchangers. 4,420,317, Cl. 62-20.000.  
Stief, Reinhard: See—  
Schilling, Hermann; and Stief, Reinhard, 4,420,526, Cl. 428-171.000.  
Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan: See—  
Andermo, Nils I., 4,420,754, Cl. 340-870.370.  
Stone, Wayne B., Jr., to Wood Manufacturing Co., Inc. Decanter for reducing oxidation and evaporation of coffee. 4,419,927, Cl. 99-275.000.  
Stoy, Vladimir A. Polymer composition including polyacrylonitrile polymers and process for preparing same. 4,420,589, Cl. 525-93.000.  
Strahan, Virgil H.: See—  
James, Kenneth A.; Quick, William H.; August, Rudolf R.; and Strahan, Virgil H., 4,420,251, Cl. 356-32.000.  
Strain, Don R., to H.D. Research Company. Hair dryer. 4,419,835, Cl. 34-80.000.  
Strand, Olaf; Omdal, Bjarne; and Svendsen, Jens, to Norsk Hydro A/S. Method and apparatus for filling of flexible containers. 4,420,021, Cl. 141-10.000.  
Strandberg, Lars, to ASEA Aktiebolag. Electrical equipment. 4,420,793, Cl. 361-413.000.  
Strandell, Per Olof: See—  
Frykendahl, Bjorn, 4,420,031, Cl. 164-473.000.  
Stratton, Andrew: See—  
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, 4,419,933, Cl. 102-206.000.  
Stricker, Walter: See—  
Peroutka, Fritz; Thumm, Helmut; Bahr, Theodor; and Stricker, Walter, 4,420,117, Cl. 241-46.170.  
Strobel, Harald M.: See—  
Horoldt, Ernst; Vollmuller, Helmut; Bernhard, Heinz D.; and Strobel, Harald M., 4,420,572, Cl. 523-322.000.  
Stroupe, Stephen D.: See—  
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,420,568, Cl. 436-536.000.  
Stumpf, Gunter O. Material cutting machine. 4,419,820, Cl. 30-124.000.  
Su, Hsueh-Ling: See—  
Chang, Ching-Te; Lee, Lian-Tze; and Su, Hsueh-Ling, 4,420,430, Cl. 260-429.00R.  
Sudo, Ryoichi: See—  
Nakatani, Mitsuo; Yamazaki, Mitsuo; Okunaka, Masaaki; Sudo, Ryoichi; Tochigi, Kenji; and Yokono, Hitoshi, 4,420,500, Cl. 427-54.100.  
Sueyoshi, Susumu; and Ishikawa, Kikuo, to Pioneer Electronic Corporation. Wide-bandwidth low-distortion amplifier. 4,420,725, Cl. 330-288.000.  
Suezawa, Takahiko; Koizumi, Satoru; Nakao, Hiroaki; and Tsuchitani, Takashi, to Sharp Kabushiki Kaisha. Mode selector assembly for use in tape recorders. 4,420,783, Cl. 360-137.000.  
Sugai, Hideo: See—  
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, 4,420,419, Cl. 252-455.00Z.  
Suling, Carlhans: See—  
Bomer, Bruno; Suling, Carlhans; Konig, Joachim; Hespe, Hans; Heynemann, Carl; and Weber, Raimund, 4,420,225, Cl. 350-409.000.  
Sullivan, Donald E. Adjustable tank discharge valve for controlling flush water volume. 4,419,773, Cl. 4-392.000.  
Sullivan, Kevin J.: See—  
Rogers, Arthur H.; Sullivan, Kevin J.; and Mansfield, Gerald R., 4,420,689, Cl. 250-385.000.  
Sumi, Akihiko: See—  
Chibata, Ichiro; Sumi, Akihiko; Ito, Hiroshi; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,420,432, Cl. 260-501.110.  
Sumitomo, Hidehiko: See—  
Ueda, Masanori; Sumitomo, Hidehiko; and Yoshimura, Hirofumi, 4,420,347, Cl. 148-12.00E.  
Sung, Rodney L.; Zoleski, Benjamin H.; Cullen, William P.; and Kablaoui, Mahmoud S., to Texaco Inc. Method of lubricating upper cylinder of marine diesel engine. 4,420,407, Cl. 252-33.400.  
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Richardson-Vicks, Inc. Analgesic and anti-inflammatory compositions comprising ibuprofen and methods of using same. 4,420,483, Cl. 424-253.000.  
Surko, Walter E., Jr., to Emhart Industries, Inc. Door closer assembly. 4,419,786, Cl. 16-51.000.  
Suzuki, Akitoshi: See—  
Shiga, Shoji; Suzuki, Akitoshi; Goma, Yasuo; and Kawada, Kenji, 4,420,377, Cl. 204-28.000.  
Suzuki, Atsushi: See—  
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukino, Tadashi; and Yoshida, Minoru, 4,420,444, Cl. 264-21.000.  
Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, to Canon Kabushiki Kaisha. Computer control means for an electrostatic recording apparatus. 4,420,247, Cl. 355-14.00C.  
Suzuki, Kunihiko, to Nissan Motor Company, Limited. Vehicle drive system. 4,420,059, Cl. 180-248.000.  
Suzuki, Seiichi: See—  
Jikihara, Tetsuo; Oda, Masatsugu; Ushinohama, Kazuyuki; Watanabe, Hisao; and Suzuki, Seiichi, 4,420,327, Cl. 71-96.000.  
Suzuki, Takuya, to Nippon Gakki Seizo Kabushiki Kaisha. Circuit to compensate for deficit of output characteristics of a microphone by output characteristics of associated other microphones. 4,420,655, Cl. 381-94.000.  
Suzuki, Toshiko: See—  
Sakai, Kiyoshi; Mabuchi, Minoru; Suzuki, Toshiko; Egashiri, Yuji; and Ishikawa, Shozo, 4,420,548, Cl. 430-59.000.  
Svendsen, Jens: See—  
Strand, Olaf; Omdal, Bjarne; and Svendsen, Jens, 4,420,021, Cl. 141-10.000.  
Svenska Traforskningsinstitutet: See—  
Fladda, Gerd; and Pettersson, Thorulf, 4,420,256, Cl. 356-336.000.  
Sykes, Richard B., to E. R. Squibb & Sons, Inc. Synergistic antifungal compositions. 4,420,474, Cl. 424-121.000.  
Synergistics Chemicals Limited: See—  
Crocker, Zenas; and Wright, A. Nelson, 4,420,449, Cl. 264-68.000.  
Szymaszek, Paul G., to Vilter Manufacturing Company. Oil cooling apparatus for refrigeration screw compressor. 4,419,865, Cl. 62-193.000.  
Szyngiel, Stanislaw: See—  
Skolik, Wojciech; Wodecki, Jozef; Gortat, Zenon; Szyngiel, Stanislaw; Bulenda, Andrzej; and Sopora, Piotr, 4,420,075, Cl. 198-735.000.  
T.C.A., Inc.: See—  
Lee, Quarterman; Watson, Larry E.; and Montgomery, Glenn E., 4,420,003, Cl. 134-80.000.  
Tabata, Yukio; and Kawanishi, Toshiyuki, to Ricoh Company, Ltd. Electrothermic non-impact recording method and apparatus. 4,420,758, Cl. 346-76.0PH.  
Taber, Bruce E.: See—  
Price, Robert J.; and Taber, Bruce E., 4,420,819, Cl. 364-900.000.  
Tabler, Donald C.: See—  
Beckworth, Alden E.; Howell, Jerald A.; and Tabler, Donald C., 4,420,389, Cl. 208-251.00R.  
Tachibana, Eiichi; and Katsuta, Tetsuro, to Dai Nippon Insatsu Kabushiki Kaisha. One-bath etching method for processing gravure plate, and etching condition calculating device. 4,420,363, Cl. 156-627.000.  
Tadauchi, Masaharu; Tanno, Kiyohiko; and Nakano, Taizoh, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Scan signal processing system. 4,420,742, Cl. 340-347.0AD.  
Taiho Kogyo Co., Ltd.: See—  
Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,420,163, Cl. 277-96.100.  
Taisho Pharmaceutical Co., Ltd.: See—  
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiohara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631, Cl. 560-104.000.  
Takada, Sanae: See—  
Ohyama, Hiroshi; Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Takada, Sanae; Morita, Ken; Wada, Takuo; Miyahara, Masahiko; and Arakawa, Masazumi, 4,420,486, Cl. 424-272.000.  
Takagi, Tomio; Ueda, Jitsuhiko; Fujii, Tadaomi; and Tanaka, Kazuhiko, to Hitachi Shipbuilding & Engineering Company Limited. Materials for rolls. 4,420,335, Cl. 75-124.000.  
Takahashi, Atsushi; Muratsubaki, Yoshiharu; and Ishizaka, Hiroyuki, to Nippon Carbide Kogyo Kabushiki Kaisha. Powdery desulfurizer composition. 4,420,333, Cl. 75-55.000.  
Takahashi, Masao: See—  
Ogawa, Masahide; Masuko, Tetsuo; Goto, Kunio; Sugai, Hideo; and Takahashi, Masao, 4,420,419, Cl. 252-455.00Z.  
Takahashi, Sankichi: See—  
Okouchi, Isao; Takahashi, Sankichi; Mukai, Yasuteru; Otake, Katsumoto; Sasaki, Takuya; and Miyai, Masahiko, 4,420,038, Cl. 165-95.000.  
Takahashi, Shinji: See—  
Kaneko, Yasuyuki; Itoh, Masao; and Takahashi, Shinji, 4,420,397, Cl. 210-611.000.  
Takahashi, Soichi; and Kobayashi, Susumu, to Victor Company of Japan, Limited. Circuit arrangement for different color light emission. 4,420,711, Cl. 315-296.000.  
Takahashi, Toshihiro, to Toko Kabushiki Kaisha. Display type push button. 4,420,664, Cl. 200-308.000.  
Takai, Toshiaki: See—  
Masuda, Yutaka; Takai, Toshiaki; and Tohyama, Shunroku, 4,420,522, Cl. 428-95.000.  
Takakura, Koichi: See—  
Tanihara, Masao; Nakashima, Toshihide; and Takakura, Koichi, 4,420,395, Cl. 210-263.000.  
Takano, Yoshikazu; Kamimura, Tomohisa; and Fujikawa, Mitsunobu, to Sony Corporation. Automatic cassette changer. 4,420,779, Cl. 360-92.000.  
Takasaki, Yasuto: See—  
Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304, Cl. 432-83.000.  
Takata, Akira: See—  
Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, 4,419,972, Cl. 123-337.000.  
Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,420,477, Cl. 424-246.000.  
Takayanagi, Yoshiaki: See—  
Suzuki, Koji; Nakahira, Joji; Kuroda, Koki; Nagashima, Nao; and Takayanagi, Yoshiaki, 4,420,247, Cl. 355-14.00C.



- Take, Hiroshi: See—  
Koyanagi, Katubumi; Hamada, Hiroshi; Yano, Kohzo; Take, Hiroshi; and Inami, Yasuhiko, 4,420,749, Cl. 340-763.000.
- Takebe, Yoshiharu: See—  
Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, 4,420,445, Cl. 264-40.400.
- Takehara, Hideaki, to Victor Company of Japan, Limited. Method for making a stylus having a conductive carbon layer and a stylus made by the method. 4,420,675, Cl. 219-121.0LM.
- Takenaka, Akira; and Fukuoka, Tatsuhiro, to Taiho Kogyo Co., Ltd. Mechanical seal. 4,420,163, Cl. 277-96.100.
- Takenaka, Michio: See—  
Yamashita, Hajime; and Takenaka, Michio, 4,419,801, Cl. 29-156.4WL.
- Takeuchi, Tomio: See—  
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, 4,420,473, Cl. 424-118.000.
- Takiue, Yukihiko: See—  
Arikawa, Tetsuro; Inoue, Teruo; and Takiue, Yukihiko, 4,420,814, Cl. 364-565.000.
- Talon, Inc.: See—  
Moertel, George B., 4,419,793, Cl. 24-413.000.
- Tam, Matthias L.; and Custode, Frank Z., to Rockwell International Corporation. Method of producing redundant ROM cells. 4,419,808, Cl. 29-571.000.
- Tamai, Yasuo: See—  
Ogawa, Hiroshi; and Tamai, Yasuo, 4,420,540, Cl. 428-457.000.
- Tamura, Masanori: See—  
Ueno, Haruo; Yano, Takefumi; Shimizu, Michimasa; Tamura, Masanori; and Yuasa, Sakae, 4,420,594, Cl. 526-128.000.
- Tamura, Masuhiko: See—  
Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, 4,420,640, Cl. 568-434.000.
- Tanabe Seiyaku Co., Ltd.: See—  
Chibata, Ichiro; Sumi, Akihiko; Ito, Hiroshi; Ohtsuki, Osamu; and Izutsu, Nozomu, 4,420,432, Cl. 260-501.110.
- Inoue, Hirozumi; and Hashiyama, Tomiki, 4,420,628, Cl. 560-17.000.
- Tanahashi, Toshio: See—  
Tsuzuki, Yoshihiko; Uchida, Kiyoshi; and Tanahashi, Toshio, 4,419,925, Cl. 92-212.000.
- Tanaka, Haruhiko: See—  
Makabe, Hachiro; Hagiwara, Muneaki; and Tanaka, Haruhiko, 4,419,947, Cl. 112-158.00E.
- Tanaka, Hiroshi: See—  
Oka, Koichiro; Tanaka, Hiroshi; and Harigae, Makoto, 4,420,366, Cl. 156-644.000.
- Tanaka, Itsuo: See—  
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,419,869, Cl. 68-5.00D.
- Tanaka, Kazuhiko: See—  
Takagi, Tomio; Ueda, Jitsuhiko; Fujii, Tadaomi; and Tanaka, Kazuhiko, 4,420,335, Cl. 75-124.000.
- Tanaka, Shuji: See—  
Okamura, Akio; Tanaka, Shuji; and Sakamoto, Tamotsu, 4,419,960, Cl. 118-712.000.
- Tanaka, Toshie: See—  
Yamamoto, Kiyokazu; Hiratsuka, Ko; Tanaka, Toshie; and Iwasaki, Shigeyuki, 4,420,396, Cl. 210-416.400.
- Tanami, Tohru: See—  
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kensei; Shiobara, Yoshinori; Sato, Tatsuhiro; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631, Cl. 560-104.000.
- Taniguchi, Nobuyuki; Hoda, Takeo; Oyokota, Shigeru; and Seigenji, Koyoshi, to Minolta Camera Kabushiki Kaisha. Camera for use with film having sprocket holes and/or coded perforations. 4,420,236, Cl. 354-21.000.
- Tanihara, Masao; Nakashima, Toshihide; and Takakura, Koichi, to Kuraray Co., Ltd. Blood purification device. 4,420,395, Cl. 210-263.000.
- Tanimichi, Jisaku: See—  
Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, 4,420,445, Cl. 264-40.400.
- Tanin, Leonid V.: See—  
Rubanov, Alexandr S.; Tanin, Leonid V.; Vasilieva, Ljudmila V.; Kalinin, Anatoly N.; Bursky, Vyacheslav A.; and Vidmant, Felix V., 4,420,218, Cl. 350-3.850.
- Taniuchi, Mamoru: See—  
Mori, Kenji; Narita, Kichii; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dento; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332, Cl. 75-26.000.
- Tanno, Kiyohiko: See—  
Tadauchi, Masaharu; Tanno, Kiyohiko; and Nakano, Taizoh, 4,420,742, Cl. 340-347.0AD.
- Tarjan, Peter P., to Cordis Corporation. Cardiac pacer apparatus. 4,419,996, Cl. 128-419.0PG.
- Tarkett AB: See—  
Lussi, Eduard; Ahlstedt, Ulf L.; and Ryden, Sven A., 4,420,351, Cl. 156-62.400.
- Tarmay, Matthew G.; and LaBelle, John T., to Price-Pfister Brass Mfg. Co. Water temperature and flow rate selection display and control system and method. 4,420,811, Cl. 364-510.000.
- Targ, Ming L., to RCA Corporation. Multi-layer passivant system. 4,420,765, Cl. 357-54.000.
- Tatani, Atsushi: See—  
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; Oshima, Michio; Okino, Susumu; and Shigeta, Sadaichi, 4,420,465, Cl. 423-242.000.
- Taylor, Clyde L. Seed harvesting apparatus. 4,419,856, Cl. 56-1.000.
- Taylor, Frank; and Maurer, Klemens, to Monitronik Ltee. Diagram board element. 4,419,838, Cl. 40-605.000.
- Taylor, Gerald M.; and Emms, Norman R., to Item Products Limited. Removable fixing device. 4,420,178, Cl. 294-158.000.
- Taylor, Henry F., to United States of America, Navy. Double coupled dual input rate sensor. 4,420,259, Cl. 356-350.000.
- Taylor, Leonard S., to University of Maryland. Method for shucking bivalve mollusks using microwave energy. 4,420,492, Cl. 426-241.000.
- Taylor, Robert B.: See—  
McFarlane, Finley E.; and Taylor, Robert B., 4,420,581, Cl. 524-431.000.
- Taylor, Wayne A. Trailer hitch. 4,420,169, Cl. 280-446.00R.
- TDK Electronics Co., Ltd.: See—  
Hayama, Masashi; Saguchi, Hiroto; and Hirabayashi, Kenji, 4,420,537, Cl. 428-403.000.
- Kajimoto, Norifumi; and Sasaki, Kinji, 4,420,408, Cl. 256-62.540.
- Okamura, Masatoshi; and Shiba, Haruo, 4,420,128, Cl. 242-199.000.
- Tokuda, Fuminori, 4,420,531, Cl. 428-329.000.
- Techsonic Industries, Inc.: See—  
Andrews, Wayne S., 4,420,762, Cl. 346-136.000.
- Teich, Dieter, to Siemens Aktiengesellschaft. Proximity switch operable without physical contact. 4,420,651, Cl. 174-50.000.
- Teikoku Piston Ring Co., Ltd.: See—  
Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahara, Toru, 4,420,543, Cl. 428-564.000.
- Tekno-Detaljer Sture Carlsson AB: See—  
Astrom, Erik J. H., 4,420,012, Cl. 137-319.000.
- Teledyne Industries, Inc.: See—  
Martinez, Mark S.; and Pust, Harold W., 4,420,687, Cl. 250-343.000.
- Rorer, David L.; and Hardin, Jasper E., 4,419,815, Cl. 29-623.200.
- Telegin, Vasily D.: See—  
Kostikov, Valery I.; Koshelev, Yuri I.; Telegin, Vasily D.; Khomenko, Alexandr A.; and Filimonov, Evgeny F., 4,420,539, Cl. 428-450.000.
- Tengler, John N., to A P Products Incorporated. Variable effective length cantilever contact and connector. 4,420,215, Cl. 339-176.00R.
- Terachi, Junichi: See—  
Hisatsune, Fumiyuki; Yamagata, Shinji; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,420,660, Cl. 200-144.00R.
- Terada, Eiichi: See—  
Seki, Kenji; and Terada, Eiichi, 4,420,599, Cl. 526-318.000.
- Terada, Katumi, to Olympus Optical Company Ltd. Shutter drive safety device for a camera. 4,420,235, Cl. 354-266.000.
- Teramachi, Hiroshi. Linear ball bearing unit. 4,420,193, Cl. 308-6.00C.
- Terashima, Kuniomi: See—  
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- Texaco Inc.: See—  
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- Texas Instruments Incorporated: See—  
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- Scalf, Gerald W.; and Koberlein, James H., 4,420,669, Cl. 219-10.55B.
- Wallace, Steven J.; and Culley, Paul L., 4,420,717, Cl. 318-696.000.
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- Thomson-CSF: See—  
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- Le Bars, Jean-Francois, 4,420,688, Cl. 250-352.000.
- Tonnel, Eugene, 4,420,379, Cl. 204-38.00A.
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- Tokuda, Fuminori, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,420,531, Cl. 428-329.000.
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- Townsend, Robert L.: See—  
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- Toyo Jozo Company, Ltd.: See—  
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- Toyo Kogyo Co., Ltd.: See—  
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- Yamashita, Hajime; and Takenaka, Michio, 4,419,801, Cl. 29-156.4WL.
- Toyo Seikan Kaisha, Limited: See—  
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- Toyo Soda Manufacturing Co., Ltd.: See—  
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- Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; and Miyaji, Akira, to Nippon Kogaku K.K. Electronic photographic camera. 4,420,773, Cl. 358-335.000.
- Toyoda, Takashi; Ohba, Yozo; Yamanaka, Masaaki; and Shirai, Kanji, to Oji Yuka Goseishi Kabushiki Kaisha. Coating agents and thermoplastic resin films coated therewith. 4,420,530, Cl. 428-323.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
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- Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Tamotsu, 4,419,972, Cl. 123-337.000.
- Kojima, Ikuzo, 4,420,172, Cl. 280-802.000.
- Kondo, Katsumi; Fuwa, Yoshio; Harayama, Akira; and Nakahara, Toru, 4,420,543, Cl. 428-564.000.
- Matsushima, Katsuaki; and Uchida, Goro, 4,420,115, Cl. 237-12.30A.
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- Nagase, Masaomi; Ono, Hironobu; Nakano, Jiro; and Miyagi, Hideo, 4,419,974, Cl. 123-418.000.
- Tsuzuki, Yoshihiko; Uchida, Kiyoshi; and Tanahashi, Toshio, 4,419,925, Cl. 92-212.000.
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- Triumph-Adler A.G. fur Büro- und Informationstechnik: See—  
Ackermann, Rolf; Jung, Friedrich; Mauer, Egon; and Rupertinger, Hermann, 4,420,269, Cl. 400-356.000.
- Troy, Michael K.: See—  
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- Trump, Dennis H., to Nashua Control Instruments, Inc. Image reproportioning machine. 4,420,249, Cl. 355-84.000.
- TRW Inc.: See—  
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- Hamada, Shinobu J.; and Yodokawa, Taro, 4,420,756, Cl. 343-16.00M.
- Tsang, Paul J.: See—  
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- Tsuchitani, Takashi: See—  
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- Tsuji, Nobuhiko; Nakamura, Keijiro; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keichi, to Fuji Electric Company, Ltd. Blood sugar analyzer having fixed enzyme membrane sensor. 4,420,564, Cl. 435-288.000.



- Tsukamura, Yoshihiro; Azawa, Hidekuni; and Ohta, Keichi, to Sony Corporation. Printing apparatus and tape clamp therefor. 4,420,268, Cl. 400-233.000.
- Tsutomu, Nozaki: See—  
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- Tsuzuki, Yoshihiko; Uchida, Kiyoshi; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Assembled piston for engine. 4,419,925, Cl. 92-212.000.
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- Tufts, Wesley M., to Control Fluidics, Inc. Filter module. 4,420,403, Cl. 210-787.000.
- Tunstall, Karl N., to Otis Engineering Corporation. Method for cutting and replacing tubing without killing well. 4,420,042, Cl. 166-297.000.
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- Tyler, Derek E.: See—  
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- Tyszkiewicz, Theodore J.: See—  
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- Ube Industries, Ltd.: See—  
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- Ueno, Haruo; Yano, Takefumi; Shimizu, Michimasa; Tamura, Masanori; and Yuasa, Sakae, 4,420,594, Cl. 526-128.000.
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- Uchida, Yoko: See—  
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- Ueda, Jitsuhiko: See—  
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- Ueda, Masanori; Sumitomo, Hidehiko; and Yoshimura, Hirofumi, to Nippon Steel Corporation. Process for producing an austenitic stainless steel sheet or strip. 4,420,347, Cl. 148-12.00E.
- Uemura, Nobuo: See—  
Mori, Kenji; Narita, Kiichi; Ijiri, Ryuzo; Morimitsu, Tsuneo; Kaneko, Dentaro; Uemura, Nobuo; Kameoka, Yoshifumi; and Taniuchi, Mamoru, 4,420,332, Cl. 75-26.000.
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- Uhl, George A.: See—  
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- Uhrhan, Paul; Krauthausen, Edmund; Stahlke, Kurt-Rainer; Quaas, Gerwolf; and Ruetz, Lothar, to Bayer Aktiengesellschaft. Dihydrobenzothiazine compounds and the preparation thereof. 4,420,613, Cl. 544-51.000.
- Uhrig, Heinz: See—  
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- Uibel, Paul-Ulrich: See—  
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- Ukawa, Naohiko: See—  
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- Union Special Corporation: See—  
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- Union Special G.m.b.H.: See—  
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- United States Gypsum Company: See—  
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Agriculture: See—  
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- Wiley, Walter H., III; and Gunn, John A., 4,420,834, Cl. 372-35.000.
- Wise, Joseph F.; and Holt, James F., 4,420,650, Cl. 136-255.000.
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- DeWilde, Mark A.; and Beyer, Richard A., 4,420,255, Cl. 356-315.000.
- Fox, David S.; and Cawelti, Donald G., 4,420,123, Cl. 242-147.00R.
- Gentiluomo, Joseph A., 4,419,881, Cl. 73-37.000.
- Gerharz, Reinhold, 4,420,217, Cl. 350-362.000.
- Huber, William A., 4,420,682, Cl. 235-472.000.
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- Hewitt, Dennis R., 4,420,035, Cl. 165-32.000.
- Progar, Donald J., 4,420,518, Cl. 428-40.000.
- Schroeder, James E.; and Shlichta, Paul J., 4,420,352, Cl. 156-89.000.
- Navy: See—  
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- Camp, Albert T.; and Csanady, Elmer R., 4,420,350, Cl. 149-98.000.
- Taylor, Henry F., 4,420,259, Cl. 356-350.000.
- U.S. Philips Corporation: See—  
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- de Jager, Frank, 4,420,723, Cl. 330-10.000.
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- Meyer-Ebrecht, Dietrich, 4,420,753, Cl. 340-870.260.
- Mixner, Ingomar, 4,420,702, Cl. 310-50.000.
- Nelissen, Johann W. A.; Ponnee, Johannes J.; Legierse, Petrus E. J.; and Van Ruler, Johannes, 4,420,506, Cl. 427-162.000.
- Ortega, Francis, 4,420,338, Cl. 106-20.000.
- Raadsen, Johannes F. A., 4,420,698, Cl. 307-351.000.
- United Technologies Corporation: See—  
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- Dvorak, Herman G.; Klapatch, Robert D.; Russell, Sid; and Spadaccini, Louis J., 4,419,863, Cl. 60-748.000.
- Kos, Joseph M.; Patrick, John P.; and Harner, Kermit I., 4,420,692, Cl. 290-44.000.
- Universal Foods Corporation: See—  
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- University of Maryland: See—  
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- University Patents, Inc.: See—  
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- UOP Inc.: See—  
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- Upadhyayula, Lakshminarasimha C., to RCA Corporation. Voltage comparator using unequal gate width FETs. 4,420,743, Cl. 340-347.0AD.
- Upjohn Company, The: See—  
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- Bonk, Henry W.; Nelb, Robert G., II; and Oertel, Richard W., III, 4,420,602, Cl. 528-80.000.
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- White, David R., 4,420,623, Cl. 549-361.000.
- White, David R.; and Thomas, Richard C., 4,420,624, Cl. 549-361.000.
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- Uschold, Ronald E., to Du Pont de Nemours, E. I., and Company. Fluorinated ether-ketones. 4,420,638, Cl. 568-415.000.
- Ushinohama, Kazuyuki: See—  
Jikihara, Tetsuo; Oda, Masatsugu; Ushinohama, Kazuyuki; Watanabe, Hisao; and Suzuki, Seiichi, 4,420,327, Cl. 71-96.000.
- USM Corporation: See—  
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- Utsch, Francis V.: See—  
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- Utsumi, Noriyuki: See—  
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- Uwai, Toshihiro: See—  
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- Vaidyanathan, Kumbakonam R., to Monsanto Company. Process for the nitration of halobenzenes. 4,420,645, Cl. 568-937.000.
- Vales, Jean-Pierre: See—  
Salle, Jacques E.; Jossif, Jean A. M.; Rathier, Gilbert J. M.; and Vales, Jean-Pierre, 4,420,832, Cl. 370-56.000.

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- Von Holdt, John W. Molded bucket and lid having high stack strength. 4,420,093, Cl. 220-306.000.
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- Walker, Graham K.: See—  
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- Watanabe, Takao: See—  
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- Westland Aircraft Limited: See—  
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- Weyerhaeuser Company: See—  
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- Wilms, Gunter: See—  
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- Wilson, John C.: See—  
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- Wolters, Martin: See—  
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- Wong, Louis F., to Procter & Gamble Company. The. Activation of hypochlorite bleaching of dyes. 4,420,412, Cl. 252-186.380.
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- Wright, Randall J. Composite level construction. 4,419,833, Cl. 33-379.000.
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- Wu, Tsun Z. Component framework structure for the frame of a foldable umbrella. 4,420,007, Cl. 135-25.00R.
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- Wuerzer, Bruno: See—  
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- Wysocki, Thomas J., to General Motors Corporation. Camber adjustment tool and method for strut type vehicle suspension. 4,420,170, Cl. 280-661.000.
- Yacobucci, Paul D.; and Wilson, John C., to Eastman Kodak Company. Polymerizable vinyl benzoates. 4,420,630, Cl. 560-104.000.
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Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, 4,420,592, Cl. 526-65.000.
- Yamamoto, Sueshi; Nagata, Kenichi; Tanimichi, Jisaku; and Takebe, Yoshiharu, to Mitsui Engineering & Shipbuilding Co., Ltd. Coal pellets production. 4,420,445, Cl. 264-40.400.
- Yamamoto, Yasunobu; Tomikawa, Ryoichi; and Ishii, Masami, to Aisin Seiki Kabushiki Kaisha; and Aisin Kako Kabushiki Kaisha. Friction member of resin mold type. 4,420,067, Cl. 188-251.00A.
- Yamanaka, Masaaki: See—  
Toyota, Takashi; Ohba, Yozo; Yamanaka, Masaaki; and Shirai, Kanji, 4,420,530, Cl. 428-323.000.
- Yamashina, Hisao: See—  
Furusaki, Shinichi; Manada, Noriaki; Yamashina, Hisao; and Matsuda, Masaaki, 4,420,633, Cl. 560-232.000.
- Yamashita, Hajime; and Takenaka, Michio, to Toyo Kogyo Co., Ltd. Method for manufacturing a cast iron cylinder block. 4,419,801, Cl. 29-156.4WL.
- Yamashita, Keitaro, to Hitachi Metals, Ltd. Magnetic brush developing and cleaning process. 4,420,242, Cl. 355-3.0DD.
- Yamashita, Yoshisato; Inoue, Masanobu; and Fukatsu, Kohichi, to Chisso Corporation. Method of treating converted potassium sulfate for reducing a small amount of chlorine contained therein. 4,420,468, Cl. 423-482.000.
- Yamaura, Mitsuru; Kondow, Ryotaro; and Inagaki, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Protective relaying system. 4,420,805, Cl. 364-184.000.
- Yamazaki, Mitsuo: See—  
Nakatani, Mitsuo; Yamazaki, Mitsuo; Okunaka, Masaaki; Sudo, Ryoichi; Tochigi, Kenji; and Yokono, Hitoshi, 4,420,500, Cl. 427-54.100.
- Yamazaki, Shigeru; Arai, Takao; Kobayashi, Masaharu; Hoshino, Takashi; Hibino, Chitoshi; and Kobari, Harukuni, to Nippon Victor Kabu-

shiki Kaisha; and Hitachi, Ltd. Circuit and method for protecting a horizontal synchronous signal. 4,420,775, Cl. 360-38.100.

Yamazaki, Shigetomo: See—  
Onoguchi, Akira; Miyazawa, Mitsuhi; Yamazaki, Shigetomo; and Inoue, Masahiro, 4,420,686, Cl. 250-310.000.

Yamazaki, Takeo: See—  
Miyoshi, Tadahiko; Yamazaki, Takeo; and Maeda, Kunihiro, 4,420,737, Cl. 338-21.000.

Yamazaki, Toshiaki: See—  
Ishii, Hiroshi; Seki, Kohji; Morishita, Hiroshi; and Yamazaki, Toshiaki, 4,419,882, Cl. 73-40.700.

Yanagida, Yoshinobu: See—  
Nakatani, Genji; Kanai, Kazuo; Itoh, Haruo; Takasaki, Yasuto; Ohkoshi, Kenji; and Yanagida, Yoshinobu, 4,420,304, Cl. 432-83.000.

Yanai, Tadamas; Sagehashi, Risaburo; Kameyama, Yoshio; and Shimomura, Takao, to Eagle Industry Co., Ltd. Mechanical seal and method of forming a sliding surface thereof. 4,420,162, Cl. 277-96.100.

Yano, Kohzo: See—  
Koyanagi, Katubumi; Hamada, Hiroshi; Yano, Kohzo; Take, Hiroshi; and Inami, Yasuhiko, 4,420,749, Cl. 340-763.000.

Yano, Takefumi: See—  
Ueno, Haruo; Yano, Takefumi; Shimizu, Michimasa; Tamura, Masanori; and Yuasa, Sakae, 4,420,594, Cl. 526-128.000.

Yasuda, Nobuyoshi: See—  
Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, 4,420,477, Cl. 424-246.000.

Yasui, Tsuyoshi: See—  
Hirose, Masahiko; Yasui, Tsuyoshi; Ochi, Yoshiharu; and Nakagawa, Masatoshi, 4,420,498, Cl. 427-39.000.

Yasuyuki, Haneishi; and Komoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exchange mount with data transmitting electrical contacts. 4,420,239, Cl. 354-286.000.

Yates, Vincent A.: See—  
Dean, Noel S.; Lawton, Kenneth L.; and Yates, Vincent A., 4,420,220, Cl. 350-96.230.

Yin, Chieh-Kung: See—  
Goodman, Thomas P.; Yin, Chieh-Kung; and Kosrow, Robert L., 4,419,949, Cl. 112-262.100.

Yodokawa, Taro: See—  
Hamada, Shinobu J.; and Yodokawa, Taro, 4,420,756, Cl. 343-16.00M.

Yokoi, Fumio: See—  
Sotome, Tatsu; and Yokoi, Fumio, 4,419,912, Cl. 82-5.000.

Yokomichi, Isao; Haga, Takahiro; Nasu, Rikuo; Nagatani, Kuniaki; and Nakajima, Toshio, to Ishihara Sangyo Kaisha Ltd. Process for producing 5-chloro- $\beta$ -trifluoromethylpyridines. 4,420,618, Cl. 546-345.000.

Yokono, Hitoshi: See—  
Nakatani, Mitsuo; Yamazaki, Mitsuo; Okunaka, Masaaki; Sudo, Ryoichi; Tochigi, Kenji; and Yokono, Hitoshi, 4,420,500, Cl. 427-54.100.

Yokota, Tepei; and Joichi, Yoshiro, to Sony Corporation. Muting circuit. 4,420,694, Cl. 307-130.000.

Yokoyama, Shoji: See—  
Miki, Nobuaki; and Yokoyama, Shoji, 4,419,910, Cl. 74-867.000.

Yoshida, Hitoshi: See—  
Hattori, Tadashi; Yoshida, Hitoshi; Akutagawa, Keichi; Takata, Akira; and Fukuda, Matsumoto, 4,419,972, Cl. 123-337.000.

Yoshida, Junichi: See—  
Kato, Akifumi; Yoshida, Junichi; and Yamamoto, Ryoichi, 4,420,592, Cl. 526-65.000.

Yoshida Kogyo K.K.: See—  
Matsuda, Yoshio, 4,419,868, Cl. 66-195.000.

Tsuboi, Masatake; Hirono, Hatsuo; and Aikawa, Kazuo, 4,420,378, Cl. 204-35.00N.

Yoshida Kogyo K.K.: See—  
Seki, Fumio, 4,420,071, Cl. 192-134.000.

Yoshida, Kunio, to Sharp Kabushiki Kaisha. Electronic word retrieval device for searching and displaying one of different forms of a word entered. 4,420,816, Cl. 364-900.000.

Yoshida, Kunio, to Sharp Kabushiki Kaisha. Word endings inflection means for use with electronic translation device. 4,420,817, Cl. 364-900.000.

Yoshida, Minoru: See—  
Yamada, Hiromichi; Suzuki, Atsushi; Oba, Yoichi; Uchida, Yoko; Kohno, Hideki; Fukuno, Tadashi; and Yoshida, Minoru, 4,420,444, Cl. 264-21.000.

Yoshida, Tomio; Nagashima, Michiyoshi; Harigae, Shunji; Ichinose, Makoto; and Wakami, Noboru, to Matsushita Electric Industrial Co., Ltd. Optical recording and/or reproducing device. 4,420,828, Cl. 369-47.000.

Yoshie, Kato; Kyoji, Nakanishi; and Tsutomu, Nozaki, to Kawasaki Steel Corporation. Method for controlling the bottom-blowing gas in top-and-bottom blown converter steel making. 4,420,334, Cl. 75-60.000.

Yoshikawa, Kenji: See—  
Amano, Takehiro; Ogawa, Toshihisa; Yoshikawa, Kenji; Shiobara, Yoshinori; Sano, Tatsuhiko; Ohuchi, Yutaka; Tanami, Tohru; Ito, Shoichi; and Sawada, Jiro, 4,420,631, Cl. 560-104.000.

Yoshikawa, Toshiyuki: See—  
Otsuka, Saburo; Yoshikawa, Toshiyuki; Tokuda, Shoichi; and Ito, Yuusuke, 4,420,470, Cl. 424-28.000.



- Yoshimura, Hirofumi: See—  
Ueda, Masanori; Sumitomo, Hidehiko; and Yoshimura, Hirofumi, 4,420,347, Cl. 148-12.00E.
- Yoshimura, Noriaki: See—  
Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, 4,420,640, Cl. 568-454.000.
- Yoshioka, Yoshihiro; and Harima, Hiroshi, to Kuraray Company Limited. Water-absorbing rubber composition. 4,420,588, Cl. 525-93.000.
- Yoshiyasu, Hajimu: See—  
Hisatsune, Fumiyuki; Yamagata, Shinji; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,420,660, Cl. 200-144.00R.
- Yoshizawa, Minoru: See—  
Fukano, Yoshimasa; and Yoshizawa, Minoru, 4,420,409, Cl. 252-78.300.
- Yosida, Akio: See—  
Moriya, Shigeru; Yosida, Akio; Hayashi, Yoshihiro; Kubota, Tatsu-shi; and Katsuno, Mitsuaki, 4,420,173, Cl. 280-804.000.
- Young, Thornton J.: See—  
Karol, James J.; and Young, Thornton J., 4,420,210, Cl. 339-94.00M.
- Yuasa, Sakae: See—  
Ueno, Haruo; Yano, Takefumi; Shimizu, Michimasa; Tamura, Masanori; and Yuasa, Sakae, 4,420,594, Cl. 526-128.000.
- Yugen Kaisha Shindo Sessaku Kenkyusho: See—  
Sotome, Tatsu; and Yokoi, Fumio, 4,419,912, Cl. 82-5.000.
- Yuki, Nakaji; and Kitagawa, Hiroshi, to Director-General of Agency of Industrial Science & Technology. Process for the production of carbon molecular sieves. 4,420,415, Cl. 568-180.000.
- Zabielski, Ray F. Centerline-attached looseleaf notebook page lifter. 4,420,271, Cl. 402-80.00L.
- Zahn, Heinrich; and Falk, Gerhard, to Robert Bosch GmbH. Flutter compensated magnetic tape transducing drive apparatus. 4,420,109, Cl. 226-181.000.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: See—  
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; and Ishii, Kiyoto, 4,420,473, Cl. 424-118.000.
- Zajber, Adolf G.: See—  
Hoffmann, Rudolf; Zajber, Adolf G.; and Hansen, Herbert, 4,420,837, Cl. 373-78.000.
- Zanker, Klaus J.; and Anderson, Gerald, to Sarasota Automation Limited. Method and apparatus for determining the mass flow of a fluid. 4,419,898, Cl. 73-861.020.
- Zasio, John J., to Fujitsu Limited. Method of aligning electron beam apparatus. 4,420,691, Cl. 250-491.100.
- Zavisza, Daniel M., to American Cyanamid Company. Polyurethane elastomers from hindered aliphatic diisocyanates. 4,420,600, Cl. 528-60.000.
- Zelins, Ronald P.: See—  
Martinez, Manuel; and Zelins, Ronald P., 4,420,125, Cl. 242-77.000.
- Zerlik, Willibald, to BBC Brown, Boveri & Company, Limited. Electrical connection. 4,420,198, Cl. 339-5.00R.
- Zilog, Inc.: See—  
Hodge, Robin H.; and Brodsky, Mark A., 4,420,767, Cl. 357-81.000.
- Zimmer, Ernst, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Method and apparatus for reproducibly associating two mechanical elements which are movable relative to each other. 4,419,831, Cl. 33-181.00R.
- Zimmermann, Ulrich, to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung. Method of enzymatically converting a substrate using membrane vesicles. 4,420,559, Cl. 435-99.000.
- Zoleski, Benjamin H.: See—  
Sung, Rodney L.; Zoleski, Benjamin H.; Cullen, William P.; and Kablaoui, Mahmoud S., 4,420,407, Cl. 252-33.400.
- Zolotov, Lev A.: See—  
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Kabanov, Pavel S.; Potekhin, Konstantin F.; Zolotov, Lev A.; Karymov, Anatoly A.; Nikolsky, Alexandr I.; Nemeni, Tibor M.; Bezchastnov, Gennady A.; and Morin, Jury E., 4,420,701, Cl. 310-54.000.
- Zonco Federico & Figlio di Federico, Pietro e Placido Zonco S.n.c.: See—  
Zonco, Placido; and Zonco, Maurizio, 4,419,871, Cl. 68-22.00R.
- Zonco, Maurizio: See—  
Zonco, Placido; and Zonco, Maurizio, 4,419,871, Cl. 68-22.00R.
- Zonco, Placido; and Zonco, Maurizio, to Zonco Federico & Figlio di Federico, Pietro e Placido Zonco S.n.c. Filling machine for textile material in continuous rope form or in hose form. 4,419,871, Cl. 68-22.00R.
- Zuev, Vyacheslav S.: See—  
Belkin, German S.; Voskresensky, Stal N.; Kiselev, Viktor Y.; Lukatskaya, Ida A.; Rodionov, Valery V.; Skurikhin, Mikhail N.; Frolova, Irina B.; Zuev, Vyacheslav S.; Kornev, Lev I.; Chervonenkis, Rauza A.; Rabinovich, Efim M.; Volkova, Tatyana P.; and Goryaev, German A., 4,420,346, Cl. 148-4.000.
- Zumfeld, Heinz: See—  
Becker, Rolf; Bertrams, Josef; Grabatsch, Franz; Kathke, Gregor; Kiesewetter, Wolfgang; Knors, Herbert; Leven, Jakob; Quack, Erich; Rautenberg, Klaus; Rohner, Joachim; Rosen, Klaus; Wilms, Gunter; and Zumfeld, Heinz, 4,419,860, Cl. 57-22.000.
- Rohner, Joachim; Zumfeld, Heinz; Mauries, Reinhard; and Preuhs, Hans-Jürgen, 4,419,858, Cl. 57-22.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF DECEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Automation Industries, Inc.: See—  
McCormick, Larry L.; and Selk, Ben F., Re. 31,462, Cl. 339-90.00R.
- Callery, Patrick S.: See—  
Loberg, Michael D.; Callery, Patrick S.; and Cooper, Malcolm, Re. 31,463, Cl. 424-1.100.
- Cooper, Malcolm: See—  
Loberg, Michael D.; Callery, Patrick S.; and Cooper, Malcolm, Re. 31,463, Cl. 424-1.100.
- Loberg, Michael D.; Callery, Patrick S.; and Cooper, Malcolm, to Research Corporation. Radiopharmaceutical chelates and method of external imaging. Re. 31,463, Cl. 424-1.100.
- Martin, David O.; and Martin, Lawrence G., to Martin Overhead Door and Electronics Co. Method of preparing a section for an overhead door. Re. 31,461, Cl. 29-526.00R.
- Martin, Lawrence G.: See—  
Martin, David O.; and Martin, Lawrence G., Re. 31,461, Cl. 29-526.00R.
- Martin Overhead Door and Electronics Co.: See—  
Martin, David O.; and Martin, Lawrence G., Re. 31,461, Cl. 29-526.00R.
- McCormick, Larry L.; and Selk, Ben F., to Automation Industries, Inc. Electrical connector. Re. 31,462, Cl. 339-90.00R.
- Research Corporation: See—  
Loberg, Michael D.; Callery, Patrick S.; and Cooper, Malcolm, Re. 31,463, Cl. 424-1.100.
- Selk, Ben F.: See—  
McCormick, Larry L.; and Selk, Ben F., Re. 31,462, Cl. 339-90.00R.

## LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Callender, Maurice E.; and Jeffers, Thomas K., to Eli Lilly and Company. Anticoccidial combinations comprising nicarbazin and the polyether antibiotics. B1 4,218,438, 12-13-83, Cl. 424-251.000.
- Clark, Steven D.: See—  
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., B1 4,360,288, Cl. 403-268.000.
- Eli Lilly and Company: See—  
Callender, Maurice E.; and Jeffers, Thomas K., B1 4,218,438, Cl. 424-251.000.
- Fiberflex Products, Inc.: See—  
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., B1 4,360,288, Cl. 403-268.000.
- Freeman, John E.: See—  
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., B1 4,360,288, Cl. 403-268.000.
- Green, Philip S.; Saraf, Dilip G.; and Havlice, James F., to SRI International. Ultrasonic imaging method and apparatus with electronic beam focusing and scanning. B1 4,305,296, 12-13-83, Cl. 73-626.000.
- Havlice, James F.: See—  
Green, Philip S.; Saraf, Dilip G.; and Havlice, James F., B1 4,305,296, Cl. 73-626.000.
- Jeffers, Thomas K.: See—  
Callender, Maurice E.; and Jeffers, Thomas K., B1 4,218,438, Cl. 424-251.000.
- Rutledge, Russell P.: See—  
Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., B1 4,360,288, Cl. 403-268.000.
- Rutledge, Woodrow T., Jr.; Rutledge, Russell P.; Freeman, John E.; and Clark, Steven D., to Fiberflex Products, Inc. Fiberglass sucker rod construction. B1 4,360,288, 12-13-83, Cl. 403-268.000.
- Saraf, Dilip G.: See—  
Green, Philip S.; Saraf, Dilip G.; and Havlice, James F., B1 4,305,296, Cl. 73-626.000.
- SRI International: See—  
Green, Philip S.; Saraf, Dilip G.; and Havlice, James F., B1 4,305,296, Cl. 73-626.000.

## LIST OF DESIGN PATENTEEES

- Abbott Laboratories: See—  
Araujo, Antonino, Jr., 271,798, Cl. D24-46.000.
- Larkin, Mark E.; Tripp, Edward S.; and Ziegler, John S., 271,803, Cl. D24-58.000.
- Larkin, Mark E.; Tripp, Edward S.; and Ziegler, John S., 271,805, Cl. D24-58.000.
- Agfa-Gevaert AG: See—  
Schlagheck, Norbert; and Rabold, Lutz, 271,777, Cl. D16-34.000.
- Aldrich, Thomas, to Thermo-Tech Corp. Wind controlled sprayer unit. 271,790, 12-13-83, Cl. D23-18.000.
- Alpha Enterprises, Inc.: See—  
Hehn, Bruce A., 271,736, Cl. D6-184.000.
- American Cyanamid Company: See—  
Li, Lehmann K.; and Butter, Reinhart, 271,742, Cl. D8-48.000.
- Applications Industrielles et Artistiques des Matieres Plastiques Apia: See—  
Mabille, Pierre H. G.; and Perrin, Yannick A. R., 271,778, Cl. D19-64.000.
- Araujo, Antonino, Jr., to Abbott Laboratories. Premature nipple or the like. 271,798, 12-13-83, Cl. D24-46.000.
- Atkins, Ian, to Nolato A.B. Urine collecting device for men. 271,799, 12-13-83, Cl. D24-51.000.
- Axton, Hoyt W.; and Bailey, Corey B., to Sierra Survival Company, Inc. Flashlight. 271,808, 12-13-83, Cl. D26-37.000.
- Axton, Hoyt W.; and Bailey, Corey B., to Sierra Survival Company, Inc. Flashlight. 271,809, 12-13-83, Cl. D26-37.000.
- Axton, Hoyt W.; and Bailey, Corey B., to Sierra Survival Company, Inc. Flashlight. 271,810, 12-13-83, Cl. D26-37.000.
- Bailey, Corey B.: See—  
Axton, Hoyt W.; and Bailey, Corey B., 271,808, Cl. D26-37.000.
- Axton, Hoyt W.; and Bailey, Corey B., 271,809, Cl. D26-37.000.
- Axton, Hoyt W.; and Bailey, Corey B., 271,810, Cl. D26-37.000.
- Bayerische Motoren Werke Aktiengesellschaft: See—  
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 271,811, Cl. D26-122.000.
- Beekenkamp, Gerald; and Curtis, Donald. Playground equipment ladder. 271,785, 12-13-83, Cl. D21-244.000.
- Beekenkamp, Gerald; and Curtis, Donald. Playground equipment step. 271,786, 12-13-83, Cl. D21-245.000.
- Boeing Company, The: See—  
Chamberlain, Michael J.; Myers, David R.; and Furlong, Donald R., 271,731, Cl. D6-114.000.
- Borg-Warner Chemicals, Inc.: See—  
Hardee, Carl L.; and Wagner, Robert E., 271,789, Cl. D23-2.000.



## LIST OF DESIGN PATENTEES

- Borglum, Keith B. Vertically adjustable cantilevered grill. 271,740, 12-13-83, Cl. D7-332.000.
- Braun, Hans: See—  
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 271,811, Cl. D26-122.000.
- Brendling, Lennart I., to Landstingens Inkopscentral, Lic. Male incontinence pad. 271,800, 12-13-83, Cl. D24-51.000.
- Brittner, Frank W., to J & J Snack Food Corp. Display case. 271,735, 12-13-83, Cl. D6-172.000.
- Brown, Wilbert C.; and Pomponi, Roman F., to TIE/Communications, Inc. Direct station selection console. 271,763, 12-13-83, Cl. D14-66.000.
- Burns, David W. Rocking chair. 271,728, 12-13-83, Cl. D6-49.000.
- Butter, Reinhart: See—  
Li, Lehmann K.; and Butter, Reinhart, 271,742, Cl. D8-48.000.
- Campana, Alfred, to Florists' Transworld Delivery Association. Floral container. 271,751, 12-13-83, Cl. D11-151.000.
- Campbell, David L.: See—  
Patterson, Thomas C.; and Campbell, David L., 271,759, Cl. D12-158.000.
- Cannondale Corporation: See—  
Patterson, Thomas C.; and Campbell, David L., 271,759, Cl. D12-158.000.
- Carbajales Santa-Eulalia, Javier B.: See—  
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 271,752, Cl. D11-158.000.
- Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Co., Inc. Figurine of a Collie pup. 271,752, 12-13-83, Cl. D11-158.000.
- Caskey, Margaret; and Jernigan, Doyle D., to Wood-Arts Company, Inc. Golf club head. 271,784, 12-13-83, Cl. D21-220.000.
- Chamberlain, Michael J.; Myers, David R.; and Furlong, Donald R., 12-13-83, Cl. D6-114.000.
- Chrones, Anthony, to Gerber Products Company. Nipple for a screw cap bottle. 271,797, 12-13-83, Cl. D24-46.000.
- Claxton, Bruce A.: See—  
Eckmann, John A.; and Claxton, Bruce A., 271,766, Cl. D14-86.000.
- Collin, Pierre, to Spontex Societe Anonyme. Sponge. 271,817, 12-13-83, Cl. D32-40.000.
- Combi Co., Ltd.: See—  
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, 271,795, Cl. D23-148.000.
- Compagnie Generale des Etablissements Michelin: See—  
Gorez, Jean-Philippe, 271,756, Cl. D12-147.000.
- Ricquet, Joel, 271,755, Cl. D12-147.000.
- Cordis Dow Corp.: See—  
Preussner, Andreas, 271,801, Cl. D24-51.000.
- Preussner, Andreas, 271,802, Cl. D24-51.000.
- Cragin, Richard, to Textron Inc. Fork or similar article of flatware. 271,738, 12-13-83, Cl. D7-137.000.
- Curtis, Donald: See—  
Beekenkamp, Gerald; and Curtis, Donald, 271,785, Cl. D21-244.000.
- Beekenkamp, Gerald; and Curtis, Donald, 271,786, Cl. D21-245.000.
- Custom Craft Pickup Covers Corporation: See—  
Miller, William A., 271,757, Cl. D12-156.000.
- Daenen, Robert H. C. M.; and Herlow, Erik, to Dart Industries Inc. Ice cube tray. 271,769, 12-13-83, Cl. D15-90.000.
- Daimler-Benz Aktiengesellschaft: See—  
Zimmermann, Gert; and Langenbeck, Andreas, 271,760, Cl. D12-209.000.
- Dart Industries Inc.: See—  
Daenen, Robert H. C. M.; and Herlow, Erik, 271,769, Cl. D15-90.000.
- Davenport, Roger. Mobile storage unit. 271,733, 12-13-83, Cl. D6-166.000.
- Doddrill, Richard W. Adjustable bed. 271,729, 12-13-83, Cl. D6-84.000.
- Drake, Craig D., to Ring King Visibles, Inc. Storage tray for print-wheels. 271,726, 12-13-83, Cl. D3-74.000.
- DuBois, R. Clark; and Hamma, John C., to Gradco/Dendoki, Inc. Copying and sorting apparatus. 271,775, 12-13-83, Cl. D16-31.000.
- Durst A.G. Fabrik Fototechnischer Apparate: See—  
Vikoler, Florian, 271,774, Cl. D16-25.000.
- Dynapac Maskin AB: See—  
Ekelund, Bo, 271,773, Cl. D15-147.000.
- Eckmann, John A.; and Claxton, Bruce A., to Motorola, Inc. Portable radio whip antenna or similar article. 271,766, 12-13-83, Cl. D14-86.000.
- Eckmann, John A.: See—  
Toth, Richard J.; and Eckmann, John A., 271,764, Cl. D14-68.000.
- Ekelund, Bo, to Dynapac Maskin AB. Poker vibrator electric drive unit. 271,773, 12-13-83, Cl. D15-147.000.
- Eldon Industries, Inc.: See—  
Riccio, Ronald, 271,741, Cl. D8-30.000.
- Elliott, Quenton T.; and Elliott, Quenton T., Jr. Belt. 271,724, 12-13-83, Cl. D2-385.000.
- Elliott, Quenton T., Jr.: See—  
Elliott, Quenton T.; and Elliott, Quenton T., Jr., 271,724, Cl. D2-385.000.
- Ervin, Dennis L. Bicycle mounted carrying case. 271,758, 12-13-83, Cl. D12-158.000.
- Extraversion, Inc.: See—  
Ytter, Willy, 271,732, Cl. D6-139.000.
- Fabridyne, Inc.: See—  
Sommerfeld, John E., 271,768, Cl. D15-27.000.
- Finley, Randall B. Ammo pouch. 271,787, 12-13-83, Cl. D22-14.000.
- Florists' Transworld Delivery Association: See—  
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- Omata, Nobuaki, to Nifco Inc. Lid movement damping device or the like. 271,745, 12-13-83, Cl. D8-400.000.
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## CLASSIFICATION OF PATENTS

ISSUED DECEMBER 13, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

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434	4,419,804	436	0.5 AA	4,420,330	207	4,419,954	129	4,420,021	245	4,420,055
458	4,419,805	501	6	4,420,331	227	4,419,955	147	4,420,022	45	4,420,049
526 R	Re.31.461	523	6	4,420,332	235	4,419,956	18	4,420,023	374	4,420,050
568	4,419,806	CLASS 56	55	4,420,333	245	4,419,957	10	4,420,024	25	4,420,051
571	4,419,807	11.3	60	4,420,334	405	4,419,958	18	4,420,025	132	4,420,052
	4,419,808	CLASS 57	124	4,420,335	657	4,419,959	198	4,420,026	139	4,420,053
	4,419,809	22	246	4,420,336	712	4,419,960	10	4,420,027	154	4,420,054
	4,419,810	261	CLASS 81		14.03	4,419,961	10	4,420,028	212	4,420,055
	4,419,811	562	62	4,419,911	17	4,419,962	18	4,420,029	245	4,420,056
	4,419,812	748	CLASS 82		51 R	4,419,963	18	4,420,030	6.04	4,420,056
	4,419,813	CLASS 60	5	4,419,912	4 D	4,419,964	18	4,420,031	156 A	4,420,057
	4,419,814	562	CLASS 83		4 D	4,419,965	18	4,420,032	54 A	4,420,057
	4,419,815	748	407	4,419,913	403	4,419,966	18	4,420,033	68 P	4,420,058
	4,419,816	CLASS 62	887	4,419,915	CLASS 123		2	4,420,034	248	4,420,059
	4,419,817	20	CLASS 84		1 A	4,419,967	2	4,420,035	300	4,420,060
	4,419,818	98	1.01	4,419,916	3	4,419,968	361 DM	4,420,036	1	4,420,061
	4,419,819	193	1.03	4,419,917	41.74	4,419,969	2	4,420,037	166	4,420,062
576 W	4,419,820	228.4	1.27	4,419,918	48 R	4,419,970	2	4,420,038	204	4,420,062
605	4,419,821	514 JT	115	4,419,919	193 C	4,419,971	2	4,420,039	229	4,420,063
623.2	4,419,822	542	467	4,419,920	337	4,419,972	2	4,420,040		
724	4,419,823	CLASS 66	115	4,419,921	396	4,419,973	2	4,420,041		
749	4,419,824	195	440	4,419,922	418	4,419,974	2	4,420,042		
832	4,419,825	CLASS 68	458	4,419,923	440	4,419,975	2	4,420,043		
857	4,419,826	5 D	502	4,419,924	458	4,419,976	2	4,420,044		
	4,419,827	18 FA	43 R	4,419,925	502	4,419,977	2	4,420,045		
	4,419,828	22 R	CLASS 91		CLASS 124		2	4,420,046		
	4,419,829	CLASS 70	460	4,419,926	62	4,419,978	2	4,420,047		
	4,419,830	18	CLASS 92		CLASS 125		2	4,420,048		
	4,419,831	38 A	27	4,419,927	11 R	4,419,979	2	4,420,049		
	4,419,832	459	212	4,419,928	CLASS 126		2	4,420,050		
		CLASS 71	CLASS 98		247	4,419,980	2	4,420,051		
		5	1.5	4,419,928	425	4,419,981	2	4,420,052		
		13	CLASS 99		426	4,419,982	2	4,420,053		
		43	275	4,419,927	434	4,419,983	2	4,420,054		
		82	7	4,419,928	439	4,419,984	2	4,420,055		
		87	CLASS 100		CLASS 128		2	4,420,056		
		92	1 R	4,419,929	1 R	4,419,985	2	4,420,057		



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CLASS 198	128 4,420,074	CLASS 221	265 4,420,095	CLASS 254	158 4,420,182	63 R 4,420,204	81 4,420,767
347 4,420,073	CLASS 222	134.3 PA 4,420,143	CLASS 256	181 4,420,183	74 R 4,420,205	CLASS 358	
735 4,420,075	44 4,420,096	345 4,420,144	62.54 4,420,408	221 4,420,184	75 M 4,420,206	107 4,420,768	
CLASS 200	111 4,420,097	CLASS 260	112.5 R 4,420,424	223 4,420,185	88 R 4,420,207	139 4,420,769	
67 A 4,420,659	190 4,420,098	123.5 4,420,425	245.2 R 4,420,426	CLASS 297	90 R 4,420,208	183 4,420,770	
144 B 4,420,661	205 4,420,099	397.25 4,420,427	410.9 R 4,420,428	284 4,420,186	91 R 4,420,209	261 4,420,771	
144 R 4,420,660	212 4,420,101	429 R 4,420,429	465.9 4,420,430	CLASS 299	94 M 4,420,210	294 4,420,772	
159 B 4,420,663	CLASS 223	429 R 4,420,430	501.11 4,420,431	17 4,420,187	98 4,420,211	335 4,420,773	
302 4,420,665	34 4,420,102	501.12 4,420,432	544 D 4,420,433	31 4,420,188	113 L 4,420,212		
308 4,420,664	CLASS 224	544 D 4,420,433	544 D 4,420,433	40 4,420,189	116 R 4,420,213		
340 4,420,666	210 4,420,103	544 D 4,420,433	544 D 4,420,433	CLASS 301	147 P 4,420,214		
CLASS 202	280 4,420,104	544 D 4,420,433	544 D 4,420,433	63 R 4,420,190	176 R 4,420,215		
173 4,420,373	328 4,420,105	544 D 4,420,433	544 D 4,420,433	CLASS 303	183 4,420,216		
176 4,420,374	CLASS 225	544 D 4,420,433	544 D 4,420,433	28 4,420,740			
234 4,420,375	2 4,420,106	544 D 4,420,433	544 D 4,420,433	29 4,420,741			
CLASS 203	32 4,420,107	544 D 4,420,433	544 D 4,420,433	347 AD 4,420,742			
29 4,420,376	181 4,420,108	544 D 4,420,433	544 D 4,420,433	365 E 4,420,744			
CLASS 204	32 4,420,107	544 D 4,420,433	544 D 4,420,433	510 4,420,745			
28 4,420,377	181 4,420,108	544 D 4,420,433	544 D 4,420,433	630 4,420,746			
35 N 4,420,378	34 4,420,109	544 D 4,420,433	544 D 4,420,433	674 4,420,747			
38 A 4,420,379	54 4,420,110	544 D 4,420,433	544 D 4,420,433	715 4,420,748			
66 4,420,380	7 4,420,111	544 D 4,420,433	544 D 4,420,433	763 4,420,749			
70 4,420,381	72 4,420,112	544 D 4,420,433	544 D 4,420,433	791 4,420,750			
147 4,420,382	472 4,420,682	544 D 4,420,433	544 D 4,420,433	825.33 4,420,751			
180 G 4,420,383	492 4,420,683	544 D 4,420,433	544 D 4,420,433	870.17 4,420,752			
192 N 4,420,386	CLASS 236	544 D 4,420,433	544 D 4,420,433	870.26 4,420,753			
192 R 4,420,385	118 4,420,450	544 D 4,420,433	544 D 4,420,433	870.37 4,420,754			
263 4,420,387	173 4,420,451	544 D 4,420,433	544 D 4,420,433	870.38 4,420,755			
CLASS 206	328.8 4,420,452	544 D 4,420,433	544 D 4,420,433	CLASS 343			
37 4,420,076	502 4,420,453	544 D 4,420,433	544 D 4,420,433	16 M 4,420,756			
45.14 4,420,077	512 4,420,454	544 D 4,420,433	544 D 4,420,433	912 4,420,757			
305 4,420,078	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 346			
315.4 4,420,079	512 4,420,454	544 D 4,420,433	544 D 4,420,433	76 PH 4,420,758			
387 4,420,080	512 4,420,454	544 D 4,420,433	544 D 4,420,433	82 4,420,759			
449 4,420,081	512 4,420,454	544 D 4,420,433	544 D 4,420,433	108 4,420,760			
519 4,420,082	512 4,420,454	544 D 4,420,433	544 D 4,420,433	136 4,420,761			
526 4,420,083	512 4,420,454	544 D 4,420,433	544 D 4,420,433	139 R 4,420,763			
538 4,420,084	512 4,420,454	544 D 4,420,433	544 D 4,420,433	140 R 4,420,764			
566 4,420,085	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 350			
571 4,420,086	512 4,420,454	544 D 4,420,433	544 D 4,420,433	3.85 4,420,218			
CLASS 208	512 4,420,454	544 D 4,420,433	544 D 4,420,433	96.18 4,420,219			
112 4,420,388	512 4,420,454	544 D 4,420,433	544 D 4,420,433	96.23 4,420,220			
251 R 4,420,389	512 4,420,454	544 D 4,420,433	544 D 4,420,433	167 4,420,221			
CLASS 209	512 4,420,454	544 D 4,420,433	544 D 4,420,433	295 4,420,222			
216 4,420,390	512 4,420,454	544 D 4,420,433	544 D 4,420,433	310 4,420,223			
403 4,420,391	512 4,420,454	544 D 4,420,433	544 D 4,420,433	338 4,420,224			
CLASS 210	512 4,420,454	544 D 4,420,433	544 D 4,420,433	362 4,420,225			
86 4,420,392	512 4,420,454	544 D 4,420,433	544 D 4,420,433	409 4,420,226			
101 4,420,393	512 4,420,454	544 D 4,420,433	544 D 4,420,433	427 4,420,227			
169 4,420,394	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 351			
263 4,420,395	512 4,420,454	544 D 4,420,433	544 D 4,420,433	138 4,420,227			
416.4 4,420,396	512 4,420,454	544 D 4,420,433	544 D 4,420,433	212 4,420,228			
611 4,420,397	512 4,420,454	544 D 4,420,433	544 D 4,420,433	224 4,420,229			
641 4,420,398	512 4,420,454	544 D 4,420,433	544 D 4,420,433	565 4,420,814			
700 4,420,399	512 4,420,454	544 D 4,420,433	544 D 4,420,433	724 4,420,815			
710 4,420,400	512 4,420,454	544 D 4,420,433	544 D 4,420,433	900 4,420,816			
714 4,420,401	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 365			
783 4,420,402	512 4,420,454	544 D 4,420,433	544 D 4,420,433	105 4,420,820			
787 4,420,403	512 4,420,454	544 D 4,420,433	544 D 4,420,433	154 4,420,821			
808 4,420,404	512 4,420,454	544 D 4,420,433	544 D 4,420,433	182 4,420,822			
CLASS 211	512 4,420,454	544 D 4,420,433	544 D 4,420,433	206 4,420,823			
46 4,420,086	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 366			
189 4,420,087	512 4,420,454	544 D 4,420,433	544 D 4,420,433	110 4,420,262			
CLASS 213	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 367			
50.5 4,420,088	512 4,420,454	544 D 4,420,433	544 D 4,420,433	98 4,420,824			
CLASS 215	512 4,420,454	544 D 4,420,433	544 D 4,420,433	122 4,420,825			
216 4,420,089	512 4,420,454	544 D 4,420,433	544 D 4,420,433	167 4,420,826			
CLASS 219	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 368			
10.41 4,420,667	512 4,420,454	544 D 4,420,433	544 D 4,420,433	80 4,420,263			
10.55 B 4,420,668	512 4,420,454	544 D 4,420,433	544 D 4,420,433	223 4,420,264			
428 4,420,669	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 369			
491.1 4,420,670	512 4,420,454	544 D 4,420,433	544 D 4,420,433	43 4,420,827			
10.81 4,420,671	512 4,420,454	544 D 4,420,433	544 D 4,420,433	47 4,420,828			
69 W 4,420,672	512 4,420,454	544 D 4,420,433	544 D 4,420,433	103 4,420,829			
73.1 4,420,673	512 4,420,454	544 D 4,420,433	544 D 4,420,433	261 4,420,830			
78.16 4,420,674	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 370			
99 4,420,675	512 4,420,454	544 D 4,420,433	544 D 4,420,433	50 4,420,831			
121 LM 4,420,676	512 4,420,454	544 D 4,420,433	544 D 4,420,433	56 4,420,832			
160 4,420,677	512 4,420,454	544 D 4,420,433	544 D 4,420,433	83 4,420,833			
341 4,420,678	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 372			
387 4,420,679	512 4,420,454	544 D 4,420,433	544 D 4,420,433	35 4,420,834			
400 4,420,680	512 4,420,454	544 D 4,420,433	544 D 4,420,433	88 4,420,835			
469 4,420,681	512 4,420,454	544 D 4,420,433	544 D 4,420,433	98 4,420,836			
521 4,420,682	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 373			
CLASS 220	512 4,420,454	544 D 4,420,433	544 D 4,420,433	78 4,420,837			
3.7 4,420,090	512 4,420,454	544 D 4,420,433	544 D 4,420,433	92 4,420,838			
37 4,420,091	512 4,420,454	544 D 4,420,433	544 D 4,420,433	CLASS 374			
254 4,420,092	512 4,420,454	544 D 4,420,433	544 D 4,420,433	133 4,420,265			
306 4,420,093	512 4,420,454	544 D 4,420,433	544 D 4,420,433				

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CLASS 376	338	4,420,291	577	4,420,297	564	4,420,543	169	4,420,417	102	4,420,612	
245	4,420,455	CLASS 418	241	4,420,492	CLASS 429	13	4,420,544	261	4,420,420	CLASS 544	
446	4,420,456	47	4,420,293	420	4,420,493	101	4,420,545	316	4,420,421	51	4,420,613
447	4,420,458	CLASS 419	441	4,420,494	CLASS 430			112	4,420,570	163	4,420,614
CLASS 381	61	4,420,459	564	4,420,495	57	4,420,546	CLASS 521			279	4,420,615
15	4,420,658	CLASS 420	609	4,420,496		4,420,547	149	4,420,571	5	4,420,616	
94	4,420,655	417	8	4,420,497	59	4,420,548	322	4,420,572	257	4,420,617	
CLASS 400		CLASS 422	39	4,420,498	158	4,420,549	333	4,420,573	345	4,420,618	
124	4,420,266	61	53.1	4,420,499	223	4,420,550	404	4,420,574			
149	4,420,267	201	54.1	4,420,500	234	4,420,551	504	4,420,575	352	4,420,619	
233	4,420,268	266		4,420,501	252	4,420,552			554	4,420,620	
356	4,420,269	CLASS 423	85	4,420,502	446	4,420,553	47	4,420,576	CLASS 548		
CLASS 402			90	4,420,503	507	4,420,554	83	4,420,577	322	4,420,621	
76	4,420,270	65	4,420,464	420,504	549	4,420,556	322	4,420,578	326	4,420,622	
80 L	4,420,271	242	4,420,465	420,505	559	4,420,557	328	4,420,579	361	4,420,623	
CLASS 403		304	4,420,466	420,506			424	4,420,580	386	4,420,624	
4	4,420,272	328	4,420,467	420,507	359	4,420,301	431	4,420,581	394	4,420,625	
24	4,420,273	382	4,420,468	420,508	CLASS 431		450	4,420,582	501	4,420,626	
227	4,420,274	592	4,420,469	420,509	CLASS 432		502	4,420,583	548	4,420,627	
268	BI 4,360,288	CLASS 424		4,420,510	14	4,420,302	769	4,420,584	593	4,420,628	
CLASS 405		Re. 31,463	236	4,420,511	83	4,420,303		4,420,585	CLASS 560		
217	4,420,275	28	386	4,420,512	CLASS 433		39	4,420,587	17	4,420,628	
224	4,420,276	49	407.1	4,420,513	176	4,420,305	93	4,420,588	70	4,420,629	
260	4,420,277	58	430.1	4,420,514	228	4,420,306		4,420,589	104	4,420,630	
301	4,420,278	118			CLASS 428		357	4,420,590	119	4,420,632	
CLASS 406		121	29	4,420,515		4,420,515			232	4,420,633	
14	4,420,279	184	35	4,420,516	7	4,420,517			CLASS 562		
CLASS 407		232	40	4,420,518	99	4,420,519	62	4,420,591		4,420,634	
109	4,420,280	246	42	4,420,520	134	4,420,520	65	4,420,592	512.2	4,420,635	
CLASS 411		248.4	74	4,420,521	161	4,420,561	128	4,420,593	555	4,420,636	
392	4,420,281	250	95	4,420,522	227	4,420,562		4,420,594	589		
CLASS 412		251	109	4,420,523	245	4,420,563	141	4,420,595			
4	4,420,282	253	110	4,420,524	288	4,420,564	212	4,420,596	CLASS 564		
CLASS 413		257	156	4,420,525			261	4,420,597	443	4,420,637	
8	4,420,283	272	171	4,420,526	27	4,420,565	307.5	4,420,598	CLASS 568		
CLASS 414		273 B	172	4,420,527	46	4,420,566	318	4,420,599	180	4,420,641	
17	4,420,284	274	220	4,420,528	139	4,420,567	60	4,420,600	328	4,420,639	
291	4,420,285	275	244	4,420,529	169	4,420,568	76	4,420,601	415	4,420,638	
539	4,420,286	309	323	4,420,530	536		80	4,420,602	454	4,420,640	
729	4,420,287	311	329	4,420,531	327	4,420,839		4,420,603	473	4,420,641	
CLASS 416		326	351	4,420,532	606	4,420,840	93	4,420,604	753	4,420,642	
244 A	4,420,288		372	4,420,533	607	4,420,841	111	4,420,605	806	4,420,644	
CLASS 417		79	379	4,420,534	608	4,420,842	298	4,420,606	937	4,420,645	
216	4,420,289	92	383	4,420,535			324	4,420,607	CLASS 585		
283	4,420,290	101	403	4,420,536	30	4,420,569	486	4,420,609	10	4,420,646	
		142	411	4,420,537		4,420,570	501	4,420,610	269	4,420,647	
		443	450	4,420,538	77	4,420,418			434	4,420,648	
		464	457	4,420,539	168	4,420,416	88	4,420,611		4,420,649	
		464	523	4,420,540							
		464	541	4,420,541							



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1 : 4,419,785	4,420,544	08 : 4,305,296	4,420,232	4,420,076	4,420,170
4,420,208	4,420,657	4,419,982	4,420,254	4,420,217	4,420,176
4,420,314	4,420,665	4,420,820	4,420,261	4,420,255	4,420,184
4,420,762	4,420,679	09 : 4,419,863	4,420,271	4,420,291	4,420,195
4,420,123	4,420,687	4,419,941	4,420,288	4,420,300	4,420,199
4,420,164	4,420,691	4,420,098	4,420,463	4,420,312	4,420,212
4,420,262	4,420,731	4,420,183	4,420,541	4,420,350	4,420,290
4,420,786	4,420,756	4,420,487	4,420,567	4,420,356	4,420,311
4,419,778	4,420,767	4,420,602	4,420,568	4,420,369	4,420,354
4,419,798	4,420,780	10 : 4,420,325	4,420,586	4,420,400	4,420,390
4,419,811	4,420,798	4,420,422	4,420,590	4,420,437	4,420,416
4,419,815	4,420,799	4,420,611	4,420,608	4,420,492	4,420,585
4,419,856	4,420,819	4,419,794	4,420,609	4,420,521	4,420,604
4,419,873	4,420,836	4,419,839	4,420,649	4,420,533	4,420,623
4,419,886	4,420,849	4,419,996	4,420,663	4,420,600	4,420,624
4,419,900	4,420,872	4,420,005	4,420,706	4,420,842	4,420,632
4,419,903	4,420,886	4,420,087	4,420,744	4,419,792	4,420,681
4,419,961	4,420,900	4,420,120	4,419,851	4,419,855	4,420,752
4,419,991	4,420,919	4,420,165	4,419,902	4,419,928	4,420,829
4,420,000	4,420,016	4,420,438	4,419,970	4,419,980	4,420,831
4,420,019	4,420,047	4,420,720	4,420,014	4,419,999	4,419,796
4,420,047	4,420,095	4,420,740	4,420,089	4,420,010	4,419,819
4,420,095	4,420,707	4,420,806	4,420,116	4,420,266	4,419,866
4,420,097	4,420,770	4,420,834	4,420,206	4,420,297	4,419,872
4,420,101	4,420,808	4,420,840	4,420,292	4,420,398	4,419,993
4,420,102	4,420,103	4,420,054	4,420,392	4,420,401	4,420,082
4,420,103	4,420,138	4,420,137	4,420,479	4,420,403	4,420,100
4,420,160	4,420,168	4,420,529	4,420,489	4,420,449	4,420,189
4,420,174	4,420,187	15 : 4,419,836	4,420,536	4,420,551	4,420,203
4,420,197	4,420,782	17 : 4,419,775	4,420,542	4,420,627	4,420,549
4,420,221	4,420,807	4,419,817	4,420,791	4,420,690	4,420,668
4,420,228	Re.31,462	4,419,853	4,421,838	4,420,692	4,420,736
4,420,231	4,419,808	4,419,857	4,419,832	4,420,709	4,420,790
4,420,251	4,419,837	4,419,893	4,419,907	4,420,714	4,420,794
4,420,265	4,419,884	4,419,931	4,420,119	4,420,746	4,420,803
4,420,286	4,419,891	4,419,949	4,420,136	4,420,795	4,419,914
4,420,306	4,419,926	4,419,959	4,420,154	4,419,777	4,419,989
4,420,322	4,420,107	4,419,984	4,419,950	4,419,835	4,420,003
4,420,323	4,420,319	4,419,998	4,420,340	4,419,840	4,420,171
4,420,352	4,420,359	4,420,023	4,419,905	4,419,843	4,420,399
4,420,375	4,420,365	4,420,048	4,419,969	4,419,870	4,420,645
4,420,385	4,420,460	4,420,052	4,420,006	4,419,875	4,420,169
4,420,394	4,420,466	4,420,068	4,420,011	4,419,885	4,420,105
4,420,455	4,420,497	4,420,077	4,420,376	4,419,908	4,420,056
4,420,458	4,420,505	4,420,084	4,420,405	4,419,962	4,419,895
4,420,459	4,420,545	4,420,085	4,420,836	4,419,977	4,420,027
4,420,464	4,420,689	4,420,093	4,420,818	4,420,022	4,420,249
4,420,496	4,420,772	4,420,141	4,419,774	4,420,081	4,420,277
4,420,504	4,420,776	4,420,148	4,419,927	4,420,094	4,420,825
4,420,509	4,420,811	4,420,182	4,419,936	4,420,127	4,420,826
	4,420,818	4,420,211	4,419,992	4,420,155	Re.31,463
	4,420,839	4,420,213	4,420,035	4,420,156	4,419,848
				4,420,166	4,419,864

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,419,965	4,419,915	37 : 4,419,772	4,420,431	4,420,760	4,420,580
4,419,997	4,420,013	4,419,788	4,420,824	4,420,788	4,420,587
4,420,125	4,420,061	4,420,002	4,420,118	4,420,789	4,420,606
4,420,149	4,420,066	4,420,462	4,420,238	4,420,829	4,420,625
4,420,204	4,420,083	4,420,502	4,420,494	4,419,830	4,420,641
4,420,282	4,420,099	4,420,527	4,420,555	4,420,205	4,420,646
4,420,305	4,420,111	4,420,821	4,420,787	4,420,018	4,420,717
4,420,341	4,420,112	4,420,841	4,419,793	4,420,230	4,360,288
4,420,411	4,420,121	39 : 4,419,771	4,419,803	4,420,507	Re.31,461
4,420,418	4,420,143	4,419,773	4,419,805	4,420,517	4,419,978
4,420,423	4,420,161	4,419,779	4,419,834	4,419,849	4,420,024
4,420,428	4,420,175	4,419,802	4,419,880	4,419,944	4,420,755
4,420,461	4,420,192	4,419,812	4,419,921	4,419,983	4,419,896
4,420,471	4,420,210	4,419,988	4,420,020	4,420,581	4,420,096
4,420,472	4,420,243	4,420,053	4,420,104	4,420,607	4,420,258
4,420,474	4,420,316	4,420,088	4,420,153	4,420,669	4,420,259
4,420,475	4,420,317	4,420,092	4,420,201	4,419,879	4,420,518
4,420,485	4,420,374	4,420,147	4,420,281	4,419,887	4,420,635
4,420,491	4,420,402	4,420,215	4,420,301	4,419,892	53 : 4,419,942
4,420,503	4,420,407	4,420,295	4,420,307	4,419,953	4,420,158
4,420,561	4,420,434	4,420,298	4,420,361	4,419,986	4,420,181
4,420,565	4,420,448	4,420,315	4,420,362	4,420,008	4,420,188
4,420,571	4,420,483	4,420,412	4,420,368	4,420,041	4,420,372
4,420,579	4,420,484	4,420,336	4,420,404	4,420,042	4,420,510
4,420,589	4,420,493	4,420,412	4,420,442	4,420,043	4,420,741
4,420,605	4,420,514	4,420,453	4,420,469	4,420,044	54 : 4,420,040
4,420,621	4,420,515	4,420,519	4,420,520	4,420,480	4,420,202
4,420,626	4,420,525	4,420,520	4,420,552	4,420,499	4,420,584
4,420,643	4,420,535	4,420,596	4,420,574	4,420,552	55 : 4,419,833
4,420,644	4,420,556	4,420,620	4,420,583	4,420,574	4,419,850
4,420,648	4,420,566	4,420,650	4,420,591	4,420,583	4,419,865
4,420,682	4,420,598	4,420,670	4,420,615	4,420,591	4,419,985
4,420,726	4,420,569	4,420,751	4,420,638	4,420,615	4,420,028
4,420,732	4,420,598	4,420,787	4,420,642	4,420,638	4,420,078
4,420,743	4,420,617	4,420,801	4,420,672	4,420,672	4,420,386
4,420,765	4,420,630	4,420,801	4,420,673	4,420,673	4,420,391
4,419,781	4,420,647	4,420,801	4,420,705	4,420,705	4,420,563
4,419,809	4,420,656	4,420,838	4,420,713	4,420,713	4,420,636
4,419,810	4,420,658	4,420,868	4,420,722	4,420,722	4,420,677
4,419,842	4,420,769	4,420,045	4,420,724	4,420,724	4,420,678
4,419,881	4,420,802	4,420,321	4,420,724	4,420,724	4,420,735
4,419,883	4,420,815	4,420,389	4,420,727	4,420,727	4,420,784

## DESIGN PATENTS

06 : 271,725	271,804	12 : 271,796	19 : 271,726	271,794	45 : 271,756
271,729	271,808	271,751	271,740	271,818	271,724
271,734	271,809	271,764	25 : 271,762	271,793	271,737
271,741	271,810	271,766	271,813	271,736	271,765
271,758	271,816	271,791	27 : 271,746	271,754	271,771
271,779	271,742	271,749	271,768	271,798	271,784
271,780	271,750	13 : 271,789	29 : 271,748	42 : 271,735	49 : 271,787
271,781	271,759	17 : 271,783	271,757	271,776	51 : 271,728
271,783	271,763	271,803	36 : 271,730	271,738	53 : 271,731
271,801	271,772	271,805	271,790	271,797	271,788
271,802	271,775	271,753			

## PLANT PATENTS

06 : 5,155	5,156	39 : 5,158			
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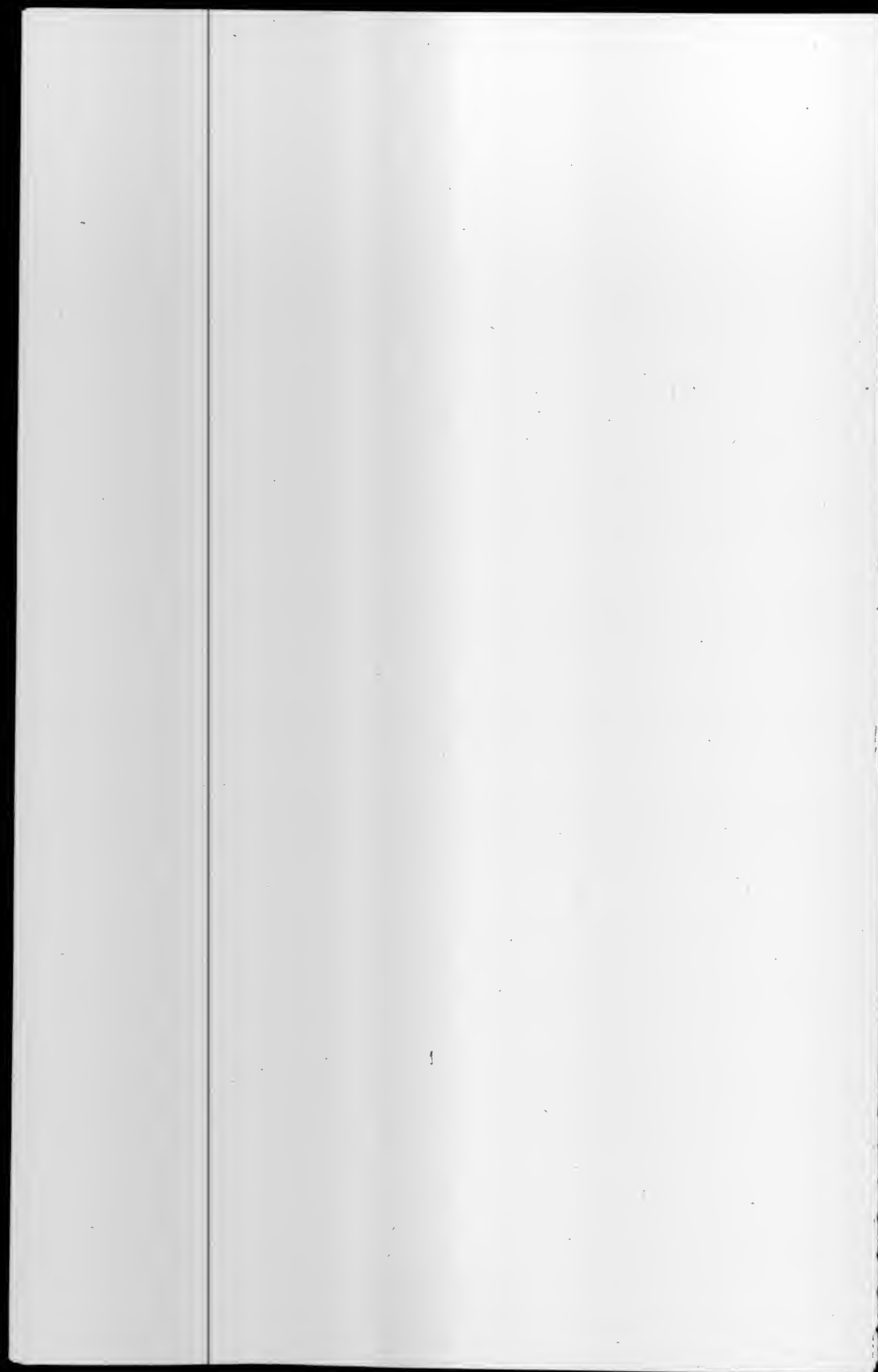
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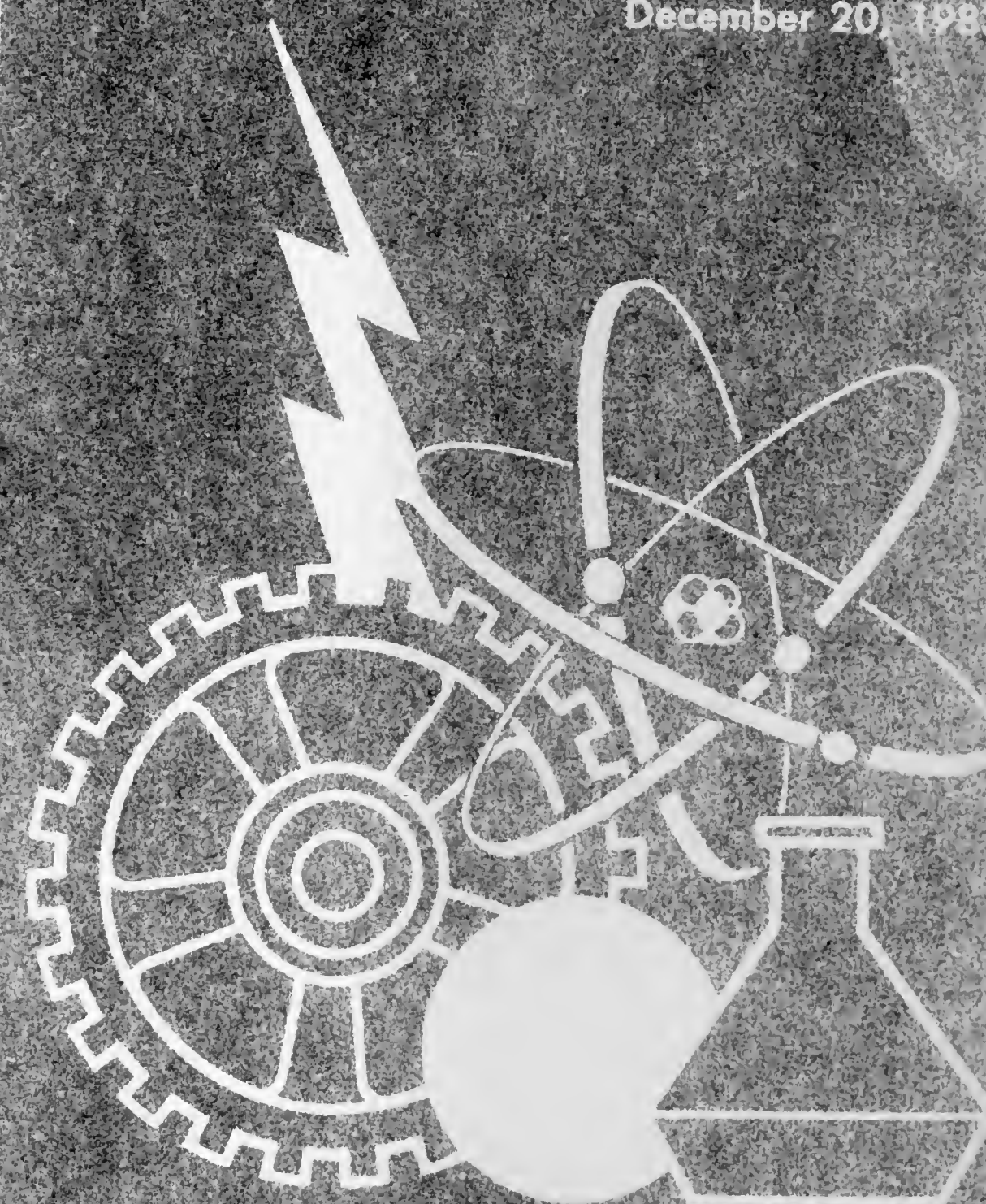
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Malcolm Baldrige, Secretary  
PATENT AND TRADEMARK OFFICE  
Gerald J. Mossinghoff, Commissioner



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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	\$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,  
Commissioner of Patents  
and Trademarks.

Dec. 3, 1982.

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,281,535, Re. S.N. 515,546, Filed July 20, 1983, Cl. 73/49.8, CYLINDER GRIPPING APPARATUS, William E. Wesch, Jr., Owner of Record: *Inventor*, Attorney or Agent: Emil J. Bednar, et al., Ex. Gp.: 244

4,294,787, Re. S.N. 541,566, Filed Oct. 13, 1983, Cl. 264/46.6, METHOD OF PRODUCING REINFORCED COMPOSITE RACKET FRAME, Kun Nan Lo, Owner of Record: *Inventor*, Attorney or Agent: Richard P. Berg, Ex. Gp.: 147

4,295,340, Re. S.N. 543,468, Filed Oct. 19, 1983, Cl. 62/82, REFRIGERATED DISPLAY CASE HAVING AMBIENT AIR DEFROST, Faye F. Ibrahim, Owner of Record: *Tyler Refrigeration Corp., Niles, Mich.*, Attorney or Agent: Henry Shur, et al., Ex. Gp.: 344

4,295,472, Re. S.N. 542,822, Filed Oct. 17, 1983, Cl. 128/690, HEART RATE MONITOR, John M. Adams, Owner of Record: *Medtronic, Inc., Minneapolis, Minn.*, Attorney or Agent: Reed A. Duthler, et al., Ex. Gp.: 335

4,381,825, Re. S.N. 541,701, Filed Oct. 13, 1983, Cl. 175/393, DRILL BIT NOZZLE, Robert P. Radtke, Owner of Record: *Strata Bit Corp., Houston, Tex.*, Attor-

ney or Agent: William L. Mathis, et al., Ex. Gp.: 356

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,379,273, Reexam. No. 90/000,465, Requested: Oct. 31, 1983, Cl. 367/144, POWERFUL SOUND IMPULSE GENERATION METHODS AND APPARATUS, Steven V. Chelminski, Owner of Record: *Bolt Technology Corp., South Norwalk, Conn.*, Attorney or Agent: Roland T. Bryan, Ex. Gp.: 220, Requester: Mark Precision Corp., Houston, Tex.

4,302,920, Reexam. No. 90/000,463, Requested: Oct. 28, 1983, Cl. 53/399, FILM WEB DRIVE STRETCH WRAPPING APPARATUS AND PROCESS, Patrick R. Lancaster, et al., Owner of Record: *Lantech, Inc., Louisville, Ky.*, Attorney or Agent: Gipple & Hale, Ex. Gp.: 170, Requester: Lantech, Inc., Louisville, Ky.

### Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

All That Glitters, Inc. (a Corporation of the State of North Carolina), Charlotte, N.C. Reg. No. 1,096,329, for the mark "ALL THAT GLITTERS," Can. No. 13,329.

Marquay, S.a.r.l., New York, N.Y. Reg. No. 767,970, for the mark "MONSIEUR MARQUAY," Can. No. 13,718.

ERMA S. BROWN,

Deputy Clerk,  
Trademark Trial and  
Appeal Board.

For MARGARET M. LAURENCE,  
Assistant Commissioner  
for Trademarks.

### Transmittals for Use of Deposit Accounts

When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

THERESA A. BRELSFORD,  
Assistant Commissioner  
for Administration.

Nov. 21, 1983.

DECEMBER 20, 1983

U.S. PATENT AND TRADEMARK OFFICE

1037 OG 19

### Inadvertently Issued Registration Numbers

Effective Jan. 3, 1984, a new subsection identified as "Inadvertently Issued Registration Numbers" will exist as the last category of cancellations listed under the "Trademark Registrations Canceled" section of the *Official Gazette*.

This new sub-section will provide public notice of the cancellation of registration numbers which have been inadvertently issued by the Patent and Trademark Office.

MARGARET M. LAURENCE,  
Assistant Commissioner  
for Trademarks.

Nov. 15, 1983.

### Errata

The following registration numbers were inadvertently canceled in the "Trademark Registrations Canceled, Section 8" section of the *Official Gazette* listed below:

1,002,154	TM331	Mar. 8, 1983
1,053,694	TM487	June 28, 1983
1,061,168	TM294	Aug. 9, 1983
1,035,536	TM142	Aug. 2, 1983
1,045,723	TM452	Feb. 15, 1983
1,061,798	TM431	Aug. 16, 1983
1,061,953	TM376	Oct. 18, 1983
1,064,340	TM355	Sept. 20, 1983
1,065,190	TM122	Oct. 4, 1983
1,067,166	TM119	Nov. 1, 1983
1,034,827	TM592	July 27, 1982
1,032,578	TM748	June 29, 1982
1,067,643	TM243	Nov. 8, 1983
1,055,436	TM591	May 31, 1983
1,065,957	TM247	Oct. 11, 1983

Consequently, the above-identified registrations are still active.

MARK M. NEWMAN,  
Director, Trademark  
Examining Operation.

Nov. 15, 1983.

### Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the *Official Gazette* of Oct. 11, 1983 was inadvertently issued:

1,253,539 TMOG Oct. 11, 1983

Consequently, the certificate of registration bearing the above-identified number was not issued on the date indicated, and this registration number has been vacated.

MARK M. NEWMAN,  
Director, Trademark  
Examining Operation.

Nov. 15, 1983.

### Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the *Official Gazette* of Nov. 1, 1983 was inadvertently issued:

1,256,417 TMOG Nov. 1, 1983

Consequently, the certificate of registration bearing the above-identified number was not issued on the date indicated, and this registration number has been vacated.

MARK M. NEWMAN,  
Director, Trademark  
Examining Operation.

Nov. 15, 1983.



# PATENT NOTICES

## Certificates of Correction for the Week of Dec. 20, 1983

D. 260,733	4,373,617	4,395,179	4,403,209
D. 270,536	4,375,947	4,395,260	4,403,414
3,922,163	4,378,649	4,395,373	4,403,614
4,117,436	4,379,788	4,395,520	4,403,785
4,272,880	4,379,789	4,395,595	4,403,872
4,283,753	4,380,309	4,396,513	4,404,329
4,301,256	4,380,508	4,397,094	4,404,542
4,305,856	4,380,536	4,397,166	4,404,942
4,312,875	4,382,874	4,397,313	4,405,929
4,321,796	4,383,490	4,397,314	4,406,099
4,323,567	4,384,347	4,397,343	4,406,254
4,326,989	4,384,790	4,397,442	4,406,901
4,330,671	4,384,797	4,397,640	4,406,955
4,332,481	4,385,176	4,399,573	4,407,107
4,334,058	4,385,328	4,399,796	4,407,175
4,343,986	4,385,480	4,400,550	4,407,278
4,344,888	4,388,233	4,400,673	4,407,649
4,345,191	4,389,669	4,401,072	4,407,875
4,356,005	4,390,628	4,401,282	4,408,264
4,357,372	4,390,940	4,401,373	4,408,422
4,362,382	4,391,367	4,401,454	4,409,108
4,363,102	4,391,734	4,401,501	4,409,228
4,364,595	4,391,922	4,401,523	4,409,361
4,367,286	4,392,894	4,402,512	4,409,429
4,370,049	4,393,025	4,402,878	4,409,792
4,371,897	4,394,825	4,403,026	4,410,286

## Disclaimer

4,150,897.—*Thomas E. Roberts, Jr.*, Saratoga; *James L. Wiederrich*, Lodi; *Melvin H. Lill*, San Jose; and *Andrew K. Chang*, Malibu, Calif. WHEEL-MOUNTED VEHICLE WHEEL ALIGNER. Patent dated Apr. 24, 1979. Disclaimer filed Nov. 3, 1983, by the assignee, *FMC Corp.*  
Hereby enters this disclaimer to claims 3, 4, 5, 6, 7 and 17 of said patent.

## Disclaimer and Dedication

3,516,898.—*Richard L. Cook*, Phoenix, Ariz. HARD FACED PLASTIC ARMOR. Patent dated June 23, 1970. Disclaimer and Dedication filed Oct. 14, 1983, by the assignee, *Goodyear Aerospace Corp.*  
Hereby disclaims and dedicates to the Public the term of this patent subsequent to Aug. 8, 1983.

# Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
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Missouri	Kansas City: Linda Hall Library St. Louis Public Library	(816) 363-4600 (314) 241-2288 Ext. 390, Ext. 391
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Nevada	Reno: University of Nevada Library	(702) 784-6579
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin Milwaukee Public Library	(608) 262-6845 (414) 278-3043

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**PATENT EXAMINING CORPS**  
**RENE D. TEGTMEYER, Assistant Commissioner**  
**WILLIAM FELDMAN, Deputy Assistant Commissioner**  
**CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983**

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
<b>GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director</b> . . . . .	1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal- lurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
<b>GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director</b> . . . . .	11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
<b>HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director</b> . . . . .	3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
<b>COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director</b> . . . . .	3-09-82
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
<b>SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—</b> <b>R. F. WHITE, Director</b> . . . . .	1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufac- ture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
<b>INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director</b> . . . . .	5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
<b>SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director</b> . . . . .	3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Composi- tions; Thermal and Photoelectric Batteries.	
<b>INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director</b> . . . . .	1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
<b>RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—</b> <b>G. M. FORLENZA, Director</b> . . . . .	5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	
<b>ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director</b> . . . . .	8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
<b>DESIGN, GROUP 290—KENNETH L. CAGE, Director</b> . . . . .	1-30-81
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
<b>HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director</b> . . . . .	5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprin- kling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
<b>MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director</b> . . . . .	7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
<b>AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—</b> <b>R. E. AEGERTER, Director</b> . . . . .	8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Infor- mation Dissemination.	
<b>HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director</b> . . . . .	11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Genera- tion and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	
<b>GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—</b> <b>A. L. SMITH, Director</b> . . . . .	9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscel- laneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,243,822 to 3,248,737, inclusive  
Plant Patents . . . . . Numbers 2,616 to 2,627 inclusive

1037 OG 22

## REEXAMINATIONS

DECEMBER 20, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 Re. 28,474 (152nd)**  
**PROCESS FOR RAPIDLY DISSOLVING**  
**WATER-SOLUBLE POLYMERS**  
Donald R. Anderson, Oswego, and Alvin J. Frisque, La Grange, Ill., assignors to Nalco Chemical Co., Oak Brook, Ill.  
Reexamination Request No. 90/000,213, Jun. 3, 1982.  
Reexamination Certificate for Reissue Patent Re. 28,474, issued  
Jul. 8, 1974, Ser. No. 413,831, Nov. 8, 1973.  
Original No. 3,624,019, dated Nov. 30, 1971, Ser. No. 92,031,  
Dec. 15, 1970.  
Int. Cl.<sup>3</sup> C08J 3/06  
U.S. Cl. 523—336

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-15 is confirmed.

Claims 16 and 18 are determined to be patentable as amended:

Claims 17 and 19, dependent on amended claims, are determined to be patentable.

New claims 20-30 are added and determined to be patentable.

1. A method of rapidly dissolving an acrylamide polymer into water, which comprises the steps of:

- A. preparing a water-in-oil emulsion which contains dispersed therein between 5-75 percent by weight of finely-divided acrylamide polymer; said emulsion having an oil-to-water ratio between 5:1-1:10 and said oil being a hydrocarbon liquid; and then,
- B. inverting said emulsion in water which contains a water-soluble surfactant whereby the acrylamide polymer is released into the water as a solution.

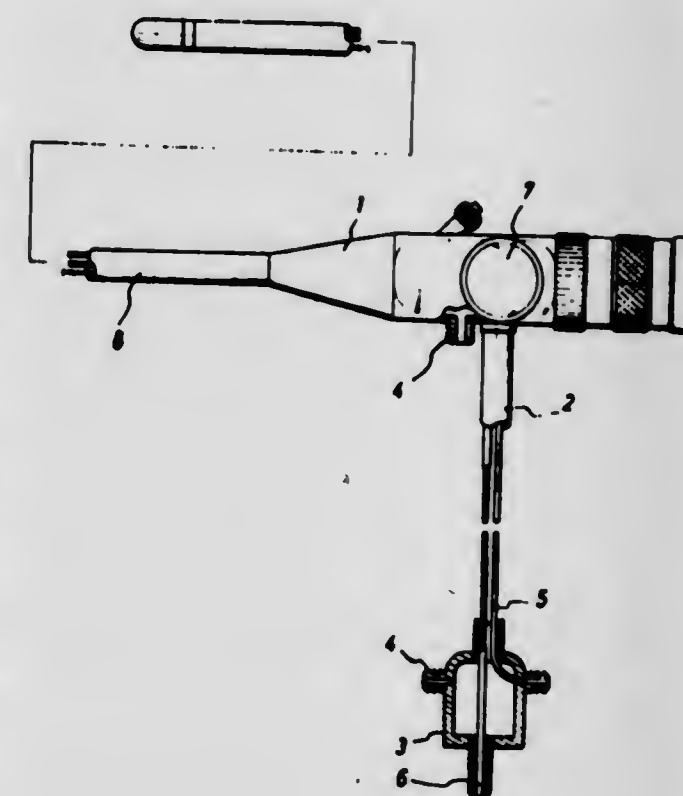
**B1 4,216,767 (151st)**  
**ENDOSCOPE WITH CLOSED PRESSURIZED INNER CAVITY**

Hisatake Aoshiro, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan  
Reexamination Request No. 90/000,201, May 18, 1982.  
Reexamination Certificate for Patent No. 4,216,767, issued Aug. 12, 1980, Ser. No. 877,899, Feb. 15, 1978.  
Claims priority, application Japan, Feb. 21, 1977, 52-19060  
Int. Cl.<sup>3</sup> A61B 1/06  
U.S. Cl. 128—6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-6 having been finally determined to be unpatentable, are cancelled.

[1. An endoscope comprising a grip end, an elongated sheath adapted to fit into a body orifice having a distal end and a proximal end, a fiber optic bundle extending from said proximal end to said distal end of said sheath, said grip end connected with said sheath and said sheath terminating in an examining end, said endoscope including said sheath having a closed inner cavity portion, the portions of said endoscope forming the walls of said closed cavity being non-expandable, said cavity extending along a major portion of said sheath, said sheath being flexible gas inlet means communicating with said



closed inner cavity portion of said endoscope, a source of pressurized gas connected to said gas inlet means to introduce pressurized gas into said closed inner cavity portion to be contained therein coupling means for enabling repeated connection between said source of pressurized gas and the gas inlet means for repeatedly pressurizing the inner cavity portion, wherein said pressurized gas prevents cleansing liquid on the outside of said endoscope from permeating said sheath and highlights pinholes in said sheath by the production of gas bubbles thereat.]



# REISSUES

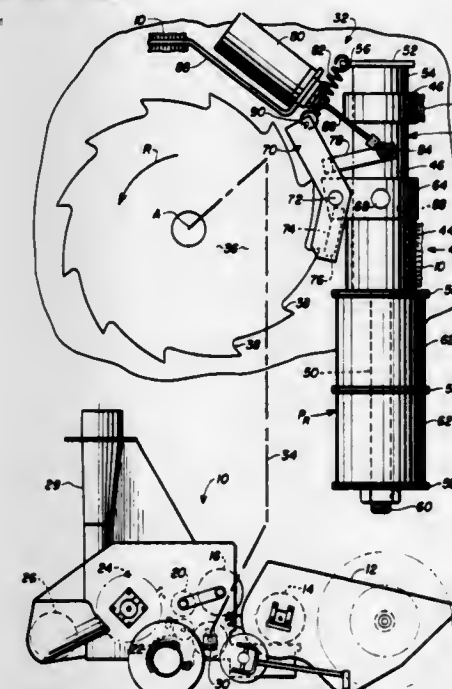
DECEMBER 20, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,464  
**DAMPED APPARATUS FOR QUICK-STOPPING  
 ROTATING MEMBERS**  
 Wayne B. Martenas, New Holland; Edward H. Pripke, Stevens,  
 and Robert A. Wagstaff, New Holland, all of Pa., assignors to  
 Sperry Corporation, New Holland, Pa.  
 Original No. 4,296,591, dated Oct. 27, 1981, Ser. No. 192,783,  
 Oct. 1, 1980. Application for reissue Sep. 30, 1982, Ser. No.  
 432,164

Int. Cl.<sup>3</sup> A01D 75/18  
 U.S. Cl. 56—10.3

8 Claims



1. A damped apparatus for quick-stopping a rotating member which is connected to rotate with a feed roll of a crop harvesting machine, said damped apparatus comprising:  
 a reaction member supported adjacent said rotating member, said reaction member including a slide and a slide support, said slide movable relative to said support;  
 a stop carried by said slide, said stop movable relative to said slide between a first position, free of engagement with said rotating member, and a second position in engagement with said rotating member;  
 means connected for damping movement of said slide in response to said stop being in said second position; and  
 means connected for moving said stop between said first and second positions.

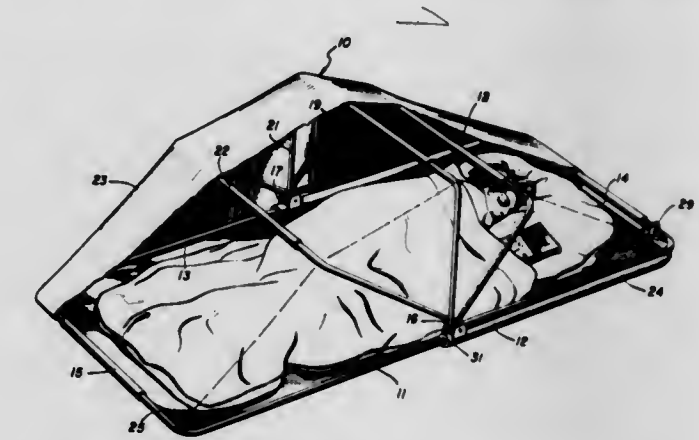
Re. 31,465  
**COMPACTIBLE SHELTER**  
 Vincent P. Robichaud, Westminster, Mass., assignor to Eric A. Robichaud, Westminster; Edward R. Robichaud and Denis J. Arsenault, both of Fitchburg, all of, Mass.  
 Original No. 3,995,649, dated Dec. 7, 1976, Ser. No. 580,874, May 27, 1975. Application for reissue Mar. 30, 1978, Ser. No. 891,950

Int. Cl.<sup>3</sup> A45F 1/16  
 U.S. Cl. 135—102

6 Claims

4. Compactible shelter, comprising:  
 (a) a rectangular frame having sides and ends,  
 (b) a hinge located at an intermediate portion of each of the sides,  
 (c) a plurality of U-shaped roof elements having their bights overlying the interior of the frame and the free ends of their legs pivotally attached to the hinges, and  
 (d) a flexible member formed of sheet material joining the frame and the roof elements, the rectangular frame consisting

of two U-shaped members, the legs of one U-shaped member being received within the legs of the other U-shaped member, so that the frame can be reduced in size to a collapsed condition in which the bight of the said one U-shaped member lies adjacent the free ends of the said other U-shaped member, the flexible member being fixedly attached on one end to the



bight of one of the U-shaped members of the frame and at the other end to the bight on one of the U-shaped roof elements, this last-named roof element being adapted to lie against the other of the U-shaped members of the frame, thus providing a means of entering and leaving the assembled shelter, and means being provided to lock the two together when they lie face-to-face.

Re. 31,466  
**PROCESS FOR THE ADJUSTMENT OF THE GLASS  
 TEMPERATURE IN A FLOAT GLASS LEHR AND FLOAT  
 GLASS LEHR IN ORDER TO BRING THIS PROCESS  
 INTO OPERATION**

Jean P. Garcelon, Paris, France, assignor to Stein Surface, Ris  
 Oranges, France  
 Original No. 4,303,437, dated Dec. 1, 1981, Ser. No. 150,238,  
 May 15, 1980. Application for reissue Dec. 1, 1982, Ser. No.  
 445,935

Claims priority, application France, May 16, 1979, 79 13281  
 Int. Cl.<sup>3</sup> C03B 25/04

7 Claims

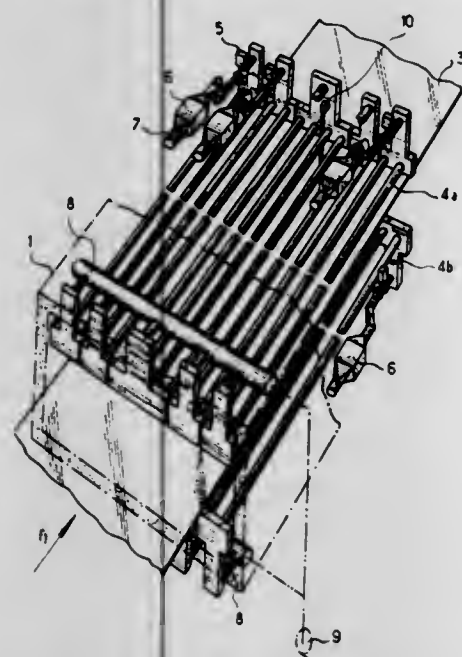
1. In a method of operating a float glass lehr in which a float glass ribbon is passed on rollers through a lehr tunnel and is subjected to heating and cooling therein, and wherein arrays of tubes for heat exchange are provided above and below the glass ribbon, said tubes extending parallel to the direction of movement of the glass ribbon through the lehr, the improvement which comprises:

- (a) forming each array in sets of mutually parallel transversely spaced coplanar tubes in successive zones along said path and grouping a plurality of tubes of each array for the respective zone in groups whereby for each array and each zone a respective plurality of such groups is disposed transversely of the direction of movement of the glass ribbon through the lehr;
- (b) heating air separately for each of said groups and admitting the heated air to the tubes of each group at an [upstream] downstream end of the respective zone with respect to said direction of movement of the glass ribbon through each lehr;
- (c) drawing heated air from the [downstream] upstream ends of the tubes of each zone; and
- (d) measuring the temperature of the glass ribbon at the upstream end of each zone and selectively controlling the



rates of flow through the respective groups of tubes in response to the measured temperature, thereby maintaining temperature homogeneity of the glass ribbon.

3. A float glass lehr for the heat treatment of a float glass ribbon, said lehr comprising:  
an elongated lehr tunnel;  
a multiplicity of rollers spaced apart longitudinally of said tunnel but extending transversely therein and forming a path along which said ribbon is displaced on said rollers;  
a lower array of longitudinally extending, mutually parallel coplanar heat-exchanger tubes disposed below said path, and an upper array of mutually parallel coplanar transversely spaced heat-exchange tubes disposed above said path within said tunnel each of said arrays being subdivided longitudinally into respective zones, each zone having an upstream side and a downstream side with



respect to the direction of travel of said ribbon along said path;  
means connecting a plurality of tubes of each array and each zone in a respective group whereby, for each zone, each of said arrays comprises a plurality of such groups in succession transversely of said direction;  
a respective air heater communicating with the tubes of each group at an upstream end of the respective zone whereby heated air flows through said tubes in a direction opposite the direction of movement of said glass ribbon along said path;  
means at the downstream end of each of said zones for drawing air from said tubes; and  
means at the upstream end of each zone for measuring the temperature of the glass ribbon and controlling selectively the heating effect contributed by each group to said glass ribbon.

Re. 31,467

## TRIARYL OR DIARYLPYRIDYL METHANES

Geraint Jones, and David S. Thomson, both of Macclesfield, England, assignors to Imperial Chemical Industries PLC, London, England

Original No. 4,152,341, dated May 1, 1979, Ser. No. 907,861, May 19, 1978. Division of Ser. No. 747,995, Dec. 6, 1976, Pat. No. 4,113,879. Application for reissue Mar. 4, 1980, Ser. No. 127,135

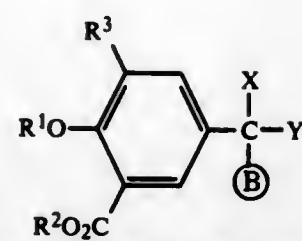
Claims priority, application United Kingdom, Dec. 29, 1975, 52999/75

Int. Cl.<sup>3</sup> C07C 65/12; C07D 211/30

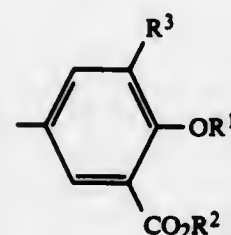
U.S. Cl. 260—395

4 Claims

1. A compound of the formula:



wherein [either] X is hydrogen and Y is a radical of the formula:



wherein R<sup>1</sup> is hydrogen or an acetyl radical; R<sup>2</sup> is hydrogen or a phenyl radical optionally substituted by a halogen atom; R<sup>3</sup> is hydrogen, a C<sub>1</sub>-alkyl radical or a halogen atom; B is a 4-pyridyl radical, or a phenyl radical which may optionally bear from 1 to 3 substituents selected from halogen atoms, nitro, cyano, carbamoyl, carboxy, formyl and N-hydroxymethylidene (HO—N=CH—) radicals; or a pharmaceutically acceptable salt of a compound of formula I wherein R<sup>2</sup> is hydrogen; but excluding those compounds of formula I as defined above wherein R<sup>1</sup> and R<sup>2</sup> are hydrogen, R<sup>3</sup> is a methyl radical, and B is a phenyl, 2-chlorophenyl, 4-chlorophenyl, 2-nitrophenyl, 4-nitrophenyl, 2,6-dichlorophenyl, 2,5-dichlorophenyl or a 2,3,6-trichlorophenyl radical; or wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are hydrogen and B is a 2,4-dinitrophenyl radical.

Re. 31,468

## LIQUID REACTIVE POLYMERS

Chin C. Hsu, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

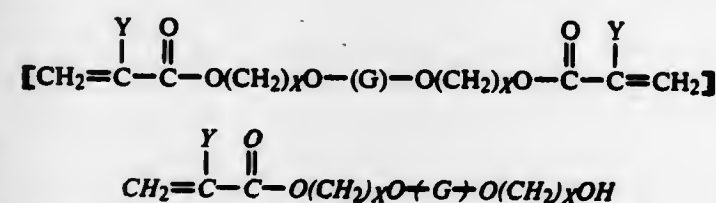
Original No. 4,256,910, dated Mar. 17, 1981, Ser. No. 73,161, Sep. 6, 1979. Application for reissue Mar. 15, 1983, Ser. No. 475,433

Int. Cl.<sup>3</sup> C08G 65/24

U.S. Cl. 560—209

19 Claims

1. A terminally unsaturated liquid epihalohydrin polymer having the formula



wherein Y is hydrogen or methyl, X is 2 to 10 and G is a polymeric backbone obtained by homopolymerizing an epihalohydrin, copolymerizing two or more epihalohydrins, or copolymerizing an epihalohydrin with a vicinal epoxide.

Re. 31,469

## REACTIVE LIQUID POLYMERS

Changkiu K. Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

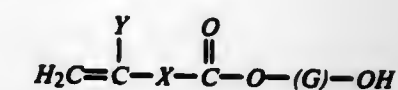
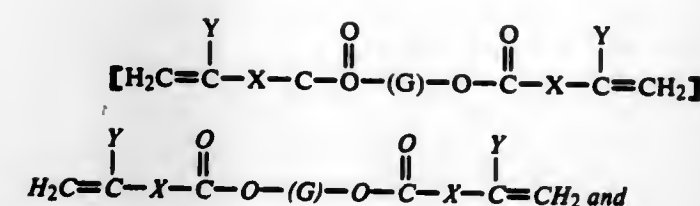
Original No. 4,256,904, dated Mar. 17, 1981, Ser. No. 73,160, Sep. 6, 1979. Application for reissue Mar. 15, 1983, Ser. No. 475,435

Int. Cl.<sup>3</sup> C08G 65/24

U.S. Cl. 560—209

18 Claims

1. A terminally unsaturated liquid epihalohydrin polymer having the formula



wherein Y is hydrogen or methyl, [X] X is zero, alkylene or arylene and G is a polymeric backbone obtained by homopolymerizing an epihalohydrin or copolymerizing at least one epihalohydrin with at least one other 1,2-epoxide.

Re. 31,470

## STRIPLINE FILTER DEVICE

Brian E. Bedard, Tamarac, and Bertho K. Boman, Fort Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Original No. 4,266,206, dated May 5, 1981, Ser. No. 938,564, Aug. 31, 1978. Application for reissue May 6, 1982, Ser. No. 375,433

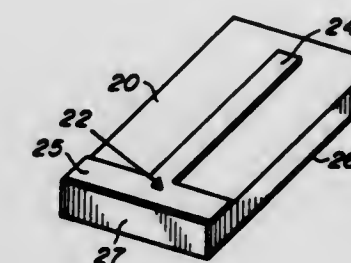
Int. Cl.<sup>3</sup> H01P 2/03, 7/08

U.S. Cl. 333—204

24 Claims

1. An improved transmission line resonator device, adapted for use in a predetermined frequency band, wherein the effects

of mask misalignment during manufacture are minimized, including in combination,  
a dielectric substrate having a conducting layer formed on one side thereof as a ground plane,  
a thin film conductor structure formed on said substrate on the side thereof opposite to said ground plane layer which



includes at least one elongated relative narrow resonator portion having a length related to the predetermined frequency but less than the length of said dielectric substrate, and a relatively wide grounding portion connected to said resonator portion at one end thereof, and electrical means connecting said grounding portion to said ground plane conducting layer.



## PLANT PATENTS

GRANTED DECEMBER 20, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,159

### CHERRY ROOTSTOCK—COB VARIETY

Henry M. Tydeman, deceased, late of Maidstone, England (by Elizabeth M. Tydeman, executor), and by William M. Tydeman, executor, Bangor, Wales, assignors to National Seed Development Organisation Limited, Newton, England

Filed Aug. 16, 1982, Ser. No. 408,596

Int. Cl.<sup>3</sup> A01H 5/03

U.S. Cl. Plt.—37

1 Claim

1. A new and distinct variety of cherry tree useful as an improved rootstock for ornamental flowering cherry cultivars, substantially as illustrated and described, which when used as such rootstock facilitates more vigorous growth, enhanced blossom formation, and thicker trunk growth during the first six years.

5,160

### KALANCHOE PLANT NAMED CINNABAR

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsen, Inc., Ashtabula, Ohio

Filed Sep. 15, 1982, Ser. No. 418,488

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of kalanchoe plant known by the cultivar name Cinnabar, as described and illustrated, and particularly characterized by deep orange-red florets; floriferous flowering habit; strong, vigorous stems and vigorous growth habit with close internodes; medium size, nearly round foliage, and excellent self-branching.

5,161

### BEGONIA PLANT NAMED LYRIC

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsen, Inc., Ashtabula, Ohio

Filed Sep. 15, 1982, Ser. No. 418,490

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of begonia named Lyric, as

described and illustrated, and particularly characterized by its double white flowers with ruffled edges; dark green, firm to crisp glabrous foliage with serrated edges; excellent keeping qualities, and continuous year round flowering.

5,162

### BEGONIA PLANT NAMED DORTHE

Erland V. Schelbeck, Odense, Denmark, assignor to L. Daehnfeldt Ltd., Odense, Denmark

Filed Sep. 20, 1982, Ser. No. 420,521

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of begonia named Dorthie, as described and illustrated, and particularly characterized by its compact and upright growth habit; year round flowering; large deep red double flowers; medium and firm waxy foliage, and by its outstanding keeping qualities.

5,163

### CHRYSANTHEMUM PLANT

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 27, 1982, Ser. No. 343,259

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—76

1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., plant known by the cultivar name of Sequoia, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; red bronze ray floret color; diameter across face of capitulum ranging from 100 to 125 mm. at maturity; uniform 10 week flowering response; medium plant height; spreading branching pattern, and by its photosynthetic efficiency, producing strong plants under low winter light regimes with 14 to 16 hour continuous dark periods.



# PATENTS

GRANTED DEC. 20, 1983

## ERRATA

For CLASS	See PATENT NO.
374-043 .....	4,420,965
383-061 .....	4,421,150
266-143 .....	4,421,263
502-055 .....	4,421,672
502-167 .....	4,421,673
502-154 .....	4,421,674
502-150 .....	4,421,675
502-185 .....	4,421,676
549-360 .....	4,421,689
424-248 .....	4,421,927
381-098 .....	4,421,949



# PATENTS

GRANTED DECEMBER 20, 1983

## GENERAL AND MECHANICAL

4,420,843

### CYCLISTS' GLOVES

Claude Genzling, 7, rue Serevo, Paris, France (75014), and Michel Mathieu, 4, Allee du Chatellier, Lussault, France 37400

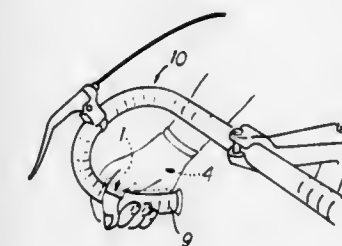
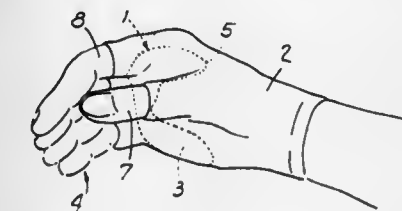
Filed Apr. 13, 1982, Ser. No. 367,893

Claims priority, application France, Apr. 16, 1981, 81 07682

Int. Cl.<sup>3</sup> A41D 19/00

U.S. Cl. 2—161 A

4 Claims



1. Improvement to cyclists' gloves, wherein a lining member is provided inside the glove, which lining member is placed between the cyclist's hand and the wall of the glove, the said lining member having a part which adopts the outline of the palm of the hand and a collar-shaped part provided with an opening on one side, defining the space between the thumb and the index, when the hand is half-closed.

4,420,844

### VANDAL RESISTANT DRAIN STOPPER

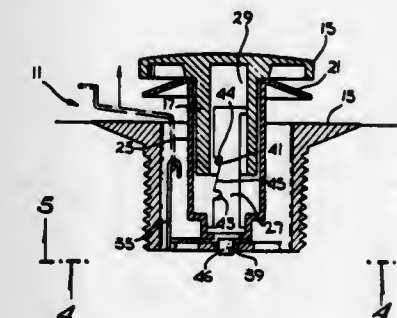
William E. Puckett, Kirkland, Wash.; Wanda F. Baird, and Richard C. Chappell, both of Downey, Calif., assignors to Rapid Fit Enterprises, Inc., Bell Gardens, Calif.

Filed Nov. 18, 1982, Ser. No. 442,644

Int. Cl.<sup>3</sup> A47K 1/14

U.S. Cl. 4—295

18 Claims



1. In a drain valve for selectively sealing a conduit, said drain valve having a drain housing with a first sealing surface, latching means removably coupled to said drain housing for releasably latching and holding a second sealing surface in sealing relationship with said first sealing surface, whereby fluid is prevented from flowing through said drain valve into said conduit when said sealing surfaces are in said sealing relationship, and actuator means coupled to said latching means, for transmitting force to latch and unlatch said latching means, the improvement comprising:

locking means for preventing said latching means from being

disengaged from said housing, wherein said locking means is comprised of a locking member coupled to said latching means, said locking member having means for receiving a tool adapted for insertion into said drain valve, through an end thereof adjacent said first and second sealing surfaces, for releasing said locking member, thereby allowing the disengagement of said latching means from said drain housing.

4,420,845

### FLOAT VALVE ASSEMBLY WITH FLOW CONTROL AND VOLUME BALANCING MEANS

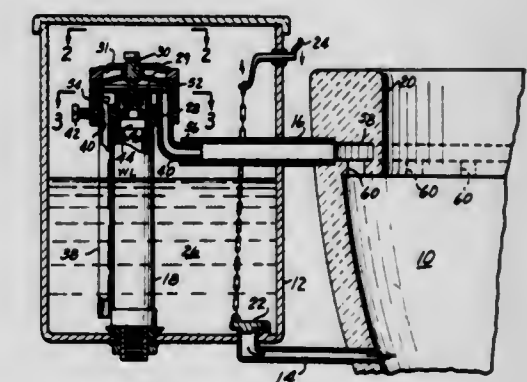
Bruce A. Antunez, 2153 Iron Club Dr., La Verne, Calif. 91750

Filed Mar. 2, 1982, Ser. No. 353,819

Int. Cl.<sup>3</sup> F16K 31/26, 47/08

U.S. Cl. 4—366

14 Claims



1. A valving system for a toilet installation that includes a storage tank, a toilet bowl, and a conduit with a flush valve discharging from the tank to the bowl, said toilet bowl having a wall to be washed, and a rim above said walls, said system comprising: a water level-responsive valve adapted to be mounted in said tank, said valve having an inlet and an outlet; a supply line connected to the inlet of said valve to supply water to it under pressure; a tank refill line for discharging from said valve into said tank; a bowl wash line for discharging to said rim, said tank refill line and bowl wash line being directly connected to the outlet of said valve so that both always simultaneously receive water from said level responsive valve whenever said valve is open to flow; and adjustable flow proportioning means in at least one of said tank refill line and said bowl wash line to proportion to flow between them, said flow proportioning means being disposed at a location such that both lines always simultaneously receive water under pressure when said valve is open to flow and regardless to the rate of flow of the water from said valve, and said storage tank will be refilled at a rate which assures simultaneous flushing of the bowl, rinsing of the bowl, and the making of a gas seal, all before the storage tank is refilled to a level where the level responsive valve shuts off.

4,420,846

### SPA SYSTEM

Jack D. Bonner, 3938 Deer Haven Ct., Las Vegas, Nev. 91820

Continuation-in-part of Ser. No. 226,528, Jan. 19, 1981,

abandoned. This application Jan. 19, 1982, Ser. No. 340,815

Int. Cl.<sup>3</sup> A47C 19/12; A61H 9/00

U.S. Cl. 4—542

15 Claims

1. In a recirculating spa system wherein water is drawn from a tub containing water and pumped back into the tub by a pump through jets to cause an entering air/water mixture, the improvement comprising:

(a) water manifold means located generally adjacent said pump on one side only of said tub for receiving water exiting the pump and maintaining a supply of such water within a water chamber thereof at substantially equal water pressures throughout said chamber, said manifold

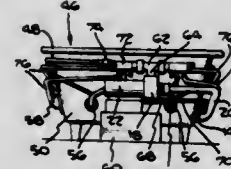
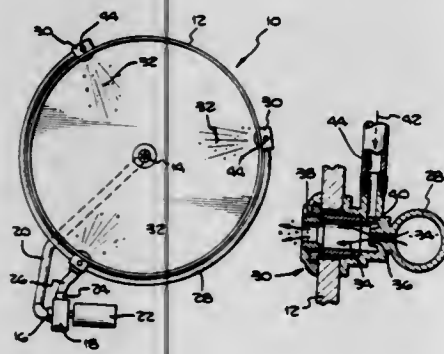


means having a plurality of water exit openings equal in number to the number of jets being used in the tub and being positioned relative said chamber to receive equal water pressure; and

(b) individual water connecting conduits connecting the jets to respective ones of said water exit openings.

2. In a recirculating spa system wherein water is drawn from a tub containing water and pumped back into the tub by a pump through jets to cause an entering air/water mixture, the improvement comprising:

a water manifold having a water receiving chamber disposed to receive water exiting the pump, said manifold having a plurality of water exit openings equal in number to the



number of jets being used in the tub and being positioned relative said water receiving chamber to receive equal water pressure; and,

individual water connecting conduits connecting the jets to respective ones of said water exit openings, wherein:

- the jets are venturi jets wherein each jet has an air inlet through which air is drawn as a result of the water passing through the jet; and additionally comprising,
- an air manifold having an air inlet to an air chamber and a plurality of air exit openings from said air chamber; and,
- individual air connecting conduits connecting the air inlets of the jets to respective ones of said air exit openings.

4,420,847

## HEAD WARMING PILLOW CASE

Jean E. Smith, 3305 Longbow Dr., Pittsburgh, Pa. 15235

Filed Dec. 8, 1980, Ser. No. 214,411

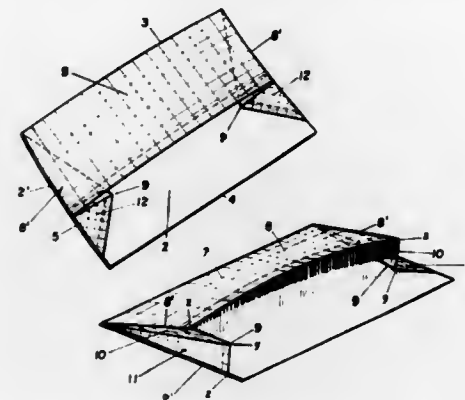
Int. Cl.<sup>3</sup> A47G 9/02

U.S. Cl. 5-490

6 Claims

1. A pillow case comprising two overlying rectangular panels joined together along both the two long edges and across one end only with their other edges unattached and free of each other thus forming an envelope-like cover to receive a pillow through the open end, a trapezoidal strip more than half as wide but less than the full width of the panels from one long edge to the other, the trapezoid having a rectangular central area with parallel lengthwise edges and end edges of equal length diverting from the shorter edge of the trapezoid to the longer whereby there are opposite equal right angle triangular end areas, one at each end of the rectangular central area of the strip, the shorter of the parallel edges of the trapezoid being

stitched along one long edge of the pillowreceiving envelope, one diagonal end edge of said trapezoidal strip being stitched along the closed end of the envelope and the other diagonal edge of the strip being stitched to the other edge of the underlying rectangular panel, the long edge of the rectangular central area of the trapezoidal strip being loose and unattached to



the envelope-like cover, the triangular end areas of each end of the trapezoidal strip being folded into a reversely folded pleat under the central area of the overlying rectangular area of the trapezoidal strip, with the end edges of the rectangular area of said strip being even with corresponding ends of the envelope-like cover.

4,420,848

## METHOD AND APPARATUS FOR MANUFACTURING WELDED CAPPED WHEEL NUTS

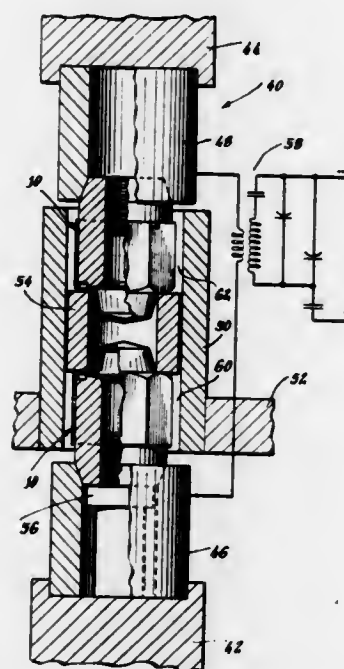
Philip D. Becker, Southbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed Apr. 15, 1982, Ser. No. 368,764

Int. Cl.<sup>3</sup> B21D 53/24

U.S. Cl. 10-72 R

12 Claims



1. The method of welding a cap to a nut body to form a welded capped nut comprising the steps of taking a pair of nuts each having a nut body with a bottom engaging end, a top end opposite said bottom end, a threaded opening between the two ends for receiving a securing stud, a plurality of wrench flats extending between said top end and said bottom end, a sheath-like cap covering said top end and said wrench flats, said cap being capable of contacting said top end of said nut body, positioning said pair of capped nuts in linear spaced-apart alignment with their top ends opposed to one another, positioning an open ring-like connector of electrically conductive material between said aligned capped nuts and in contact with said tops thereof, surrounding said aligned capped nuts with an

open sleeve of electrically nonconductive material, the ends of said sleeve extending to at least a portion of the respective nut bodies leaving said bottom ends thereof exposed, bringing one each of a pair of welding electrodes into contact with each respective exposed bottom end, applying sufficient pressure to said electrodes to cause said ring-like connector to urge said caps of each nut into contact with said top ends of said nut body and to form a welding electrical circuit, and applying a current between said electrodes sufficient to weld each of said caps to their respective nut bodies at a location of contact between said caps and said top end of said nut body.

4,420,849

## RAMP BRIDGING DEVICE

Kurt Alten, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany

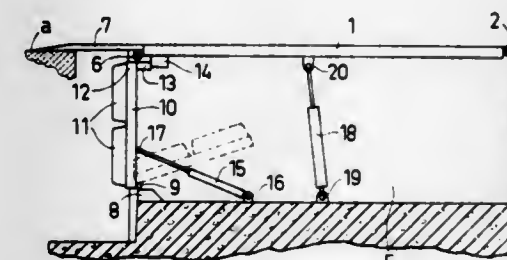
Filed Apr. 16, 1981, Ser. No. 254,615

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015717

Int. Cl.<sup>3</sup> E01D 1/00

U.S. Cl. 14-71.3

4 Claims



1. A ramp bridging device, the ramp having therewith means forming a recess delimited by a rear surface and a base surface, said device comprising in combination:

a bridge plate having a rear end and a forward end, said rear end of said bridge plate being pivotally mounted on said rear surface of said ramp so as to be pivotable about a horizontal axis;

an extension portion mounted on said forward end of said bridge plate, said extension portion being extensible and retractable with respect to said bridge plate and being locatable, in said extended state, on a platform to be loaded on/unloaded; and

stop buffers pivotally mounted on said base surface of said recess and extending laterally of said extension portion of said bridge plate, said stop buffers being pivotable between a first operative position wherein said stop buffers extend substantially vertically, and a second inoperative position wherein said stop buffers are located in said recess below said bridge plate, whereby in said first operative position, said stop buffers protrude forwardly of said forward end of said bridge plate, said stop buffers respectively including an upper free end, said bridge plate being provided with an abutment for the free ends of said stop buffers during bracing engagement thereagainst, when said stop buffers are located in said first operative position, to prevent movement of said stop buffers to said second inoperative position, said bridge plate including a bottom surface, an abutment member being provided on, and directed away from, said bottom surface, to engage the stop buffers accordingly directly as to the free end though also slightly below the upper free end thereof, said abutment member effecting the bracing engagement of said stop buffers when said stop buffers are located in said first operative position.

4,420,850

## BACK WASHING DEVICE

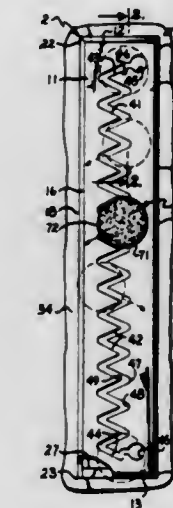
Larry E. Moore, Box 96, Osage Beach, Mo. 65065

Filed Jan. 18, 1982, Ser. No. 340,313

Int. Cl.<sup>3</sup> A61H 33/00

U.S. Cl. 15-21 R

16 Claims



1. A device for back washing and the like, which comprises:
  - (a) a guide assembly having a panel with a slot extending therethrough, said slot comprising a plurality of interconnected, alternating slanted runs;
  - (b) a traveler assembly mounted on said guide assembly and movable along said runs, said traveler assembly including:
    - (1) a mounting block;
    - (2) a guide pin extending from said mounting block and through said slot;
    - (3) a retainer attached to said guide pin whereby said panel is positioned between said mounting block and said retainer with said guide pin in said slot; and
    - (4) washing means mounted on said mounting block and engageable by a person.

4,420,851

## MECHANIZED TOOTH BRUSH HAVING MOVEMENT IN TWO PLANES

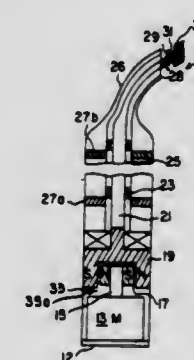
Stanley M. Wiener, 1857 Floyd St., Sarasota, Fla. 33579

Filed Dec. 7, 1981, Ser. No. 328,373

Int. Cl.<sup>3</sup> A46B 13/02

U.S. Cl. 15-22 R

1 Claim



1. A mechanical tooth brush having rotary and longitudinal motion comprising:

an elongated cylindrical housing; said housing contains a motor located at a first end of said housing; said housing contains an orifice at a second end opposite to said first end at which said motor is located within said housing; an output shaft is connected to said motor; said inner magnet is connected to said output shaft; said inner magnet is perpendicular to said output shaft;



a flexible shaft extends through the interior of said housing and passes outside said housing through said orifice;  
 a guide tube guides said flexible shaft through said interior of said housing until reaching said orifice;  
 said flexible shaft adapted for slidable longitudinal motion within said guide tube;  
 said flexible shaft exits said housing and is connected to an output coupling at a first end of said flexible shaft outside of said interior of said housing;  
 a cup-shaped magnet is connected to a second end of said flexible shaft within housing, opposite to said first end of said flexible shaft;  
 said cup-shaped magnet forms a first edge shaped in a circular, sinusoidal wave;  
 a bearing rotatable on a bearing shaft;  
 said first edge of said cup-shaped magnet bears continuously on said bearing, to provide said flexible shaft with longitudinal motion as said flexible shaft rotates; and  
 said cup-shaped magnet is disposed over and around said inner magnet.

4,420,852

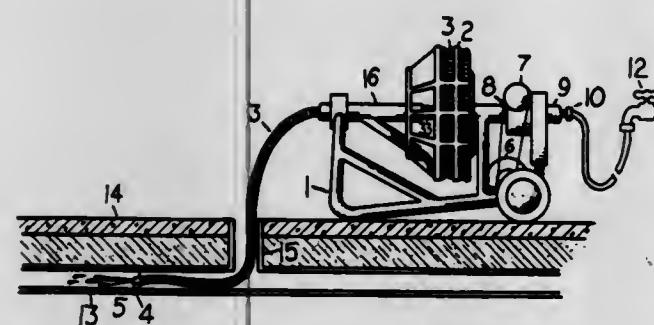
**DRAIN CLEANING MACHINES**

David Bowlsby, 533 W. State St., Ithaca, N.Y. 14850

Filed May 8, 1981, Ser. No. 262,202

Int. Cl.<sup>3</sup> B08B 9/02

U.S. Cl. 15—104.3 SN



1. In a drain cleaning machine of the type having a removable powered rotatable drum for storing a length of coiled spring snake for insertion into the drain to be cleaned; said drum mounted upon, and cooperating with, a powered rotatable shaft having two portions, one adapted to supporting and engaging the drum, the other adapted to receiving the rotary power; power means for imparting rotating power to the shaft; said coiled spring snake being attached at one end to the drum such that a rotary motion is imparted to the other, free, end of the snake, which is inserted into the drain to be cleaned; means for supporting the shaft and the drum in cooperation with each other; wherein the improvement comprises providing a stream of water to the free end of the snake by means of a modification to the machine comprising:

- (a) said powered rotatable shaft having a gallery extending from the end of the shaft adapted to receiving the rotary power to a point in the outside of the shaft in the drum supporting portion;
- (b) swivel coupling means for attaching a water-supply hose from a source of house pressure water to the rotatable shaft such that water from said source of house pressure water passes from said hose into the gallery through the power receiving end;
- (c) flange means for engaging the drum mounted upon the drum-supporting portion of the rotatable shaft;
- (d) hub means for supporting the frame of the drum upon the drum-supporting portion of the rotatable shaft, having means for attaching a hose on the outside surface of the hub, said means for attaching a hose communicating with the interior of the hub means, for feeding water from the interior of the hub means into a tube attached to the hose attaching means;

- (e) seal means for preventing leakage between the hub means and the flange means;
- (f) clamp means for holding the hub means firmly against the flange means of the rotatable shaft, such that they compress around the seal means without leakage of water;
- (g) flexible tube means for carrying water, inserted inside the coiled spring snake, having an inside diameter of at least 5/16" and a length at least equal to the length of the coiled spring snake;
- (h) cable end means rigidly attached to the free end of the coiled spring snake;
- (i) nozzle means for directing water flow, mounted upon the cable end means, and aligned along the longitudinal axis of the cable end, such that water passing through the nozzle means is directed down the pipe to be cleaned;
- (j) said tube means being connected at one end to the hose attaching means of the hub means, and at the other end to the nozzle means mounted upon the cable end means of the coiled spring snake;
- (k) the cable end means at the free end of the coiled spring snake attaching to the tube means through a swivel coupling means for allowing differential twisting between the snake and the tube.

4,420,853

**SCRUB BRUSH**

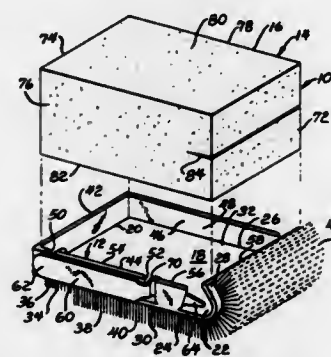
Thomas Gilman, Woodstock, Ill., and Frank N. Miller, Racine, Wis., assignors to The Kendall Company, Boston, Mass.

Filed Nov. 25, 1981, Ser. No. 324,748

Int. Cl.<sup>3</sup> A46B 9/00

U.S. Cl. 15—111

6 Claims



1. A scrub brush comprising, a housing having a base, a back side, a front side, a pair of opposed sides extending between the back side and front side, and a forward portion extending from the base on the front side at an acute angle relative to the base, said base having a plurality of bristles extending from a lower surface of the base, and said forward portion having a plurality of bristles extending outwardly from the forward portion, including a handle member positioned on an upper surface of the base, wherein the housing includes an upstanding back wall on the back side, and a pair of opposed upstanding sidewalls on the opposed sides and connected to the back wall, said walls defining a cavity to receive said handle member, and wherein the handle member comprises a block of foam received in the cavity.

4,420,854

**APPARATUS FOR CLEANING TRAYS**

John Newton, 126 Church Rd., Hartshead, Liversedge, West Yorkshire, England

Filed Jun. 23, 1981, Ser. No. 276,652

Claims priority, application United Kingdom, Jun. 28, 1980, 8021295; Aug. 12, 1980, 8026244; Jan. 15, 1981, 8101237

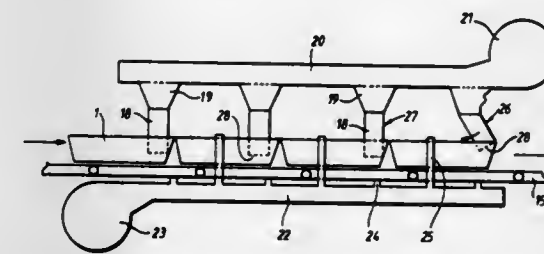
Int. Cl.<sup>3</sup> B08B 9/08

U.S. Cl. 15—302

13 Claims

13. Apparatus for washing and drying trays having upstanding side walls and comprising washing means comprising a tank for containing a washing fluid, means defining a path of

travel for the trays through the tank in relationship to the intended liquid level within the tank such that the bases of the trays are immersed in liquid to a shallow depth as the trays move through the tank, and a series of rotatable brushes arranged along the path of travel through the tank and mounted for rotation about horizontal axis extending transversely to said path of travel through the tank and above the maximum height of the side walls, each said brush comprising a floppy brush extending transversely to said path of travel through the tank and having floppy filaments extending radially from said axis, said filaments serving to brush-wash the tray surfaces, upon rotation of the brush, by agitation of the washing fluid in contact therewith, and simultaneously to propel the trays along said path through said tank, and said filaments being sufficiently floppy to yield upon engagement with the tray walls so as not to impede the brush-washing and propelling action imparted to the trays by the brush, said apparatus further comprising means defining a further path of travel for the trays, means for passing the trays along said further path of



travel and drying means disposed along the further path of travel for the trays for directing jets air onto the tray surfaces to dry the latter, said drying means comprising a plurality of depending air nozzles arranged along said further path of travel and each having an outlet at the lower end thereof for directing the jet of drying air toward the surfaces of the trays as the trays move along said further path of travel for the trays, and mounting means for mounting each air nozzle in relationship to the further path of travel for the trays so as to be displaceable between a drying position in which the respective outlet is located inside of a tray close to the base of the tray and below the upper edge of the side wall of the tray, in below the upper edge of the side wall of the tray, in a displaced position in which the nozzle does not impede the travel of the tray along said path, and such that each nozzle is displaceable from its drying position by engagement therewith of the side wall of one of the trays as that tray moves along said further path of travel for trays, and is thereafter returnable automatically to the drying position when no longer engaged by the side wall of the tray.

4,420,855

**SET OF ELECTRODES FOR AN APPARATUS FOR ELECTRICALLY STUNNING SLAUGHTER CATTLE**

Gerrit J. Nijhuis, Winterswijk, Netherlands, assignor to Machinefabriek G.J. Nijhuis B.V., Winterswijk, Netherlands

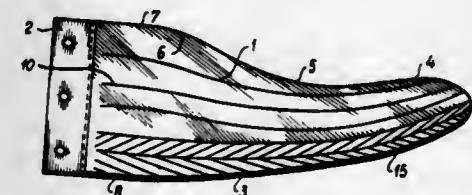
Filed Jul. 21, 1981, Ser. No. 285,579

Claims priority, application Netherlands, Jul. 25, 1980, 8004289

Int. Cl.<sup>3</sup> A22B 3/06

U.S. Cl. 17—1 E

4 Claims



1. Electrodes for stunning an animal without leaving trace on the animal hide, comprising:  
 a first electrode and a second electrode, the second electrode

being generally shaped in a mirror image of the first electrode, said electrodes being located between the operating surfaces of two endless conveyors defining a V-shaped passage and running synchronously and in parallel relationship to each other, said electrodes being arranged side by side pivotably around a horizontal transverse axis lying above the conveyors and each comprising a plate the outer edges of which extend substantially parallel to and in close relationship along the operating surfaces of the conveyors and of which the edges facing to each other diverge in upward directions from the under ends and through a curvature merge into edges converging to each other, said electrodes viewed in the direction of conveyance being directed slantingly downwards and frontwards from above with the inner edges directed further frontwards from beneath with respect to the outer edges and subsequently run back again such that in the center portion viewed in the direction of advance a V-shaped position of the operating surfaces of the electrodes is obtained, the under edges of the electrodes being rounded off, which rounding-off leads smoothly to the outer edges on the diverging portion and on said curvature and said diverging portion merges smoothly into the converging edge portion having a reverse bending upwards.

4,420,856

**APPARATUS FOR PROCESSING STUFFED SAUSAGE CASING**

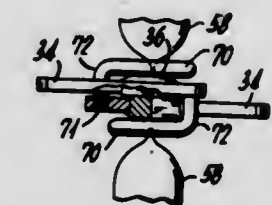
Francis J. Ziolk, Bridgewater, N.J., assignor to Devro, Inc., Somerville, N.J.

Division of Ser. No. 279,895, Jul. 2, 1981. This application Jun. 1, 1983, Ser. No. 500,204

Int. Cl.<sup>3</sup> A22C 11/00

U.S. Cl. 17—34

5 Claims



1. Apparatus for forming individual sausage links from stuffed casing comprising a plurality of pairs of forming arms attached to a mounting means which is capable of moving in an endless cycle, said pairs of forming arms being capable of opening and closing at predetermined points in the cycle, each of the forming arms in a pair of forming arms having an inner surface which faces the inner surface of the other forming arm in the same pair of forming arms and an outer surface which is opposite the inner surface, each of such forming arms having at the end of said arm an opening which faces the opening in the other forming arm in the same pair, a stabilizer affixed to at least one forming arm in each pair of forming arms, a portion of the stabilizer extending beyond the outer surface of the other forming arm in the same pair if forming arms, so that the stabilizer will not contact the opposing forming arm when the forming arms are brought into a closed position, the stabilizer being positioned to contact the stuffed casing and guide the casing into the closed end of the opening in said forming arms.

4,420,857

**BAG FASTENER**

Bobby L. Clay, Rohnert Park, Calif., assignor to Cevco, Inc., Rohnert Park, Calif.

Continuation of Ser. No. 118,477, Feb. 2, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,207

Int. Cl.<sup>3</sup> B65D 63/00, 30/00

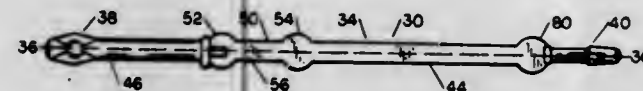
U.S. Cl. 24—16 PB

7 Claims

1. A fastener capable of being assembled, with a flexible



article having a plurality of annular orifices, the orifices being of a predetermined diameter, comprising:  
 an elongated body defining a longitudinal axis with a one end and an other spaced apart ends and being formed of a resiliently deformable material;  
 a flexible strap of said body longitudinally extending a predetermined first distance from said other end toward said one end;  
 a shank of said body longitudinally extending a predetermined second distance from said one end toward said other end, said shank being rigid relative said strap;  
 a medial portion of said body interconnecting said shank and said strap and of a construction sufficient to be fitted and held in one of the orifices of the flexible article; and



reusable means for snappingly connecting said ends of said body together and for easily releasing a connection of said ends, said reusable means including a bore passing through said shank adjacent said one end of said body and a peniform member having a blunt leading tip, a cylindrical shaft, and an annular surface between and contiguous with said leading tip and said shaft, said annular surface radially outwardly projecting from said shaft to said leading tip and inclined therebetween toward said leading tip, said ends of said body being easily released by application of a manual force imposed upon said blunt leading tip of said peniform member.

4,420,858

# DEVICE FOR ADJUSTING THE LENGTH OF A BAND OR THE LIKE

Taizo Noda, Hyogo, Japan, assignor to Kohshoh Limited, Kyoto, Japan

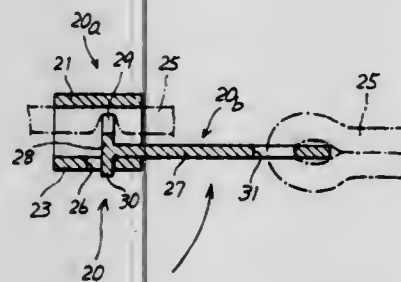
Filed Jan. 9, 1981, Ser. No. 223,767

Claims priority, application Japan, Jan. 14, 1980, 55-2794

Int. Cl.<sup>3</sup> A44B 11/06

U.S. Cl. 24—170

12 Claims



1. A device for adjusting the length of a strip of material such as a band, a belt, a shoulder strap or the like; comprising a first component member and a second component member detachably connected to said first component member; said first component member comprising a passage for said strip to be inserted through and bearing means, an annular body made of a top wall, a pair of opposite side walls and a bottom wall and so shaped as to define said passage, and said second component member comprising a plate member, one end portion of which is bent substantially perpendicularly to the remainder of said plate member, said second component member having a portion disposed inside said passage of said first component member when said second component member is connected to said first component member, said portion of said second component member comprising first means cooperating with said bearing means of said first component member thereby to connect said first and second component members so that said second component member can be moved between a first and

a second position relative to said first component member, and second means for engaging a portion of said strip to securely fasten the same when said second component member is in one of said first and second positions, said second component member further comprising a tongue provided on said plate member adjacent to said bent portion and extending in a direction substantially opposite to said bent end portion, and a slot formed in the opposite end portion of said plate member for attaching one end of said strip to said second component member.

4,420,859

# TWO-PART PANEL FASTENER

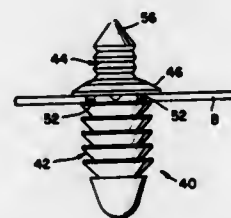
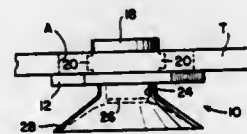
Frederick A. Hammerle, Topsfield, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 5, 1981, Ser. No. 308,225

Int. Cl.<sup>3</sup> A44B 21/00

U.S. Cl. 24—585

17 Claims



1. A two-part fastener for attaching two apertured panels together, comprising a socket member and a stud member, said socket member comprising a base, a retainer extending from one side of said base, said retainer including an elongated head supported above said base and which is adapted to pass through an elongated aperture in a first one of the panels in that said head and the aperture are relatively dimensioned to permit the head to pass through the aperture from one surface of the panel when the head is oriented so that it lies generally parallel to the longer dimension of the aperture, and to retain said socket member relative to the first panel when said head is turned a quarter turn from said orientation so that it overlaps the opposite surface of the panel, a receptacle extending from a side of said base opposite said retainer and defining a bore and an opening to the bore, and a flange extending from said receptacle and having a concave surface facing away from said base and surrounding the opening to the bore, said stud member comprising a lower shank adapted to pass through an aperture in a second one of the panels and to retain said stud member relative to the second panel, a collar for limiting the travel of said lower shank through the aperture in the second panel, and an upper shank adapted to pass through the opening into the bore of said receptacle of said socket member and to retain said stud member relative to said socket member.

4,420,860

# QUICK DISCONNECT PIN ASSEMBLY

Steve R. Chamel, West Peabody, Mass., assignor to The United States of America as represented by the Secretary of the Army, Alexandria, Va.

Filed May 17, 1982, Ser. No. 379,225

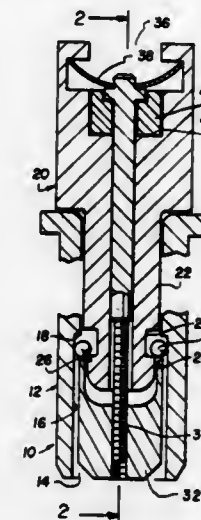
Int. Cl.<sup>3</sup> A44B 17/00

U.S. Cl. 24—613

6 Claims

1. A quick disconnect pin assembly of type permitting insertion of a pin into a receiving bushing, comprising a receiving bushing having an internal bore adapted to receive a disconnect pin, a portion of the bore away from its receiving end being enlarged, or recessed, to form a shoulder between its smaller bore section and its larger bore section, a disconnect

pin insertable in the bore and having a side face portion and an end face portion with an annular groove there between, the groove being in alignment with the recess when the pin is in an inserted position in the bushing, the groove defining a locking ring seat, the end face portion of the disconnect pin having a diameter less than that of the side face portion to provide a release means space, a resilient locking ring disposed in the groove between said pin and said bushing, being of a size and resilience that it is pushed aside into said groove on insertion of



said pin into said bushing but locks between said seat and said shoulder to prevent withdrawal of said pin after said pin is inserted into said bushing, and a release means for releasing said ring from engagement between said seat and said shoulder to permit removal of said pin from said bushing, the release means including a release member, movably mounted on said disconnect pin and having a skirt portion in said release means space engageable with said locking ring to dislodge the locking ring from its locked position.

4,420,861

# WARP BEAM LOADING AND UNLOADING APPARATUS FOR A WARPING MACHINE

Wilhelm Kofler, Uzwil, Switzerland, assignor to Maschinenfabrik Benninger AG, Uzwil, Switzerland

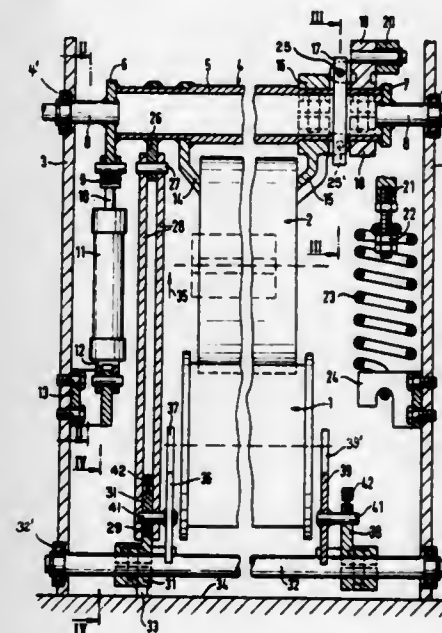
Filed Aug. 26, 1980, Ser. No. 181,489

Claims priority, application Switzerland, Sep. 13, 1979, 8279/79

Int. Cl.<sup>3</sup> D02H 3/00

U.S. Cl. 28—196

3 Claims



1. An apparatus for use with a beam warping machine equipped with means enabling the clamping and unclamping of a warp beam at the beam warping machine and serving for lifting-in and lifting-out the warp beam and for advancing and

uniformly pressing a press roll against the warp beam during operation of the beam warping machine as well as for lifting-off the press roll from the warp beam, comprising:

- a first shaft defining an axis of rotation;
- lifting fork members pivotally mounted for pivotable movement at said first shaft about said axis of rotation;
- said lifting fork members serving for lifting-in and lifting-out a warp beam;
- a second shaft;
- a pair of press roll arms radially protruding from said second shaft and rigidly connected for rotation with said second shaft;
- a press roll mounted between said pair of press roll arms;
- said pair of press roll arms serving for advancing the press roll towards the warp beam and for lifting-off the press roll from said warp beam;
- a single cylinder unit operatively connected with said second shaft for pivoting the lifting fork members and the press roll arms;
- a lever rigidly connected for rotation with said second shaft;
- hinge means operatively connecting said lever with said lifting fork members;
- said lifting fork members being actuated by said lever through the action of said hinge means such that a rotation of said second shaft through a first angular range only pivots the press roll and only after pivoting said second shaft thereafter through a second angular range is there pivoted said lifting fork members;
- said hinge means includes a pair of bracket members extending in the same direction of extent;
- said pair of bracket members having opposed ends;
- means for hingedly connecting said lever with one end of said pair of bracket members;
- a roller carried by the other end of said pair of bracket members;
- guide means including a guide slot coaxing with said roller;
- said guide means including a guide lever which when actuated pivots said lifting forks;
- said roller sliding within said guide slot without pivoting said guide lever during such time as said second shaft moves through said first angular range; and
- said roller bearing at an end of said guide slot and pivotally actuating said guide lever during such time as said second shaft moves through said second angular range.

4,420,862

# APPARATUS FOR MAKING SLATS FOR A SLATTED BLIND

Gerardus H. Edixhoven, Voorschoten, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands

Filed Jun. 12, 1981, Ser. No. 273,042

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024832

Int. Cl.<sup>3</sup> B23P 19/00

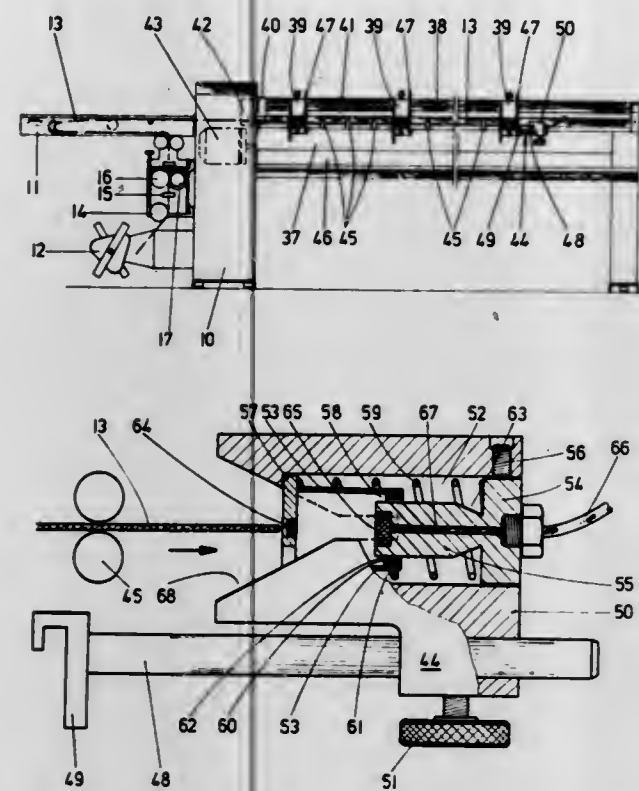
U.S. Cl. 29—24.5

12 Claims

1. Apparatus for making slats for a slatted blind, said apparatus comprising, in combination:
- (a) means for mounting a supply roll of slat-forming strip material;
  - (b) drive means effective to draw strip material from said supply roll;
  - (c) a guide channel positioned to receive a loop of said strip material drawn by said drive means to form a loop having an outer surface and an inner surface;
  - (d) a discharge table positioned to receive strip material from said guide channel;
  - (e) machining and/or assembly stations positioned in the region of said discharge table;
  - (f) an end stop associated with said discharge table movable to a predetermined position on said table for determining the length of the finished slat;
  - (g) an advancing member movable in the longitudinal direc-



tion of said guide channel and engagable by the end of said loop; and,



(h) resilient means urging the advancing member towards said discharge table for effecting conveyance of the strip material onto said discharge table.

4,420,863

## CANE CRUSHING APPARATUS

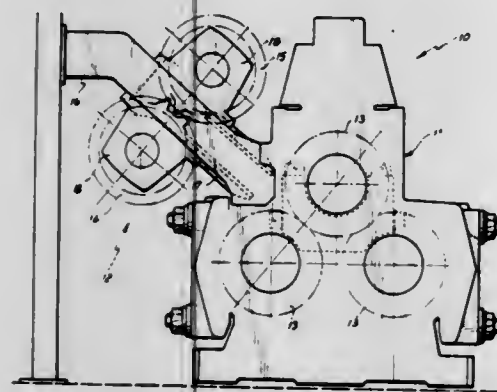
Raymond W. Trimmer, Oatley, and Morris B. McCullagh, Double Bay, both of Australia, assignors to Polymex Pty. Limited, Sydney, Australia

Filed Jul. 10, 1981, Ser. No. 282,093

Claims priority, application Australia, Jul. 10, 1980, PE4464  
Int. Cl.<sup>3</sup> A01B 29/00; B21B 31/08

U.S. Cl. 29—121.5

6 Claims



1. Apparatus for feeding sugar cane to a sugar cane crushing mill, said apparatus comprising a pair of opposed rotatable feeder rollers, on inlet chute to feed sugar cane between said feeder rollers and an outlet chute to direct sugar cane from said feeder rollers to the intake of the crushing mill, each of said feeder rollers having a central shaft, a plurality of disks coaxial with said shaft and extending radially therefrom, said disks being longitudinally spaced along each said shaft; said disks having outer radial peripheral surfaces which are provided with a plurality of spaced radially extending teeth of dimensions suitable to impel the sugar cane between said feeder rollers and through said outlet chute to the intake of said crushing mill, said pair of opposed feeder rollers being separated in the region of the nip thereof such that arcs described by the outer radial periphery of the teeth of one of said feeder

rollers overlaps the arc described by the outer radial periphery of the teeth of the other of said feeder rollers, said opposed feeder rollers being mounted to rotate synchronously with the teeth of one of said opposed feeder rollers intermeshing between but without contacting the teeth of the other of said feeder rollers.

4,420,864

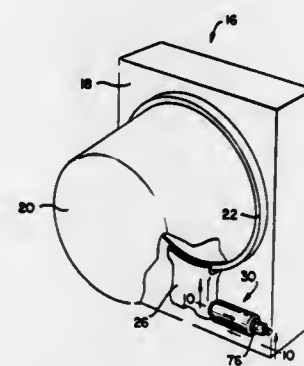
## BOLT TYPE LOCK PULLER

Richard E. Hoyt, Worcester, Mass., assignor to Omco, Inc., Holden, Mass.

Continuation-in-part of Ser. No. 102,925, Dec. 12, 1979, abandoned. This application Feb. 24, 1981, Ser. No. 237,618  
Int. Cl.<sup>3</sup> B23P 19/04

U.S. Cl. 29—263

2 Claims



1. A bolt type lock puller comprising:

- a hollow sleeve having an open leading end and a closed trailing end in which an axially centered circular aperture is provided, said sleeve having a longitudinally extending slot provided therein;
- an extractor mounted to axially reciprocate within said sleeve, said extractor having two split jaws at its leading end, said jaws constrained for limited transverse movement relative to each other;
- said extractor jaws having opposed pairs of teeth positioned to clamp around and bite into the cylindrical head of a bolt type lock having a radius of curvature which is greater than the radius of curvature of said teeth, each said pair of teeth extending over an arc of between 60° and 150° on each said jaw;
- means for releasably closing said split jaws by transversely moving said jaws towards each other to progressively bite into the head of a bolt type lock from an initial four point contact and to tightly grip the head of the bolt type lock, said jaw closing means including a transverse screw threadably engaging one said jaw and extending through the other said jaw, said transverse screw adapted to be acted upon by a tool to transversely draw said two jaws towards each other, a transverse pin extending through said split jaws, extending into and riding along said longitudinally extending sleeve slot; and
- means for reciprocating said extractor relative to said sleeve to pull the tightly gripped bolt type lock into said sleeve, said extractor reciprocating means including a longitudinal stud affixed to said extractor and extending through said sleeve trailing end aperture, said longitudinal stud adapted to be acted upon by a tool to axially move said extractor within said sleeve, said split extractor jaws constrained for limited transverse movement and fixed against axial movement relative to said longitudinal stud.

4,420,865

## METHOD FOR RETHRADING TUBULAR MEMBERS

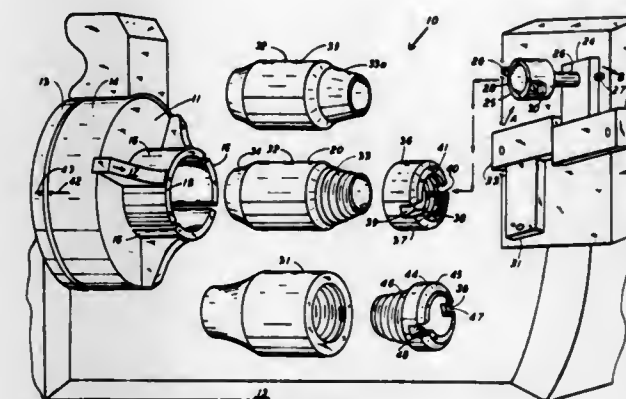
Jerry Haygood, Houston, Tex., assignor to Reed Tubular Products Co., Sugarland, Tex.

Filed Nov. 6, 1981, Ser. No. 318,909

Int. Cl.<sup>3</sup> B23P 6/00

U.S. Cl. 29—402.19

9 Claims



1. A method of rethreading and resurfacing a threaded tubular member having damaged or defective threads or a damaged or defective sealing surface; said method comprising: placing in the spindle of a numerically-controlled machining system, a blank tubular member to be threaded; actuating a standard numerical production program of the machining system to form a standard acceptable thread and sealing surface for the blank member; placing a preselected threaded adapter on the newly formed threads in tight engagement therewith, while said tubular member is still engaged in said machining system; said adapter having alignment means formed therein; actuating a preprogrammed position in said machining system thereby advancing the turret toward said adapter to a preprogrammed stopping point; releasing a sliding locator assembly from said turret and sliding it into aligning engagement with said alignment means in said adapter; locking said locator assembly in said turret while it is engaged in said adapter; actuating said program in said machine system to withdraw said turret and locator assembly from said adapter; removing said adapter from said standard threaded blank; removing said standard threaded blank from the collet of said spindle; placing a tubular piece to be rethreaded loosely in said collet of said spindle; threading said adapter onto the threads of said tubular piece in tight engagement; aligning said spindle radially with a fixed position on said machine system; actuating said program in said machine system to move said turret to said preprogrammed stopping point; sliding and rotating said loosely held tubular piece and adapter until said adapter fittingly engages said locator assembly; activating said machine system to lock said tubular piece in the collets of said spindle; actuating said machine system to withdraw said turret to disengage said locator assembly from said adapter; removing said adapter from said tubular piece; and, activating a rework program in said machine system to form a standard thread and seal surface on said tubular piece a predetermined distance into said piece further than said production program, wherein said predetermined distance is some multiple, including a single multiple, of the width of one standard thread.

4,420,866

## APPARATUS AND PROCESS FOR SELECTIVELY EXPANDING TO JOIN ONE TUBE INTO ANOTHER TUBE

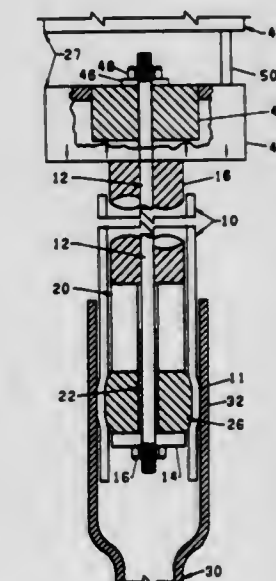
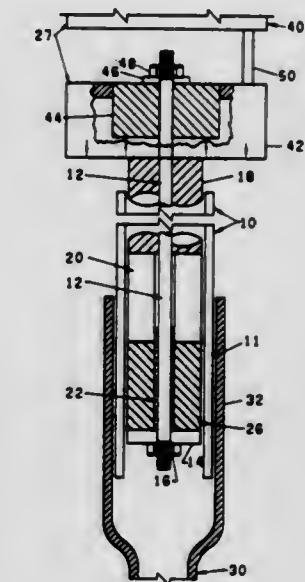
Richard A. Mueller, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Jan. 25, 1982, Ser. No. 342,252

Int. Cl.<sup>3</sup> B23P 17/00; B21D 39/08, 39/20

U.S. Cl. 29—421 R

14 Claims



1. An apparatus for joining at least one pair of tubes by selectively radially expanding a first tube into a second tube in proximity to their respective ends to form a selective interference fit between the tubes comprising:

- the first tube including a shaft extending axially therein;
- an inner cap bound to the shaft for longitudinal axial movement in combination with the shaft with respect to the first tube;
- an outer cap slidably mounted on and along the shaft for longitudinal axial movement on and along the shaft with respect to the first tube, said outer cap including at least one prong means bound thereto;
- a bushing means slidably mounted on and along the shaft between the outer cap and the inner cap for longitudinal axial movement on and along the shaft with respect to the first tube, said bushing means including a structure defining at least one longitudinal slot which longitudinally traverses said bushing means, said longitudinal slot registering said prong means therein;
- an elastomeric means slidably lodged within the longitudinal slot of said bushing means;
- the second tube with an end sleeve segment having a greater diameter than the first tube, said end sleeve seg-



ment defining a female opening to slidably mate with an end segment of said first tube, which includes the elastomeric means therein, such that the inner surface of the end sleeve segment of the second tube overlaps the outer surface of the end segment of the first tube; and

- (g) a means for pulling the shaft in one axial direction while simultaneously pushing the outer cap in the opposite axial direction such that when the inner cap contacts the bushing means and the prong means contacts the elastomeric means the continuing respective axial forces from pulling and pushing, in combination with the prong means of the outer cap in contact with the elastomeric means within the longitudinal slot, compress and thereby radially expand the elastomeric means at predetermined selective points against the end segment wall of the first tube causing said wall to expand against the inner surface of the end sleeve segment of the second tube to form a selective interference fit therebetween.

8. A process for joining at least one pair of tubes by selectively radially expanding a first tube into a second tube in proximity to their respective ends to form a selective interference fit between the tubes comprising the following steps:

- (a) placing a shaft axially inside a first tube, said shaft having an inner cap bound thereto for longitudinal axial movement in combination with the shaft with respect to the first tube;
- (b) mounting a bushing means, including at least one longitudinal slot which longitudinally traverses said bushing means, slidably on and along the shaft for longitudinal axial movement on and along the shaft with respect to the first tube, said bushing means having an elastomeric means slidably lodged within said longitudinal slot;
- (c) mounting an outer cap, including at least one prong means bound thereto, slidably on and along the shaft for longitudinal axial movement on and along the shaft with respect to the first tube such that said prong means is slidably lodged within the longitudinal slot of said bushing means, said outer cap positioned on the shaft such that the elastomeric means is between said prong means and said inner cap;

- (d) sizing an end sleeve segment of the second tube such that said end sleeve segment has a larger diameter than the first tube;

- (e) registering an end segment of the first tube, which includes the elastomeric means therein, within the end sleeve segment of the second tube such that the inner surface of the end sleeve segment of the second tube overlaps the end segment outer surface of the first tube; and

- (f) pulling the shaft in one axial direction while simultaneously pushing the outer cap in the opposite axial direction such that when the inner cap contacts the bushing means and the prong means of said outer cap contacts the elastomeric means the continuing respective axial forces from pulling and pushing, in combination with the prong means of the outer cap in contact with the elastomeric means within the longitudinal slot, compress and thereby radially expand the elastomeric means at predetermined selective locations against the end segment wall of the first tube causing selective radial expansion of the wall of the first tube end segment against the inner surface of the end sleeve segment of the second tube to form a selective interference fit therebetween.

#### 4,420,867 METHOD OF PRESSURE FITTING A TUBE IN A TUBE SHEET

Wilfried Busse, Harkortstrasse 8-10, 4630 Bochum 6, Fed. Rep. of Germany

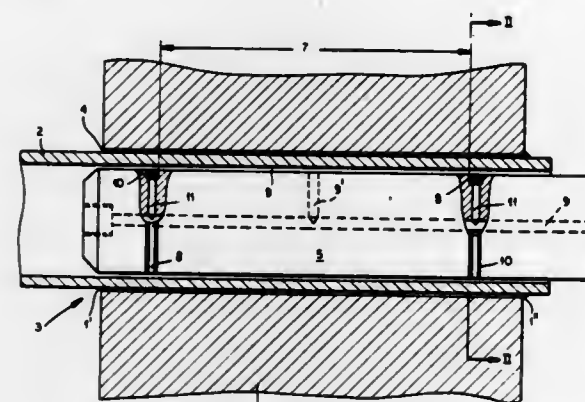
Filed Feb. 16, 1982, Ser. No. 349,258

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105736

Int. Cl.<sup>3</sup> B23P 17/00; B21D 19/00, 53/00

U.S. Cl. 29—421 R

5 Claims



1. A method of force-fitting a tube end in a plate such as a tube sheet, comprising the steps of:
- inserting a tube end in a bore formed in a plate;
- introducing into said tube end within said bore, an expansion mandrel so that the mandrel is received with clearance within said tube end;
- forcing a fluid under pressure through said mandrel and urging a pair of seals outwardly under fluid pressure into engagement with an inner wall of said tube end to seal said clearance between said seals of an expansion zone;
- supplying said fluid through said mandrel to said zone at a pressure sufficient to expand said tube end and force-fit the same in said wall.

4,420,868

#### TROUGH MANUFACTURING PROCESS

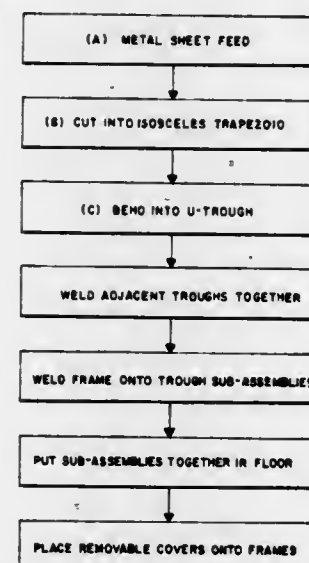
Stephen N. McEwen; Robert L. Stevens, and Barry R. Benschoter, all of Bowling Green, Ohio, assignors to Henry Filters, Inc., Bowling Green, Ohio

Filed Jun. 22, 1981, Ser. No. 276,059

Int. Cl.<sup>3</sup> B23P 19/04

U.S. Cl. 29—460

18 Claims



1. The method of making a section of troughing having parallel vertical side walls joined by an arcuate, semi-cylindrical, continuous bottom wall which slopes at a predetermined pitch when the free upper edges of the side walls are in the same horizontal, the steps of:

- (A) forming a regular trapezoidal blank having oppositely and equally inclined longitudinal edges defining the upper extremities of the side wall portions of the finished trough section, having a central longitudinal portion destined to form the bottom of the finished section, and having parallel side edges of unequal length,
- (B) securing the blank beneath a cylindrical forming die which contacts the blank linearly at the juncture of one side wall portion,
- (C) contacting the undersurface of the blank with a forming roll urging the blank into contact with the forming die, and
- (D) in a single uninterrupted motion, displacing the forming roll in an arcuate path concentric with said forming die and through an arc of at least 180° to bend the blank bottom to its final semi-cylindrical configuration and to align the blank longitudinal edges with one another.

4,420,869

#### METHOD OF MANUFACTURING A THYRISTOR HOUSING

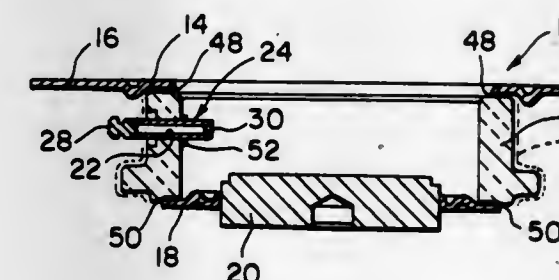
Gunduz Erkan, Middletown, and George Scott, Warwick, both of N.Y., assignors to Interceram, Inc., Middletown, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,139

Int. Cl.<sup>3</sup> H01L 21/48

U.S. Cl. 29—460

9 Claims



1. The method of manufacture of a thyristor housing comprising the steps of:

- a. Applying metalization coating along each generally circular edge of a generally tubular insulator and along a radially directed bore through a wall of said insulator;
- b. Forming a gate tube assembly by securing metal closures sealably on opposite ends of a gate tube, in a manner that the interior of said gate tube is hermetically sealed;
- c. Assembling said thyristor housing by brazing generally circular metal members, each having a generally circular periphery, on opposite ends of said insulator and respectively along the metalization coatings on opposite ends thereof and brazing said gate tube assembly in said bore with one end of said gate tube projecting radially outward from said insulator; and
- d. Thereafter, plating the exposed metal surfaces of said housing.

4,420,870

#### METHOD OF CONTROLLING CHANNEL LENGTH BY IMPLANTING THROUGH POLYCRYSTALLINE AND SINGLE CRYSTALLINE REGIONS FOLLOWED BY DIFFUSION ANNEAL

Minoru Kimura, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1981, Ser. No. 304,913

Claims priority, application Japan, Oct. 9, 1980, 55-141717

Int. Cl.<sup>3</sup> B01J 17/00; H01L 21/265

U.S. Cl. 29—571

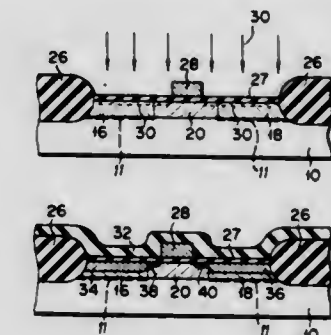
4 Claims

1. A method for manufacturing a semiconductor device, comprising the steps of:

- a. randomizing or disordering the lattice structure of an unmasked surface portion of a first single-crystalline silicon semiconductor region using a mask provided on the

remaining surface portion of said first single-crystalline semiconductor region, said mask being wider than a channel to be formed on the surface of the first single-crystalline semiconductor region;

- b. epitaxially forming a second single-crystalline semiconductor region on the masked portion of the first single-crystalline semiconductor region and a polycrystalline semiconductor region on that unmasked portion of the first single-crystalline semiconductor region where the lattice structure is randomized or disordered;



- c. forming a gate on the second single-crystalline semiconductor region with an insulating film interposed therebetween, the gate being smaller in its width than that of the second single-crystalline semiconductor region; and
- d. forming a source region and a drain region by introducing an impurity into the polycrystalline semiconductor region and into the portion of the second single-crystalline semiconductor region adjacent to the polycrystalline semiconductor region and subjecting the resultant semiconductor structure to heat treatment.

4,420,871

#### METHOD OF PRODUCING A MONOLITHICALLY INTEGRATED TWO-TRANSISTOR MEMORY CELL IN ACCORDANCE WITH MOS TECHNOLOGY

Adolf Scheibe, Ottobrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

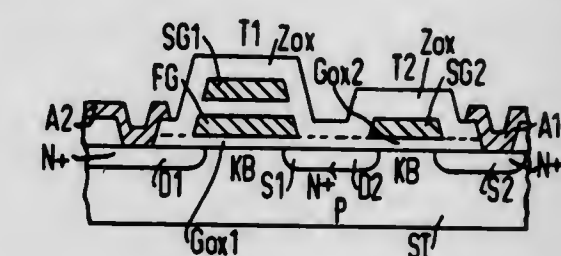
Filed Oct. 2, 1981, Ser. No. 307,884

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1980, 3037744

Int. Cl.<sup>3</sup> H01L 21/76, 21/88, 21/95

U.S. Cl. 29—571

9 Claims



1. In a method of producing a monolithically integrated two-transistor memory cell in accordance with MOS technology, including a silicon crystal for accommodating the memory cell and having a surface, a first MOS field effect transistor for information storage having a current-carrying channel and both a control gate and a floating gate located between the control gate and the surface of the crystal, a second MOS field effect transistor having a current-carrying channel and a control gate, an SiO<sub>2</sub> film supporting the gates, a doped polycrystalline silicon layer deposited on the SiO<sub>2</sub> film, the control gates and the floating gate being formed by masked etching technology of the doped polycrystalline silicon layer, and an erase area apart from the current-carrying channel of the two MOS field effect transistors of the memory cell for the floating



gate of the first MOS field effect transistor, the improvement which comprises preparing the surface of the silicon crystal for implantation, initially covering a part of the surface of the silicon crystal intended for the memory cell with an SiO<sub>2</sub> film by thermal oxidation forming a part of the gate oxide of the first MOS field effect transistor of the memory cell, forming a window through the SiO<sub>2</sub> film at a location intended for the erase area of the memory cell exposing an area of the surface of the silicon crystal and leaving remaining areas of the SiO<sub>2</sub> film, subsequently re-oxidizing the exposed area of the surface of the crystal in the window in the erase area and simultaneously increasing the remaining areas of the SiO<sub>2</sub> film to a given final thickness of the gate oxide in a further joint oxidation process producing a new thinner SiO<sub>2</sub> film in the window in the erase area, subsequently depositing a first doped polycrystalline silicon layer forming a base of the floating gate of the first MOS field effect transistor on the gate oxide film including the new thinner SiO<sub>2</sub> film, covering the doped polycrystalline silicon layer with another SiO<sub>2</sub> film at least in the part thereof forming the floating gate, depositing a second doped polycrystalline silicon layer on the other SiO<sub>2</sub> film, and forming the control gates of the first and of the second MOS field effect transistors from the second doped polycrystalline silicon layer and producing the source and drain zones of the two MOS field effect transistors by at least one of diffusion and implantation at sites on the surface of the crystal uncovered for this purpose.

4,420,872

#### METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Jose Solo de Zaldivar, Zürich, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

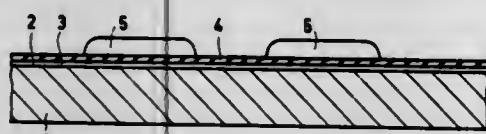
Filed Dec. 22, 1981, Ser. No. 333,353

Claims priority, application Netherlands, Dec. 23, 1980, 8006996

Int. Cl.<sup>3</sup> H01L 21/265, 21/31

U.S. Cl. 29—571

10 Claims



1. A method of manufacturing a semiconductor device having at least one insulated gate field effect transistor, which comprises:

- providing a silicon semiconductor body having a major surface;
- providing a silicon oxide layer on said major surface;
- providing a doped silicon layer on said oxide layer;
- providing a silicon-nitride-containing masking layer on said silicon layer;
- etching said masking layer and said underlying silicon layer into a pattern comprising at least a gate electrode;
- implanting nitrogen ions into those parts of the silicon surface not underlying the silicon layer;
- oxidizing the exposed parts of the silicon pattern by thermal oxidation, said masking layer masking the underlying silicon layer against said thermal oxidation; and
- forming source and drain zones by ion implantation in parts of the silicon surface not underlying the silicon pattern.

4,420,873

#### OPTICAL GUIDED WAVE DEVICES EMPLOYING SEMICONDUCTOR-INSULATOR STRUCTURES

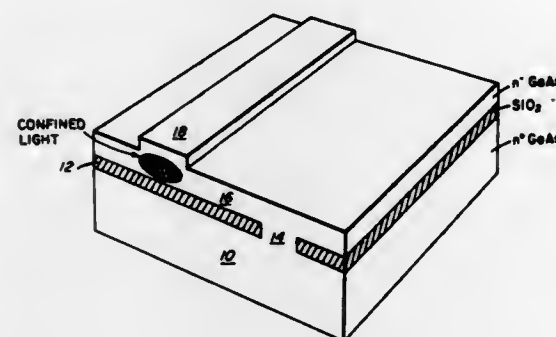
Frederick J. Leonberger, Lexington; Ivars Melngailis, Newton; Carl O. Bozler, Sudbury, and Robert W. McClelland, Weymouth, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 25, 1980, Ser. No. 115,420

Int. Cl.<sup>3</sup> G02B 5/172

U.S. Cl. 29—576 E

5 Claims



1. A method of fabricating a three-dimensional optical waveguide, comprising:

- a. forming a single crystal semiconductor substrate;
- b. forming an insulator layer on said substrate;
- c. forming a single crystal semiconductor layer upon the insulator layer; said insulator layer having an index of refraction lower than that of said semiconductor layer, said semiconductor layer being formed to a thickness sufficient to provide confinement of light in the lower vertical direction by the boundary between the insulator layer and the semiconductor layer above and in the upper vertical direction by the boundary between the semiconductor layer and an insulator; and,
- d. removing portions of said semiconductor layer to leave a three-dimensional waveguide region of single crystal semiconductor between the insulator layer on the bottom and the semiconductor layer on the top and creating an effective larger index of refraction on two sides of said three-dimensional waveguide region to thereby provide confinement of said light in said region in the lateral direction.

4,420,874

#### METHOD OF PRODUCING AN IIL SEMICONDUCTOR DEVICE UTILIZING SELF-ALIGNED THICKENED OXIDE PATTERNS

Tsunao Funatsu, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 105,152, Dec. 19, 1979, Pat. No. 4,375,645.

This application Jan. 18, 1982, Ser. No. 340,286

Claims priority, application Japan, Dec. 30, 1978, 53-165804

Int. Cl.<sup>3</sup> H01L 21/20, 21/302

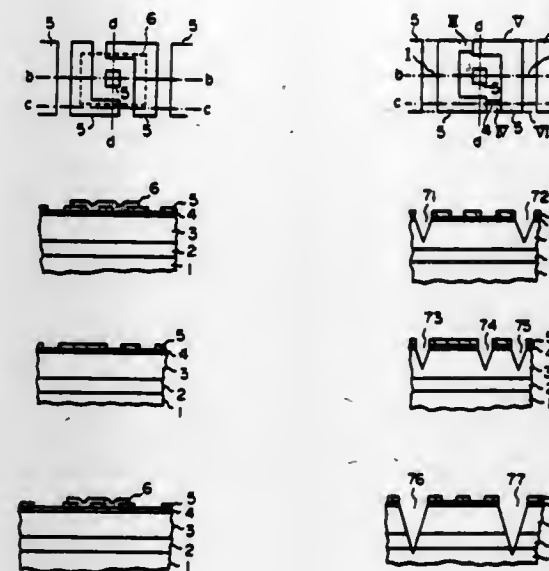
U.S. Cl. 29—576 W

9 Claims

1. A method for producing a semiconductor device with plural elementary regions comprising the steps of forming an insulating layer on a semiconductor body of a first conductivity type, selectively forming an anti-oxidation mask layer on said insulating layer, patterning said anti-oxidation mask layer so as to determine the locations of a plurality of pairs of first regions of opposite conductivity type, and a corresponding plurality of injector regions of the opposite conductivity type, in said semiconductor body in each said elementary region, forming shallow and deep V-shape grooves extending in respectively different directions in said semiconductor body, said deep V-shape grooves isolating each adjacent pair of elementary regions in a first direction and said

shallow V-shape grooves extending transversely to said first direction and terminating at a depth in said semiconductor body to isolate each adjacent pair of said first regions,

removing said anti-oxidation mask layer, and forming said pairs of first regions and said injector regions under said insulating layer in said semiconductor body at said locations determined by the patterning of the anti-oxidation mask layer.



4,420,875

#### METHOD OF MOUNTING AND CASTING A FLAT ROTOR

Michel Coquillart, Saint Etienne Terrenoire, France, assignor to Mavilor Systemes, Switzerland

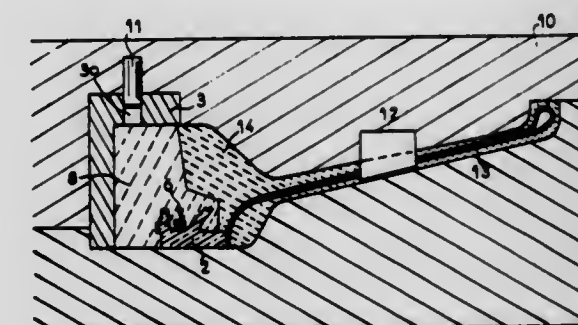
Filed Nov. 21, 1980, Ser. No. 209,295

Claims priority, application France, Dec. 5, 1979, 79 30269

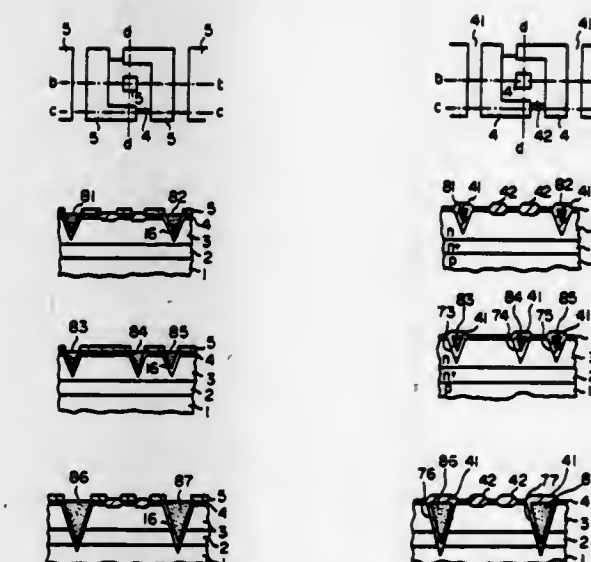
Int. Cl.<sup>3</sup> H01R 43/08; H02K 15/02

U.S. Cl. 29—597

1 Claim



1. A method of mounting and casting flat rotors of electric motors, comprising the following successive operational steps: first, angularly positioning within a first mold, an inner tubular casing and a commutator having segments, wherein the angular positioning of said tubular casing in said first mold is performed by at least one indexing finger which is present in said first mold, said at least one indexing finger of said first mold traverses at least one orifice in said inner tubular casing, and another at least one indexing finger goes between said segments of said commutator so as to assure the proper orientation of said commutator in said first mold in relation to said inner tubular casing; second, pouring a suitable resin into said first mold between said tubular casing and said commutator forming a molded commutator; third, crimping a winding coil-by-coil onto said molded commutator; fourth, separating said commutator segments of said molded commutator and windings; fifth, angularly positioning within a second mold, said molded commutator and windings, wherein the angular positioning of said molded commutator and windings in said second mold is performed by at least one indexing key which is present in said second mold and which fits between said coils to assure proper orientation of said coils in relation to at least one indexing finger in said second mold for positioning said inner tubular casing, whereby said two angular positioning steps ensures correct adjustment of said commutator because said segments of said commutator are correctly positioned with respect to said tubular casing in said first mold and said windings are



enlarging the thickness of predetermined portions of said insulating layer, said predetermined portions separating each said injector region from the corresponding pair of first regions,



correctly positioned with respect to said tubular casing in said second mold so that said windings and said commutator segments are correctly positioned with respect to one another; and  
sixth, pouring suitable resin into said second mold, so as to coat said windings with resin.

#### 4,420,876 METHOD OF COIL ASSEMBLY FOR HOT MELT INDUCTION HEATER APPARATUS

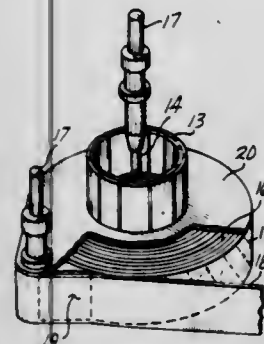
Arthur W. McDermott, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 6, 1981, Ser. No. 260,970

Int. Cl.<sup>3</sup> H05B 3/00

U.S. Cl. 29—611

7 Claims



1. The method of making an induction heating coil (10) comprising the steps of:  
providing a conductor (16) having a rectangular cross sectional area and an inside end;  
brazing an inner terminal lead (14) to said inside end of said conductor (16) with a high-temperature braze alloy;  
wrapping said conductor (16) by winding in spiral overlap fashion a polyimide tape (15) around said conductor (16) said polyimide tape (15) having a fluorocarbon resin coating on both sides;  
winding under tension a plurality of turns of said conductor (16) so that opposing surfaces of said fluorocarbon resin coatings between windings of said conductor (16) are in direct contact;  
after winding of the last conductor turn (16), forming of an outer terminal lead at 90° to the coil body (11), and subsequently high temperature brazing inner (17) and outer (17) terminals to said leads; inserting wedges (19) to stabilize said outer terminal lead (17), and then winding a further plurality of turns on the coil periphery with dielectric polyimide tape (18).

#### 4,420,877 SELF-MASKING SOCKET PIN CARRIER FOR PRINTED CIRCUIT BOARDS

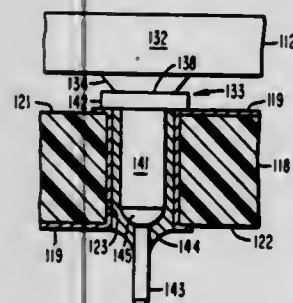
Joseph A. McKenzie, Jr., 6330 Laura La., Pleasanton, Calif. 94566

Filed Mar. 19, 1981, Ser. No. 245,442

Int. Cl.<sup>3</sup> B23P 19/00

U.S. Cl. 29—739

20 Claims



1. A tool for fabricating an electrical socket within a non-

conductive substrate of a printed circuit board, said fabricated socket having at least one electrical receptacle contact body defining an opening for receiving an electrical contact pin terminal of an electrical plug, said receptacle contact body secured by solder within a terminal lead-hole formed in said substrate with its opening exposed to receive said contact pin terminal, said tool comprising:

- a support structure including a support block to which is secured a pin structure for receiving and releasably supporting each receptacle contact body for insertion and soldering in the lead-hole of the substrate so that the opening of said receptacle contact body of the fabricated electrical socket is exposed to receive the contact pin of the electrical plug; and
- a barrier structure defined by a transition body joined to the support block and pin structure for covering the opening of the receptacle contact body supported by said pin structure, said pin structure and transition body having configurations and dimensions enabling said pin structure to be inserted into said receptacle contact body through its opening and support same with said transition body closing said opening to prevent solder applied to said receptacle contact body to secure same within the lead-hole from entering said opening.

#### 4,420,878 INSERTION HEAD FOR DIP AND DIP SOCKET COMPONENTS

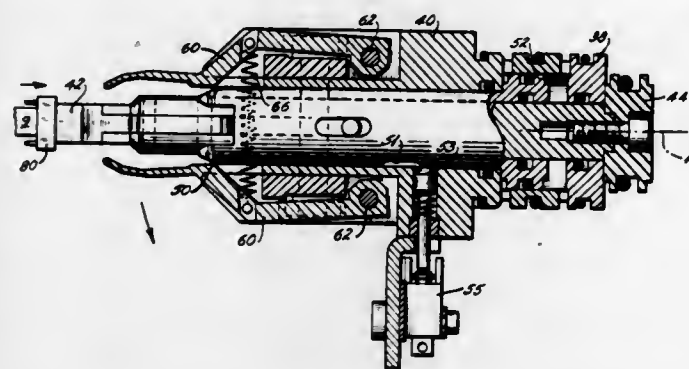
James W. Tripp, Whitney Point, and John Schoenmaker, Greene, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Feb. 23, 1982, Ser. No. 351,416

Int. Cl.<sup>3</sup> H05K 3/30

U.S. Cl. 29—741

4 Claims



1. An apparatus for picking up DIP and DIP socket components and population of said components in a laterally spaced relation on a circuit board having lead receiving holes, each of said components having a lateral dimension and comprising a body and substantially parallel leads extending generally in a perpendicular direction away from a planar surface of said body said lateral dimension including body width and lead spacing and said DIP socket lateral dimension being greater than said DIP lateral dimension said apparatus comprising:  
a tooling head movable toward and away from said circuit board along a longitudinal axis for insertion of said leads in said holes, said head comprising spring-biased guide jaws each pivotally attached at one end and free at the other end, said other end having guide grooves, such that said guide jaws are spring-biased toward a closed position and engageable with said leads to guide said leads during insertion thereof into said holes;  
pusher means extensible and retractable relative to said tooling head along said longitudinal axis and engageable with said body;  
primary cam means for opening said guide jaw other ends in opposition to said spring biasing to a spacing sufficient to clear said component lateral dimension during said picking up and insertion, and for controlling the rate of biased clo-

sure of said grooves onto said leads during reception of said component in said tooling head;  
means for controlling the spacing of said guide jaw other ends after insertion of said leads into said holes by opening said guide jaw ends less than said primary cam means such that said laterally spaced relation of adjacent components is minimized; and  
means for actuating said primary cam means, said pusher means, said movable tooling head, and said spacing controlling means upon command.

#### 4,420,879 DEVICE FOR OPENING SNAP-LOCKED HOUSING SECTIONS OF A CABLE CONNECTOR

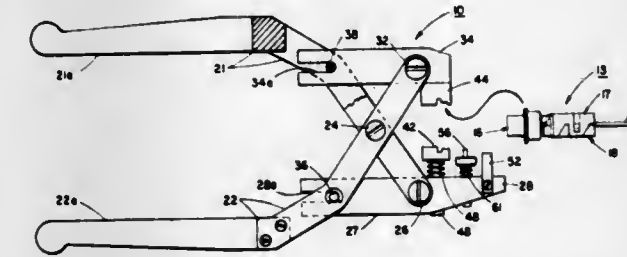
Robert V. Harringer, Joliet, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,746

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—764

11 Claims



1. A device for releasing and separating a first housing section from a second housing section of a cable connector, wherein the first and second housing sections are normally releasably secured together by a pair of laterally spaced, side-wall-located snap-locked latches, and wherein the second housing section is fixedly secured to a third housing section, said device comprising:

- first and second pivotally connected handle-defining gripping members;
- first and second jaw means respectively connected to said first and second gripping members, said jaw means, in response to a compressive force manually exerted on the handle portions of said gripping members, acting to precisely position and resiliently clamp the third housing section of a connector when interposed therebetween;
- first and second laterally disposed latch-releasing members mounted on one of said first and second jaw means, each of said latch-releasing members being positioned, and having a terminated end acting to engage and effect the release of a different one of the latches of a clamped connector, and
- biasing means mounted on the same one of said first and second jaw means as said latch releasing members, said biasing means being positioned so as to contact and effect the displacement of the first connector housing section, when released, a predetermined distance from the second housing section.

#### 4,420,880 DEVICE FOR EXTRACTING AN IN-LINE ARRAY OF SOCKET-MOUNTED CIRCUIT PACKAGES OF THE DUAL-IN-LINE-TYPE

Robert W. Mielke, Warrenville, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 29, 1982, Ser. No. 373,195

Int. Cl.<sup>3</sup> B23P 19/00; H01R 43/00

U.S. Cl. 29—764

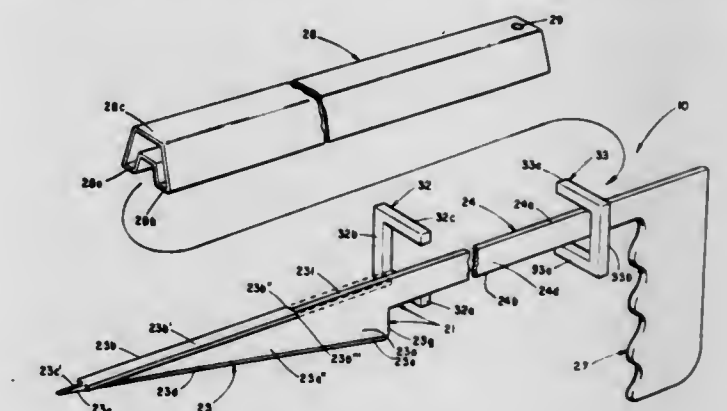
15 Claims

1. An extraction device for successively removing a linear array of multi-leaded integrated circuit packages, of the type having dual-in-line leads, from a corresponding array of respectively associated support board-mounted sockets, and for facilitating the temporary replaceable-magazine storage of such extracted circuit packages, and wherein each socket is

formed with a guide slot that communicates with the upper surface thereof, and which slot is positioned to extend parallel to, and be interposed between, the laterally spaced rows of leads of a socket-mounted circuit package, said extraction device comprising:

an elongated composite body member that includes:

- a. a forward wedge-shaped portion having an upper, longitudinally extending and inclined ramp for effecting the successive extraction of an array of socket-mounted circuit packages, and guiding the latter in back-to-back relationship into a replaceable storage magazine when mounted on said device, said wedge-shaped portion further having a lower edge from which a thin, longitudinally extending socket slot-receiving rib projects downwardly a predetermined distance;
- b. an elongated rearward portion having an upper edge that is particularly for supporting the intermediate leg



portion of a substantially U-shaped type of circuit package storage magazine along at least a major portion of the longitudinal length of the latter, said upper magazine-supporting edge being co-linear with, but substantially narrower than, the width of said wedge-shaped portion ramp, and

- c. a handle portion positioned at a predetermined point along said rearward magazine-supporting portion, and extending downwardly therefrom, said extraction device further including:  
bracket means secured to said rearward body member portion, and cooperating with opposite major sides and said upper magazine-supporting edge of said rearward portion to define on each side of the latter at least one substantially enclosing channel area, each of said opposite side channel areas receiving a longitudinal section of a different leg portion of a storage magazine of the U-shaped type to be removably confined therewithin.

#### 4,420,881 METHOD OF MANUFACTURING A PREFORM FOR MINERAL-INSULATED ELECTRIC CABLE

Jean-Claude Bourget, Isay les Moulineaux, France, assignor to Les Cables de Lyon, Lyons, France

Filed Sep. 11, 1981, Ser. No. 301,483

Claims priority, application France, Sep. 23, 1980, 80 20393 Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—825

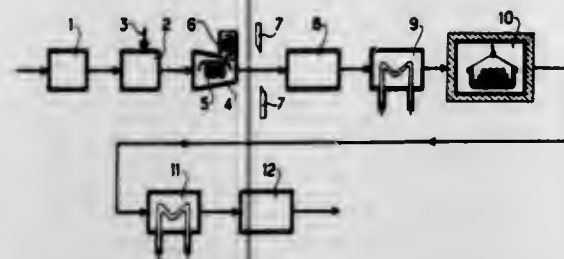
5 Claims

1. A method of manufacturing a preform made of an electrically insulating mineral substance for an electric cable having compressed mineral insulation, said method comprising the steps of:

- (a) mixing the mineral insulating substance with an organic binder;
- (b) extruding a cylindrical structure which has at least one internal duct;
- (c) cutting the extruded cylindrical structure into portions of a length corresponding to the size of a chaplet of a heat treating furnace;



- (d) heat treating the portions in said furnace to cause the organic binder to burn; and



- (e) inserting the portions while still hot in a metal tube forming the cable sheath and passing the conductor(s) through the internal duct(s)

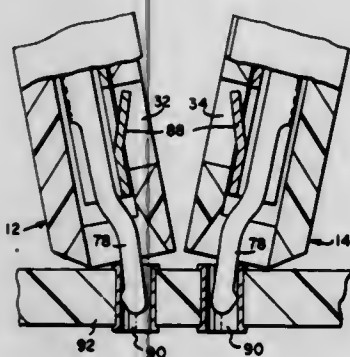
4,420,882

**METHOD OF MOUNTING TILT LATCH ZERO INSERTION FORCE CONNECTOR TO A SUBSTRATE**  
Leon T. Ritchie, Mechanicsburg; Clair W. Snyder, Jr., York, both of Pa.; Thurston H. Toepfen, Poughkeepsie, N.Y., and John A. Woratyla, Camp Hill, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 240,524, Mar. 4, 1981, Pat. No. 4,372,634.  
This application Sep. 2, 1982, Ser. No. 414,230  
Int. Cl.<sup>3</sup> H05K 3/30

U.S. Cl. 29—837

2 Claims



1. A method of effecting zero insertion force mating of an electrical connector with a plurality of conductive holes in an array in a circuit board or the like, comprising the steps of:  
forming a pair of subassemblies each comprising a housing having a mating face, a plurality of terminals in said housing each with a resilient beam portion extending from said mating face, and a cover member;  
mating said subassemblies with said circuit board at a tilted angle with respect to the plane of said circuit board, said beams entering said conductive holes making only incidental contact therewith; and  
rotating said subassemblies relative to each other and to said circuit board to bring said subassemblies into abutting position and said beams into contact with walls of said conductive holes.

4,420,883

**PRUNING APPARATUS OF THE COMPOUND ACTION HOOK AND BLADE TYPE**

Edward M. Wallace, Longmeadow; Robert G. Gosselin, Springfield, and Ernest D. Labarre, Holyoke, all of Mass., assignors to Wallace Mfg. Corp., Enfield, Conn.

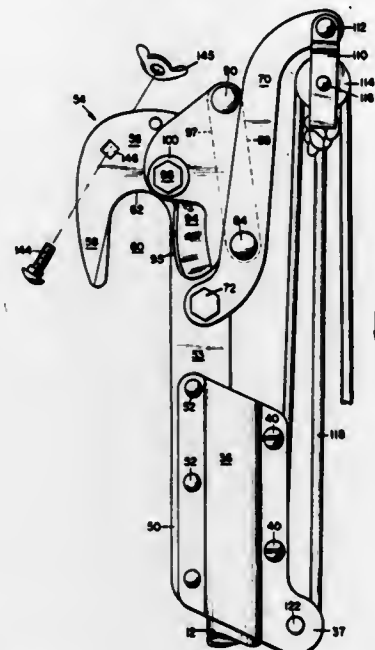
Filed Jun. 26, 1981, Ser. No. 277,927  
Int. Cl.<sup>3</sup> B26B 13/26

U.S. Cl. 30—251

8 Claims

1. A rope-actuated pruning apparatus incorporating a compound leverage force for oscillating a cutting blade comprising:  
a handle,

a hook fixed to the handle and defining a downwardly-facing limb engaging-surface,  
a movable blade having a cutting edge and being oscillatable for defining cutting and return strokes in intersecting relationship with the limb-engaging-surface of the hook,  
a lever pivotally mounted relative to the hook,  
a link pivotally connected to each of the lever and blade,



the hook and blade and lever and link being each in surface confrontation with a common vertically disposed plane,  
a rope and pulley assembly operatively interconnecting with the blade through the lever and link and having a manually engageable free end for effecting pivotal movements of the blade through the cutting strokes, and  
spring means for effecting movements of the blade through the return strokes.

4,420,884

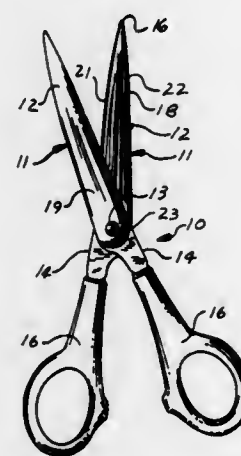
**CAMMING SCISSORS**

William G. Hembling, Milford, Conn., assignor to The Scott & Fetzer Company, Shelton, Conn.

Filed Dec. 11, 1981, Ser. No. 329,813  
Int. Cl.<sup>3</sup> B26B 13/06

U.S. Cl. 30—266

5 Claims



1. Scissors comprising a pair of blades connected at a pivot, the blades each having mutually cooperating elongate cutting portions on one side of the pivot and handle shank portions on the opposite side of the pivot, said blades being pivotal about said pivot from an open position in which said cutting portions form an acute angle to a closed position where they are generally superposed, said blades being formed from sheet steel and being of generally uniform thickness, said blades having inner and outer faces, said inner faces being concave substantially along the full length of said cutting portions and said outer

faces of said cutting portions being correspondingly convex, the profile of said cutting portion faces being substantially described by lead and trailing edges, the lead edges of said cutting portions forming the cutting surfaces of said blades, the shank portion of a blade including integral cam means embossed in the sheet material of its body to tilt the blades relative to one another to promote contact between the cutting edges of said blades and avoid contact of said trailing edges of said blades, the cam means embossment being disposed on the arc of a circle generally concentric with said pivot, the shank portion between said cam embossment and said pivot comprising substantially entirely a hollow spheroidal area which merges smoothly with the associated cutting portion whereby the cam embossment and spheroidal shank area are mutually reinforced and stiffened.

4,420,886

**X-Y PLOTTER FOR PRODUCING DIAGRAMS FROM COMPUTER INFORMATION**

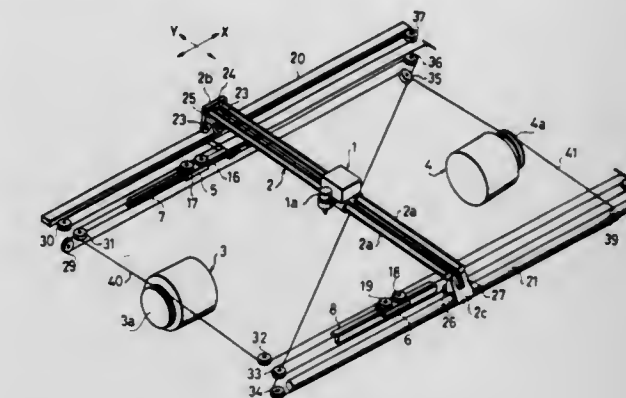
Toshiaki Amano, 50-2 Aza-kami-Imoda, Oaza-Imoda, Tamaya-mura, Iwate-gun, Iwate-ken, Japan

Filed Nov. 16, 1981, Ser. No. 321,698

Claims priority, application Japan, Nov. 14, 1980, 55-160342  
Int. Cl.<sup>3</sup> G01D 15/16; F16H 55/52

U.S. Cl. 33—1 M

4 Claims



1. An X-Y plotter comprising:

- a frame
  - a pen carriage equipped with recording pen means to make marks on a recording surface;
  - a slider upon which said pen carriage is movably mounted for sliding motion in a first direction thereon, said slider means being movably mounted on said frame for sliding motion in a second direction orthogonal to the direction of pen carriage movement;
  - a first driving means for moving said pen carriage along said slider, which comprises a first driving motor and a first wire mounted in a closed loop not fixed to said frame, said loop including said motor and said pen carriage;
  - a second driving means for moving said slider in said second direction, which comprises a second driving motor and a second wire mounted in a closed loop not fixed to said frame including said second motor and said slider; and
  - tension means engaging said first wire for keeping said first wire free from slack;
- wherein said tension means comprises slide means which is equipped with a pair of pulleys, one of which engages said first wire and is movable along guide means in the second direction; and a slack-preventing wire having one end fixed to said slider and the other end fixed to said frame and engaging another pulley of said slide means so that said slack-preventing wire keeps said first wire free from slack through said slide means.

4,420,885

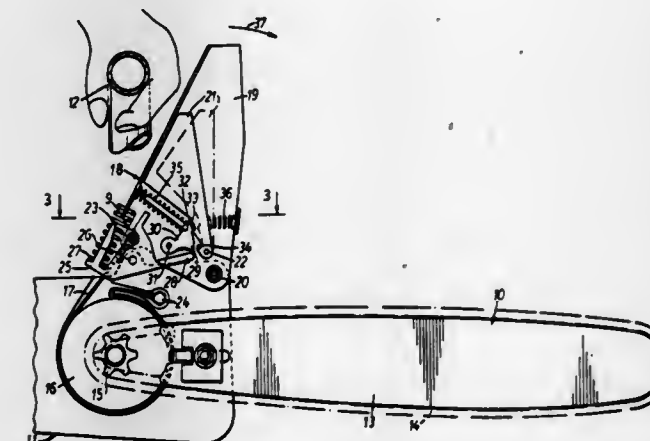
**POWER TOOL WITH IMPROVED BRAKING DEVICE**  
Giuseppe Todero, Mandello del Lario, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 15, 1982, Ser. No. 368,514

Claims priority, application Italy, Apr. 17, 1981, 21266 A/81  
Int. Cl.<sup>3</sup> B27B 17/02

U.S. Cl. 30—381

22 Claims



1. A portable power tool, comprising:  
means for driving the tool;  
means for transmitting power from said driving means to the tool;  
means, operable on said transmitting means from an inoperative condition to an operative condition, for braking the tool;  
first energy storage means for applying said brake means;  
safety lever means, operable to release said first energy storage means, for applying said brake means when said safety lever means contacts an operator's hand, wrist or arm during kick-back or like violent movement of the tool;  
second energy storage means, operable independently of said safety lever means, for releasing said first energy storage means; and  
an inertia mass displaceable effectively independently of said safety lever means when said brake means is in the inoperative condition, said inertia mass releasing said second energy storage means which in turn releases said first energy storage means to apply said brake means, upon occurrence of kick-back or like violent movement of the tool.

4,420,887

**INSTRUMENT FOR MEASURING A LENGTH**

Hideo Sakata; Ichiro Mizuno; Masao Nakahara, and Takasi Sanpei, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,942

Claims priority, application Japan, Jul. 21, 1981, 56-108515[U]; Nov. 21, 1981, 56-187350

Int. Cl.<sup>3</sup> G01B 5/00

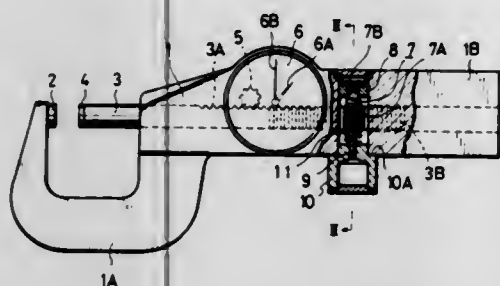
U.S. Cl. 33—147 F

9 Claims

1. An instrument for measuring a length, comprising:  
a main frame means which includes an anvil and elongated guide means, the axis of which is aligned with said anvil;  
an elongated spindle linearly movable in the axial direction of said elongated guide means, said spindle having means defining a rack thereon;  
length indicating gauge means responsive to an axial movement of said spindle;  
a pinion shaft and means rotatably mounting said pinion shaft on said main frame means, said pinion shaft having a driving gear thereon engaged with said rack so that a



rotation of said pinion shaft will effect an axial movement of said spindle, said pinion shaft further having a threaded segment thereon;  
 a rotary knob rotatably mounted on said main frame means and having means thereon threadedly engaging said threaded segment of said pinion shaft;  
 resilient means for yieldably resisting relative rotation between said pinion shaft and said rotary knob so that a rotation of said rotary knob will effect a rotation of said pinion shaft and a consequent axial movement of said spindle, said resilient means yielding and permitting the aforesaid relative movement in response to a resistance to axial movement being applied to said spindle; and



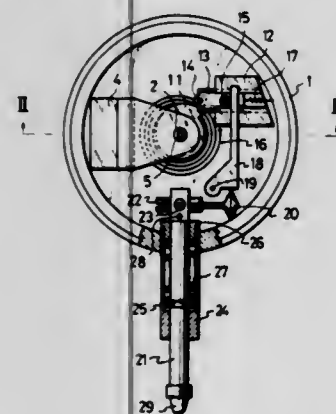
releasable locking means interposed between said rotary knob and said main frame means and being activated in response to a relative rotation between said pinion shaft and said rotary knob for locking said rotary knob against rotation and, consequently locking said spindle in a fixed position whereby when said spindle engages an object to be measured oriented in the path of movement of said spindle toward said anvil, said rotary knob will rotate relative to said pinion shaft and said releasable locking means will effect a fixing of the position of said spindle to thereby enable a visual inspection of said gauge means without inadvertently shifting the position of said spindle and the consequent altering of the indication on said gauge means.

#### 4,420,888 DIAL GAUGE

Masato Wakao, and Iwao Sugizaki, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan  
 Filed Jun. 4, 1982, Ser. No. 385,243  
 Claims priority, application Japan, Jun. 23, 1981, 56-97226  
 Int. Cl.<sup>3</sup> G01B 3/22

U.S. Cl. 33—172 R

4 Claims



1. A dial gauge, comprising:

- a gauge case body;
- an elongated spindle protruding from said body and supported on said body for displacement toward and away from said body, and first biasing means urging said spindle in a direction outwardly from said body;
- a shaft rotatably mounted within said body, an indicator hand mounted on one end of said shaft for rotation therewith, a cam member mounted on said shaft and adapted to effect rotation thereof, and second biasing means con-

nected between said shaft and said body for urging said shaft and thereby said cam member and said indicator hand in one predetermined rotational direction;  
 a reciprocable member supported on said body for reciprocation toward and away from said cam member, said reciprocable member having a rotatable roller mounted thereon and abutting against the cam surface of said cam member so that reciprocation of said reciprocable member effects rotation of said cam member and thereby said shaft;  
 a link mechanism connected between said spindle and said reciprocable member for transmitting and multiplying a displacement of said spindle with respect to said body to effect an enlarged movement of said reciprocable member with respect to said shaft, said link mechanism being pivotally mounted at the end thereof adjacent to said spindle and the opposite end thereof being coupled to said reciprocable member, said link mechanism having a flat surface and said spindle having a driving piece connected thereto and engaging said flat surface so that movement of said spindle effects pivoting of said link mechanism.

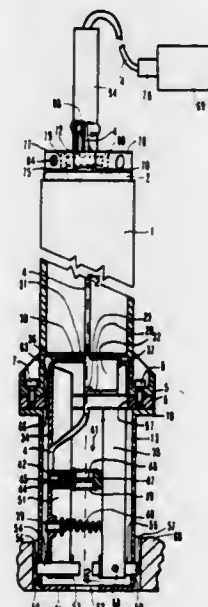
4,420,889

#### PLUG COMPARATOR FOR CHECKING THE DIAMETER OF HOLES

Mario Possati; Guido Golinelli, both of Bologna, and Narciso Selli, Montevoglio, all of Italy, assignors to Finike Italiana Marpos S.p.A., S. Marino di Bentivoglio, Italy  
 Filed May 29, 1981, Ser. No. 268,631  
 Claims priority, application Italy, Jun. 20, 1980, 3436 A/80  
 Int. Cl.<sup>3</sup> G01B 3/22

U.S. Cl. 33—178 F

3 Claims



1. A manual plug comparator for checking the diameter of holes of mechanical parts, comprising,

- a support plate defining first and second sides and at least a through hole;
- an integral body including: a first section coupled to the support plate; two lightened portions connected to the first section and defining relevant fulcrum devices; and two further sections, each defining a relevant movable arm, connected to the lightened portions for rotation movement about the relevant fulcrum devices;
- two feelers coupled to the movable arms, respectively, for contacting the part to be checked;
- transducer means coupled to the movable arms for providing a signal responsive to the mutual position of the movable arms, the transducer means including two transducer elements coupled to the movable arms, respectively, each transducer element and each feeler being coupled to the relevant movable arm on the same side with respect to the relevant fulcrum device;
- a hollow handle coupled to the support plate;
- a protective nosepiece coupled to the support plate and

defining with the handle a geometrical longitudinal axis of the plug comparator, the nosepiece substantially housing the arms, the arms being substantially arranged along said longitudinal axis and passing through said through hole of the support plate, the nosepiece further defining two openings for the passage of the feelers;  
 wherein the handle, the support plate and the nosepiece define an internal chamber and the handle and the nosepiece have bases spaced along said longitudinal axis, these bases defining further openings for carrying out a cleaning operation inside said chamber by introduction of a pressurized fluid through one of said further openings, the flow of the fluid within the chamber, substantially along said longitudinal axis, for removing any foreign matter, and the discharge of the fluid to the outside of the plug comparator.

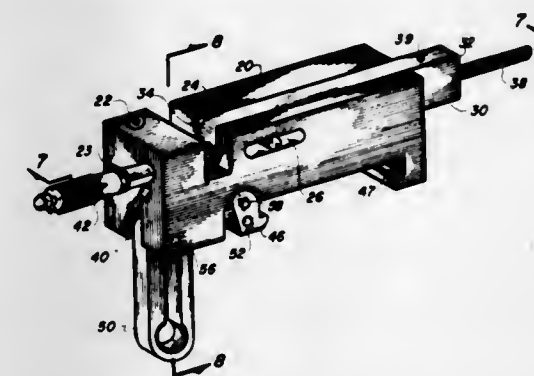
4,420,890

#### MICROMETER ADJUSTABLE BACKGAUGE

Nelson A. Naylor, 3941 Rocky View Dr., Norco, Calif. 91760  
 Filed Feb. 22, 1982, Ser. No. 350,718  
 Int. Cl.<sup>3</sup> G01B 5/02; B21D 11/22

U.S. Cl. 33—180 R

8 Claims



1. A micrometer adjustable backgauge for locating a workpiece in a machine tool press brake, having a mechanical adjustable backgauge comprising:

- (a) a body having a first and second end, said body including means for attaching said body to said press brake,
- (b) an adjustable probe having means on one end pivotally and slideably mounting said probe on said body for sliding movement toward and away from said press brake and pivotal movement about an axis parallel to said press brake, the other end of said probe extending outward from the body for engaging said workpiece, and,
- (c) a micrometer head having a sleeve, thimble and spindle compressibly affixed into said body first end at said sleeve with said thimble extending outward from the body and said spindle contiguous to said probe for adjustably positioning said probe from said body.

4,420,891

#### FRAMING AND LAYOUT SQUARE

Howard L. Orem, Petrolia, Calif., assignor to Richard B. Cogswell, Hinsdale, Ill.

Filed Aug. 5, 1981, Ser. No. 290,351

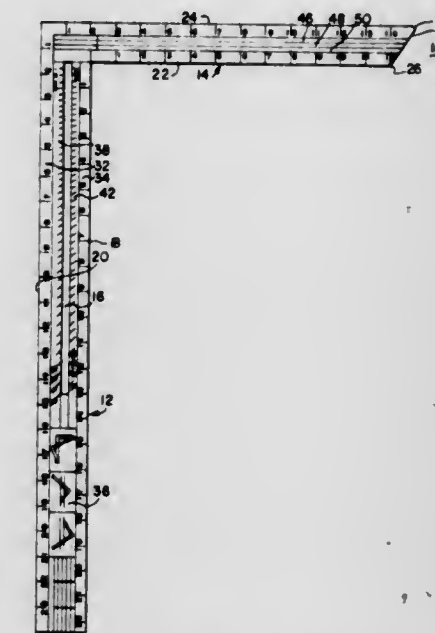
Int. Cl.<sup>3</sup> B43L 7/00

U.S. Cl. 33—476

9 Claims

1. A framing and layout square of unitary construction comprising a blade and a tongue, each of which have flat upper and lower surfaces, said blade and tongue disposed coplanarly and perpendicularly each to the other, said blade having an interior rectilinear lateral edge and an exterior rectilinear lateral edge, each of which include a linear measurement scale defined thereon, an elongated slot defined in said blade of sufficient width to provide a sight opening for aligning the edge of a piece of lumber, said slot arranged parallel to and disposed between the lateral edges of the blade, said slot including first and second measurement edges disposed at either side thereof, said blade including a first angular measurement scale defined

along said first edge of said slot graduated from 0° to 45° and a second angular measurement scale defined along said second edge of said slot graduated from 45° to 90°, said first and second angular measurement scales arranged such that they are positioned in reciprocal alignment with each other, said tongue having an interior rectilinear lateral edge, and an exterior



4,420,892

#### THIN FILM CONTACT DRYER

Burkhard Braun; Bernhard Vosteen; Reiner Skerhut, all of Cologne, Fed. Rep. of Germany, and Adolf Sinn, Muri, Switzerland, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

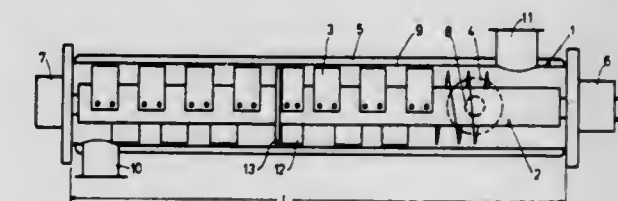
Continuation of Ser. No. 126,764, Mar. 3, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,791

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911549

Int. Cl.<sup>3</sup> F26B 17/20

U.S. Cl. 34—183

8 Claims



1. A thin film contact dryer comprising a stationary housing having a closed cylindrical internal wall, an inlet at one end and an outlet at the other end, means for heating the housing wall, means for effecting an axial flow from the inlet to the outlet and a rotor mounted for rotation in the housing and extending longitudinally throughout the length thereof, wherein along the rotor between the inlet and the outlet is arranged a unit comprising at least one combination of distributing elements and an annular weir which revolves with the rotor and leaves a constant 360° narrow annular gap open with respect to the internal wall of the housing, the distributing elements being bent back with respect to the direction of rotation to form wedge shaped corners with the internal surface of the housing and the annular weir being disposed immediately downstream of the distributing elements in the direction of



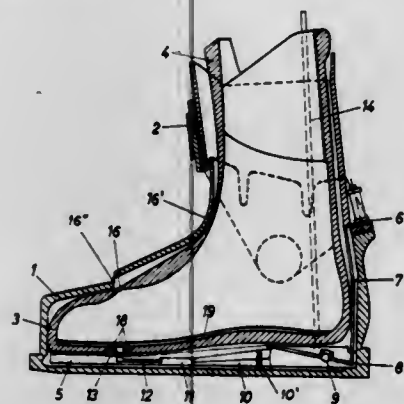
axial flow and apertured in an annular region adjacent to said rotor to permit vapor flow therethrough.

**4,420,893**  
**SHOE COMPRISING A SYSTEM FOR SUPPLYING AIR TO THE INTERIOR OF THE SHOE**

Walter Stephan, Ried im Innkreis, Austria, assignor to Fischer Gesellschaft M.B.H., Ried im Innkreis, Austria  
Filed Nov. 10, 1981, Ser. No. 320,076  
Int. Cl.<sup>3</sup> A43B 7/06, 7/08

U.S. Cl. 36—3 R

4 Claims



1. In a ski boot of the type having a shell, a gaiter which is pivotally mounted on the shell and movable in the longitudinal direction of the boot, an inner shoe and a wedge-shaped hollow section below the outer portion of the sole of the inner shoe, a system for supplying air to the interior of the boot comprising:

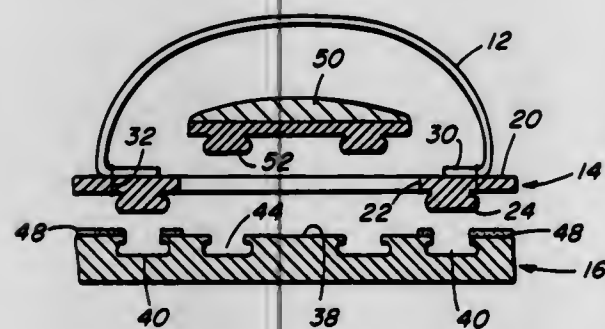
- an air handling device mounted on the shell of the boot;
- an actuating means operatively connected at one end to the air handling device and connected at the other end to the rear side of the gaiter directly above the heel;
- one or more nozzles which are embedded in the walls of the inner shoe;
- one or more conduits for air passage which are connected at one end to the air handling device and at the other end to the nozzle;
- air passage openings in the top of the inner shoe on the side remote from the actuating means; and
- openings in the shell of the boot on the side remote from the actuating means for air exhaust to the outside of the boot.

**4,420,894**  
**SNAP SHOE**

Joel Glassman, 500 Bowling Ave., Nashville, Tenn. 37205  
Filed Apr. 19, 1982, Ser. No. 369,653  
Int. Cl.<sup>3</sup> A43B 13/28, 13/42, 23/00

U.S. Cl. 36—12

1 Claim



1. In a shoe comprising:  
a first sole means,  
said first sole means comprising an insole having a lip surrounding a central opening,  
said first sole means also having a plurality of attaching members disposed on and extending from a bottom surface of said lip of said insole,  
each said attaching member comprising an elongated

domed-shaped snap, said snaps and said insole being molded of a single piece of plastic,  
said lip having an upper stitched thereto,  
a second sole means comprising an outsole,  
said outsole having a plurality of receiving members in one surface, said receiving members being inverted, elongated domed-shaped openings, and  
a shank,  
said shank having a plurality of attaching members disposed on and extending from a bottom surface whereby said first sole means and said shank are fixed to said second sole means to form a completed sole by engagement of said attaching members to said receiving members.

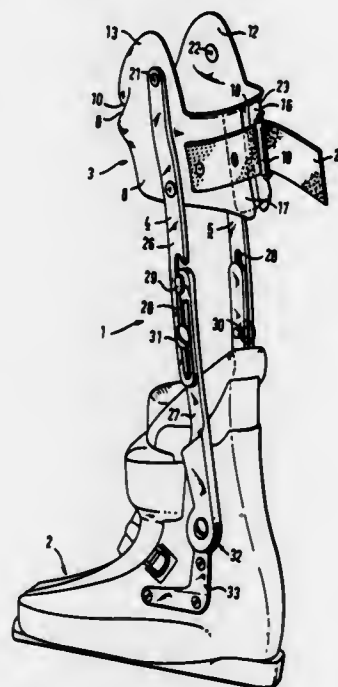
**4,420,895**  
**SKI BOOT**

Peter Baumann, Gaswerkstr. 13, D-7768 Stockach, and Lutz Biedermann, Am Schäfersteig 8, D-7730 Villingen, both of Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,390  
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 2930648; Apr. 1, 1980, 3012716  
Int. Cl.<sup>3</sup> A43B 5/04

U.S. Cl. 36—118

9 Claims



1. A ski boot comprising a boot part to receive a wearer's foot and a leg engaging part which extends upwards from and is hinged to the boot part at a hinge point, said leg engaging part being shaped and positioned so as to at least partially grip around the knee joint of the wearer.

**4,420,896**  
**METHOD FOR FABRICATION OF ELECTROSCOPIC DISPLAY DEVICES AND TRANSMISSIVE DISPLAY DEVICES FABRICATED THEREBY**

Donald E. Castleberry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,275  
Int. Cl.<sup>3</sup> A47F 11/06; G09F 9/00

U.S. Cl. 40—427

20 Claims

1. An information display device, comprising:  
first and second substantially transparent substrates, each having an interior surface spaced from and facing the interior surface of the other substrate;  
at least one conductive electrode fabricated upon the interior surface of a first one of said substrates;  
a conductive electrode fabricated directly upon the interior surface of the second one of said substrates and compris-

ing at least one support portion directly attached to the second substrate interior surface, at least one plate portion having a substantially circular periphery and at least one sector-shaped aperture formed therethrough within said periphery, and a plurality of arcuate spring arms each having a first end attached to a point on the periphery of an associated plate portion substantially equally spaced from adjacent spring arm attachment points and having a second end connected to an associated fixed support portion for mechanically biasing said plate portion toward said second substrate interior surface;  
said plate portion being adapted for movement, against the force of said arcuate spring arms, toward said electrode fabricated upon said first substrate interior surface, responsive to the coupling of a potential between the elec-

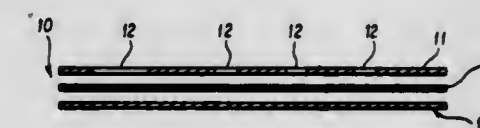
one of said substrate surface and said dielectric layer, for maintaining the resting plate portion of said at least one additional conductive electrode substantially parallel to and at a predetermined distance from said dielectric layer;  
a quantity of a light-absorbing liquid material; and  
means only for containing said liquid material at least between said dielectric layer and said plate portion of said at least one additional conductive electrode;  
each plate portion being adapted for movement, against the force of said spring arm means, toward an associated one of said at least one conductive electrode, responsive to the coupling of a potential between that plate portion and the associated one of said at least one conductive electrode.



**4,420,898**  
**FLAT EMERGENCY EXIT SIGN UTILIZING AN ELECTRO-ILLUMINESCENT LAMP**  
John R. Moses, 3440 Chesapeake Walk, Annapolis, Md. 21403  
Filed Mar. 1, 1982, Ser. No. 353,390  
Int. Cl.<sup>3</sup> G09F 13/04

U.S. Cl. 40—570

3 Claims



trodes on the interior surface of said first and second substrates, and with the position of each of said at least one sector-shaped apertures rotating about a plate portion center as said plurality of arcuate spring arms are flexed by movement of said plate portion toward and away from said second substrate interior surface; and  
a multiplicity of reflective members each fixed to said second substrate interior surface and positioned such that light entering said display through said second substrate and reflected from that surface of said plate portion closest to said second substrate, when said plate portion is electrostatically moved closest to said first substrate electrode, is reflected from said fixed reflective members through said plate portion apertures and said first substrate and the electrode thereon.

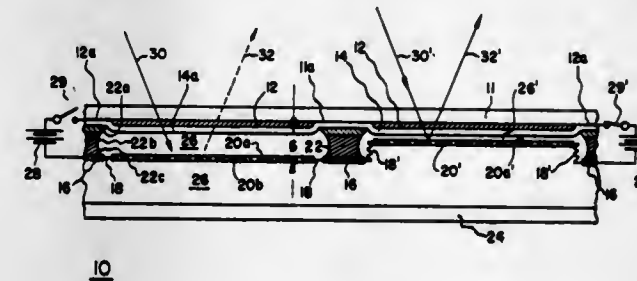
1. An emergency exit sign comprising:  
a stencil with the term "EXIT" formed by openings there-through;  
a single, flat electro-luminescent lamp disposed behind the stencil to provide illumination through the stencil; the electro-luminescent lamp being opaque with respect to one side and being of unitary construction; the lamp comprising a lamination including a steel substrate, a layer of phosphors on the steel substrate and a layer of glass over the phosphors to seal the phosphors between the layer of glass and substrate, the lamination further including an electrode spaced from the substrate and connected to a first lead and a second lead connected to the substrate wherein the lamp glows when AC line current is applied to the leads, and  
a layer of translucent phosphorescent material juxtaposed with the lamp and aligned with the opening through the stencil, the phosphorescent material being energized by the lamp and continuing to glow when power to the lamp is cut;  
whereby, a flat, inexpensive exit sign is provided which has improved longevity while consuming minimal electrical power.

**4,420,897**  
**ELECTROSCOPIC DISPLAY DEVICES**  
Donald E. Castleberry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,402  
Int. Cl.<sup>3</sup> A47F 11/06; G09F 9/00

U.S. Cl. 40—427

11 Claims



1. An information display device, comprising:  
a substantially transparent substrate having a surface;  
at least one conductive electrode fabricated upon the substrate surface;  
a layer of a dielectric material fabricated over at least said at least one conductive electrode;  
at least one additional conductive electrode comprising at least one support portion, at least one plate portion positioned in registration with an associated one of said at least one conductive electrode and each having a periphery, and spring arm means connected between each plate portion periphery and associated ones of said at least one support portion for mechanically biasing each plate portion to a resting position; support means, attached only between each of said at least one support portion of said at least one additional electrode and

**4,420,899**  
**AUTOMATIC PISTOL WITH COMBINED MAGAZINE CONTROL SAFETY AND MAGAZINE EJECTION MECHANISM**

Maurice V. Bourlet, Liege, and Jean-Pierre H. Storder, Namur, both of Belgium, assignors to Fabrique Nationale Herstal, Herstal, Belgium

Filed Sep. 2, 1981, Ser. No. 298,574

Claims priority, application Belgium, Oct. 16, 1980, 2/58809  
Int. Cl.<sup>3</sup> F41C 17/08

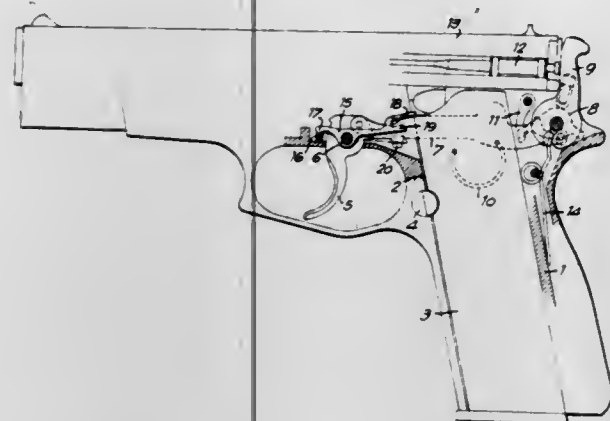
U.S. Cl. 42—70 A

4 Claims

1. In an automatic pistol including a body, a housing in the body for accommodating a magazine, means for locking the magazine in the housing, a pivot pin, a trigger mounted on the pivot pin, a hammer, linking means including a plurality of elements defining an interruptible kinematic chain between the trigger and the hammer, and wherein the improvement comprises a lever mounted on the body, the lever having a first end and a second end, the second end including first and second



prongs, biasing means for urging the first prong against a magazine and forcing it to eject, an interrupt means carried by one of the elements defining the kinematic chain and being



engageable by the second prong for interrupting the kinematic chain when a magazine is not locked in the housing, thereby preventing operation of the hammer by the trigger.

4,420,900

**AUTOMATIC FISHING JIGGER**

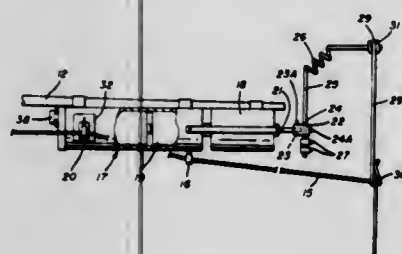
John M. Nestor, 2397 Penny La., Youngstown, Ohio 44515

Filed May 11, 1981, Ser. No. 262,748

Int. Cl.<sup>3</sup> A01K 97/12

U.S. Cl. 43-17

7 Claims



1. An automatic fishing jigger comprised of an enclosure secured to a fishing rod, a fishing line on said rod, a motor in said enclosure having a drive shaft, an arm on said drive shaft, means for flexing the arm, a line connector connected pivotally to the arm, means for detachably securing said fishing line to said line connector, an alarm device secured to said enclosure and means for activating said alarm device, a power source in said enclosure.

4,420,901

**IMPLEMENT FOR FLAME TREATING SOIL**

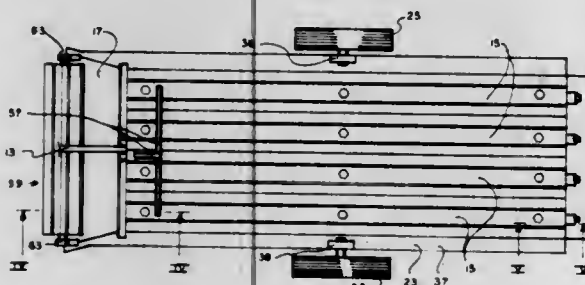
Howard Y. Clarke, 315 South Dudley, Memphis, Tenn. 38104

Filed Feb. 8, 1982, Ser. No. 347,006

Int. Cl.<sup>3</sup> A01M 15/00

U.S. Cl. 47-144

10 Claims



1. An implement for movement over the ground and for flame treating soil from the ground, said implement comprising:

(a) an elongated tube member having an opened first end and an opened second end, said tube member having an elongated combustion chamber and an elongated conveyor chamber, said combustion chamber being located above and in communication with said conveyor chamber;

(b) scoop means located adjacent said first end of said tube member for digging soil from the ground as said implement is moved thereover and for directing the soil into said first end of said tube member;

(c) a single elongated screw means for being mounted in said conveyor chamber of said tube member and for moving the soil from said first end of said tube member completely through said tube member and out said second end thereof; and

(d) an elongated burner means for being mounted in said combustion chamber of said tube member and for subjecting the soil moving through said tube member to flame substantially along the entire length of said tube member, said burner means including an elongated burner element supported within said combustion chamber of said tube member and having a plurality of downwardly directed orifices therein.

4,420,902

**MODULAR PLANTING APPARATUS**

Maxwell A. Rayner, 76 Hinds St., Lota, Queensland, Australia

PCT No. PCT/AU81/00012, § 371 Date Sep. 29, 1981, § 102(e)

Date Sep. 29, 1981, PCT Pub. No. WO81/02087, PCT Pub.

Date Aug. 6, 1981

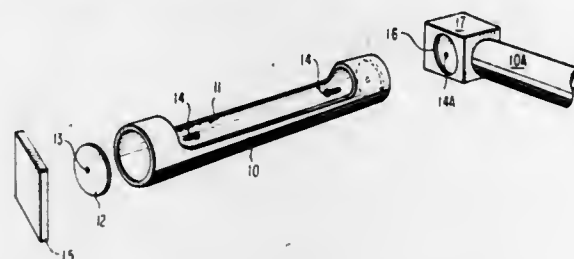
PCT Filed Jan. 29, 1981, Ser. No. 308,553

Claims priority, application Australia, Jan. 29, 1980, PE2168

Int. Cl.<sup>3</sup> A01G 9/00

U.S. Cl. 47-66

7 Claims



1. A modular planting apparatus comprising a plurality of separate tubular modules each having a continuous side wall having an access opening therethrough whereby the interior of each module is adapted to contain planting material, an end cap secured to each end of each tubular module, at least one connector block interposed between adjoining tubular modules and connecting means associated with each connector block for connecting an adjacent end cap of a tubular module thereto.

4,420,903

**SHIPPING CONTAINER FOR LIVING BOTANICALS**

Alexander S. Ritter, Coral Gables, and James A. Lee, Miami, both of Fla., assignors to Far West Botanicals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 257,101, Apr. 24, 1981, abandoned. This application Apr. 23, 1982, Ser. No. 371,427

Int. Cl.<sup>3</sup> A01G 25/00

U.S. Cl. 47-81

4 Claims

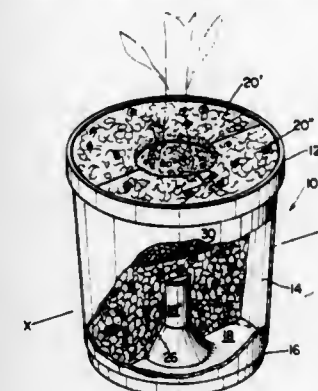
1. A plant pot for the continuous growth, shipping and transfer of a living botanical, comprising in combination:

(A) an outer pot of fluid impermeable material, said outer pot having an open end at its top and a closed end at its bottom, the bottom defining in upward extension thereof an open overfill tube;

(B) corresponding first cohesive soilless media growth fillers, said fillers being in opposed contiguous relation to each other within the pot, each said filler defining a top cavity which is less than one half the vertical cross-section of a net pot to be inserted therein, said cavity being bounded on its top by an annular rim which is of smaller horizontal

section than the top cavity, said fillers likewise defining a bottom vertical cavity to receive the overfill tube;

(C) a net pot of plastic material for the botanical, said net pot having a second growth filler contained therein, said net pot with filler being forcibly seated within the top cavity of the first growth fillers and retained therein by the annular rim aforesaid, the first growth fillers and the net pot



filler each containing a fluid-permeable soilless composite consisting of bonded, fibrous and spongy matter, said first fillers together being of greater lateral dimension than the interior of the outer pot and the net pot filler being of greater volume than the top cavity defined by the first fillers, whereby the first and second fillers are compressibly held within the plant pot.

4,420,904

**DEVICE FOR FEEDING POTTED PLANTS**

Siegfried Joswig, Kausen/Betzdorf/Sieg; Johannes Liebscher, Nassau; Peter Kells, Oberhof, and Peter Tiwi, Fachbach, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 216,991, Nov. 10, 1980, abandoned.

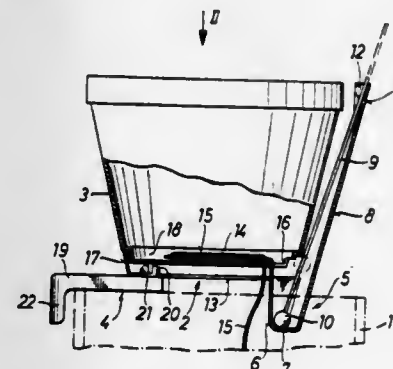
This application Mar. 30, 1983, Ser. No. 480,511

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910217

Int. Cl.<sup>3</sup> A01G 9/02

U.S. Cl. 47-81

9 Claims



1. Apparatus for supplying a potted plant with air, and liquids including water and nutrients from a reservoir comprising:

a pot for holding the plant and including a base having a slotted opening in its periphery;

a holder unit for supporting the pot and having a tongue for insertion into the slotted opening, the tongue having a flat wick positioned thereon for watering and feeding the plant potted in the pot so that the wick may be inserted into the pot after the pot is filled with soil;

holder unit including level indicator means for showing the amount of liquid in the reservoir; and

an adapter movably attached to the unit for varying the height of the pot with respect to the reservoir so that liquid can be added to the reservoir.

4,420,905

**CLOSURE HARDWARE**

Eckard Kucharczyk, Netphen, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Fed. Rep. of Germany

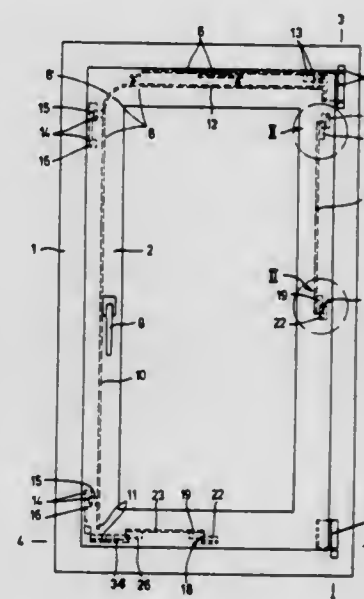
Filed Mar. 20, 1980, Ser. No. 132,073

Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920581

Int. Cl.<sup>3</sup> E05B 65/06; E05C 19/02, 9/10, 1/12

U.S. Cl. 49-192

10 Claims



1. Latching mechanism for a planar closure which is hingedly mounted on a frame for swinging movement about one side of the frame between an open position and a closed position relative to the frame, said latching mechanism comprising:

(a) a control cam fixed to the hinge side of the frame, (b) a catch fixed to the hinge side of the frame and spaced from the control cam, (c) a driving rod slidably mounted for movement along its longitudinal axis within the plane of the closure on the hinge side of the closure, (d) a dog mounted on one end of the driving rod for latchingly engaging the catch, (e) biasing means operatively connected to the driving rod for urging the dog away from latching engagement with the catch, and (f) a cam follower mechanism connected to the opposite end of the driving rod adjacent the control cam and engageable with the control cam when the closure moves from the open position to the closed position for moving the driving rod axially in opposition to said biasing means to position the dog for latching engagement with the catch and into latching engagement with the catch.

4,420,906

**WINDOW REGULATOR**

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Southfield, Mich.

Filed Oct. 26, 1981, Ser. No. 314,668

Int. Cl.<sup>3</sup> E05F 11/48

U.S. Cl. 49-352

3 Claims

1. Window regulating mechanism for a vehicle window glass which is moved generally vertically between open and closed position and is tilted during vertical movement about a substantially horizontal axis located adjacent the lower edge of the window and extending longitudinally of the vehicle in accordance with its vertical position, which comprises a generally upright guide post, a guide bracket slidable on said post, a floating bracket adapted to be fixed to the lower edge portion of the window and pivotally connected to said guide bracket by hinge means acting between said guide bracket and said floating bracket and having a pivot axis extending substantially horizontally and longitudinally of the vehicle and located



adjacent the lower edge of the window, means for moving said guide bracket longitudinally of said post comprising a functionally rigid guide track, an elongated flexible drive member slidably supported on said track, rotary drive means engaging said flexible drive member, said guide bracket being of horizontally elongated plate like configuration occupying a generally vertical plane, said guide bracket having laterally extend-



ing ears adjacent its upper and lower edges, said ears having openings therethrough slidably interfitted with said post, one of said ears having a second opening in the form of an open ended slot, said slot having an inner portion receiving and being movable along said track, the outer end of said slot receiving and being closed by an end portion of said flexible drive member, and means fixing the end portion of said flexible drive member to said guide bracket.

4,420,907

## SHALLOW DOUBLE HUNG WINDOW

Charles A. Swan, Seminole, Fla., assignor to Windows, Inc., Largo, Fla.

Continuation-in-part of Ser. No. 216,813, Dec. 16, 1980, abandoned, which is a continuation of Ser. No. 923,344, Jul. 10, 1978, Pat. No. 4,238,907, which is a continuation-in-part of Ser. No. 758,866, Jan. 12, 1977, abandoned. This application Dec. 18, 1980, Ser. No. 217,987

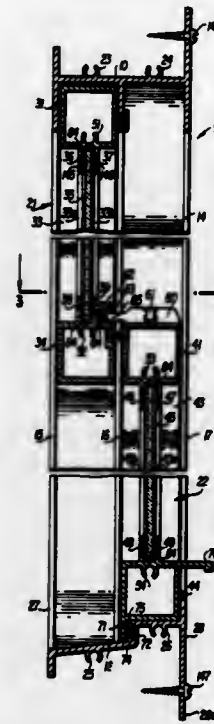
The portion of the term of this patent subsequent to Dec. 16, 1997, has been disclaimed.  
Int. Cl.<sup>3</sup> E05D 13/10

U.S. Cl. 49-446

7 Claims

1. A pair of block and tackle sash balances in combination with a double hung window not greater than substantially two inches in over-all thickness, each balance comprising a rod having a U-shaped cross-section, a tension spring extending within said rod connected to one end thereof, a block and tackle mechanism within said rod connected to the other end of said spring, a cable of said block and tackle mechanism extending from the other end of said rod, the window comprising a jamb with a pair of inward grooves and a corresponding pair of outward grooves each defined by U-shaped sides provided side-by-side in said jamb, the outermost exterior facing said side of said jamb comprising a perimeter part having apertures for connective means therein which is coplanar and extends outwardly relative to the remainder of said jamb, a pair of window panels each with a stile having a U-shaped cross-section on one vertical side thereof, the legs of each said stile received in a corresponding said interior groove defining a longitudinal space having a substantially rectangular cross-section, each said stile defining an outwardly facing longitudinal groove at the outer end of each said leg thereof, a pile sealing strip received along the entire length of each said longitudinal groove, each said pile strip bearing against a corresponding side of an interior groove in said jamb whereby each said space is sealed, a said balance received in each said inward groove

and having said cable affixed thereto whereby each said balance is urged upwardly, a headpiece attached to the top of each said stile, a stop member mounted on the top of each said rod, said stop member having an inclined surface adapted to cooperate with a mating inclined surface provided on said



headpiece whereby the urging of said stop member against said headpiece urges said window panel in a lateral direction away from the corresponding said inward groove, said window being for installation on an existing framework of a porch or room wherein said framework consists essentially of beams having a thickness of substantially two inches.

4,420,908

## BUFFING WHEEL

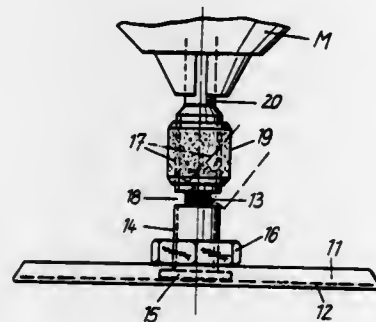
Reinhold Reiling, and Karl Reiling, both of Grundeltorstrasse 9, Kämpelbach-Ersingen, Fed. Rep. of Germany  
Filed Oct. 15, 1981, Ser. No. 311,543

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038850

Int. Cl.<sup>3</sup> B24B 23/02

U.S. Cl. 51-170 T

14 Claims



1. In a buffing wheel comprising a wheel body, abrasive-containing flexible material secured to said wheel body, and a drive shaft non-rotatably connected to said wheel body, the improvement residing in that said drive shaft comprises a flexible portion and a rigid member is mounted on said drive shaft and slidable relative thereto between an inoperative position, in which said drive shaft is flexible, and a stiffening position, in which said rigid member stiffens said drive shaft.

4,420,909

## WAFERING SYSTEM

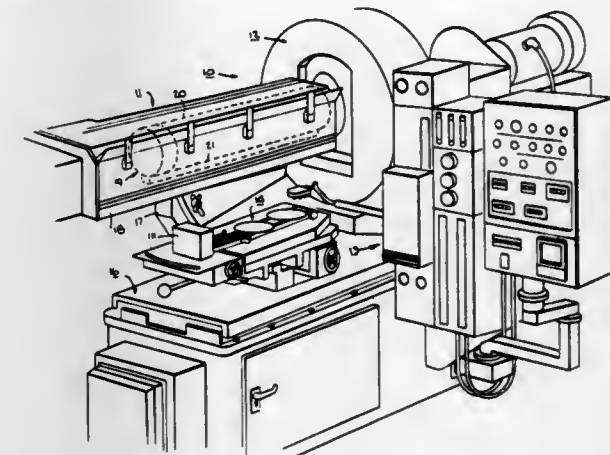
Robert E. Steere, Jr., Boonton, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Filed Nov. 10, 1981, Ser. No. 320,097

Int. Cl.<sup>3</sup> B24B 7/20

U.S. Cl. 51-73 R

26 Claims



## 1. A wafering system

a rotary cutting blade having a bore and a cutting edge about said bore for severing a wafer from a delivered ingot;

a chuck assembly on one side of said blade having a head for engaging a wafer severed from the ingot; and means for moving said head between a rest position on said one side of said blade and a wafer holding position on an opposite side of said blade.

4,420,910

## CONTROL DEVICE FOR A GRINDING MACHINE

Sture Larsson, Lidköping, Sweden, assignor to Lidkopings Mekaniska Verkstads AB, Lidköping, Sweden

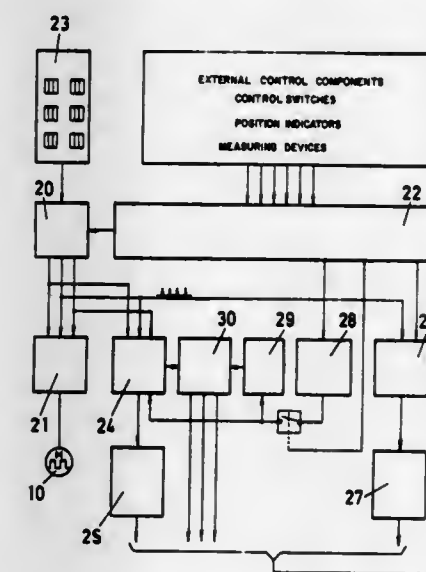
Continuation of Ser. No. 88,420, Oct. 26, 1979, abandoned, which is a continuation of Ser. No. 930,758, Aug. 23, 1978, abandoned. This application May 4, 1981, Ser. No. 260,376

Claims priority, application Sweden, Aug. 5, 1977, 7708912

Int. Cl.<sup>3</sup> B24B 49/04

U.S. Cl. 51-165.88

4 Claims



1. A device for controlling the feeding of a grinding wheel (2, 16) relative to a truing device (8, 19) for the grinding wheel at truing operations in a grinding machine incorporating a measuring apparatus (9) for indicating finished size of the ground surface of the workpiece (5, 12), means for controlling the feeding using the indications obtained, means for setting the operation cycle of the machine thus that truing of the grinding wheel is effected after a predetermined number of

grinding operations by means of a truing device, which is mounted in a fixed position on the workhead and arranged in such a manner as to follow the movements of the workpiece during the grinding procedure, first members (24) for establishing the position of the grinding wheel spindle relative to the workpiece and the truing device and second members (26, 27) for controlling the feeding movement of the workpiece and of the truing device relative to the grinding wheel during the truing a specific distance, characterized thereby, that it incorporates a comparator (30), to which is connected said first member (24) and a memory (29) for establishing the initial position for the truing at each truing operation and a position index (28) for establishing the position of the grinding wheel spindle relative to the truing device after each truing operation in dependency of a settled position indication or a settled grinding time, when the desired finish size on the ground surface is indicated in the measuring apparatus (9) in a grinding cycle after the preceding truing operation, whereby the position of the position index (28) is fed into said first member (24) and into the memory (29) at each truing operation.

4,420,911

## WORK PIECE HOLDER ASSEMBLY

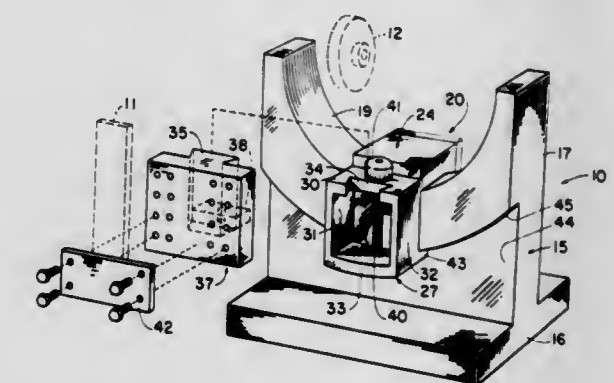
Jan D. Michael, R.R. 1, Box 64, Solon, Iowa 52333

Filed Nov. 20, 1978, Ser. No. 961,990

Int. Cl.<sup>3</sup> B24B 41/06

U.S. Cl. 51-216 R

2 Claims



1. A work piece holder assembly for moving a work piece along a selected annular path relative to a predetermined fixed position of a work tool, said assembly comprising:

- a base member that is stationary with respect to said work tool and has an arcuate shaped guide track means with an upper portion and a pair of side walls;
- a saddle member having a top portion rideable on the upper portion of said guide track means, and spaced side portions slidably engageable with said sidewalls of said track means to hold said saddle member against lateral movement;
- means for adjustably attaching the work piece to said saddle member in a predetermined relation with respect to said work tool and including:
  - a work piece mount slidably disposed on one side portion of said saddle member for vertical movement with respect thereto; and
  - a clamping member attachable to said work piece mount to releasably secure the work piece to said mount;
- means for precisely controlling the movement of said saddle member with respect to said work tool, said means including:
  - a gear sector associated with one of said sidewalls of said saddle member and engageable with said movement control means; and
  - gear means mounted on said base member and in meshing engagement with said gear sector.



4,420,912

**APPARATUS FOR HOLDING WORKPIECES DURING HONING WORK**

Heinz Gehring, Ostfildern, Fed. Rep. of Germany, assignor to Maschinenfabrik Gehring Gesellschaft mit beschränkter Haftung & Co. Kommanditgesellschaft, Ostfildern, Fed. Rep. of Germany

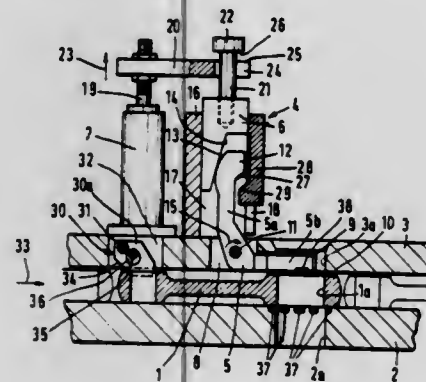
Filed Feb. 27, 1981, Ser. No. 239,119

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, 3007261

Int. Cl.<sup>3</sup> B24B 19/00

U.S. Cl. 51—227 R

7 Claims



1. An apparatus for holding at least one workpiece, such as a connecting rod, while honing a bore through the workpiece; wherein the workpiece has a first surface extending perpendicular to the axis of the bore and a second surface extending generally perpendicular to the first surface, the apparatus comprising:

at least one pair of first and second plates defining a space therebetween which space is wider than the thickness of the workpiece, the plates having a hole therethrough for receiving the honing tool, the workpiece resting against the first plate while being honed;

holding means for each pair of plates for holding the workpiece against the first plate while allowing the workpiece to slide on the first plate, the holding means comprising:

at least one rigid member mounted on the second plate for movement toward the first plate, the rigid member having at least one first surface for abutting only the first surface of the workpiece; while the workpiece is between the first and second plates and is being honed, the rigid member having a second surface thereon in juxtaposition with an opposed surface on one of the plates;

wedge means mounted on one of the plates, and means for inserting the wedge means between the second surface on the rigid member and the opposed surface on one of the plates once the first surface on the rigid member engages the first surface of the workpiece to lock the rigid member in place; whereby movement of the workpiece away from the first plate is precluded while sliding movement of the workpiece is allowed during honing, and

means engaging one side of the workpiece along the second surface thereof to prevent rotation of the workpiece during honing.

4,420,913

**ROOF RIDGE STRUCTURE AND SYSTEM**

Gene M. Long, Houston, Tex.; Terry E. DeWitt, Memphis, and John R. Bell, III, Germantown, both of Tenn., assignors to AMCA International

Filed Jul. 20, 1981, Ser. No. 284,970

Int. Cl.<sup>3</sup> E04B 7/00

U.S. Cl. 52—57

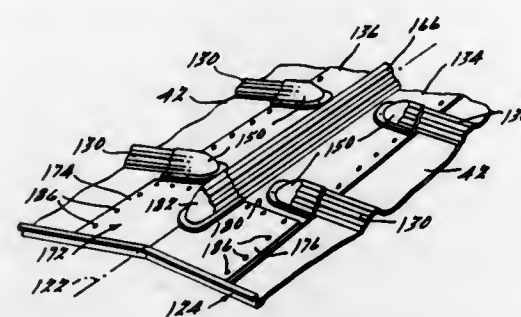
11 Claims

1. A roof ridge system for enclosing the ridge of a building roof, said building roof having at least two surfaces covered with raised rib seam roofing panels whereby said raised rib

seams may be of non-uniform height and spacing, said ridge system comprising:

a first ridge panel section connected to one of the roof surfaces and having a plurality of notches corresponding to the raised rib seams along said surface,

a second ridge panel section connected to another of the roof surfaces and having a plurality of notches corresponding to the raised rib seams along said surface,



said first and second ridge panel sections being interlocked together to form a raised rib seam substantially along the ridge line of said roof, and

a plurality of cap means positioned on said first and second ridge panel sections, each of said cap means covering one of said notches and an end of said raised rib seams of said roofing panels.

4,420,914

**SPHERICAL SEGMENT EDGE ATTACHMENT**

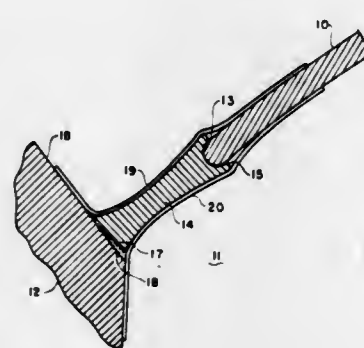
W. Wayne Williams, Westwood, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 23, 1981, Ser. No. 324,342

Int. Cl.<sup>3</sup> E04F 15/14

U.S. Cl. 52—80

3 Claims



1. An edge attachment for supporting on an annular supporting surface a spherical shell segment, which comprises:

a. a generally frustoconical member having on its inner edge an annular groove for receiving the peripheral edge of said shell segment;

b. said member having a generally rounded peripheral edge including means for rolling engagement with said supporting surface, said means comprising a plurality of concentric annular corrugations on the peripheral edge of said member and a plurality of mating corrugations on said support surface.

4,420,915

**LARGE-PANEL CONCRETE WALL BEARING COMPONENTS**

Boris Netupsky, Vancouver, Canada, assignor to Dyform Engineering Ltd., Canada

Filed Apr. 14, 1980, Ser. No. 140,370

Claims priority, application Canada, Apr. 18, 1979, 325689

Int. Cl.<sup>3</sup> E04B 1/92

U.S. Cl. 52—98

13 Claims

1. A large-panel concrete wall bearing component compris-

4,420,917

**GUYLINE TENSION DEVICE FOR COMMUNICATION TOWERS**

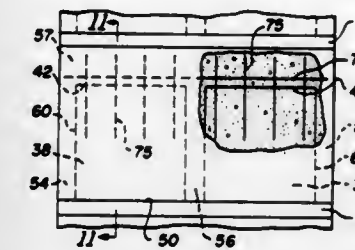
Conrad A. Parlanti, 7182 Rasmussen Ave., Visalia, Calif. 93277

Filed Dec. 28, 1981, Ser. No. 334,983

Int. Cl.<sup>3</sup> E04H 12/34

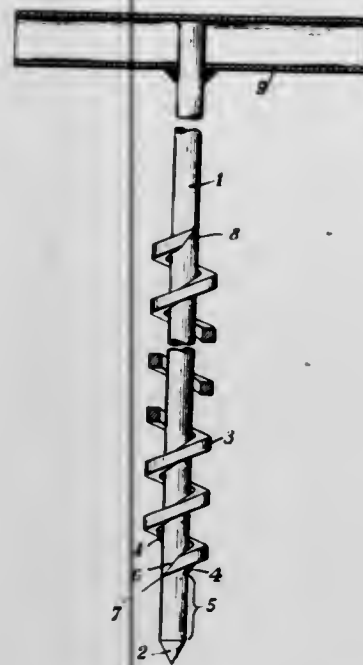
U.S. Cl. 52—123.1

6 Claims





short radial distance therefrom and which is welded to the rod at a limited number of points, so that a substantial part of the



spring is free to move resiliently with respect to the rod while being guided thereby.

4,420,919

## WALL OPENING FRAME MEMBER

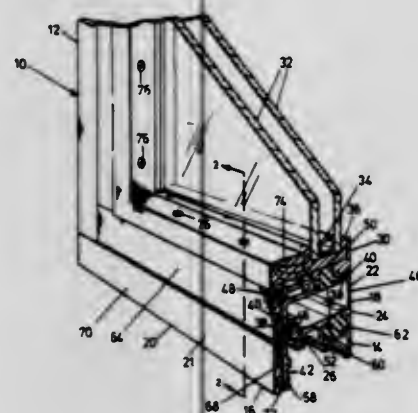
Ronald J. Weber, Wausau, Wis., assignor to Wausau Metals Corporation, Wausau, Wis.

Filed Aug. 17, 1981, Ser. No. 293,168

Int. Cl.<sup>3</sup> E06B 1/04

U.S. Cl. 52—204

5 Claims



1. A wall opening frame member (10, 79) for framing doors, windows, and the like, comprising:

(a) a metal frame (18) having an exterior side (14) and an interior side (16) with interior surfaces (66, 72, 82);

(b) a wood facing (20) adapted to cover all substantial interior surfaces (66, 72, 82) of the metal frame (18) when the metal frame (18) is in use; and

(c) means for attaching the wood facing (20) to the interior surfaces (66, 72, 82) so that no substantial surface of the metal frame (18) is exposed to the inside ambient air and no continuous metallic heat transfer path exists between the exterior side (14) and the inside ambient air uninterrupted by the wood facing (20), including an insulating foam body (68) with an adhesive on each side of the body, the adhesive sides respectively attached to the wood facing (20) and the metal frame (18) so that heat transfer between the exterior and interior sides (14 and 16) is further reduced by the insulating foam body, the foam body being selected to be sufficiently elastic and deformable that thermal dimensional changes in the wood facing (20)

and metal frame (18) are insufficient to disengage those parts from the foam body.

4,420,920

## CORED PLASTICS PROFILES AND MANUFACTURE OF FRAMES FOR WINDOWS AND THE LIKE THEREFROM

Michael J. Hewitt, 5 Hayling Crescent, Leicester, England (LE5 ORH)

PCT No. PCT/GB80/00133, § 371 Date Apr. 29, 1981, § 102(e) Date Apr. 9, 1981, PCT Pub. No. WO81/00588, PCT Pub. Date Mar. 5, 1981

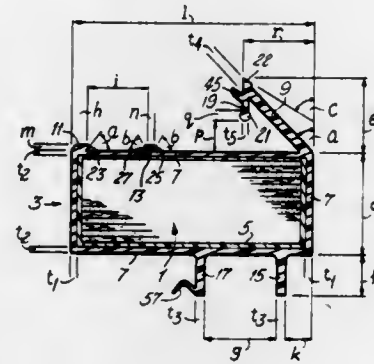
PCT Filed Aug. 29, 1980, Ser. No. 253,502

Claims priority, application United Kingdom, Aug. 29, 1979, 7929902; Jan. 11, 1980, 8000926; Jun. 24, 1980, 8018338

Int. Cl.<sup>3</sup> E04C 1/00

U.S. Cl. 52—309.15

11 Claims



1. A cored extruded plastics profile suitable for use in the manufacture of frames for panels including windows and comprising a core of shape-retaining material and a cladding of plastics material extruded therearound, characterized in that the core (1) is of generally rectangular cross sectional shape and in that the cladding (3) provides (a) along one surface of the profile at a locality adjacent one edge of said surface a retaining member (9) for a panel, which retaining member (9) extends inwardly over said surface and is inclined at an angle thereto and (b) along said surface of the profile, at a locality spaced from the retaining member, a rib (11) having an undercut face (23) inclined to said surface at an angle at least substantially corresponding to the angle of inclination of the retaining member (9), the retaining member (9) being severable from the profile to form the profile into an outer frame (42) and being utilized as glazing strips (9') in the manufacture of a corresponding inner frame (40), the glazing strips (9') being arranged, after the insertion of a panel, to abut against the undercut face (23) of the rib (11) of the profile and to be supported by supporting members (47) mounted on said surface of the profile.

4,420,921

## BUILDING SPACER

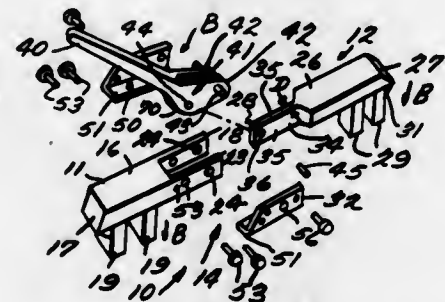
Isaac H. Hardin, General Delivery, Lexington, Ind. 47138

Filed Apr. 12, 1982, Ser. No. 367,741

Int. Cl.<sup>2</sup> E04F 21/00; B43I 13/00

U.S. Cl. 52—749

10 Claims



1. A tool for holding and spacing structural members, comprising:

a first jaw assembly including a linear body portion elongated in a predetermined dimension and a pair of stationary first jaws spaced from each other a fixed predetermined distance and extending parallel to each other in the same direction from a first end of said body portion, said direction substantially perpendicular to said dimension of elongation;

a second jaw assembly including a linear body portion elongated in a predetermined dimension and a pair of stationary second jaws spaced from each other a fixed predetermined distance and extending parallel to each other in the same direction from a first end of said body portion, said direction substantially perpendicular to said dimension of elongation;

a locking lever comprising a handle and a body; cooperating surface means formed on second ends of said jaw assemblies, opposite said first ends, for providing overlap between said first and second jaw assembly body portions in the dimension of elongation thereof; and means for pivotally mounting said locking lever body to said first and second jaw assemblies body portions at spaced points adjacent the second ends thereof, so that the jaw assemblies are movable from a first, locked, substantially in-line position, with said locking lever body therebetween and said handle extending outwardly with said first and second jaws spaced from each other a fixed predetermined distance; to a second, unlocked, position wherein said jaw assemblies do not overlap and said jaw assembly body portions are not in-line, and said first and second jaws are not spaced a fixed, predetermined position from each other.

4,420,922

## STRUCTURAL SECTION FOR CONTAINING A VACUUM

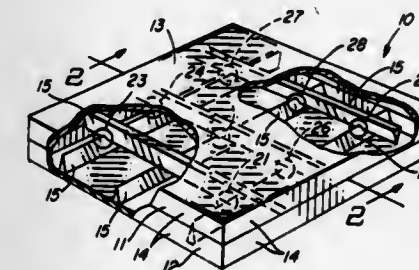
Pryce Wilson, 2202 N. 38th St., Phoenix, Ariz. 85008

Filed Dec. 18, 1980, Ser. No. 217,770

Int. Cl.<sup>3</sup> E04C 2/34

U.S. Cl. 52—791

7 Claims



1. A structural section comprising: a pair of engaging parts, each having a confronting edge which together form walls for encompassing and sealing a space therebetween containing less than surrounding atmospheric pressure, means for positioning said parts, one relative to the other, comprising at least a pair of spacer members, each one of said members of said pair of spacer members extending into the interior of said space from a different one of said parts for engaging the other one of said spacer elements laterally thereof at least at point contacts along a line, said spacer members comprising elongated triangular configurations with each member having its base secured to the interior of a different one of said parts, each of said spacer members engaging the other laterally thereof at its apex, one of said engaging spacer members being notched for positioning the engaging members relative to each other, and the angle defined by the notch being greater than the angle defined by the converging sides forming the apex of engaging spacer members.

4,420,923

## METHOD AND APPARATUS FOR COMBINED GUIDANCE, INCORPORATING A REGISTER, OF TWO CONTINUOUSLY ADVANCED FOIL STRIPS

Theo Moser, Steinenberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

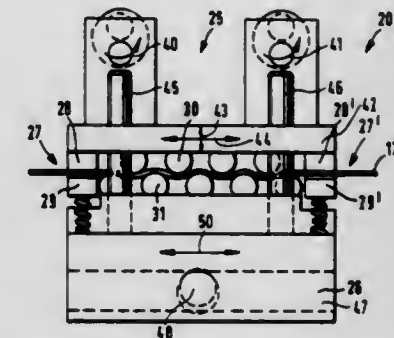
Filed Oct. 21, 1981, Ser. No. 313,513

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039616

Int. Cl.<sup>3</sup> B65B 41/18, 57/04

U.S. Cl. 53—51

6 Claims



1. An apparatus for producing a unitized strip containing preformed package units, each of said units bearing a complete legend thereon, comprising a supply source for a first strip of deformable material, means for advancing a leading edge of said first strip of deformable material to a heating station, means for conveying said first heated strip to a molding means, said molding means arranged to produce recesses in said first heated strip, means for advancing said first strip to a filling station, means associated with said filling station to control filling said recesses; means for advancing said first strip to a sealing station, a supply source for a second strip of deformable material, means for advancing a leading edge of said second strip of deformable material to a stretching station, clamping means in said stretching station adapted to clamp a portion of said second strip of deformable material, distention means arranged to cooperate with said clamping means to selectively stretch said second strip of deformable material, means for advancing said second strip to a scanning station, said stretching station including an oscillating lifting press system ahead of said scanning station and said second strip has a predetermined feed rate, said system being adapted to said feed rate; said clamping means comprises first and second pairs of aligned clamping devices associated with the oscillating lifting press system and said pairs of aligned clamping devices are separated by a distance from center to center equal to a circumferential path of the oscillating lifting press system; means in said scanning station for sensing markings applied to said second strip of deformable material, means associated with said scanning station for actuating said clamping means and said distention means in response to relative positions of said markings, means for advancing said second strip of deformable material to said sealing station, means in said sealing station for sealing said strips into said unitized strip, means for advancing said unitized strip to a perforating and punching station, means in said perforating and punching station for severing said package units from said unitized strip and thereafter discharging said package units from the apparatus, whereby each package unit bears a complete legend thereon.

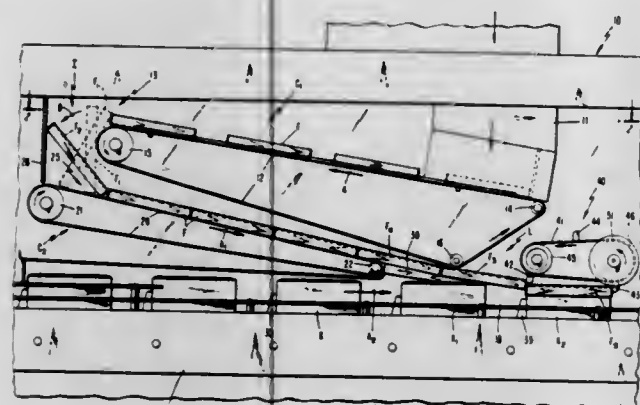


**4,420,924**  
**APPARATUS AND METHOD FOR INVERTING AND APPLYING FLANGED LIDS TO ERRECTED CARTONS**  
 S. Johannes Hoyrup, Monta Vista, and Karl A. Krause, Moken-lume Hill, both of Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Sep. 1, 1981, Ser. No. 298,607  
 Int. Cl.<sup>3</sup> B65B 7/28

U.S. Cl. 53—307

4 Claims



1. Apparatus for inverting and applying flanged lids to cartons, comprising:
  - (a) upper conveying means defining an upper feed path extending in a first direction for receiving and conveying inverted lids;
  - (b) lower conveying means defining a lower feed path moving in a second direction, said lower conveying means positioned beneath the upper conveying means for receiving the lids from said upper conveying means, said upper and lower feed path being spaced apart from each other;
  - (c) inverting means for said flange lids to provide upright lid position during the transition from the upper to the lower feed path;
  - (d) transfer means receiving and supporting the lids being discharged from the lower conveying means and presenting the lids to a lidding station;
  - (e) carton conveyor means intersecting said lower feed path adjacent said transfer means at said lidding station;
  - (f) means positioned downstream of the lid transfer means for applying the lid to the carton;
  - (g) an endless member having a plurality of lugs, a first lug being positioned at said lidding station to initially align and engage the leading edge of the lids with the corresponding moving cartons, said endless member and said lugs having idler movement in the direction of carton travel to said lids;
  - (h) means for braking said idler movement for engaging said lids to firmly engage said lug and allow the lids to be securely applied;
  - (i) a second in-line lug contacting the lids adjacent the trailing edge for seating engagement on the cartons.

**4,420,925**  
**MULTI-BLADE LAWNMOWER ATTACHMENT**  
 Kenneth Webster, Odin, Ill., assignor to Branson, Jones & Branson, Centralia, Ill.

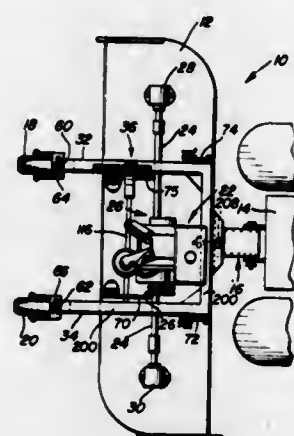
Filed Feb. 25, 1981, Ser. No. 238,352  
 Int. Cl.<sup>3</sup> A01D 35/12

U.S. Cl. 56—15.9

3 Claims

1. A lawnmower assembly comprising in combination:
  - a pulling unit having a first lawnmower blade assembly operably associated therewith, said first lawnmower blade assembly serving to cut a first swath of a predetermined width through grass and the like;
  - a towed unit having a second lawnmower blade assembly operably associated therewith, said second lawnmower blade assembly being positionable relative to said pulling unit in a manner whereby at least one second swath of a

predetermined width is cut through said grass and the like concurrently with cutting of said first swath; and  
 hitch means connecting said towed unit to said pulling unit, wheel means providing support for the towed unit, said hitch means including a first pivot bolt means extending parallel to the longitudinal horizontal direction of movement of the lawnmower assembly and enabling relative pivotal movement between the towed unit and pulling unit only about a longitudinal axis parallel to the longitudinal direction of the towed and pulling units, and a second pivot bolt means extending perpendicular to the first pivot bolt means and transverse to the longitudinal horizontal



direction of movement of the lawnmower assembly and enabling relative pivotal movement between the towed unit and pulling unit only about a transverse axis perpendicular to the longitudinal direction of movement of the towed and pulling units thereby enabling the towed unit to follow the contour of the supporting surface engaged by the wheel means by permitting relative pivotal movement between the units about a longitudinal horizontal axis and a transverse horizontal axis and preventing relative movement of the units about a vertical axis to prevent jackknifing of said towed unit with respect to said pulling unit when said lawnmower assembly moves in a reverse direction.

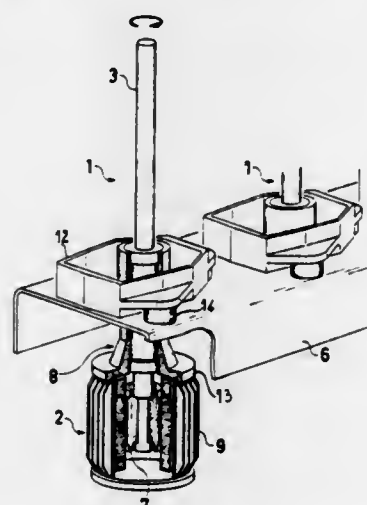
**4,420,926**  
**TWISTING SPINDLE DRIVEN BY AN INDIVIDUAL ELECTRIC MOTOR**

Jean Remonet, Loire, France, assignor to ASA S.A., France  
 Filed Jun. 21, 1982, Ser. No. 390,703

Claims priority, application France, Jun. 29, 1981, 81 12918  
 Int. Cl.<sup>3</sup> D01H 1/24, 7/08

U.S. Cl. 57—100

4 Claims



1. A twisting spindle driven by an individual electric motor, the spindle comprising:
  - a spindle barrel mounted on a support frame by means permitting free rotation of the barrel;

a motor having a rotor which is rigidly connected to the spindle barrel, with the rotor or stator of the motor rigidly connected to the support frame by a sleeve extending there-through and surrounding the barrel of the spindle; the sleeve having an upper collar elastically fastened to the support frame and a lower collar rigidly connected to the body or stator of the motor, with anti-friction bearings contained within the sleeve.

**4,420,927**  
**PROCESS FOR THE MANUFACTURE OF A FANCY YARN**

Pierre Payen, 53, rue Chaziere, 69004 Lyons, France

Filed Oct. 14, 1981, Ser. No. 311,404

Claims priority, application France, Oct. 14, 1980, 80 22186

Int. Cl.<sup>3</sup> D02G 1/02

U.S. Cl. 57—288

3 Claims



1. A process for manufacturing fancy yarns having a crepe effect, comprising:
  - (a) first overtwisting a multifilamentary partially oriented synthetic yarn, and
  - (b) then simultaneously false twist texturing and complementary stretching the overtwisted multifilamentary partially oriented synthetic yarn, said false twist texturing being carried out in the same twist direction as said overtwisting.

**4,420,928**  
**APPARATUS FOR MANUFACTURING A YARN**

Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria

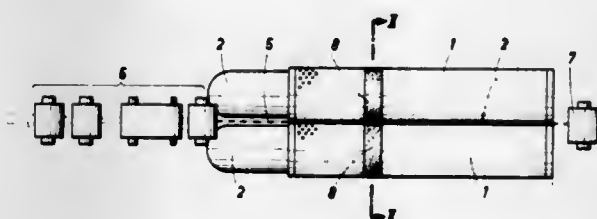
Filed Jan. 21, 1982, Ser. No. 341,294

Claims priority, application Austria, Feb. 9, 1981, 560/81

Int. Cl.<sup>3</sup> D01H 1/12, 7/882

U.S. Cl. 57—401

7 Claims



1. In apparatus for manufacturing a yarn, comprising two juxtaposed, closely spaced apart suction drums defining a generally triangular space therebetween and adapted to be rotated in the same sense, the drums having confronting suction zones,
  - a drawing frame disposed near one end of said suction drums and operable to deliver a roving into said triangular space, said suction zones being operable to produce in said triangular space a suction flow tending to pull said roving in said triangular space into contact with said suction drums so that said suction drums, when rotated in the same sense, will twist said roving to form a yarn, and
  - withdrawing means disposed near the other end of said

suction drums and operable to withdraw said yarn from said triangular space, the improvement of peripherally extending, confronting annular roughening zones on said suction drums, said roughening zones being axially spaced from said other end of said suction drums and being adapted to pull the ends of fibers of said roving out of said roving and to wind the fibers around said roving in said triangular space, and said suction zones extending between said annular roughening zones and said other end of said suction drums.

**4,420,929**  
**DUAL STAGE-DUAL MODE LOW EMISSION GAS TURBINE COMBUSTOR SYSTEM**

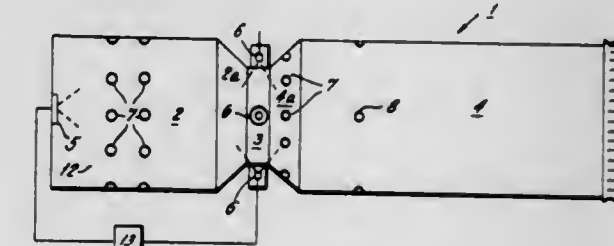
Robert A. Jorgensen, Clifton Park; Roger A. Farrell, Schenectady, and Bruce W. Gerhold, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 3,016, Jan. 12, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,285

Int. Cl.<sup>3</sup> F23R 3/30, 3/34

U.S. Cl. 60—39.06

6 Claims



1. A method of operating gas turbine combustor to produce low NO<sub>x</sub> emission, said combustor having first and second combustion chambers interconnected by a throat chamber, said first chamber having first fuel introduction means and at least one of said throat chamber and said second chamber having second fuel introduction means, comprising in sequence,
  - (a) continuously introducing fuel into said first chamber through said first fuel introduction means and causing said fuel to burn therein;
  - (b) commencing the introduction of fuel to said second chamber through said second fuel introduction means and increasing the rate of introduction thereof until the rate of fuel introduction through all of said fuel introduction means is about the desired fuel introduction rate, ignition of the fuel in said second chamber being commenced as a result of passage of combustion products from said first chamber to aid second chamber;
  - (c) decreasing the rate of fuel introduction through said first fuel introduction means and correspondingly increasing the rate of introduction through said second fuel introduction means such that the overall rate of introduction remains substantially constant until at least the burning of fuel in said first chamber ceases; and
  - (d) increasing the rate of fuel introduction through said first fuel introduction means and correspondingly decreasing the rate of introduction through said second fuel introduction means such that the overall rate of introduction remains substantially constant until the desired level of NO<sub>x</sub> emission from the combustor is realized.



4,420,930

**PROCESS FOR OPERATING A FURNACE OR A COMBUSTION ENGINE**

Harold Beuther, Cheswick, and Johan G. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 46,442, Jun. 7, 1979, Pat. No. 4,278,443. This application Feb. 9, 1981, Ser. No. 232,997  
Int. Cl.<sup>3</sup> F02C 3/20

U.S. Cl. 60—39,461

27 Claims

1. Process for operating a furnace or a combustion engine which comprises burning in said furnace or said combustion engine a mixture of polycyclic, polycarboxylic acids obtained by oxidizing coal with aqueous nitric acid, separating from the resulting product an aqueous phase and a solid phase and then extracting the solid phase with a solvent to recover said mixture.

18. The process of claim 1 wherein said burning is effected in a turbine.

4,420,931

**METHOD OF GENERATING COMBUSTION GASES UTILIZING POLYNORBORENE-BASED COMBUSTIBLE COMPOSITIONS**

William S. Anderson, Sunnyvale, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 121,344, Feb. 14, 1980. This application Jun. 4, 1982, Ser. No. 385,216  
Int. Cl.<sup>3</sup> C06D 5/00

U.S. Cl. 60—219

16 Claims

1. A method of generating combustion gases which comprises burning a composition of matter comprising polynorborene having a liquid fuel material having a heat of combustion above about 9300 Kcal/cc dispersed uniformly therethrough, said composition having a heat of combustion of least 9300 Kcal/cc.

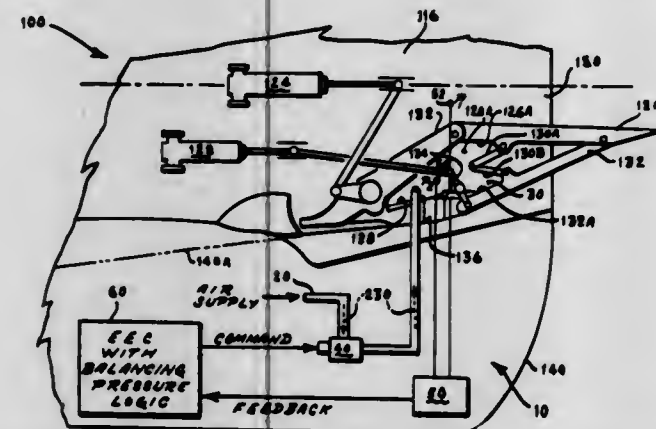
4,420,932

**PRESSURE CONTROL SYSTEM FOR CONVERGENT-DIVERGENT EXHAUST NOZZLE**

Juan A. Mendez, Miami, and John L. Mayers, Lake Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.  
Filed Mar. 2, 1982, Ser. No. 353,984  
Int. Cl.<sup>3</sup> F02K 1/18

U.S. Cl. 60—230

1 Claim



1. A pressure control system for a rectangular convergent-divergent exhaust nozzle of a jet aircraft turbofan engine having exhaust nozzle flaps located within the main exhaust flow, said system comprising:

a. means for providing a cavity located in said exhaust nozzle adjacent one side of said exhaust nozzle flaps, wherein said means includes and said cavity is defined by constituent convergent flaps of said exhaust nozzle flaps, by a forward end of constituent divergent flaps, by constituent sealing flaps of said exhaust nozzle flaps, by a forward end of constituent external flaps of said exhaust nozzle flaps,

wherein said sealing flaps interlink said divergent flaps and said external flaps, by a cross-beam-to-convergent flaps seal of said exhaust nozzle flaps, and by a side wall of said rectangular convergent-divergent exhaust nozzle; and

b. means, operably connected to said cavity, for controlling pressure within said cavity in relationship to induced loads applied to the other side of said nozzle flaps by said main exhaust flow during operation of said jet aircraft turbofan engine, wherein this pressure control means includes:

(1) means, operably connected to said cavity, for conveying air into said cavity;

(2) means, operably connected to said cavity and to said main exhaust flow, for sensing pressure difference between said pressure in said cavity acting on said one side of said nozzle flaps and pressure applied to said other side of said nozzle flaps by said main exhaust flow and for providing a signal in response thereto, wherein this pressure difference sensing and signalling means includes: an air pressure sensor in said cavity; another air pressure sensor in said main exhaust flow; and, a differential air pressure sensor connected to said air pressure sensor in said cavity and to said other air pressure sensor in said main exhaust flow;

(3) means, operably connected to said air conveying means and to said cavity at a location therebetween, for controlling the pressure of air entering said cavity in response to said signal, wherein this entering air pressure control means includes a pressure control valve; and

(4) means, operably connected to said pressure control valve and to said differential air pressure sensor, for maintaining a predetermined difference between the pressure of the air in said cavity and the pressure of the air in the main exhaust flow, wherein this means includes an electronic engine control with balancing pressure logic.

4,420,933

**EXHAUST SYSTEM**

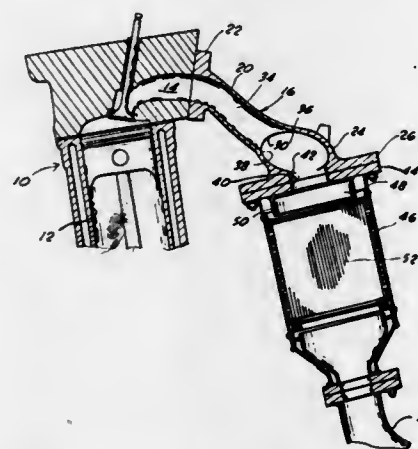
Ikuo Kajitani, Hanno; Tadayoshi Hayashi, Fujimi; Sakuji Arai, Saitama, and Yutaka Hirayama, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,292

Claims priority, application Japan, Jun. 12, 1981, 56-85555[U]  
Int. Cl.<sup>3</sup> F01N 3/28, 7/06

U.S. Cl. 60—302

10 Claims



1. An exhaust system in a multicylinder engine, having a plurality of elongate exhaust passages in communication with respectively cylinders in the multicylinder engine, a manifold chamber in communication with said elongate exhaust passages and a catalyst in communication with said manifold chamber, wherein the improvement comprises a common wall between two adjacent exhaust passages of said plurality of elongate exhaust passages, said manifold chamber having an

4,420,934

**AUTOMOTIVE VEHICLE HYDRAULIC SYSTEM**

Jun Udono, Higashiyamato, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

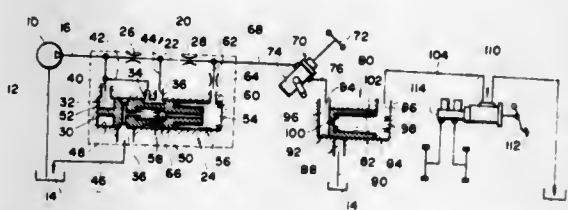
Filed Jan. 29, 1980, Ser. No. 116,639

Claims priority, application Japan, Jan. 30, 1979, 54-8674

Int. Cl.<sup>3</sup> F15B 11/20; G05D 11/02

U.S. Cl. 60—422

11 Claims



1. A hydraulic system for use in an automotive vehicle including an internal combustion engine, comprising:

(a) an engine driven pump adapted to discharge hydraulic fluid in amounts directly proportional to the operating speed of said engine;

(b) a first hydraulic unit including a first fluid flow control means and a first open-center type hydraulic control valve included in a power steering unit, said first fluid flow control means being arranged to receive fluid supplied thereto in varying amounts and to discharge to said first open-center type hydraulic control valve fluid at a first predetermined flow rate in response to the receipt of fluid at a low flow rate and to discharge to said first open-center type control valve fluid at a second predetermined flow rate smaller than said first predetermined flow rate in response to the receipt of fluid at a high flow rate; and

(c) a second hydraulic unit including a second fluid flow control means and a second open-center type hydraulic control valve, said second fluid flow control means being arranged to receive fluid supplied thereto at varying flow rates and, regardless of said received varying flow rates, to discharge fluid at a constant flow rate to said second open-center type hydraulic control valve;

(d) said engine driven pump, said first hydraulic unit and said second hydraulic unit being connected in series with each other.

4,420,935

**HYDRAULIC SYSTEM**

Walter Kobald, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,791

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910611

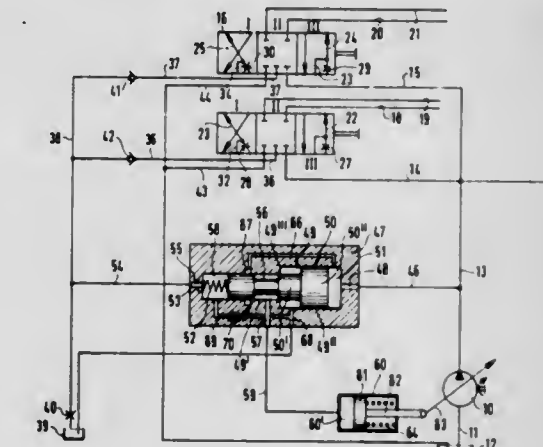
Int. Cl.<sup>3</sup> F15B 13/08

U.S. Cl. 60—427

2 Claims

1. In a hydraulic system having an adjustable pump, a plurality of multiway control valves each having inlet and outlet ports and shiftable control passages, conduits for delivering pressure fluid from said pump via said control valves to a plurality of loads, means for adjusting the flow of the pressure fluid to the working conditions of said loads, the adjusting means including measuring throttles provided respectively in the passages of said multiway control valves which are assigned to high pressure conduits for said loads, an additional passage provided in each of the multiway control valves and being connected to the outlet of the assigned measuring throttle, a regulating flow return conduit connected to respective multiway control valves to communicate with the additional passage when the control valves are switched-over into a working position; an additional throttle provided in the outlet end of the regulating return conduit, flow regulating means

controlled by the pressure difference between the outlet of the pump and the pressure in the regulating return conduit, and a hydraulically controlled actuator connected to the outlet of the pump via the flow regulating means and being mechanically coupled to the pump to adjust the discharge of the latter in response to the working conditions of the load, an arrangement of said flow regulating means comprising a flow regulating valve having a housing and, within the housing, a stepped differential piston defining a first part of a larger diameter and a second part of a smaller diameter; a first pressure space adjoining the end face of the first piston part and being con-



ected to the pressure conduit at the outlet of said pump; a second pressure space adjoining the second piston part and being connected to said regulating return conduit; an adjusting spring arranged in said second pressure space to bias said differential piston toward said first pressure space; a first annular groove formed in said second piston part; a control port formed in said housing in the range of said annular groove; a second annular groove formed in said housing between the end face of the second piston part and said first annular groove; a bypass conduit connecting said first pressure space to said second annular groove; and said control port being connected to said actuator.

4,420,936

**DRIVE CONTROL CIRCUIT FOR DENTAL TREATMENT TABLE**

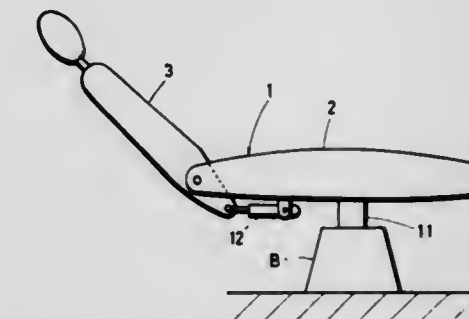
Takahiro Matsui, Uji, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Mar. 31, 1981, Ser. No. 249,385

Claims priority, application Japan, Jun. 18, 1980, 55-85339[U]  
Int. Cl.<sup>3</sup> F16D 31/02

U.S. Cl. 60—431

6 Claims



1. A drive control circuit for a dental treatment table with a hydraulic cylinder for elevating and lowering a seat, comprising:

a hydraulic drive circuit equipped with a hydraulic pump, a first hydraulic valve for supplying hydraulic fluid to said cylinder, and a second hydraulic valve for exhausting hydraulic fluid from said hydraulic cylinder, and  
a hydraulic pump operation circuit equipped with an air switch for turning on said hydraulic pump when said air switch is operated, a first air valve for operating said air



switch and said first hydraulic valve, and a second air valve for controlling said second hydraulic valve.

4,420,937

# HYDRAULIC CIRCUIT FOR A VARIABLE DISPLACEMENT PUMP

Toshihiro Naruse, Kawasaki; Kazuo Uehara, Tokyo, and Hideaki Saito, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

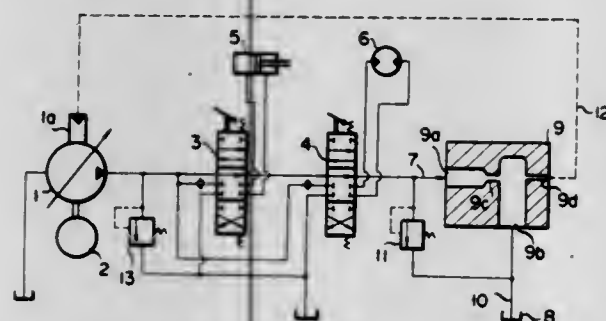
Filed Jul. 24, 1981, Ser. No. 286,535

Claims priority, application Japan, Jul. 28, 1980, 55-105608[U]

Int. Cl.<sup>3</sup> F16H 39/46

U.S. Cl. 60—450

4 Claims



1. A hydraulic circuit for controlling displacement of a variable displacement pump including a servo mechanism connected thereto for controlling the same, comprising: an actuator driven by said variable displacement pump; a control valve disposed between said variable displacement pump and said actuator for controlling the latter; and means for converting static pressure of a fluid into a dynamic pressure thereof, said means being disposed in a circuit for connecting a system pressure line of the hydraulic circuit to a reservoir when said control valve occupies its neutral position and comprising a body having formed therein an inlet port connected to the system pressure line and an outlet port connected to the reservoir, said body also having formed therein a nozzle provided between said inlet and outlet ports for producing a jet flow of the fluid and a dynamic pressure sensing means operatively connected to the servo mechanism for said variable displacement pump.

4,420,938

# GEOHERMAL POWER PLANT

William C. Lieffers, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation of Ser. No. 173,995, Jul. 31, 1980, which is a continuation-in-part of Ser. No. 953,644, Oct. 23, 1978, Pat. No. 4,244,190. This application Jun. 29, 1982, Ser. No. 393,460

Int. Cl.<sup>3</sup> F03G 7/00

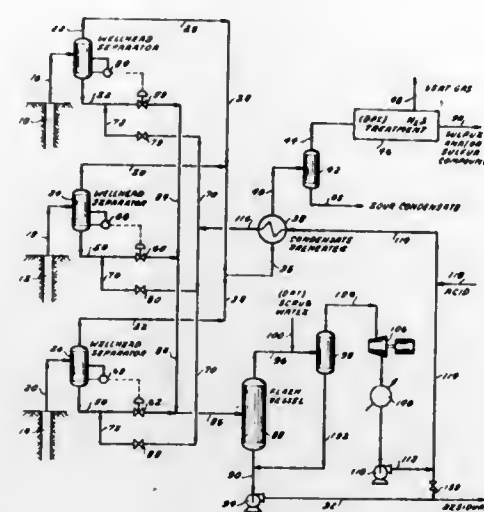
U.S. Cl. 60—641.5

9 Claims

1. A process for treating and deriving useful energy from a hot geothermal brine having a tendency to deposit amorphous silica and/or calcite upon a reduction in the temperature or pressure of said brine, which process comprises the steps of:

- (a) mixing said hot geothermal brine with an acidified preheated steam condensate so as to form a hot aqueous mixture having a reduced tendency for depositing amorphous silica and/or calcite;
- (b) reducing the pressure of the hot aqueous mixture from step (a) so as to flash a portion thereof, thereby forming high quality steam and residual brine;
- (c) deriving useful energy from said high quality steam and condensing said steam to form steam condensate;
- (d) pressurizing at least a portion of the steam condensate from step (c), and preheating and acidifying the pressurized portion, thereby forming acidified preheated steam condensate; and
- (e) recycling the acidified preheated steam condensate from

step (d) for mixture with said hot geothermal brine in step (a),



whereby the mixing of said acidified preheated steam condensate with said hot geothermal brine in step (a) substantially inhibits the deposition of amorphous silica and/or calcite during step (b).

4,420,939

# SOLAR BUILDING CONSTRUCTION

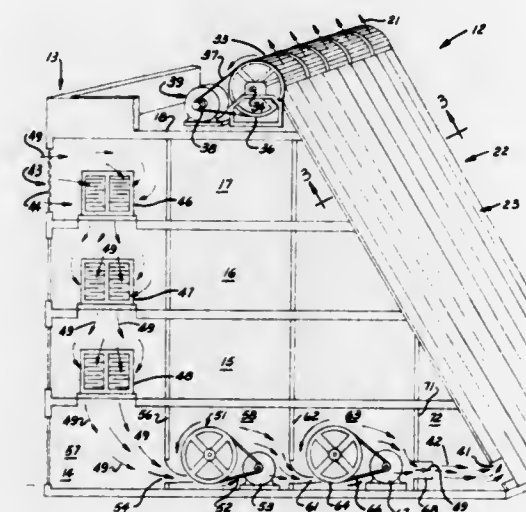
James H. McCue, P.O. Box 189, Columbia, Calif. 95310

Filed Jul. 16, 1982, Ser. No. 399,050

Int. Cl.<sup>3</sup> F03G 7/02

U.S. Cl. 60—641.12

10 Claims



1. A solar building construction comprising:

- a. a structure having a floor, roof and side walls extending between said floor and said roof to enclose a substantially air tight space except for an elevated air inlet opening adjacent said roof and an air outlet opening adjacent said floor;
- b. a solar collector including a plurality of elongated open-ended vertically inclined air ducts, the bottom of said ducts being in communication with said outlet opening;
- c. a first air turbine generator in communication with the top of said ducts for rotation by the ascending solar heated air emerging from said ducts; and,
- d. means for conducting relatively cool air entering said structure through said air inlet opening downwardly through said structure and toward said air outlet opening.

4,420,940

# THERMO-ELECTRIC INSTALLATIONS

Jean Buffet, Paris, France, assignor to Air Industrie, Courbevoie, France

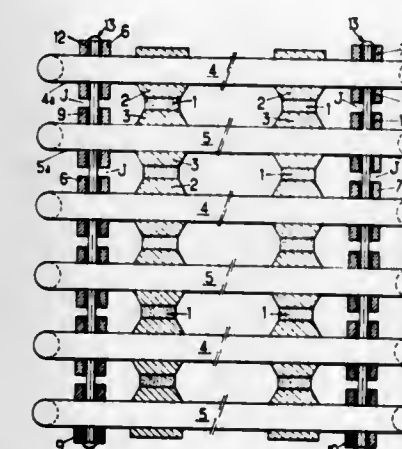
Filed Dec. 21, 1981, Ser. No. 332,596

Claims priority, application France, Dec. 23, 1980, 80 27374; Dec. 3, 1981, 81 22636

Int. Cl.<sup>3</sup> F25B 21/02

U.S. Cl. 62—3

10 Claims



1. A thermo-electric installation comprising:

- a first network of hot tubes, extending between two ends, disposed in parallel relation and in which flows a hot fluid;
  - a second network of cold tubes, extending between two ends, disposed in parallel relation and in a plane parallel to the plane of the hot tubes, and in which flows a cold fluid;
  - thermo-elements mounted between said hot tubes and said cold tubes;
  - at least two mechanical connection structures, called hot structures, connecting the hot tubes together, respectively towards their two ends, these two hot structures being formed by hot flanges, each connecting together the tubes of a layer of hot tubes, and
  - at least two mechanical connection structures, called cold structures, connecting together the cold tubes, respectively towards their two ends, these two cold structures being formed by cold flanges, each connecting together the tubes of a layer of cold tubes, the size of these hot and cold flanges in a direction perpendicular to the plane of the tubes being such that there exists a clearance between two adjacent hot and cold flanges,
  - and fixing devices comprising a plurality of rods adapted to pass through the two successions of hot and cold flanges which are located respectively at the two ends of the hot tubes and of the cold tubes, said fixing devices providing said transverse connection perpendicular to the hot tubes and to the cold tubes between the hot structures and the cold structures,
- whereby the first and second network of hot and cold tubes are maintained, or an application force between said hot and cold tubes and said thermo-elements is created or both.

4,420,941

# COOLING SYSTEM

Demos Papastavros, 2429 NE. 184 Ter., N. Miami Beach, Fla. 33160

Filed May 10, 1983, Ser. No. 493,229

Int. Cl.<sup>3</sup> F25D 9/00

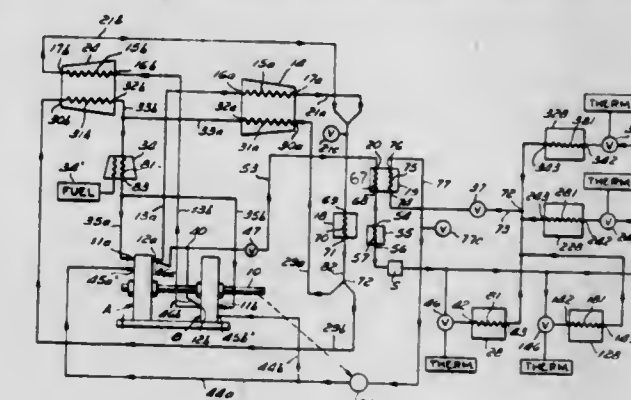
U.S. Cl. 62—402

17 Claims

- In a cooling system having condenser means having an inlet and an outlet; and evaporator means having an inlet operatively connected to said condenser means to receive refrigerant fluid therefrom and cause said fluid to boil, said evaporator means having an outlet;

the combination of:

- a turbine having fluid inlet and outlet means;
- a first heat exchanger having a first fluid passageway arrangement operatively connected to receive hot turbine exhaust fluid from said turbine outlet means;
- a condenser operatively connected to receive fluid from said first passageway arrangement in said first heat exchanger; said first heat exchanger having a second fluid passageway arrangement operatively connected to receive fluid from said last-mentioned condenser, said second fluid passageway arrangement being in heat exchange relationship to said first fluid passageway arrangement in said first heat exchanger;
- a heater operatively connected between said second fluid passageway arrangement in said first heat exchanger and said turbine inlet means to heat fluid returning to the latter



- from said second fluid passageway arrangement in said first heat exchanger;
- an additional heat exchanger having a first fluid passageway arrangement operatively connected between said turbine outlet means and the inlet of said first-mentioned condenser means, said additional heat exchanger having a second fluid passageway arrangement operatively connected to receive fluid from the outlet of said evaporator means, said second fluid passageway arrangement in said additional heat exchanger being in heat exchange relationship to said first fluid passageway arrangement therein;
- and a compressor operatively connected between the outlet of said second fluid passageway arrangement in said additional heat exchanger and said turbine inlet means to compress fluid returning to the turbine from said additional heat exchanger.

4,420,942

# NITROGEN LIQUID TO GAS CONVERTER EMPLOYING WATER HEAT EXCHANGERS

Warren E. Davis, 304 Everette Dr., Houma, La. 70360, and Donald W. Granger, Rte. #11, Box 832, Lake Charles, La. 70601

Filed Jul. 16, 1982, Ser. No. 399,013

Int. Cl.<sup>3</sup> F17C 7/02

U.S. Cl. 62—53

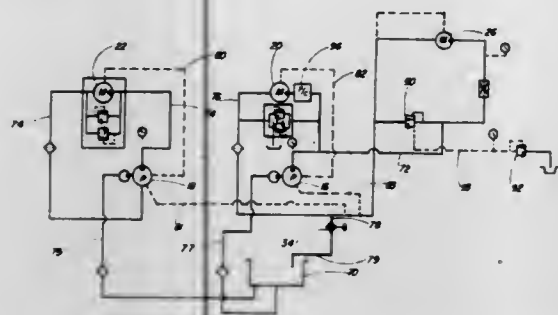
43 Claims

1. An apparatus for converting liquid nitrogen to gaseous nitrogen comprising:

- a. a source of liquid nitrogen;
- b. at least one liquid nitrogen inlet;
- c. means for pumping said liquid nitrogen connected to said inlet;
- d. engine means for driving said pumping means having engine fluid flow therethrough;
- e. first heat exchanger having first fluid flow therethrough and connected to said means for pumping liquid nitrogen wherein heat is provided from said first fluid to said liquid nitrogen thereby converting said liquid nitrogen to gaseous nitrogen;



f. means for conducting said first fluid through said first heat exchanger; and



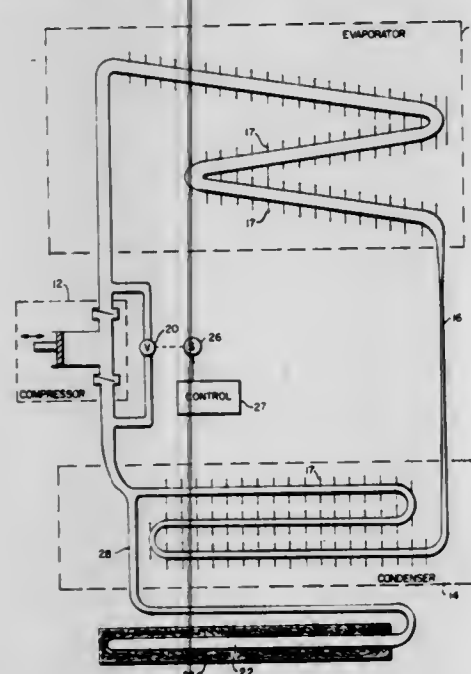
g. second heat exchanger having said first fluid flow there-through and providing engine fluid from said engine means in heat exchange relation with said first fluid.

**4,420,943**  
**METHOD AND APPARATUS FOR REFRIGERATOR DEFROST**  
Lawrence G. Clawson, Dover, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 10, 1982, Ser. No. 376,886  
Int. Cl.<sup>3</sup> F25B 41/00

U.S. Cl. 62—81

15 Claims



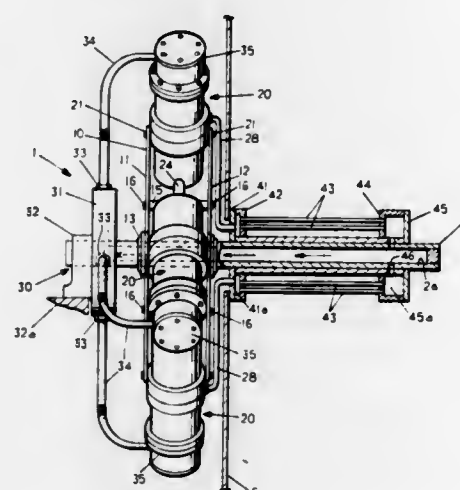
1. A refrigeration system comprising: an evaporator; a condenser; a reservoir for holding refrigerant; a compressor having its input coupled to said evaporator and its output coupled in parallel to said condenser and said reservoir wherein, during a steady state cooling cycle when said compressor is activated, said compressor pumps refrigerant from said evaporator to said condenser and said reservoir to provide a first pressure in said condenser and said reservoir and a second pressure in said evaporator, said first pressure being substantially higher than said second pressure; a capillary connecting said condenser to said evaporator for completing the refrigerant cooling cycle loop; a thermal mass thermally coupled to said reservoir; means for deactivating said compressor and for opening a passage wherein the pressure at the input to said compressor is rapidly equalized with the pressure at the outlet of said compressor at an intermediate pressure between said first and second pressures wherein said refrigerant evaporates in said reservoir, flows through said passage, and

condenses in said evaporator, said condensing providing heat to melt ice off the outside of said evaporator; and the heat for continued evaporation of said refrigerant in said reservoir being provided from said thermal mass.

**4,420,944**  
**AIR COOLING SYSTEM**  
Edwin W. Dibrell, San Antonio, Tex., assignor to Centrifugal Piston, Expander, Inc., San Antonio, Tex.  
Filed Sep. 16, 1982, Ser. No. 418,651  
Int. Cl.<sup>3</sup> F25B 9/00

U.S. Cl. 62—86

34 Claims



1. Air cooling apparatus comprising, in combination: a rotatable body; power means for rotating said body; a cylinder element defining a fluid pressure chamber; a piston element cooperable with said fluid pressure chamber; means for mounting one of said elements on said rotatable body at a position radially spaced from the axis of rotation of said rotatable body, whereby centrifugal force produces relative movement of said piston element in said fluid pressure chamber in a direction to reduce the volume of said fluid pressure chamber; a first valve means communicating with said fluid pressure chamber and openable only when said piston element approaches the minimum volume position relative to said fluid pressure chamber; a second valve means communicating with said fluid pressure chamber openable only when said piston is remote from said minimum volume position relative to said fluid pressure chamber; one said valve means being closed whenever the other said valve means is open; a room air heat exchanger having refrigerant fluid passages therethrough; a compressor co-rotatable with said hollow body; and conduit means for circulating a refrigerant fluid from said second valve means, through said refrigerant fluid passages of said heat exchanger, to the inlet of said compressor and from the outlet of said compressor to said first valve means.

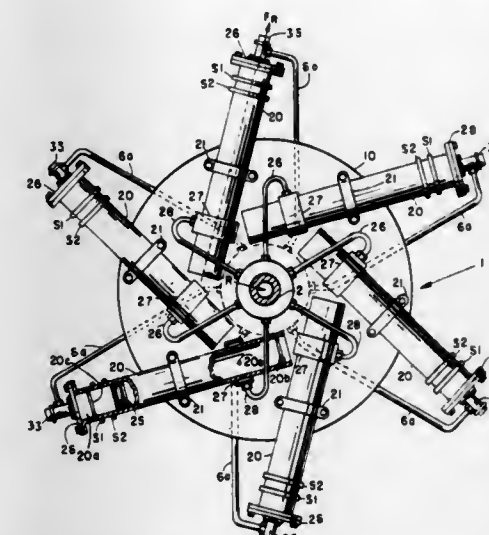
**4,420,945**  
**METHOD AND APPARATUS FOR EXTRACTING ENERGY FROM A PRESSURED GAS**  
Edwin W. Dibrell, San Antonio, Tex., assignor to Centrifugal Piston, Expander, Inc., San Antonio, Tex.  
Continuation-in-part of Ser. No. 436,412, Oct. 25, 1982. This application Dec. 20, 1982, Ser. No. 451,606  
Int. Cl.<sup>3</sup> F25D 9/00

U.S. Cl. 62—86

34 Claims

1. Apparatus for extracting heat and mechanical energy from a pressured gas comprising: a body rotatable about an axis; power means for rotating said body; a plurality of cylinder elements secured to said rotating body in an equi-spaced array around said axis; each said cylinder element defining an elongated fluid pressure chamber; a free piston movable longi-

tudinally in each said fluid pressure chamber; said cylinder elements being fixed on said rotatable body with the path of movement of each free piston extending from a position proximate to said axis to a position remote from said axis; whereby centrifugal force will move said free pistons to said remote position; inlet valve means communicating between a source of pressured gas and the remote end of each said cylinder ele-

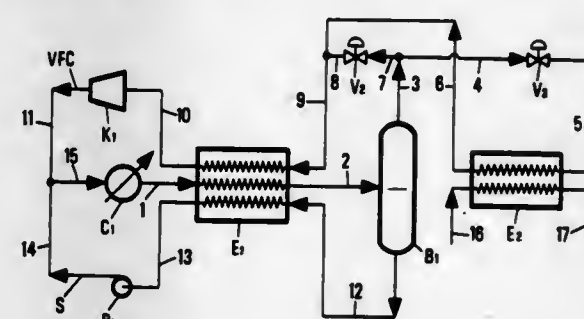


ment; means for opening said inlet valve means only when all of said free pistons reach said remote positions to concurrently receive a charge of pressured gas in the respective fluid pressure chamber; and exhaust valve means respectively communicating with said fluid pressure chambers and openable only when said free pistons respectively approach said proximate position, whereby said free pistons are removed in substantial synchronism in response to said each charges of pressured gas.

**4,420,946**  
**PROCESS FOR PRODUCING COLD OPERATED WITH PHASE SEPARATION**  
Alexandre Rojey, Garches; Joseph Larue, Vaucresson, and Alain Barrean, Chatou, all of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France  
Filed Dec. 1, 1981, Ser. No. 326,320  
Claims priority, application France, Dec. 1, 1980, 80 25514  
Int. Cl.<sup>3</sup> F25B 15/00

U.S. Cl. 62—101

20 Claims



1. In a process for producing cold in a phase separation cycle, which comprises the steps of:

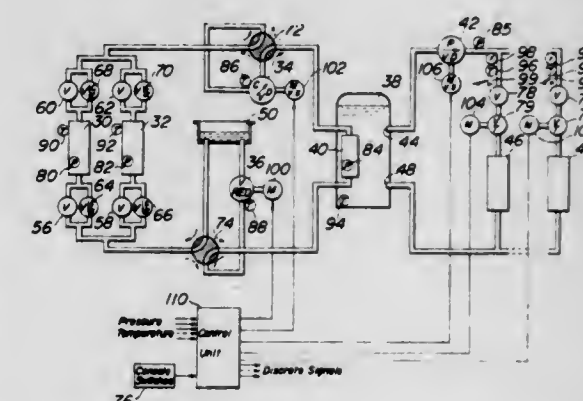
- compressing, in a compression zone, a gas phase of a refrigerant fluid, to form a compressed gas phase, dissolving at least in part the compressed gas phase in a liquid solvent phase, to obtain a solution, and transferring at least in part the compression heat and the dissolution heat to an external cooling fluid,
- cooling the solution recovered from step (a) in the manner defined in step (d) hereinafter, to obtain the separation of the solution into two distinct liquid phases,
- separating the light liquid phase from the heavy liquid phase,
- contacting the heavy liquid phase of step (c), in heat exchange relationship, with the solution to be cooled of step (b), and thereafter supplying said heavy liquid phase,

as a solvent phase, to step (a) to dissolve an additional amount of compressed gas phase,  
(e) expanding the light liquid phase of step (c) and vaporizing it to produce cold,  
(f) recycling the vaporized light phase of step (e) to the compression zone of step (a) as a gas phase of refrigerant fluid, with the improvement comprising: dividing the light liquid phase in step (e) into at least two portions (F<sub>1</sub>) and (F<sub>2</sub>); vaporizing the one portion (F<sub>1</sub>) of the light liquid phase in heat exchange contact with the solution from step (a), to further decrease the temperature of said solution and to facilitate its separation in step (b); and vaporizing the other portion (F<sub>2</sub>) of said light liquid phase in heat exchange contact with an external medium which is cooled, and said external medium being a medium other than the solution recovered from step (a).

**4,420,947**  
**HEAT PUMP AIR CONDITIONING SYSTEM**  
Hozo Yoshino, Tokyo, Japan, assignor to System Homes Company, Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan  
Filed Jul. 2, 1982, Ser. No. 394,866  
Claims priority, application Japan, Jul. 10, 1981, 56-106893  
Int. Cl.<sup>3</sup> F25B 13/00; F24J 3/02

U.S. Cl. 62—160

31 Claims



1. A heat pump air conditioning system, comprising: a refrigeration cycle having a compressor for compressing a refrigerant, means for exchanging heat including an evaporator for evaporating said refrigerant and a condenser for condensing said refrigerant, and an expansion valve for controlling passage of said refrigerant; first means for measuring an ambient temperature; second means for measuring a temperature of said refrigerant; third means for measuring a pressure of said refrigerant; and controlling means receiving the measured data of said ambient temperature, said temperature of said refrigerant and said pressure of said refrigerant for controlling a rotational speed of said compressor and an opening of said expansion valve in accordance with said measured data to maximize a coefficient of performance of said refrigeration cycle.

**4,420,948**  
**APPARATUS FOR DISPENSING HARD ICE CREAM AND THE LIKE**  
Don H. Savage, No. 2 Windsor, Sandy, Utah 84070  
Filed Mar. 12, 1981, Ser. No. 243,124  
Int. Cl.<sup>3</sup> B29C 1/00; A23G 3/18, 9/28

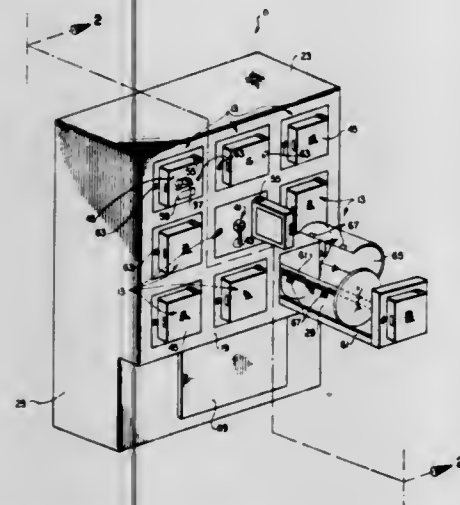
U.S. Cl. 62—340

35 Claims

1. An apparatus for dispensing a semisolid substance in scoops having a generally spherical shape and a uniform consistency, said apparatus comprising: a closed container into which said semisolid substance may be loaded;



pressure means for forcing said semisolid substance against a front wall of said closed container;  
exit means for allowing said semisolid substance to exit through said front wall in response to said pressure means;  
scoop dispensing means coupled to said exit means for forming said semisolid substance into a scoop having a generally spherical shape and a uniform consistency, and for delivering said spherical scoop to a user of said apparatus;



said semisolid substance comprising a food;  
said pressure means comprising a helical spring adapted to apply a force against said movable end wall of said closed container; and  
said pressure means further including motor means for compressing said spring to a desired force level.

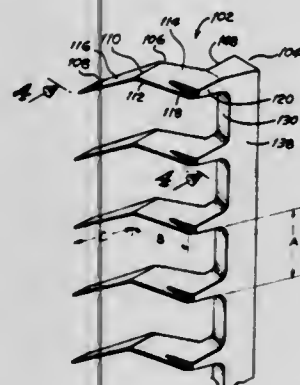
4,420,949

**SEAWATER ICE MAKING APPARATUS**

Don S. Bartholmey, Bellevue; Ronald D. Babcock, and George L. Weisel, both of Seattle, all of Wash., assignors to North Star Ice Equipment Corporation, Seattle, Wash.  
Filed Jun. 23, 1982, Ser. No. 391,460  
Int. Cl.<sup>3</sup> F25C 1/14

U.S. Cl. 62—354

21 Claims



1. In a salt water ice making machine having a freezing surface upon which ice is formed in a thin sheet, an improved knife for dislodging ice from the freezing surface and means for supporting and moving the knife along the freezing surface, said improved knife comprising:

- (a) an elongate leading section extending along said freezing surface and having:
  - a leading cutting edge extending along the portion of said leading section disposed adjacent to said freezing surface in close proximity to said freezing surface; and
  - a generally planar leading face surface disposed transversely to said freezing surface; and
- (b) an elongate trailing section angularly disposed relative to said leading section, said trailing section:
  - having a trailing cutting edge extending along the portion of said trailing section disposed adjacent to said freezing surface in close proximity to said freezing surface to

form a continuous cutting edge with the leading cutting edge; and  
a trailing face surface disposed at an obtuse angle relative to the leading face surface.

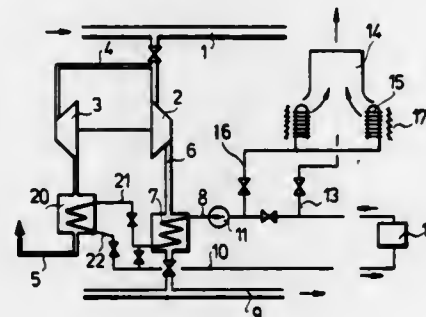
4,420,950

**PLANT FOR UTILIZATION OF LOW-POTENTIAL WASTE HEAT OF A GAS-PIPELINE COMPRESSOR STATION**

Janos Bodas; Istvan Papp; György Palfalvi, and Zoltan Vadas, all of Budapest, Hungary, assignors to Energiagazdalkodási Intezet, Budapest, Hungary  
Filed Apr. 1, 1982, Ser. No. 364,537  
Claims priority, application Hungary, Apr. 1, 1981, 835/81  
Int. Cl.<sup>3</sup> F25D 9/00

U.S. Cl. 62—402

4 Claims



1. A plant for utilization of low-potential waste heat of a gas pipeline compressor station, comprising means to convey gas in gaseous phase to the station at relatively low pressure, means to convey gas in gaseous phase away from the station at a relatively high pressure, a gas compressor between the low pressure means and the high pressure means, a gas expansion motor fed from the low pressure means and driving said compressor, a heat exchanger between the compressor and the high pressure means for cooling gas compressed in said compressor, means to circulate a cooling liquid in a closed circuit in heat exchange with said heat exchanger, a heat consumer warmed by said liquid heated in said heat exchanger, a circulation pump for circulating said liquid in said closed circuit, and means controllably to divert a selected portion of said liquid through an air cooling tower thereby to remove a selected amount of heat from said liquid in addition to the heat which is removed by said heat consumer.

4,420,951

**FILTER AND DISPENSER SYSTEM FOR AUTOMATIC WASHERS**

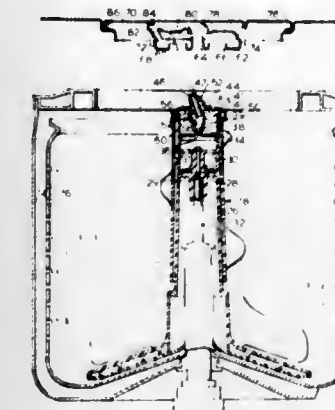
Jack F. Clearman, Blakely, Ga.; James R. Hageman, Pipestone Township, Berrien County, and Clark I. Platt, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.  
Filed Jun. 23, 1982, Ser. No. 391,004  
Int. Cl.<sup>3</sup> D06F 39/02

U.S. Cl. 68—17 R

20 Claims

3. In an automatic washer having a cabinet housing a basket for containing clothes to be washed, a vertically disposed motor driven agitator within said basket, an additive dispenser system for said automatic washer comprising:  
means for pumping liquid up through said agitator;  
nozzle means pivotally mounted in the top of said agitator and communicating with said pumped liquid,  
said nozzle movable between a first position and a second position;  
filtering means positioned to receive liquid from said nozzle in said first position;

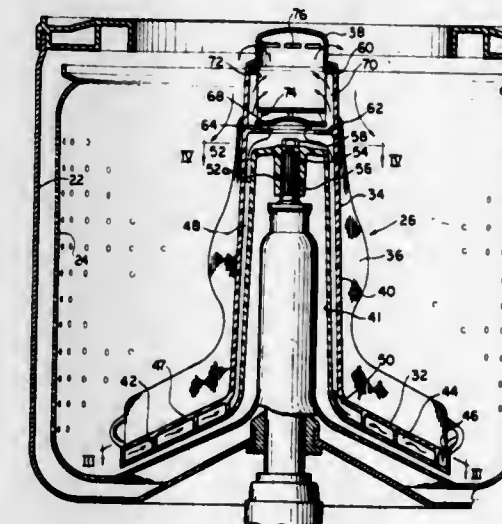
additive dispensing means positioned to receive liquid from said nozzle in said second position; and

**LIQUID PUMPING AGITATOR WITH BARREL VALVE FOR AUTOMATIC WASHERS**

Robert A. Brenner; Jack F. Clearman, and Clark I. Platt, all of St. Joseph Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.  
Filed Sep. 19, 1981, Ser. No. 294,138  
Int. Cl.<sup>3</sup> D06F 17/10

U.S. Cl. 68—53

17 Claims



15. A washing machine agitator comprising:  
a vertical barrel portion defining an outlet and an interior passage extending upwardly from a lower end of said barrel to said barrel outlet, a passage forming means at said lower end of said barrel portion for defining an interior arcuate passage with an inlet and an outlet; and  
a free floating disc valve means in said barrel interior passage for retarding the downward flow of washing liquid from said barrel passage through said arcuate passage.

4,420,953

**COMBINATION LOCKS**

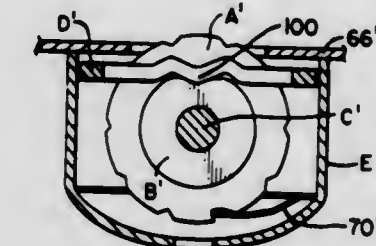
Richard C. Remington, Pompton Plains, N.J., assignor to Presto Lock, Inc., Garfield, N.J.  
Division of Ser. No. 33,540, Apr. 26, 1979, Pat. No. 4,308,731.  
This application Oct. 7, 1981, Ser. No. 309,506  
Int. Cl.<sup>3</sup> E05B 65/48

U.S. Cl. 70—74

5 Claims

1. A combination lock having a plurality of dials, each coupled to a corresponding rotary element having a peripheral portion that must be turned to a predetermined position relative to cooperable means to permit the lock to be opened, by relative sliding movement between the rotary elements and the cooperable means in a direction axially of a shaft upon which the rotary elements are supported for rotation, characterized in that the peripheral portion has a notch and the cooperable

means has a ridge portion for each notch, each dial having a series of indicia spaced about its periphery with one indicium displayed when the peripheral portion of the corresponding rotary element has said predetermined position, each rotary element being disposed axially adjacent the corresponding ridge portion and having a blocking interface with the corresponding ridge portion preventing relative sliding movement between the rotary elements and the cooperable means when the corresponding dial is turned to display an indicium that



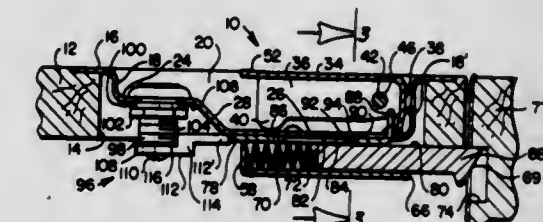
4,420,954

**FLUSH MOUNTABLE DOOR LATCH MECHANISM**

Gabriel C. Hieronymi, Sloatsburg, N.Y., and Randall C. Hansen, Gurnee, Ill., assignors to Abex Corporation, New York, N.Y.  
Filed Dec. 14, 1981, Ser. No. 330,738  
Int. Cl.<sup>3</sup> E05B 55/04; E05C 1/14

U.S. Cl. 70—150

8 Claims



1. A latch mechanism which comprises a tray; a bottom surface formed in the tray, wherein the bottom surface of the tray is recessed; a handle; means for pivotally mounting the handle within the tray such that the handle overlies the recessed bottom surface, wherein the handle is pivotable between a stored position and an operated position; an actuator formed on one end of the handle; means for housing a bolt, wherein the housing means is on back of the bottom surface of the tray; a bolt slidably mounted in the housing means and movable between an extended position and a retracted position; means for biasing the bolt into the extended position; a top surface on the bolt which faces the bottom surface of the tray; a slot formed in the bottom surface of the tray; a slide bar mounted in the bolt housing between the bottom surface of the tray and the top surface of the bolt, wherein the slide bar is movable between a locked position and an unlocked position and a part of the slide bar projects upwardly through the slot in the bottom surface; and means connecting the slide bar with the bolt, wherein the biasing means biases the bolt into engagement with the slide bar and the handle actuator engages the slide bar projection as the handle is moved from the stored position to the operated position to move the slide bar from the



locked position to the unlocked position which simultaneously moves the bolt from the extended position to the retracted position.

4,420,955

## PERMUTATION LOCK

Ulrich Marold, Hinzgarten, Fed. Rep. of Germany, assignor to Theodor Kromer GmbH & Co. KG, Umkirch, Fed. Rep. of Germany

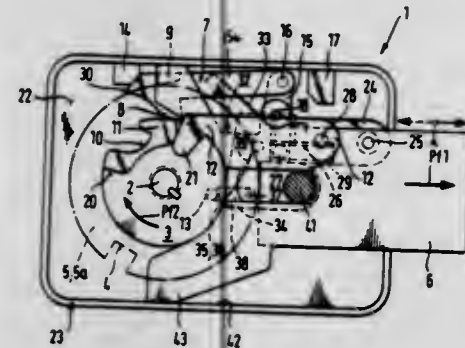
Filed Jul. 28, 1981, Ser. No. 287,825

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029735

Int. Cl.<sup>3</sup> E05B 37/08

U.S. Cl. 70—303 A

43 Claims



1. A permutation lock, comprising a housing; a locking bolt installed in and movable with reference to said housing between extended and retracted positions; a plurality of rotary tumblers in said housing; means for rotating said tumblers relative to each other to and from predetermined positions, said rotating means comprising a cam in said housing; locating means movable in said housing into engagement with said cam only in said predetermined positions of said tumblers so as to effect a movement of said bolt to one of said positions in response to rotation of said cam; and a coupling device movable in said housing to and from an operative position in which said device moves said bolt to the other of said positions in response to rotation of said cam, one of said tumblers having means for effecting a movement of said device to said operative position in response to movement of said one tumbler from the predetermined position thereof so that such movement of said one tumbler must precede the movement of said bolt to said other position.

4,420,956

## COMBINATION LOCK

Sze Y. Li, Kowloon, Hong Kong, assignor to Kwoon Kwen Metal Ware Company Ltd., Kowloon, Hong Kong

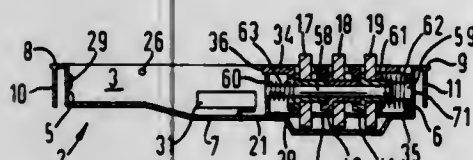
Filed Apr. 6, 1981, Ser. No. 251,690

Claims priority, application United Kingdom, Apr. 9, 1980, 8011671

Int. Cl.<sup>2</sup> E05B 37/02, 65/52

U.S. Cl. 70—312

2 Claims



1. A combination lock comprising a housing; a tongue member; a latch member pivotally mounted in said housing for movement between a latched position and an unlatched position and capable, when in said latched position, of securing said tongue member against removal from said housing; bolt means for locking said latch member in said latched position; projections on said bolt means; a plurality of cams; a spring biasing said bolt means to a release position and so moved to said

release position when said projections on said bolt means can engage in respective recesses in said cams; and a plurality of wheels each associated with a respective one of said plurality of cams, said wheels each being manually indexable around, bearing a visible marking and when indexed entraining for movement the respective one of said plurality of cams, whereby when each of said wheels is rotated to a respective determined position of rotation as indicated by said marking thereon, said projections from said bolt means can enter said recesses in said cams to allow said bolt means to move to said release position, but in all other rotational positions of said wheels and said cams, said bolt means is pressed by said cams into said locked position in which it prevents said pivotally mounted latch member pivoting to said unlatched position and thus retains said tongue member against movement away from said pivotally mounted latch out of said housing; wherein each of said cams is formed as a stepped cylindrical bush rotatable on a mounting pin, said recesses in said cams are provided as a respective recess in each said bush to receive a respective one of said projections from said bolt means and each said recess is provided in a larger diameter portion of said respective stepped bush, said respective wheel is rotatable, to change the combination of said lock, on a smaller diameter portion thereof and at least one projection is provided, to effect said interlocking of said cam and said respective wheel, projecting from said bush at the position of the step thereon between said portions of different diameter; and wherein said bolt means comprises an angled plate member having a first limb with a projection at its free end to engage said pivotally mounted latch, slots are provided in said first limb through respective ones of which slots portions of said wheels can project with lateral clearance and depressed portions are provided in said first limb forming said projections to cooperate with said recesses in said cams, a second limb of said angled plate member extends at right angles to said first limb and has an aperture therein through which said mounting pin projects, and movement of said bolt means between its said locking and release positions causes said first limb to move in the plane of said first limb and parallel to said mounting pin.

4,420,957

## MONITOR METHOD AND APPARATUS FOR PARTICLE BLASTING EQUIPMENT

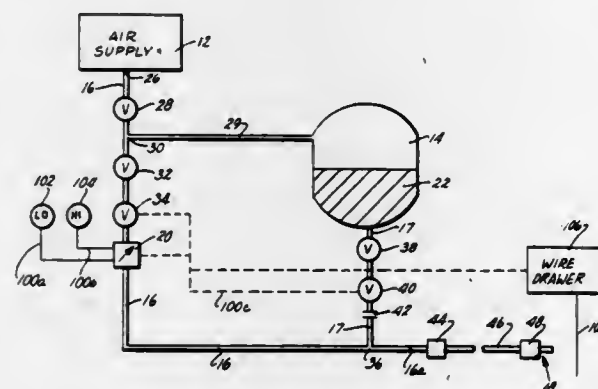
Joseph H. Weber, Grand Rapids, Mich., assignor to Progressive Blasting Systems, Inc., Grand Rapids, Mich.

Filed Oct. 26, 1981, Ser. No. 314,792

Int. Cl.<sup>3</sup> B21J 00/00

U.S. Cl. 72—1

24 Claims



1. An improved particle blasting apparatus for monitoring media flow, nozzle wear, and nozzle blockage, said equipment having a source of compressed air, a nozzle defining a restricted opening, means conveying said compressed air from said source to said nozzle in an airstream, and means operatively connected to said air conveying means introducing particle blasting media into said airstream, whereby said media is carried through said nozzle by said airstream, wherein the flow rate of said airstream through said air conveying means is

affected both by the amount of said media introduced into said airstream and by the effective size of said restricted opening in said nozzle, wherein the improvement comprises air flow metering means operatively connected to said air conveying means indicating said flow rate through said air conveying means, whereby insufficient media introduction and an excessive size of said restricted opening increases said flow rate causing said metering means to indicate an excessive flow rate greater than a predetermined maximum parameter, and whereby excessive media introduction and blockage of said nozzle reduces said flow rate causing said metering means to indicate an insufficient flow rate less than a predetermined minimum parameter.

4,420,958

## METHOD AND APPARATUS FOR REGULATING PRESELECTED LOADS ON FORMING DIES

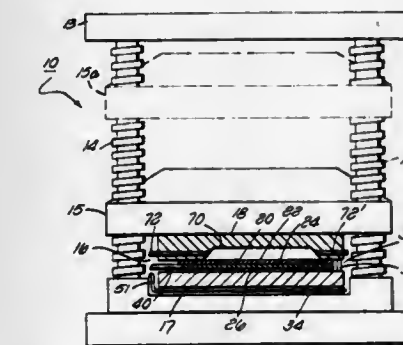
David W. Schulz, Hermosa Beach, and Edward D. Weisert, Rolling Hills Estates, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 148,873, May 12, 1980, Pat. No. 4,306,436. This application Dec. 17, 1981, Ser. No. 331,749

Int. Cl.<sup>3</sup> B21B 37/08

U.S. Cl. 72—21

13 Claims



1. In the method of making a structure from at least one workpiece wherein said at least one workpiece is constrained about its periphery between a pair of dies creating an actual gap therebetween, said dies applying a clamping force to said at least one workpiece, said dies being constrained between a pair of non-inflatable platens, and said at least one workpiece is formed within said pair of dies by fluid under pressure, the improvement comprising:

providing force adjustment means for varying said actual gap between said dies to adjust the force applied by said dies to said at least one workpiece; sensing the actual gap between said dies during forming, and providing a first output signal proportional to the size of said actual gap; providing a second output signal proportional to a preferred gap size between said dies; and controlling said force adjustment means using said first and second signals such that the actual gap size substantially equals said preferred gap size during forming of said workpiece.

4,420,959

## APPARATUS FOR THREADING CLOSURES

Roderick V. King, Glend, Pa., assignor to Ethyl Products Company, Richmond, Va.

Filed Dec. 31, 1980, Ser. No. 221,568

Int. Cl.<sup>3</sup> B21D 1/08

U.S. Cl. 72—113

10 Claims

1. An apparatus for forming lug threads in a closure having a top surface and an integral cylindrical wall comprising:

a. an apparatus support means;

b. nest means fixedly attached to said support means, said nest means having a vertically extending cylindrical bore therein with

(i) an upper section having a plurality of inwardly directed

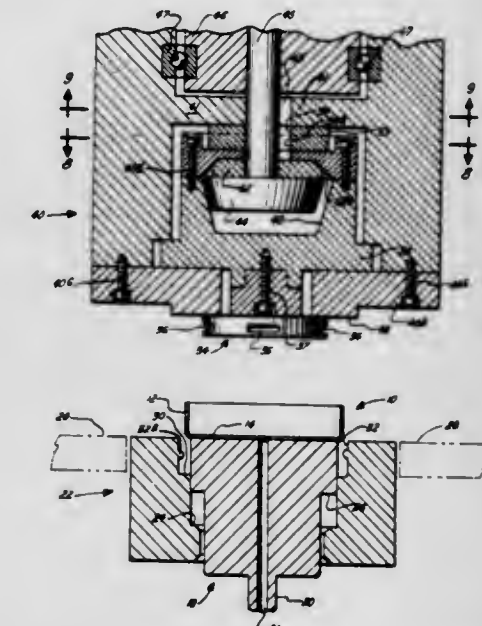
thread forming members extending from the sidewall thereof and a first upwardly facing circular shoulder therebelow,

(ii) a lower, smaller diameter section terminating in an upwardly facing shoulder, and

(iii) a bottom opening below said lower section with a diameter smaller than said lower section;

c. closure support means slidably received in said nest means for moving a cap vertically into and out of said upper section of said nest means, and having a downwardly facing shoulder adapted to abut said second upwardly facing shoulder when in the fully retracted position and a lowermost portion extending through said bottom opening of said nest means;

d. horizontally movable, cylindrical threading tool means having indentations on the outside thereof matching said thread forming members on said nest means for forming threads in the cylindrical wall of said closure;



e. means for vertically inserting and withdrawing said threading tool means in said closure;

f. threading tool housing means axially aligned with said nest means and having threading tool carrier means mounted therein which is rigidly connected to said threading tool means, said carrier means including a carrier having a conical recess that has the shape of an inverted truncated cone located in its interior, and a truncated conical actuator adapted to slide into and out of said recess to move said threading tool carrier means transversely to bring said threading tool means into contact with said cylindrical wall of said closure; and

g. orbiting means for moving said threading tool means in an orbital path whereby the axis of said threading tool moves in a circle about the axis of said closure while preventing rotational and axial movement of said threading tool about its own axis.

4,420,960

## ARRANGEMENT FOR HOT-ROLLING OF METAL WORKPIECES

Hans W. Grasshoff, Dortmund, Fed. Rep. of Germany, assignor to Estel Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed May 5, 1981, Ser. No. 260,188

Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019123

Int. Cl.<sup>3</sup> B21B 1/26, 41/02, 41/06, 45/00

U.S. Cl. 72—202

1 Claim

1. Arrangement for continuous hot-rolling of metal workpieces, comprising:

first means, including at least one roughing stand in which

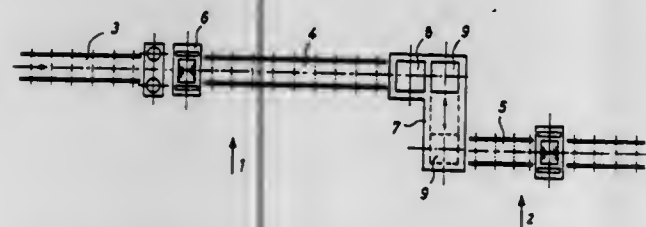


the workpiece is rough-rolled to a product having roughly the desired dimensions while advancing along a first path; second means, including at least one finishing stand in which the rough-rolled product is finish-rolled to the final desired dimensions while advancing along a second path which is offset from said first path;

a heat-retaining station extending between an end of said first path and a beginning of said second path;

a take-up coiler in said heat-retaining station at a location adjacent said end of said first path for coiling up the rough-rolled product; and

transporting means in said heat-retaining station for transporting the coiled-up rough product from said location to said beginning of said second path; said transporting means and take-up coiler separating said first means from said second means inside a continuous rolling train, said product being retained hot in passage through said take-up coiler and transporting means, winding of the coil produc-



ing a heating effect for retaining said coil in heated condition due to reduction in exposed surface from which heat flow may take place, said heat-retaining station comprising a coiling and uncoiling station, said heating station being free from externally supplied heat; said first and second paths being laterally offset from one another, said transporting means comprising an uncoiler for paying out coiled rough product, said uncoiler being movable between said location and said beginning of said second paths, said first and second paths being so offset relative to one another as to form with said heat retaining station a Z-shaped outline, said roughing stand of said first means being a reversing stand and said first means further including a string of run-out rollers extending from said reversing stand to said heat-retaining station and extending underneath the take-up coiler and the transporting means and beyond said heat-retaining station in line with said first path.

4,420,961

#### METHOD FOR PRODUCING BEAM BLANK FOR UNIVERSAL BEAM

Yoshiaki Kusaba, Nishinomiya, and Chihiro Hayashi, Takarazuka, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 10, 1982, Ser. No. 387,202

Claims priority, application Japan, Jul. 10, 1981, 56-107940; Apr. 30, 1982, 57-72706

Int. Cl.<sup>3</sup> B21B 1/10

U.S. Cl. 72-221

4 Claims

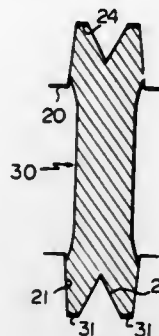
1. A method for producing a beam blank for a universal beam, comprising the steps of:

making a slit longitudinally of a flat slab in each of both the side edges thereof by hot rolling using a plurality of pairs of knifing calibers each having a triangular projection at the center of the bottom thereof, said triangular projections having the same predetermined apical angles and heights gradually increasing sequentially;

gradually deepening the slit; and

gradually widening the slit after the depth of the slit has

reached a predetermined value, wherein during the steps of making the slit and deepening the slit, tip ends of the



material on both sides of the slit are substantially free from reduction caused by the bottom of the caliber.

4,420,962

#### METHOD OF COLD COINING A TOOTHED SEGMENT FOR AN ENDLESS TRACK WHEEL AND TWO-PIECE DIE THEREFOR AND ARTICLE FORMED THEREBY

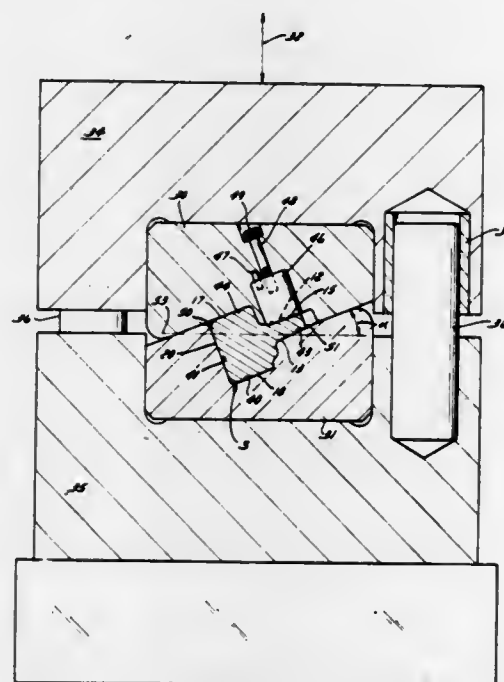
Donald J. Peterson, Racine, Wis., assignor to Walker Forge, Inc., Racine, Wis.

Filed Sep. 2, 1981, Ser. No. 298,451

Int. Cl.<sup>3</sup> B21D 22/00

U.S. Cl. 72-360

22 Claims



1. A method of manufacturing and finishing without machining of various surfaces of a toothed segment for an endless track wheel and wherein said surfaces are arranged generally at right angles to one another, the method comprising inserting a rough blank in an open two piece die that closes along one direction and positioning said blank in said die so that said surfaces are at an inclined angle to said direction, closing said die whereby said die creates forces simultaneously on all of said surfaces to accurately finish said surfaces and accurately locate them relative to one another, wherein said segment is arcuate in shape and has a radially inwardly extending, central mounting flange with opposite sides, said segment also has an outer driving tooth portion extending laterally beyond either of said flange opposite sides, said portion having opposite sides and a gear tooth profile surface formed between its sides and at an angle of about ninety degrees with respect thereto, said surfaces to be finished including (1) at least a part of one side of said flange, (2) said opposite sides of said driving tooth portion and (3) said gear tooth profile surface.

4,420,963

#### IMPACT RAIL FORGER

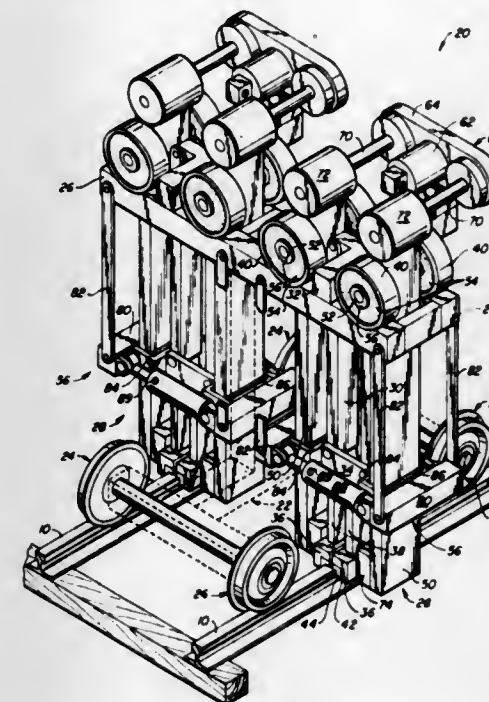
Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Company, Sparks, Nev.

Filed Dec. 7, 1981, Ser. No. 328,163

Int. Cl.<sup>3</sup> B21J 7/20

U.S. Cl. 72-407

16 Claims



1. An apparatus for impact forging an elongate object such as a rail, said apparatus comprising:

a mobile frame that is capable of travelling along the object in place;

first and second forging shoes located so that the first shoe lies on one side of the object and the second shoe lies on the opposite of the object;

first and second resonant beams having anti-nodes at each end and at least one node spaced inward from the end, said beams being suspended from the frame from a location on the beam substantially coincident with the uppermost node so that the lower anti-nodes of the beams are located on the outer sides of the respective forging shoes; and

means for inducing a lateral wave in each of the beams at or near its resonant frequency whereby the beams drive the forging shoes in phase against the opposite sides of the rail.

4,420,964

#### METHOD OF AND APPARATUS FOR THE PRESSWORKING OF ARTICLES

Alexander S. Petrov, and Mihail S. Konstantinov, both of Sofia, Bulgaria, assignors to V M E I "Lenin", Sofia, Bulgaria

Filed Apr. 28, 1981, Ser. No. 258,420

Claims priority, application Bulgaria, Apr. 29, 1980, 47580

Int. Cl.<sup>3</sup> B21J 9/18

U.S. Cl. 72-451

7 Claims

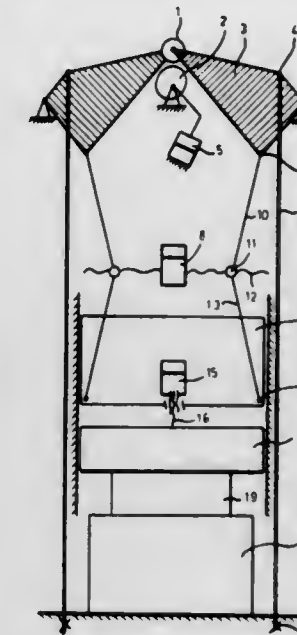
1. A method of operating an apparatus for the press working of an article in which a movable tool member is urged against said article, said method comprising the steps of

(a) storing force in a force-storing element over a first time interval;

(b) driving said tool against said article with force stored in said element during a second time interval;

(c) storing force in said element during a third time interval

immediately following said second time interval while simultaneously and independently of the storage of force



in said element, maintaining the advance of said tool against said article; and

(d) repeating steps (b) and (c) at least once.

4,420,965

#### COOLING EFFECT SENSOR

Thomas P. Farkas, Bloomfield; Gary D. Burr, Berlin, and Robert W. Smith, Simsbury, all of Conn., assignors to Dynamic Controls Corporation, South Windsor, Conn.

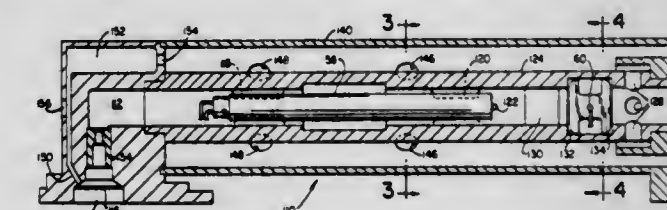
Division of Ser. No. 943,300, Sep. 17, 1978, Pat. No. 4,257,552.

This application Aug. 21, 1980, Ser. No. 179,938

Int. Cl.<sup>3</sup> G01M 17/06

U.S. Cl. 374-43

5 Claims



1. A cooling effect sensor for detecting the cooling capacity of a moving heat transfer fluid comprising:

conduit means defining a fluid passageway having an entrance at one end for receiving the moving fluid and an exit at the other end from which the moving fluid is discharged;

an insulating jacket mounted over the conduit means and having one end communicating with the fluid passageway at the entrance and an opposite end communicating with the fluid passageway at the exit, and discharge vents in the jacket intermediate the one and opposite ends;

heating means connected with the conduit means for applying predetermined quantities of heat to the moving fluid in the fluid passageway; and

temperature sensing means positioned in the fluid passageway downstream in the fluid flow from the heating means for measuring the temperature of the moving fluid to which the predetermined quantities of heat are applied.



4,420,966

**METHOD FOR DETERMINING SOLIDS OR LIQUIDS IN VAPOR**

Lloyd A. Baillie, Homewood, and George A. Uhl, Crete, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

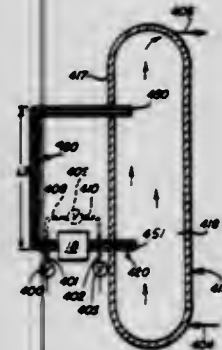
Division of Ser. No. 255,915, Apr. 20, 1981, abandoned, which is a division of Ser. No. 99,348, Dec. 3, 1979, Pat. No. 4,299,116.

This application Jul. 20, 1982, Ser. No. 399,941

Int. Cl.<sup>3</sup> G01N 15/06

U.S. Cl. 73—28

1 Claim



1. A process for measuring changes in the amount of solids or liquids entrained in a vapor contained in a container by means of a photocell manometer having an orifice of a first sensor and an orifice of a second sensor located at different levels in vapor contact with said vapor within said container, said process comprising:

introducing a first vapor purge stream into said first sensor at a rate at least sufficient to maintain said first sensor uniformly filled with a vapor from said first vapor purge stream,

introducing a second vapor purge stream into said second sensor at a rate at least sufficient to maintain said second sensor uniformly filled with a vapor from said second vapor purge stream,

locating said orifice of said first sensor at a different relative height to said orifice of said second sensor, and measuring a relative pressure transmitted by said first sensor relative to a pressure transmitted by said second sensor, whereby changes in said relative pressure indicate changes in said amount of entrained solids or liquids.

4,420,967

**KNOCK DETECTOR**

Toshio Enoshima, Fujisawa; Shoji Furuhashi, and Hideyuki Tamura, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

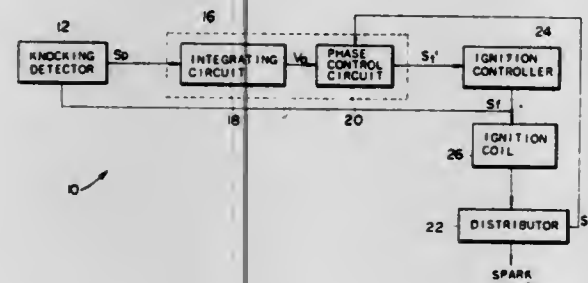
Filed Feb. 12, 1981, Ser. No. 234,008

Claims priority, application Japan, Feb. 18, 1980, 55-18426

Int. Cl.<sup>3</sup> G01L 23/22

U.S. Cl. 73—35

22 Claims



1. A knock detector for a spark ignition internal combustion engine, comprising:

- a vibration sensor for sensing engine vibrations to produce a vibration signal corresponding to the vibrations;
- means for transmitting therethrough a signal obtained from the vibration signal;

- a reference level signal forming means including:
  - a rectifier for rectifying the vibration signal to produce a rectified signal;
  - an averaging means for smoothing the rectified signal to produce a smoothed signal; and
  - a first amplifying means for amplifying the smoothed signal to produce a reference level signal;
- a comparator for comparing the signal from said transmitting means with the reference level signal to produce a knock signal representing the occurrence of knock when the former signal is greater in magnitude than the latter;
- an engine speed determining means for sensing the engine speed to produce a drive signal when the engine speed exceeds a predetermined value; and
- a changeover means responsive to the drive signal for changing the magnitude of the output of at least one of said transmitting means and the reference signal forming means such that the relationship in magnitude between the reference signal and the signal from the transmitting means before the drive signal is produced is maintained.

4,420,968

**UNDESIRABLE COMBUSTION CHARACTERISTIC DETECTION APPARATUS**

Ingo Dudeck, Weinstadt, and Manfred Maass, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

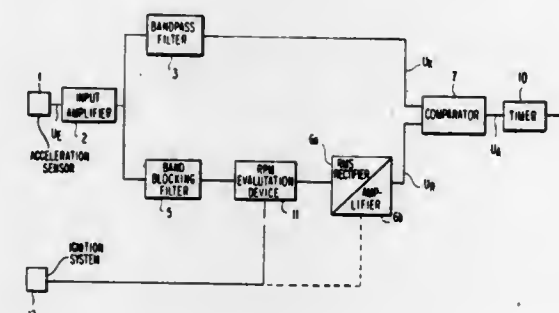
Filed Nov. 17, 1981, Ser. No. 322,224

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044745

Int. Cl.<sup>3</sup> G01L 23/22

U.S. Cl. 73—35

7 Claims



1. An apparatus for detecting undesirable combustion characteristics in the combustion process in a spark-ignited internal combustion engine and discriminating those characteristics from disturbances having similar characteristics which do not originate in the combustion process, the apparatus comprising sensor means for sensing solid borne signals and for providing a knocking frequency output signal in response thereto, band-pass filter means tuned to the frequency of an engine knocking vibration, wherein the output signal of the sensor means is fed to the band-pass filter means resulting in a knocking frequency signal, and band-blocking filter means for suppressing frequencies below a predetermined knocking vibration frequency and frequencies above a predetermined knocking vibration frequency higher than the knocking vibration frequency, rotational speed evaluation means for evaluating an output signal from the band-blocking filter means, r.m.s. rectifier means arranged in series with the band-blocking filter means and evaluation means for forming a reference knock signal, comparator means for comparing the reference knock signal with the knocking frequency signal, and timer means responsive to the comparator means for supplying an output pulse of a predetermined duration when the comparator means senses the knocking frequency signal exceeds the reference knock signal.

4,420,969

**ORIFICE METERING FAN DEVICE**

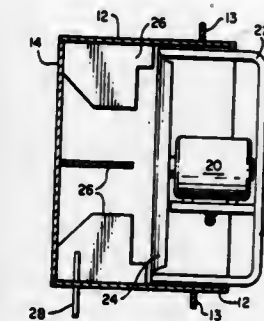
Arthur M. Saum, Waynesboro, Va., assignor to Saum Enterprises, Inc., Falls Church, Va.

Filed Jun. 2, 1981, Ser. No. 269,755

Int. Cl.<sup>3</sup> G01M 3/04

U.S. Cl. 73—40

14 Claims



1. A device for transferring a gas and simultaneously measuring the volume flow rate of the gas, the device comprising a propeller-type fan for generating gas flow, said fan mounted within air-flow guide means concentrically spaced about the fan perimeter, drive means for rotating the fan, an orifice located upstream from the fan, the orifice comprising an opening in a plate said plate mounted at one end of a housing, which extends from the plate and encloses at least the air flow guide means of the device, the plane of the plate being approximately parallel to the plane of rotation of the fan, and the orifice and fan being spaced less than one fan diameter apart, said housing enclosing the space between the orifice plate and air flow guide means, means to adjust gas flow rate through the orifice in a controlled manner, one or more vanes mounted inside the housing between the fan and the orifice plate so as to direct gas flow in a generally axial direction relative to the fan, and pressure sensing means within the housing and located between the orifice plate and the fan.

4,420,970

**APPARATUS FOR CHECKING FOR LEAKS FROM METAL-CLAD HIGH-TENSION ELECTRIC GEAR**

Henri Organi, Villeurbanne, France, assignor to Alsthom-Atlantique, Paris, France

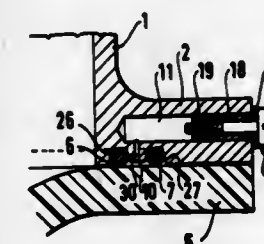
Filed Apr. 6, 1981, Ser. No. 251,441

Claims priority, application France, Apr. 17, 1980, 80 08591; Sep. 16, 1980, 80 19904

Int. Cl.<sup>3</sup> G01M 3/26

U.S. Cl. 73—46

18 Claims



1. Apparatus for checking for leaks between the connection flanges of two portions of metal-clad electric gear, said flanges being sealed by means of two seals disposed concentrically in series on the facing surfaces of the flanges, said electric gear being filled with compressed gas, the improvement comprising a smooth bore hole in communication with the internal volume lying between the two seals and leading to the exterior of the metal-clad electric gear, and an axially compressible resilient cylindrical seal within said smooth hole, a screw projecting through said compressible resilient cylindrical seal from the

exterior, said screw being threaded only at its end, leaving a smooth surface portion near the head thereof and projecting within said resilient cylindrical seal, a nut threaded to said threaded screw portion at its end and means for preventing rotation of said nut but allowing axial movement of the nut within said bore hole such that rotating said screw relative to said nut causes said resilient cylindrical seal to increase in diameter during axial compression for effecting fluid-tight sealing between said resilient cylindrical seal and both the smooth surface portion of said screw and said smooth bore hole.

4,420,971

**DEVICE FOR FLOWTHROUGH RATE MEASUREMENT IN AN INTERNAL COMBUSTION ENGINE**

Peter Rapps, Karlsruhe, and Ulrich Drews, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

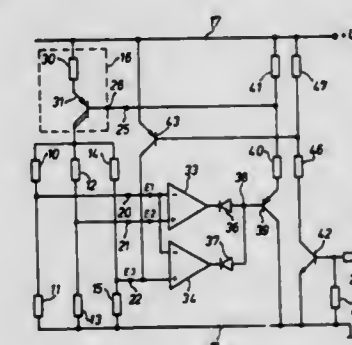
Filed Jun. 18, 1981, Ser. No. 274,992

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022685

Int. Cl.<sup>3</sup> G01F 1/68

U.S. Cl. 73—118

8 Claims



1. A burnout device for flowthrough rate measurement for measuring the air throughput in the intake tube of an internal combustion engine comprising:

- a bridge circuit assembly having at least three voltage dividers connected to respective control voltages,
- a heated resistance material disposed in the flow of the medium included in one of said voltage dividers and at which a control voltage is connected for regulating the electric current through said resistance material,
- means for selectively connecting either one of the remaining two of said voltage dividers in conjunction with said one of said voltage dividers for a measurement or a burn-off operation, and
- control means responsive to said bridge circuit assembly for controlling said control voltage for regulating the electric current to said heated resistance material.

4,420,972

**AIR INTAKE MEASURING APPARATUS FOR INTERNAL COMBUSTION ENGINE**

Hiroshi Kuroiwa, Hitachi, and Yoshishige Oyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1982, Ser. No. 337,819

Claims priority, application Japan, Jan. 13, 1981, 56-4428

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73—118

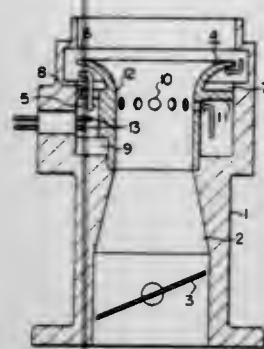
8 Claims

1. An air intake measuring apparatus for an internal combustion engine, comprising:

- a main air path;
- a bypass for passing an amount of air in a predetermined ratio with respect to an amount of air passing through said main air path, said bypass being comprised of a straight path portion connected to an inlet of said bypass and a circumferentially curved path portion connected to an



outlet of said bypass, at least a part of said curved path portion situated closest to an outlet end of said straight path portion being separated by a wall relative to said main air path, whereby the amount of air passing through



the bypass will be directed, thereby, circumferentially of said main air path prior to returning to the main air path via said outlet; and  
an air flow rate measuring element disposed in said bypass.

4,420,973

### MAGNETICALLY ATTACHABLE TIMING GAUGE FOR A FUEL INJECTOR

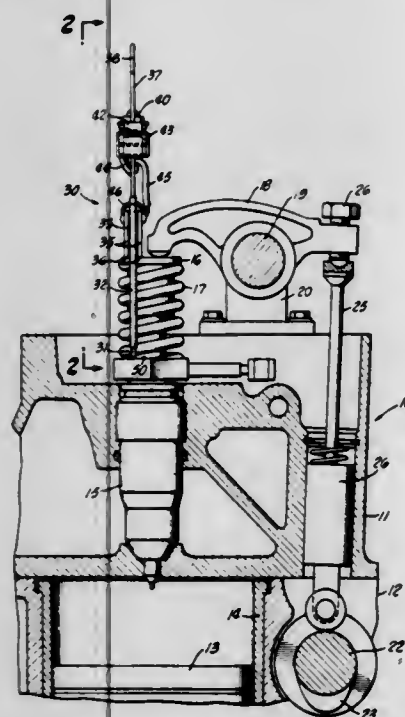
Guillermo E. Garcia, 830 Dos Robles Pl., Alhambra, Calif. 91801

Filed Sep. 28, 1981, Ser. No. 306,201

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73-119 A

13 Claims



1. A timing gauge for use in setting a fuel injector plunger while mounted in an engine said gauge comprising:  
permanent magnet means having a conductive pole face adapted to hold said gauge firmly clamped to and supported solely by the outer end of an injector plunger;  
a conductive probe secured to said magnet means and insulated therefrom, said probe extending a predetermined distance beyond said pole face and corresponding to the precise distance between the outer end of an injector plunger and a timing reference surface beside said plunger on an engine when the injector plunger is properly positioned to measure a fuel injection stroke; and  
said permanent magnet means and said probe being adapted to be connected in series with a source of power and with indicator means groundable on the engine whereby said indicator means is activated when the injector plunger is so adjusted that the end of said probe is in contact with

said timing reference surface at the beginning of a fuel injection stroke.

4,420,974

### IN-SITU MEASUREMENT SYSTEM

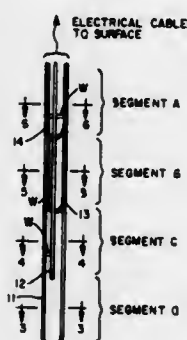
David E. Lord, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1980, Ser. No. 209,929

Int. Cl.<sup>3</sup> E21B 49/00; G01F 1/68; H01G 3/04

U.S. Cl. 73-154

7 Claims



1. An in situ measurement system for measuring temperatures and other parameters and conditions in an underground volume of interest, said system comprising:

a plurality of steel bar resistance elements emplaced in spaced relation in the underground volume of interest, each said bar having the same uniform and known temperature functional resistance characteristics along its length, each said element having a U-shaped open loop "hairpin" configuration with two parallel legs in close thermal proximity, said elements being arranged in pairs with the elements in each said pair sharing nearly a common path in close thermal proximity throughout the extent of the shorter element in the pair, and with the free ends of each said element disposed adjacent the free ends of the other elements; and

measurement means for obtaining, for said pairs, the electrical resistance of each element and the difference in electrical resistance of the two elements in each pair, whereby said resistance difference values may be used in analytical methods involving resistance as a function of temperature to obtain information with respect to said underground volume.

4,420,975

### SYSTEM AND METHOD FOR DETERMINING THE RELATIVE PERMEABILITY OF AN EARTH FORMATION SURROUNDING A WELLBORE

Walter A. Nagel, and David J. Walsh, both of Englewood, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 279,094, Jun. 30, 1981,

abandoned. This application May 23, 1983, Ser. No. 497,396

Int. Cl.<sup>3</sup> E21B 49/00

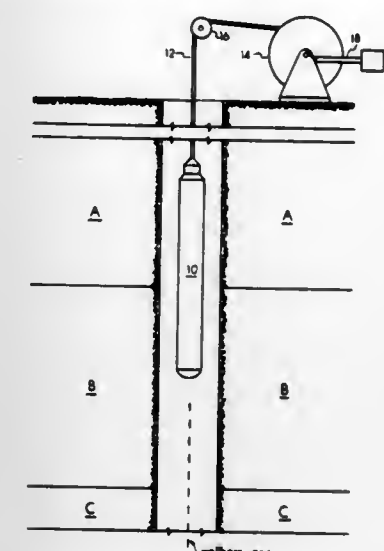
U.S. Cl. 73-155

13 Claims

1. A method for determining the relative permeability of an earth formation surrounding a wellbore having a longitudinal axis comprising the steps of:

injecting a fluid into the wellbore such that the fluid invades the earth formation;  
measuring at different points in time a quantity that varies in response to the radius from the wellbore axis of the fluid invasion into the earth formation;  
determining in response to said quantity measurements the

radius from the wellbore axis of the fluid invasion into the earth formation at different points in time; and



determining in response to said radii determinations the relative permeability of the earth formation.

4,420,976

### MULTIPLEXED TRUE MASS GAGING SYSTEM

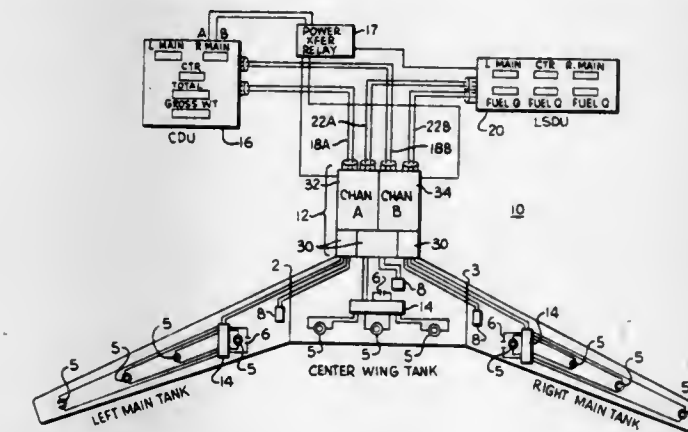
Eugene F. Orloff, Long Beach, Calif.; Martin Horowitz, Lynbrook, and Charles H. Ritter, Great River, both of N.Y., assignors to McDonnell Douglas Corporation, Long Beach, Calif. and Gull Airborne Instruments, Inc., Smithtown, N.Y.

Filed Sep. 9, 1981, Ser. No. 300,570

Int. Cl.<sup>3</sup> G01F 23/26

U.S. Cl. 73-304 C

34 Claims



1. A multiplexed true mass gaging system for aircraft with multiple fuel tanks comprising:

a plurality of tank probes situated in respective individual tanks for measuring the level of fuel therein;  
a plurality of compensating capacitors, one in each tank, for developing signals proportional to fuel density;  
a plurality of densitometers, one in each tank, for measuring the density of fuel therein, the signals from the tank probes, compensating capacitors and densitometers being combined to provide indications of the true mass of the fuel contained in an individual tank;  
a cockpit display unit mounted in the aircraft cockpit and a load selector display unit mounted at a refueling station, each display unit including digital displays for providing indications of fuel quantity to an operator;  
a standard electronic module mounted adjacent at least one of the tanks for converting analog signals corresponding to fuel level measurement data into serial digital data signals;  
at least one signal channel including of a pair of shielded, twisted leads extending from the standard electronic module to each of the display units;

means for applying the serial digital data signals to said channel; and  
means at each of the displays for receiving the digital data signals from said channel and utilizing them to energize the digital displays in accordance with the digital data signals.

4,420,977

### ACOUSTIC ROTATION CONTROL

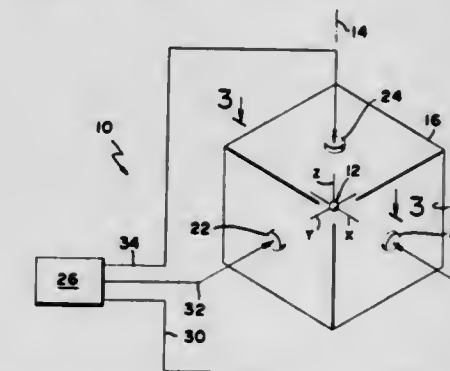
Daniel D. Elleman, San Marino; Arvid P. Croonquist, Pasadena, and Taylor G. Wang, Glendale, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 15, 1982, Ser. No. 358,089

Int. Cl.<sup>3</sup> H02N 11/00

U.S. Cl. 73-505

7 Claims



1. A method for controlling rotation of an object, comprising:

applying acoustic waves along first and second different directions to said object, to establish standing wave patterns extending across the object location, with the wavelengths of the acoustic waves passing along said directions being equal;  
said step of applying including controlling the relative phases of said acoustic waves so they are substantially 90° out of phase, and repeatedly switching the relative phases so that each acoustic wave alternately leads and lags the other one by 90°.

4,420,978

### METHOD AND DEVICE FOR TRANSMITTING AND RECEIVING ELECTRO-MAGNETIC ULTRASOUND

Thomas Robinson, and Willy Ohlsson, both of Nyköping, Sweden, assignors to Studsvik Energiteknik AB, Nyköping, Sweden

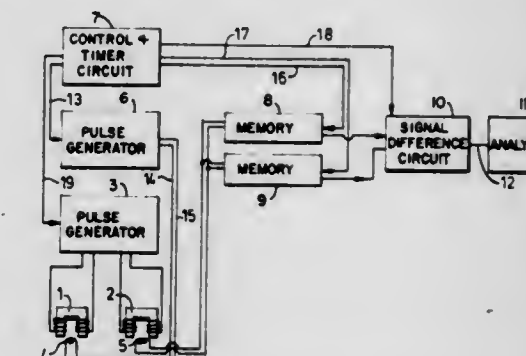
Filed Apr. 7, 1981, Ser. No. 251,888

Claims priority, application Sweden, Apr. 18, 1980, 8002948

Int. Cl.<sup>3</sup> G01N 29/04

U.S. Cl. 73-643

5 Claims



1. An apparatus for non-destructively testing an electrically conductive material, such as steel at a temperature above the



Curie temperature, with pulses of ultrasound, comprising first and second core means, a first coil wound on said first core means for producing a first magnetic field in the region of said material upon conduction of electrical current through the first coil, a second coil wound on said second core means for producing a second magnetic field in the region of said material upon conduction of electrical current through the second coil, circuit means electrically connected to one of said first and second coils for conducting current through said one of said first and second coils first in one direction and then in an opposite direction, said circuit means also being electrically connected to the other of said first and second coils for conducting current through said other of said first and second coils, a transmitter coil lying in said first magnetic field, means for conducting a first pulse of current through said transmitter coil to produce at least one ultrasonic pulse in said material while current is being conducted in said one direction through said one of said first and second coils and for further conducting at least a second pulse of current through said transmitter coil to produce at least one additional ultrasonic pulse in said material while current is being conducted in said opposite direction through said one of said first and second coils, a receiver coil lying in said second magnetic field for supplying a first electrical signal in response to said one ultrasonic pulse and a second electrical signal in response to said additional ultrasonic pulse, each of said first and second electrical signals varying as a function of its associated ultrasonic pulse, memory means electrically connected to said receiver coil for storing at least said first electrical signal, an electrical circuit, means for supplying said second electrical signal to said electrical circuit and also for delivering said first electrical signal from said memory means to said electrical circuit, said electrical circuit comprising means for developing an electrical output signal from the difference between said first and second electrical signals to reduce interference in said output signal due to vibration of said first and second coils and said first and second core means, and said output signal containing information for analyzing said material for defects.

4,420,979

## ULTRASONIC MICROSCOPE

Isao Momii, Yunotani, Noriyoshi Chubachi, and Junichi Kishibiki, both of Sendai, all of Japan, assignors to Olympus Optical Company Ltd., Japan

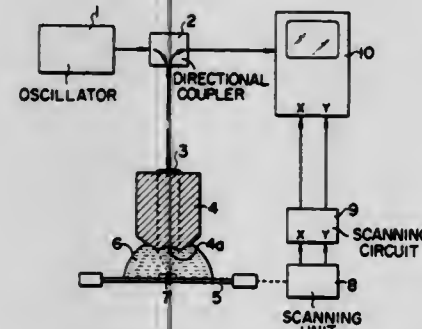
Filed Apr. 20, 1982, Ser. No. 370,062

Claims priority, application Japan, Apr. 21, 1981, 56-59995

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—644

12 Claims



1. An ultrasonic microscope comprising an impedance matching layer composed of a chalcogenide glass film, said layer being on a spherical lens portion of an ultrasonic condensing lens which contacts with an acoustic field medium.

# 4,420,980 ARRANGEMENT FOR MEASURING THE PRESSURE IN CYLINDRICAL CAVITIES

Klaus Dunemann, Karlsbad, and Harald Fritz, Waldbronn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

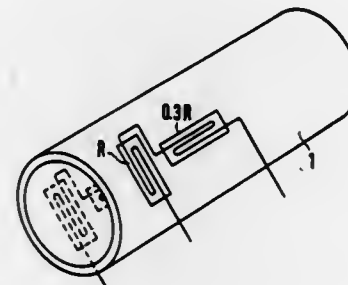
Filed Sep. 30, 1981, Ser. No. 307,275

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1980, 3037753

Int. Cl.<sup>3</sup> G01L 7/04

U.S. Cl. 73—730

5 Claims



1. An arrangement for measuring the pressure in a cylindrical cavity by measuring the expansion of the cylindrical cavity in the circumferential direction by means of a first electrical transducer having a predetermined sensitivity to elongation of the cylindrical cavity in the circumferential direction, the arrangement further comprising a second electrical transducer responsive to elongation of the cylindrical cavity along a longitudinal direction, said second electrical transducer having a sensitivity to said longitudinal elongation which corresponds to the product of the predetermined sensitivity of the first electrical transducer and the reciprocal value of the Poisson ratio, the first electrical transducer and said second electrical transducer being connected in series with one another.

4,420,981

## MANOMETER SWITCHING VALVE

Otmar Schoen, Scheldterberg, Fed. Rep. of Germany, assignor to Flutec Fluidtechnische Geräte GmbH, Fed. Rep. of Germany

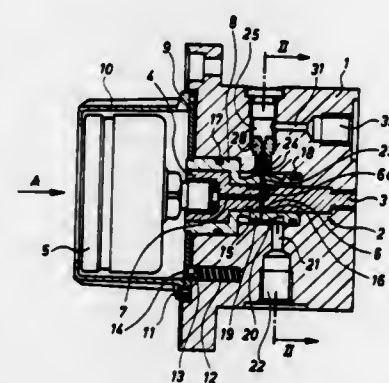
Filed May 11, 1982, Ser. No. 377,076

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119858

Int. Cl.<sup>3</sup> G01L 19/00

U.S. Cl. 73—756

6 Claims



1. A switching valve for selectively interconnecting a manometer and each of a plurality of locations to be measured, comprising

- a manometer having a measuring passage;
- a first valve body mechanically coupled to said manometer;
- a second valve body rotatably coupled to said first body, said second body having
- a radial control bore continuously coupled to said measuring passage of said manometer, and
- a spherical zone through which said control bore opens;

said first valve body having a portion surrounding said spherical zone comprising a plurality of bores extending radially relative to said spherical zone, a packing body in each said bore, each body having a control opening and an annular sealing surface having a greater diameter than the opening of said control bore, means for urging each said sealing surface into contact with said spherical zone, said spherical zone having a space between said sealing surfaces, and means for defining a volume enclosing said spherical zone and for connecting said volume to a reservoir whereby said manometer can be coupled to said reservoir between said packing bodies.

flux to induce a signal in said electrodes which is a function of flow rate.

4,420,983

## MASS FLOW MEASUREMENT DEVICE

Roger M. Langdon, Colchester, England, assignor to The Marconi Company Limited, Chelmsford, England

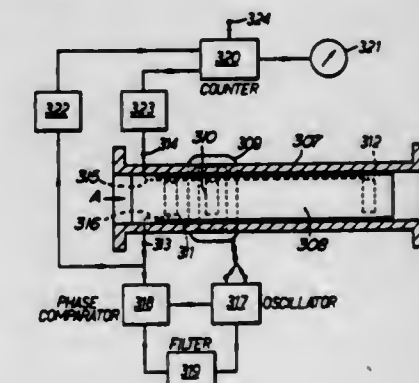
Filed Jul. 27, 1981, Ser. No. 287,293

Claims priority, application United Kingdom, Feb. 28, 1980, 8006685; Jan. 30, 1981, 8102925; Jan. 30, 1981, 8102961; Feb. 16, 1981, 8104794

Int. Cl.<sup>3</sup> G01F 1/78

U.S. Cl. 73—861.18

14 Claims



8. A mass flow measurement device comprising means for generating a traveling flexural wave in the surface of a body, said body being in the form of a thin walled hollow cylinder having an outer cylinder surface, said cylinder being rigidly supported at at least one end, with the flexural wave being arranged to travel circumferentially around the outer surface of the cylinder, and said cylinder being mounted longitudinally within a duct; means for causing fluid to flow along said duct and over at least part of the outer surface of said cylinder; deflector means provided within said duct for imparting to the fluid a component of motion which is directed around the surface of the cylinder; and means for detecting the effect of the fluid on the wave velocity of the flexural wave, wherein the frequency of the traveling flexural wave is controlled to maintain said cylinder in resonance.

11. A mass flow measurement device comprising means for generating a travelling flexural wave in the surface of a body, said body being in the form of a thin vane rigidly clamped at one of its ends to the internal surface of a hollow tube and extending along the direction of the axis of the tube; means for causing fluid to flow over said surface, with the fluid being constrained to flow, in operation, through said tube; and means for detecting the effect of the fluid on the wave velocity of the flexural wave, wherein the frequency of the traveling flexural wave is controlled to maintain said vane in resonance.

4,420,984

## STRING-TYPE MEASUREMENT CELL

Hans R. Zulliger, Feldmeilen, Switzerland, assignor to Mettler Instrumente A.G., Greifensee, Switzerland

Filed Dec. 9, 1981, Ser. No. 310,978

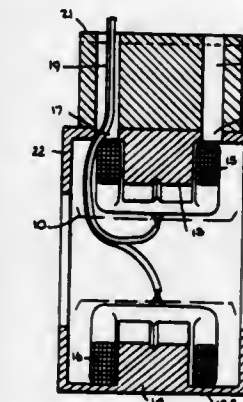
Claims priority, application Switzerland, Dec. 16, 1980, 9254/80

Int. Cl.<sup>3</sup> G01L 1/10

U.S. Cl. 73—862.59

10 Claims

1. A measuring cell adapted for use in a string-type instru-



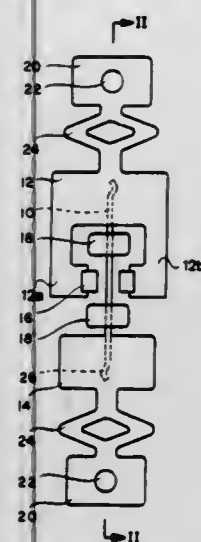
1. A flangeless electromagnetic flowmeter unit interposable between the end flanges of the upstream and downstream pipes of a line conducting a fluid whose flow rate is to be metered, the end flanges of the pipes having a predetermined diameter and a circle of bolt holes, said unit comprising:

- A. a cylindrical metal housing having an external diameter which is smaller than that of the circle whereby when the unit is interposed between the end flanges of the pipes, the housing lies within the circle and the flanges are bridged by bolts passing through the holes to encage the unit and subject it to a compressive force effecting a fluid seal;
- B. a non-magnetic spool coaxially disposed within said housing and provided with end flanges which are seated against the ends of the upstream and downstream pipes and define with said housing an internal cavity, said spool forming a fluid conduit having a longitudinal flow axis which joins the upstream and downstream pipes, said spool having a strength sufficient to withstand the pressure of fluid flowing in the conduit and said compressive force;
- C. a pair of electromagnet coils disposed at diametrically-opposed sides of said spool to create a magnetic field whose lines of flux extend across the conduit, said coils lying on a coil axis which is normal to said flow axis; and
- D. a pair of electrodes mounted on said spool at diametrically-opposed positions along an electrode axis perpendicular both to the coil axis and to the flow axis whereby the fluid which flows through the conduit intersects said lines of



ment for measuring force, pressure, distance or the like, comprising

(a) a metallic measuring string (10); and



(b) a plurality of cast nodal masses (18) each of which is cast in secured relation to said string at nodal points spaced from the ends of said string, respectively.

4,420,985

# FORCE MEASUREMENT DEVICE

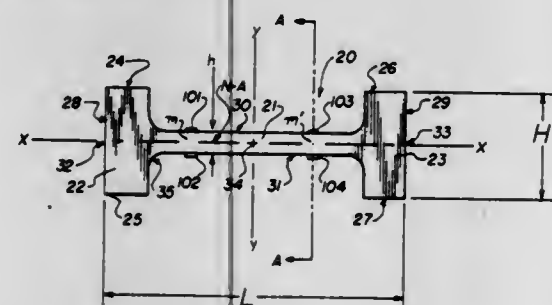
Seymour H. Raskin, 7333 Rustic Valley Dr., Dallas, Tex. 75248

Division of Ser. No. 37,133, May 8, 1979, abandoned. This application Oct. 31, 1980, Ser. No. 202,460

Int. Cl.<sup>3</sup> G01L 1/22

U.S. Cl. 73—862.66

6 Claims



1. A force measurement device wherein a tension strain gage and compression strain gage are secured to a beam, and tension and compression strain gages being connected in a Wheatstone bridge circuit, the improvement comprising: rigid flange portions on each end of the beam, said flange portions extending symmetrically from the neutral axis in a direction perpendicular to the neutral axis of the beam; and means symmetrically supporting the beam through the rigid flange portions about the neutral axis on one end of the beam from locations symmetrically spaced from the neutral axis of the beam a distance greater than the distance the strain gages are spaced from the neutral axis such that when force is applied to the other rigid flange portion an output signal from the Wheatstone bridge circuit is related to the magnitude of force applied to the rigid flange portion.

## 4,420,986 SLIDING SHOE FOR A ROTATABLE SWASH-PLATE TYPE REFRIGERANT GAS COMPRESSOR

Shozo Nakayama; Kimio Kato, both of Kariya; Tusneo Sugiura, Hekinan; Yoshio Kato, Toyota; Mikio Shugiura, Okazaki, and Keiichi Otu, Toyota, all of Japan, assignors to K. K. Toyoda Jidoshokki Selsakusho and Taihou Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 953,917, Oct. 23, 1978, abandoned.

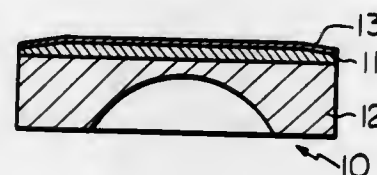
This application Feb. 4, 1981, Ser. No. 231,461

Claims priority, application Japan, Nov. 1, 1977, 52-130979; Nov. 1, 1977, 52-146487[U]; Nov. 1, 1977, 52-146488[U]

Int. Cl.<sup>3</sup> F16H 23/00

U.S. Cl. 74—60

10 Claims



1. In a sliding shoe for a rotatable swash-plate type refrigerant gas compressor, in which said shoe is slidably connected between a swash-plate secured to a rotatable shaft at a predetermined inclined angle thereto and a ball rotatably engaged with a piston which effects compression of refrigerant gas by means of rotation to the swash-plate, the improvement wherein said shoe has a configuration substantially in the form of a circular disc having a swash-plate engaging surface with a major portion of said surface including a sliding plane for slidably engaging the sliding surface of the swash-plate, said shoe having a lubrication-enhancing surface slightly inclined with respect to the sliding plane within a predetermined distance from the outer periphery of the shoe, so that the cross section of the shoe, through a plane including the axis thereof, is chamfered in a substantially triangular shape having a predetermined angle between the lubrication-enhancing surface and the sliding plane, in such a way that the height H, the width L and the angle  $\alpha$  of the chamfered portion are more than  $5\mu$ , from 0.5 to 2 mm and less than  $10^\circ$ , respectively.

2. In a sliding shoe for a rotatable swash-plate type refrigerant gas compressor, in which said shoe is slidably connected between a swash-plate secured to a rotatable shaft at a predetermined inclined angle thereto and a ball rotatably engaged with a piston which effects compression of refrigerant gas by means of rotation of the swash-plate, the improvement wherein said shoe has a configuration substantially in the form of a circular disc having a swash-plate engaging surface with a major portion of said surface including a sliding plane for slidably engaging the sliding surface of the swash-plate, the outer periphery of the sliding plane of the shoe facing the swash-plate is chamfered and at least said sliding plane of the shoe is coated with a lead alloy, in such a way that the height H, the width L and the angle  $\alpha$  of the chamfered portion are more than  $5\mu$ , from 0.5 to 2 mm and less than  $10^\circ$ , respectively, and the thickness of the lead alloy coating is 3 to  $15\mu$ .

4,420,987

## RECIRCULATING BALL DISC ACTUATOR

Theodore A. Heinz, Simi Valley, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 17, 1981, Ser. No. 244,530

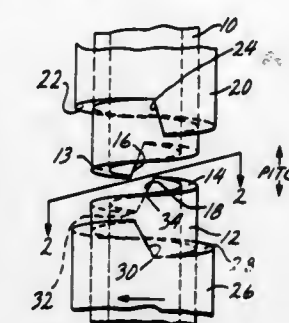
Int. Cl.<sup>3</sup> F16H 25/18, 25/22

U.S. Cl. 74—99 A

12 Claims

1. A linear actuator for moving a load along an axis comprising first and second thrust members journaled for relative rotation about said axis and movable relative to each other along said axis, the thrust members having opposing surfaces substantially transverse to said axis, each of said surfaces having at least one pair of concentric grooves forming circular ball-races coaxial with said axes, each race lying directly oppo-

site a mating race on the opposing surface, a plurality of balls positioned between the opposing surfaces and spaced around the circumferences of the pairs of mating races, at least some of the balls engaging mating races on the opposing surfaces when the thrust members are urged toward each other along said



axis, the bottom of the grooves forming the mating races being formed as an axially extending helix around substantially their full circumference with the ends of the helix being joined by a step, and means for rotating one thrust member relative to the other thrust member.

4,420,988

## MECHANICAL CONTROL ARRANGEMENT BY A CABLE WHICH IS SLIDEABLE AXIALLY IN A FLEXIBLE SHEATH

Jean Deligny, Epinay sur Seine, France, assignor to Societe Anonyme D.B.A., Paris, France

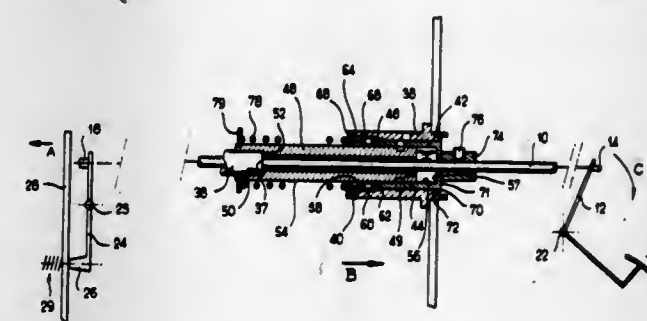
Filed Nov. 28, 1980, Ser. No. 211,008

Claims priority, application France, Dec. 7, 1979, 79 30097

Int. Cl.<sup>3</sup> F16C 1/22

U.S. Cl. 74—501.5 R

10 Claims



1. A mechanical actuating mechanism including a cable axially slidable in a flexible sheath, said cable having one end connected to a receiving member to be actuated and its other end connected to an actuating member, said flexible sheath having one end adjacent said one end of said cable anchored to a fixed support structure and its other end adjacent said other end of said cable axially slidably received in a stationary tubular support member, from which extend said one end of said cable, spring biased releasable blocking means interposed between said other end of said sheath and said stationary support member for momentarily blocking axial movement of said other end of said sheath with respect to said stationary support member upon actuation of said cable, and control means coupled adjacent to said other end of said cable for releasing said blocking means against the biasing force of said spring when said cable is not actuated.

4,420,989

## ADJUSTABLE SHOCK ABSORBING HANDLEBAR STRUCTURE

Louis J. Finkle, 3300 E. 59th St., Long Beach, Calif. 90805

Filed Jul. 6, 1981, Ser. No. 280,281

Int. Cl.<sup>3</sup> B62K 21/14

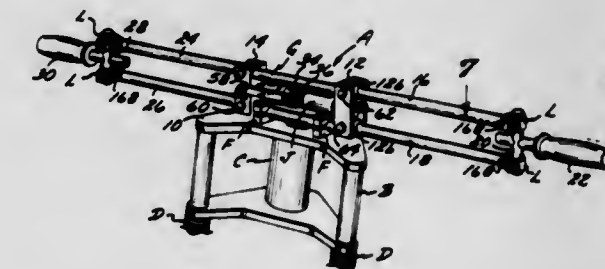
U.S. Cl. 74—551.2

5 Claims

1. In combination with a motorcycle that has a frame that pivotally supports a forked forward front wheel supporting

structure having an upper extremity, an adjustable shock absorbing handlebar structure that includes:

- a rigid plate secured to said upper extremity;
- a rigid frame secured to said plate and extending upwardly therefrom, said frame including first and second end pieces and an upper cross piece;
- first upper and lower cross bars pivotally connected to said first end piece and second upper and lower cross bars pivotally connected to said second end piece, said cross bars having outer ends, said first and second cross bars extending from said frame in opposite directions;
- first and second supports pivotally connected to said outer ends of said first upper and lower cross bars and said outer ends of said second upper and lower cross bars;
- first and second grips extending outwardly in opposite directions from said first and second supports;
- a rod that extends between said first and second end pieces;
- first and second tubular resilient pads mounted in longitudinally spaced relationship on said rod, each of said pads



having first and second end surfaces, and said first end surfaces adjacently disposed;

- rigid first means slidably mounted on said rod and in abutting contact with said first end surfaces;
- first and second linkage means pivotally connected to said rigid means and to said first upper cross bar and to said lower cross bar, and said first and second resilient pads, said rigid means, and said first and second linkage means cooperating to maintain said first upper and lower cross bars and second upper and lower cross bars at a first position relative to said frame; and
- second and third means mounted on said rod and in abutting contact with said second end surfaces, with at least said second means being in abutting contact with said second end surface of said second resilient pad, with said second means when moved longitudinally relative to said rod varying the degree of compression on said first and second resilient pads and the degree of shock that will be transmitted from said motorcycle to said grips.

4,420,990

## TRANSMISSION FILLER

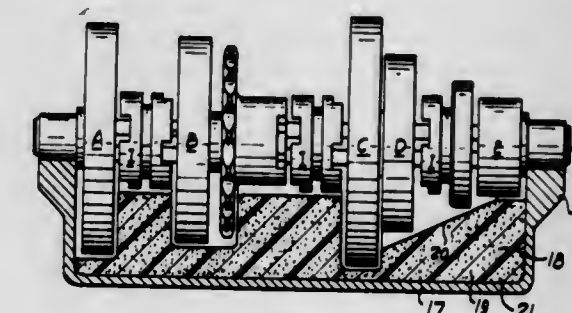
Hans Hauser, Chippewa Lake, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Oct. 2, 1981, Ser. No. 307,810

Int. Cl.<sup>3</sup> F16H 57/02, 57/04

U.S. Cl. 74—606 R

15 Claims



2. A filler for a transmission having a lower half of a housing and at least one pair of intermeshing gears spaced from the



housing, the housing being adapted to contain lubricant for lubricating said gears, the gears having lower portions with contours, said filler comprising a body in fixed form of a material having low lubricating quality relative to said lubricant, said body being positioned between the housing and the gears, said body having a top surface and a bottom surface, said top surface of said body having cavities formed to contain the lower portions of the gears, said cavities generally following the contours of the lower portions of the gears a spaced distance therefrom to clear the gears and said bottom surface of said body engaging the lower half of the housing, said body occupying a major portion of the open space between the lower portions of the gears and the lower half of the housing and thus reducing the amount of lubricant necessary to lubricate the gears.

4,420,991

## DRIVE SYSTEM FOR TRACK-LAYING VEHICLE

Michael Meyerle, Meckenbeuren, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

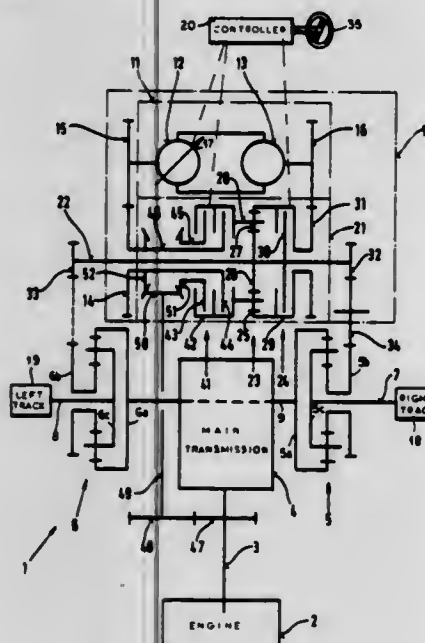
Filed Mar. 26, 1981, Ser. No. 247,855

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012220

Int. Cl.<sup>3</sup> F16H 37/06

U.S. Cl. 74—682

10 Claims



1. A drive system for a track-laying vehicle, said system comprising:

- a main drive shaft connectable to an engine;
- right and left summing transmissions having primary inputs operatively connected to said shaft, secondary inputs, and outputs connected respectively to right and left tracks;
- a compensating shaft;
- means operatively connecting said compensating shaft to said secondary inputs of said summing transmissions for rotation of one of said secondary inputs in one direction and rotation of the other secondary input in the opposite direction on rotation of said compensating shaft in one direction and vice versa;
- a planetary-gear transmission having a pair of separate inputs and an output connected to said compensating shaft;
- a hydraulic machine operatively connected to and driven by said main drive shaft;
- another hydraulic machine connected to and drivable by the first-mentioned machine and having an output connected to one of said inputs of said planetary-gear transmission, one of said machines having a control element and being of variable volume and the other machine being of constant volume, whereby said machines form a variable-ratio hydrostatic transmission;
- a first clutch having one side connected to said output of said other hydraulic machine and to said one input of said

planetary-gear transmission and another side connected to said compensating shaft; and  
a second clutch having one side connected to the other input of said planetary-gear transmission and another side operatively connected to said main drive shaft.

4,420,992

## PLANETARY TRANSMISSION

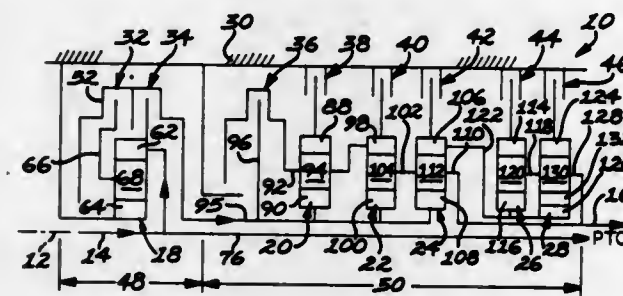
Willis E. Windish, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 7, 1981, Ser. No. 288,953

Int. Cl.<sup>3</sup> F16H 3/44, 57/10, 37/00

U.S. Cl. 74—781 R

18 Claims



1. A planetary transmission (10) comprising:

- a front section (48) having a rotating housing (52) and a planetary gear set (18) including a ring gear (62), a sun gear (64) and a planet carrier (66), the ring gear (62) serving as the input and the rotating housing (52) serving as the output;
- holding means (69) for holding the sun gear (64) stationary;
- first clutch means (32) for selectively connecting the planet carrier (66) to the rotating housing (52) and providing underdrive; and
- second clutch means (34) for selectively connecting the ring gear (62) to the rotating housing (52) and providing direct drive.

4,420,993

## SHIFT INHIBITOR ASSEMBLY

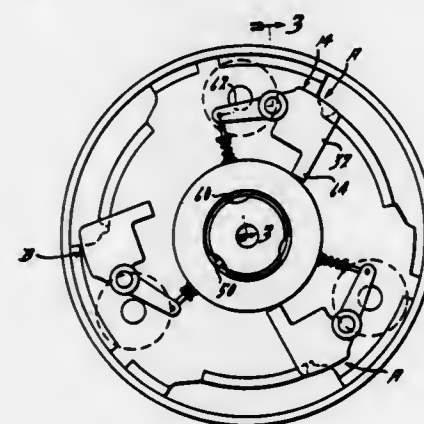
Stewart J. Woodcock, Fayetteville, N.Y., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 29, 1981, Ser. No. 278,805

Int. Cl.<sup>3</sup> F16H 57/06; F16D 13/60

U.S. Cl. 74—785

1 Claim



1. In a power transmission having a housing, an input shaft, an output shaft, and a planetary gear assembly disposed operatively therebetween, the planetary gear assembly including a sun gear in driven relationship with the input shaft, and a sub-assembly, said sub-assembly having a carrier, a ring gear, and planet gear means in meshing relationship with the sun and ring gears, said sub-assembly being shiftable relative to said sun gear along said output shaft for effecting gear ratio changes,

the improvement comprising shift inhibitor means operatively associated with said gear assembly for preventing axial movement of said gear sub-assembly when said output shaft is rotating at a speed above a predetermined speed; said shift inhibitor means including a plurality of speed responsive flyweight actuator members mounted for rotation with said carrier; means defining a plurality of axially spaced sets of axially aligned pockets in the outer periphery of said output shaft; means defining an axially extending hub portion of said carrier having a plurality of radially extending bores formed therethrough; each said actuator members pivotally mounted on said carrier for reciprocal movement with respect thereto at a position spaced radially outwardly from said hub portion; and a plurality of radially extending actuating rod members, each rod member pivotally connected to one of an associated actuator members for movement therewith in response to centrifugal force exerted on its actuator member, each said rod member including a cylindrical plug portion insertable through an associated one of the carrier member bores to engage a pocket when the speed of said output shaft exceeds said predetermined speed, a plurality of biasing helical compression springs, each said spring oriented on the radial axis of its associated rod member, each said spring engaged between a portion of its associated rod member and said hub portion for continuously biasing said actuator member radially outwardly, thereby insuring disengagement of said plug portions from said pockets at speeds below said predetermined speed.

4,420,994

## HYDRAULIC REGULATING DEVICE FOR LOAD OPERATED GEAR SHIFT SYSTEMS

Alfred Müller, Leonberg, and Joseph Sauer, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

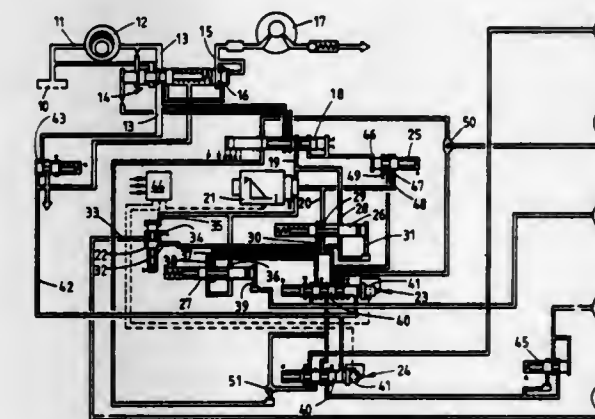
Filed Oct. 23, 1980, Ser. No. 199,918

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1979, 2947897

Int. Cl.<sup>3</sup> B60K 41/04

U.S. Cl. 74—867

14 Claims



1. A hydraulic regulating device for a load operated gear shift system, particularly for an automatic transmission in motor vehicles including a plurality of hydraulic coupling elements, a source of pressure fluid, a return conduit, a high pressure conduit connected to the source, a manually operable hydraulic selector valve for preselecting a gear stage, a working pressure conduit connected via the selector valve to the high pressure conduit, and a plurality of shift control valves assigned to respective coupling elements, the device comprising a single pressure regulating valve having an input and an output; said working pressure conduit being connected to the input of said pressure regulating valve; a shift pressure conduit connected to the output of the pressure regulating valve; a plurality of holding valves connected between said working pressure conduit and said shift pressure conduit; said shift control valves being connected to said shift pressure conduit and cooperating with said holding valves to connect, in response to an increased gear speed in the preselected gear stage

the coupling elements pertaining to a higher gear in the preselected gear stage to said shift pressure conduit and after the gear shift operation is completed, to connect via said working pressure conduit the latter coupling elements with the exception of the last connected coupling element, to said high pressure conduit while the last connected coupling element remains connected to said shift pressure conduit.

4,420,995

## QUICK-RELEASE AND POSITIVE LOCKING MECHANISM FOR USE ON SOCKET WRENCHES AND ON POWER AND IMPACT TOOLS

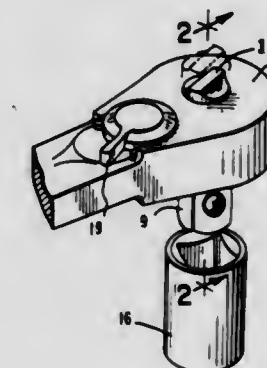
Peter M. Roberts, P.O. Box 15762, Red Bank, Tenn. 37415

Filed Jun. 5, 1981, Ser. No. 270,733

Int. Cl.<sup>3</sup> B25B 13/46

U.S. Cl. 81—60

13 Claims



1. In a tool for receiving a removable tool attachment, a handle, a head mounted thereon, a drive stud secured to the head of the tool for receiving said removable tool attachment, said drive stud having a longitudinal passage for receiving an elongate slidable and rotatable pin, said drive stud further having an aperture for receiving a ball detent, said aperture securing the ball detent to the drive stud, said ball detent being normally in contact with the surface of the pin so that the detent extends outward of the drive stud and engages a recess in said tool attachment to securely hold said tool attachment to the drive stud, said elongate pin having two recesses and a passage between said recesses, a first recess for receiving the ball detent by selective longitudinal alignment of the pin, in which first recess the ball detent retracts thereby releasing the tool attachment, and a second recess for receiving the ball detent by selective rotation of the pin such that during rotation the ball detent travels from the first recess through said passage between the recesses to the second recess, the depth of said second recess being such that the ball detent is maintained in an outward position, and the width of said second recess being such that the tool attachment is securely locked to the drive stud essentially precluding substantial movement of the ball detent.

4,420,996

## SLITTER INDEXING SYSTEM

Robert Greding, Beaconsfield, and Rodney H. Bryce, Lachine, both of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Jan. 19, 1982, Ser. No. 340,731

Claims priority, application Canada, Jan. 23, 1981, 369244

Int. Cl.<sup>3</sup> B26D 1/24, 7/26

U.S. Cl. 83—13

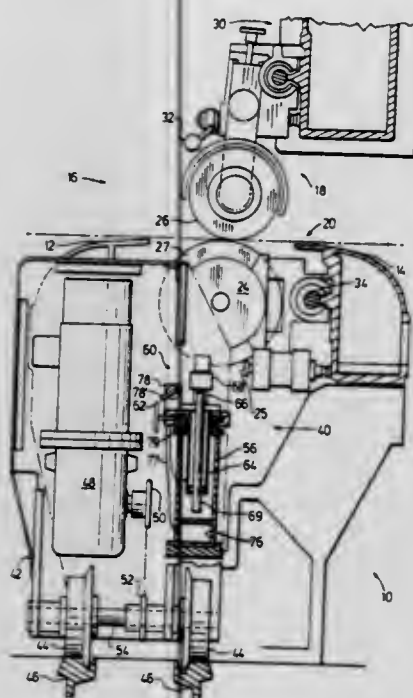
12 Claims

12. The method of operating a slitting machine for slitting an endless wide web, said machine having a plurality of mutually spaced apart slitting means normally inaccessible during operation of the machine when slitting a web, comprising the steps of;

- providing a plurality of individually adjustable slitter indexing means, one for each said slitting means, mounted on traverse means storable within the slitting machine and



withdrawable therefrom during continuing operation of the machine;  
 withdrawing the traverse means to a position providing access to the indexing means;  
 adjusting the respective positions of at least selected ones of



the indexing means along the length of the traverse means relative to a predetermined datum;  
 re-inserting the traverse means within the machine in predetermined spaced related therewith, and resetting the slitting means to the indexing means when the machine is inoperative.

4,420,997

## APPARATUS FOR PORTIONING MEAT

John A. Whitehouse, Norwich, England, assignor to AEW Engineering Co. Limited, Norwich, England

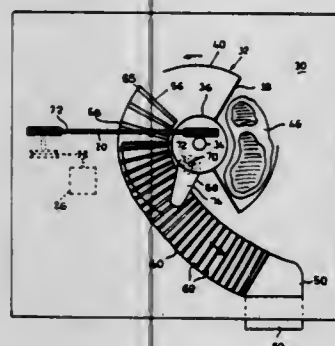
Filed Aug. 31, 1981, Ser. No. 297,747

Claims priority, application United Kingdom, Sep. 4, 1980, 8028634; May 20, 1981, 8115516

Int. Cl.<sup>3</sup> B26D 7/06

U.S. Cl. 83—105

11 Claims



1. Apparatus for portioning meat, comprising a bandsaw having a generally horizontal cutting flight, a meat holder, driving means for moving said meat holder, thereby in use to move the meat to be portioned in a path intersecting the cutting flight at a cutting station, a depth stop below the cutting flight for supporting such meat during its movement through the cutting station, means for moving said depth stop in a path of movement through the cutting station which corresponds to the path of movement of the meat being moved by the meat holder, means for substantially synchronizing said two movements, and separating means at a separating station downstream of the cutting station for separating a cut portion of

meat for transport on the depth stop from a remaining portion of meat retained by the meat holder.

4,420,998

## DIE CUTTER AND DIE-CUTTING PROCESS

Masateru Tokuno, Nishinomiya, and Tetsuya Sawada, Kyoto, both of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

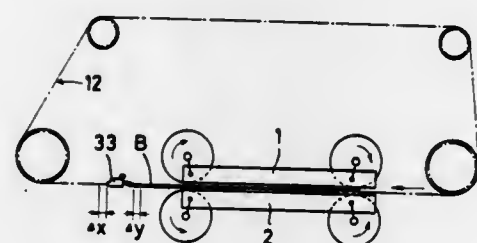
Filed Apr. 26, 1982, Ser. No. 372,240

Claims priority, application Japan, May 29, 1981, 56-84047

Int. Cl.<sup>3</sup> B26D 1/58

U.S. Cl. 83—328

4 Claims



1. A die cutter for die-cutting blanks supplied one after another into a desired shape, said die cutter comprising a cutting means having a blade and an anvil opposed to each other with said blanks supplied to therebetween and link and transmission means for driving said blade and said anvil interlocked with each other in such a manner that they will contact each other at a point moving from one end thereof to the other, said anvil having a surface facing to the blade shaped to be convex; and a blank feed means having a pair of endless conveyors provided one at each side of the die cutter, and a plurality of blank support units transversely mounted on and between said conveyors for feeding said blanks through said cutting means, characterized in that said blanks are supported for a limited amount of movement with respect to said blank feed means so that during the die-cutting said blanks will be fed by their engagement with said blade and said anvil, not by said blank feed means.

4,420,999

## ROTARY PLATE-SHAPE MATERIAL CUTTING ARRANGEMENT

Tadashi Hirakawa, Toshiaki Kusubayashi, and Yukio Oku, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

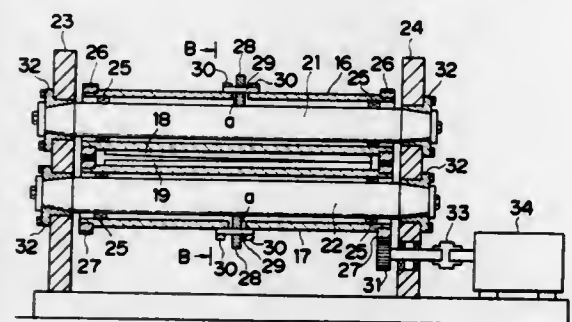
Filed Feb. 18, 1982, Ser. No. 349,970

Claims priority, application Japan, Feb. 23, 1981, 56-24230

Int. Cl.<sup>3</sup> B26D 1/62

U.S. Cl. 83—345

1 Claim



1. A rotary plate-shaped material cutting apparatus which comprises a pair of hollow knife cylinders, each provided with a cutting knife and adapted to rotate in mutually opposite directions, shafts piercing the hollow portion of the knife cylinders and having both ends thereof supported by frames, bearings positioned at both ends of the knife cylinders and interposed between the shafts and knife cylinders and at least one roll provided at each of the knife cylinders, rotatably supported

therein and having its rotary surface kept in contact with the external circumference of the shafts.

4,421,000

## HOLE PUNCHING DEVICE

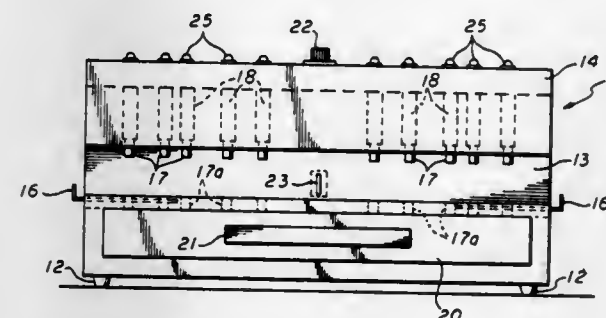
Ina H. Murphy, 5610 Minden, Houston, Tex. 77026

Filed May 15, 1981, Ser. No. 263,932

Int. Cl.<sup>3</sup> B26F 1/04

U.S. Cl. 83—372

2 Claims



1. An improved electrically powered paper hole punching device, comprising:

- a housing, having a front surface, and including a removable tray mounted on a bottom surface thereof;
- a plurality of linearly aligned punches mounted within the housing, said punches spaced in accordance with hole spacing requirements of loose leaf binders;
- a plurality of electrically powered actuator means, each actuator means connected to one punch;
- selection means for simultaneously selecting one or more of the punches for inclusion in an electric circuit;
- guide means mounted on the housing for positioning the paper in relation to the front surface of the housing and the punches;
- a first switch means mounted in the housing for detecting the presence of paper in position with respect to the housing and the punches;
- an electric circuit connecting those punches and actuators selected with the first switch means and the selection means whereby the insertion of paper into the housing will close the first switch means so as to complete the electric circuit and to activate the punches thereby forming holes in the paper;
- actuator means comprised of a solenoid, the shaft of said solenoid being axially aligned with and affixed to said punch; and,
- electrical indicator means for signaling which punches and actuator means have been included in the electric circuit.

4,421,001

## FULL NOTE GENERATOR SYSTEM FOR AN ELECTRONIC ORGAN

Brian N. Wilcox, Kettering, Ohio, and John W. Robinson, Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind. Division of Ser. No. 234,001, Feb. 12, 1981, Pat. No. 4,361,065, which is a continuation of Ser. No. 962,400, Nov. 20, 1978, abandoned. This application Feb. 26, 1981, Ser. No. 238,481

Int. Cl.<sup>3</sup> G10H 1/38, 7/00

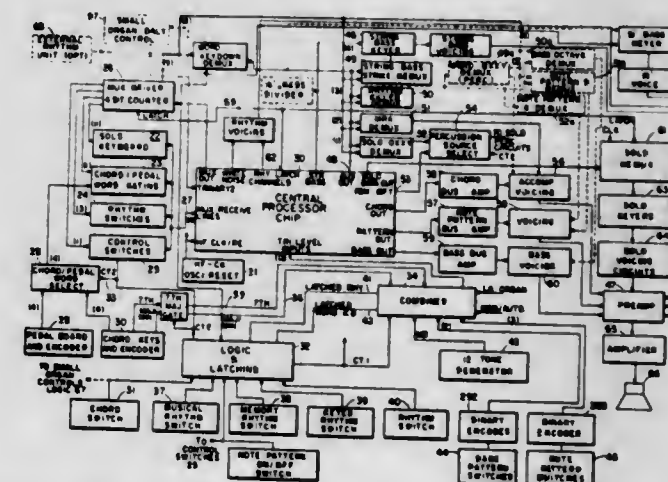
U.S. Cl. 84—1.17

5 Claims

1. In an electronic organ including keyboard means having playing keys for calling forth respective tones and comprising a solo portion and an accompaniment portion, clock means for producing a train of clock pulses, multiplexer means for scanning at least said solo portion of said keyboard means in synchronism with said clock means and generating a data stream on each scan of the keyboard containing keydown signals in respective time slots for each depressed key in the solo manual, and solo chord generating means operable in response to an initiating keydown signal in said data stream and the depression of a key in the accompaniment portion for supplying at

least one keydown signal to said data stream in a fill note time slot different from the time slot pertaining to the respective keydown signal, said fill note time slot corresponding to a key octavely related to a key corresponding to the tone called forth by the depressed accompaniment key, the improvement in said solo chord generating means comprising:

- a multistage first shift register clocked in synchronism with the scanning of said keyboard, said shift register having an output feeding into said data stream and having respective inputs for at least some of its stages,
- a multistage second shift register clocked in synchronism with the scanning of said keyboard means, each of said stages having an output line,



means synchronized with the scanning of said keyboard and responsive to the depression of a key in the accompaniment manual for loading a data bit in said second shift register, and

memory means having a plurality of input lines connected respectively to said second shift register output lines, and a plurality of output lines connected respectively to the stages of said first shift register inputs, said memory means having address points sequentially addressed by said second shift register over said memory input lines and loading a data bit into at least one stage of said first shift register when said initiating keydown signal appears in said data stream.

4,421,002

## ADAPTIVE ACCOMPANIMENT TONE COLOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

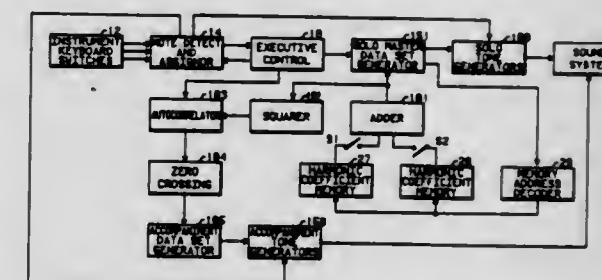
Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jan. 29, 1982, Ser. No. 344,093

Int. Cl.<sup>3</sup> G10H 1/36, 7/00

U.S. Cl. 84—1.17

10 Claims



1. In a keyboard musical instrument having a solo keyboard comprising a solo linear array of keyswitches and having an accompaniment keyboard comprising an accompaniment linear array of keyswitches wherein a number of solo tone generators associated with said solo keyboard produce musical waveshapes from a solo master data set having a plurality of data words defining the waveform of a solo musical tone are computed and transferred sequentially to a digital-to-analog converter to be converted into musical waveshapes and



wherein a number of accompaniment tone generators associated with said accompaniment keyboard produce musical waveshapes from an accompaniment master data set having a plurality of data words defining the waveform of an accompaniment musical tone are computed and transferred sequentially to a digital-to-analog converter to be converted into musical waveshapes, apparatus for generating accompaniment musical tones which complement a selected solo musical tone comprising:

- a coefficient memory for storing a set of solo harmonic coefficient values,
- a harmonic coefficient addressing means for reading out solo harmonic coefficient values from said coefficient memory,
- a first means for computing, responsive to solo harmonic coefficient values read out from said coefficient memory, whereby said selected solo master data set comprising a plurality of data points defining a solo musical tone is computed,
- a solo means for producing said selected solo musical tones from said solo master data set in response to keyswitches actuated in said solo linear array of keyswitches,
- a second means for computing, responsive to said solo harmonic coefficient values read out from said coefficient memory, whereby a set of autocorrelation function data values are computed,
- a third means for computing, responsive to said set of autocorrelation function data values, whereby a set of accompaniment harmonic coefficient values are computed,
- a fourth means for computing, responsive to said set of accompaniment harmonic coefficient values, whereby said accompaniment master data set comprising a plurality of data points defining an accompaniment musical tone is computed, and
- an accompaniment means for producing said accompaniment musical tones in response to keyswitches actuated in said accompaniment linear array of keyswitches, which complement said selected solo musical tones, from said accompaniment master data set.

4,421,003

#### ENVELOPE GENERATOR FOR ELECTRONIC MUSICAL INSTRUMENTS

Tatsunori Kondo, Iwata, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

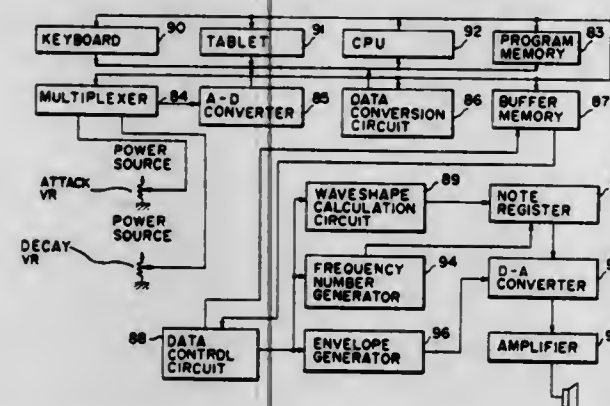
Filed Nov. 23, 1981, Ser. No. 324,848

Claims priority, application Japan, Nov. 25, 1980, 55-165721; Apr. 30, 1981, 56-65710; May 12, 1981, 56-71173; May 30, 1981, 56-83006

Int. Cl.<sup>3</sup> G10H 1/02

U.S. Cl. 84-1.26

15 Claims



1. An envelope generator for electronic musical instruments which generates an envelope of a musical note by a calculation of predetermined timing, comprising:
  - tablet switch means for selecting a tone type,
  - variable resistor means for setting attack and decay rate data;
  - control information generating means for generating control information responsive to either or both of said tablet switch means and said variable resistor means;
  - first memory means for storing speed parameters of the

envelope which are determined corresponding to the speeds of attack, decay and release of the envelope to be generated in response to a key depression;

second memory means for storing a signal for determining which to control of a rise and a fall time of a sound to be produced;

first readout means responsive to said signal from said second memory means and said control information generating means, for reading out a speed parameter from said first memory means; and

calculating means for calculating an envelope waveshape based on the speed parameter readout by said first readout means.

4,421,004

#### METHOD AND A DEVICE FOR CAST-LOADING EXPLOSIVE CHARGES

Stig Hallström, and Lars Hörman, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

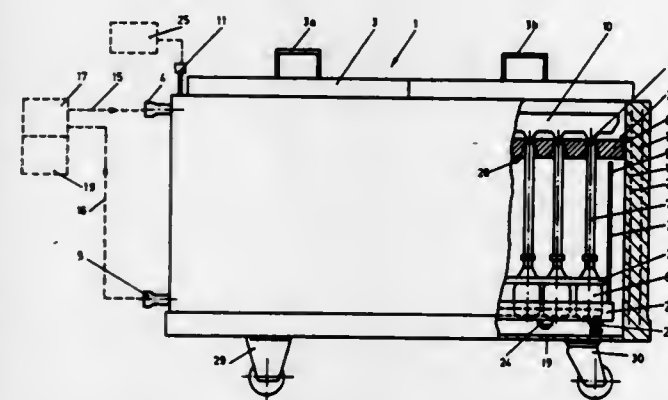
Filed Jan. 15, 1982, Ser. No. 339,589

Claims priority, application Sweden, Jan. 19, 1981, 8100253

Int. Cl.<sup>3</sup> C06D 1/08

U.S. Cl. 86-20 D

9 Claims



1. A method for cast loading an explosive charge composition of the type including liquid and solid sedimentary components comprising:

vertically positioning a plurality of shell bodies within a wheel supported enclosure for receiving said explosive charge composition;

preheating the interior of said enclosure with heating channels within said enclosure to maintain said shell bodies at a pre-established temperature for maintaining said charge composition in a liquid state;

filling said plurality of shell bodies with said charge composition of liquid and solid components while maintaining said shell bodies at said predetermined temperature;

vibrating said filled shell bodies at a predetermined frequency while maintaining said predetermined temperature whereby heavy particles of said explosive charge composition sink to the lower portions of said shell bodies; and

moving said enclosure to a cooling station and thence cooling said shell bodies until said composition assumes a solid state.

4,421,005

#### EXPLOSIVE ACTUATED VALVE

Kenneth G. Byrne, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 28, 1962, Ser. No. 183,706

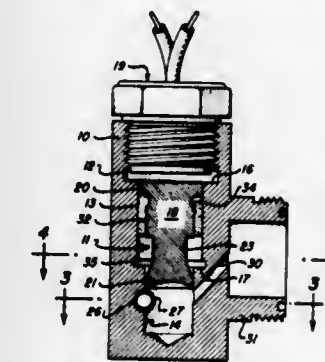
Int. Cl.<sup>3</sup> F16K 17/00

U.S. Cl. 89-1 B

4 Claims

1. A device of the character described comprising the combination of a housing having an elongate bore and including a shoulder extending inwardly into said bore, a single elongate movable plunger disposed in said bore including an outwardly

extending flange adjacent one end thereof overlying said shoulder, normally open conduit means having an inlet and an outlet perpendicularly piercing said housing intermediate said shoulder and said flange and including an intermediate portion intersecting and normally openly communicating with said bore at said shoulder, normally closed conduit means piercing said housing and intersecting said bore at a location spaced from said normally open conduit means, said elongate plunger including a shearing edge adjacent the other end thereof normally disposed intermediate both of said conduit means and overlying a portion of said normally closed conduit means, a



deformable member carried by said plunger intermediate said flange and said shoulder and normally spaced from and overlying the intermediate portion of said normally open conduit means, and means on the housing communicating with the bore to retain an explosive actuator for moving said plunger to force the deformable member against the shoulder and extrude a portion of the deformable member out of said bore into portions of the normally open conduit means for plugging the same and to effect the opening of said normally closed conduit means by the plunger shearing edge substantially concomitantly with the plugging of the normally open conduit means.

4,421,006

#### MANUAL COCKING DEVICE FOR AN AUTOMATIC FIRING WEAPON

Willi Kocher, Zurich, and Jakob Zimmermann, Pfäffikon, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

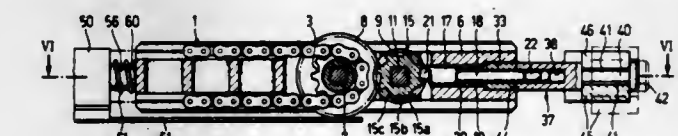
Filed Nov. 30, 1981, Ser. No. 325,906

Claims priority, application Switzerland, Dec. 18, 1980, 9341/80

Int. Cl.<sup>3</sup> F41D 11/00; F41F 19/16

U.S. Cl. 89-1 K

5 Claims



1. A manual cocking device for an automatic firing weapon, comprising:

a movable entrainment element for retracting a weapon breechblock against the force of a forward advancing means thereof;

a cocking chain for displacing said movable entrainment element;

a sprocket wheel engaging with said cocking chain;

a drive shaft operatively connected to said sprocket wheel; said drive shaft being capable of actuation by a removable handcrank which drives said drive shaft;

a locking wheel mounted upon said drive shaft;

a spring-loaded locking bolt operatively associated with said locking wheel for blocking the same in one predetermined direction of rotation;

a safety bolt for axially securing said handcrank to said drive shaft; and  
common holder means for disengaging said locking bolt and said safety bolt from said locking wheel and said handcrank, respectively.

4,421,007

#### AIR BOMB SYSTEM

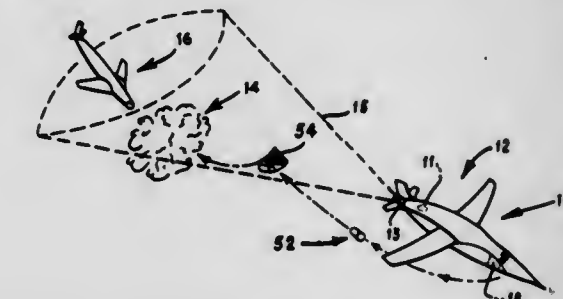
Norris H. Hanes, Jr., 192 White Birch Dr., Pease AFB, N.H. 03801

Filed Dec. 10, 1981, Ser. No. 329,445

Int. Cl.<sup>3</sup> F41F 5/02; B64D 1/04

U.S. Cl. 89-1 A

8 Claims



1. An air bomb system for an aircraft for the defense of said aircraft from a rearward attacking aircraft comprising:
  - means within said defending aircraft for determining dynamic motion variables of said attacking aircraft;
  - means within said defending aircraft for computing a time-delay detonation period and a time for dispensing bombs from said defending aircraft based upon the dynamic motion variables of said dynamic motion variable determining means, and for providing signals in accordance therewith; and
  - means located on said defending aircraft for dispensing bombs from said defending aircraft in response to said signals from said computing means whereby dispensed bombs explode in the path of or vicinity of said attacking aircraft.

4,421,008

#### TIMED ROUND STOP FOR A SPROCKET FED WEAPON

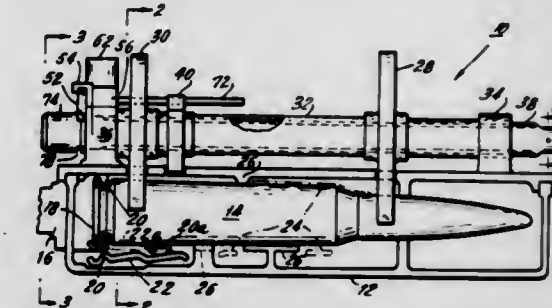
George E. Kontis, South Burlington, and Sherwood P. Evans, Burlington, both of Vt., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 27, 1981, Ser. No. 296,738

Int. Cl.<sup>3</sup> F41D 10/06

U.S. Cl. 89-33 CA

9 Claims



1. A timed round stop for a sprocket fed weapon, said round stop comprising:
  - feed means for sequentially feeding rounds along a feed path to a feed transfer position in a weapon for chambering of the rounds for firing;
  - pivoting round stop means having a first round stop position in which it blocks said feed path and a second round stop position in which it is remote from said feed path to allow movement of rounds therealong to said feed transfer position; and said round stop means having a first condition in



which it is held in said first round stop position for preventing movement of a round past it along said feed path to said feed transfer position, and said round stop means having a second condition in which it is freely pivotable between said first and second round stop positions; control means for placing said round stop means alternately in said first condition and in said second condition with a predetermined timing; a control surface and wherein said control means comprises ratchet means having tooth means adapted to engage said control surface to place said round stop means in said first condition; and feed sprocket means having a number of teeth equal to the number of said tooth means of said ratchet means; wherein said feed sprocket means and said ratchet means are mounted for rotation at the same rate about the same axis.

4,421,009

## REPEATING FIREARM

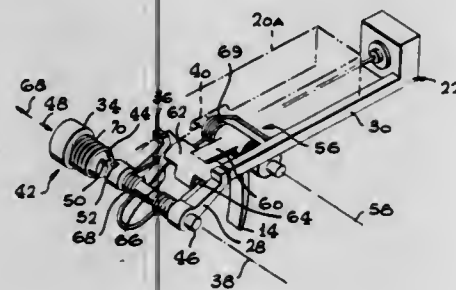
Thomas P. Castellano, 2738 Westwood Blvd., Los Angeles, Calif. 90064, and Nathan Mandel, 20283 Lorenzana Ave., Woodland Hills, Calif. 91364

Filed Oct. 15, 1982, Ser. No. 434,564

Int. Cl.<sup>3</sup> F41D 11/02

U.S. Cl. 89—140

10 Claims



1. A repeating firearm, comprising:  
a gun frame with front and rear ends;  
a gun barrel mounted on said frame;  
a bolt moveable in predetermined longitudinal directions in said frame, including a forward longitudinal direction to chamber a cartridge at the rear of the barrel, and a rearward direction;  
a firing pin device moveable forwardly in said frame to fire a chambered cartridge, and moveable rearwardly;  
a trigger assembly mounted on said frame, including a trigger moveable by a person and a sear mechanism coupled to said trigger to control release of said firing pin device; and  
auto control means for controlling operation of said sear mechanism selectively in full automatic and semiautomatic modes;  
said auto control means including a manually moveable auto control member which is accessible from outside said frame, a spring coupled to said member and urging said member toward a predetermined semiautomatic operating position while allowing it to be moved to a predetermined full automatic position, and coupling means for coupling said control member to said sear mechanism for repeatedly releasing said firing pin device for full automatic operation as long as the trigger is depressed when said control member is in said full automatic position, and for only singularly releasing said firing pin each time said trigger is depressed to operate in the semiautomatic mode when said control member is in said semiautomatic mode; said auto control member being depressible to said full automatic position by the hand of a person operating the firearm and being extended by said spring to said semiautomatic position when not depressed, whereby the operator has to remember only to apply depressing forces to switch to the full automatic mode operation in the confusion of battle.

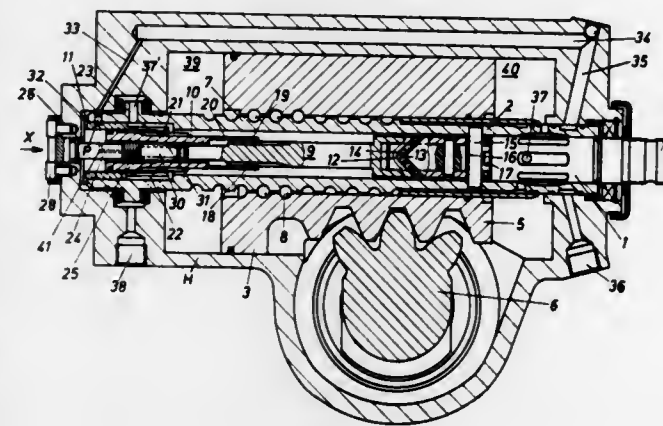
4,421,010  
STEERING GEAR FOR MOTOR VEHICLES  
Dieter Elser, Essingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, A.G., Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,456  
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028175

Int. Cl.<sup>3</sup> F15B 9/10

U.S. Cl. 91—375 R

18 Claims



1. In a booster steering system including a housing H, a double acting servomotor in said housing and a flow control valve in said housing having relatively rotatable valve members (1 and 2) with coaxing passages for operating said servomotor, a neutral return mechanism comprising relatively rotative cam members (12, 13), one of the cam members (13) being secured to one of said valve members (1), neutral return biasing means (9) secured to the other of the cam members (12) for biasing said cam members to center said valve members in a neutral position, wherein relative rotation between said cam members stores energy for return of said valve members to the neutral position in response to relative rotation between said valve members causing relative rotation of said cam members; the improvement residing in said neutral return mechanism including:  
an outer coupling sleeve (11) secured to said other of the valve members (2);  
an inner coupling sleeve (10) within said outer sleeve;  
a threaded connection (25) between said inner coupling sleeve and said housing and a linear sliding keyed connection (18) between said inner coupling sleeve and said biasing means (9) whereby rotation of said inner coupling sleeve effects axial movement thereof on said threaded connection;  
interacting cam means (21) carried by said coupling sleeves for rotation of said outer coupling sleeve by said other of the valve members to effect rotation of said inner sleeve with said biasing means in response to said axial movement in a rotative direction opposite to the direction of rotation of said one of the valve members to increase the relatively rotated position of said cam members (12, 13) and increase return bias beyond that needed for return of said valve members to the neutral position so that, upon release of steering force on said one of the valve members, said valve members overtravel beyond the neutral position to reversely pressurize said servomotor to return the wheels of a vehicle to straight ahead position.

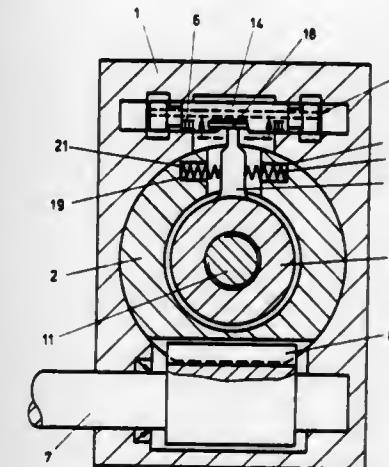
4,421,011  
POWER STEERING SYSTEM FOR MOTOR VEHICLES  
Dieter Elser, Essingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, A.G., Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,325  
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035407

Int. Cl.<sup>3</sup> F15B 9/10

U.S. Cl. 91—380

11 Claims



1. In a power steering system comprising within a housing, a servomotor having a piston (2) with a worm shaft (11) rotative by a steering wheel extending thereto and a steering nut (8) rotative on said worm shaft within said piston and having axial movement therewith including a flow control valve (14) for pressure and exhaust flow control of said servomotor and actuatable in a selected direction by actuating means (16) (160) engaged with said control valve and carried by and rotative with said steering nut;

further including valve return means (18, 19, 22) for return of said flow control valve to a neutral position connected to be stressed upon initial rotation of said steering nut by steering rotation of said worm shaft in actuating said valve and being operative to effect return of said steering nut to a centered position upon release of steering force on said steering wheel whereat said valve is in a neutral position; the improvement wherein:

said actuating means comprises elements (16-16', 17) (23, 24) operatively connected to said steering nut and to said flow control valve and coaxing responsive to axial movement of said steering nut by said servomotor piston to actuate said flow control valve in a direction to reverse the pressurizing of said servomotor by actuating said flow control valve in a direction opposite to the selected direction to straighten the wheels of a vehicle after a turn upon release of the steering wheel and said actuating means being operatively connected to said valve return means for return to neutral position.

4,421,012

## CONTROL CIRCUIT THROTTLING VALVE

Norbert Mucheyer, Rechtenbach, and Heinz Schulte, Marktheldenfeld, both of Fed. Rep. of Germany, assignors to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Feb. 13, 1981, Ser. No. 234,433

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005755

Int. Cl.<sup>3</sup> F15B 13/16

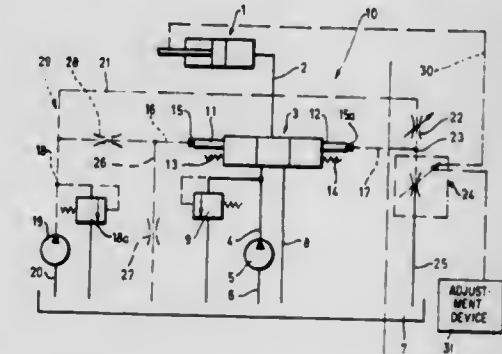
U.S. Cl. 91—388

8 Claims

1. A control circuit throttling valve defining a valve throttling section provided as a controlled dimension received in a hydraulic circuit for the control of a final control element, wherein said valve is adjustable and performs a receiver function under control of a mechanical coupling coupled to a

moving part of the final control element which changes the valve throttling section, comprising:  
a casing having a control connection and a discharge connection; and

a single movable throttling body received in a sealed manner provided in said casing and capable of linear movement and rotational movement within said casing, said body having a control surface formed a sealed throttling space between the throttling body and the inner surface of the casing located relative to said control and discharge con-



nections such that rotational movement and linear movement of said body independently control the opening degree of communication between said control and discharge connections;  
wherein the receiver function is effected by selecting one of said rotational and linear movements and implementing the selected of said movements of said body, and an adjusting function is implemented by selecting the other of said rotational and linear movements and implementing the other movement of said body.

4,421,013

## AERATION FAN MOUNTING SYSTEM

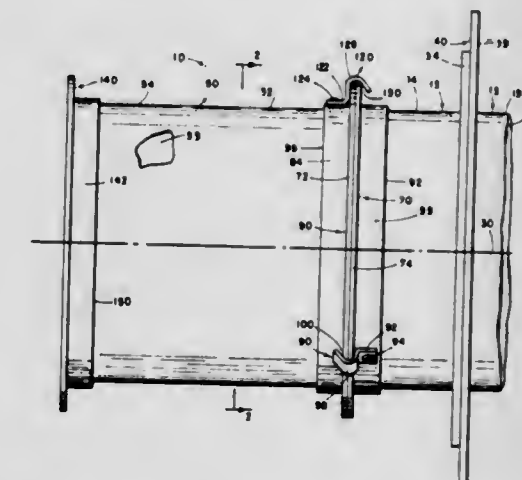
James L. Hansen, P.O. Box 233, Crofton, Nebr. 68730

Filed Apr. 7, 1980, Ser. No. 138,146

Int. Cl.<sup>3</sup> F16L 37/26; E04H 7/22

U.S. Cl. 98—55

1 Claim



1. An aeration fan mounting system comprising a grain storage building, a wall adapter mounted on said building, a fan housing adapted to have a fan of a size suitable for grain aeration mounted therein, said adapter and fan housing having aligned cylindrical interior and exterior surfaces having a same horizontal axis, said wall adapter and said fan housing being arranged end-to-end adjacent each other, said wall adapter and said fan housing having on the cylindrical interior surfaces thereof wall adapter-mounted and fan housing-mounted insertion rings thereon and protruding outwardly therefrom substantially radially of said axis and means retaining said wall adapter insertion ring and said fan housing mounted insertion ring on said wall adapter and fan housing, respectively, wall



adapter-mounted support bracket means providing upwardly opening support recess means receiving said fan-mounted insertion ring and disposed on opposite sides of said horizontal axis as seen in top plan view at first and second horizontally spaced support points and means securing said support bracket means to said wall adapter mounted insertion ring, a holding bracket means providing a downwardly opening holding recess means disposed above said upwardly opening support recess means and removably receiving said fan-mounted insertion ring whereby as said fan housing is lifted with respect to said wall adapter said fan housing-mounted bracket means is removed from the upper side of said adapter-mounted insertion ring, said support recess means of each of said bracket means being progressively narrower towards its radially outermost portion so as to guide said insertion rings toward each other whereby said fan housing is guided toward said adapter and whereby accuracy of initial placement of said rings in said recesses is not as critical and yet said rings are drawn into a close fit and in axial alignment with each other.

4,421,014

## BEVERAGE PREPARATION ASSEMBLY

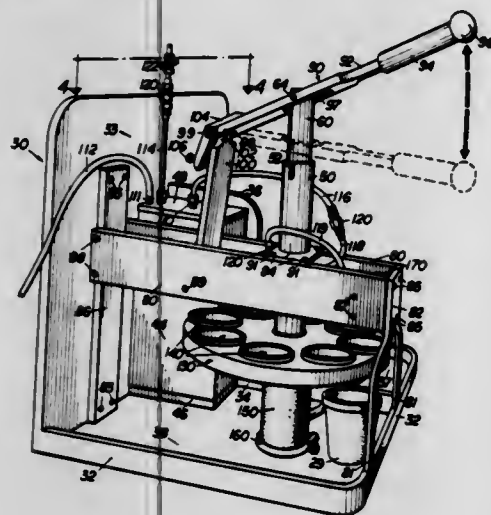
Wayne Vicker, 2480 SW. 57th Ter., Hollywood, Fla. 33023

Filed Jan. 5, 1983, Ser. No. 441,085

Int. Cl.<sup>3</sup> A47J 31/00

U.S. Cl. 99—289 P

17 Claims



1. A beverage preparation assembly of the type primarily designed to individually produce beverage servings of predetermined quantity, said assembly comprising:

base means disposed in supporting relation to a remaining portion of said assembly, liquid storage means disposed for liquid delivery to other portions of said assembly, liquid dispersement means disposed in fluid communication with said liquid storage means, liquid driving means mounted on said base means in fluid communication between said liquid storage means and said liquid dispersement means and structured to force a predetermined quantity of liquid from said liquid storage means to said liquid dispersion means, filter means structured for holding beverage ingredients therein and disposed for liquid delivery to a predetermined position container wherein such filter means comprises a support plate and a plurality of filter receptacles mounted thereon in spaced apart relation to one another substantially about the periphery thereof, said support plate movably mounted on said base means and positionable rotatably for alignment of successive filter receptacles with said liquid dispersion means and further positionable axially along the rotational axis of said support plate into sealing engagement between an aligned filter receptacle and said liquid dispersion means, whereby an individual quantity of beverage is formed by filtering separate liquid quantities through beverage ingredients maintained in separate filter receptacles.

4,421,015

## RADIANT HEAT COOKING APPARATUS

Adrian G. Masters, and Jeffery E. Munden, both of Maidenhead, England, assignors to United Biscuits (UK) Limited, Middlesex, England

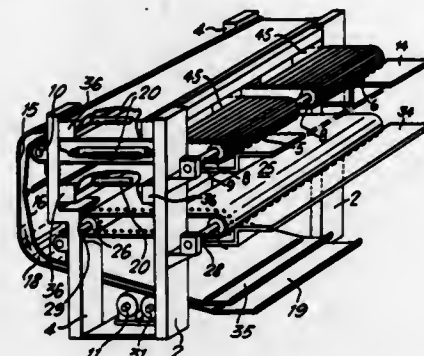
Filed May 15, 1981, Ser. No. 263,960

Claims priority, application United Kingdom, May 16, 1980, 8016223; May 16, 1981, 8108188

Int. Cl.<sup>3</sup> A47J 27/62

U.S. Cl. 99—332

16 Claims



1. An apparatus for heating a food article, said apparatus comprising means defining a heating zone, support means positioned to support a food article in said heating zone, source means of radiation for heating a food article on said support means, said source means when energized at a first voltage level producing radiation having maximum intensity at a wavelength between 0.72  $\mu\text{m}$  and 2.5  $\mu\text{m}$  and when energized at a second voltage level lower than said first voltage level producing radiation having maximum intensity at a wavelength greater than 2.5  $\mu\text{m}$ , means for energizing said source means at either said first or said second voltage level, sensing means for sensing the presence of a food article on said support means, and control means adapted to change said source means energization from said second voltage level to said first voltage level in response to the sensing of a food article on said support means by said sensing means.

4,421,016

## COOKING APPARATUS

Mirko H. Sich, 70 Dudley Ave., Daw Park, Australia 5041

Division of Ser. No. 179,796, Aug. 20, 1980, abandoned. This

application Apr. 23, 1982, Ser. No. 371,251

Int. Cl.<sup>3</sup> A47J 37/07

U.S. Cl. 99—402

11 Claims



1. A barbecue of a type which holds food to be cooked above a heat source, characterized according to this invention in that there is provided a deep box comprising a base and confining sides having an upper perimeter, means within the base to support burning coals across the base to provide the heat source, and food holding means pivotally supported for rotation about a pivot support axis and adapted to hold separate pieces of food symmetrically about the pivot support axis of the food holding means, the food holding means including a support frame comprising a plurality of opposed support arms

arranged to separably support food holding grids, said support arms radially extending from said pivot support axis adjacent lateral extremities of said food holding means at axially spaced positions along said pivot support axis, each of said food holding grids being separably mounted between an associated pair of opposed support arms for pivotal rotation about an arm pivot axis which is parallel to the pivot support axis, each of said food holding grids comprising a pair of unconnected framed grid members adapted to be assembled in overlying relationship with the food to be cooked therebetween for mounting between its associated pair of opposed support arms during cooking, each of said pairs of framed grid members being retained in said assembled overlying relationship during cooking solely by the mounting thereof between said support arms, and said framed grid members of each pair being detached and freely separable from one another upon dismounting from said support arms to allow access to the food.

4,421,017

## ROTISSERIE ACCESSORY FOR PREPARING FOWL

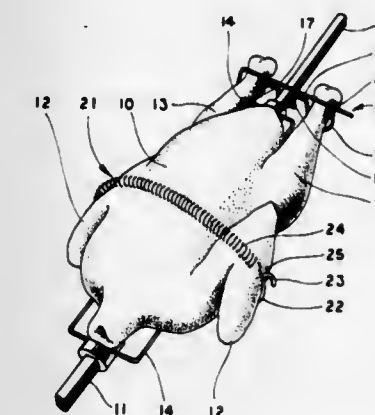
John Ross, Akron, Ohio, assignor to The Collectors Box, Akron, Ohio

Filed Feb. 28, 1983, Ser. No. 470,054

Int. Cl.<sup>3</sup> A47J 43/18

U.S. Cl. 99—421 R

10 Claims



1. Apparatus for confining the wings and legs of a fowl, the fowl being mounted on the spit of a rotisserie with the spit extending longitudinally through the fowl between its wings and between its legs comprising, pin means extending generally laterally through the body of the fowl near the wings thereof, truss means extending around the wings of the fowl and held by each end of said pin means, and leg clip means fixedly positioning the legs of the fowl relative to the spit.

4,421,018

## FORCED CONVECTION OVEN

Gunter G. Pryputsch, South Delta; Lennox M. Leila, Richmond; Gerald E. Parkinson, Vancouver, and Leonard A. Arneson, Port Coquitlam, all of Canada, assignors to Omega Air Flow-21, Ltd., South Delta, Canada

Filed Oct. 5, 1981, Ser. No. 308,158

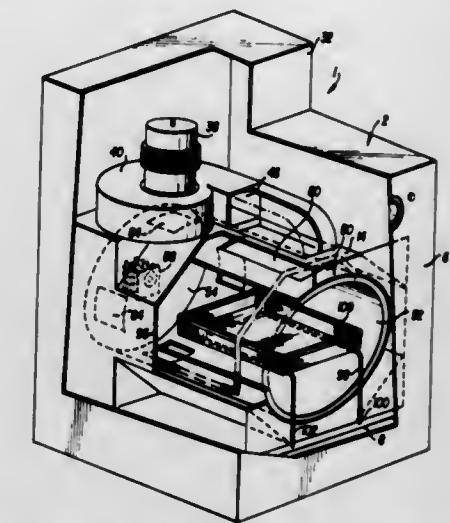
Int. Cl.<sup>3</sup> A47J 27/026

U.S. Cl. 99—447

18 Claims

1. A device for cooking or heating food comprising: a housing with an inside; a stationary support inside the housing with a position for supporting the food; means for supplying a stream of hot air to the inside of the housing; and means for directing the stream of hot air towards the position of the food and for moving the stream of hot air about the position of the food to uniformly heat or cook the

food, the means for directing comprising a hollow drum with an open end, the stationary support projecting into



the open end of the drum and the drum being rotatable about the stationary support.

4,421,019

## COOKIE DISPENSING APPARATUS

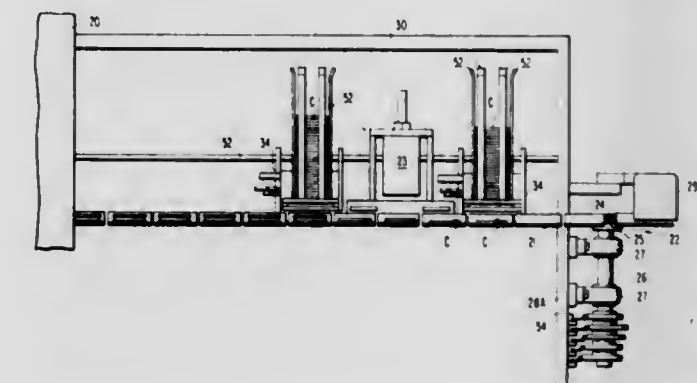
Paul R. Hocking, Jay G. Straight, and Henry P. Moore, all of Richmond, Va., assignors to Eskimo Pie Corporation, Richmond, Va.

Filed Aug. 16, 1982, Ser. No. 408,566

Int. Cl.<sup>3</sup> A21C 9/04, 15/00; A23P 1/00; B65G 59/06

U.S. Cl. 99—450.4

14 Claims



11. In an apparatus for the manufacture of frozen confections including an endless conveyor, a freezing chamber, means for moving said conveyor along a fixed path externally of said freezing chamber and thence through said freezing chamber, a downwardly facing extruder nozzle of established cross sectional shape located above said fixed path wherein the improvement comprises,

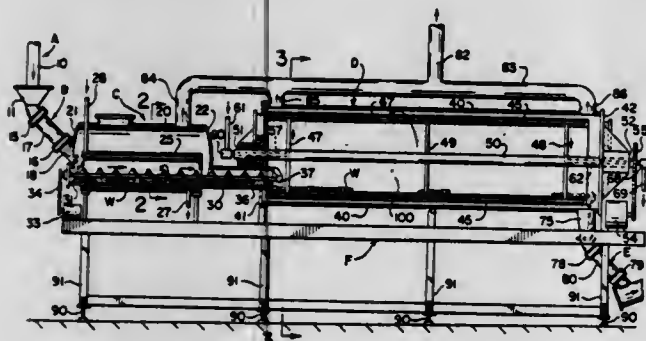
an apparatus for dispensing a lowermost cookie from the bottom of a stack of cookies onto a location along said fixed path including a frame, a substantially horizontal block supported by said frame having a vertical aperture therein, means connected to said block for holding said stack of cookies in vertical alignment with said aperture, a horizontal plate means under said block supported by a first moving means mounted on said frame operable to move said plate means between an obstructing position in which said plate obstructs said aperture to a cleared position in which said plate does not obstruct said aperture, a horizontal finger means above said horizontal plate means supported by a second moving means mounted on said frame operable to move said finger means from a closed position in which said finger means obstructs said aperture to an open position in which said finger means does not obstruct said aperture, and a control means operable in timed relation to said conveyor



moving means operatively associated with said first and second moving means to move said plate means to its obstructing position while said finger means is in its open position to allow said stack of cookies to be supported by said plate means, then to move said finger means to its closed position to separate the lowermost cookie in the stack from cookies thereabove and to support the cookies thereabove, then to move said plate means to its cleared position to allow said lowermost cookie to drop downwardly, then to return said plate means to its obstructing position, then to move said finger means to said open position to allow said stack of cookies to drop onto said plate means.

4,421,020

**APPARATUS FOR THE CONCENTRATION OF FRUITS**  
David R. Gross, Orrville, Ohio, assignor to The J. M. Smucker Company, Orrville, Ohio  
Division of Ser. No. 266,203, May 22, 1981, Pat. No. 4,379,796.  
This application Jan. 24, 1983, Ser. No. 460,462  
Int. Cl.<sup>3</sup> A23L 1/212, 2/08; A23N 1/00  
U.S. Cl. 99-472 2 Claims



1. Apparatus for the concentration of fruits comprising in combination: a deaerating chamber and a concentrating chamber, each of said chambers having an entrance end and an exit end, said exit end of said deaerating chamber being in continuous communication with said entrance end of said concentrating chamber; means for maintaining both of said chambers at a vacuum in excess of 20 inches of mercury; an air lock at the entrance to said deaerating chamber for communicating pieces of fruit to said chamber; means for moving said fruit through said deaerating chamber and into said concentrating chamber, said concentrating chamber comprising a hollow heated cylinder having a smooth inner surface; means for rotating said cylinder about a longitudinal axis; an air lock at the exit end of said cylinder remote from said deaerating chamber for receiving concentrated fruit; means for heating said deaerating chamber and independent means for heating said concentrating chamber; said cylinder having a longitudinal axis sloping downwardly from said exit end of said deaerating chamber to said exit end of said concentrating chamber.

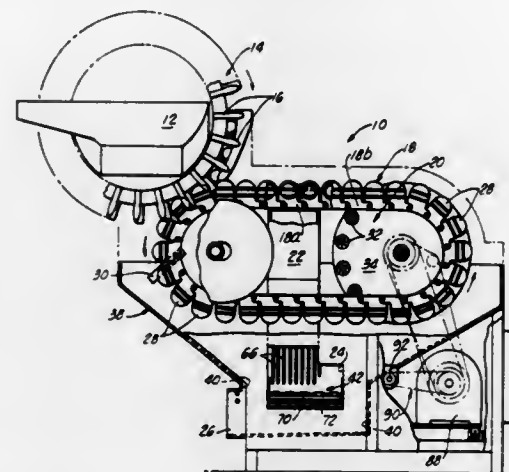
4,421,021

**CITRUS JUICE EXTRACTOR HAVING MEANS FOR SEPARATING JUICE PULP AND RAG FROM PEEL**  
Franklin K. Holbrook, La Habra, Calif., assignor to Brown International Corporation, Convina, Calif.  
Continuation of Ser. No. 935,492, Aug. 21, 1978, abandoned.  
This application Apr. 15, 1980, Ser. No. 140,471  
Int. Cl.<sup>3</sup> A23N 1/00 35 Claims

1. In a citrus fruit juice extractor of the type having means for extracting juice, rag and pulp from citrus fruit, a discharge for citrus peel sections at one outlet and a discharge for rag and pulp particles and juice therefrom at another outlet, the juice, rag and pulp tending to include contaminants such as peel portions, whole fruit and whole fruit portions, the improvement comprising:

a roller grid structure positioned in spaced-apart relation

below the juice extracting means, said roller grid structure comprising a plurality of rollers, means for supporting said rollers in rotatable, parallel spaced-apart relation and longitudinally extending surface means on said rollers, means for collecting the juice, rag, pulp and included contaminants from the juice extracting means and conducting the juice, rag, pulp and included contaminants downwardly to said roller grid structure,

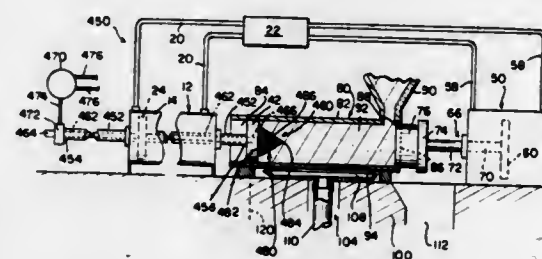


a contaminant outlet means formed above and adjacent one lateral side of said parallel rollers, the juice, rag and pulp outlet being formed below said parallel rollers, and means for driving said rollers in rotation whereby said roller spacing and longitudinal surface means on said rollers allow the juice, rag and pulp to pass between the rollers while the contaminants are carried toward said contaminant outlet means.

4,421,022

**APPARATUS FOR PRODUCING AND COLLECTING A LIQUID EXTRACT AND A DRY BY-PRODUCT FROM A MASH**  
Kermit H. Burgin, R.R. #1, Box 334, Whitestown, Ind. 46075  
Continuation-in-part of Ser. No. 135,922, Mar. 31, 1980, Pat. No. 4,343,233. This application Mar. 10, 1982, Ser. No. 356,841  
Int. Cl.<sup>3</sup> B30B 9/06 10 Claims

U.S. Cl. 100-98 R



1. An apparatus for producing and collecting a liquid extract and a dry by-product from a mash of material, comprising: an extraction chamber having at least one open end, the chamber including a material inlet opening in proximity to the open end for filling the chamber with the mash and a liquid outlet opening for collecting the liquid extract, a by-product outlet opening for collecting the dry by-product, a piston, a plunger movable in the chamber to compress the mash, first means for coupling the plunger to the piston, enclosure means for closing the open end, first drive means for moving the piston to compress the mash within the extraction chamber and to expel the by-product therefrom, agitating means for agitating the mash, second means for coupling the agitating means to the piston, and second drive means for rotating the agitating means with respect to the plunger to agitate the mash.

4,421,023  
**PRINTER CONTROL SYSTEMS FOR ELECTRONIC POSTAGE METER**

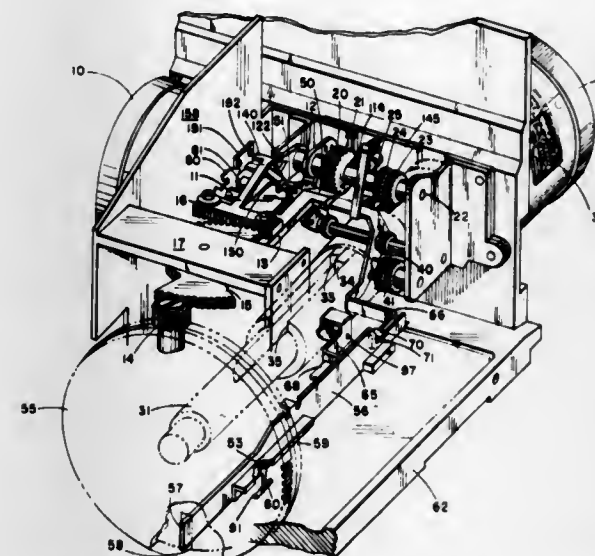
Lloyd G. Kittredge, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 20, 1982, Ser. No. 380,206

Int. Cl.<sup>3</sup> B41J 3/44

U.S. Cl. 101-45

14 Claims



1. In an electronic postage meter including a printer, a setting mechanism for setting the printer, and an electronic accounting and control system connected to control the setting mechanism, wherein the setting mechanism includes a shutter bar movable into and out of a position to block operation of the printer, and first and second interposers positioned to selectively block the shutter bar, said electronic accounting and control system being connected to control said first interposer to block said shutter bar in the event of incorrect operating conditions or failure in the postage meter; the improvement comprising means coupled to said electronic accounting and control system for controlling the position of said second interposer to enable blocking of said shutter bar in accordance with a program of said control system independently of said setting mechanism; said setting mechanism having a first position at which said printer cannot be set and at least one other position at which said printer can be set, and lock means inhibit the release of said second interposer at said other position or position of said setting mechanism.

4,421,024

**PRINTING PLATE ATTACHMENT SYSTEM**  
Rainer Burger, Augsburg, and Werner Kleininger, Neusass, both of Fed. Rep. of Germany, assignors to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,882

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116506

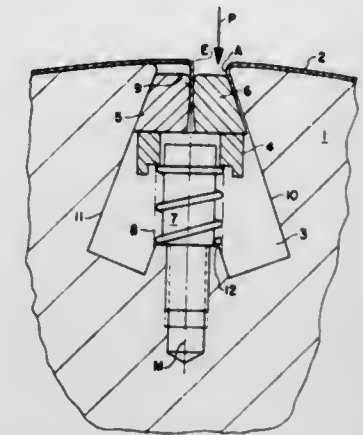
Int. Cl.<sup>3</sup> B41F 27/12

U.S. Cl. 101-415.1

12 Claims

1. Printing cover attachment system for attachment of a cover element (2) to a cylinder (1) of a printing machine, in which the cylinder is formed with an axial groove (3) having outwardly converging side walls (10, 11), and outwardly spring-biased clamping wedge means (5, 6) are provided to clamp the end portions of the cover element (2) in position on the cylinder, wherein in accordance with the new invention the clamping wedge means comprises two essentially parallel parts (5, 6) extending axially in the groove, said parts having essentially trapezoidal cross section with an inclined surface facing against the inclined side walls (10, 11) and facing surfaces fitting essentially against each other; and the cover element (2) is clamped with one end (A)

between one inclined side wall (10) and the inclined surface of the adjacent clamping part (6) and with the other



end (E) between the facing surfaces of both clamping parts (5, 6).

4,421,025

**SPRING MOUNTED TORSIONALLY RIGID PRINT HAMMER MECHANISM**

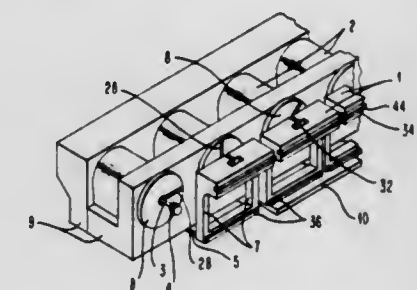
William D. Thorne, Wake Forest, and William A. Patterson, Durham, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,091

Int. Cl.<sup>3</sup> B41J 3/00

U.S. Cl. 101-93.04

2 Claims



1. A printing hammer and driver mechanism for impact printers, comprising:  
an electromagnetic coil having a hollow axial core;  
a magnetic plunger slidably received within said hollow axial core;  
a magnetic flux path member connecting the ends of said hollow core on said electromagnetic coil and completing a flux path from one end of said coil to the other, said flux path member having apertures coaxially aligned with said hollow core;  
a push wire;  
said push wire being connected to one end of said plunger and extending outwardly therefrom through said hollow core and through one of said apertures in said flux path member;  
said push wire having a termination means on the end thereof opposite to said plunger;  
a print hammer;  
said hammer having an impact face spanning a plurality of impact positions along a print line proximate to one end of said hammer;  
a single flexible spring hammer support and restoring element proximate the other end of said hammer having a width in the direction of said print line approximately as great as that of said impact face of said hammer measured to said print line parallel said spring lying in a plane parallel to said print line and spaced from said print line by a distance substantially equal to the distance between said impact face and said other end of said hammer, said hammer having an axis which is perpendicular to both said one



end and said other end, said spring being perpendicular to said axis  
 said flexible spring having two ends, one end being anchored and the other end thereof being rigidly affixed to said hammer to support said hammer's weight and to resiliently restore said hammer towards its retracted position; said push wire being connected through said termination means to said hammer at a position along said axis thereof which is removed from the point thereon where said flexible spring is attached thereto;  
 said plunger being positioned in said hollow core of said electromagnet and resiliently biased away from the symmetrical center thereof by said flexible spring forcing said hammer and attached push wire in a direction to exert force on said push wire to position said plunger; and  
 said plunger being drawn toward the symmetrical center of said core upon application of electrical current thereto to force said push wire and hammer in the opposite direction to that urged by said spring.

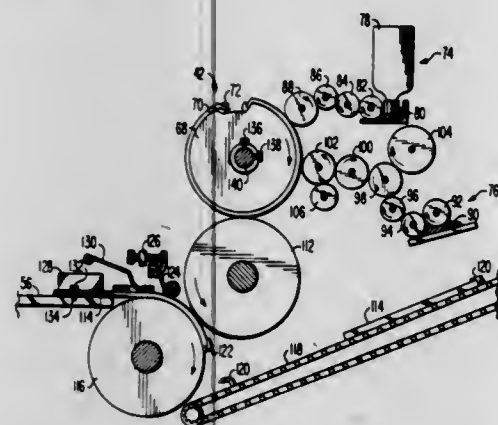
4,421,026

**PROCESS COLOR OFFSET PRINTING DUPLICATOR**  
 Francis E. McCullion, Jr., Colts Neck, N.J., assignor to Cymatic Corporation, Edison, N.J.

Filed Apr. 15, 1981, Ser. No. 254,456  
 Int. Cl.<sup>3</sup> B41F 7/06, 21/12, 21/14

U.S. Cl. 101—136

17 Claims



1. A process color offset printing duplicator for printing an image in full color which comprises:
  - (a) means for feeding sheet stock onto a delivery table of a first duplicator head for effecting registration of said sheet stock;
  - (b) a plurality of serially arranged offset duplicator heads each of which includes a plate cylinder for holding a plate bearing said image, an impression cylinder, and a blanket cylinder having mounted thereon a blanket to receive said image from said plate cylinder, said impression cylinder adapted to bring a sheet of said stock into contact with said blanket to print a single color ink onto said sheet of said stock;
  - (c) said serially arranged offset duplicator heads each having one of said delivery tables, a first one of said offset duplicator heads having means for receiving said sheet of said stock from said feeding means and delivering said sheet of said stock onto said impression cylinder of said first duplicator head, means on said impression cylinder for transferring said sheet to a first chain gripper, said first chain gripper including means for feeding said sheet onto one of said delivery tables of a second of said offset duplicator heads, each of said second, and subsequent ones of said offset duplicator heads further including corresponding ones of said delivery tables, sheet stock receiving and delivering means, transferring means and a chain gripper, said impression cylinder of a final one of said offset duplicator heads feeding said sheet of said stock onto a corresponding final one of said chain grippers, and registration means at each of said delivery tables for providing hori-

zontal and vertical registration for the accurate application of said image to said sheet of said stock between each of said offset duplicator heads, and each of said offset duplicator heads including a water reservoir for holding water, means for delivering water from said water reservoir to said plate on said plate cylinder, an ink fountain for holding ink, and means for delivering ink from said ink fountain to said plate on said plate cylinder, said means for delivering ink being adapted to apply a relatively thin coat of ink onto said plate mounted on said plate cylinder.

4,421,027

**MULTIPLE PRINTING MODE PRINTING MACHINE SYSTEM**

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

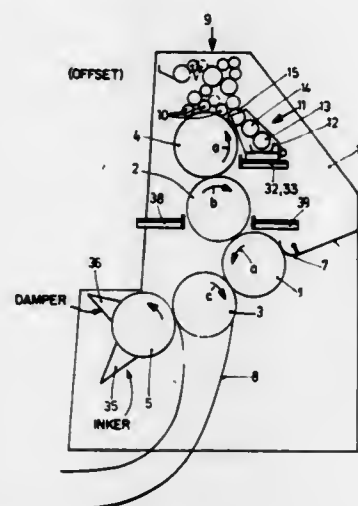
Filed Mar. 22, 1982, Ser. No. 360,068

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116505

Int. Cl.<sup>3</sup> B41F 11/00, 5/24, 7/36; B41L 25/14

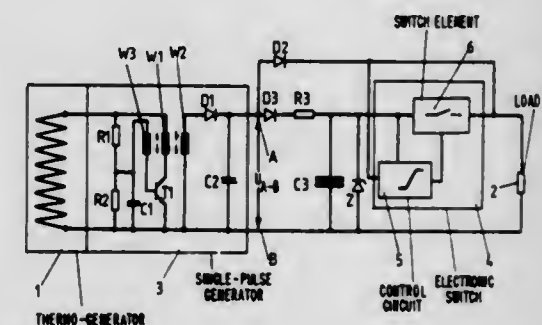
U.S. Cl. 101—142

8 Claims



1. Multiple printing mode rotary printing machine system for selectively printing in
  - (a) offset printing mode;
  - (b) direct lithographic printing mode;
  - (c) flexographic printing mode, having two side walls (17, 18);
 a blanket cylinder (2, 3) located between the side walls; cylinder means (1) for forming a printing or impression cylinder and defining, with the blanket cylinder, a printing line;  
 a plate cylinder (4, 5) located and retained between the side walls adjacent the blanket cylinder (2, 3), said plate cylinder being movable into and out of engagement with the adjacent blanket cylinder;  
 an inker (9) selectively engageable with the plate cylinder; and a liquid application system (11) wherein, in accordance with the invention, the liquid application system (11) is a film system having a liquid trough (12), a pickup roller (13) at least in part located in the trough, a liquid transfer roller (14), and a liquid application roller (15);  
 and first, second and third individual positioning and support means (32, 33; 38; 39) are provided, located on said side walls for selectively positioning and supporting said liquid application system in accordance with a selected mode of printing of the machine, comprising
  - (a) for offset printing: the first support means (32, 33) being located for, and supporting the liquid application system adjacent to and in liquid transfer contact with said plate cylinder (4, 5) in advance—with respect to the direction of rotation (a) of the plate cylinder—of the inker (9);

and wherein the liquid in the liquid trough comprises damping liquid;  
 (b) for direct lithographic printing: the second support means (38) being located for and supporting said liquid application system adjacent to and in liquid transfer contact with said blanket cylinder (2, 3) in advance—with respect to the direction of rotation (b) of the blanket cylinder—of said plate cylinder (4, 5);  
 wherein the liquid in the liquid trough comprises damping liquid; and  
 wherein said plate cylinder supplies ink to the blanket cylinder from the inker;  
 (c) for flexo printing: the third support means (39), being located for and supporting said liquid application system adjacent to and in liquid transfer contact with said blanket cylinder (2, 3) in advance—with respect to the direction of rotation (b) of the blanket cylinder—of the printing line and in the zone adjacent the blanket cylinder between the plate cylinder and said printing line;  
 wherein the liquid in the liquid trough (12) comprises flexo printing ink; and  
 wherein said plate cylinder is out of contact with the blanket cylinder, the blanket cylinder carries a flexo printing plate.



4,421,028

**DELIVERY TABLE FOR SHEET-FED PRINTING PRESSES**

Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

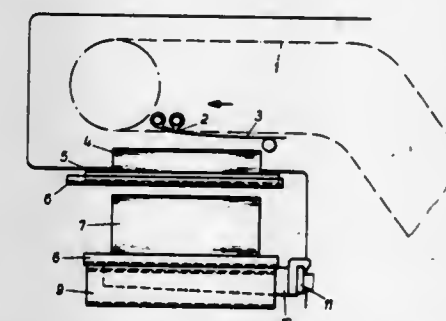
Continuation of Ser. No. 771,788, Feb. 24, 1977, which is a continuation of Ser. No. 631,679, Nov. 13, 1975, abandoned. This application Aug. 22, 1978, Ser. No. 935,784

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1975, 25063916

Int. Cl.<sup>3</sup> B41F 13/64

U.S. Cl. 101—240

1 Claim



1. Method of removing printed sheets from a printing machine which comprises stacking printed sheets delivered from a sheet delivery system onto a legless first delivery table having means for securing supporting legs thereto, securing legs to the legless first delivery table, interposing a legless second delivery table between the first delivery table and the sheet delivery system, removing the first delivery table, and repeating the foregoing method steps with the second delivery table and a third delivery table.

4,421,029

**SUPPLY CIRCUIT FOR A LOAD WHICH IS TO BE CONTINUALLY SUPPLIED WITHIN A PROJECTILE**  
 Harald Wich, Schwaig, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,473

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1980, 3029491

Int. Cl.<sup>3</sup> F42C 11/00

U.S. Cl. 102—207

4 Claims

1. In a supply circuit for a load to be continually supplied in a projectile, including a generator, particularly a thermo-generator connected ahead of a voltage generator, which provides

a power output which rises to a maximum in a first phase of the load and drops off in a second contiguous phase of the load, wherein during the first and the second supply phase the power provided is greater than the power required for the operation of the load; the improvement comprising: said load and an RC-charging circuit having a storage condenser connected in parallel with said voltage generator output so as to charge the storage condenser during the first supply phase; a diode connected in said RC-charging circuit so as to prevent a

discharge of said storage condenser during the second supply phase; and a switch controlled by the output voltage of the voltage generator being connected between the storage condenser and the load, said switch being blocked during the first and the second supply phase and being actuated upon the output voltage of the voltage generator having reached a value insufficient for the operation of the load whereby in a contiguous third supply phase the load is supplied through said switch from said storage condenser.

4,421,030

**IN-LINE FUZE CONCEPT FOR ANTIARMOR TACTICAL WARHEADS**

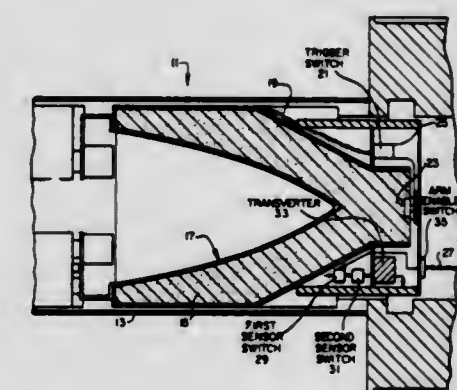
Jon G. DeKoker, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 15, 1981, Ser. No. 311,907

Int. Cl.<sup>3</sup> F42C 15/40, 19/00; F42B 13/10

U.S. Cl. 102—218

11 Claims



1. A safe and arm device for supplying a triggering signal to an explosive detonator of a shaped charge warhead flown to impact a target comprising:
  - a power source;
  - a toroidally-shaped trigger capacitor surrounding a portion of said shaped charge;
  - means for selectively coupling said power source to said trigger capacitor to charge said trigger capacitor; and
  - means responsive to the impact of the warhead against the target for enabling the discharge of said capacitor to generate said triggering signal.

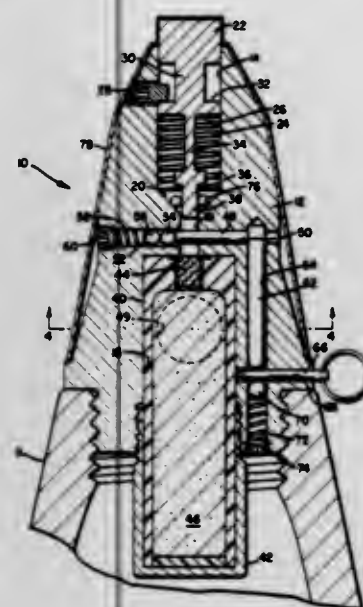


4,421,031

**PERCUSSION FUSE FOR TRAINING PROJECTILES**  
 Harry R. Carter, and Randall R. Carter, both of Moscow, Pa.,  
 assignors to Pocal Industries, Inc., Moscow, Pa.  
 Filed May 1, 1981, Ser. No. 259,542  
 Int. Cl.<sup>3</sup> F42C 15/24

U.S. Cl. 102—252

30 Claims



1. A fuse assembly for use in a projectile such as a mortar shell or the like, said assembly comprising:

- (a) a body,
- (b) striker means generally axially movably mounted within said body between a forward safe position and a rearward charge detonating position in which it causes detonation of a charge,
- (c) slider means mounted within said body for movement between a safe position in which it prevents movement of said striker means to said detonating position and a retracted armed position in which it permits movement of said striker means to said detonating position,
- (d) set-back means mounted within said body in a normal safe position in which it retains said slider means in safe position,
- (e) said set-back means being movable from said safe position to an armed position in response to a predetermined inertial force acting thereupon following propulsion of said projectile to release said slider means for movement to its armed position, and
- (f) blocking means mounted within said body for movement in response to gravity to a safe position during upward trajectory flight of said projectile in which it prevents movement of said striker means to said detonating position and to an armed position during downward trajectory flight of said projectile in which it permits movement of said striker means to said detonating position upon impact with a target.

4,421,032

AMMUNITION

Karl Rudolf, Schrobenthausen, and Helmut Hessberg, Sünzhausen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany  
 Filed Sep. 2, 1980, Ser. No. 186,614  
 Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936749

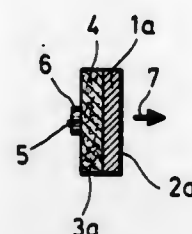
Int. Cl.<sup>3</sup> F42B 1/02

U.S. Cl. 102—307

3 Claims

1. Ammunition for combatting armored targets, comprising a projectile of inert material formed as a form-stable plate having a first face surface arranged to face the target, an oppositely directed second face surface, and a peripheral edge surface extending around and between said first and second face surfaces, an explosive charge located on and covering said

second face surface of said plate for accelerating said plate as a unit thereby retaining substantially the original shape and



dimension of said plate in direction toward the respective target from a pre-determined target distance.

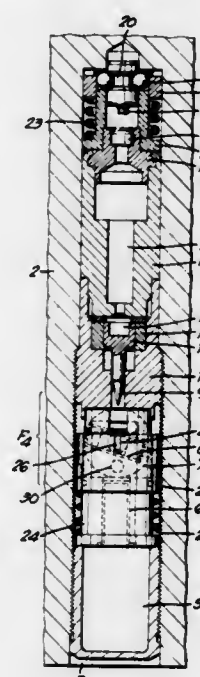
4,421,033

EXERCISE PROJECTILE

Gerard E. Dupont, Dolsche, Belgium, assignor to s.a. PRB, societe anonyme, Brussels, Belgium  
 Filed Aug. 31, 1981, Ser. No. 298,107  
 Claims priority, application Belgium, Sep. 19, 1980, 2/58755  
 Int. Cl.<sup>3</sup> F42B 9/20

U.S. Cl. 102—529

1 Claim



1. In a practicing projectile having a head and including at least one explosive charge having associated therewith at least one delayed firing device, the improvement comprising:

- (a) first and second coaxial pyrotechnic chains positioned one behind the other between the head and the charge;
- (b) the first chain including:
  1. a first striker,
  2. a first locking means securing the first striker and releasing same when subjected to the joint effect of projectile acceleration and centrifugal force developed when the projectile is fired,
  3. a primer,
  4. a delaying charge, and
  5. an explosive propulsive charge;
- (c) the second chain including:
  1. a second striker,
  2. a second locking means for securing the second striker and releasing and permitting same to be propelled when the explosive propulsive charge is fired;
- (d) a pyrotechnic switch including:
  1. a rotor having two pins with flat ends,
  2. a rotor carrier rotatably mounting the rotor, and
  3. a detonator carried by the rotor; and
- (e) a third locking means including:
  1. a spring,

2. a slidable ring surrounding the rotor carrier and including slots for receiving the flat ends of the pins, and
3. the slidable ring being maintained in an operative position by the spring for securing the rotor, and being brought into an inoperative position for releasing the rotor through the action of the acceleration force, during which the rotor is rotated to align the detonator with the striker through the action of the centrifugal force.

4,421,034

**COMPACT BIDIRECTIONALLY OPERATIVE TIE EXCHANGING APPARATUS**

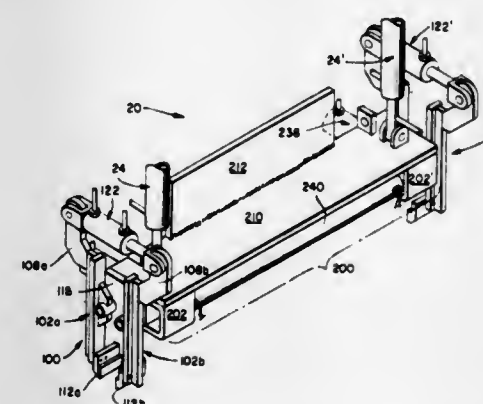
Franz Allmer, Sophia, N.C., assignor to Canon Corporation, West Columbia, S.C.

Filed Jun. 18, 1981, Ser. No. 274,768

Int. Cl.<sup>3</sup> B61D 15/00; E01B 29/06, 29/10

U.S. Cl. 104—9

30 Claims



1. A railway tie removing apparatus comprising:  
 an extensible beam means including first and second beams, one telescopically received within the other;  
 a support means for supporting said first and second beams relative to a support vehicle;  
 selectively actuatable lock means for locking a selected one of said first and second beams to said support means;  
 tie gripping means mounted on said first and said second beams for selectively gripping a railway cross tie; and  
 force actuator means connected to said first and to said second beams for causing said first and said second beams to telescopically extend relative one another;  
 whereby actuating said locking means to lock one of the first and second beams to the support means and unlock the other and operating the force actuator means causes the unlocked other of the first and second beams to extend relative to the locked beam, and actuating said locking means to lock the other of the first and second beams to the support means and unlock the one and operating the force actuator means causes the unlocked one of the first and second beams to extend relative to the locked other beam.

4,421,035

**APPARATUS FOR LOCKING A KEYBOARD AT SELECTED INCLINATIONS TO A HORIZONTAL REFERENCE**

Bernd Gubbe, Nuremberg; Klaus-Dieter Krause, Oberasbach; Otto Schonemann, Furth, and Rudolf Neldhardt, Nuremberg, all of Fed. Rep. of Germany, assignors to Triumph-Adler A.G. für Büro-und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 254,124

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014325

Int. Cl.<sup>3</sup> A47F 5/12

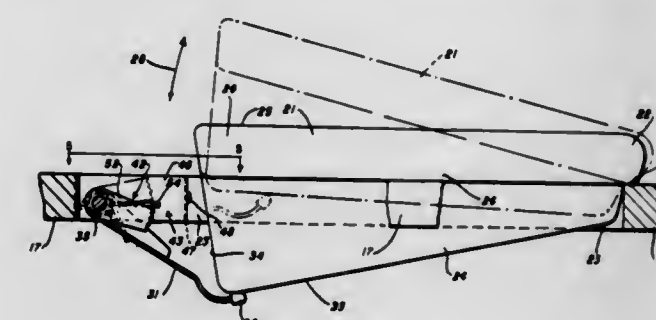
U.S. Cl. 108—6

4 Claims

1. A work station support comprising  
 a horizontal extending platform having an opening defining front, rear and side walls,  
 a work station having an upper portion whose width is

greater than the distance between said side walls, said work station being pivotally mounted on said platform adjacent the front wall of said opening for adjusting pivotal movement upwardly from a rest position at which the work station is supported on said platform to selected positions at which the work station is inclined relative to said horizontal platform,

means for lockingly supporting said work station in a selected inclined position within a range of positions incident to its release following its upward pivoting movement to an inclined position, comprising  
 a shaft rotatably mounted in opposite side walls of said platform opening with its axis parallel to said rear wall, a toothed segment and an arm secured to said shaft, said toothed segment extending into said opening at right angles to said shaft axis with its teeth directed toward said front wall, and said arm extending below said opening and underlying said work station,  
 spring means mounted to rotatably bias said shaft whereby said arm is biased against the underside of said work sta-



tion to follow said work station as it is moved from its rest position to an inclined position, the uppermost tooth of said tooth segment in the rest position of said work station being below a horizontal line,

a pawl,  
 a mounting means on said rear wall for pivotally supporting said pawl on an axis parallel to and spaced horizontally from the axis of said shaft and from the toothed end of said toothed segment,  
 said pawl having a tooth extending towards the shaft axis for arrangement with the teeth of said toothed segment, and  
 spring means for urging said pawl to a normal horizontal attitude above the uppermost tooth of the toothed segment whereby rotation of said shaft incident to pivoting upward movement of said work station will cause the toothed segment to deflect the pawl about its pivot axis and upon release of said work station will cause said pawl tooth to engage a segment tooth to thereby arrest return movement of said tooth segment and said arm whereby said work station will be supported at a selected inclination by said arm.

4,421,036

**PLANT FOR THE COMBUSTION OF IMPURE SOLID FUEL**

Rolne Brännström, Finspong, and Lars-Erik Karlsson, Åby, both of Sweden, assignors to Stal-Laval Turbine AB, Västerås, Sweden

Filed Feb. 9, 1982, Ser. No. 347,204

Claims priority, application Sweden, Feb. 19, 1981, 8101110

Int. Cl.<sup>3</sup> F23H 5/18

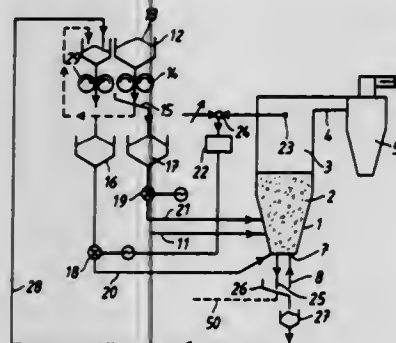
U.S. Cl. 110—186

13 Claims

1. A plant for the combustion of impure solid fuel, comprising:  
 a combustion chamber;  
 means for supplying impure solid fuel to said combustion chamber;  
 means for supplying fine-grained and coarse-grained absorbent material to said combustion chamber, said absorbent



material being effective to absorb sulfur formed in said combustion chamber by combustion of said solid fuel therein;  
 means for creating a fluidized bed of said absorbent material in said combustion chamber;  
 means for withdrawing absorbent material directly from said fluidized bed;  
 means for crushing said absorbent material withdrawn directly from said fluidized bed into a fine-grained absorbent material;



transducer means for producing a first signal proportional to the sulfur dioxide content in the exhaust gases leaving said fluidized bed;  
 signal processing means, connected to said transducer means, for comparing said first signal with a second signal proportional to a desired value of the sulfur dioxide content; and  
 regulator means, connected to said signal processing means, for regulating the flow into said fluidized bed of fine-grained absorbent material produced by said means for crushing, in response to the difference between said first and second signals.

4,421,037

**WASTE MATERIAL TREATMENT FURNACE**

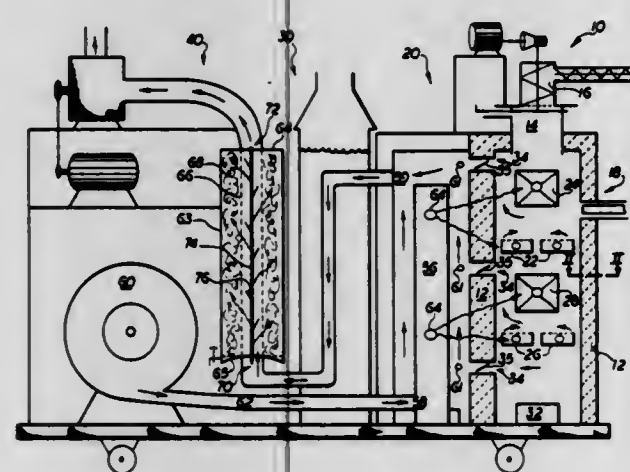
John A. Leam, 6445 Fairway Dr., Fayetteville, Pa. 17222

Filed May 10, 1982, Ser. No. 376,614

Int. Cl.<sup>3</sup> F23G 7/04

U.S. Cl. 110—238

21 Claims



1. Apparatus for treating exhaust gases emitted from a furnace, comprising:  
 an elongated chamber defined by exterior wall members, an inlet opening adjacent a first end of said chamber for introducing said exhaust gases into said chamber, and an outlet opening adjacent a second and opposite end of said chamber for conducting said exhaust gases out of said chamber;  
 an elongated conduit defined by sidewalls extending within said chamber between and in communication with said inlet opening and said outlet opening, spaced from said exterior wall members of said chamber to provide a compartment therebetween extending about the periphery of

the interior of said chamber between said first and second ends thereof, said sidewalls of said elongated conduit being permeable to the passage of said exhaust gas there-through, said compartment communicating with said inlet opening and said outlet opening only through said permeable sidewalls of said elongated conduit;

selected material within said compartment between the exterior walls of said chamber and the sidewalls of said conduit through which said exhaust gas may pass during portions of its advancement from said first end toward said second end, said selected material reactive with at least portions of the composition of said exhaust gas to remove and/or alter said portions during passage there-through; and

means mounted within said elongated conduit for directing said exhaust gas from the interior of said conduit through the sidewalls thereof into said compartment for interaction with said selected material, said directing means oriented within said elongated conduit to permit the return of said exhaust gas from said compartment to said elongated conduit and therefrom to said outlet opening.

4,421,038

**METHOD AND APPARATUS FOR REMOVING FOREIGN OBJECTS FROM FLUID BED SYSTEMS**

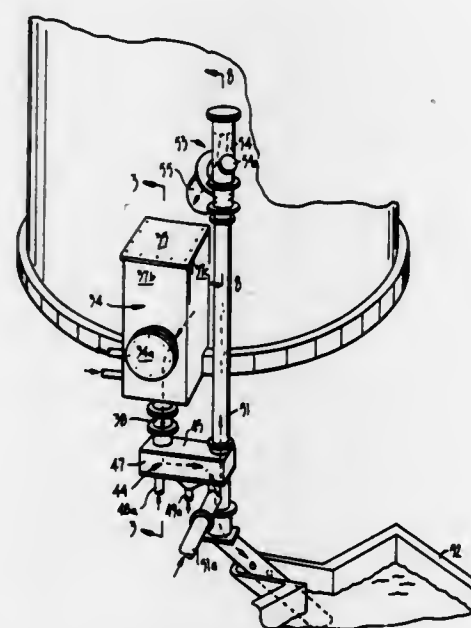
Gary O. Goldbach, San Jose, and Michael A. O'Hagan, Cupertino, both of Calif., assignors to Combustion Power Company, Inc., Menlo Park, Calif.

Filed Sep. 20, 1982, Ser. No. 419,873

Int. Cl.<sup>3</sup> F23G 7/00

U.S. Cl. 110—245

4 Claims



1. In a fluid bed combustion apparatus having, an upstanding combustion chamber,  
 a porous support structure within the combustion chamber supporting a quantity of finely divided inert particles,  
 a first opening into the combustion chamber below the porous structure for introducing a stream of air for passage up through the porous support structure for fluidizing the quantity of particles,  
 a second opening into said combustion chamber for introducing combustible material which contains foreign objects,  
 a third opening at the top of the combustion chamber above the particles for passing products of combustion out of the combustion chamber,  
 a foreign object removal opening for removal of foreign objects from the quantity of particles from one side of the combustion chamber, and  
 means at a plurality of locations beneath the quantity of particles for introducing fluidizing air into the quantity of

particles in a lateral direction toward said foreign object removal opening,

the improvement comprising

a foreign object removal chamber projecting laterally outwardly from said combustion chamber,  
 a material flow control plenum chamber below said removal chamber, and having a first and a second end,  
 a foreign object collection tank located below said control plenum,

a first passageway means connecting said removal chamber to said first end of said plenum chamber for passing inert particles and foreign objects out of said combustion chamber,

particle separation and return means connecting said second end of said plenum chamber with both said combustion chamber and said collection tank for separating foreign objects which move to said tank from inert particles which move to said combustion chamber, and means at a plurality of locations in the bottom of said plenum chamber for introducing fluidizing air into a quantity of inert particles and foreign objects in a direction from said first end to said second end of said plenum chamber.

4. In a fluid bed combustion apparatus having, an upstanding combustion chamber,  
 a porous support structure within the combustion chamber supporting a quantity of finely divided inert particles,  
 a first opening into the combustion chamber below the porous structure for introducing a stream of air for passage up through the porous support structure for fluidizing the quantity of particles,  
 a second opening into said combustion chamber for introducing combustible material which contains foreign objects,  
 a third opening at the top of the combustion chamber above the particles for passing products of combustion out of the combustion chamber,  
 a foreign object removal opening for removal of foreign objects from the quantity of particles from one side of the combustion chamber, and  
 means at a plurality of locations beneath the quantity of particles for introducing fluidizing air into the quantity of particles in a lateral direction toward said foreign object removal opening,

the improvement comprising

a foreign object removal chamber projecting laterally outwardly from said combustion chamber,  
 a material flow control plenum chamber below said removal chamber, and having a first and a second end,  
 a deentrainment chamber means located above said control plenum for deentraining inert particles from a classifying stream of air,  
 a foreign object collection tank located below said control plenum,

a first passageway means connecting said removal chamber to said first end of said plenum chamber for passing inert particles and foreign objects out of said combustion chamber,  
 a second passageway means connecting said deentrainment chamber with said combustion chamber for returning inert particles to said combustion chamber,  
 an air classifier means connecting said second end of said plenum chamber with both said deentrainment chamber and said collection tank for separating foreign objects which move to said tank from inert particles which move to said deentrainment chamber means, and means at a plurality of locations in the bottom of said plenum chamber for introducing fluidizing air into a quantity of inert particles and foreign objects in a direction from said first end to said second end of said plenum chamber.

4,421,039

**PULVERIZED COAL-FIRED BURNER**

Vincent Llinares, Jr., Rockville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

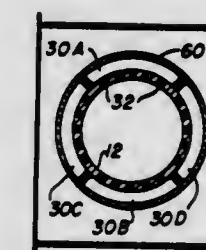
Division of Ser. No. 305,060, Sep. 24, 1981. This application

Dec. 10, 1982, Ser. No. 448,453

Int. Cl.<sup>3</sup> F22B 37/42; F23K 5/00

U.S. Cl. 110—263

3 Claims



1. A burner for pulverized coal furnace comprising:  
 a. a horizontally disposed longitudinally elongated coal delivery pipe having an outlet end opening into the furnace, said coal delivery pipe defining a flowpath through which a stream of pulverized coal entrained in air passes to the furnace;  
 b. a second pipe disposed coaxially about said coal delivery pipe at least near the discharge end thereof so as to define therebetween an annular plenum chamber, said annular plenum chamber divided into at least four subchambers, said first chamber along the top of said coal delivery pipe, said second chamber along the bottom thereof, and third and fourth chambers along each side thereof, each plenum chamber connected in fluid communication with the flowpath defined within said coal delivery pipe by an opening through the wall of said coal delivery pipe at the discharge end thereof; and  
 c. said coal delivery pipe has an outwardly flared flange at its outlet end, said flange beginning to flare outwardly at a point just downstream of the plenum chamber openings in the wall of the coal delivery pipe.

4,421,040

**FURNACE**Olle Lindstrom, Lorensvikav 14, S-18363 Täby, Sweden  
 PCT No. PCT/SE81/00071, § 371 Date Oct. 27, 1981, § 102(e)  
 Date Oct. 27, 1981, PCT Pub. No. WO81/02619, PCT Pub. Date Sep. 17, 1981

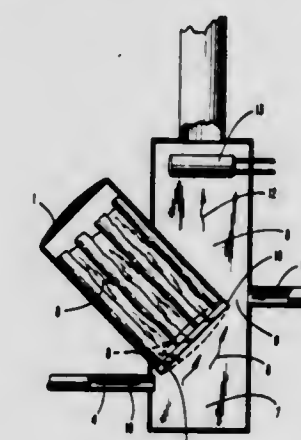
PCT Filed Mar. 6, 1981, Ser. No. 315,522

Claims priority, application Sweden, Mar. 7, 1980, 8001801

Int. Cl.<sup>3</sup> F23N 13/00

U.S. Cl. 110—294

5 Claims



1. A furnace for the container firing of non-slagging solid fuels such as wood, peat, and lignite, said furnace comprising:



a housing enclosing therewithin a grid space and a flame space, the latter disposed above the former,  
 a fuel container for retaining said non-slagging solid fuel, said container including an upper portion and a lower portion, at least said lower portion being disposed within said housing,  
 a perforate fuel retainer disposed across said lower portion of said fuel container, said retainer being inclined relative to horizontal so as to extend upwardly generally toward a restricted passage which interconnects said grid space and said flame space, said retainer including an upper side against which said solid fuel engages, and a lower side facing toward said grid space,  
 means for introducing reaction gas into said grid space at a location below said retainer to support combustion of said fuel within a gasification zone extending along said retainer, with fuel gas formed by such combustion flowing to said flame space through said passage, and  
 means for introducing combustion air to a location adjacent said passage to support combustion of said fuel gas within said flame space.

4,421,041

## NEEDLE DESIGN AND CLAMPING SYSTEM

William Weisz, Tenafly, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 7, 1981, Ser. No. 309,296

Int. Cl.<sup>3</sup> D05B 55/02, 85/02

U.S. Cl. 112—226

2 Claims



1. For a sewing machine or like mechanism utilizing a needle bar to carry a sewing needle having a point and a thread carrying eyelet adjacent to the point, through a work material, a needle clamping system comprising:

a sewing needle having an elongated blade having a first axis and a point at one end, and eye extending along a second axis through said blade adjacent said point, said blade opening up opposite said point to an enlarged shank, said shank terminating in a locator portion extending along a third axis substantially normal to said shank and forming a known angle with a plane including said first axis and said second axis; and means for clamping said sewing needle to said needle bar with said eye maintained in a specific position with respect to said needle bar, said clamping means further comprising a rod having an enlarged end with a transverse bore adjacent said end for receiving said locator portion of said needle and a groove extending from said transverse bore to said end for receiving said shank of said needle; a clamping sleeve having an axially aligned aperture extending from one end to receive said enlarged end of said rod with said locator portion and shank of said needle therein to be firmly retained thereby, an orifice communicating with said axially aligned aper-

ture for accommodating passage of said rod, and a counterbore extending from said orifice to the other end of said clamping sleeve; a compression spring accommodated about said rod in said counterbore; and means for affixing said rod to said needle bar with said eye of said needle in said specific position, whereby said clamping sleeve may be axially shifted in opposition to said compression spring to expose said enlarged end of said rod so as to remove or install a needle with said locator portion in said transverse bore and said shank in said groove of said rod, and whereby said clamping sleeve may be urged by said compression spring to have said axially aligned aperture thereof firmly retain said needle to said rod.

4,421,042

## SEWING MACHINE HEAD END MODULE CONSTRUCTION

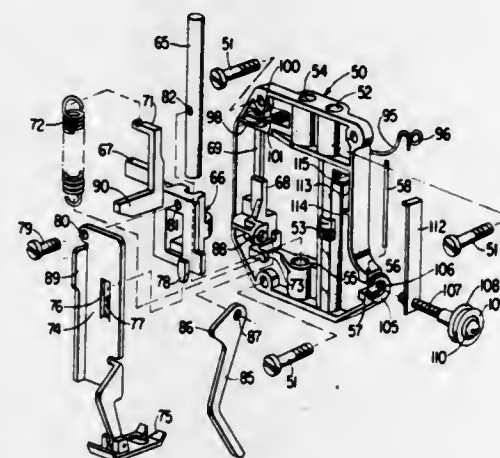
Karl H. Killinger, Dover, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 22, 1983, Ser. No. 507,207

Int. Cl.<sup>3</sup> D05B 73/02

U.S. Cl. 112—259

1 Claim



1. In a sewing machine having a casing with a work supporting bed and a bracket arm overhanging said bed, a stitch forming loop taker and a work feeding mechanism carried within said work supporting bed, said loop taker adapted to cooperate with a reciprocating needle of the type carrying a thread which is influenced by a thread take-up device and a thread tensioning device, and said work feeding mechanism adapted to engage work fabrics in opposition to a spring biased presser foot having a presser lifter associated therewith facilitating insertion and removal of work fabrics between said work feeding mechanism and said presser device, actuating mechanism in said bed for said loop taker and work feeding mechanism, and a needle actuating mechanism extending into said bracket arm with operative connections with said actuating mechanism in said bed,

the improvement which comprises a module secured to said sewing machine bracket arm and providing support for stitch forming devices including said reciprocating needle, said needle thread take-up, said thread tension, said presser device and said presser lifter;

said module including an integral module frame of which the manufacture may be finished in a single molding operation utilizing a two part die with retractable mold inserts to define spaced aligned bearing bores in the module frame providing sliding support for the reciprocating needle and presser device,

an individual leaf spring having predetermined unstressed configuration for sustaining said needle thread take-up and said thread tension on said module frame, said module frame being formed with leaf spring accommodating apertures each with a configuration deviating substantially from that of a respective one of said unstressed leaf spring configurations,

a boss molded on said module frame pivotally accommodating said presser lifter, and said presser device including a surface arranged closely adjacent to said presser lifter constraining said presser lifter on said module frame boss.

4,421,043

## CONVERTIBLE BED FOR A SEWING MACHINE

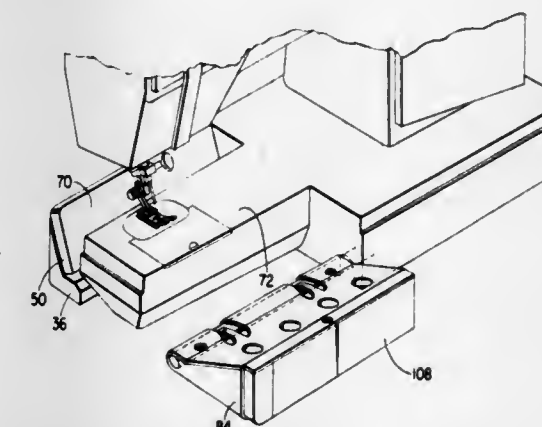
Boleslaw Kornatowski, Elizabeth, and Kenneth D. Adams, Madison, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jun. 8, 1982, Ser. No. 386,176

Int. Cl.<sup>3</sup> D05B 73/10

U.S. Cl. 112—260

6 Claims



1. A convertible bed sewing machine comprising a bracket arm extending from an upright standard to a depending head, a bed which supports the standard and includes as a part thereof a free arm which extends under the bracket arm and head, a fixed machine supporting leg extending substantially parallel to the free arm at the rear of the machine, a rear bed extending member for the free arm, a cover member fitted over the leg and having the rear bed extending member pivoted thereon for movement into and away from a position wherein a working surface on the extension is coplanar with a working surface on the free arm, the cover and rear bed extending member being removable as a unit from the machine supporting leg to provide space for an attachment, and means for securing an embroidery attachment to the free arm when the cover and rear bed extending member have been removed from the machine.

4,421,044

## AUTOMATIC METHOD AND APPARATUS FOR FEEDING A TEXTILE PIECE TO A SEWING MACHINE

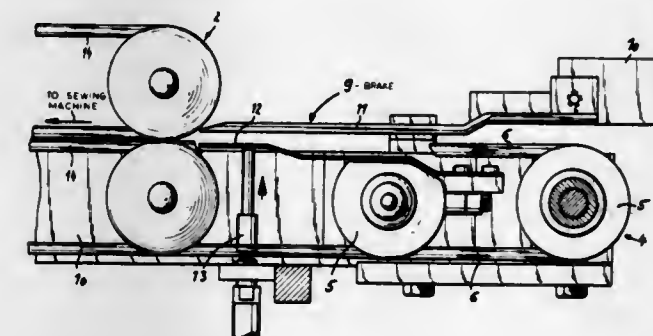
Johannes Freemann, and Dieter Malcherek, both of Ochtrup, Fed. Rep. of Germany, assignors to Carl Schmale KG, Ochtrup, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,813

Int. Cl.<sup>3</sup> D05B 97/00, 27/16

U.S. Cl. 112—262.3

10 Claims



1. A method of feeding a textile piece having a nonstraight edge to a stitching location, said method comprising the steps of:

gripping said piece at an interior location spaced from said edge;

advancing said interior gripped location at an intermediate transport speed in a transport direction parallel to said edge toward said stitching location, whereby relative to said direction said edge has a leading portion and a trailing portion that are successively displaced past a speed-change location;

advancing said leading portion of said edge in said direction toward said stitching location at a relatively slow transport speed slower than said intermediate speed; and advancing said trailing portion of said edge in said direction toward said stitching location at a relatively fast transport speed faster than said intermediate speed.

4. An apparatus for feeding a textile piece having a non-straight edge to a stitching location, said apparatus comprising: inner conveyor means for gripping said piece at an interior location spaced from said edge and for advancing said interior gripped location at an intermediate transport speed in a transport direction parallel to said edge toward said stitching location, whereby relative to said direction said edge has a leading portion and a trailing portion that are successively displaced past a speed-change location; brake means for advancing said leading portion of said edge in said direction toward said stitching location at a relatively slow transport speed slower than said intermediate speed; and

outer conveyor means for advancing said trailing portion of said edge in said direction toward said stitching location at a relatively fast transport speed faster than said intermediate speed.

4,421,045

## AUTOMATED THREAD TRIMMING APPARATUS FOR USE FOR SEWING MACHINES

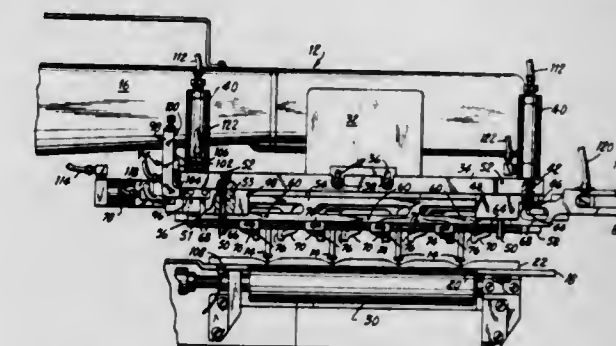
Mario Portilla, 1975 Troy Ave., Brooklyn, N.Y. 11234

Filed May 5, 1982, Ser. No. 374,998

Int. Cl.<sup>3</sup> D05B 65/04

U.S. Cl. 112—288

13 Claims



1. A thread trimming apparatus for use with a sewing machine having at least one needle, said needle being operative to produce an array of stitches, said apparatus for severing said array of stitches, said apparatus comprising:

a frame means;

first and second blade mounting means slidably connected to said frame means and in slidable relationship with each other;

positioning means connected to said sewing machine and said frame means for selectively moving said frame means with respect to said sewing machine and towards or away from said array of stitches;

a pair of opposed blade means for each said needle, each said pair comprising a first blade means mounted on said first blade mounting means and a second blade means mounted on said second blade mounting means;

blade actuating means for selectively generating slidable movement of said first and second blade mounting means relative to each other and relative to said frame means; and

control means for actuating said positioning means and said



blade actuating means, said control means being operative to cause said positioning means to move said frame means toward said array of stitches and to cause said blade actuating means to generate slidable movement between said first and second blade mounting means such that each said pair of blade means straddles and severs one said array of stitches, and after which said positioning means moves said frame means away from each said array of stitches.

4,421,046

**THREAD CUTTER ASSEMBLY IN SEWING MACHINE**  
Minoru Morita, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

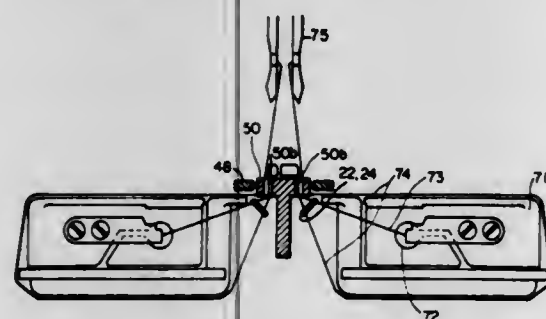
Filed Feb. 20, 1981, Ser. No. 236,413

Claims priority, application Japan, Feb. 21, 1980, 55-20857; Nov. 21, 1980, 55-164864

Int. Cl.<sup>3</sup> D05B 65/00

U.S. Cl. 112—292

21 Claims



1. A thread cutter mechanism for a two-needle sewing machine comprising first and second cutter assemblies, one of said cutter assemblies being disposed on each side of a feed dog of said sewing machine, each of said assemblies comprising:

a movable edge reciprocally mounted with respect to said stationary edge for cutting a needle thread and a bobbin thread when engaged with said stationary edge, said movable edge and said stationary edge being mounted slantingly with respect to a horizontal plane so that first ends of said stationary edge and said movable edge are higher than second ends thereof in a vertical section perpendicular to the direction of movement of said movable edge;

a rotary hook assembly;

a thread cutting cam coupled to be driven in response to rotation of a rotary shaft securing said rotary hook assembly, said rotary shaft being adapted to drive said rotary hook assembly;

a thread cutting link mechanism comprising a movable edge mounting plate to which said movable edge is fixedly secured, a guide for supporting and guiding said movable edge mounting plate in a plane parallel to a direction of movement of a feed dog of said sewing machine and with said movable edge disposed between said feed dog and said movable edge mounting plate, and an end portion on which a cam follower engageable with said thread cutting cam is provided, said thread cutting link mechanism being operatively coupled for driving said movable edge in response to movement of said thread cutting cam; and engagement control means for controlling the engagement and disengagement of said thread cutting cam and said cam follower according to a thread cutting instruction.

4,421,047

**UPPER FEED DOG DEVICE**

Adriano Alberti, Pavia, Italy, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 9, 1981, Ser. No. 319,858

Claims priority, application Italy, Jun. 2, 1981, 22098 A/81

Int. Cl.<sup>3</sup> D05B 27/06

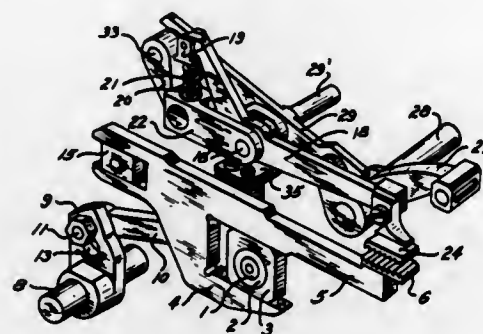
U.S. Cl. 112—311

6 Claims

1. An upper feed dog device for sewing machines of the type having a needle, pressure foot, trimming blade and a main feed bar for supporting and moving a main lower feed dog through

a rectangular pathway and an oscillatably driven shaft for controlling the machine's trimming blade and presser foot, said upper feed dog device comprising:

- (a) a support (35) fixed on and for movement with the main feed bar;
- (b) an upper feed dog carrier arm (18) pivotably mounted on said support (35) having:
  - (i) an upper feed dog (24) fixed on one end thereof;



- (c) a control arm (22) pivotably mounted on said support (35) adjacent said upper feed dog carrier arm (18);
- (d) means connected to one end of said control arm (22) for oscillating the same on said support (35); and
- (e) means for transmitting the oscillating movement of said control arm (22) to said upper feed dog carrier arm (18) for actuating said upper feed dog (24).

4,421,048

**SITU INCINERATION/DETOXIFICATION SYSTEM FOR ANTIFOULING COATINGS**

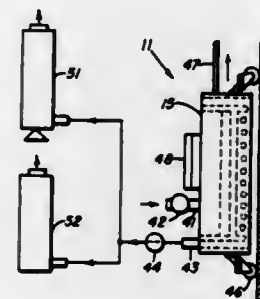
Carl M. Adema, Mayo, and Paul Schatzberg, Annapolis, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1981, Ser. No. 313,557

Int. Cl.<sup>3</sup> B63B 59/06

U.S. Cl. 114—222

12 Claims



1. A method of removing and detoxifying organotin antifoulants from marine antifouling coatings having a thickness of between about six and fifteen mils comprising the steps of:

moving an infrared heating unit across an antifouling coating region of the hull surface so that a power density is applied to the coating region of between about 110 watts/square centimeter and about 140 watts/square centimeter for between about 7.5 seconds to about 4.0 seconds respectively, thereby raising the temperature of the coating above 800° F.;

collecting the gasses and vapors given off from the heated coating region; and

treating the collected gasses and vapors to remove toxic substances therefrom prior to passing the collected gasses and vapors to the environment.

4. An electrical paint stripping apparatus for removing organometallic antifouling coatings from a ship surface comprising:

- a housing designed to be supported adjacent to the coated surface;
- a heating chamber formed in the housing and having an

opening therefrom so that heat generated in the heating chamber is directed toward the coated surface;

- a plurality of elongated electrical heating elements positioned in the heating chamber in spaced apart relationship for generating a power density within the chamber above 110 watts per square centimeter;
- a plenum chamber formed in the housing for supplying cooling air to the electrical heating elements;
- a ceramic separator element positioned between the plenum chamber and the heating chamber for reducing the transfer of thermal energy therebetween and for reflecting thermal energy into the heating chamber, the ceramic separator element is provided with a plurality of passages extending therethrough for permitting the flow of cooling air from the plenum chamber to the heating elements in the heating chamber;
- a plurality of elongated tubular mounting brackets projecting through the separator element for supporting the end portions of the elongated heating elements and for supplying cooling air to the heating elements in the heating chamber;
- an air inlet connected to the housing and communicating with the plenum chamber;
- blower means connected to the air inlet for supplying air to the plenum chamber;
- a circumferential exhaust chamber surrounding the heating chamber and communicating therewith for receiving exhaust gasses from the heating chamber;
- an exhaust conduit connected to the exhaust chamber;
- an exhaust blower means connected to the exhaust conduit for drawing exhaust gasses from the exhaust chamber; and
- an exhaust gas treatment means connected to the exhaust conduit for treating the exhaust gasses to remove toxic substances therefrom prior to passing the gasses to the environment.

4,421,049

**SUBMERGED DEVICE, CARRYING OCEANOGRAPHY APPARATUSES, WITH AUTOMATIC DEPTH CONTROL**  
Jacques Cholet, L'Etang la Ville, France, assignor to Institut Français du Pétrole, Rueil-Malmaison, France

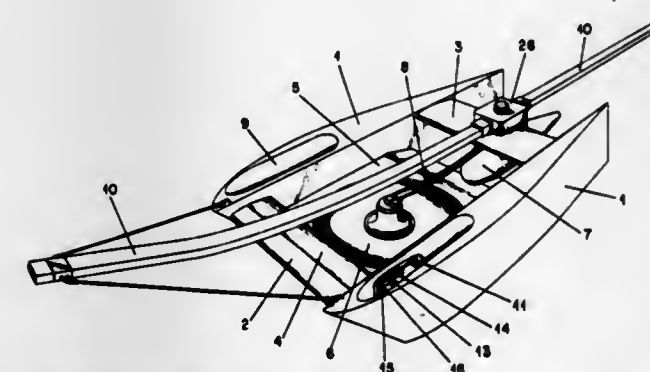
Continuation of Ser. No. 925,243, Jul. 17, 1978, abandoned. This application Oct. 27, 1980, Ser. No. 200,867

Claims priority, application France, Jul. 18, 1977, 77 22182

Int. Cl.<sup>3</sup> B63B 21/56

U.S. Cl. 114—245

12 Claims



3. A support device for carrying at least one oceanography apparatus, said support device adapted for being towed from a ship at an automatically controlled submerged depth and having connecting means for being connected to the ship, said support device comprising:

at least one assembly of two spaced apart closed hulls, said hulls extending longitudinally parallel and connected to each other, said hulls having a greater volume top portion for providing said support device with a center of buoyancy substantially above its center of gravity and having its greatest width at the top portion thereof and tapering downwardly and rearwardly to have a smaller volume and lesser width, relative to said top portion, at the lower

and rearward portion thereof, said top portion being substantially flat at the top surface thereof;

a first connecting element located between said two spaced apart hulls at the front thereof connecting said two spaced apart hulls together, said first connecting element having a substantially airfoil shape and comprising a first front portion and a second rear portion with the first portion being fixed and the second portion being pivotally connected for pivotal movement about its connecting axis for varying the submerged depth of said support device;

control device means mounted in each of said two hulls and connected to said first connecting element for automatically controlling the pivotal movement of said second rear portion of said first connecting element;

at least one secondary connecting element having a substantially airfoil shape for stabilizing said support device and reducing drag thereon when being towed; and

said connecting means located toward the rear of said support device relative to said at least one secondary connecting element for being connected to a single line, said single line being a single unit containing control lines therein for simultaneously controlling said at least one oceanographic apparatus and towing said support device.

4,421,050

**CARGO TORPEDO**

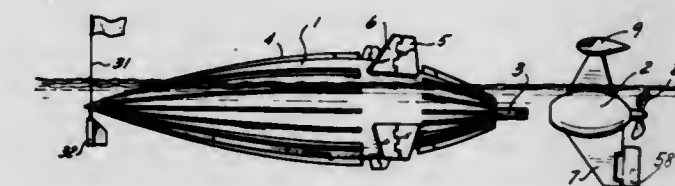
Friedrich Weinert, 219-19131st Ave., Jamaica, Queens, N.Y. 11413

Continuation-in-part of Ser. No. 273,457, Sep. 23, 1970, abandoned. This application Jul. 19, 1982, Ser. No. 399,497

Int. Cl.<sup>3</sup> B65D 89/10

U.S. Cl. 114—256

3 Claims



1. A cargo vessel system comprising a floating semi-submerged hull and a prime mover vessel; said hull being rotatable about its longitudinal axis and including stud means centralized at the stern thereof; said prime mover vessel including an opening at its bow adapted to mately receive said stud means to couple said hull to said prime mover vessel; said rotatable hull including a plurality of remote-controlled fins installed around the circumference of the hull; and control means for selectively adjusting the angle of attack of said fins such that in a first position the fins create a turning moment to rotate the hull by the forward motion of the hull while in a second position the fins create a stabilizing force to prevent the hull from rotating.

4,421,051

**AUXILIARY BOOM FOR EMERGENCY EVACUATION**  
Dillard S. Hammett, Dallas, Tex., assignor to Sedco, Inc., Dallas, Tex.

Filed Oct. 29, 1979, Ser. No. 88,761

Int. Cl.<sup>3</sup> B63B 35/00

U.S. Cl. 114—264

12 Claims

1. A method for erecting a temporary walkway between a marine service vessel equipped with a revolving crane having a main boom and an offshore oil platform comprising the steps of:

attaching a first walkway to said main boom;

mounting an extendable, articulating auxiliary boom to said main boom, said auxiliary boom including an extendable walkway;

maneuvering said service vessel into a position proximate said drilling platform;

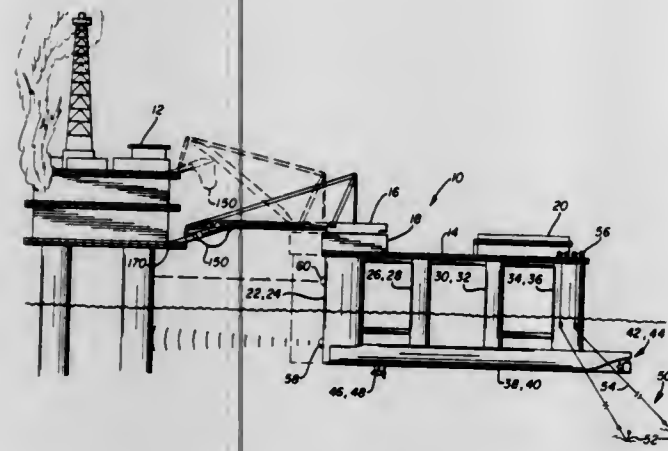
positioning said auxiliary boom on said platform while sub-



stantially maintaining the position of said service vessel with respect to said platform.

2. A self-propelled vessel for servicing an offshore oil platform comprising:

- means for maintaining said vessel at a predetermined position with respect to said platform;
- a revolving crane mounted on said vessel for rotation about a vertical axis, said crane including a base and a main boom pivotally mounted for rotation about a horizontal axis;
- an auxiliary boom mounted on said main boom and including means permitting articulation of said auxiliary boom with respect to said main boom;



said auxiliary boom comprising an articulating section having a pair of pivotally-connected subsections, and an adjoining section operably engaging said articulating section, and capable of translating with respect thereto;

first walkway means forming a passageway for personnel on said main boom; and

second walkway means forming a passageway for personnel on said auxiliary boom and cooperating with said first walkway means to form a passageway for personnel between said vessel and said platform when the auxiliary boom is rested on the platform.

4,421,052

#### TIRE PRESSURE SIGNALLING DEVICE

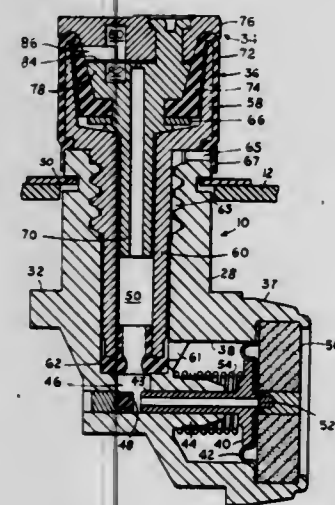
Edward J. Cook, South Hamilton, Mass., assignor to Safety Research & Engineering Corp., North Reading, Mass.

Filed Jun. 9, 1980, Ser. No. 157,897

Int. Cl.<sup>3</sup> B60C 23/04

U.S. Cl. 116—34 R

5 Claims



1. A tire pressure warning device for use with a wheel having a pneumatic tire mounted thereon, comprising:
  - (a) a body mountable to said wheel and formed with a cylindrical chamber the axis of which is perpendicular to the radius of said wheel when mounted thereto,

- (b) said body mountable to said wheel with at least a portion thereof exterior to said wheel,
- (c) a piston mounted to said chamber for movement along said axis and responsive to pressure in said tire,
- (d) an acoustical signal generating means in said body and communicating with said exterior portion of said body,
- (e) conduit means in said device forming an air flow passage from the interior of said tire to said signal generating means, one portion of said passage being generally parallel to said axis and another portion being perpendicular thereto,
- (f) said piston being operatively associated with said conduit means and adapted to close said passage at different tire pressure conditions and to open said passage at another operative position related to an abnormal tire pressure condition,
- (g) resilient means operatively associated with said piston and urging said piston into one of the closed positions thereof,
- (h) said acoustical signal generating means being formed with at least one outlet port in the exterior portion of said body for the emission of an acoustical signal therefrom, and,
- (i) a resilient cap mounted to said body, said cap including one portion fixed to said body and another portion movable with respect to said one portion and to said body, said other portion normally covering said outlet port and movable away from said port in response to the flow of air in said passage and returning to cover said port when said flow of air is stopped.

4,421,053

#### TWO-STAGE POP UP THERMOMETER

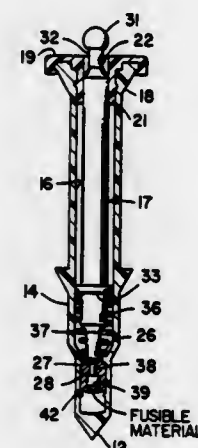
Anthony J. Volk, P.O. Box 943, Turlock, Calif. 95380

Filed Dec. 18, 1981, Ser. No. 331,985

Int. Cl.<sup>3</sup> G01K 11/06

U.S. Cl. 116—218

9 Claims



1. An improved disposable cooking thermometer comprising:
  - an elongated barrel having a central longitudinal bore with an open rear end and a closed front end,
  - said barrel having a reduced interior cross-section adjacent the front end thereof forming a neck separating a front internal cavity from the remainder of the bore with said neck having a lesser cross-sectional opening than said bore and cavity and said neck tapering laterally outwardly to said cavity,
  - an elongated indicator stem having a flange and slidably disposed substantially entirely within said barrel and having a first reduced stem portion below said flange and a second reduced stem portion below said first stem portion and terminating in an enlarged portion at an inner stem end that is disposed entirely within said cavity abutting the inner end thereof,
  - a spring within said barrel engaging said flange on said stem

and an internal shoulder for urging said stem from the rear end thereof, and

a fusible material having a predetermined melting temperature disposed in said barrel cavity about said inner stem end and the second reduced cross-section of said stem for holding said stem in said barrel until said fusible material reaches a predetermined temperature whereat said stem is extended from the rear end of the barrel.

4,421,054

#### APPARATUS FOR PREVENTING SURFACE BLEMISHES ON ALUMINUM-ZINC ALLOY COATINGS

Anthony J. Stavros, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

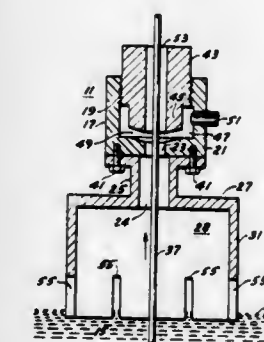
Division of Ser. No. 139,607, Apr. 11, 1980, Pat. No. 4,310,572.

This application Oct. 13, 1981, Ser. No. 310,596

Int. Cl.<sup>3</sup> B05C 11/06

U.S. Cl. 118—63

14 Claims



1. An improved apparatus for wiping and protecting linear material passing from a molten metallic aluminum-zinc coating bath comprising:

- (a) a gas wiping die which wipes the linear material as it passes from the molten bath with a protective non-oxidizing gas,
- (b) a containment means for protective gas surrounding the linear material as it leave the molten bath and positioned adjacent to the gas wiping die such that protective non-oxidizing gas is discharged from the gas wiping means into the containment means, and
- (c) orifice means in the containment means adjacent to the surface of the molten bath through which protective gas is discharged from the containment means carrying with it metallic zinc particles which might otherwise settle upon the surface of the molten bath within the containment means.

4,421,055

#### APPARATUS FOR TREATING FILTER MATERIAL

Hugh M. Arthur, High Wycombe, England, and Francis A. M. Labbe, Neuilly-sur-Seine, France, assignors to Molins Limited, London, England

Filed Jul. 16, 1980, Ser. No. 169,358

Claims priority, application United Kingdom, Jul. 17, 1979, 7924869

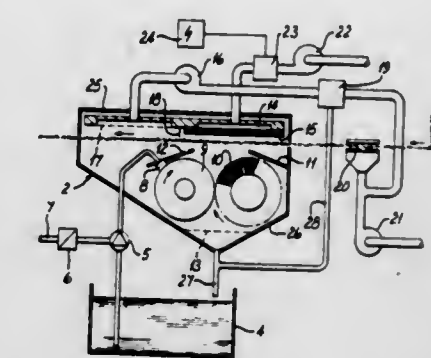
Int. Cl.<sup>3</sup> B05C 5/00, 15/00

U.S. Cl. 118—620

27 Claims

1. Apparatus for treating filter material, including means defining a path for filter tow, a chamber through which said path passes, means for supplying fluid additive including means for directing additive towards the path for the tow in a first direction in said chamber, means for causing an air flow to direct additive towards the tow in a second direction in said chamber, said air flow means comprising an intercepting plate located closely adjacent to and extending substantially across the entire width of said tow path, said plate being air permeable

and forming the boundary of an air pressure manifold, whereby said plate is arranged to intercept fluid additive



which has penetrated the tow and to diffuse said air flow to disperse and propel said intercepted additive towards the tow.

4,421,056

#### NOZZLE FOR APPLYING A LIQUID TO THE INTERMEDIATE IMAGE CARRIER OF AN ELECTROPHORETIC PRINTER

Franz Schlinke, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

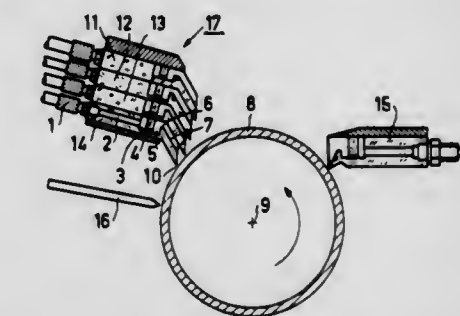
Filed Mar. 11, 1982, Ser. No. 357,246

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111893

Int. Cl.<sup>3</sup> G03G 15/01

U.S. Cl. 118—645

8 Claims



1. An apparatus for applying liquid to an intermediate image carrier of an electrophoretic printer comprising the combination of an intermediate image carrier of an electrophoretic printer, said image carrier being movable in a given direction, a nozzle for applying liquid, in particular a toner suspension or a cleaning liquid, to a surface of said image carrier, said nozzle comprising inlet means for said liquid and discharge means for said liquid, the discharge means having a width larger than the diameter of the inlet means, said nozzle being positioned sufficiently close to said image carrier so as to provide a narrow gap (10) between said nozzle and said surface, and at least one electrode positioned in the vicinity of the surface of said image carrier for applying a static charge to said surface prior to the application of liquid from said nozzle to said surface, characterized in that said nozzle comprises, viewed in the direction of the movement to said surface; an inlet means for receiving liquid from a supply thereof, a front chamber (3), having a width corresponding to the width of the intermediate image carrier for receiving liquid from said inlet means, passage means for providing access for flow of said liquid between said inlet means and said front chamber (3), a rear chamber (5), having a width corresponding to the width of the intermediate image carrier located in front of said front chamber (3) in the direction of said liquid flow, a plurality of bore means (4) for providing access for flow of said liquid from said front chamber (3) to said rear chamber (5), the diameter of each of said bore means (4) being smaller than the widths of said chambers, said rear chamber (5) being situated near said discharge means and separated from said discharge means by a raised overflow



edge (6), the height of said overflow edge (6) being higher than that of said bore means (4), said discharge means comprising an inclined surface (7) extending from said rear chamber (5) in the direction of said surface of said image carrier and terminating sufficiently close to said surface to provide a narrow gap (10) between said surface of said intermediate image carrier and said inclined surface (7), and each of said front chamber (3), said rear chamber (5), said overflow edge (5) and said inclined surface (7) extending across the entire width of the surface of said intermediate image carrier.

4,421,057

# DEVELOPING APPARATUS FOR ELECTROSTATIC IMAGE

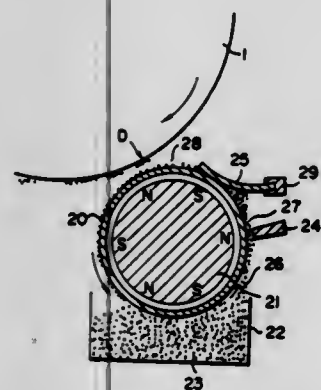
Nagao Hosono, Shizuoka; Koichi Kinoshita, Narashino, and Toru Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 261,771, May 28, 1981, Pat. No. 4,386,577, which is a continuation of Ser. No. 938,494, Aug. 31, 1978, abandoned. This application Jan. 18, 1982, Ser. No. 340,464 Claims priority, application Japan, Sep. 10, 1977, 52-109240; Sep. 10, 1977, 52-109241

Int. Cl.<sup>3</sup> G03G 15/09

U.S. Cl. 118—657

3 Claims



1. A developing apparatus for developing with power developer, comprising:

a movable developer supporting member provided in facing relationship with a movable image carrying member in a developing station; and

means for forming a thin layer of powder developer on said movable developer supporting member;

the image carrying member and said developer supporting member being spaced apart in the developing station by a predetermined distance, said developer supporting member and the image carrying member being moved in the developing station in the same direction and at substantially the same peripheral speeds, and said forming means having a magnetic field generating means and a developer limiting member opposed to such magnetic field generating means and located within the range of the magnetic field therefrom, said forming means being effective to form the developer layer with a thickness smaller than said predetermined distance between the image carrying member and said developer supporting member in the developing station.

4,421,058

# CAT PORTS

Graham R. Paul, 29 Haliburton Rd., Twickenham, Middlesex, England

Filed Mar. 7, 1979, Ser. No. 18,009

Claims priority, application United Kingdom, Mar. 8, 1978, 9164/78; May 30, 1978, 9164/78

Int. Cl.<sup>3</sup> E06B 3/32

U.S. Cl. 119—19

8 Claims

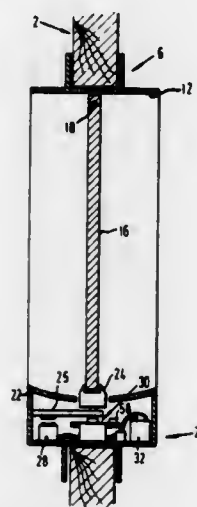
1. A cat port comprising:

(a) a framework defining an opening through which a small

animal must pass to gain access to, or exit from a designated area, and

(b) a flap mounted on the frame within said opening for pivotal movement in both directions from a closed position in which the flap substantially closes the opening, the cat port comprising means for controlling movement of the flap from its closed position, said means comprising:

(i) catch means mounted on the frame and which is movable between an operative position in which it restrains pivotal movement of the flap in at least one of said directions and an inoperative position in which such pivotal movement is permitted, and



(ii) operating means mounted on the frame and which may be rendered operative under the action of a first permanent magnet carried by the small animal on movement thereof into close proximity with the cat port to move the catch means to its inoperative position, said operating means comprising a reed switch mounted on the frame, a second permanent magnet mounted adjacent to said switch, the relative dispositions of the reed switch and the second permanent magnet being adjustable to vary the operating threshold of the switch and there is provided a re-setting means to render the reed switch inoperative subsequent to activation of said switch.

4,421,059

# AUTOMATIC CAT FEEDER

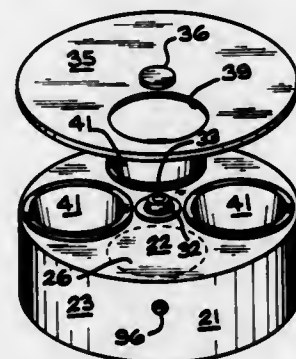
Bernard A. Cousino, Fort Myers, Fla., assignor to Cousino Corporation, Ft. Myers, Fla.

Filed Dec. 21, 1981, Ser. No. 332,660

Int. Cl.<sup>3</sup> A01K 5/02

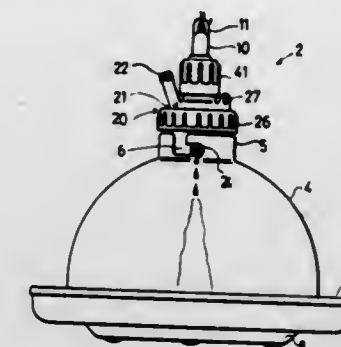
U.S. Cl. 119—51.12

1 Claim



1. A cat feeder, comprising, a housing having a top, said top defining a plurality of spaced feed positions, feed cups located at said spaced feed positions, a rotatable cover overlying such top and having a feed opening for indexing with one of said feed positions, a drive member connected to said cover for sequentially rotating said cover at predetermined time intervals, said drive member includes a plurality of radially spaced stops and said control means includes a solenoid assembly

having a plunger arm which engages said stops, whereby actuation of said solenoid disengages said plunger arm from said stop allowing rotation of the drive member and the cover, spring means for rotating said drive member, said spring means comprise a pair of tension springs operatively connected to said drive member, control means for actuating said spring means, and said control means includes a timer for actuating said solenoid at predetermined time intervals, sound means operatively connected to said drive member whereby said sound is actuated upon rotation of said drive member and said cover, said control means includes a battery power supply, a switch assembly mounted adjacent said drive member and a switch actuator on said drive member for engagement with said switch assembly, whereby upon rotation of said cover to the last feed position, said switch actuator engages said switch assembly to open the electrical circuit to said battery power supply.



attachment and detachment of said bowl with respect to this hanger assembly.

4,421,060

# NIPPLE WATERER

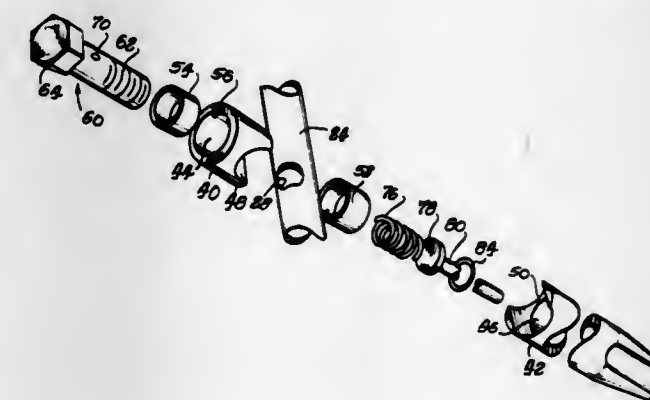
Don R. Frush, Warsaw, Ind., and Keith B. Coffman, Harrisonburg, Va., assignors to Chore-Time Equipment, Inc., Milford, Ind.

Filed Sep. 23, 1981, Ser. No. 304,843

Int. Cl.<sup>3</sup> A01K 7/06, 39/04

U.S. Cl. 119—72.5

17 Claims U.S. Cl. 122—1 R



12. A watering system including a tubular manifold having a hollow interior and a valve waterer for interfitting with the tubular manifold, the valve waterer including two body elements, each body element having an arcuate face adapted to engage the tubular manifold, fastener member means extending through one body element, through the tubular manifold and manifold interior, and into another body element for drawing the valve elements toward one another around the tubular manifold, at least one fluid flow path being defined in the fastener member and extending from the tubular manifold interior to the interior of one body element for delivering fluid from the manifold interior to that body element.

4,421,061

# SUSPENSION-TYPE POULTRY DRINKING FOUNTAIN

Yair Shomer, Kibbutz Maagan Michael D.N. Menashe, Israel, assignor to Plasson Maagan Michael Industries Ltd., Kibbutz Maagan Michael, D.N. Menashe, Israel

Filed Aug. 30, 1982, Ser. No. 412,896

Claims priority, application Israel, May 14, 1982, 65778

Int. Cl.<sup>3</sup> A01K 7/00

U.S. Cl. 119—81

14 Claims

1. A suspension-type poultry drinking fountain comprising a hanger assembly adapted to be supported in suspension, and a bowl supported by said hanger assembly and containing a water trough for receiving water to be made available for drinking by the poultry; characterized in that said hanger assembly comprises a water inlet and a tubular water outlet projecting laterally of the hanger assembly, and the upper end

of said bowl includes a slot forming with said tubular water outlet a bayonet-pin-and-socket connection permitting quick

6. A well effluent heat treating system including a well effluent tank, a heat exchange fluid tank, heat exchange means including a closed loop liquid flow path having heat exchange means in each of said tanks, gas pressure operated pump means for pumping a heat exchange liquid through said flow path, gas burner means for said heat exchange fluid tank, well pressurized gas supply means, first gas delivery means operatively connecting said gas supply means to said pump through a thermostat valve operative to sense the need for heating said well effluent tank, a gas burner for heating said heat exchange fluid tank, second gas delivery means for supplying gas being discharged from said pump to said burner and including a gas operated control valve and third gas delivery means for delivering gas from said supply means to said control valve, said third gas delivery means including a thermostat operated valve responsive to a demand for heating said heat exchange fluid tank.

11. The method of treating well effluent including oil, water and gas supplied to a closed effluent tank including a gas outlet, said method including providing a heat transfer liquid tank and a closed heat transfer liquid loop flow path including heat exchange portions disposed within said effluent tank and heat transfer liquid tank, pumping a heat transfer liquid through said flow path responsive to a demand for heating said effluent tank and through the utilization of a gas pressure eductor pump serially connected into said flow path, separating the eductor pump gas discharge from the heat transfer liquid within said flow path and communicating said gas discharge with a burner means for heating said heat transfer liquid tank through a gas operated control valve to which gas is supplied from said gas



discharge through a thermostat operative to sense a need for heating said heat transfer liquid tank.

4,421,063

**FLUIDIZED BED COMBUSTION APPARATUS**

Ronald B. Stuart, Dalbeattie, and Alan G. Troup, Annan, both of Scotland, assignors to Northern Engineering Industries plc, Newcastle upon Tyne, England

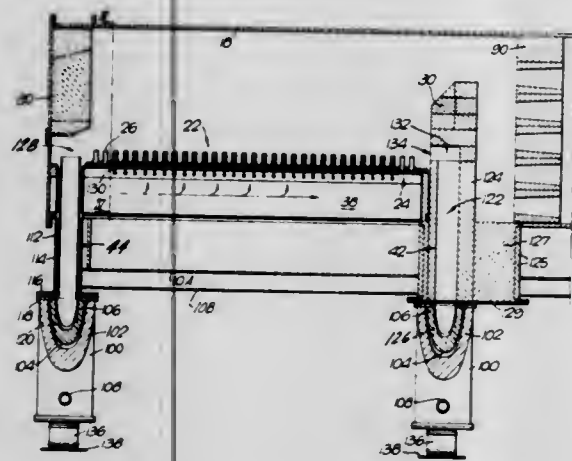
Filed Nov. 27, 1981, Ser. No. 325,599

Claims priority, application United Kingdom, Jan. 9, 1981, 8100563

Int. Cl.<sup>3</sup> F23C 11/02

U.S. Cl. 122—4 D

4 Claims



1. Fluidised bed combustion apparatus comprising a horizontal furnace duct, containment means within said duct, particulate inert fluidisable bed material forming a fluidisable bed in said containment, first means operable to feed particulate solid fuel to said bed in said containment means through a first upstream end of said duct, second means operable to feed air into said bed to fluidise the same, a combustion chamber into which said duct opens at a second downstream end thereof, horizontal firetubes conducting gaseous products of combustion of said fuel from said combustion chamber outside said duct, said firetubes and said combustion chamber forming with said duct a path for gas leaving said containment, said containment comprising a base for supporting said bed, said second means comprises nozzles upstanding from said base, each said nozzle defining fluidizing fluid outlets therefrom within said containment but spaced above said base thereof, whereby material of said bed only in an upper zone thereof extending above said fluid outlets is fluidized and material of said bed in a lower zone thereof intermediate said upper zone and said base and overlying the latter is left quiescent, first conduit means which have open upper end means in said containment above said base and which pass downwardly out of said duct, means operable to conduct coolant water in non-contacting heat-exchange relationship with material removed from said bed by said first conduit means, second conduit means leading from said path downstream of said containment, screening mechanism to which said first and second conduit means lead, conveyor means in material receiving relationship with said screening mechanism, said mechanism being operable to separate materials into a first class of relatively larger particles and a second class of relatively smaller particles including inert bed material and to convey said second class back to said containment.

4,421,064

**HEATING BOILER**

Alpo S. Lehtinen, Tanokas, 32610 Vampula, Finland  
Filed Oct. 23, 1981, Ser. No. 314,739

Claims priority, application Finland, Oct. 27, 1980, 803363

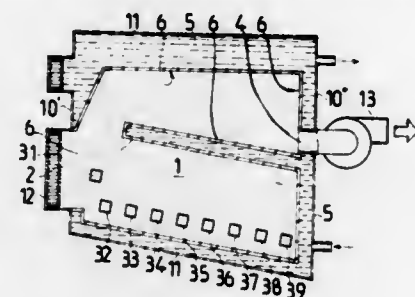
Int. Cl.<sup>3</sup> F22B 31/04

U.S. Cl. 122—15

3 Claims

1. A heating boiler comprising top, bottom, front, rear and side walls, at least certain of said walls being formed to retain

water to be heated, said walls defining a combustion chamber for receiving fuel to be burned therein and said front wall having an aperture and cooperating door for introducing said fuel into said chamber, a flue communicating with said combustion chamber, air guiding means for introducing air into said chamber for burning of said fuel, and means for operating said air guiding means for displacing the point of air entry into said combustion chamber to effect burning of said fuel in successive zones at predetermined time intervals, said air guiding means comprising a plurality of apertures in at least one wall of said boiler spaced throughout the length of the fuel combustion zone of said chamber and the last said means including valves



coupled with each of said apertures and means for successively opening and closing each of said apertures in succession to effect burning of said fuel in successive zones throughout the length of the combustion zone, the last said means being operable to first deliver air to the first of said apertures at one edge of the combustion zone, then after the fuel adjoining said first aperture is burned the last said means opens the valve controlling the air to the second aperture and when maximum air flow through the second aperture is achieved the last said means closes the first aperture and the operation of the last said means continues in like manner until burning has been proceeded throughout the combustion zone.

4,421,065

**HEATING EQUIPMENT FOR AN INSTALLATION USING STEAM AND HEATED GAS**

Jean Tillequin, Paris, France, assignor to Creusot-Loire, Paris, France

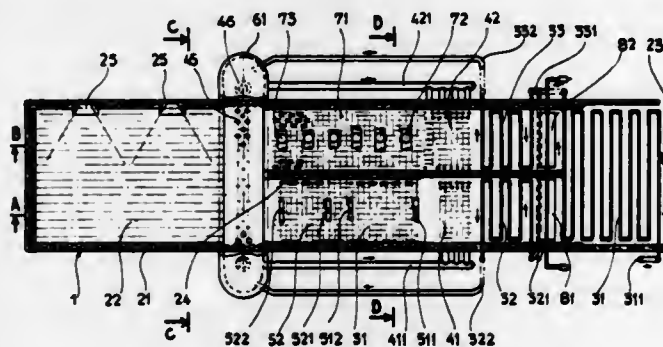
Continuation of Ser. No. 100,219, Dec. 4, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,630

Claims priority, application France, Dec. 6, 1978, 78 34357

Int. Cl.<sup>3</sup> F22B 7/00

U.S. Cl. 122—155 R

11 Claims



1. Heating apparatus for use with an installation using steam and hot gas and including a combustion chamber (22) out of which waste gases pass which circulate within an enclosure (21) and during their passage provide heating of a bundle of vaporizer tubes (41, 42, 45), which supply water vapor to a bundle of super-heating tubes (51, 52) which provide super-heated steam and a bundle of tubes (71) in which a gas furnished by an exterior source of gas circulates, said vaporizer tubes (45) being located upstream of said bundle of tubes (71), said apparatus comprising a partition (24) which divides said enclosure into two chambers so as to separate two flows of

waste gases, one of said chambers containing said bundle of tubes (71) in which said gas circulates and the other of said chambers containing at least one bundle (51, 52) of super-heating tubes which are supplied with dry steam damper means (81, 82) being provided on each side of said partition for controlling the flow of the waste gases through each of said chambers.

4,421,066

**HIGH EFFICIENCY BOILER**

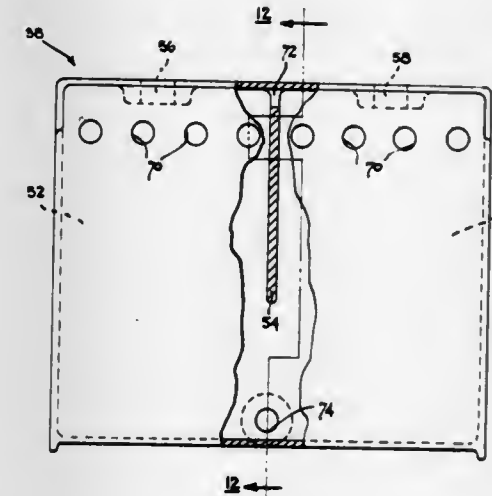
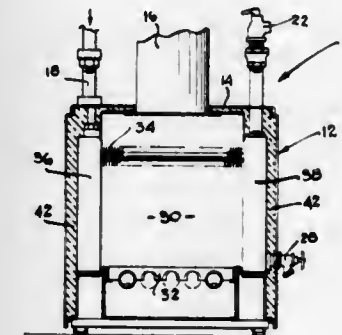
Manochehr Gordbegli, Santa Ana, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 16, 1982, Ser. No. 348,934

Int. Cl.<sup>3</sup> F22B 15/00

U.S. Cl. 122—264

1 Claim



1. A boiler comprising a housing; a combustion chamber in the housing; a burner situated at the bottom of the chamber; a horizontal heat exchanger including a plurality of hollow tubes positioned horizontally within the chamber; a first vertical heat exchanger including a water reservoir and positioned to form a first vertical wall of the combustion chamber and further including a hollow body which extends from a first end of the hollow tubes to the burner, a vertical partition wall within the body which extends the length of the body to divide the interior of the first vertical heat exchanger into first and second cavities, and means for connecting the first end of some of the hollow tubes to communicate with the first cavity and the first end of the remainder of the hollow tubes to communicate with the second cavity; and a second vertical heat exchanger including a water reservoir and positioned to form a second vertical wall of the combustion chamber and further including a hollow body which extends from a second end of the hollow tubes, means for connecting the second ends of the hollow tubes to communicate with the interior of the second vertical heat exchanger, a second vertical partition wall within its hollow body which extends a portion of the length of the body to divide the second vertical heat exchanger into two cavities which communicate with each other, where the second vertical partition wall extends from the top of the hollow body a length sufficient to ensure that a substantial amount of water flowing into one of the cavities reaches the bottom of the hollow body before entering the other cavity, and further includes a slot through the second vertical partition wall adjacent the top of the hollow body to permit the rapid escape of trapped air from the boiler.

4,421,067

**APPARATUS AND METHOD FOR SOOT CLEANING IN HIGH-PRESSURE HEAT EXCHANGERS**

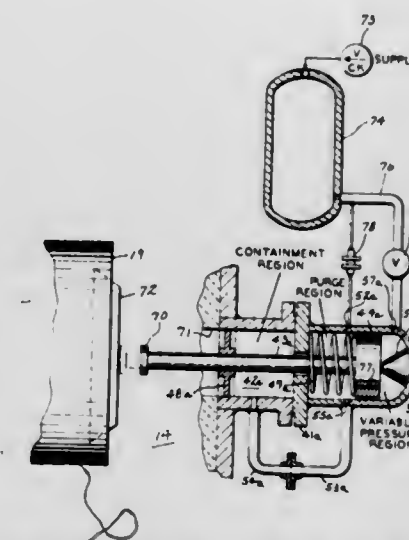
Robert J. Krowech, Minneapolis, Minn., assignor to Deltak Corporation, Minneapolis, Minn.

Filed Sep. 7, 1982, Ser. No. 415,318

Int. Cl.<sup>3</sup> F22B 37/52; F28G 9/00

U.S. Cl. 122—390

20 Claims



1. Soot cleaning apparatus, which is operable with a source of a pressurized blowing medium, and which is adapted to seal an opening into a heat exchanger vessel, the opening leading into a chamber in which a heat transfer structure is positioned in a volume of a pressurized gas, the apparatus comprising:  
a movable cleaning head adapted to be positioned in the chamber proximate the heat transfer structure for dislodging soot therefrom during a cleaning operation in which the cleaning head is moved between a first position and a second position; and  
a pneumatic actuator adapted to be fixed to the vessel around the opening, the actuator having  
a pressure cylinder that communicates at one end with the vessel chamber,  
a piston disposed in the cylinder between a containment region that communicates with the vessel chamber, and a variable pressure region that is on an opposite side of the piston from the containment region,  
a connecting rod that couples the piston to the movable cleaning head, and  
means for admitting into the variable pressure region of the cylinder, for a timed interval, a blowing medium at greater pressure than the gas in the vessel chamber to generate a force that moves the piston through a forward stroke to move the cleaning head from its first position to its second position.

4,421,068

**OPTIMIZATION OF STEAM DISTRIBUTION**

Gurcan Aral, Cupertino, Calif., assignor to Measurix Corporation, Cupertino, Calif.

Filed Jul. 6, 1982, Ser. No. 395,408

Int. Cl.<sup>3</sup> F22B 37/46; F22D 5/00

U.S. Cl. 122—448 B

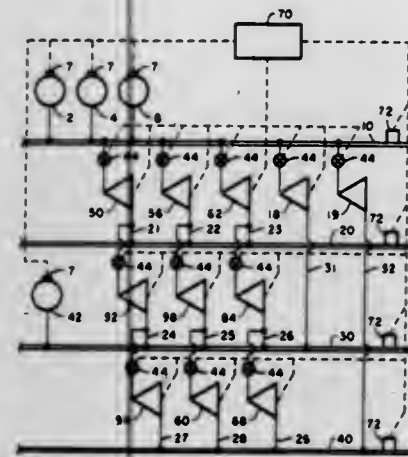
5 Claims

1. A process for controlling a steam generation and distribution system which includes a plurality of headers, each of said headers being coupled to steam-using devices which create demands for steam; supply means for supplying steam to each of the headers; and steam transferring devices to transfer steam between headers so that a plurality of paths is formed between the headers, the process comprising:

- measuring the pressure at each header;
- when the pressure changes from a first predetermined pressure at a first header,



- (i) identifying each path beginning at said first header and terminating at a steam supply means;
- (ii) identifying each transfer means included in each said path;
- (iii) determining the incremental cost associated with each transfer means and with the supply means in each said path;



- (iv) determining the alteration of selected transfer means and steam supply means in at least one of said paths required to restore the predetermined pressure in said first header at the least total incremental cost;
- (c) implementing the required alterations to restore the predetermined pressure in said header.

4,421,069

**DESUPERHEATER SPRAY LINER ASSEMBLY**

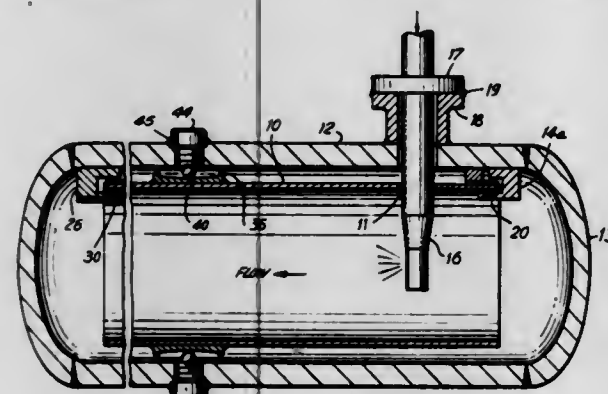
Joseph P. Diggins, Coraopolis, Pa., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sep. 7, 1982, Ser. No. 415,624

Int. Cl.<sup>3</sup> F22G 5/12

U.S. Cl. 122-487

15 Claims



1. A spray liner assembly supported within a pressurizable desuperheater header, comprising:

- (a) A cylindrical-shaped metal liner attached and axially retained at one end to a header inner wall by multiple circumferentially spaced support means;
- (b) multiple circumferentially spaced support means located at the opposite end of said cylindrical liner for slidably attaching the liner to said header inner wall; and
- (c) multiple radial support means located on opposite sides of said liner at an intermediate point along the length of the liner for providing an elastic inward loading to the liner.

4,421,070

**STEAM COOLED HANGER TUBE FOR HORIZONTAL SUPERHEATERS AND REHEATERS**

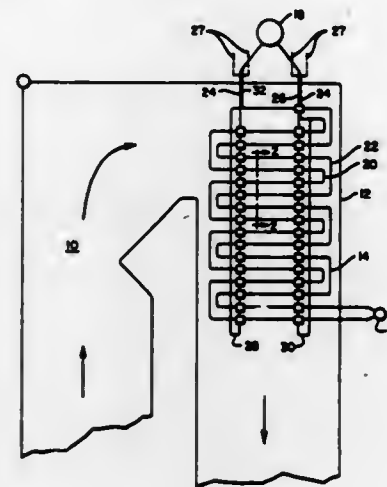
Robert P. Sullivan, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 25, 1982, Ser. No. 392,412

Int. Cl.<sup>3</sup> F22B 37/24

U.S. Cl. 122-510

2 Claims



1. In combination, a vertical gas pass through which hot gases flow, a heat exchanger including a first tube panel having serpentine tube means, each tube means having a plurality of first horizontal tube portions, said heat exchanger having a second tube panel having serpentine tube means, each tube means having a plurality of second horizontal tube portions which lie adjacent to and in the same horizontal planes as the first horizontal tube portions, the upper terminal ends of the serpentine tube means having first vertical runs extending downwardly to a point beneath the bottom of the serpentine tube means, and having U-bends at the bottom, and having second vertical runs, which bend at the top and are integral with and form the upper-most horizontal tube portions, lug means attached to opposite sides of some of the vertical runs, a plurality of band means encircling adjacent first and second horizontal tube portions, the ends of the band means being attached to the lug means, each band means being loose enough to permit relative movement between the two adjacent horizontal tube portions, and also permit relative movement between the vertical run and each of the horizontal tube portions.

4,421,071

**CONTROL METHOD AND CONTROL APPARATUS FOR OPERATING A REFORMED GAS GENERATOR AND AN INTERNAL COMBUSTION ENGINE CONNECTED THERETO**

Bernt Paul, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 15, 1978, Ser. No. 933,793

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2737072; Aug. 19, 1977, 2737531

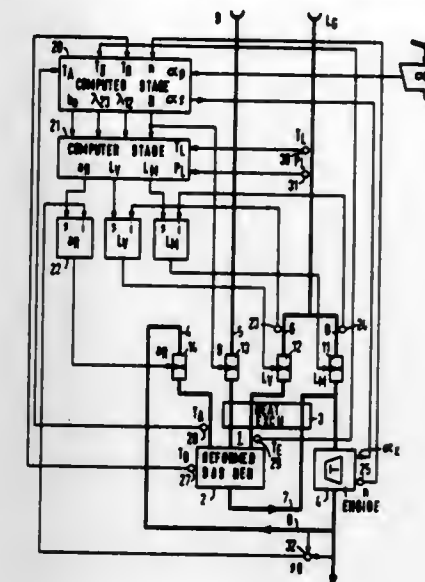
Int. Cl.<sup>3</sup> F02C 43/08

U.S. Cl. 123-1 A

24 Claims

1. In a method for operating a reformed gas generator, in which liquid fuel is reacted with primary air, at an elevated reactor temperature, to form a reformed gas, and an internal combustion engine connected thereto in which said reformed gas is burned with secondary air, wherein the supply of liquid fuel and total air and the ratio of the primary air stream to the secondary air stream are regulated under steady state conditions to values adapted to the steady state conditions, the improvement comprising, while operating under steady state conditions, after reaching normal operating temperature, upon an increase of the fuel supply, increasing, along with the in-

creased fuel supply, the ratio of the primary air stream to the secondary air stream for a short time, thereby increasing the



reactor temperature for said short time, corresponding the change in time of the fuel supply relative to the steady state condition.

4,421,072

**METHOD OF FEEDING CARBURETOR INTERNAL COMBUSTION ENGINE**

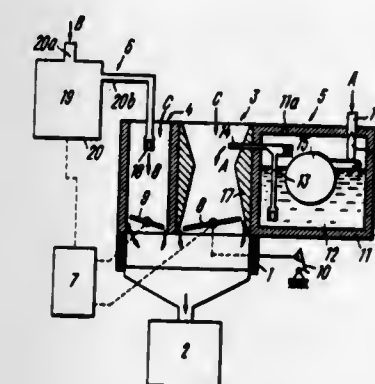
Anatoly I. Mischenko, ulitsa Lermontovskaya, 14/16, kv. 37; Gennady B. Talda, prospekt Gagarina, 38, kv. 89; Alexandr V. Belogub, Saltovskoe shosse, 250-a, kv. 468; Anatoly N. Podgorny, ulitsa Sumskaya, 118, kv. 14; Alexandr A. Makarov, ulitsa Balrora, 146, kv. 71; Anatoly T. Zhmerenko, ulitsa 2 Pyatiletki, 1b, kv. 81; Anatoly I. Domrachev, Saltovskoe shosse, 141b, kv. 36, and Petr K. Efremov, ulitsa Geroev Truda, 17, kv. 23, all of Kharkov, U.S.S.R.

Filed Dec. 30, 1981, Ser. No. 336,018

Int. Cl.<sup>3</sup> F02B 75/12, 7/02

U.S. Cl. 123-1 A

1 Claim



1. A method of feeding a carburetor internal combustion engine, which comprises forming a combustible mixture from the flow of a petrol-air mixture and the flow of a hydrogen-air mixture, feeding said combustible mixture to said engine, and controlling the quantities of said mixture components depending on the load on a shaft of said engine by varying the quantity of said petrol-air mixture and the quantity of and component proportions in said hydrogen-air mixture so that resulting combustible mixture fed to said engine contains (by weight %):

- at a full load
  - petrol—from 5.8 to 6.0
  - hydrogen—from 0.14 to 0.17,
  - air—from 93.7 to 94.0;
- at a load constituting 0.75 of the full load
  - petrol—from 4.3 to 4.7
  - hydrogen—from 0.19 to 0.22
  - air—from 95.2 to 95.5;

- at a load constituting 0.5 of the full load
  - petrol—from 3.1 to 3.2
  - hydrogen—from 0.25 to 0.29
  - air—from 96.4 to 96.7;
- at a load constituting 0.25 of the full load
  - petrol—from 1.8 to 2.0
  - hydrogen—from 0.37 to 0.40
  - air—from 97.6 to 97.8;
- at a load constituting 0.1 of the full load
  - petrol—from 1.2 to 1.5
  - hydrogen—from 0.42 to 0.45
  - air—from 98.1 to 98.4; and at loads lying between said values the quantities of the gasoline, hydrogen and air are varied to obtain quantities lying between said corresponding values.

4,421,073

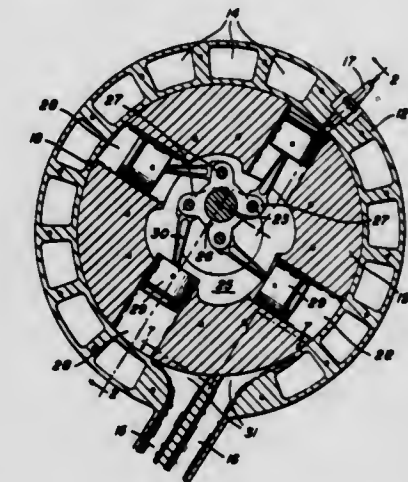
**ROTATING CYLINDER INTERNAL COMBUSTION ENGINE**Manuel Arregui, P.O. Box 495-8, Prince Albert, Saskatchewan Province, Canada; Rafael Diaz, 5 St. Charles St., Ile Bizard, Quebec Province, Canada H9C 1L3; Vicente Gamon, 25 - 1<sup>a</sup> D., and Javier Yarra, 4 - 3<sup>a</sup>, both of Irun S.S., Spain

Filed Dec. 14, 1981, Ser. No. 330,080

Int. Cl.<sup>3</sup> F02B 57/08

U.S. Cl. 123-43 R

8 Claims



1. An internal combustion rotary engine comprising: a casing defining a cylindrical chamber; a rotor rotatively mounted in the cylindrical chamber, defining a rotor axis, a central chamber and piston chambers communicating with said central chamber, each piston chamber having its longitudinal axis parallel to a radius of said rotor, an output shaft rotatably carried through the casing, freely extending in the central chamber of the rotor, and radially offset relative to the rotor axis; pistons operatively reciprocable in the piston chambers; connecting rods pivotally connected to the pistons and to connecting points carried by and uniformly radially spaced from the axis of said output shaft, bodily rotatable therewith, and angularly advanced in the direction of rotor rotation relative to virtual radial line connections between the axis of the output shaft and the pivotal connections of the connecting rods to the pistons; and a drive train drivingly coupling the output shaft to the rotor and operatively transmitting rotation to the latter and producing concurrent and synchronous rotation of the rotor with the output shaft.



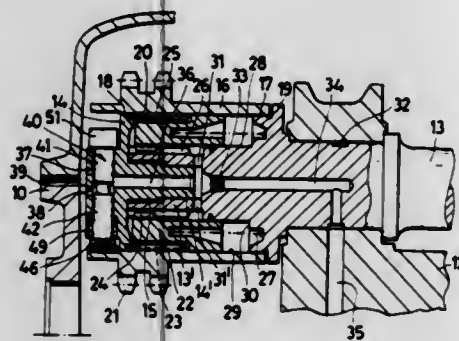
# 4,421,074 AUTOMATIC TIMING VARIATOR FOR AN INTERNAL COMBUSTION ENGINE

Giampaolo Garces; Ambrogio Banfi, both of Milan, and Michele L. Di Stefano, Limbiate, all of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

Filed Jul. 21, 1981, Ser. No. 285,614  
 Claims priority, application Italy, Jul. 31, 1980, 23841 A/80  
 Int. Cl.<sup>3</sup> F01L 1/34

U.S. Cl. 123—90.15

3 Claims



1. A timing variator for an internal combustion engine especially for motor vehicles, said internal combustion engine including intake valves, exhaust valves, two camshafts, a crankshaft, a lubricating circuit, said intake valves being controlled by one of said camshafts and said exhaust valves being controlled by the other of said camshafts, both of said camshafts being provided with a gear for their driving by said engine crankshaft and for their appropriate timing relative to said crankshaft, in the case of at least one of said camshafts the connection to the relative gear being made by means of a mobile drive member constituted by an annular piston seated in a cavity and provided with a first and a second splined coupling, said first splined coupling being engaged with a spline provided on said gear, said second splined coupling being engaged with a spline provided on said one camshaft, at least one of said splines of said two couplings having a helical extension, said one camshaft having an axis and said annular piston being able to undergo axial sliding in the direction of said camshaft axis, said sliding being limited by two limit stop surfaces disposed in an annular cavity between said one camshaft and said gear, said annular piston being urged into and maintained in a first of its two limiting positions by a piston spring having a preload, said cavity in which said piston is housed being in communication by way of a bore of predetermined size with said engine lubricating oil circuit, said cavity being in selective communication with the outside by way of a shut-off slide valve, said shut-off slide valve having a slide valve element which by moving in a direction normal to said camshaft axis can move from a first adjustment position to a second adjustment position and to a third adjustment position, said slide valve element being rigid with a mass which is eccentric to said camshaft axis, a first small spring and a second small spring each having a preload acting on said slide valve element in its sliding direction so as to urge it into its said first position if the rotational speed of the engine is less than a value  $n_1$  at which a centrifugal force due to an eccentric mass carried by said one camshaft balances the preload of said first small spring, whereas at rotational speeds greater than  $n_1$  but less than a value  $n_2$  which exceeds  $n_1$  said centrifugal force exceeds the preload of said first small spring so as to move said slide valve element into its said second position, and furthermore at rotational speeds greater than  $n_2$  said centrifugal force also exceeds the preload of said second small spring so as to move said slide valve element into said third position, said slide valve element putting said annular cavity into communication with the outside when in its first adjustment position and when in its third adjustment position, whereas it shuts off the communication between said annular cavity and the outside when in its second adjustment position so as to cause oil under pressure to flow into said cavity in the absence of oil under pressure

in said cavity said annular piston being maintained by said piston spring in said first of its two limiting positions whereas when there is oil under pressure in said cavity this oil moves said annular piston into and maintains it in the second of said piston two limiting positions, so that by the effect of said spline helical extension on the annular piston, a first determined timing of said one camshaft relative to said crankshaft is attained at rotational speeds less than said value  $n_1$ , whereas at rotational speeds greater than  $n_1$  and less than  $n_2$  a second determined timing is attained, and at rotational speeds exceeding  $n_2$  the first timing is again attained.

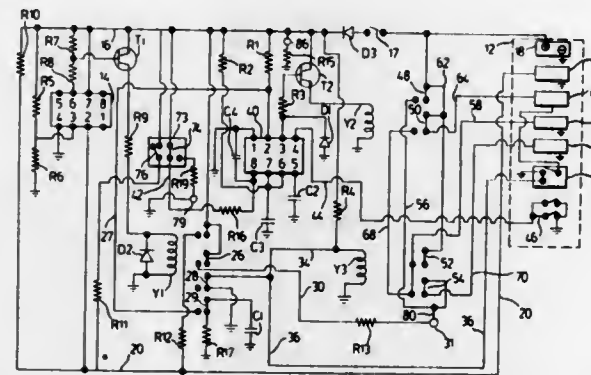
# 4,421,075 APPARATUS FOR MAINTAINING A DIESEL ENGINE AT A READY TO START TEMPERATURE

Max Mandel, Willowdale, Canada, assignor to Era Electronics (Canada) Limited, Toronto, Canada

Continuation-in-part of Ser. No. 291,758, Aug. 10, 1981. This application Sep. 7, 1982, Ser. No. 415,500  
 Int. Cl.<sup>3</sup> F02N 17/02

U.S. Cl. 123—142.5 R

5 Claims



1. Apparatus for maintaining a diesel engine at a ready to start temperature, the diesel engine comprising an engine block, a starter and fuel supply means, the apparatus comprising electrical means providing a signal varying in accordance with engine block temperature, means responsive to the signal when indicating fall of the engine block temperature to a predetermined low value to actuate the starter for up to a predetermined maximum period of time and to actuate the fuel supply means, means responsive to the attainment of a predetermined oil pressure corresponding to an engine running condition to de-actuate the starter and continue the actuation of the fuel supply means to continue running of the diesel engine, and means responsive to the signal when indicating increase of the engine block temperature to a value which is a predetermined amount higher than said lower value to de-actuate the fuel supply means and thereby stop the engine.

# 4,421,076 STARTING AUXILIARY DEVICE FOR INTERNAL COMBUSTION ENGINE

Masahiro Sasaki, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

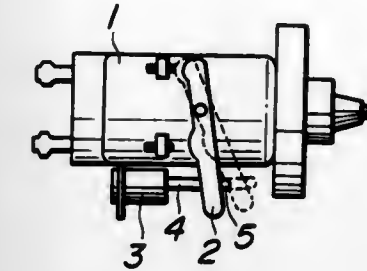
Filed May 22, 1981, Ser. No. 266,392  
 Claims priority, application Japan, May 23, 1980, 55-70938[U]

U.S. Cl. 123—179 L

7 Claims

1. An auxiliary starting device for an internal combustion engine, said device comprising a control lever for increasing and decreasing fuel to be injected from a fuel injection pump and driving means actuated by a starting switch, said driving means including means for releasably engaging said control lever for actuating said control lever in a direction to increase an amount of fuel provided while starting said internal combustion

tion engine to at least a predetermined amount, said last mentioned means operable for permitting said control lever to



move in a direction increasing the amount of fuel beyond said predetermined amount.

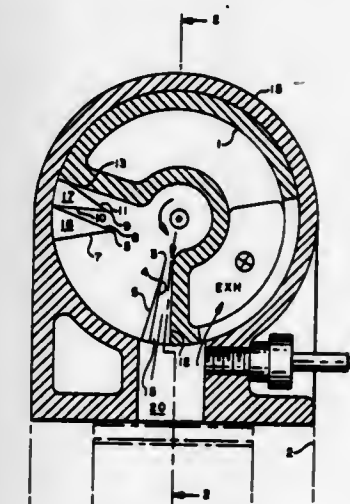
# 4,421,077 VARIABLE TIMING ROTARY VALVE FOR AN INTERNAL COMBUSTION ENGINE

John R. Ruggeri, 79 Apple Valley Rd., Stamford, Conn. 06903  
 Continuation-in-part of Ser. No. 38,280, May 11, 1979, Pat. No. 4,370,955, which is a continuation-in-part of Ser. No. 21,444, Mar. 19, 1979, abandoned. This application Sep. 10, 1980, Ser. No. 185,971

Int. Cl.<sup>3</sup> F01L 7/18

U.S. Cl. 123—190 BD

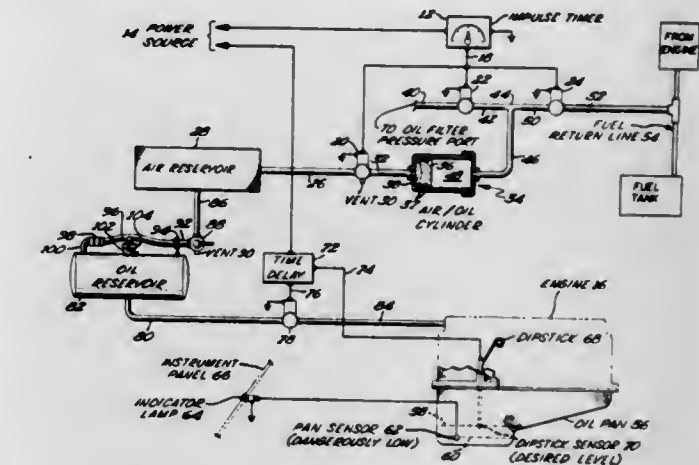
15 Claims



1. Engine apparatus for obtaining variable intake valve timing in an internal combustion engine comprising at least one cylinder said apparatus comprising:

- a support member having at least one port communicating with each cylinder and formed with an interior which is at least partially hollow;
- a rotatable valve member housed within said support member said valve member having means of support for rotation about an axis, and circumferential intake porting means for uncovering said port in said support member for selectively enabling and preventing the flow of intake charge through the valve and its ducting means into the cylinder;
- means for driving said rotatable valve member at a precise angular speed in relation to crankshaft speed; and,
- means mounted for rotation with said rotatable valve member responsive to the difference in the pressure in said rotatable valve member and said cylinder for changing the effective length of said circumferential intake porting means in said rotatable valve said changing of effective length resulting in changing of the timing and duration of effective communication of said circumferential intake port with said support member port during which intake charge flow is permitted.

# 4,421,078 OIL CHANGING SYSTEM Erwin E. Hurner, 413 Valley Ave., Moorhead, Minn. 56560 Continuation-in-part of Ser. No. 192,077, Dec. 29, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 218,918 Int. Cl.<sup>3</sup> F02M 1/00 U.S. Cl. 123—196 R 11 Claims



1. An oil changing system for automatically metering control amounts of engine lubricating oil into the diesel fuel supply of diesel engines as the engine operates, comprising: a fuel tank remote from the engine containing diesel fuel oil; an engine lubrication system containing a predetermined quantity of a lubricating oil different from said diesel fuel oil and including an oil pan; control means for generating a regular, periodic signal at preset time intervals during engine operation, said time intervals corresponding to a predetermined oil change interval to provide for desired oil removal from said engine lubrication system; fixed displacement pump means communicating with said engine lubrication system and with said fuel tank, said pump means being intermittently operable in response to said signal during engine operation for a controlled, limited duration in response to each periodic signal generated to withdraw a limited, predetermined amount of said lubricating oil from said engine lubrication system and to transport said limited amount into said fuel tank for thorough mixing of lubricating oil and fuel oil for subsequent combustion of the resultant mixture in the engine as fuel, said predetermined amount of lubricating oil withdrawn by said pump means at each signal interval and such predetermined intervals being such that said predetermined quantity of lubricating oil is withdrawn from said engine lubrication system over a predetermined lubricating oil drain time period; and means for maintaining a predetermined oil level in said oil pan; whereby lubricating oil removed by said pump means is replaced and the lubricating oil in said lubrication systems maintains a substantially constant acceptable contaminant level and the need for discrete periodic oil changes is eliminated.

# 4,421,079 DIESEL ENGINE COMBINATION FUEL VAPORIZER AND AIR/FUEL MIXER

Wallace R. Wade, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01374, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982

PCT Filed Sep. 30, 1982, Ser. No. 444,399  
 Int. Cl.<sup>3</sup> F02B 19/08

U.S. Cl. 123—255

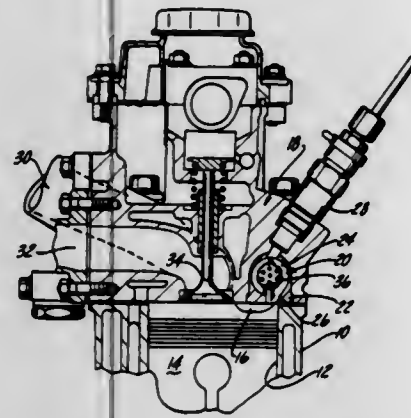
7 Claims

1. A combination fuel vaporizer and air/fuel mixer for a compression ignition type engine having a divided combustion chamber including a main chamber contiguous to the face of



the engine piston and a second prechamber in the cylinder head facing the main chamber and connected to the main chamber by a throat type transfer passage for the transfer of air in a tangential manner into the prechamber from the main chamber during the compression stroke of the engine to create a swirling motion to the air in the prechamber, and means for spraying fuel into the prechamber, the improvement comprising,

the prechamber having a hollow member located centrally therein in the path of fuel sprayed into the prechamber to



wet a portion of the outer surface thereof, the member being spaced from the walls of the prechamber for the flow of swirl air between the prechamber and member, supplementary air transfer passage means connecting a portion of the incoming hot air from the main chamber to the interior of the member for heating the same and vaporizing fuel sprayed against the outer surface thereof, and a plurality of air transpiration holes in the wall of the member connecting the air from the interior of the member to the prechamber space surrounding the member for mixing with the fuel.

4,421,080

### COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Katsushige Kogure, Higashimatsuyama; Kenzo Suzuki, Fujimi, and Masami Kamimura, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

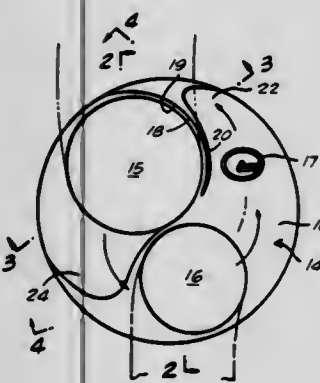
Filed Jul. 13, 1981, Ser. No. 283,113

Claims priority, application Japan, Jul. 26, 1980, 55-101867

Int. Cl.<sup>3</sup> F02B 23/00

U.S. Cl. 123—306

1 Claim



1. A combustion chamber construction for an internal combustion engine having a cylinder head, comprising, in combination: a ceiling wall in the cylinder head forming a combustion chamber, a suction port and an exhaust port in the cylinder head both communicating with the combustion chamber, a curved swirl guide wall partially encircling the periphery of said suction port and projecting from the ceiling wall into the combustion chamber, an opening in the ceiling wall for reception of an ignition plug, said opening being located on the opposite side of the curved swirl guide wall from said suction

port, said curved swirl guide wall acting to cause fluid entering said combustion chamber from said suction port to swirl in a direction to pass the exhaust port and said opening in that sequential order, said ceiling wall having a flame guide recess extending with decreasing depth from said opening in the downstream direction of the swirl and toward said curved swirl guide wall.

4,421,081

SPARK-IGNITION INTERNAL COMBUSTION ENGINE  
Ken Nakamura, Kawasaki; Tadashi Nagai, and Masanori Takami, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

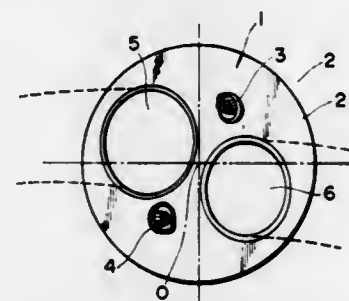
Filed Feb. 9, 1981, Ser. No. 232,858

Claims priority, application Japan, Feb. 12, 1980, 55-15855; Feb. 13, 1980, 55-16434; Feb. 14, 1980, 55-17151; Mar. 27, 1980, 55-39438; Mar. 27, 1980, 55-39439

Int. Cl.<sup>3</sup> F02P 15/02

U.S. Cl. 123—310

11 Claims



1. A spark-ignition internal combustion engine having a cylinder with a cylinder bore and an axis defining the center of said bore, comprising:

a piston reciprocally disposed in the cylinder;

a cylinder head having a wall surface closing an end of said cylinder bore and defining a combustion chamber between said wall surface and the piston;

intake and exhaust valves disposed on said wall surface and positioned generally symmetrically with respect to an extension of said center axis of the cylinder bore, said intake and exhaust valves having centers disposed in a first vertical plane which defines first and second sections of the combustion chamber on opposite sides thereof;

means defining first and second squish areas located respectively in said first and second sections of the combustion chamber, said first and second squish areas defining means including first and second projecting wall portions, respectively, which project from and are integral with said cylinder head, and which respectively have first and second sidewall portions extending generally parallel to said center axis, to define the combustion chamber;

a first spark plug having a tip disposed in said first section of the combustion chamber and located in the vicinity of said first projecting wall portion;

means defining a first recess at a surface of said first projecting wall portion in the vicinity of said first spark plug, the surface of said recess being spaced from the tip of said spark plug whereby flame propagation from the tip of said first spark plug is substantially unobstructed by the surface of said first projecting wall portion;

a second spark plug having a tip disposed in said second section of the combustion chamber and located in the vicinity of said second projecting wall portion;

means defining a second recess at a surface of said second projecting wall portion in the vicinity of said second spark plug whereby flame propagation from the tip of said second spark plug is substantially unobstructed by the surface of said second projecting wall portion;

the surfaces of said first and second recesses extending generally radially outward and generally parallel to the side-

walls of said first and second projecting wall portions, respectively, and towards an end of said wall portions in a central region thereof.

4,421,082

### ENGINE CONTROL APPARATUS

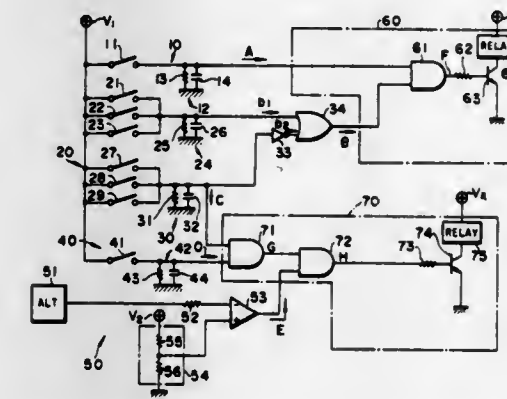
Shinji Katayose, Tokyo, and Masatsugu Ohwada, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 16, 1982, Ser. No. 408,628

Int. Cl.<sup>3</sup> F02D 33/00

U.S. Cl. 123—333

17 Claims



1. An apparatus for controlling an internal combustion engine of an automotive vehicle having a transmission, a clutch, a throttle valve, and sources for generating signals indicative of: (a) the throttle valve opening at an angle less than a predetermined value, (b) the transmission being in high gear or in neutral, (c) the transmission being in low gear, (d) the engine operating at a speed less than a predetermined value, and (e) the clutch being disengaged, said apparatus comprising means for terminating delivery of fuel to the engine upon the occurrence of two conditions indicated by signals (a) and (b), and means for restarting the engine upon the occurrence of three conditions indicated by signals (c), (d) and (e).

4,421,083

### ENGINE AIR FLOW REGULATOR

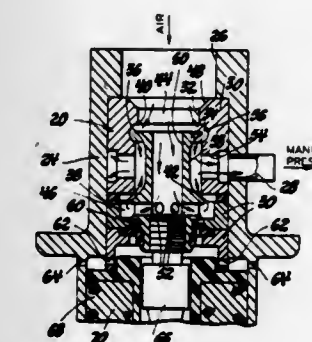
Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1982, Ser. No. 377,387

Int. Cl.<sup>3</sup> F02D 11/10

U.S. Cl. 123—339

4 Claims



1. An air flow regulator for an engine having an air induction passage containing a throttle, said regulator comprising a valve body having a bore and a valve member disposed in said bore, said valve body having a pair of axially spaced concentric valve seats formed on said bore, said valve member having a pair of valve surfaces each associated with one of said valve seats, said valve seats and valve surfaces dividing said bore to define an inlet pressure region at one end of said bore and an intermediate pressure region at the other end of said bore, said regulator having an open inlet connection to said inlet pressure region and a restricted inlet connection to said intermediate

pressure region, said inlet connections being adapted to receive air from said induction passage upstream of said throttle, said regulator having an outlet connection from said bore between said valve seats adapted to discharge air to said induction passage downstream of said throttle, whereby air may flow from said induction passage upstream of said throttle through said inlet connections and said regions, past said valve seats and through said outlet connection to said induction passage downstream of said throttle, a reference device exerting a bias on said valve member tending to increase such air flow, and a diaphragm responsive to the pressure in said intermediate pressure region and exerting a force on said valve member tending to reduce such air flow, said reference device and said diaphragm positioning said valve member to create a pressure in said intermediate pressure region which balances the force exerted by said diaphragm with the bias exerted by said reference device, whereby said valve member is positioned to provide the desired air flow past said valve seats.

4,421,084

### FUEL INJECTION PUMPING APPARATUS

Brian E. Broadwith, Burnham on Crouch, and Robert T. J. Skinner, High Wycombe, both of England, assignors to Lucas Industries Limited, Birmingham, England

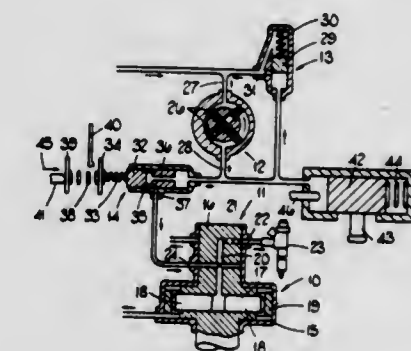
Filed Mar. 17, 1978, Ser. No. 887,468

Claims priority, application United Kingdom, Feb. 21, 1978, 6750/78

Int. Cl.<sup>3</sup> F02M 59/20

U.S. Cl. 123—365

8 Claims



1. A fuel injection pumping apparatus for supplying fuel to a compression ignition internal combustion engine comprising an injection pump operable to deliver fuel at high pressure to injection nozzles of the associated engine, a fuel control member movable to vary the amount of fuel supplied by the injection pump, a timing control member movable to vary the timing of delivery of the fuel by the injection pump, and governor means including speed responsive means which is responsive to the speed of the associated engine, said governor means comprising a first spring having one end thereof subjected to a force exerted by said speed responsive means, an adjustable abutment engaging the other end of said first spring, a second spring, a support member, said second spring being positioned between said adjustable abutment and said support member and having a strength less than the strength of said first spring, said second spring being operative under engine idle conditions and forming with said speed responsive means an idle governor, said first spring being operative at higher engine speeds and forming with said speed responsive means a maximum speed governor, manually operable means engageable with said adjustable abutment to increase the amount of fuel supplied by the apparatus, and means operable from the exterior of the apparatus for effecting an increase in the force exerted by said second spring whereby the idling speed of the engine is increased.



**4,421,085**  
**METHOD OF AND APPARATUS FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE**

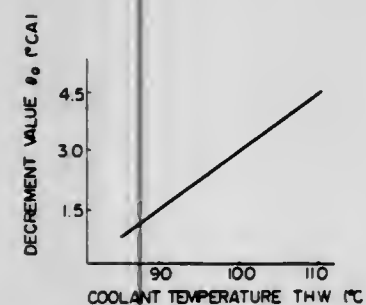
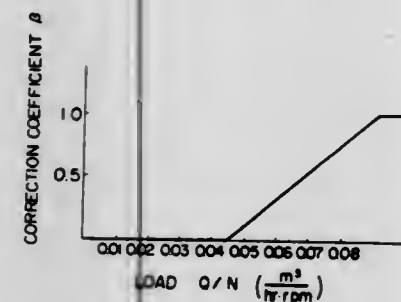
Masaomi Nagase, Toyota, and Hideo Miyagi, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 18, 1981, Ser. No. 303,495

Claims priority, application Japan, Sep. 25, 1980, 55-132268  
 Int. Cl.<sup>3</sup> F02P 5/04

U.S. Cl. 123—416

16 Claims



1. A method of controlling the ignition timing of an internal combustion engine having an intake manifold, said method comprising the steps of:

generating a first electrical signal related to one of the flow rate of air sucked into the engine and the pneumatic pressure in the intake manifold;

generating a second electrical signal related to a rotational speed of said engine;

calculating, in response to said first and second electrical signals, a spark advance angle which represents an optimum ignition timing at the operating conditions corresponding to said first and second electrical signals;

generating a third electrical signal related to a temperature of said engine;

correcting, in response to said third electrical signal, said calculated spark advance angle to decrease by a decrement value which is determined depending upon the detected engine temperature, when the detected engine temperature exceeds a predetermined value which is higher than the engine temperature at the normal operating condition, said decrement value being increased when the detected engine temperature is increased; and

controlling the timing of the sparks applied to the engine depending upon said corrected spark advance angle.

**4,421,086**  
**IGNITION TIMING CONTROL SYSTEM FOR AN ENGINE**

Tomoyuki Watanabe, and Takashi Shigematsu, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 28, 1981, Ser. No. 229,264

Claims priority, application Japan, Feb. 1, 1980, 55-11636  
 Int. Cl.<sup>3</sup> F02P 5/04

U.S. Cl. 123—425

8 Claims

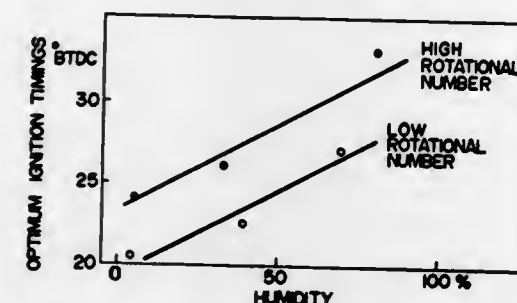
1. An ignition timing control system in an internal combustion engine, comprising:  
 ignition timing changing means for emitting a signal to alternately advance and delay ignition timing from a reference

ignition timing at a predetermined frequency in response to a periodic signal;

engine vibration detecting means for detecting vibration of said engine and emitting a vibration signal;

ignition timing determining means, responsive to said periodic signal and said vibration signal, for monitoring said vibration signal in a frequency zone substantially equal to said predetermined frequency, and emitting a lag angle

signal to delay the ignition timing when said periodic signal and said vibration signal have a first phase relationship;



ship, and for emitting an advance angle signal when said periodic signal and said vibration signal have a second phase relationship; and

ignition timing controlling means for adjusting said reference ignition timing in response to an output of said ignition timing determining means so that said vibrations of the engine can be decreased, and controlling the ignition timing in response to an output signal from said ignition timing changing means so that the ignition timing can be changed at the predetermined frequency.

**4,421,087**  
**ALTERNATIVE LIQUID FUEL INJECTION SYSTEM AND METHOD**

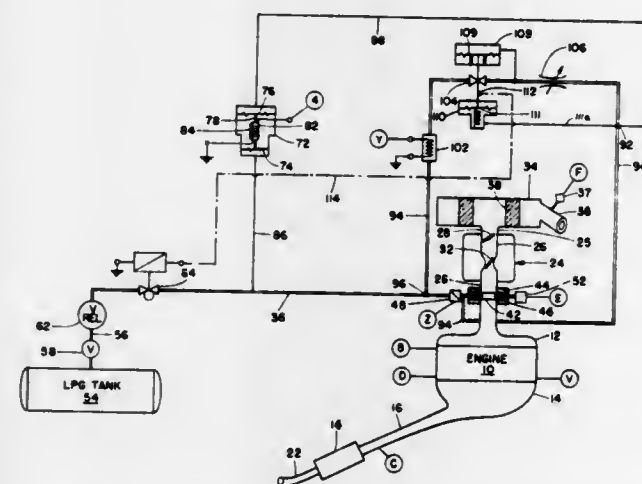
Eiko A. Schuurman, 70 Rechthuisdrift, Nieuwegein, Netherlands

Filed Feb. 5, 1982, Ser. No. 346,251

Int. Cl.<sup>3</sup> F02M 7/00

U.S. Cl. 123—445

20 Claims



1. A fuel injection system for an internal combustion engine having an intake manifold comprising:

(a) means for supplying a gaseous fuel in a liquid state;  
 (b) means for receiving said fuel and injecting same in a liquid state directly into said intake manifold;

(c) means responsive to predetermined engine conditions for controlling the rate at which fuel is supplied to said manifold by said injecting means; and

(d) means for providing vaporized fuel for starting and idling conditions comprising bypass means for withdrawing up to 10% by volume of said fuel prior to injection, vaporizing the bypassed fuel and delivering same to said intake manifold, bypassing said injecting means.

**4,421,088**  
**FUEL SYSTEM FOR COMPRESSION IGNITION ENGINE**  
 Alec H. Selly, North Wembley, England, Assignor to Lucas Industries Limited, Birmingham, England

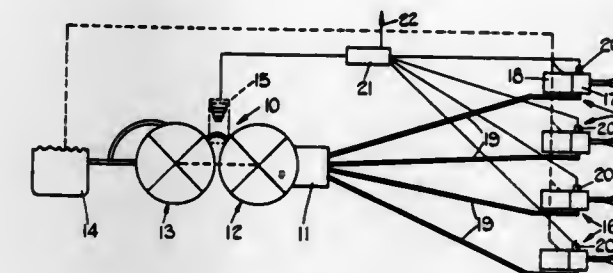
Filed Jun. 23, 1981, Ser. No. 276,463

Claims priority, application United Kingdom, Jul. 3, 1980, 8021836

Int. Cl.<sup>3</sup> F02M 51/00

U.S. Cl. 123—447

10 Claims



1. A fuel system for supplying fuel to a compression ignition engine comprising a plurality of electromagnetically controlled fuel injection nozzles, an accumulator in which in use, fuel is stored under pressure, electrical circuit means for effecting operation of said nozzles in timed relationship with the associated engine, transducer means for providing a signal representative of the fuel pressure in said accumulator, the signal provided by said transducer means being supplied to the electrical circuit means, said signal providing an indication of the fall in pressure of the fuel within said accumulator as a result of fuel flow through the nozzle, said fall in pressure being related to the quantity of fuel supplied through the nozzle and means for delaying the recharging of the accumulator with fuel under pressure.

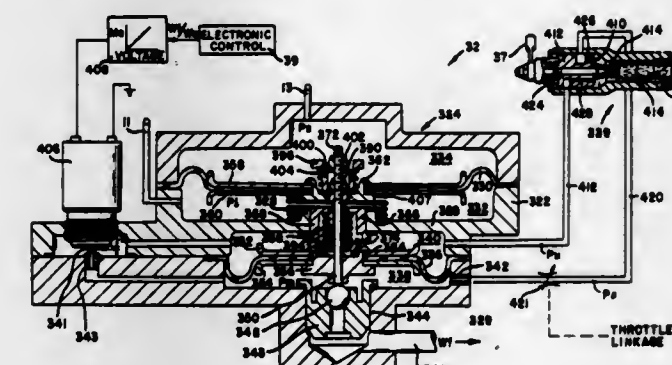
**4,421,089**  
**FUEL METERING APPARATUS**  
 Robert G. Moore, Jr., South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 19, 1982, Ser. No. 399,515

Int. Cl.<sup>3</sup> F02D 1/04; F02M 39/00

U.S. Cl. 123—454

10 Claims



1. A fuel control apparatus for a combustion engine having an intake manifold comprising:

means for generating a first force proportional to the mass air flow ingested into the engine;

means for generating a second force proportional to a differential fuel pressure, wherein said differential fuel pressure is the difference between an input fuel pressure and an output fuel pressure and wherein said output fuel pressure is developed from said input fuel pressure by restricting the input fuel pressure across two parallel orifices;

a metering valve positioned in response to said first and second forces for metering fuel to said engine at said output pressure;

means for controlling the effective cross-sectional area of one of said restrictions in response to an electrical signal indicative of a desired fuel/air ratio for the engine; and

means for generating said electrical signal from at least one

operating parameter of the engine indicative of the actual fuel/air ratio of the engine.

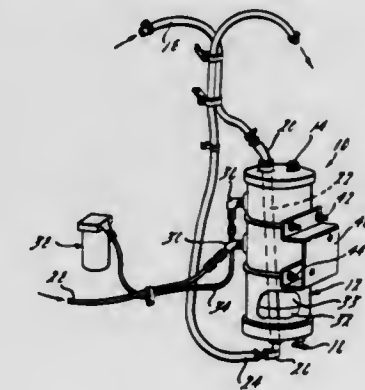
**4,421,090**  
**FUEL PROCESSOR APPARATUS FOR DIESEL ENGINE POWERED VEHICLES**

Leland L. Davis, Salline, Mich., assignor to Davco, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 188,875, Sep. 19, 1980, Pat. No. 4,368,716. This application Oct. 21, 1982, Ser. No. 435,681. The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> F02M 31/00; B01D 23/00  
 U.S. Cl. 123—557

2 Claims



1. A fuel processor means for use with diesel engines on diesel trucks, automobiles, and the like, and whereby said fuel processor means is operative to preheat the diesel fuel and to separate out water-impurities from the diesel fuel, comprising, a vertically oriented tubular vessel means operative for separating water out of the fuel, inlet conduit means to introduce hot liquid from the engine, another conduit means passing through a central portion of said vessel for transmitting the hot liquid therethrough, outlet conduit means for recirculating the hot liquid back through the engine system, a second inlet conduit means for introducing fuel to the interior of the vessel near the midpoint thereof for flow therethrough and such that this inlet is above the level of water-impurities being collected in the vessel, a second outlet conduit means for the fuel near the top of the vessel for transmitting the water-free fuel to the engine, drain means at the bottom of the vessel for draining out water-impurities which collect therein, and vent means near the top of the vessel for venting the vessel when desired.

**4,421,091**  
**IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES**

Hisasi Kawai, Toyohashi; Hiroshi Sada, Okazaki; Toshihiko Igashira, Toyokawa, and Toru Yoshinaga, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 25, 1982, Ser. No. 361,614

Claims priority, application Japan, Mar. 31, 1981, 56-49160  
 Int. Cl.<sup>3</sup> F02P 1/00

U.S. Cl. 123—620

4 Claims

1. An ignition system for an internal combustion engine comprising:

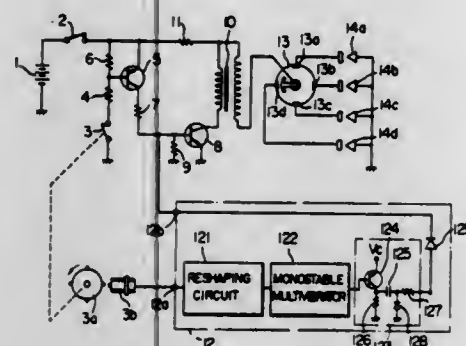
ignition coil means having a primary and secondary winding;

means for supplying a primary current to energize said primary winding whereby a high voltage for producing a spark is induced in said secondary winding when said primary current is interrupted;

ignition signal generating means for generating a first ignition signal in synchronism with the rotation of said engine

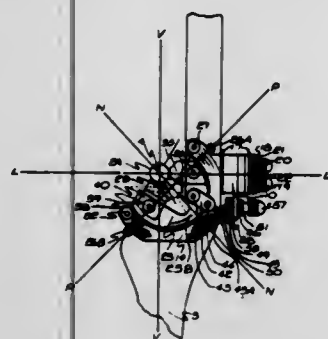


to determine the times of switching on and off said primary current;  
switching means with a control input terminal responsive to said first ignition signal from said ignition signal generating means for switching on and off said primary current;  
TDC signal generating means for detecting, substantially the top dead center of each of cylinders of said engine to generate a TDC signal; and  
a control circuit for generating a second ignition signal



having a sawtooth waveform, said second ignition signal attaining a predetermined potential at the moment said TDC signal is applied and then decreasing gradually with the lapse of time, said control circuit having an output terminal connected to said control input terminal of said switching means;  
whereby said switching means turned off in response to said first ignition signal is turned on again upon occurrence of said TDC signal and then turned off gradually in accordance with said sawtooth signal.

**4,421,092**  
**ARCHERY ARROW SUPPORT DEVICE**  
Sherrell G. Christian, Rte. 1, Box 72-L, Tickfaw, La. 70466  
Filed Aug. 24, 1981, Ser. No. 295,383  
Int. Cl.<sup>3</sup> F41B 5/00  
U.S. Cl. 124-41 A  
2 Claims

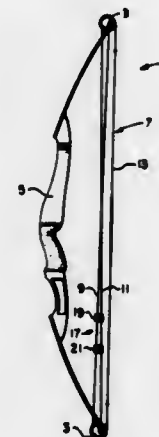


1. An arrow support assembly for counteracting the vertical and horizontal forces imposed on an arrow being shot from an archery bow, said assembly being adapted for mounting on the handle section of an archery bow having a longitudinal axis extending perpendicularly to the horizontal plane containing the longitudinal axis of intended arrow flight and having a cut-out sight window through which arrows are to be shot, said assembly comprising, in combination, the following:

- a pivot frame means for rigidly connecting to said handle section of said archery bow,
- a yoke member means pivotally connected to said pivot frame means, all of said yoke member means pivoting in response to the forces imposed on an arrow being shot from a bow, said yoke member means having connected thereto, and extending in the direction of intended arrow flight, at least two, spaced apart, elongated, substantially non-resilient means for engaging and supporting an arrow along a substantial length of an arrow, and
- c. resilient means for biasing in unison said yoke member

means and said means for supporting an arrow toward a predetermined neutral position as an arrow is being shot from an archery bow to counteract the vertical and horizontal forces imposed on said arrow as said arrow is being shot from said archery bow.

**4,421,093**  
**DRAW STOP MECHANISM FOR A COMPOUND ARCHERY BOW**  
Carl R. Stock, Bridgeton, Mo., assignor to ACCRA Manufacturing Co., Broken Arrow, Okla.  
Filed May 27, 1982, Ser. No. 382,601  
Int. Cl.<sup>3</sup> F41B 5/00  
U.S. Cl. 124-86  
10 Claims

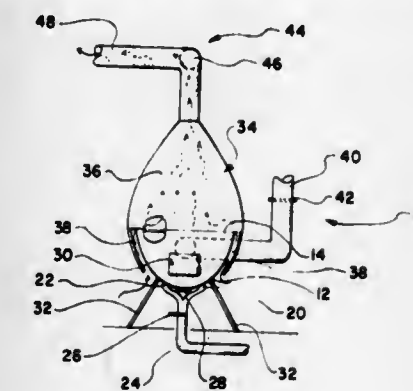


1. A compound archery bow comprising:  
a bow member having two ends,  
at least one pulley wheel and means for mounting said pulley wheel adjacent one end of said bow member,  
bow string and means for mounting said bow string to make at least three passes between the ends of said bow member with respective portions of said first and second passes extending adjacent one another between the two ends of said bow member and moving in opposite directions as said third pass is drawn, and  
draw stop, said draw stop including first and second stop members, means on said first stop member for fixedly securing said first stop member to said first pass at a first predetermined location along said associated portion thereof between said bow member ends, and means on said second stop member for fixedly securing said second stop member to said second pass at a second predetermined location said associated portion thereof between said bow member ends whereby said first and second stop members are moved toward one another as said third pass of said bow string is drawn and abut one another at a predetermined draw position of said bow string.

**4,421,094**  
**PARABOLIC SHAPED HEATER**  
Roscoe K. Crane, Rte 12, Box 764-A Fayetteville, N.C. 28306  
and Alton B. King, Hope Mills, 3547 Antilles Cir. N.C. 28306  
Filed Apr. 11, 1980, Ser. No. 139,571  
Int. Cl.<sup>3</sup> F24C 1/14  
U.S. Cl. 126-61  
7 Claims

1. A heater comprising: a generally closed arcuately shaped lower wall structure having a bottom area and generally upwardly projecting sides; support means associated with said lower wall structure for supporting the same; a burning area defined interiorly within said lower wall structure in such a manner that radiant heat resulting from material burned therein is reflected upwardly by the interior of said arcuately shaped lower wall structure; a generally horizontal heat collector panel extending across the upwardly projecting sides of said lower wall structure for collecting radiant heat reflected by the interior of said arcuately shaped lower wall structure; flue means communicatively connected with the burning area

defined between said lower wall structure and said collector panel for enabling smoke and other exhaust gases resulting from material burned therein to be expelled from said heater; hood means extending downwardly around a portion of said lower generally closed arcuately shaped wall structure and projecting upwardly pass said collector panel, said hood means being spaced outwardly from said lower wall structure so as to define an air induction space between said hood means and the generally closed arcuately shaped lower wall structure for enabling air to move upwardly into and through said air induction space between said hood means and said lower wall structure and about said collector panel where heat is transferred to the passing air from said heater, said generally arcuately shaped lower wall structure being provided in the form of a parabola having a foci area within said burning area, and

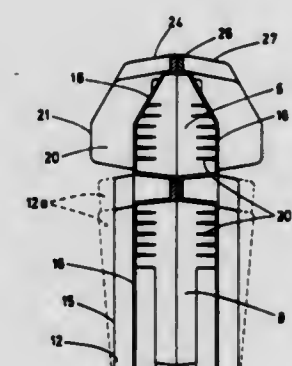
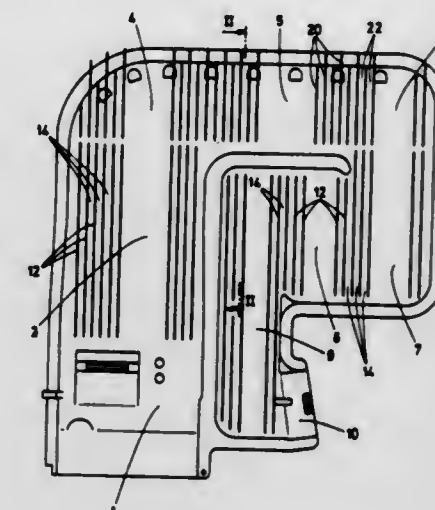


wherein said burning area is provided with burning material support means for supporting material being burned in the foci area such that combustion generally occurs about the foci area of said parabola and thus the resulting radiant energy is directed outwardly against the interior walls of said parabola type lower wall structure where the radiant energy is reflected back upwardly to said horizontal collector panel; and wherein said hood means assumes a suspended position over said lower parabolic shaped wall structure and extends downwardly pass said collector panel where a lower portion of said hood means generally encompasses the collector panel and an upper portion of said parabolic shaped lower wall structure; and wherein said hood means is spaced outwardly from said parabolic shaped wall structure such that air may be induced generally upwardly therebetween and over said collector panel before efficiently transferring heat from said heater to the passing air.

**4,421,095**  
**ROOM HEATING APPARATUS FOR SMALL SPACES**  
Philipp Kreis, Munich, Fed. Rep. of Germany, assignor to Philipp Kreis GmbH & Co., Munich, Fed. Rep. of Germany  
Filed Sep. 28, 1981, Ser. No. 305,983  
Int. Cl.<sup>3</sup> F24C 3/00; F28F 1/20  
U.S. Cl. 126-91 R  
7 Claims

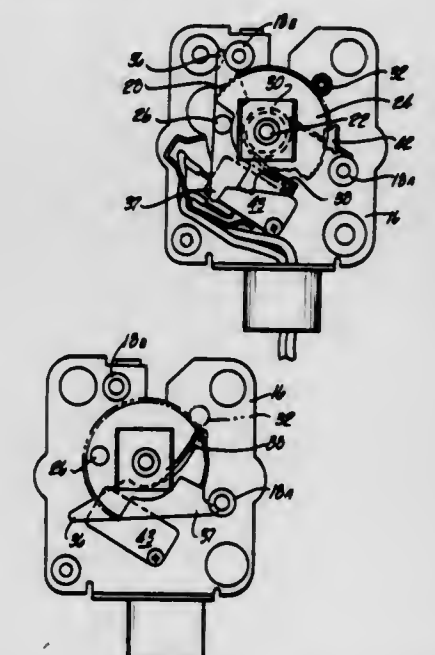
1. In a room heating apparatus for small spaces adapted to be fired with a gaseous or vaporized liquid fuel, such as in mobile homes, and having a combustion space, a combustion gas channel connected thereto serving as a heat exchanger provided with an upper horizontal cross channel having vertical walls, and outer fins vertically arranged on the sidewalls of said combustion gas channel, the improvement comprising said outer fins of the cross channel being formed at least in the region of its greatest heating as large surface fins, having outer edges which have a greater distance from the respective vertical walls of the cross channel than the distance of outer edges

of the outer fins provided thereunder from their respective channel walls, and each of said large surface fins extending for



substantially the full height of the respective vertical walls of the cross channel.

**4,421,096**  
**VENT DAMPER DRIVE**  
Thomas J. Butzen, 3448 Colony Dr., Greenfield, Wis. 53221  
Continuation of Ser. No. 253,124, Apr. 10, 1981, abandoned, which is a continuation of Ser. No. 93,479, Nov. 13, 1979, Pat. No. 4,262,652. This application Oct. 21, 1982, Ser. No. 435,781  
Int. Cl.<sup>3</sup> F23L 3/00  
U.S. Cl. 126-285 B  
4 Claims



1. A drive system for a damper which is supported in a housing for motion between first and second positions, comprising: a shaft attached to the damper so that axial rotation of the shaft moves the damper between said first and second



positions; a pair of stops fixed with respect to the housing; stop means connected to the shaft for engaging said first and second stop means at extreme positions of motion of the damper to limit motion of the damper between said first and second positions; bias means fixed between the housing and the shaft adapted to urge motion of the damper toward said first position; a uni-directional drive motor having an output and being adapted when energized to overcome said bias means and move said damper toward said second position; and means connecting the output of the drive motor to the shaft, said connecting means including means for allowing limited rotation of the drive motor under the force of inertia after the damper has reached the end of its travel toward the first position under the force of the bias means, said means for allowing limited rotation including a gear member drivingly coupled with said drive motor and mounted for rotation on said shaft, said gear member including a cutout therein, said connecting means further including a drive member mounted on said shaft for rotation therewith, said stop means being carried on said drive member, said drive member including a projection extending through said cutout in said gear member and adapted to drivingly engage said gear member at opposite extremities of said cutout.

4,421,097

### SOLAR LIGHTING SPACE AND WATER HEATING SYSTEM

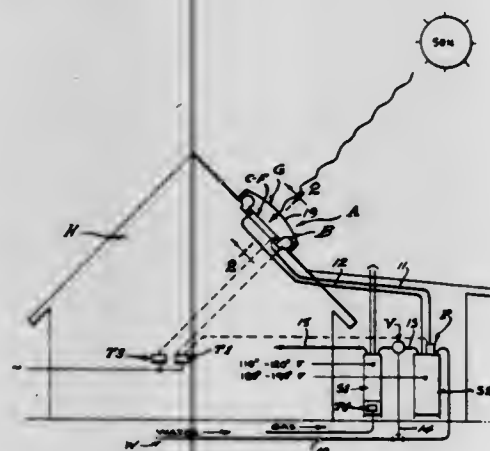
Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91348

Filed Sep. 16, 1981, Ser. No. 302,801

Int. Cl.<sup>3</sup> F24J 3/02; E06B 1/38

U.S. Cl. 126-422

21 Claims



1. A solar lighting and insolation system for room-chamber daylighting and space heating, and including;
  - a window-skylight opening exposed to the traverse plane of the sun between horizons and through a transparent cover forming the outer wall of a plenum chamber to contain heated air,
  - a solar absorber occupying said opening and comprised of a heat transfer coil for transporting fluid media and having closely related fins forming the inner wall of said plenum chamber and vertically and fixedly disposed in spaced parallel planes angularly related to said traverse plane for high absorptivity and low emissivity and forming a labyrinth for diffused daylighting within said room-chamber, means transporting the fluid media through the coil for heat transfer at the finned labyrinth,
  - a recirculating means transporting the heated air through said plenum and finned absorber coil and through said room-chamber,
  - and a temperature responsive means operating the recirculating means when insolate heated air is available through the said plenum and finned absorber coil at a higher temperature than the air in the room-chamber.

### 4,421,098 MULTIFUNCTION SOLAR WINDOW AND VENETIAN BLIND

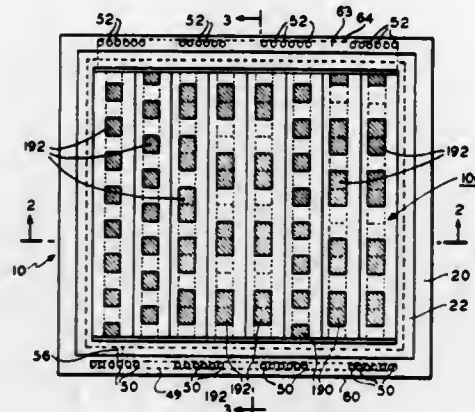
Frank Meta, 147 Haper Ave., Irvington, N.J. 07111

Filed Jun. 15, 1981, Ser. No. 273,635

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-429

7 Claims



1. A double glazed solar window for use in an exterior wall of a dwelling for selectively heating, insulating and ventilating the interior of said dwelling, said window having two parallel panes of glass separated by a predetermined distance, said parallel panes partially enclosing an intermediate space, comprising:
  - a quadrangular frame for peripherally holding said panes of glass in a vertical orientation, said frame having:
    - a. a predetermined depth, height, width and thickness, said height and width dimensions lying in a plane parallel to said wall;
    - b. an interior peripheral surface facing the interior of said dwelling and an exterior peripheral surface facing the exterior of said dwelling, said interior and exterior surfaces each parallel to said plane and spaced apart by said predetermined depth;
    - c. an external lateral peripheral surface perpendicular to said plane, said external lateral surface having said predetermined depth, height and width, said external lateral surface extending peripherally about said frame;
    - d. an internal lateral surface parallel to said external lateral surface, said internal surface situated symmetrically within said external lateral surface and spaced apart therefrom by said predetermined thickness, said internal surface cooperating with said parallel panes to enclose said intermediate space;
    - e. a plurality of first channels adjacent the bottom of said frame and communicating between said interior of said dwelling and said exterior of said dwelling;
    - f. a plurality of second channels adjacent the top of said frame and communicating between said interior of said dwelling and said exterior of said dwelling;
    - g. a plurality of third channels communicating said intermediate space with said first channels;
    - h. a plurality of fourth channels communicating said intermediate space with said second channels;
  - a first valve means disposed within said plurality of said first channels for selectively communicating said corresponding third channel to said interior or exterior of said dwelling;
  - a second valve means disposed within said plurality of said second channels for selectively communicating said corresponding fourth channel to said interior or exterior of said dwelling;
  - a plurality of rectangular slats oriented in parallel between said panes, each slat extending from one linear side of said internal surface to the opposite linear side of said internal surface, each of said slats having on side thereof predisposed to absorb solar thermal energy wherein each of said slats is provided with a predetermined number of trans-

verse slits therein, each slit of a first predetermined length and width; a plurality of longitudinally extended rectangular strips for being interwoven between said slits in said slats in a predetermined manner to provide for a plurality of decorative patterns, each of said strips having a second predetermined length and width and a predetermined thickness; and framework means for holding said slats and for enabling each of said slats to be rotated generally about their respective axes for selectively substantially facing said one side of said slats toward said interior of said dwelling or toward said exterior of said dwelling.

4,421,099

### SOLAR COLLECTOR

Herman H. M. van der Aa, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

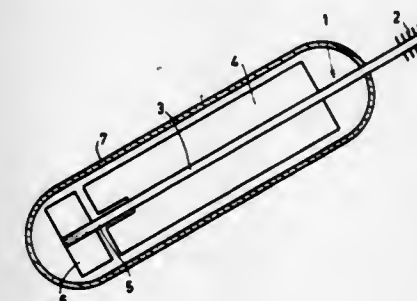
Filed Nov. 12, 1981, Ser. No. 320,364

Claims priority, application Netherlands, Dec. 11, 1980, 8006717

Int. Cl.<sup>3</sup> F24J 3/02

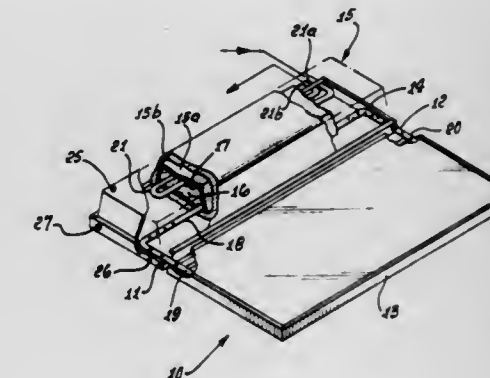
U.S. Cl. 126-433

7 Claims



1. A solar collector, which comprises a heat pipe having an evaporator section and a condenser section; a solar heat absorber plate thermally conductively connected to the evaporator section, one side of said absorber plate being provided with a layer for the selective absorption of incident solar heat; and an evacuated transparent envelope enclosing the absorber plate and the evaporator section, a part of the evaporator section being free of the absorber plate and being provided with a separate layer for the selective absorption of incident solar heat, said separate layer having the same heat absorption coefficient as but a higher heat emission coefficient than the layer on the absorber plate per unit of length of the evaporator section.

- (a) a solar collector having an inlet for a first fluid to be heated, and an outlet for the solar heated fluid,
- (b) a metallic tank for containing heat transfer second fluid,
- (c) first ducting in the tank in communication with said collector outlet to receive said heated first fluid and to transfer heat therefrom to the second fluid in the tank,
- (d) and second ducting in the tank for passing third fluid into and out of the tank, and to transfer heat from the second fluid in the tank to third fluid in the second ducting,



- (e) and including metallic structure via which heat is conducted from said first ducting to said second ducting, said first and second ducting includes generally longitudinally extending stretches in the tank contacted by said metallic structure which extends generally laterally in said second fluid,
- (f) said metallic structure comprising webbing contacting said first and second ducting and said tank,
- (g) said first and second ducting extending through said webbing the periphery of which is in heat transfer proximity to the tank wall extending about the ducting.

4,421,101

### THERMAL ENERGY STORAGE SYSTEM

James D. Stice, Manchester, N.H., assignor to Kaiwall Corporation, Manchester, N.H.

Filed Oct. 30, 1979, Ser. No. 89,451

Int. Cl.<sup>3</sup> F24J 3/02; F28D 13/00

U.S. Cl. 126-436

37 Claims

1. A thermal energy storage unit comprising:
  - a sealed container comprising a front wall portion and a rear wall portion, said front and rear wall portions together being partially absorptive and partially transmissive of visible light with a transmittance of between 4% and 85% and an absorptance of at least 9%; and
  - a thermal energy storage substance retained by said container between said front and rear wall portions, said

4,421,100

### THERMOSYPHON HEAT PIPE HOT WATER APPLIANCE

Ying-Nien Yu, Marina del Rey, Calif., assignor to Ying Mfg. Corp., Gardena, Calif.

Filed Dec. 20, 1983, Ser. No. 333,424

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-435

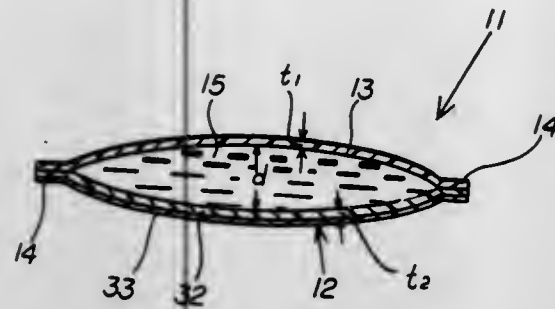
10 Claims

1. In a fluid heater assembly, the combination comprising



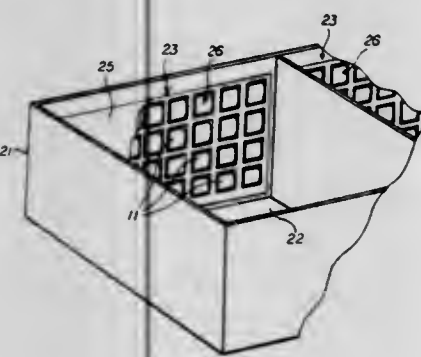
energy storage substance being at least partially transmissive of visible light and experiencing a liquid-solid phase

means for exhausting the heated gaseous medium, characterized in that the said pipes are quartz glass pipes connecting the first and second means, that a number of partially transparent bodies are disposed within each quartz glass pipe, and that spacing elements for holding the adjacent bodies are flowed around by the gaseous medium.



4,421,103

Patent Not Issued For This Number



4,421,104

### CONCENTRATING/TRACKING SOLAR ENERGY COLLECTOR

Thomas P. Adcock, 300 Meadowbrook Dr., Huntsville, Ala. 35803

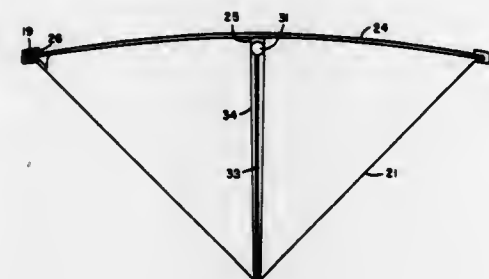
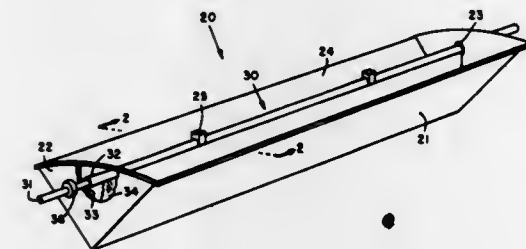
Filed Jan. 11, 1982, Ser. No. 338,694

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-438

7 Claims

change at a predetermined temperature condition between 45° F. and 190° F.



4,421,102

### PROCESS AND APPARATUS FOR HEATING A TRANSPARENT, GASEOUS MEDIUM BY MEANS OF CONCENTRATED SOLAR RADIATION

Mario Ponnansky, Melchenbühlweg 18, 3006 Bern (Canton of Berne), and Ruedi Kriest, Mühlebühl 1, 9100 Herisau (Canton of Appenzell), both of Switzerland

PCT No. PCT/CH79/00064, § 371 Date Jan. 2, 1980, § 102(c) Date Dec. 27, 1979, PCT Pub. No. WO79/01021, PCT Pub. Date Nov. 29, 1979

PCT Filed May 2, 1979, Ser. No. 192,521

Claims priority, application Switzerland, May 2, 1978, 4772/78

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-438

18 Claims



1. Apparatus for heating a transparent, gaseous medium by means of highly concentrated solar radiation, with first means for supplying the gaseous medium to a number of pipes which are exposed to the concentrated solar radiation, and second

1. A concentrating, tracking solar energy collector comprising:
  - a. A solar reflector assembly including a V-shaped trough having a reflective inner surface and a trough cover lens mounted above said trough; and,
  - b. A solar absorber assembly including a heat exchange tube mounted inside said solar reflector assembly and extending along the length thereof, said solar absorber assembly further including an absorber plate rotatably mounted on said heat exchange tube and extending into said trough along the length thereof, said heat exchange tube and said absorber plate having a coating of silicone heat conducting lubricant disposed therebetween to provide for heat conduction from said absorber plate to said heat exchange tube while permitting relative rotation therebetween, and, a heat exchange cover lens mounted in spaced relation over said absorber plate.

4,421,105

### THERMAL CONTROL METHOD

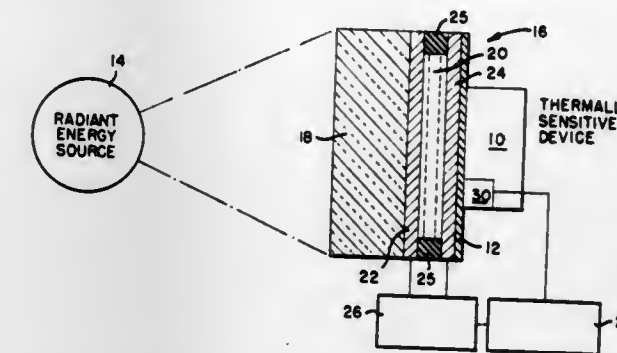
Calvin L. Wilkinson, Renton, and Christopher G. Shaw, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 10, 1981, Ser. No. 272,401

Int. Cl.<sup>3</sup> F23J 3/02

U.S. Cl. 126-452

2 Claims



1. A method for controlling the temperature of a radiant energy absorbing body exposed to radiant energy utilizing an assembly means containing a liquid-crystal-based material, said material being capable of having a cholesteric-nematic phase transition with pleochroic dyes, said method comprising: disposing said assembly means in contact with said body, sensing the temperature of said body, imposing an electric field upon said liquid-crystal-based material in response to an increase in the temperature of said body to force said liquid-crystal-based material into a nematic phase whereby the absorption of radiant energy by said body may be minimized, removing said electric field in response to a decrease in the temperature of said body to allow said liquid-crystal-based material to relax into a cholesteric phase whereby the absorption of radiant energy by said body may be maximized.

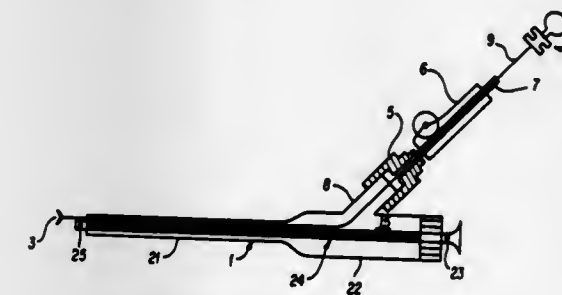
4,421,106

### FIBER SCOPE FOR BIOPSY OPERABLE BY A SINGLE OPERATOR

Takami Uehara, 1126, Hojo-1-chome, Daito-shi, Japan  
Continuation of Ser. No. 77,125, Sep. 19, 1979, abandoned, which is a continuation of Ser. No. 778,961, Mar. 18, 1977, abandoned. This application Jul. 8, 1981, Ser. No. 281,413  
Claims priority, application Japan, Mar. 19, 1976, 51-30670  
Int. Cl.<sup>3</sup> A61B 1/00

U.S. Cl. 128-4

3 Claims



1. A fiberoptic endoscope comprising:
  - a control unit housing;
  - a branched conduit in said housing having a first proximal end, a second proximal end and a distal end, said first proximal end having an inlet opening;
  - a flexible hollow conduit attached to said housing having a proximal end and a distal end, the proximal end being fixed in said housing at the distal end of said branched conduit and extending from said distal end of said branched conduit;
  - an optic assembly comprising an eyepiece assembly mounted

in said housing at said second proximal end, a bundle of flexible optical fibers extending in said branched conduit and said hollow conduit from said eyepiece assembly to said distal end of said hollow conduit, and an objective assembly mounted on said distal end of said hollow conduit optically connected through said bundle of optical fibers to said eyepiece assembly;

a guide sleeve formed as a portion of said housing at said inlet opening of said first proximal end of said branched conduit;

a flexible tube operatively aligned with said guide sleeve and said inlet opening;

a flexible forceps control wire extendable and retractable through said flexible tube, said guide sleeve, said inlet opening, said hollow conduit to and beyond the distal end and from the entirety thereof;

a forceps attached to said flexible forceps control wire at an end of said wire extending beyond the distal end of said hollow conduit, said forceps being at all times during observation and tissue taking in controllable view of said optic assembly;

a forceps control means attached to said forceps control wire at the other end of said wire extending out of said flexible tube; and

an adaptor holding said flexible tube to said guide sleeve and defining a narrow path with said flexible tube from said inlet opening extending outwardly in the direction of said forceps control means for slidably guiding said forceps control wire in combination with said flexible tube, said adaptor providing said narrow path for a length sufficient to positively support said flexible tube and the flexible tube being of sufficient length to positively direct the sliding motion of said forceps control wire, said flexible tube being connected to said adaptor, said forceps control wire being of such a length that the portion of wire between said adaptor and said forceps control means can, at all times, be maintained in longitudinal extension without flexion during progressive and recessive motion to and from a target spot of tissue, and an entire biopsy operation including a final operation of taking a tissue sample can be performed by a single operator by controlling said forceps control means in one hand and holding said control unit housing in said operator's other hand.

4,421,107

### SURGICAL RETRACTOR ELEMENTS AND ASSEMBLY

Roger Q. Estes, and Jeffery S. B. Estes, both of W. 700 7th Ave., Spokane, Wash. 99204

Filed Oct. 15, 1980, Ser. No. 197,149

Int. Cl.<sup>3</sup> A61B 17/02

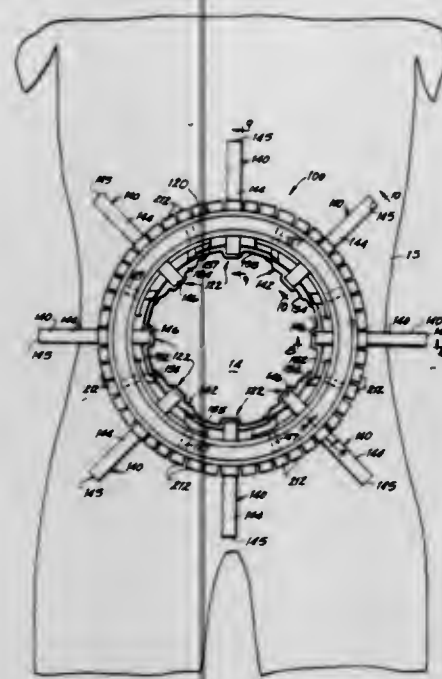
U.S. Cl. 128-20

41 Claims

1. A surgical retractor assembly for holding a surgical incision open with body tissues held clear of a desired internal surgical area, comprising:
  - a retractor frame;
  - at least one resilient retractor paddle on the retractor frame adapted to extend from the frame into the incision;
  - said paddle including a paddle body having a front face adapted to engage the body tissues along the incision and an opposed back face adapted to face the desired surgical area;
  - said front and back faces extending laterally outward and downward from the frame to side and bottom edges; and
  - wherein said paddle body is formed of a single soft non-metallic scissile material of sufficient resiliency with a flexural modulus of elasticity of between 1,000 psi and 75,000 psi throughout the cross section of the paddle body to allow the front face thereof to progressively bend resiliently from an original undeflected orientation into an arc transversely between the side edges in response to opposing forces applied to the paddle body as the retractor assembly is moved to open the incision, to thereby distribute applied forces over surfaces of the front face to minimize



stress concentrations between the said paddle body and body tissues engaged thereby and to allow the body to



return to its original orientation as the opposing forces are released as the front face of the paddle body is disengaged from the body tissues.

4,421,108

#### SURGICAL RETRACTOR HOLDER

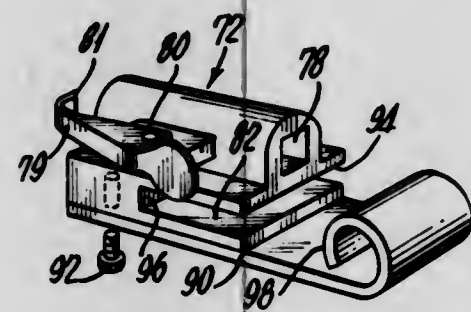
Rene J. Cabrera, Brockton, George W. Guay, North Scituate, both of Mass., and John R. Bookwalter, Brattleboro, Vt., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Jul. 27, 1981, Ser. No. 286,908

Int. Cl.<sup>3</sup> A61B 17/02

U.S. Cl. 128—20

2 Claims



1. In a surgical retractor blade holder having a quick-release pawl attachment mechanism for attaching a retractor blade to a supporting structure, said retractor blade having a retractor blade handle having ratchet teeth disposed along at least one surface thereof, said quick-release pawl attachment mechanism having:

a body section having a bottom surface a bore through said body section for receiving said retractor blade handle, said bore having an interior surface;

a pawl pivotally mounted to said body section, said pawl having a leading edge for engaging cooperating ratchet teeth on said retractor blade handle; and

an open slot in said body section for engaging a supporting structure, said slot having an inside surface and a top and a bottom surface, none of said slot surfaces being in common with said bore surfaces;

the improvement comprising:

a spring detent attached to said body section bottom surface, aligned with said slot in said body section and extending beyond the end of said bottom surface;

the free end of said spring detent including a raised portion and providing a confronting surface aligned with said open slot, the top of said raised portion extending above the top surface

of said slot but not obstructing access of a blade retractor handle to said bore through said body section;

the confronting surface of said raised portion spaced apart from the inside surface of said slot a distance greater than the width of said supporting structure;

whereby said retractor blade holder may be placed on said supporting structure by displacing said spring detent and sliding said slot onto said supporting structure until said spring detent springs back into position on the opposite side of the supporting structure to loosely hold said holder on said supporting structure even when said retractor is in the relaxed position.

4,421,109

#### METHOD AND APPARATUS FOR SIMULATING GRAVITATIONAL FORCES ON A LIVING ORGANISM

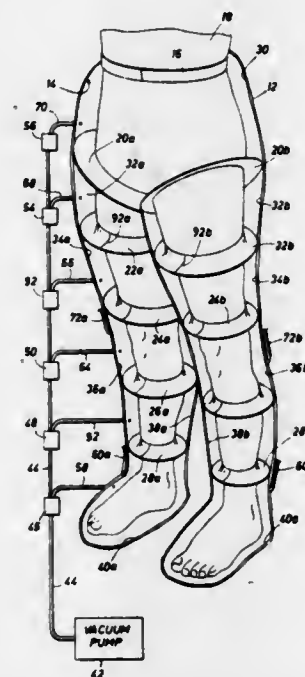
William E. Thornton, Friendswood, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 2, 1982, Ser. No. 414,106

Int. Cl.<sup>3</sup> A61H 7/00

U.S. Cl. 128—25 R

17 Claims



1. Apparatus for simulating aspects of gravitational forces on at least a portion of a living organism comprising:

casing means defining a chamber adapted to contain a portion of the body of said organism, said casing means being rigidified to resist collapse upon application of negative pressure to the interior of said chamber;

seal means extending inwardly from said casing means for effective engagement with said body portion and, in cooperation with said body portion, subdividing said chamber into a plurality of compartments each in negative pressure communicating relation with an adjacent part of said body portion;

and control means for applying negative pressures to said compartments and for maintaining said negative pressures at incrementally different levels in respective ones of said compartments.

4,421,110

#### MASSAGE AND EXERCISE MAT

Richard W. DeLisle, 90 Washington St., Leominster, Mass. 01453, and Conrad Leblanc, Leominster, Mass., assignors to Richard W. DeLisle, Leominster, Mass.

Filed Jun. 2, 1981, Ser. No. 269,685

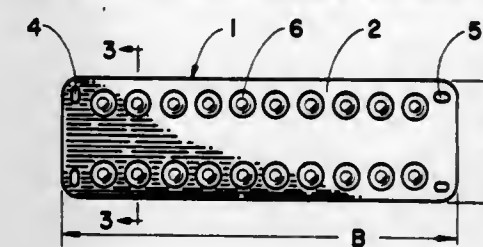
Int. Cl.<sup>3</sup> A61H 7/00

U.S. Cl. 128—60

2 Claims

1. A one piece massage and exercise mat adapted for use by

a human being to simultaneously exercise without assistance, the muscles and nerves positioned along and exiting the spinal column of said user, consisting essentially of an elongate base adapted to extend substantially from a users shoulders to his waist and two opposed rows of massage elements made of a resilient moldable material having a Shore A hardness of from about 45 to about 85, said massage elements projecting up-



wardly from said base and integral therewith, said massage elements transversely positioned on said base to proximately bracket the spinal column of said user and adapted to be juxtapositioned by the user, longitudinally along the spinal column of said user, said massage elements being longitudinally spaced to proximately bracket the vertebrae of the spinal column of said user and adapted to be positioned by said user proximately between said vertebrae.

4,421,111

#### LOW-VOLTAGE SURGICAL CAST CUTTER WITH VACUUM EXHAUST OF DEBRIS

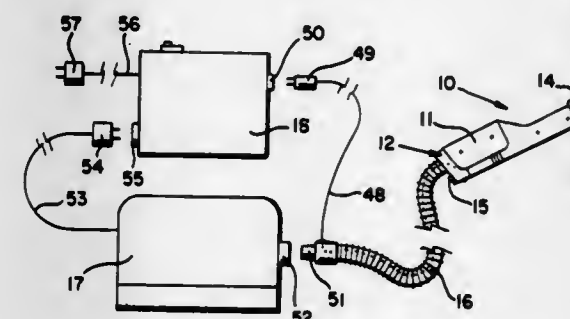
Neil S. Rothman, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Mar. 2, 1982, Ser. No. 353,917

Int. Cl.<sup>3</sup> A61F 5/04

U.S. Cl. 128—91 A

9 Claims



1. A surgical cast cutter, comprising a generally longitudinal tool section and a complementary hose section releasably secured to the tool section rearwardly thereof, first rib means formed transversely on the rearward portion of the tool section, second rib means formed transversely on the forward portion of the hose section and cooperating with the first rib means to slidably guide the sections into engagement with each other, the sections have respective housing edges inclined with respect to the first and second rib means, the housing edges substantially abutting one another when the sections are fully joined together, releasable latching means for retaining the sections together, electrical contact means carried by each of the sections and respectively engaging each other when the sections are joined together, the tool section having a housing with an electric motor therein, first conductor means connecting the motor to the respective contacts on the tool section, second conductor means connecting the respective contacts on the hose section to a source of power, an oscillating cutter mounted forwardly of the housing, a driving transmission means between the motor and the cutter, switch means for selectively energizing the motor, the housing having a debris conduit formed therein, the conduit commencing near the cutter and terminating in rearward opening in the tool section housing, the hose section having a forward opening formed therein and communicating with the rearward opening in the housing when the sections are joined together, means for substantially sealing the sections against air leakage therebetween

adjacent to the communicating openings, and a vacuum hose carried by the hose portion, communicating with the opening therein, and extending rearwardly therefrom.

4,421,112

#### TIBIAL OSTEOTOMY GUIDE ASSEMBLY AND METHOD

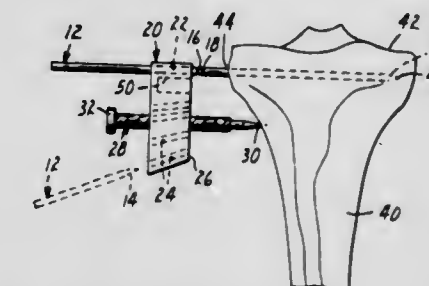
Douglas B. Mains, Wheaton, Ill., and Kenneth E. Merte, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1982, Ser. No. 380,412

Int. Cl.<sup>3</sup> A61F 5/04; A61B 17/18

U.S. Cl. 128—92 EB

11 Claims



1. An osteotomy guide assembly comprising: four guide pins, each having a cutting end surface adapted to cut bone tissue upon rotation of said guide pin about its axis with said cutting end surface pressed against said tissue, at least two of said guide pins having a locating mark a first predetermined distance from said cutting end surface;

a guide block having a first pair of spaced parallel guide bores adapted to closely receive the two of said guide pins having said locating marks, and a second pair of spaced parallel guide bores adapted to receive the other two of said guide pins, said second pair of parallel guide bores converging with respect to said first pair and being oriented to direct the guide pins extending through the second bores so that a second plane tangent to and defined by the surfaces of the second pair of pins adjacent the first pair of pins will intersect a first plane tangent to and defined by the surfaces of the first pair of pins adjacent the second pair of pins at a predetermined angle and at a second predetermined distance from a locating surface on said guide block; said second predetermined distance having a known relationship to said first predetermined distance; and

means mounted on said guide block for fixing the position of said guide block along said first pair of pins against movement toward a surface positioned on the side of said block toward which said bores converge.

4,421,113

#### METHOD AND APPARATUS FOR CONTROLLING LUNG VENTILATORS

Andras Gedeon, Täby; Ulf Lundell, Grödinge, and Göran Pilen-vik, Stockholm, all of Sweden, assignors to Engström Medical Aktiebolag, Bromma, Sweden

Filed Jun. 2, 1981, Ser. No. 269,782

Claims priority, application Sweden, Jun. 18, 1980, 8004530

Int. Cl.<sup>3</sup> A61M 16/00

U.S. Cl. 128—204.23

9 Claims

5. A device for controlling the operation of a lung ventilator including a breathing-gas source having means capable of delivering a volume of breathing gas per unit of time, which is at least equal to the maximum volume that may be required for the ventilation of the patient, an inspiratory line having means for connecting the same to the airways of a patient and through which the patient can breathe spontaneously from said breathing-gas source, a ventilator unit connected to said breathing-gas source and activatably by an activation signal to deliver to the patient through said inspiratory line a mandatory breath of







an electrical current for energizing said windings thereby to cause said coil form and stack to undergo linear displacement relative to each other;  
 a transducer head assembly having an ultrasonic energy transmissive window joined to said handle and enclosing a crystal holder containing a crystal adapted to transmit and receive ultrasonic energy through said window;  
 a stationary base disposed in said head;  
 mechanical linkage means coupling said crystal holder to said base, and  
 drive means coupling said motor to said mechanical linkage means for causing said crystal holder and crystal, when driven by said motor, to undergo reciprocating swinging motion relative to said base for transmitting ultrasonic energy to and receiving echo signals from an object in front of said window in a sector scanning motion.

4,421,119

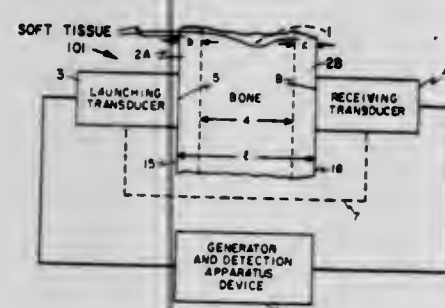
### APPARATUS FOR ESTABLISHING IN VIVO, BONE STRENGTH

George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.  
 Division of Ser. No. 48,580, Jun. 15, 1979, Pat. No. 4,361,154, which is a continuation-in-part of Ser. No. 928,654, Jul. 28, 1978, Pat. No. 4,233,845. This application Dec. 11, 1981, Ser. No. 329,932

Int. Cl.<sup>3</sup> A61B 10/00

U.S. Cl. 128—660

2 Claims



1. Apparatus for establishing, in vivo, the strength of a bone member, that comprises, in combination:

- a linear scale;
- first transducer means having a sending surface to launch an acoustic pulse through the bone member;
- second transducer means having a receiving surface to receive the pulse after transmission through the bone member, said receiving surface being parallel to and facing said sending surface so that said bone member may be positioned between and in contact with both of said surfaces; said first and second transducer means being mechanically interconnected by said linear scale so that the distance between said sending surface and said receiving surface may be measured; and
- means for measuring the transit time of the pulse from the first transducer means to the second transducer means to permit determination of the velocity of the propagated signal through the bone.

4,421,120

### PEAK RESPIRATORY FLOW MONITOR

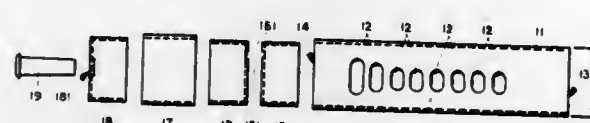
Rodney Edwards, Jr., Framingham; John W. Burke, Jr., Melrose, and Peter Gazzara, Reading, all of Mass., assignors to Biotrine Corporation, Woburn, Mass.

Filed Mar. 2, 1981, Ser. No. 239,272

Int. Cl.<sup>3</sup> A61B 5/02

U.S. Cl. 128—725

6 Claims



3. A peak respiratory flow monitor comprising:

- (a) an elongated tubular member, having (i) a front end serving as an air input port, (ii) a series of openings through the wall of the tubular member, (iii) an input flow axis, passing through the center of the input port, in the direction of air flow at the air input, and (iv) a rear end opposite to the front end;
- (b) means for covering a desired number of the openings; and
- (c) means, having an air flow input, for generating a signal when the air flow therethrough reaches a threshold, such means being called below "the whistle", wherein the whistle includes a reed and means for causing displacement of air flow, from the input flow axis, prior to flowing along the reed, and also includes a chamber, in which the reed is mounted, such chamber having a flow input, being the whistle input, which is mounted proximate to the rear end of the tubular member, such whistle input including a first baffle disposed transversely to the longitudinal axis of the tubular member, such baffle having an aperture the center of which is located off the longitudinal axis; and
- (d) a valve for regulating flow through the input of the whistle.

4,421,121

### METHOD AND APPARATUS FOR OBTAINING A NON-CEPHALIC REFERENTIAL ELECTROENCEPHALOGRAM

John W. Whisler, 1489 Albert St. North, Saint Paul, Minn. 55108, and Walter J. Re Mine, 783 Iglehart Ave., Saint Paul, Minn. 55104

Filed Oct. 3, 1980, Ser. No. 193,832

Int. Cl.<sup>3</sup> A61B 5/04

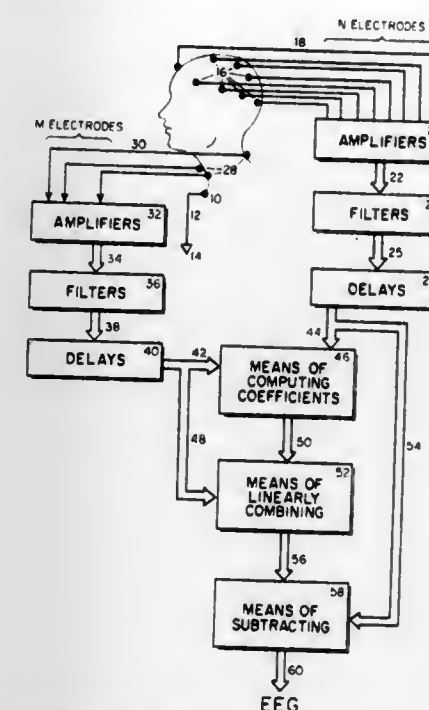
U.S. Cl. 128—731

9 Claims

1. A method for obtaining the electroencephalogram (EEG) which involves,

- I. attaching an electrode means (10) at or below the base of the neck,
- connecting the electrode means (10) to circuit ground or common (14),
- attaching at least three electrode means (28) at or below the base of the neck,
- connecting each electrode means (28) to an amplifying means (32),
- attaching electrode means (16) to the head of the subject,
- connecting the electrode means (16) to amplifying means (20),
- II. then,
- linearly combining the output signals of amplifying means (32) by multiplying each output of said amplifying means (32) by a separate adjustable coefficient and summing the results of said multiplications, thereby producing a reference signal,

and subtracting said reference signal from the output signals of amplifying means (20) thereby obtaining the EEG, and



III. adjusting the said adjustable coefficients to reduce the electrocardiographic artifact in the EEG.

4,421,122

### BRAIN ELECTRICAL ACTIVITY MAPPING

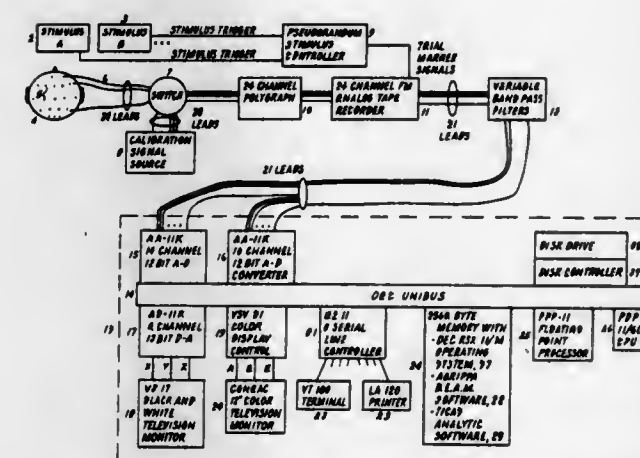
Frank H. Duffy, Brookline, Mass., assignor to The Children's Medical Center Corporation, Boston, Mass.

Filed May 15, 1981, Ser. No. 263,939

Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—731

43 Claims



1. Apparatus for generating a topographic display of information on the electrical activity of the brain, said apparatus comprising

- a plurality of electrical-activity transducers adapted for placement at spaced apart locations on the skull of a patient,
- stimulus means for repeatedly generating a sensory stimulus for the brain to produce at said transducers repeated segments of data each associated with one EP response, said stimulus means including
- pseudorandom timing means for triggering successive said stimuli at times spaced apart by pseudorandom time intervals, and for determining each said pseudorandom time interval as a combination of a subinterval of fixed length and a subinterval of pseudorandomly determined length, each said fixed length subinterval comprising a pre-stimulus subinterval of predetermined length and a post-stimulus subinterval of predetermined length,
- averaging means connected to be responsive to said trans-

ducers for averaging said repeated segments to generate average segments for each transducer, processing means connected to be responsive to said averaging means for processing said average segments to generate one or more matrices, each element said one or more matrices representing information on the electrical activity of the brain at one location on the skull, display means connected to be responsive to said processing means for displaying said one or more matrices as topographic maps of the skull, each said matrix element forming a discrete point of said maps.

4,421,123

### MULTIPLE SAMPLE NEEDLE VALVE

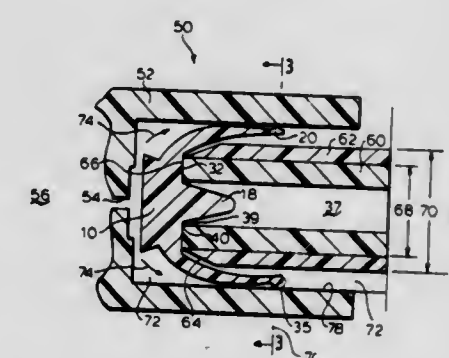
Edward P. Percarpio, North Haledon, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Nov. 30, 1981, Ser. No. 325,704

Int. Cl.<sup>3</sup> A61B 5/14

U.S. Cl. 128—766

11 Claims



1. A cup valve apparatus for a multiple blood sample assembly, comprising

- (a) an annular valve body;
- (b) an annular valve skirt having an upper and lower end, said valve skirt depending from said valve body at the upper end of said skirt and integral therewith, said skirt diverging from the axis of said body;
- (c) an integral support protrusion extending from said valve body centrally of said skirt along the axis of said body;
- (d) a flattened annular projection extending from said body on the side thereof opposite said skirt and said protrusion, said projection being coaxial with said body;
- (e) an integral annular spike on said skirt adjacent the lower end thereof; and
- (f) said spike extending radially from the side wall of said skirt.

4,421,124

### PRESSURE DETECTION ARRANGEMENT

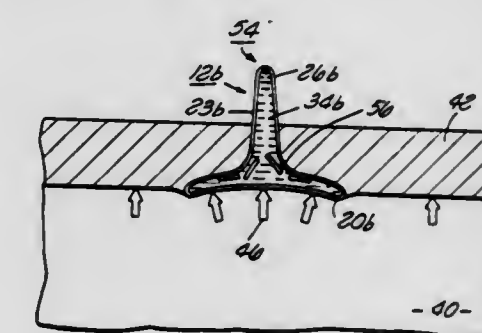
Lee Marshall, 2808 Oregon Ct., J-3, Torrance, Calif. 90503  
 Division of Ser. No. 51,431, Jun. 6, 1979, Pat. No. 4,286,603.

This application Jun. 8, 1981, Ser. No. 271,794

Int. Cl.<sup>3</sup> A61B 5/10

U.S. Cl. 128—782

4 Claims



1. A pressure detection arrangement for placement interme-



diate a part of the body means surrounding the part of the body and comprising, in combination:

capsule comprising:

- a reservoir means having first walls and second walls defining a reservoir cavity, and said first walls further defining a lower portion of said reservoir cavity having a first predetermined flexibility, and said second walls further defining an upper portion of said reservoir cavity having a second predetermined flexibility;
- an indicator means having third walls defining an indicator cavity having a third predetermined flexibility and having a preselected transmissivity for electromagnetic radiation in the visible portion of the electromagnetic radiation spectrum to allow visual inspection there-through of said indicator cavity;
- said first walls coupled to said second walls;
- said second walls further defining a first aperture through said second walls;
- said third walls coupled to said second walls adjacent said first aperture; and
- a separation means comprising a frangible disc across said first aperture to close communication between said reservoir cavity and said indicator cavity; and
- an indicator fluid in said reservoir cavity said separation means responsive to a predetermined pressure exerted on said indicator fluid in said reservoir cavity to fracture said frangible member to allow said indicator fluid to enter said indicator cavity and said separation means separating said indicator fluid from said third walls of said indicator means for the condition of said reservoir cavity subjected to less than said predetermined pressure.

4,421,125

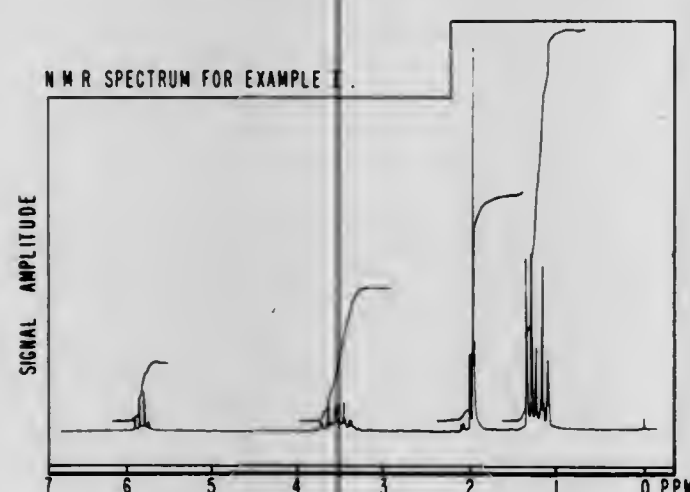
# SMOKING TOBACCO COMPOSITION OR SMOKING TOBACCO ARTICLE CONTAINING 1-ETHOXY-1-ETHANOL ACETATE AND ACETALDEHYDE

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.  
Division of Ser. No. 287,935, Jul. 29, 1981, Pat. No. 4,348,416, which is a continuation-in-part of Ser. No. 176,111, Aug. 7, 1980, Pat. No. 4,296,137. This application Mar. 26, 1982, Ser. No. 362,270

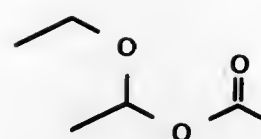
Int. Cl.<sup>3</sup> A24B 3/12, 15/30

U.S. Cl. 131—276

3 Claims



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to a smoking tobacco composition an aroma or taste augmenting or enhancing quantity of a mixture of 1-ethoxy-1-ethanol acetate having the structure:



and acetaldehyde, the range of weight ratios of 1-ethoxy-1-ethanol acetate:acetaldehyde being from 50:50 down to 5:95.

4,421,126

# PROCESS FOR UTILIZING TOBACCO FINES IN MAKING RECONSTITUTED TOBACCO

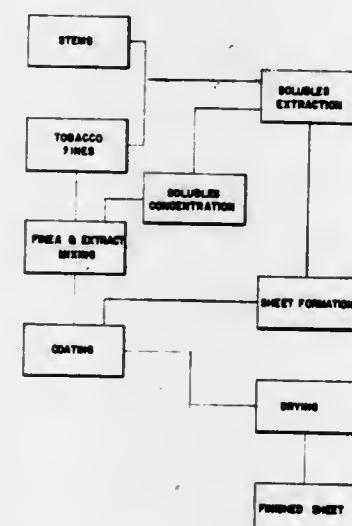
Grant Gellatly, Chester, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,450

Int. Cl.<sup>3</sup> A24B 3/14

U.S. Cl. 131—371

6 Claims



1. A method for employing tobacco fines in the preparation of reconstituted tobacco which comprises:

- (a) separating fines from a feedstock to a reconstitution process,
- (b) slurring and refining the feedstock absent the separated fines in an aqueous medium, and removing from the refined slurry the greater part of the liquid phase and replacing it with white water from step (c),
- (c) supplying the refined slurry to a paper making machine for preparing reconstituted tobacco sheet and forming a sheet therefrom, and recovering white water from said machine,
- (d) combining the separated fines from step (a) with a second aqueous medium,
- (e) treating the combination from step (d) to form a uniform dispersion of the fines, and
- (f) applying the dispersion from step (e) as a coating to the sheet from step (c) before said sheet is introduced to dryers.

4,421,127

# COMPACT CASE WITH INTERCHANGEABLE COSMETIC INSERTS

Marjorie Geer, 2429 Ridge Road Dr., Alexandria, Va. 22302  
Filed Sep. 20, 1982, Ser. No. 420,367

Int. Cl.<sup>3</sup> A45D 33/00

U.S. Cl. 132—83 R

15 Claims

1. A compact case for housing cosmetic material comprising in combination:
- a top cover;
  - a bottom support tray including on the interior surface thereof a system of integral upstanding ribs defining a matrix configuration of areas each having predetermined dimensions and geometric shapes;
  - an intermediate lid having a top and bottom surface posi-

4,421,129

# SHAPED ARTICLES FOR RAPID HAIR DRYING UTILIZING POLYMER BLENDS

Steve G. Wingard, 419 Lyndhurst Rd., Columbia, S.C. 29210  
Filed Aug. 12, 1982, Ser. No. 407,590

Int. Cl.<sup>3</sup> A45D 1/00

U.S. Cl. 132—163

8 Claims



1. A shaped article for rapidly drying hair, comprising: rigid means engaging the hair, for absorbing water therefrom, said rigid means made from a hydrolized graft starch copolymer selected from the group consisting of: starch, acrylamide and sodium acrylate, or starch, acrylamide and potassium acrylate, or starch, polyacrylate and polyacrylamide, whereby water is absorbed from the hair by hydroscopic action of said graft starch copolymer.

4,421,130

# CORROSION PROTECTION PRETREATING APPARATUS

Takao Kataishi, and Nobufumi Yokoi, both of Tokyo, Japan, assignors to Misawa Home Co., Ltd., Tokyo, Japan

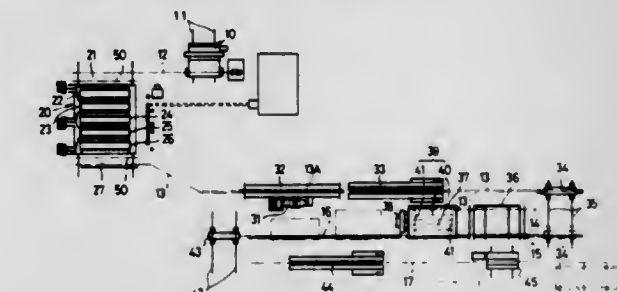
Filed Nov. 12, 1981, Ser. No. 320,627

Claims priority, application Japan, May 30, 1981, 56-82712

Int. Cl.<sup>3</sup> B08B 3/04

U.S. Cl. 134—76

5 Claims



1. A corrosion protection pretreating apparatus comprising: a plurality of treating tanks including a pickling tank, rinsing tanks and the like; a carry-in section for articles to be treated, provided at one side of a section of said treating tanks; a carry-out section for the articles to be treated, provided at the other side of the section of the plurality of treating tanks; a plurality of carrier bars capable of supporting the articles to be treated, being carried into said carry-in section for the articles to be treated and being transferred together with the articles to be treated to said carry-out section for the articles to be treated; a first transfer device being movable between said carry-in section for the articles to be treated and predetermined positions over the plurality of treating tanks and having a lifting mechanism for supporting one or more of said carrier bars and vertically moving the carrier bar or bars; and a second transfer device being movable between predetermined positions over the plurality of treating tanks and said carry-out section for the articles to be treated with its scope of movement being partially overlapped with that of the first transfer device and having a lifting mechanism for supporting one or more of said carrier bars and vertically moving the carrier bar or bars.

4,421,128

# COMPACTED GREASELESS COSMETIC STICK AND PARTICULARLY STICK OF EYE SHADOW

Jean Boulogne, L'Hay-Les-Roses; Tibaud Hochmann, Champigny-s/Seine; Jacques Michelet, Longjumeau, and Bruno Morane, Paris, all of France, assignors to L'Oreal, Paris, France  
Continuation of Ser. No. 703,362, Jul. 8, 1976, abandoned. This application Feb. 15, 1979, Ser. No. 12,518

Int. Cl.<sup>3</sup> A45D 40/30

U.S. Cl. 132—88.5

11 Claims

1. A greaseless make-up stick of the chalk type which is particularly adapted for direct application to the eyelids, said greaseless make-up stick comprising a dry compacted admixture of

- (1) 25–75% of a greaseless carrier powder,
    - (a) which has substantially rounded grains, the average diameter of which is between 1 and 20 microns, and
    - (b) which is selected from the group consisting of rice starch, corn starch and esterified rice starch, esterified corn starch and polyamide powders, and
  - (2) at least one make-up pigment,
- said compacted admixture having a hardness less than calcium carbonate when compacted at room temperature and under a pressure of 120 bars.

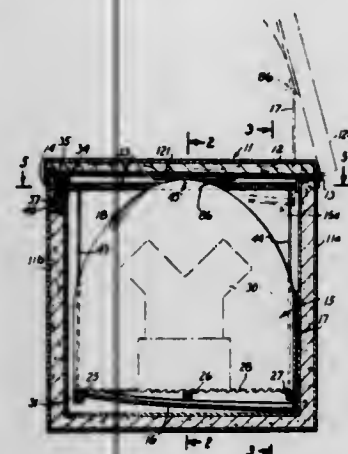


# 4,421,131 CLEANING APPARATUS

Raymond G. Auvil, Jr., P.O. Box 789, Lone Pine, Calif. 93545  
Filed Jan. 19, 1982, Ser. No. 340,736  
Int. Cl.<sup>3</sup> B08B 3/04

U.S. Cl. 134—104

12 Claims



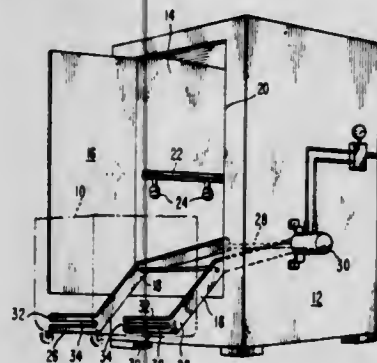
1. Cleaning apparatus comprising:  
a tank for containing a cleaning liquid,  
a basket for supporting an item having sediment adhering thereto,  
said basket having an imperforate floor,  
one side of said tank and said floor forming an opening therebetween, and  
drive means for lowering said basket from a raised position to a lowered position in said liquid to convey the portion of said liquid below said floor through said opening and over said item, whereby to cause said portion of said liquid to sweep any sediment from the bottom of said tank through said opening and to deposit said sediment on top of said floor.

# 4,421,132 CART WASHING APPARATUS

Henry Y. Kuhl, Kuhl Rd., Flemington, N.J. 08822  
Filed Apr. 23, 1982, Ser. No. 371,036  
Int. Cl.<sup>3</sup> B08B 3/02, 9/08

U.S. Cl. 134—123

14 Claims



1. A cart washing means comprising:  
(a) a housing means defining a washing chamber therein, said housing means defining an access opening in one wall thereof;  
(b) a fluid piping means extending throughout said washing chamber to deliver washing and rinsing fluid therein;  
(c) a plurality of nozzle means positioned in said fluid piping means and in fluid flow communication with respect to the fluid therein for delivering, washing and rinsing fluid throughout said washing chamber;  
(d) a drive shaft rotatably mounted within said housing means;  
(e) a drive means secured with respect to said drive shaft and

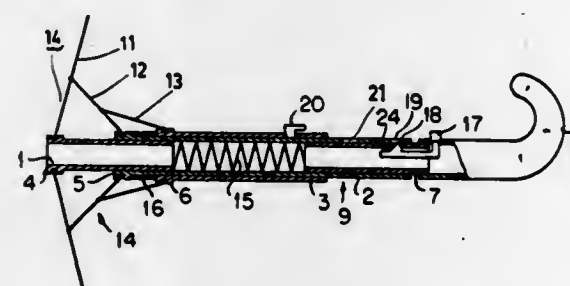
- operable to cause rotation of said drive shaft responsive to actuation of said drive means;  
(f) arm means fixedly secured with respect to said drive shaft to move upwardly responsive to rotation of said drive shaft;  
(g) cart gripping means fixedly secured with respect to said arm means and adapted to selectively secure a cart with respect to said arm means to operably lift the cart into said washing chamber of said housing means to wash and rinse same responsive to actuation of said drive means and rotation of said drive shaft.

# 4,421,133 UMBRELLA

Yueh Huang, No. 60, Fu-Ho Rd., Yung-Ho City, Taiwan  
Filed Sep. 22, 1981, Ser. No. 304,681  
Int. Cl.<sup>3</sup> A45B 25/16

U.S. Cl. 135—22

3 Claims



1. An automatic umbrella having a canopy and a frame of interconnected ribs and first and second stretchers comprising:  
a telescoping shaft including a middle tube, an outer tube slidably disposed over said middle tube, an upper inner tube and lower inner tube longitudinally offset and slidably disposed inside said middle tube;  
a first notch provided at an upper portion of said upper inner tube and pivotably connected to said ribs;  
a second notch provided at an upper portion of said middle tube and pivotably connected to said first stretchers;  
a third notch provided at an upper portion of said outer tube and pivotably connected to said second stretchers;  
a first spring coaxially disposed over said shaft between said second and third notches, said first spring being compressed when said ribs and stretchers spread so as to bias said ribs and stretchers against spreading;  
a second spring provided between said upper and lower inner tubes and having ends abutting against the ends of said upper and lower tubes for biasing said upper tube away from said middle tube so as to spread said ribs and stretchers;  
first locking means for releasably fixing said outer tube with respect to said middle tube in a position in which said ribs and stretchers are not spread; and  
second locking means for releasably fixing said lower inner tube with respect to said middle tube so as to increase the compression of said second spring;  
the force exerted by said second spring on said upper inner tube being stronger than the force exerted by said first spring on said middle tube when said second locking means is actuated and being weaker than the force exerted by said first spring on said middle tube when said second locking means is deactivated, so that when said first and second locking means are both actuated and said first locking means is subsequently released, said second spring urges said upper inner tube and said outer tube upward with respect to said middle tube, compressing said first spring to enable subsequent extension to close the umbrella when said second locking means is subsequently deactivated.

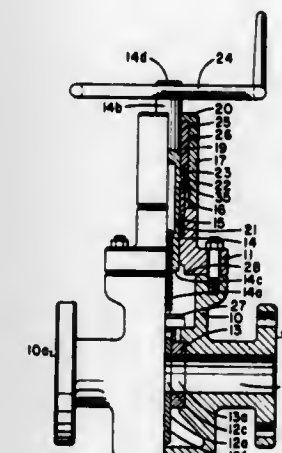
# 4,421,134 HEAT SENSITIVE GATE VALVE

Billy R. Bruton, and David E. Snyder, both of Longview, Tex.,  
assignors to Axelson, Inc., Longview, Tex.

Filed Sep. 10, 1982, Ser. No. 416,686  
Int. Cl.<sup>3</sup> F16K 13/04

U.S. Cl. 137—72

8 Claims



1. A gate valve comprising a valve body having inlet and outlet ends with means at each of said ends for connecting the valve to flow conduits; a flowway between such ends; a chamber intersecting the flowway and opening to one side of the valve body; a bonnet sealably connected to the valve body and having a bore therethrough aligned with the chamber opening; a pair of annular spaced apart seats opposing each other and each having an opening therethrough coaxial with said flowway; a gate having parallel outwardly facing seating surfaces disposed between said seats at all times and reciprocal therebetween, said gate having an imperforate portion positionable between the seats and across the flowway to prevent flow therethrough when the gate is moved to valve closed position and also having a port therethrough to be brought into alignment with the seats and the flowway to permit flow therethrough when the gate is in valve open position; actuating means for moving the gate between said valve closing and open positions including a valve stem attached to the gate and extending through the bore of the bonnet to the exterior of the bonnet; seal means between the stem and bonnet permitting movement of the stem while preventing escape of fluids from the bonnet; means for moving the stem outwardly consisting of the stem having an inner end exposed to line pressure within the valve body and an outer end exposed to atmospheric pressure exteriorly of the valve body such that a differential pressure effectively acts on the cross-sectional area of the stem within the seal means to provide the sole force to urge the stem outwardly of the valve body; said actuating means including a heat fusible element located outwardly of said seal means and disposed between opposing shoulders on the bonnet and the stem to transmit force developed by said actuating means to reciprocate the gate between valve closed and valve open positions but upon melting, being displaced by the stem being moved outwardly by said differential pressure so that said differential pressure will act on the stem to move it outwardly a distance that said gate will be moved fully from one of its valve closed and valve open positions to the other of such positions, said fusible element having a length at least equal to the distance said stem must move outwardly said distance.

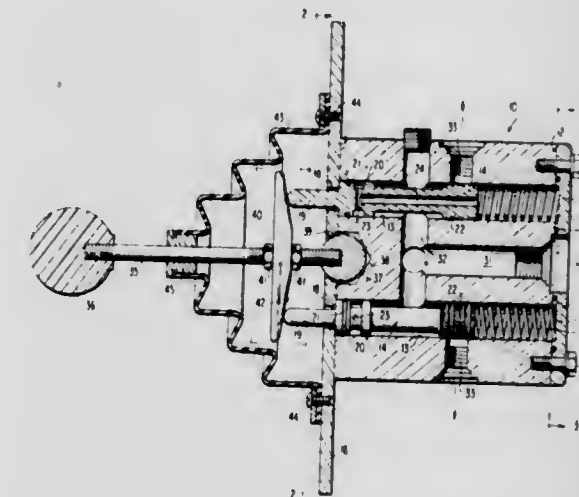
# 4,421,135 HYDRAULIC SELECTOR VALVE HAVING JOY STICK CONTROL

Ronald W. Harshman, Greencastle, and Lynn A. Dietrich, Chambersburg, both of Pa., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Continuation of Ser. No. 11,762, Feb. 12, 1979, Pat. No. 4,296,773. This application Feb. 4, 1981, Ser. No. 231,404  
The portion of the term of this patent subsequent to Oct. 27, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> F16K 29/00

U.S. Cl. 137—312

2 Claims



1. A selector valve comprising a valve body having plural spaced parallel bores, motive fluid inlet passage means leading to said bores and plural motive fluid delivery ports corresponding in number to said bores and leading from the bores, a valve spool positioned in each said bore of the valve body and being biased to a closing position in relation to the adjacent delivery port and having an extension on one end thereof projecting exteriorly of the valve body at one end thereof, a joy stick controller for said valve spools and having a universal swiveled connection with the valve body at said one end and between said bores, said universal swiveled connection comprising a ball head on one end of the joy stick controller, a swivel recess for the ball head in said one end of said valve body, a substantially planar mounting plate secured to said one end of said valve body and overlying said bores and contacting the said one end of the valve spools to retain the latter in said bores, clearance openings in said mounting plate smaller than the diameter of said bores through which the valve spool extension project exteriorly of the mounting plate, said mounting plate having a cooperating swivel recess for the ball head adjacent to and in registration with the first-named swivel recess, said mounting plate retaining a major portion of the ball head engaged within the first-named swivel recess in said valve body and below the plane of said mounting plate, and an actuating disc mounted on said joy stick controller exteriorly of the valve body at said one end thereof in spaced opposing relationship to said mounting plate and cammingly engaged all of said valve spool extensions and movable with the joy stick controller to selectively shift a single spool or a pair of such spools to an open position in relation to a single delivery port or a pair of such ports of the valve body, and said actuating disc having a diameter and a spacing from said mounting plate dimensioned such that during operation of the joy stick controller the peripheral portion of said actuating disc is adapted to engage said mounting plate to form a positive stop to limit movement of the joy stick controller in all directions, whereby not only does the mounting plate cooperate with the disc to provide a limit stop for the joy stick but also the mounting plate retains the ball head and spool valves within the valve body.



4,421,136

# FLEXIBLE TUBULAR CONDUIT FOR TRANSFERRING FLUIDS PARTICULARLY AT HIGH TEMPERATURE AND/OR PRESSURE AND PIPING COMPRISING SUCH A CONDUIT

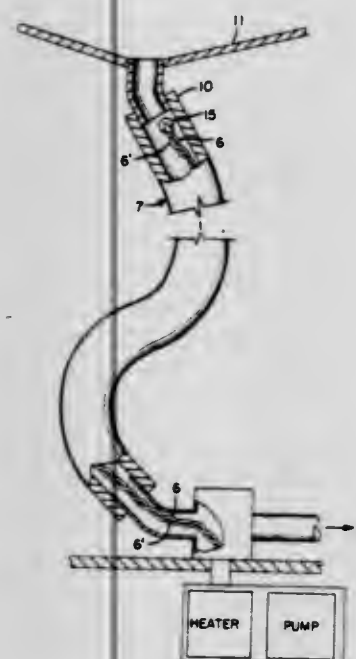
Jean-Paul Aubert, Puteaux, France, assignor to Coflexip, Paris, France

Filed Feb. 27, 1981, Ser. No. 239,126

Claims priority, application France, Feb. 28, 1980, 80 04439  
Int. Cl.<sup>3</sup> F16K 49/00

U.S. Cl. 137—340

8 Claims



1. A drain pipe arrangement for draining water from a floating roof of a storage reservoir comprising, a flexible drain pipe connected to a drain connection at the roof; said drain pipe having a water flow passage therein, said pipe extending downwardly and having a discharge end to discharge water flowing through the flow passage in the pipe, a flexible heating element within said flow passage and extending the length of the drain pipe, said heating element comprising at least two rigid metal tubes twisted on each other, means connecting said metal tubes together at a location near the roof so that a heating fluid can be introduced into one of the tubes and returns through another tube, means for circulating a heating fluid through said rigid metal tubes within said drain pipe, from a location adjacent a lower portion of said drain pipe.

4,421,137

# PLUG ASSEMBLY FOR SEALING A PRESSURE FLUID PASSAGE IN A MANIFOLD OR THE LIKE

Kay T. Nusbaumer, Fort Wayne, and Terrell R. Whitaker, Huntington, both of Ind., assignors to PHD, Inc., Fort Wayne, Ind.

Filed Feb. 2, 1981, Ser. No. 230,378

Int. Cl.<sup>3</sup> F16L 55/12

U.S. Cl. 138—89

11 Claims



1. A plug assembly for plugging the opening of a cylindrical passage comprising a generally cylindrical but out of round expansion sleeve having a socket portion, an expanding nut engageably received by said socket portion, one of said nut and socket portion being tapered such that said sleeve is radially expanded as said nut enters more deeply into said socket portion, the outer periphery of said sleeve being circumferentially

continuous and uninterrupted, the engageable portions of said nut and socket being circumferentially continuous and uninterrupted, a screw element threadedly received by said nut and through a clearance opening in said sleeve, said screw element having a head engaged with said sleeve on the side thereof axially opposite said socket portion whereby threading of said screw element into said nut draws the latter more deeply into said socket portion, and the outer periphery of said sleeve being out of round by a predetermined degree to provide for an interference fit with a bore which is round in cross-section, said sleeve periphery being adapted to provide a circumferential seal with a bore in which it is mounted, said engageable portions of said nut and socket being in a circumferential sealing engagement and said nut sealing against the threads of said screw element when the latter is tightened and said sleeve is sealed within a bore.

7. The method of fabricating a plug assembly for plugging the opening of a cylindrical passage wherein said plug assembly comprises a cylindrical expansion sleeve which is circumferentially continuous and uninterrupted, and having a socket which engageably receives a tapered expanding nut, said nut being of smaller diameter than said sleeve, the engageable portions of said nut and socket being circumferentially continuous and uninterrupted, a screw element threadedly received by said nut and through a clearance opening in said sleeve, a head on said screw element engaging the side of said sleeve axially opposite said socket; said method comprising the steps of threading said screw element into said nut for tightening said nut into said socket with a predetermined force, radially compressing said sleeve until said clearance opening bottoms onto said screw element and radially deforming said sleeve whereby the outer periphery is out of round.

4,421,138

# DOG LOCKING SLEEVE

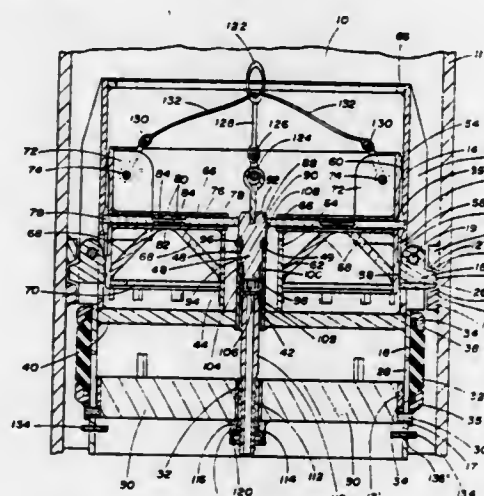
R. Benton Nickles, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 194,185, Oct. 6, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,440

Int. Cl.<sup>3</sup> F16L 55/12, 55/10

U.S. Cl. 138—89

1 Claim



1. A removable plug for temporarily sealing the interior of an annular member of a marine structure having a plug retaining means secured therein, said annular member and plug retaining means having a predetermined diameter and predetermined diametrical variations in the predetermined diameter, to prevent the flow of fluid therethrough, said removable plug comprising:

plug body means adapted to be disposed within said annular member, the plug body means comprising:  
parker mandrel means having a substantially cylindrical shape having a predetermined diameter having, in turn, substantial predetermined diametrical dimensional variations therein throughout the length of the packer man-

drel means, a plurality of apertures therein and a plug therein for preventing the flow of said fluid therethrough, the plug having a centrally located sleeve therein;

packer member means located on the packer mandrel means for sealingly engaging the interior of said annular member; packer setting sleeve means located on the packer mandrel means for compressing the packer member means into sealing engagement with the interior of said annular member;

locking dog means pivotally mounted on the packer mandrel means for retaining said plug from axial movement when installed in said annular member, the locking dog means comprising:

a plurality of members pivotally mounted on the packer mandrel, each member having a portion thereof adapted to engage a portion of the plug retaining means secured to the interior of said annular member when said plug is installed therein and being rotatable through an aperture of the plurality of apertures in the packer mandrel means;

pressure equalization plug means releasably secured within the centrally located sleeve of the packer mandrel means for allowing the flow of said fluid through said plug when said plug is installed in said annular member thereby allowing the pressure of said fluid to substantially equalize in said annular member and across said plug before the removal of said plug from said annular member; and

dog locking sleeve assembly means slidable within the packer mandrel means between a first position wherein the locking dog means about a portion of the exterior surface of the dog locking sleeve assembly means thereby preventing rotation of the locking dog means through the apertures in the packer mandrel means and a second position wherein the locking dog means are free to rotate through the apertures in the packer mandrel means thereby disengaging the interior of said annular member when said plug is installed therein to allow the removal of said plug from said annular member, the dog locking sleeve assembly means comprising:

annular cylindrical member means having a first annular cylindrical shoulder means on the exterior surface thereof having a controlled predetermined diameter substantially throughout the length thereof, which predetermined diameter compensates for the predetermined diametrical variations in the predetermined diameter of said plug retaining means, said annular member of said marine structure and the packer mandrel means, adapted to slidably engage a portion of the locking dog means to ensure satisfactory engagement of the locking dog means with said plug retaining means while eliminating any excessive clearance between the packer mandrel and the annular cylindrical member means, the predetermined diameter of the first annular cylindrical shoulder being more closely controlled than the diameter of the packer mandrel means, being more closely controlled than the diameter of said plug retaining means, and being more closely controlled than the diameter of said annular member of said marine structure, having an annular recess means in the exterior surface thereof extending throughout a portion of the exterior surface of the dog locking sleeve to minimize the area of the exterior surface in contact with the interior of the packer mandrel means and having a second annular cylindrical shoulder means on the exterior surface thereof having, in turn, a predetermined diameter more closely controlled than the diameter of the packer mandrel means, adapted to slidably engage the interior of the packer mandrel means, the dog locking sleeve means having a ratio of axial length to the diameter of the first annular shoulder means of greater than approximately 0.3 to preferably not greater than 0.5 to minimize the cocking and binding of the dog locking sleeve means within the packer mandrel means whereby the annular cylindrical member means of the dog

locking sleeve assembly means of said plug requires an amount of force to cause sliding of the annular cylindrical member means within the packer mandrel means less than the amount of force necessary to cause the sliding of an annular cylindrical member having a continuous uninterrupted exterior surface in a packer mandrel means.

4,421,139

# PLUG FOR OFFSHORE PLATFORMS AND THE LIKE

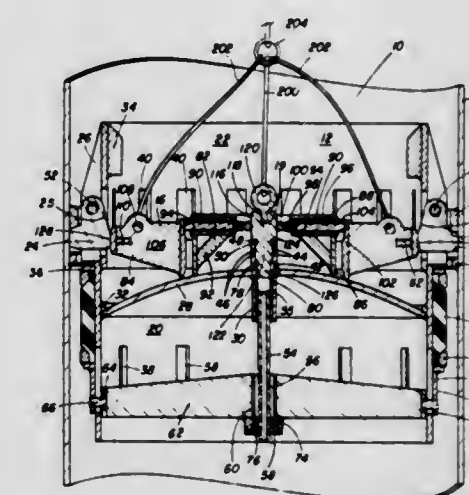
R. Benton Nickles, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 26, 1981, Ser. No. 266,762

Int. Cl.<sup>3</sup> E02B 17/00

U.S. Cl. 138—89

6 Claims



1. A removable plug for temporarily sealing the interior of an annular member to prevent the flow of fluid therethrough, said removable plug comprising:

plug body means adapted to be disposed within said annular member, the plug body means comprising:

packer mandrel means having a plurality of apertures therein and having a plug therein for preventing the flow of said fluid therethrough, the plug having a sleeve therein;

packer member means located on the packer mandrel means for sealingly engaging the interior of said annular member;

packer setting sleeve means located on the packer mandrel means for compressing the packer member means into sealing engagement with the interior of said annular member;

locking dog means pivotally mounted on the packer mandrel means for retaining said plug from axial movement when installed in said annular member, the locking dog means comprising:

a plurality of members pivotally mounted on the packer mandrel means, each member having a portion of the exterior thereof adapted to engage a portion of the interior of said annular member when said plug is installed therein, having a portion of the interior thereof including an angular inwardly extending surface terminating in a vertical surface and being rotatable through an aperture of the plurality of apertures in the packer mandrel means;

pressure equalization means releasably secured within the sleeve of the packer mandrel means for allowing the flow of said fluid through said plug when said plug is installed in said annular member thereby allowing the pressure of said fluid to substantially equalize in said annular member and across said plug before the removal of said plug from said annular member; and

dog locking sleeve assembly means slidable within the packer mandrel means between a first position wherein the locking dog means about a portion of the exterior sur-



face of the dog locking sleeve assembly means thereby preventing rotation of the locking dog means through the apertures in the packer mandrel means and a second position wherein the locking dog means are free to rotate through the apertures in the packer mandrel means thereby disengaging the interior of said annular member when said plug is installed therein to allow the removal of said plug from said annular member, the dog locking sleeve assembly means comprising:

stationary portion means having a portion thereof secured to the plug of the packer mandrel means and having movable pin means therein having one end thereof adapted to engage the exterior of the pressure equalization plug means when the pressure equalization plug means is installed in the sleeve of the packer mandrel means; and

movable portion means including annular member means having a bore therethrough adapted to engage the other end of the movable pin means of the stationary portion means when the pressure equalization plug means is installed in the sleeve of the packer mandrel means to retain the dog locking sleeve means in a first position in the packer mandrel means having the dog locking sleeve means engaging the locking dog means, radial support means having one end thereof secured to the annular member means, and dog locking ring means secured to the other end of the radial support means and having the exterior thereof adapted to engage the vertical surface of the locking dog means when dog locking sleeve means is in a first position in the packer mandrel means and to disengage the locking dog means in a second position within the packer mandrel means thereby allowing the locking dog means to rotate through the apertures in the packer mandrel means.

4,421,140

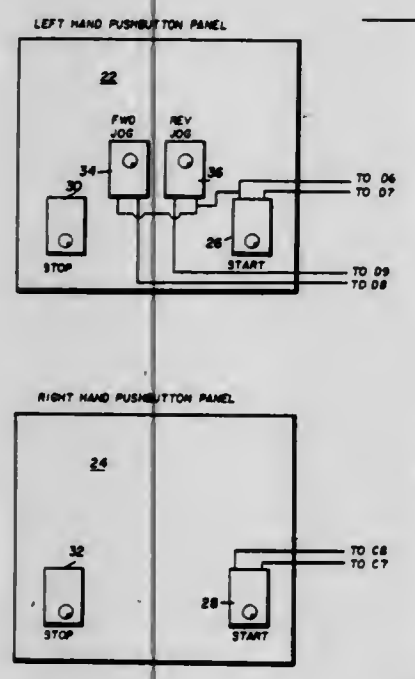
# DOBBY-ACTIVATED LOOM MOTION LOCK-OUT DEVICE

Danny H. Allen, and John H. Sumner, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.  
Filed Dec. 17, 1981, Ser. No. 331,833

Int. Cl.<sup>3</sup> D03D 51/04

U.S. Cl. 139—1 E

3 Claims



1. For a loom which is capable of being run forwards, jogged forwards, jogged in reverse, which is being used in conjunction with a lever-controlled dobby head having a control lever which is shiftably mounted relative to a guide bracket at an operator's control station, for shifting between a RUN position and a REVERSE position, which positions are spaced apart so as to permit the lever to be positioned in an

intermediate position which is located between the RUN and REVERSE positions, and wherein the loom is electrically powered by means including electrical circuitry including at least one START/STOP push button switch located at said operator's control station, a FORWARD JOG push button switch located at said operator's control station and a REVERSE JOG push button switch located at said operator's control station,

a control station improvement comprising:

a first microswitch means wired in series with said at least one START/STOP push button switch and with said FORWARD JOG push button switch in said circuitry, said first microswitch means being normally open and having a respective actuator which, only while actuated, keeps said first microswitch means closed;

a second microswitch means wired in series with said REVERSE JOG push button switch in said circuitry, said second microswitch means being normally open and having a respective actuator which, only while activated, keeps said second microswitch means closed;

means mounting the first microswitch means relative to said lever in such a disposition that said actuator of said first microswitch means will be maintained in an actuated condition by engagement with said lever only when said lever is in said RUN position, and mounting the second microswitch means relative to said lever in such a disposition that said actuator of said second microswitch means will be maintained in an actuated condition by engagement with said lever only when said lever is in said REVERSE position, whereby:

said loom may be run forwards or jogged forwards, but not jogged in reverse while said dobby head control lever is in said RUN position,

said loom may be jogged in reverse, but neither run forwards nor jogged forwards while said dobby head control lever is in said REVERSE position, and

said loom may not be run forwards, may not be jogged forwards and may not be jogged in reverse when said dobby head control lever is in said intermediate position.

4,421,141

# FABRIC SELVAGE FORMING

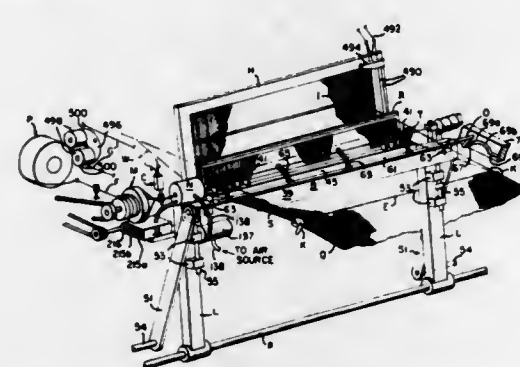
Charles W. Brouwer, East Greenwich, R.I., assignor to Leeson Corporation, Warwick, R.I.

Filed Aug. 6, 1979, Ser. No. 64,391

Int. Cl.<sup>3</sup> D03D 47/40

U.S. Cl. 139—54

16 Claims



1. In a method of weaving in which weft strands are inserted in sequence across an open shed defined by plural vertically separated groups of warp strands, each such inserted weft strand having free ends projecting beyond both side edges of the shed, at least some of said groups of warps being reversed in vertical position after each such insertion to close said shed and re-open it in said reversed position and thereby entwine the warp strands sinuously around the sequentially inserted weft strands to form a fabric, each thus inserted weft strand is beat up against the fell of the fabric being formed in timed

relation to the reversal of said groups of warp strands, and the projecting ends of each inserted weft strand are severed adjacent the side edges of the shed before the next weft strand is inserted, the improvement of forming a selvage along each side of said fabric by the steps comprising: guiding a pair of binder strands to the fell of said fabric along each side of said shed, vertically separating said binder strands for the delivery of weft strand therebetween, vertically crossing while mutually twisting together the strands of each said pair of binder strands prior to closing of said shed and severing said projecting weft strand ends to thereby grip said weft strand ends by said binder strands before said weft strand ends are severed, and forming a leno chain stitch by criss-crossing at least two leno threads beneath periodic weft strands and across a terminal plurality of said warp strands along each side of said fabric, said leno threads being criss-crossed above said plural warp strands while said shed is substantially open, said crossed and twisted binder strands being disposed outwardly of said leno chain stitch at the corresponding side of said warp shed.

4,421,142

# METHOD FOR THE PRODUCTION OF A FABRIC, PARTICULARLY TAPE FABRIC, LOOM FOR THE PERFORMANCE OF THE METHOD AND FABRIC PRODUCED ACCORDING TO THE METHOD

Jakob Müller, Stansstad, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

PCT No. PCT/CH80/00131, § 371 Date Jun. 22, 1981, § 102(e)

Date Jun. 22, 1981

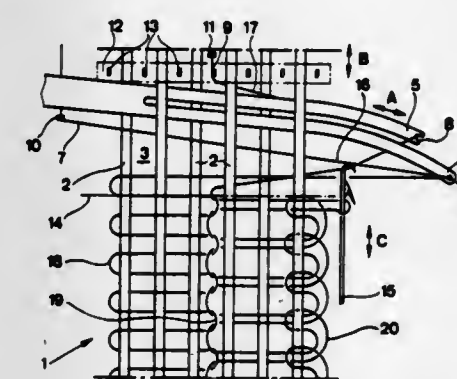
PCT Filed Oct. 30, 1980, Ser. No. 279,978

Claims priority, application Switzerland, Nov. 8, 1979, 9998/79

Int. Cl.<sup>3</sup> D03D 13/00, 47/40

U.S. Cl. 139—117

13 Claims



1. A method of weaving a fabric, particularly a tape fabric, comprising the steps of:

laying into a shed formed of warp threads at least two weft threads by means of weft thread introducing organs arranged laterally of the shed, at least one weft thread being fed, prestored according to programme, to the shed through one of a number of tooth gaps provided in a reed for the passage of the warp threads, forming the weft threads into loops which are laid-in substantially parallel to a fabric beating edge, connecting the loops with one another within the width of the fabric between two adjacent warp threads by crossing the sides of a loop with respective sides of the other loop, while for the formation of a fabric edge from said at least one weft thread fed through the reed, said thread is looped with itself or held by means of at least one auxiliary thread.

7. A loom, particularly a tape loom, comprising:

a loom reed having tooth gaps, feed means for the programmed prestored feeding of at least two weft threads into a shed formed of warp threads passing through respective tooth gaps of the loom reed, said feed means being provided with at least two weft thread guides, at least one of said guides is arranged upstream of the loom reed for guiding one of said two weft threads through one of the loom reed gaps, at least two weft thread introducing organs arranged laterally of the shed in a plane of the

fabric being woven and reciprocable across the shed in the machine rhythm such as to form said at least two weft threads into loops connected together within the width of the fabric, and at least one knitting tool reciprocable in the machine rhythm for forming an edge of the fabric from said one weft thread guided through the loom reed.

4,421,143

# INDUCTIVE PROJECTILE SENSOR ON A GRIPPER SHUTTLE WEAVING MACHINE

Erich Weidmann, Wetzikon, Switzerland, assignor to Loepfe Brothers Limited, Wetzikon, Switzerland

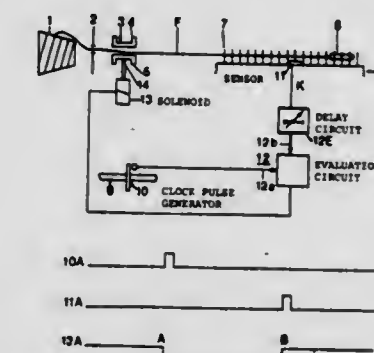
Filed Dec. 4, 1981, Ser. No. 327,560

Claims priority, application Switzerland, Dec. 13, 1980, 9189/80

Int. Cl.<sup>3</sup> D03D 51/40

U.S. Cl. 139—341

5 Claims



1. An electronic control device for a gripper shuttle weaving machine containing a lathe beam and thereto fixed guide teeth for guiding the gripper shuttle which inserts the weft thread into the weaving shed, and a thread brake located at the picking side of the weaving machine, wherein the electronic control device comprises:

a sensor arranged at least at one of the guide teeth for furnishing an electrical sensor signal indicative of the passage of the gripper shuttle;  
an evaluation circuit connected to the sensor;  
an adjustable delay circuit operatively interconnected between the sensor and the evaluation circuit for delaying the electrical sensor signal; and  
an electromagnetic device operatively connected to the evaluation circuit for actuating the thread brake upon appearance of an electrical sensor signal.

4,421,144

# FILLING STOP IDENTIFICATION FOR LOOMS

Charles D. Pugh, Raleigh, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 12, 1982, Ser. No. 348,180

Int. Cl.<sup>3</sup> D03D 51/34

U.S. Cl. 139—370.2

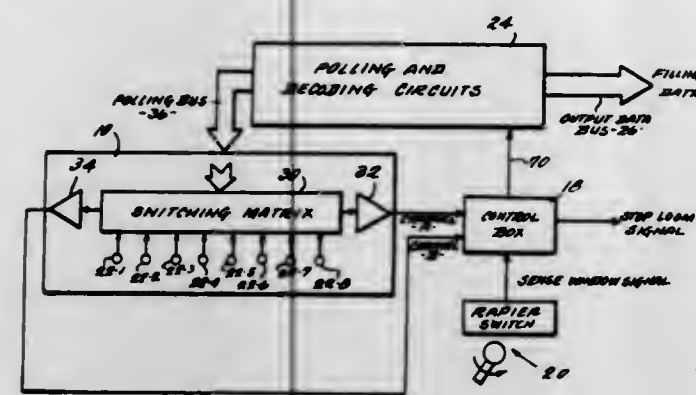
25 Claims

1. A loom monitor system for identifying which one of a plurality of filling yarns has broken, comprising:

a plurality of sensing means, each associated with one of said plurality of filling yarns, each for generating a sensing signal indicative of movement of its associated yarn;  
polling means for sequentially polling the plurality of sensing means and generating data indicative of the sensing means being polled;  
signal storage means responsive to said sensing signal generated by a polled sensing means for temporarily storing the data generated by the polling means, thereby identifying a yarn currently being drawn; and  
data transfer means responsive to said polling means and to the loom being restarted after a filling yarn break causing

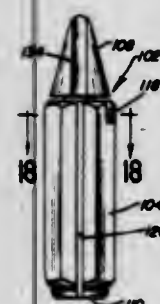
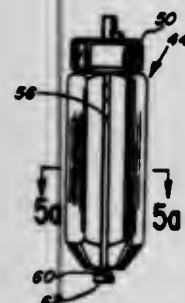


a loom stop for transferring the data temporarily stored and indicative of the first yarn being drawn through the



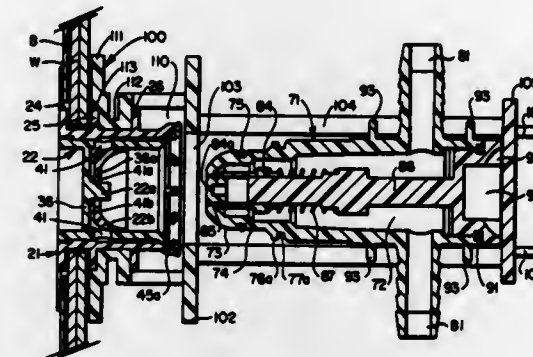
loom after restart, thereby indentifying the yarn that broke.

**4,421,145**  
**DEVICE FOR FORMING EYES AND LOOPS IN WIRE**  
Dewey O. Broberg, Jr., Long Grove, Ill., assignor to Du-Bro Products, Inc., Wauconda, Ill.  
Filed Apr. 26, 1982, Ser. No. 371,679  
Int. Cl.<sup>3</sup> B21F 1/06  
U.S. Cl. 140—104



20. A device for forming an eyelet in wire, comprising:  
a body;  
first means on said body for forming a loop in a length of wire and twisting the wire helically away from the loop in response to relative rotation between the loop and the body; and  
second means on said body for tightly wrapping a free end portion of the wire about a straight portion of the wire inwardly of the innermost twist to completely form said eyelet.

**4,421,146**  
**QUICK-DISCONNECT SERVICE-LINE CONNECTOR AND VALVE ASSEMBLY**  
Curtis J. Bond, Marion, and John G. Ulm, Upper Sandusky, both of Ohio, assignors to Liqui-Box Corporation, Worthington, Ohio  
Continuation-in-part of Ser. No. 319,580, Nov. 9, 1981. This application Mar. 8, 1982, Ser. No. 355,530  
Int. Cl.<sup>3</sup> B65B 3/04; B67C 5/37  
U.S. Cl. 141—349



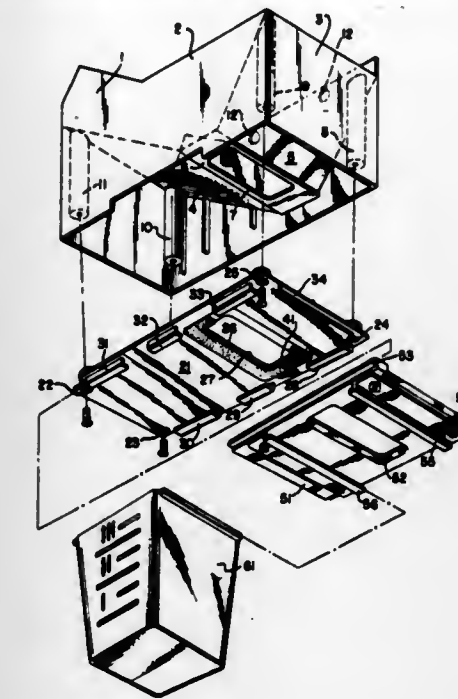
1. A service-line connector for connecting the service-line of a fluid dispensing system to a spout on a container or the like comprising means for removably mounting it on the spout, said connector including a nozzle body having a fluid passageway therethrough with a service-line connection and an inlet leading thereinto, a normally-closed valve for controlling flow into and out of said inlet, guide means extending from said mounting means for supporting the body for axial movement to insert it into and withdraw it from the spout and means for positively opening said valve as the nozzle body is inserted into the spout, said mounting means being of yoke form and being adapted to slip transversely onto the spout to interfit therewith to prevent axial movement of the mounting means relative to the spout in either direction during insertion of the nozzle body into or withdrawal of it from the spout.

**4,421,147**  
**APPARATUS FOR DISPENSING GRANULAR MATERIAL**  
Samuel M. Cannella, Pine Brook, N.J., assignor to E-Z Way Products, Inc., Paterson, N.J.  
Filed Oct. 19, 1981, Ser. No. 312,692  
Int. Cl.<sup>3</sup> B65B 1/04  
U.S. Cl. 141—362

1. An apparatus for dispensing granular material from a storage box container, comprising:  
(a) a housing having side walls and a receiving base, the receiving base having a dispensing opening therein, said side walls and receiving base being positioned so as to retain a storage box container at an adequate angle to permit gravity flow of granular material;  
(b) a main rail connected to the underside of said housing, said main rail having sliding means capable of receiving a main slide so as to permit forward and reverse movement of said main slide with said main rail, said main rail also having an opening therein coinciding with said dispensing opening of said housing;  
(c) a main slide, slidably connected to said sliding means of said main rail so as to permit its forward and reverse movement, said main slide having a main slide opening therein located so as to be coinciding with said dispensing opening of said housing when said main slide is in a first position and so as to be fully non-coincident with said dispensing opening when said main slide is in a second position, and located so as to permit the flow of granular material out of said apparatus by gravity flow of granular material when located in said second position, said main slide also having means for attaching a receiving device under said main slide opening so that the receiving device

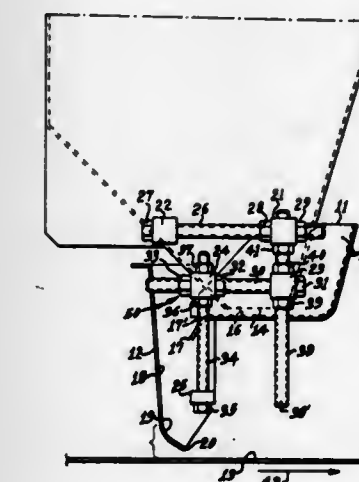
may be removably attached thereto and may receive granular material flowing out of said apparatus; and,

particulate material being discharged and the location of the bottom of said chute means with respect to said moving surface.



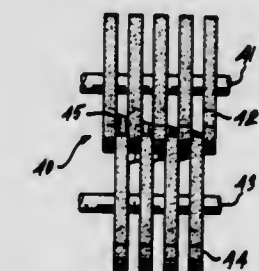
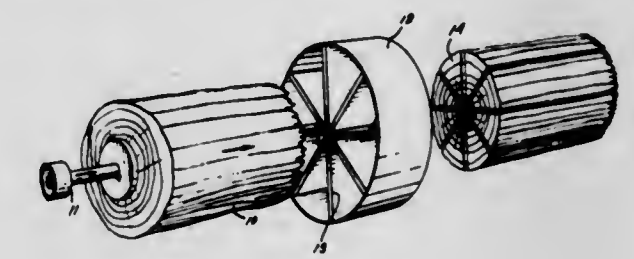
(d) a receiving device capable of attachment to said main slide.

**4,421,148**  
**DEVICE FOR FEEDING PARTICULATE MATERIAL**  
Frank S. Knoll, Jacksonville, and Arnold H. Jackson, Orange Park, both of Fla., assignors to Carpro, Inc., Jacksonville, Fla.  
Filed Oct. 29, 1981, Ser. No. 316,138  
Int. Cl.<sup>3</sup> B65B 1/30  
U.S. Cl. 141—392



1. In a device for feeding a thin evenly distributed layer of particulate material to a moving surface comprising  
(a) a hopper for containing particulate material and having an outlet in the bottom for discharging the particulate material;  
(b) a cup-shaped pan encircling and spaced downwardly from said outlet, and having a spillway on one side thereof;  
(c) a generally vertical chute means in communication with said pan and adapted to receive material from the spillway, permit the material to fall vertically to gain linear speed, and discharge such material in a generally horizontal direction in the same direction as said moving surface from the bottom of said chute means; and  
(d) connection means for adjustably attaching said chute means with respect to said spillway and with respect to said moving surface passing underneath and adjacent to the bottom of said chute means to vary the velocity of said

**4,421,149**  
**PROCESS FOR PREPARATION OF LONG WOOD STRANDS**  
Derek Barnes, Vancouver; Mark T. Churchland, Burnaby; Arnold W. Herndier, Burnaby, and James K. Welsh, Burnaby, all of Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada  
Continuation-in-part of Ser. No. 885,985, Mar. 13, 1978, abandoned. This application Oct. 21, 1980, Ser. No. 199,191  
Int. Cl.<sup>3</sup> B27L 7/00  
U.S. Cl. 144—366



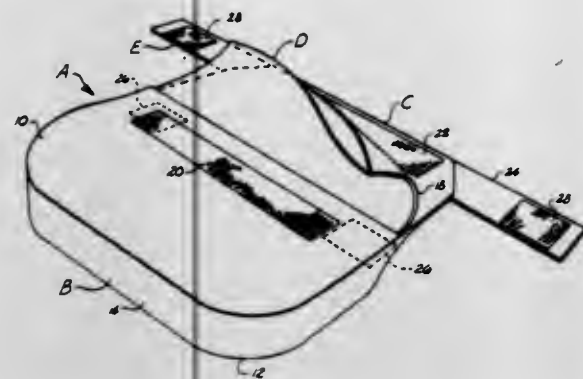
1. The method of splitting a log into longitudinal grain wood strands comprising the steps of, radially splitting the log substantially along the grain of the log into a plurality of sector shaped segments, said radial splitting including pushing the log axially through at least one sector splitter ring, and further splitting the sector shaped segments substantially along the grain of the segments, said further splitting including feeding each of the sector shaped segments through two rolls of intermeshing counter rotating parallel discs, pulling each of the segments between the rows of discs and simultaneously splitting each of the segments into a plurality of discrete longitudinal-grain wood strands whose surfaces generally follow the grain in the wood throughout their length.

**4,421,150**  
**WATERPROOF BAG DEVICE FOR ARTICLES**  
William E. Masters, 138 Norris Ave., Liberty, S.C. 29657  
Filed Jul. 13, 1981, Ser. No. 282,484  
Int. Cl.<sup>3</sup> B65D 30/08, 33/16

U.S. Cl. 383—61  
7. A bag device for containing articles in a generally airtight waterproof environment comprising:  
a flexible outer case having an inner enclosure;  
said inner enclosure being constructed of an impervious material providing an airtight waterproof environment therein rendering said bag device buoyant;  
closure means for sealing said inner enclosure;  
cover flap means carried by said outer case foldable over said closure means;  
first fastening means fastening said cover flap and outer case together;  
second fastening means securing said cover flap and outer cases; and  
said first fastening means being yieldable to open upon suffi-



cient pressure exerted upon said bag to accommodate sudden impact while said second fastening means remains fastened to retain said closure means in said sealed configuration.



uration maintaining said airtight waterproof environment within said inner enclosure to preserve the buoyancy and waterproofness of said bag device.

4,421,151

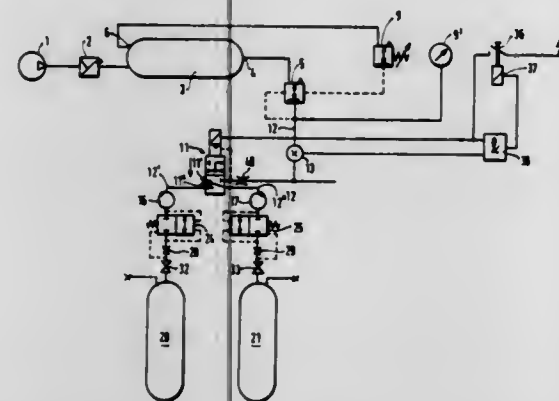
## TIRE-PRESSURE REGULATING SYSTEM

Werner Stumpe, Kornwestheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Mar. 4, 1982, Ser. No. 354,579

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108247

Int. Cl.<sup>3</sup> B60C 23/10

U.S. Cl. 152-417



1. A tire-pressure regulating system for varying the pressure in vehicle tires while driving, said system includes a compressed-air supply device which is connected with said vehicle tires via a supply line, said system further including rotor connections, control valves, flow restrictive means and an adjustable regulating valve, as well as a shut-off valve and an axle valve being disposed downstream of said regulating valve, characterized in that said axle valve is connected to said supply line on an inlet side and to a pair of branch supply lines on its outlet side, said axle valve having two switching positions, and further wherein in one switching position of said axle valve said pair of branch lines are connectable to the supply line leading back to a relay valve and in the other switching position the branch lines are connectable to a relief means.

4,421,152

## APPARATUS FOR PRECISION CASTING

Tsutomu Shinkawa, Itami; Akihide Yoshino, Osaka; Hitoshi Konishi, Ibaragi; Yoshiaki Komuro, Nishinomiya; Satoshi Hamada, Suita, and Saburo Okumura, Amagasaki, all of Japan, assignors to Sansha Electric Mfg. Co., Ltd., Osaka, Japan

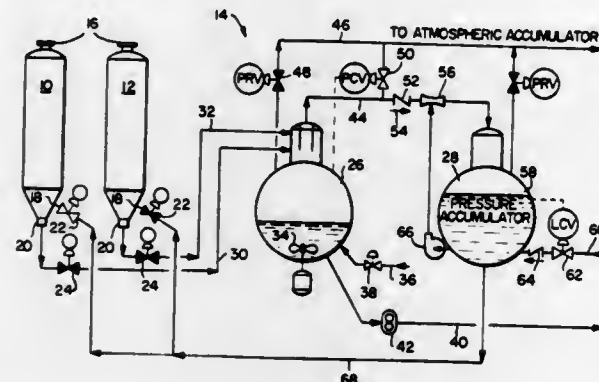
Filed Mar. 2, 1981, Ser. No. 239,470

Claims priority, application Japan, Mar. 5, 1980, 55-28270

Int. Cl.<sup>3</sup> B22D 18/06, 21/02, 27/13

U.S. Cl. 164-258

5 Claims



1. A casting device comprising a frame including spaced top and bottom walls and at least one open side, a melting chamber including a crucible within said frame and spaced from the top wall thereof, heating means for heating said crucible to melt the contents therein and means for discharging melted contents from the bottom of said crucible, a casting section containing a mold disposed beneath said melting chamber, supporting means carried by said frame for supporting said melting chamber and casting section for individual vertical movement within said frame, fluid actuated means operable between said bottom wall and said casting section to move said mold upwardly and into contact with said melting chamber and in turn move said melting chamber upwardly into contact with the top wall of said frame prior to operation of said heating means and means in said top wall for feeding a gas to said melting chamber during operation of said heating means, said open side providing ready access to said melting chamber and casting section for individual removal from said frame, said casting section including a cup-shaped cylinder block mounted for vertical displacement, a casting chamber carrying said mold disposed within said cylinder block and movable vertically relative thereto and said fluid actuated means includes a fluid inlet port in said cylinder block and beneath said casting section whereby the introduction of a fluid into said port in said cylinder block forces the casting chamber upwardly against the melting chamber, the melting chamber upwardly against said top wall and said cylinder block downwardly against said bottom wall.

4,421,153

## METHOD OF MAKING AN AEROFOIL MEMBER FOR A GAS TURBINE ENGINE

Wilfred H. Wilkinson, Turnditch; Edwin Pateman, Allestree; Anthony G. Gale, Wollaton, and John Slinger, Spondon, all of England, assignors to Rolls-Royce Limited, London, England  
Division of Ser. No. 62,419, Jul. 31, 1979, Pat. No. 4,321,010.  
This application Jul. 13, 1981, Ser. No. 283,002

Claims priority, application United Kingdom, Aug. 17, 1978, 33660/78

Int. Cl.<sup>3</sup> B22C 9/04, 9/00

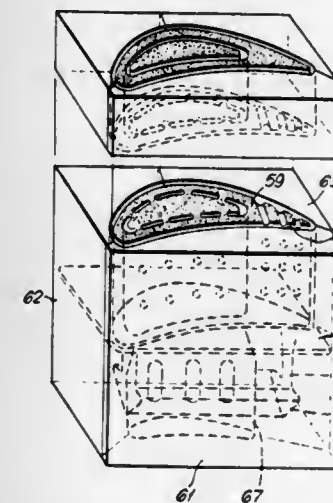
U.S. Cl. 164-35

2 Claims

1. A method of making a blade or vane structure for a gas turbine engine, the blade or vane structure including a hollow aerofoil member having an inner end and an outer end and a cooling air entry tube positioned therein, the cooling air entry tube having an inner end and an outer end and extending integrally from the inner end of the hollow aerofoil member

toward the outer end of the hollow aerofoil member in a cantilevered relationship and spaced entirely from an interior surface of the hollow aerofoil member, said method comprising the steps of:

- injection molding a disposable tube piece;
- mounting said disposable tube piece in a die;
- injection molding ceramic in a fluid state into said die to fill the interior of said disposable tube piece;
- causing said ceramic to harden;
- removing said ceramic with the disposable tube piece embedded therein from said die;
- mounting said ceramic with said disposable tube piece embedded therein in a further die having a desired shape of a ceramic core;



injecting more of said ceramic in a fluid state to fill the space between the outside of said disposable tube piece and said die;

- causing said more of said ceramic to harden;
- removing said ceramic core with the disposable piece embedded therein from said die;
- removing said disposable piece from said ceramic core;
- placing said ceramic core in a further die and injecting wax into all voids in the ceramic core and around the ceramic core to make a wax preform;
- forming a shell mold about the wax preform;
- removing the wax preform from the shell mold by melting; and
- then casting metal into said shell mold to make the aerofoil member and the cooling air entry tube.

4,421,154

## FAIL SAFE AIR WIPE

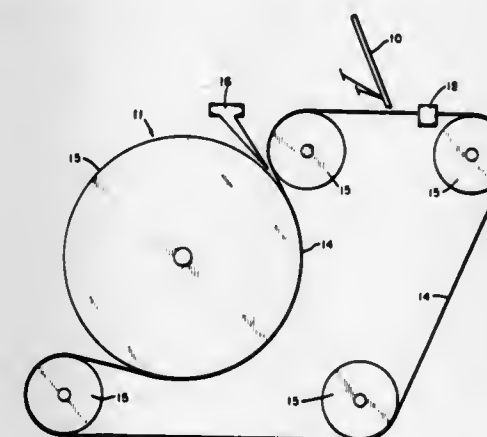
Michael C. Smith, LaGrange, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Dec. 14, 1981, Ser. No. 330,115

Int. Cl.<sup>3</sup> B22D 11/06

U.S. Cl. 164-158

13 Claims



1. A fail safe air wipe for use in a casting band cleaning system of a band type continuous casting system for thor-

oughly removing cleanser and rinsing agent from the band comprising:

- (a) pneumatic wiping means situated near the casting band and between the position where cleanser and rinsing agent is applied and the position where molten metal is poured into a continuously formed mold; and
  - (b) mechanical wiping means connected to said pneumatic wiping means downstream of and in tandem relationship with said pneumatic wiping means;
- an activator means is provided for activating said mechanical wiping means by insufficient pressure of said pneumatic wiping means.

4,421,155

## MACHINE DUPLICATABLE, DIRECT CHILL FLAT INGOT CASTING MOLD WITH CONTROLLED CORNER WATER AND ADJUSTABLE CROWN FORMING CAPABILITY

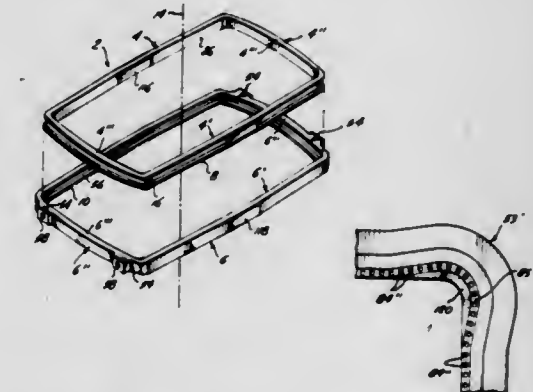
Frank E. Wagstaff, Spokane, Wash., assignor to Wagstaff Engineering, Incorporated, Spokane, Wash.

Filed Aug. 25, 1977, Ser. No. 827,587

Int. Cl.<sup>3</sup> B22D 11/124

U.S. Cl. 164-444

6 Claims



1. A flat ingot casting mold having a mold-cavity defining member at the inner periphery thereof which comprises a generally rectangularly shaped band that is monolithically continuous about the circumference thereof, including at the corners of the cavity, and inherently convexly bowed on the relatively longer and shorter sides thereof so that it forms crowns on the opposing side walls of the ingot operatively formed in the cavity, the bow in the relatively longer sides of the band having an inherent deflection adapted to form a crown intermediate between that adapted to compensate for shrinkage during the butt forming stage of the casting operation and that adapted to compensate for shrinkage when the casting operation is conducted at operating speed, but the relatively longer sides of the band being adapted to flex laterally inwardly and outwardly thereof and there being drive means connected with the relatively longer sides of the band to flex the same, firstly relatively laterally inwardly thereof to alter the deflection to that adapted to compensate for shrinkage during the butt forming stage, and thence relatively laterally outwardly thereof to alter the deflection to that adapted to compensate for shrinkage when the casting operation is conducted at operating speed, and there also being coolant delivery apertures in one axial end of the band adjacent the inner peripheral face thereof, which are spaced apart from one another about the circumference of the mold and offset from the inner peripheral facial plane of the band at a greater distance in the corner portions of the same than along the relatively longer and shorter sides thereof, to discharge the coolant so that it impinges on the ingot at points more distant from the one axial end of the band at the corners of the mold, than it impinges on the ingot along the relatively longer and shorter sides of the mold.



4,421,156

**PROCESS FOR THE OPTIMIZED HEAT TRANSFER FROM CARRIERS OF REVERSIBLE, HETEROGENEOUS EVAPORATION PROCESSES FOR THE PURPOSE OF GENERATING HEAT OR COLD AND APPARATUS FOR CARRYING OUT THE PROCESS**

Gert Vaubel, Paderborn-Schloss Neuhaus; Rolf Rathert, Bielefeld, and Alfred Ritter, Mulheim, all of Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim, Fed. Rep. of Germany

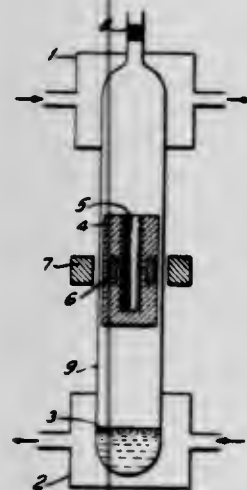
Filed Dec. 11, 1981, Ser. No. 329,797

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047632

Int. Cl.<sup>3</sup> F28D 21/00

U.S. Cl. 165—1

14 Claims



1. In a process for the heat transfer from carriers of reversible, heterogeneous evaporation processes for the purpose of generating heat or cold by means of the principle of the heat pipe, the improvement comprising optimizing the heat transfer by arranging the carrier of the reversible, heterogeneous evaporation process in the interior of a heat pipe.

10. A heat transfer apparatus comprising a vertical heat pipe, a heat source connected to the bottom of the heat pipe a heat sink connected to the top of heat pipe and a low-boiling liquid and a carrier of a reversible, heterogeneous evaporation process in the heat pipe and a feed line and discharge line for the gas of the reversible heterogeneous evaporation process.

4,421,157

**STATOR SECTOR PLATE FOR REGENERATIVE AIR PREHEATER**

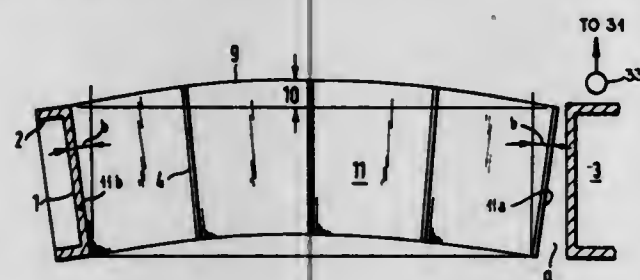
Herbert Sandmann, Olpe, Fed. Rep. of Germany, assignor to Apparatebau Rothemühle Brandt & Kritzler GmbH, Wenden, Fed. Rep. of Germany

Filed Aug. 17, 1982, Ser. No. 408,729

Int. Cl.<sup>3</sup> F28D 17/00

U.S. Cl. 165—4

12 Claims



1. A sector plate for a regenerative air preheater, the plate comprising:  
an outer support ring centered on an axis and normally of cylindrical shape;  
an inner support ring centered on the axis;  
a plurality of radially extending walls lying generally in axial

planes and having outer ends fixed to the outer ring and inner ends and guided on the inner ring;  
a plurality of angularly extending and radially spaced annular walls extending between the radial walls and forming therewith axially throughgoing passages, whereby when hot gases flow in one axial direction through the passages they thermally deform the radial walls so that their ends move into a position at an angle to each other; and  
means for thermally deforming the outer ring to a taper equal to twice the angle for holding the inner ends of the radial walls and the inner ring in the axially level with the outer ring when hot gases flow through the passages.

4,421,158

**COOLANT RECIRCULATION SYSTEM FOR DRY CLEANING PLANTS**

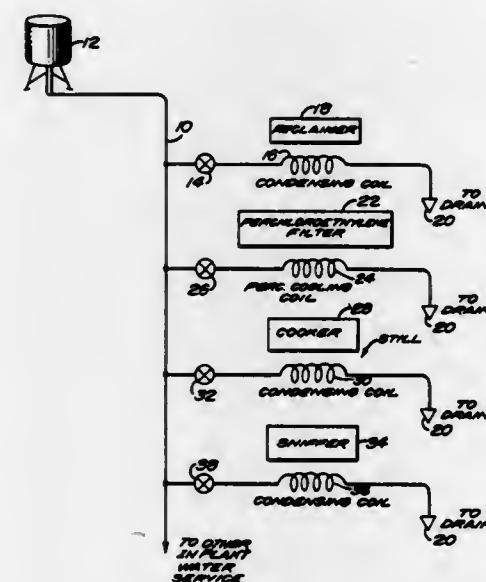
Robert D. Kirchner, 1816 Remson Ave., Merrick, N.Y. 11566

Filed May 14, 1981, Ser. No. 263,798

Int. Cl.<sup>3</sup> B60H 1/00; B61D 27/00; F28F 27/00

U.S. Cl. 165—40

14 Claims



1. A system for use in a dry cleaning facility comprising:  
apparatus for reclaiming and cooling dry cleaning fluids of the kind having condensing coils and cooling coils, respectively;  
means for connecting each of said coils of the apparatus in series to form a coolant loop;  
pump means connected to provide fluid circulation in said coolant loop;  
means for making a fluid connection from a pressurized source of water to said coolant loop;  
thermally operable valve means connected in said coolant loop; and  
means connecting said thermally operable valve means to a fluid waste line;  
said thermally operable valve including temperature sensing means arranged in said coolant loop for controlling the operation of said thermally operable valve upon exceeding a predetermined temperature, whereby upon sensing a temperature above the preselected temperature the thermally operable valve is operated to cause the water in the coolant loop to enter the fluid waste line, thereby permitting pressurized water to enter the loop from the source of the water.

4,421,159

**HEAT-DISSIPATING DEVICE OPERATED BY SOLAR ENERGY**

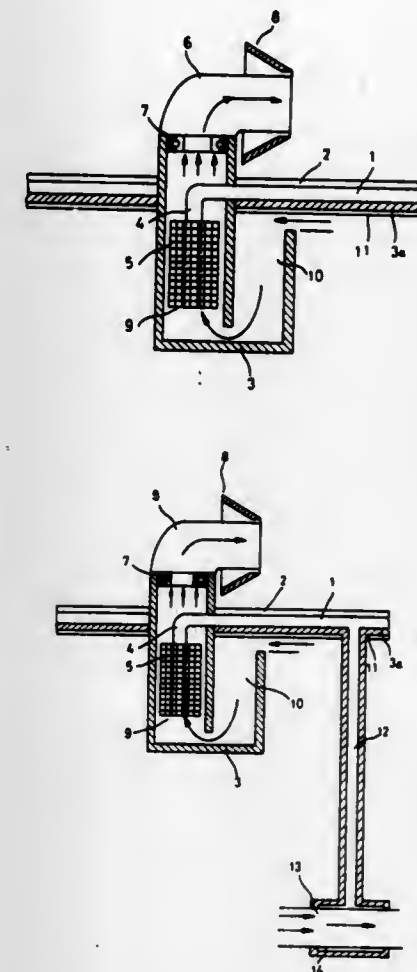
Shao C. Lin, 47-3, Section 2, Keelung Rd., Taipei, Taiwan

Filed Feb. 2, 1982, Ser. No. 345,065

Int. Cl.<sup>3</sup> B60H 3/00

U.S. Cl. 165—44

8 Claims



1. A cooling device installed on the top of an enclosure said device comprising: a heat-collecting metallic plate overlaying the top of said enclosure, a transparent panel superimposed over said metallic plate, an insulating layer lying beneath said metallic plate, an air path having an inlet at the interior of said enclosure and a rotatable outlet, heat-radiating means located in said air path and a metallic rod interconnecting said metallic plate and said heat-radiating means, said air path being such that cool air entering through said inlet is heated by said heat-radiating means and exhausted through said rotatable outlet, wherein said rotatable outlet is elbow shaped and has an end vertically and rotatably mounted and an other end horizontally oriented.

4,421,160

**SHELL AND TUBE HEAT EXCHANGER WITH REMOVABLE TUBES AND TUBE SHEETS**

Donald C. Stafford, Hinsdale, and Vincent F. Allo, Warrenville, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Oct. 16, 1980, Ser. No. 197,482

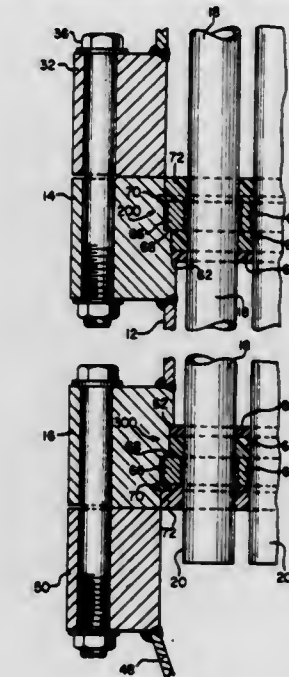
Int. Cl.<sup>3</sup> F28F 9/06

U.S. Cl. 165—76

11 Claims

1. A heat exchanger comprising:  
a plurality of spaced apart tubes loosely penetrating aligned oversized holes in two spaced apart metal tube sheets;  
a shell around the tube sheets;  
each tube sheet being secured against inward displacement axial to the tubes by contact with stop means on the shell;  
each tube sheet being barred against outward displacement axial to the tubes by releasable restraining means mechanically engaging the tube sheet and shell so that upon release

of the restraining means it no longer bars removal of the tube sheet from the shell;  
a polymeric solid binder covering the tube sheet outer surface and the restraining means and joining and sealing the tubes to the tube sheet and joining and sealing the tube sheet to the shell, with said solid binder having substantial compressive, tensile and shear strength, and being con-



vertible by heat at a sufficiently high temperature to a physical state in which it has much lower compressive, tensile and shear strength;  
means to deliver a heat exchange fluid around the tubes inside of the shell between the tube sheets; and  
means to deliver a liquid feed stream into a feed box partially defined by one of the tube sheets.

4,421,161

**HEAT EXCHANGER FOR INTEGRATED CIRCUIT PACKAGES**

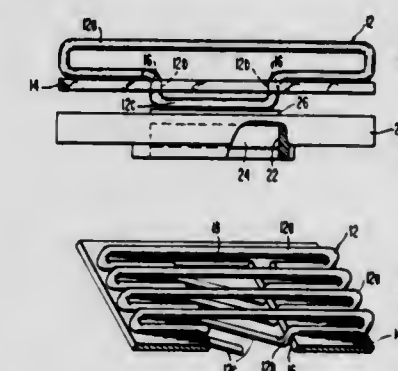
Samuel R. Romania, Phoenixville, and Grant M. Smith, Bryn Athyn, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 6, 1982, Ser. No. 375,491

Int. Cl.<sup>3</sup> F28F 7/00

U.S. Cl. 165—80 C

9 Claims



1. A heat exchange device for an integrated circuit package comprising:  
a wire form having a plurality of spaced-apart turns, each of said turns exhibiting an open T-shaped configuration wherein an upper turn portion of predetermined length is joined by a pair of opposed legs to a comparatively shorter length lower turn portion,  
a retainer plate configured as a frame-like member with a central opening,  
said wire form being disposed within said central opening such that the upper and lower turn portions of said turns



extend outward from the respective opposite planar surfaces of said retainer plate, the legs of each of said turns contacting the edges of said retainer plate adjacent said central opening, said wire form being affixed to said retainer plate to produce an integral unit.

4,421,162

**FLAT PLATE HEAT EXCHANGE APPARATUS**

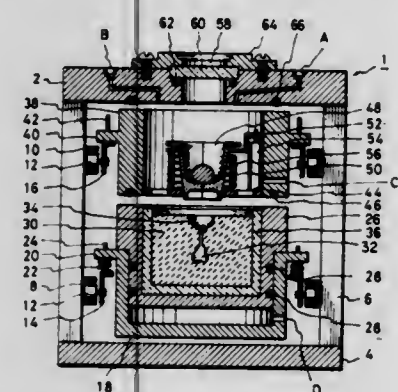
James E. Tollar, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 25, 1982, Ser. No. 392,397

Int. Cl.<sup>3</sup> F28D 1/00; F28F 9/22

U.S. Cl. 165—140

10 Claims



1. A heat exchange vessel, the vessel having an axis extending from a first end to a second end, a foraminous feed tube disposed generally coaxially with the axis of the vessel at least adjacent the first end, a first annular flat plate heat exchanger disposed coaxially about the foraminous tube; at least a second flat plate heat exchanger disposed externally to the first flat plate heat exchanger and generally coaxial therewith; means to supply a first heat exchange fluid to the first flat plate heat exchanger; means to supply a second heat exchange fluid to the second flat plate heat exchanger, the first and second flat plate heat exchangers being disposed within the vessel, the vessel having a product discharge port at the second end of the vessel with the further limitation that each of the flat plate heat exchangers comprise a plurality of generally annular flat plates, each having a centrally disposed aperture, the plate like members assembled perpendicularly to the axis of the vessel with a space between each of the individual plate members; the plate members being positioned in close proximity to one another to provide a flow pattern between adjacent members, the plate members being in spaced apart relationship; a plurality of heat exchange conduits passing through said plate like members to thereby permit circulation of heat exchange fluid through said conduits.

4,421,163

**DOWNHOLE STEAM GENERATOR AND TURBOPUMP**

Gary E. Tuttle, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 13, 1981, Ser. No. 282,487

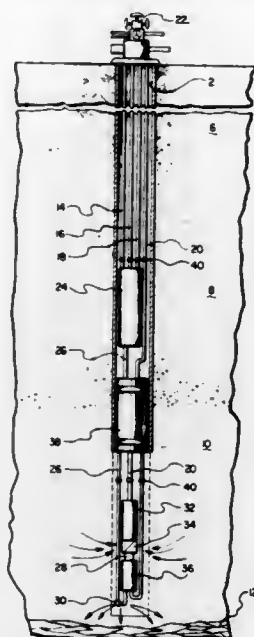
Int. Cl.<sup>3</sup> E21B 43/24

U.S. Cl. 166—59

2 Claims

1. An oil recovery system comprising:  
as borehole leading downward from a wellhead;  
a fuel-burning steam generator for generating steam at a desired downhole location within said borehole;  
an oil pump mounted adjacent said generator, said pump serving to draw oil and to deliver the oil through an oil conduit to said wellhead;  
a steam turbine mounted adjacent said generator and operable to drive said pump;  
means for delivering steam from said generator into the formations adjacent said borehole;

diverter valve means operable to supply at least a portion of the steam from said generator to operate said turbine; and



packer means for sealing said borehole above said delivering means and for securing the components of said system at a desired location in said borehole.

4,421,164

**WEIGHT-SET PACK-OFF UNIT**

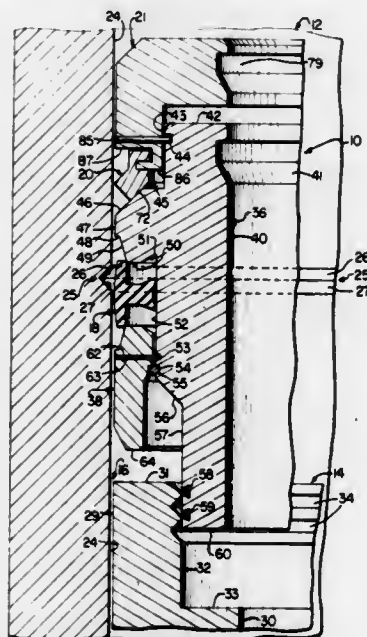
Edward M. Galle, Jr., Houston, Tex., assignor to Armo Inc., Middletown, Ohio

Filed Oct. 29, 1981, Ser. No. 316,395

Int. Cl.<sup>3</sup> F21B 23/00; F16L 35/00

U.S. Cl. 166—118

13 Claims



1. A weight-set pack-off unit for sealing the annulus between an inner pipe received in an outer pipe, the combination comprising:

an inwardly facing groove in the outer pipe;  
an upwardly facing shoulder on the inner pipe;  
a pack-off body having an annular weight-set packing received thereon and an annular actuating member coupled to said pack-off body below said weight-set packing for upward slidable movement into engagement with said weight-set packing upon landing of said actuating member on said upwardly facing shoulder on the inner pipe as a result of downward movement of said pack-off body longitudinally of the outer pipe;  
expandable annular locking means, receivable in said groove in the outer pipe, for locking said pack-off body to the inner pipe.

outer pipe and preventing upward movement of the pack-off unit relative to the outer pipe; and  
a ring, coupled to said pack-off body above said weight-set packing, for supporting said locking means above said weight-set packing and for moving said locking means into and out of said groove in the outer pipe by downward and upward movement, respectively, of said ring longitudinally of the outer pipe.

4,421,165

**MULTIPLE STAGE CEMENTER AND CASING INFLATION PACKER**

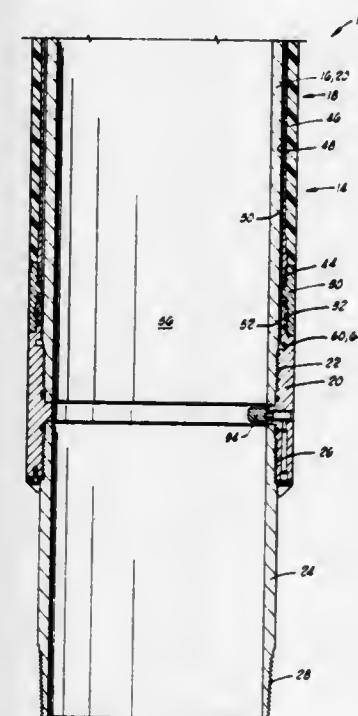
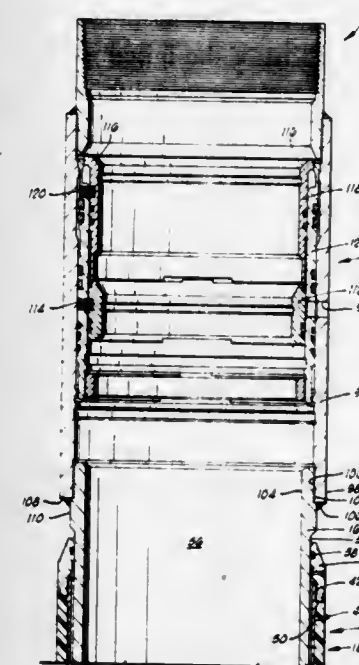
David D. Szarka, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 15, 1980, Ser. No. 169,095

Int. Cl.<sup>3</sup> F21B 33/13

U.S. Cl. 166—151

1 Claim



1. A well tool for use in stage cementing a well bore, comprising:

a substantially tubular cementing tool operated by an opening and a closing cementing plug, including a cylindrical outer casing, cementing ports disposed through the side wall of said casing, an upper adapter of lesser external diameter than said casing and permanently secured thereto, an annular opening sleeve disposed adjacent said ports in said casing and secured in place by shear means,

an annular closing sleeve above said opening sleeve and concentric therewith, an intermediate sleeve surrounding said opening sleeve and said closing sleeve and secured to said closing sleeve by shear means, said intermediate sleeve having substantially the same internal diameter as said upper adapter, said casing and said sleeves defining an open bore through said cementing tool;

a substantially tubular packer mandrel of lesser external diameter than said casing and permanently secured thereto, said packer mandrel having substantially the same internal diameter as said upper adapter;

an inflatable packing element disposed about said packer mandrel, said packing element including an annular sliding shoe at the upper end of said packer mandrel, an annular fixed shoe at the lower end of said packer mandrel, a tubular solid wall metal bladder membrane secured to said shoes and disposed therebetween about said packer mandrel, and an elastomeric bladder disposed around said membrane and extending between said shoes;

a valve body containing a packer inflation valve in the wall thereof and secured to the lower end of said packer mandrel, said valve body being of substantially the same external diameter as said fixed shoe to which it is secured, and of substantially the same internal diameter as said mandrel; a lower adapter of substantially the same internal diameter as said packer mandrel and of lesser external diameter than said casing, secured to said valve body and concentric therewith; and

knockout plug means blocking an inflation passage leading to said inflation valve, and adapted to break off from said valve body and fall to a level in the well bore below said well tool;

said inflatable packing element having a maximum external diameter in an uninflated state no greater than that of said casing, and said upper adapter, said intermediate sleeve, said mandrel, said valve body and said lower adapter defining a substantially constant diameter bore through said well tool, whereby an unobstructed bore of said substantially constant diameter may be obtained through the entirety of said well tool after a cementing operation by the drilling out of said opening sleeve, said closing sleeve and said plugs.

4,421,166

**APPARATUS FOR INJECTING MATERIAL INTO A WELL-BORE**

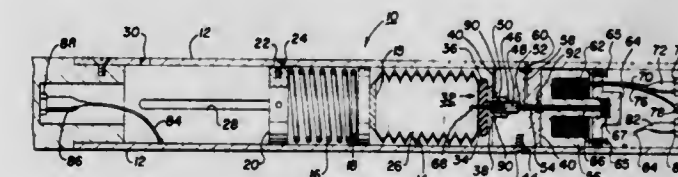
Robert W. Cain, 1812 Avondale, Colleyville, Tex. 76034

Filed May 18, 1981, Ser. No. 264,575

Int. Cl.<sup>3</sup> E21B 27/00

U.S. Cl. 166—162

38 Claims



1. An injector apparatus comprising:  
a sealed self-contained, replaceable vessel containing a predetermined amount of ejectable material;  
a motive force means operatively positioned with respect to said vessel and to pressurize the material within said vessel;  
a first exit means operatively positioned with respect to said vessel and capable of providing a passageway from said vessel through which said ejectable material is capable of flowing and being ejected therefrom;  
a valve means operatively positioned with respect to said vessel and capable of controlling the flow of material from said vessel through said first exit means; and  
an actuator means operatively positioned to control the operation of said valve means.



tion of said valve means, said actuator means comprising a solenoid means operatively positioned with respect to said valve means whereby a valve in said valve means is caused to be positioned away from a valve seat such that the ejectable material can flow through an exit opening formed in said valve seat when said solenoid is actuated.

4,421,167

# METHOD OF CONTROLLING DISPLACEMENT OF PROPPING AGENT IN FRACTURING TREATMENTS

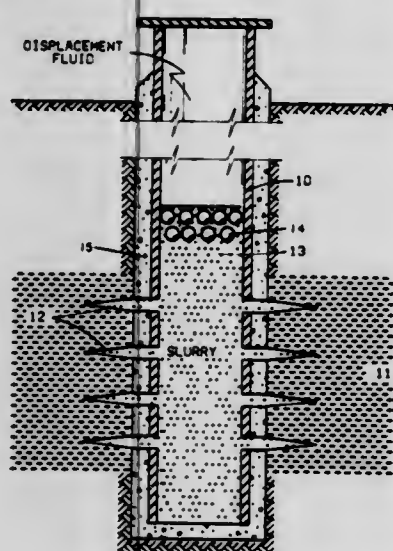
Steven R. Erbsteiner, Missouri City, and Robert L. Graham, Houston, both of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Continuation of Ser. No. 204,103, Nov. 5, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,671

Int. Cl.<sup>3</sup> E21B 33/13, 43/267, 47/06

U.S. Cl. 166—255

6 Claims



1. A method for preventing the over-displacement of propping agent in a hydraulically-induced fracture in a subterranean formation surrounding a well casing having a perforated interval therein, which comprises incorporating ball sealers in the trailing portion of a slurry of propping agent particles and fracturing fluid being injected down the well and into the formation; displacing the fracturing fluid having the ball sealers suspended therein to the perforated interval with a displacing fluid having a density equal to or less than the fracturing fluid, said ball sealers having a density greater than that of the displacing fluid but sufficiently low to prevent settling in the slurry; monitoring the surface pumping pressure during pumping of the displacing fluid; and, terminating said displacement of the fracturing fluid in response to detection of an increase in the surface pumping pressure.

4,421,168

# SURFACTANT WATERFLOODING WITH GRADED SALINITY DRIVE FOR OIL RECOVERY

Billy G. Hurd, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,354

Int. Cl.<sup>3</sup> E21B 43/22

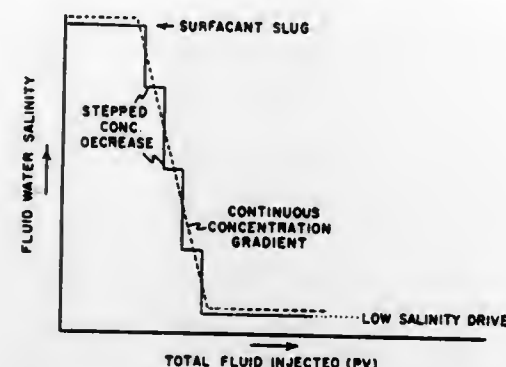
U.S. Cl. 166—273

21 Claims

1. In a method of recovering oil from a subterranean formation containing oil and having at least one injection well and at least one production well, the improvement comprising the steps of:

- injecting through an injection well and into said subterranean formation an aqueous saline surfactant solution having sufficient surfactant to effect an interfacial tension between said aqueous saline surfactant solution and said oil of less than about 0.1 dyne per centimeter;
- injecting through said injection well subsequent to said aqueous saline surfactant solution an aqueous brine drive fluid;
- gradually decreasing salt concentration of the drive fluid

at a rate sufficient to prevent excessive pressure drop in the formation, wherein the drive fluid salt concentration is decreased incrementally by a plurality of steps between a



high concentration and a low concentration, and wherein each incremental decrease is a differential amount less than about one-third of the initial salt concentration; and (d) recovering oil from a production well.

4,421,169

# PROTECTIVE SHEATH FOR HIGH TEMPERATURE PROCESS WELLS

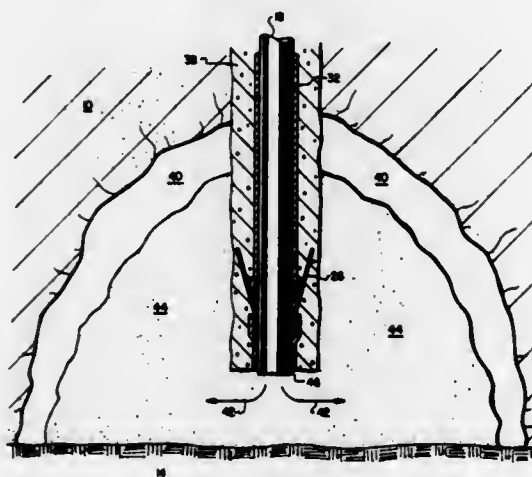
James D. Dearth, Houston, and Herbert B. Wolcott, Jr., Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 3, 1981, Ser. No. 326,984

Int. Cl.<sup>3</sup> F21B 33/14, 36/00

U.S. Cl. 166—285

10 Claims



9. A method for supporting and maintaining the integrity of a cement sheath formed in-situ between a casing and a borehole wall in a hot subterranean zone:

- slidably positioning a cement hanger on said casing, said hanger including a plurality of cement engaging arms extending outwardly from said casing for engaging said sheath;
- limiting the axial motion of said hanger along said casing; and
- wrapping all exterior surfaces of said casing and said hanger, except said cement engaging arms, with a layer of compressible refractory insulation.

4,421,170

# METHOD AND APPARATUS FOR QUICK REPLACEMENT OF CARTRIDGE FILTERS USED IN WELL FLUID CLEANING OPERATIONS

Edward R. Swift, Jr., Houston, and Philip W. Schmuck, Spring, both of Tex., assignors to Baker International Corporation, Orange, Calif.

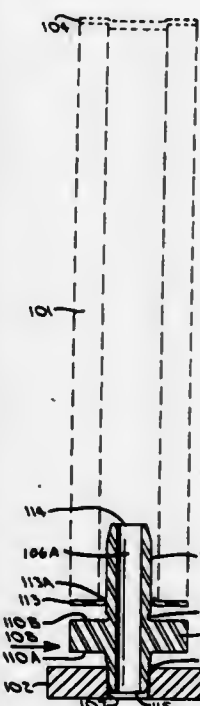
Continuation of Ser. No. 118,958, Feb. 6, 1980, Pat. No. 4,295,525. This application Oct. 2, 1981, Ser. No. 307,974

The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B01D 27/00, 27/08, 29/10; E21B 43/00

U.S. Cl. 166—312

9 Claims



1. In an apparatus for treating and removing contaminate particulate matter from fluid circulateable into, through and out of a subterranean well, the improvement comprising: a cylindrical housing adapted to receive and discharge said fluid; means disposed across said cylindrical housing for separating said cylindrical housing into a first fluid chamber for receiving fluid to be filtered and a second fluid chamber for receiving filtered fluid; at least one cartridge filter adapter receiving means disposed through said separating means; a cartridge filter adapter secured within each of said receiving means, said adapter having an elongated cylindrical housing, and having a fluid flow passageway therethrough communicable to each of said first and second fluid chambers, said elongated cylindrical housing having an enlarged cartridge positioning portion extending radially away from and about an axis of said elongated cylindrical housing; groove means on said adapter circumferentially extending around the exterior of said elongated cylindrical housing for sealingly securing one end of said cartridge filter thereon; cartridge filter means positionable on said adapter and extending within said first fluid chamber; and seal means disposed at one end of said cartridge filter and having an interiorly facing circumferentially extending flexible lip for contact with the exterior of said elongated cylindrical housing upon location of said cartridge filter on said adapter, said lip being sealingly securable within said groove.

4,421,171

# VALVE OPERABLE UNDER OPPOSITELY DIRECTED PRESSURE DIFFERENTIALS

Andrew Haynes, Missouri City, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed May 21, 1981, Ser. No. 265,866

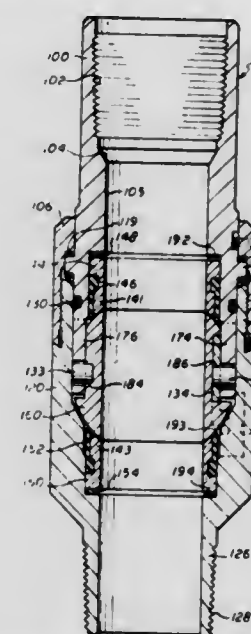
Int. Cl.<sup>3</sup> E21B 34/12

U.S. Cl. 166—331

17 Claims

1. A valve apparatus for use in a subterranean well and carryable on a fluid transmission conduit insertable therein, said valve apparatus being responsive to axial rotational manipula-

tion of said fluid transmission conduit; said valve apparatus having first and second mutually rotatable housing members having axially aligned bores; ball valve head means mounted on said first housing member and having a cylindrical flow passage extending therethrough; pivot means for mounting said ball valve head means on said first housing member with said ball valve head means being free to rotate with respect to said first housing member; and lever means mounted on said



pivot means with said pivot means comprising the fulcrum for said lever means, said lever means having first and second ends axially spaced apart, said first end engaging said ball valve head means immediate said first housing member on one side of said pivot means, said second end of said lever means engaging said second housing member on the other side of said pivot means immediate said second housing; rotation being transferred to said ball valve head means during rotation of said first and second housing members.

4,421,172

# DRILL PIPE TESTER AND SAFETY VALVE

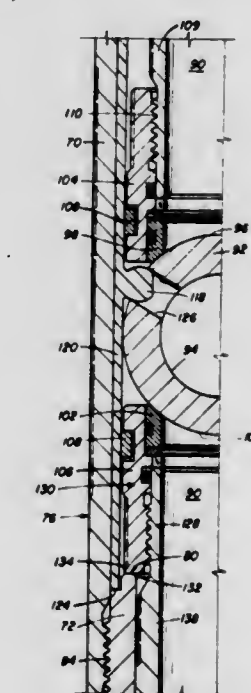
Michael E. McMahan, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 13, 1981, Ser. No. 282,979

Int. Cl.<sup>3</sup> E21B 34/08

U.S. Cl. 166—334

3 Claims



1. A pipe tester valve comprising:



a housing having a first end adapted to be connected to a string of pipe, having a flow passage therethrough and having longitudinal channel means disposed about a portion of the interior thereof;

a spherical valve member disposed in said flow passage of said housing;

lug means, attached to said housing, for engaging said spherical valve member and rotating said spherical valve member between open and closed positions wherein said flow passage is open and closed, respectively, as said spherical valve member is moved axially relative to said housing and said lug means;

moving means for moving said spherical valve member axially relative to said housing between the open and the closed positions, said moving means including:

lower valve member seat means having a downward facing surface supportably engaged by an upward facing surface of said housing when said spherical valve member is in its closed position, so that downward forces exerted on said spherical valve member in the closed position due to fluid pressure in said string of pipe above said spherical valve member are transmitted to said housing through the engagement of said downward facing surface and said upward facing surface;

upper moving mandrel portion attached to said lower valve member seat means;

lower moving mandrel portion having an upper end adapted for engagement with a lower end of the upper moving mandrel portion and having spline means on a portion of the exterior thereof which slidably engage the longitudinal channel means of said housing whereby when a predetermined amount of force is applied to said housing by a predetermined amount of weight of said string of pipe being set down on said housing said lower moving mandrel portion being moved upward relative to said housing and is engaged with said upper moving mandrel portion to move said upper moving mandrel portion upward relative to said housing thereby opening said spherical valve member;

latch means for latching said spherical valve member in the closed position, said latch means including first locking means for releasably locking said upper moving mandrel portion relative to said housing in a position holding said spherical valve member in the closed position; and

resilient means interposed between said housing abutting a portion thereof and said moving means abutting a portion thereof thereby preventing movement of said moving means with respect to said housing until a predetermined amount of force is applied by said string of pipe by setting a predetermined amount of weight of said string of pipe on said housing.

4,421,173

#### MOTION COMPENSATOR WITH IMPROVED POSITION INDICATOR

Bruce E. Beakley, Webster, and Douglas W. J. Nayler, Kingwood, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,436  
Int. Cl.<sup>3</sup> E21B 19/09, 7/12, 43/013

U.S. Cl. 166—336

13 Claims

1. Motion compensation apparatus for disposition between an offshore support structure and an offshore well structure movable with respect to said support structure, comprising:

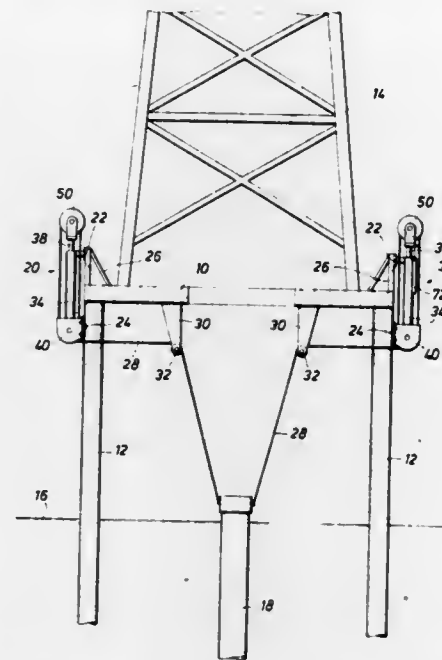
first and second compensator bodies interconnected with said support structure and said well structure such that relative movement between said structures causes relative movement between said compensator bodies, said bodies further being interconnected with each other for relative movement in generally vertical directional modes;

means associated with said compensator bodies for resili-

ently resisting relative movement therebetween in a first directional mode;

and position indicator means associated with said bodies comprising—

a flexible vessel having one end connected to said one of said compensator bodies and the other end connected to



the other of said compensator bodies generally below said one end, said vessel being filled with a liquid between said ends;

and pressure sensitive transmitter means associated with said other end of said vessel and operative to produce a signal which is a function of the hydraulic head at said other end of said vessel.

4,421,174

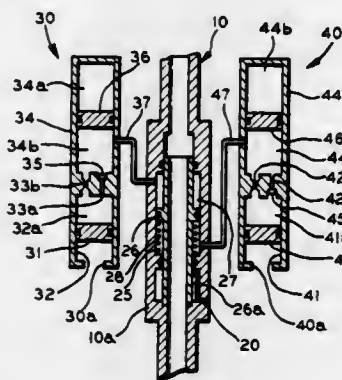
#### CYCLIC ANNULUS PRESSURE CONTROLLED OIL WELL FLOW VALVE AND METHOD

David M. McStravick, Houston, and Neil H. Akkerman, Kingwood, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Jul. 13, 1981, Ser. No. 282,639  
Int. Cl.<sup>3</sup> E21B 34/10

U.S. Cl. 166—374

11 Claims



1. The method of operating a flow valve installed on a conduit string in a subterranean well and actuable by a piston that is shiftable between two positions and biased toward one of such positions, the conduit string being surrounded by a fluid annulus, comprising the steps of:

- (1) producing cyclic variations in the pressure of said fluid annulus;
- (2) deriving a pressure signal from said cyclic variations in the pressure of said fluid annulus, during cyclic variation of the pressure in said fluid annulus, and
- (3) applying said pressure signal to said shiftable piston in a

direction in opposition to the bias whereby said shiftable piston is maintained in one position while said cycling of the pressure of the fluid annulus exists and shifts to a second position whenever the effective fluid pressure cycling of the fluid annulus is terminated.

4,421,175

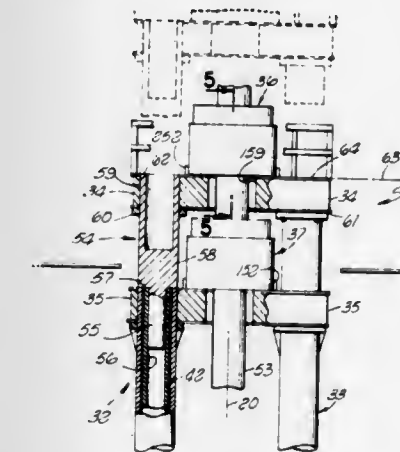
#### METHOD OF DRILLING AND CASING A WELL

George I. Boyadjieff, Anaheim, and Andrew B. Campbell, San Marino, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Filed Aug. 28, 1981, Ser. No. 297,120  
Int. Cl.<sup>3</sup> E21B 19/10

U.S. Cl. 166—383

15 Claims



1. The method of drilling and casing a well with a rig having a rig floor, which comprises:

positioning in the rig a plurality of vertically extending fluid pressure actuated units each including a piston section and a cylinder section with a first of said sections being actuable vertically relative to the second section by pressure fluid, and with said units projecting downwardly beneath the level of said rig floor;

drilling a well with a drill string extending downwardly through the rig floor and past said fluid pressure actuated units while said units remain in said positions of projection downwardly beneath the level of the rig floor to avoid interference with the drilling operation;

removing said drill string from the well after said drilling operation;

connecting to said first sections of said actuating units, after the drilling operation, an extension structure which is movable upwardly and downwardly with said first sections and projects upwardly above the level of the rig floor and carries a first casing supporting device above the level of the rig floor; and

then lowering a string of casing into the well by vertical reciprocation of said first sections of the fluid pressure actuated units and the connected extension structure and said first casing supporting device relative to a second casing supporting device, with the casing string being supported by said first device during downward movement thereof and by said second device during upward movement of the first device.

4,421,176

#### PORTABLE POWER OPERATED CULTIVATOR WITH AXIALLY ADJUSTABLE SHIELD

Lloyd H. Tuggle, Shreveport, and Ronald C. Loyd, Keithville, both of La., assignors to Emerson Electric Co., Shreveport, La.

Filed Nov. 24, 1980, Ser. No. 210,028  
Int. Cl.<sup>3</sup> A01B 33/02

U.S. Cl. 172—41

2 Claims

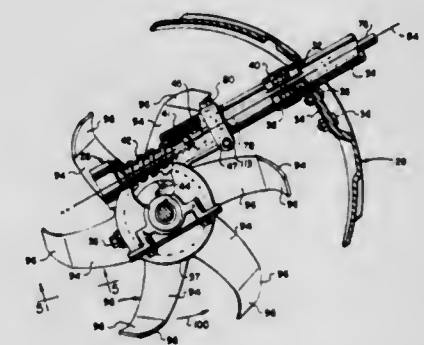
1. A portable power operated cultivator comprising:

a power unit including an internal combustion engine having a power takeoff shaft;

an elongated boom connected at one end to said power unit and including a drive shaft connected to said power takeoff shaft;

drive means disposed on said boom at the end opposite said one end, said drive means including an output shaft having oppositely projecting end portions, said output shaft being drivenly connected to said drive shaft and having an axis of rotation substantially perpendicular to the axis of rotation of said drive shaft;

rotary cultivator blade means drivably mounted on respective ones of said opposite end portions of said output shaft and on opposite sides of said axis of rotation of said drive shaft;



means for carrying said cultivator and manipulating said cultivator during the operation thereof including first handle means disposed at one end of said boom and mounted on said power unit and second handle means adjustably mounted on said boom between said first handle means and said drive means, and a shield mounted on said boom between said second handle means and said drive means, said shield comprising a plate secured to said boom for deflecting material impelled by said blade means toward said handle means, said shield being secured to said boom in such a way that said shield can be adjustably positioned axially along said boom but cannot be displaced about the axis of rotation of said output shaft to reduce the shielded area between said blade means and said handle means.

4,421,177

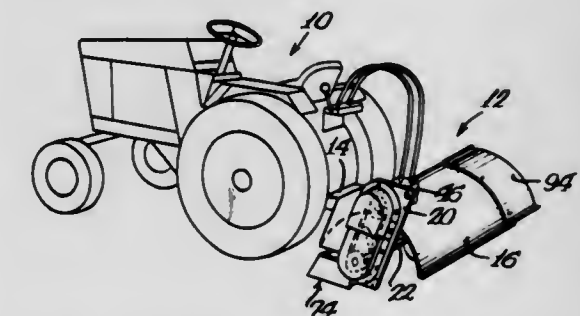
#### END DRIVE ROTARY CULTIVATOR

William J. Schlapman, Winneconne, and Roger T. Gault, Wild Rose, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Oct. 9, 1981, Ser. No. 310,080  
Int. Cl.<sup>3</sup> A01B 33/02, 33/16

U.S. Cl. 172—63

4 Claims



1. A rotary cultivator adapted to be mounted on a tractor for soil cultivation, comprising:  
a laterally extending housing,  
a tine cultivation shaft rotatably supported by said housing,  
drive means disposed at one end of said housing for rotating said cultivator shaft, and



ground-engaging means on said housing for urging the cultivator downwardly during forward movement thereof for enhancing soil cultivation by said cultivation shaft, comprising

a ground-engaging member mounted on said housing having a first leading edge portion extending angularly rearwardly of the direction of forward movement of the cultivator and including

a first ground engaging surface extending angularly inwardly and rearwardly of said leading edge portion and a second ground-engaging surface extending rearwardly of said leading edge generally parallel to the direction of forward movement of said cultivator.

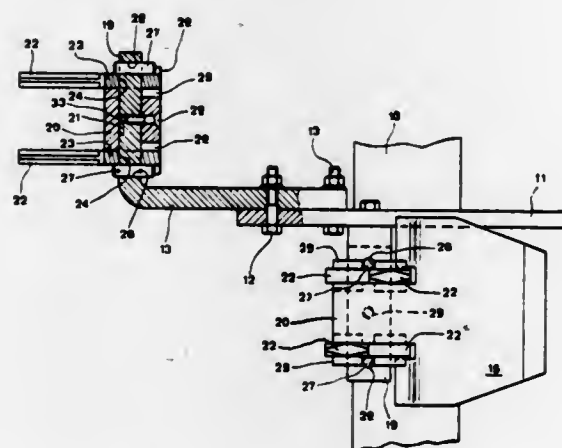
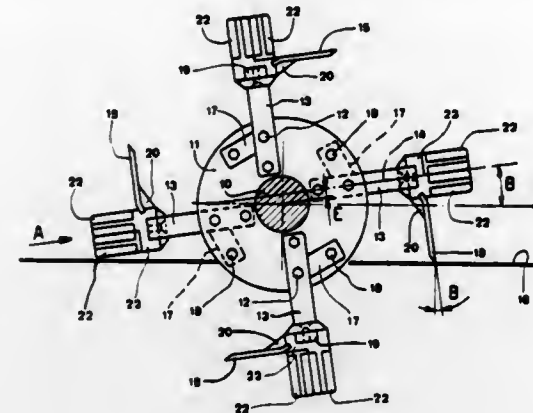
3. A rotary cultivator adapted to be mounted on a tractor for said cultivator, comprising:

a laterally extending cultivator housing, a tined cultivation shaft rotatably supported by said housing, drive means operatively connected with one end of said cultivation shaft for rotation thereof, and

a cultivation shaft extension adapted to be selectively connected to a portion of said cultivator shaft for rotation therewith for selectively extending the area of soil cultivation of said cultivator,

said cultivation shaft includes a stub shaft disposed in an outer shaft, said stub shaft being removable from said outer shaft and said shaft extension being insertable in said outer shaft in place of said stub shaft.

arm within the slot and a screw insertable to pass through an aperture formed in the cap to threadedly engage a



central threaded seat formed in the transverse second arm to thereby connect the shank to said second arm.

4,421,179

#### TOP DRIVE WELL DRILLING APPARATUS

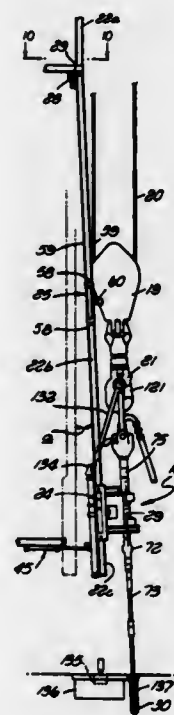
George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Jan. 23, 1981, Ser. No. 227,587

Int. Cl.<sup>3</sup> E21B 15/00, 19/00

U.S. Cl. 173—44

12 Claims



1. Well drilling apparatus comprising:  
a mast or derrick;  
a drilling unit including an element adapted to be connected

4,421,178

#### ROTARY CULTIVATOR HOEING TOOL FITTED WITH ONE OR MORE NON-COMPACTION TEETH

Dino Vandelli, Spilamberto; Ugo Fabiani, San Cesario sul Panaro, and Ambrogio Vandelli, Vignola, all of Italy, assignors to ASCO Di Vandelli Dino & C. S.N.C., Modena, Italy

Filed Aug. 25, 1981, Ser. No. 296,175

Claims priority, application Italy, Aug. 26, 1980, 40064 A/80; Jul. 23, 1981, 40079 A/81

Int. Cl.<sup>3</sup> A01B 9/00, 33/02, 33/10

U.S. Cl. 172—548

5 Claims

1. A rotary cultivator hoeing tool affixed to a flange of a cultivator shaft, comprising:

(a) an L-shaped mounting member having a first arm affixed to the cultivator shaft flange to extend in a generally radial direction of the flange and a second arm attached to the first arm to extend transversely therefrom; and

(b) a hoe blade having at an upper central section thereof a shank attachable to the transverse second arm of said L-shaped mounting member, wherein said shank includes a transverse slot engageable with said transverse second arm, and means for securing the shank to the second arm, said means including a cap positioned to retain the second

to the end of a drill string for rotation therewith about the axis of the string, and a motor operable to drive said element and the connected string rotatively about said axis;

a pair of elongated first guide rails;

a pair of shorter second guide rails forming lower extensions of said first rails;

a carriage by which said drilling unit is carried and engaging said rails for movement therealong between an upper position of guided engagement with said first rails and a lower position of guided engagement with said second rails;

pivotal connection means mounting said first rails near their upper ends for swinging movement of said first rails and said second rails and said carriage and carried drilling unit relative to said mast or derrick between drilling positions in which said carriage and drilling unit are guided by said first and second rails for movement along said axis of the drill string and inclined positions in which the first and second rails extend at an angle to said axis and guide the carriage and drilling unit for movement along an inclined path at an angle to the axis for access to a mousehole; and a connection mounting at least one of said second rails to a corresponding one of said first rails for movement therewith between said drilling and inclined positions, and for swinging movement relative thereto with said carriage and drilling unit to move the drilling unit from an active position of alignment with said axis to a retracted position at a side of the axis.

4,421,180

#### PILE DRIVER

Leonard Fleishman, Woodsburgh, and Henry J. Lynch, Cedarhurst, both of N.Y., assignors to Orin H. Jinnings, Fort Wayne, Ind., a part interest

Filed Feb. 25, 1981, Ser. No. 238,002

Int. Cl.<sup>3</sup> B25D 11/10

U.S. Cl. 173—124

11 Claims



1. For use in a pile driving process, a crane supportable hydraulically actuable drop hammer assembly comprising:

a housing supporting a hydraulic drive motor having an axially extending drive shaft and a roller cam offset from the motor drive shaft axis of rotation by a distance limiting the drop hammer free fall distance;

means coupling the roller cam to the drive shaft of the motor to execute circular motion about the axis when the drive motor is operated comprising a circular disk centrally affixed to the motor drive shaft for rotation therewith with the roller cam rotatably affixed to the circular disk off center thereof;

a ram having a substantial mass and having a bearing plate selectively engageable with the roller cam;

bearing support means positioned beneath the circular disk generally tangential thereto to at least partially support the weight of the ram while the ram is being raised;

guide means for limiting ram motion to generally vertical reciprocating motion normally limited at one extreme by a pile being driven and at the other extreme by the uppermost position of the roller cam;

movement of the roller cam in a selected direction along its circular path sequentially repetitively causing the roller cam to engage the underside of the bearing plate, raise the ram, and disengage the bearing plate allowing the ram to fall and impact a pile.

4,421,181

#### VIBRATION-DAMPING ARRANGEMENT

Roland Andersson, Upplands Väsby; Per-Erik Höglund, and Bo Glimskär, both of Stockholm, all of Sweden, assignors to Bygghogonmilaboratoriet HB, Sweden

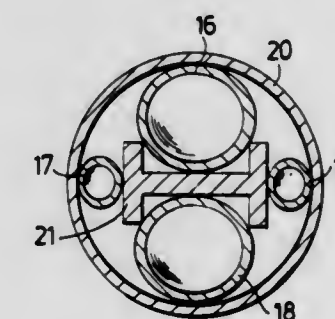
Filed Jan. 19, 1982, Ser. No. 340,758

Claims priority, application Sweden, Jan. 28, 1981, 8100532

Int. Cl.<sup>3</sup> E21B 12/00

U.S. Cl. 173—162 H

6 Claims



1. A vibration-damping arrangement for damping of vibrations from a machine (4) or the like, comprising at least one tight, hollow and flexible chamber (11; 12; 13; 16-19; 22) containing a gas with a pressure exceeding ambient pressure and arranged to be supplied with the said vibrations and a rigid casing (9; 14; 20; 36) partially surrounding the gas-filled chamber, arranged to be in contact with the body of a person, characterized in that the wall of the gas-filled chamber (11; 12; 13; 16-19; 22) is essentially non-stretchable.

4,421,182

#### COMBINATION CLEAN-OUT AND DRILLING TOOL

Arlin R. Moody, Rte. 1, Anton, Tex. 79313, and Bobby J. Moody, Hwy. 114 West, Levelland, Tex. 79336

Filed Mar. 16, 1982, Ser. No. 358,652

Int. Cl.<sup>3</sup> E21B 21/10

U.S. Cl. 175—65

21 Claims

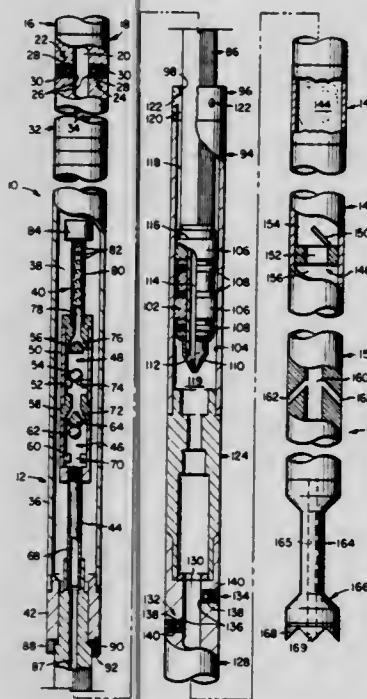
1. A tool for use in a bore hole for debris collection comprising:

a lower assembly having means for mounting an accessory at the lower end thereof, a debris chamber for holding debris, a trap valve in fluid communication with the bore hole and debris chamber for permitting fluid and debris to flow only from the bore hole into the debris chamber, a barrel section having a smooth, cylindrical inner wall, a lower valve assembly in fluid communication with said barrel section and said debris chamber, said lower valve assembly being activatable between an open position permitting fluid flow between the barrel section and debris chamber and a closed position blocking flow therebetween and said barrel section having a closure means for enclosing one end of the inner wall and having a noncircular aperture therethrough;

an upper assembly having a hollow kelley with a noncircular cross section for sliding motion through the aperture in



said closure means for joint rotation of said upper and lower assemblies, a piston assembly mounted on the kelley in sliding, sealed contact with the inner wall of the barrel section to define a first chamber within the barrel section, said piston assembly having at least one port for communication between the first chamber and hollow kelley, the closure means and piston assembly being engageable, a fluid container and at least one drain valve for fluid communication between the fluid container and the bore hole to relieve fluid pressure within the fluid container, and an upper valve assembly being positioned for fluid communication between the hollow kelley and fluid container permitting flow only from the hollow kelley to the fluid container;



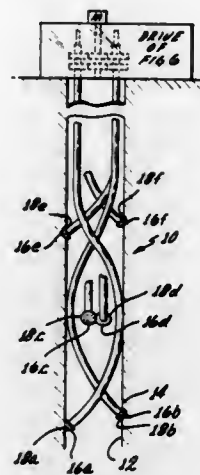
the tool being operable as a hydraulic clean-out tool by removing said lower valve assembly with said upper valve assembly installed and reciprocating the upper assembly, the upward motion of said piston assembly driving fluid and debris from the bore hole into the debris chamber through the trap valve, the trap valve closing and upper valve assembly opening on the downstroke to release the pressure in the debris chamber, the tool being operable as a hydrostatic tool by removing said upper valve assembly with said lower valve assembly installed, downward motion of said upper assembly activating said lower valve assembly to the open position through contact with said piston assembly driving fluid and debris into the debris chamber.

**4,421,183**  
**FLEXIBLE DRIVE APPARATUS FOR BORING LATERAL BORE HOLES FROM WELL**  
Earl R. Collins, Jr., 801 Craig Ave., La Canada, Calif. 91001  
Filed Apr. 1, 1981, Ser. No. 249,895  
Int. Cl.<sup>3</sup> E21B 3/04, 17/20

U.S. Cl. 174-114 25 Claims

1. In combination for penetrating a borehole in an oil well, a rod movable in rotary and linear directions, means defining first and second gears at spaced positions on the rod, the rod having gear teeth on its external surface, a shaft, means defining third and fourth gears on the shaft in coupled relationship respectively with the first and second gears on the rod, a fifth gear on the rod in mesh with the gear teeth on the rod, clutch means operatively coupled on the rod to the second and fifth gears to provide slippage between the second and fifth gears in accordance with the load on the rod, and drilling means coupled to the rod for operation in accor-

dance with the rotary and linear movements of the rod, the drilling means being provided with flexible characteristics for penetrating the borehole at adjustable positions



in the borehole and for producing a load on the rod in accordance with the load imposed on the drilling means in the borehole.

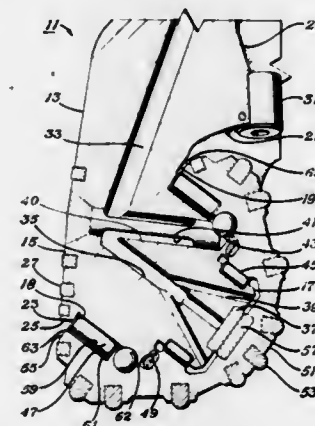
**4,421,184**  
**ROCK BIT WITH IMPROVED SHIRRTAIL VENTILATION**

John M. Mullins, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 4, 1981, Ser. No. 327,525  
Int. Cl.<sup>3</sup> E21B 10/22

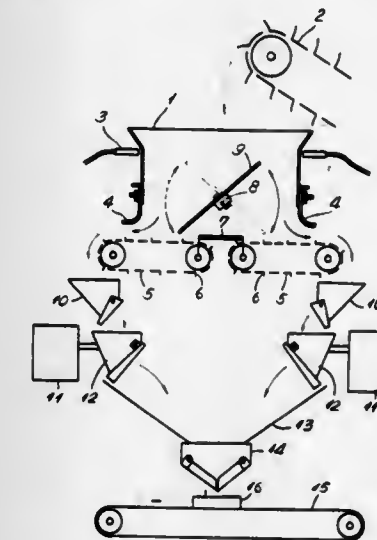
U.S. Cl. 175-337

5 Claims



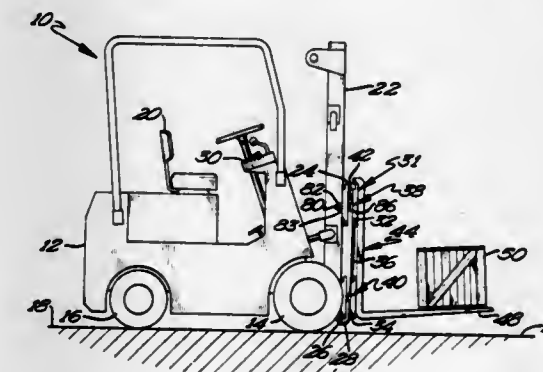
3. In a bit for drilling boreholes in the earth having rotatable cutters mounted on roller bearings on bearing pins that depend from bit legs, passage means extending through the bit legs and bearing pins to the roller bearings for transmitting drilling fluid through the roller bearings, an improved exit for the passage means of each bearing pin, comprising:  
slot means formed in the lower end of the bit leg for exposing to the borehole about one-half the diameter of an outer end of each roller bearing when on the lower side of the bearing pin.

**4,421,185**  
**COMBINATORIAL WEIGHING SYSTEM**  
Toshio Koto; Katsuhiko Murakami, and Yugo Fujitani, all of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Saisakusho, Kyoto, Japan  
PCT No. PCT/JP81/00213, § 371 Date Apr. 13, 1982, § 102(e)  
Date Apr. 13, 1982, PCT Pub. No. WO82/00883, PCT Pub. Date Mar. 18, 1982  
PCT Filed Sep. 2, 1981, Ser. No. 371,303  
Claims priority, application Japan, Sep. 9, 1980, 55-125700; Sep. 9, 1980, 55-128961  
Int. Cl.<sup>3</sup> G01G 19/22, 13/04  
U.S. Cl. 177-25 7 Claims



1. A combinatorial weighing system comprising a plurality of weighing mechanisms each comprising a feed hopper, a swing plate installed substantially in the middle of said hopper and adapted to swing in a vertical plane, at least a pair of conveyors extending in mutually opposite directions with their adjoining ends positioned below substantially the middle of the bottom of said feed hopper and with their delivery ends positioned outwardly of the lower ends of the lateral walls of said feed hopper, and at least a pair of automatic weighing machines opposed to each other and positioned below the delivery ends of said conveyors, wherein combinations of the weight values of objects weighed by the automatic weighing machines included in the individual weighing mechanisms are computed to provide a combination of weight values which is equal or the nearest to a predetermined weight.

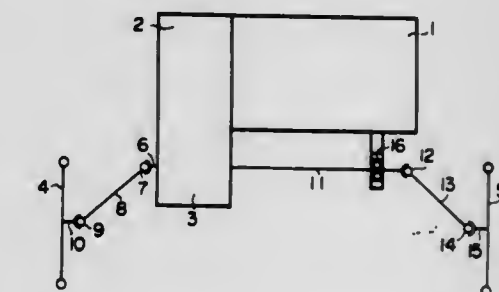
**4,421,186**  
**FORK LIFT SCALE**  
Richard S. Bradley, Fairmont, Minn., assignor to Weigh-Tronix, Inc., Fairmont, Minn.  
Continuation of Ser. No. 180,802, Aug. 25, 1980, abandoned.  
This application Dec. 28, 1982, Ser. No. 453,996  
Int. Cl.<sup>3</sup> G01G 19/12  
U.S. Cl. 177-139 9 Claims



1. A fork lift scale for weighing items placed on a fork of a fork lift truck, said fork lift scale comprising:  
a deformable member for use in attaching a fork to the fork lift truck, said deformable member having a material axis

and comprising a single beam being disposed in substantially horizontal relation and extending in a fore and aft direction, said deformable member having opposed substantially vertically disposed planar surfaces intermediate the ends thereof, a plurality of electrical strain gages mounted on said planar surfaces of said deformable member and positioned on the neutral axis of the latter to sense the deformation of said deformable member caused by the weight of an item placed on the fork, the load exerted on the deformable member by the fork of the fork lift truck being spaced longitudinally of said strain gages, and, a Wheatstone bridge circuit including said strain gages operable to produce an output signal caused by deformation of said deformable member, said strain gages being connected in said bridge circuit to electrically sense vertical load only and being insensitive to and rejecting all other loads, and means for converting the output signal into a perceptive weight readout.

**4,421,187**  
**TRANSMISSION WITH ALIGNABLE BEARING SUPPORTING LONGER POWER OUTPUT SHAFT OF DIFFERENTIAL**  
Takuo Shibata, Toyota; Mitsugu Izuta, Okazaki, and Tetsuya Matano, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan  
Filed Jul. 1, 1981, Ser. No. 279,569  
Claims priority, application Japan, Jul. 31, 1980, 55-105265  
Int. Cl.<sup>3</sup> B60K 17/24  
U.S. Cl. 180-73 D 11 Claims



1. In a vehicle comprising two axially opposed driven wheels and a fixed member, a transmission comprising:  
(a) two drive shafts of equal length, each flexibly drivingly coupled at its outer end to one of said wheels;  
(b) a differential axially located closer to a first one of said wheels and further from the other one of said wheels, defining a preferred power output line for power output to said other one of said wheels, and comprising:  
(b1) a short power output shaft extending towards said first wheel and flexibly drivingly coupled at its outer end to the inner end of the one of said drive shafts whose outer end is drivingly coupled to said first wheel; and  
(b2) a long power output shaft extending towards said other wheel substantially along said preferred power output line and flexibly drivingly coupled at its outer end to the inner end of the one of said drive shafts whose outer end is drivingly coupled to said other wheel; and  
(c) a support device comprising:  
(c1) a bearing, comprising an inner race which supports a part of said long power output shaft remote from said differential, and an outer race which rotatably supports said inner race;  
(c2) a support member, which supports said outer race of said bearing so that said inner race is rotatable about a rotational axis substantially parallel to said preferred power output line, and which is coupled to said fixed member of said vehicle; and



(c3) a means for adjusting the position of said rotational axis of said inner race of said bearing with respect to the position of said preferred power output line, in the plane substantially perpendicular to said rotation axis of said inner race, with two degrees of freedom, and for fixing said adjusted position; said adjusting means comprising a first movable member which is movable with respect to said support member with one degree of freedom, and a second movable member which is movable with respect to said first movable member with one degree of freedom, said movement of said first movable member with respect to said support member altering the position of said second movable member with respect to said fixed member, and said second movable member supporting said outer race of said bearing in a fixed relation to said second movable member, said movement of said second movable member with respect to said first movable member altering the position of said outer race with respect to said first movable member; said adjusting means further comprising means for fixing the position of said first movable member with respect to said support member, and for fixing the position of said second movable member with respect to said first movable member; so that said adjusted position of said rotational axis of said inner race of said bearing may be fixed after it has been adjusted;

(d) whereby, by adjusting said adjusting means so as to bring said rotational axis of said inner race of said bearing, and also the rotational axis of said long power output shaft of said differential which is supported thereby, to be substantially coincident with said preferred power output line of said differential, thus compensating for offset in the positioning of said support member, power output from said differential to said long power output shaft may be performed substantially along said preferred power output line, thus minimizing wear on, and maximizing the lifespan of, said differential, and also minimizing side strain on said bearing.

4,421,188

# SELF-PROPELLED MULTIPLE-PURPOSE AGRICULTURAL MACHINE WITH DISPLACEABLE DRIVER'S CABIN

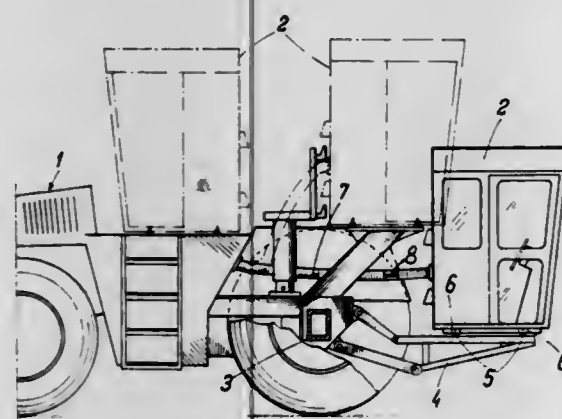
Nils Fredriksen, Harzewinkel, Fed. Rep. of Germany, assignor to Claas OHG, Harzewinkel, Fed. Rep. of Germany  
Filed Jun. 30, 1981, Ser. No. 279,039

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024650

Int. Cl.<sup>3</sup> B62D 33/06

U.S. Cl. 180—327

8 Claims



1. A self-propelled multiple-purpose agricultural machine, particularly a tractor, comprising a chassis; a driver's cabin movable relative to said chassis between at least two working positions and lowerable to a third lower transporting position; at least one machine axle connected with said chassis and located at a predetermined height above a ground level; an auxiliary frame detachably mountable on said machine axle

when the machine is to be transported and supporting said driver's cabin when said driver's cabin is lowered from one of said working positions to said third transporting position so that said driver's cabin becomes located in a supporting plane substantially at a height corresponding to the height of said machine axle; and a plurality of control elements extending from said driver's cabin, said control elements being formed so and having a length such that their connection with respective parts of the machine is guaranteed and does not need to be interrupted even when said driver's cabin is lowered to said third transporting position so that for transportation with said lowered cabin the machine can propel itself.

4,421,189

# STAIR VEHICLE

Cecil J. Watkins, Hove, and Simon R. Watkins, Southsea, both of England, assignors to Tobex Motivated Chair Company Limited, Hove, England

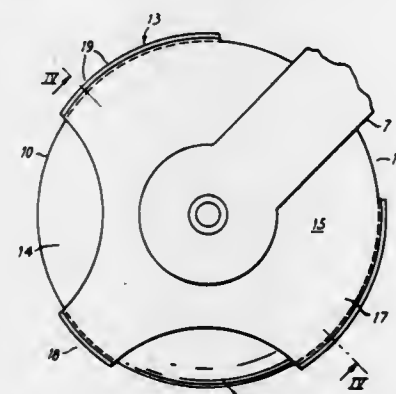
Filed Mar. 16, 1982, Ser. No. 358,745

Claims priority, application United Kingdom, Mar. 17, 1981, 8108224; Oct. 5, 1981, 8130044

Int. Cl.<sup>3</sup> B62B 5/02

U.S. Cl. 180—8 A

11 Claims



1. A device for use in moving a load up or down a stepped path, comprising a structure for receiving the load, at least one support element rotatably mounted on the structure and having rotatably mounted thereon at least three symmetrically disposed wheels whereby, in use, the wheels cooperate with successive steps of the path, and foot means secured to each support element adjacent the corresponding wheel, the foot means being clear of the circumference of the wheel at two regions so that the wheel can roll freely on a plane when the support element is positioned with the wheel and respectively one or other of the adjacent wheels in contact with the plane, and having engagement portions located forwardly of the said two regions so as, when the support element is rotated forwardly of the said position, to engage the plane to prevent rolling movement.

4,421,190

# OVERHEAD INSTRUMENT CONSOLE

William E. Martinson, Fargo, and Michael A. Tuchscherer, West Fargo, both of N. Dak., assignors to Steiger Tractor Inc., Fargo, N. Dak.

Filed Jun. 3, 1981, Ser. No. 270,111

Int. Cl.<sup>3</sup> B60K 35/00

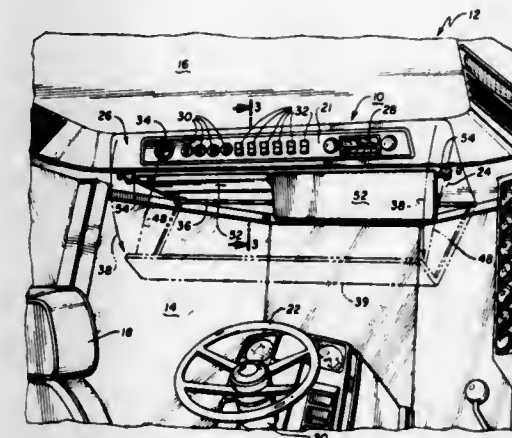
U.S. Cl. 180—90

5 Claims

1. An overhead instrument console in combination with a tractor having a driver's compartment with a steering column and steering wheel, and having windows with motor driven windshield wipers, and a ceiling structure, the console comprising:

a panel having vertical and horizontal panel sections and transversely substantially spanning the driver's compartment overhead adjacent to the windows and having a plurality of instruments mounted on the vertical panel portion and extending through to the rear of said panel,

secured to the ceiling structure when in the up position, said panel when in the down position providing access to electrical components and the electrical circuitry located within the ceiling structure and connecting the electrical components located within the ceiling structure; a hinge pivotally connecting said horizontal panel section to the ceiling structure so that said horizontal panel section constitutes part of the ceiling structure and such that the



panel can be pivotally lowered to a down position without interference from the steering wheel, thus permitting full access to the rear of the instruments mounted on the panel and can be pivotally moved to an up position hiding from view the rear of the instruments mounted thereon; and means for limiting the downward pivoting of the panel and holding the panel in a downwardly angular plane in a stable position.

4,421,191

# POWER ASSISTED STEERING DEVICE FOR A VEHICLE

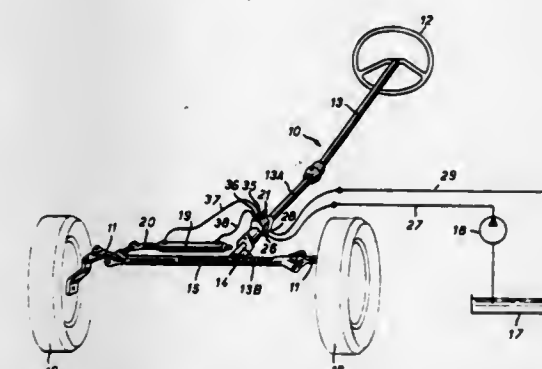
Patrice Bertin, Paris, and Claude Ledamoisel, Asnieres, both of France, assignors to VALEO Societe Anonyme, Paris, France  
Filed Sep. 22, 1981, Ser. No. 304,633

Claims priority, application France, Sep. 30, 1980, 80 20892; Feb. 20, 1981, 81 03371

Int. Cl.<sup>3</sup> B62D 5/06; F16K 11/02

U.S. Cl. 180—132

12 Claims



1. A power-assisted steering device for a vehicle, comprising control means operable to act on steering means, said control means comprising a transmission element in two parts, at least one of said parts being provided with a prism-shaped cavity at its end adjacent the other of said parts, and a prism-shaped plug which is received in said cavity with an angular offset therebetween and is connected to the other of said two parts, the two parts being capable of a limited relative angular displacement which is determined by the said angular offset between the plug and the cavity; and

power-assistance means responsive to relative angular displacement of said two parts to act on said steering means in the same direction of force as the control means, said power-assistance means comprising a hydraulic unit, an actuator acting on the steering means, and a hydraulic distributor located between the hydraulic unit and the

actuator, said hydraulic distributor comprising two rotors, each rotationally integral with a respective one of said two parts, and at least one thin annular element, at least one of the said parts being notched on the outside and the associated rotor being notched on the inside, said at least one annular element being toothed both internally and externally and being located between said at least one part and said rotor, the teeth of said element engaging the notches in both said part and said rotor, so that the part and its associated rotor are rotationally integral.

4,421,192

# APPARATUS FOR RUNNING A VEHICLE AT A CONSTANT SPEED

Keiichi Ito, Nagoya; Nobuyuki Yamaguchi; Kazuhiko Hayashi, both of Toyota; Ken Asami, Nagoya; Kazuo Sato, and Takeshi Ochiai, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

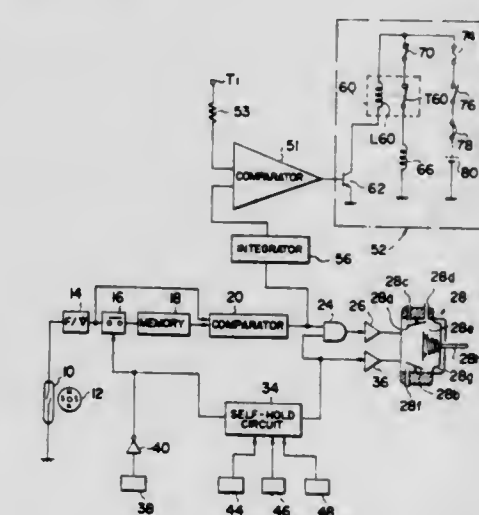
Filed Jan. 7, 1982, Ser. No. 337,713

Claims priority, application Japan, Jan. 20, 1981, 56-7628

Int. Cl.<sup>3</sup> B60K 31/00

U.S. Cl. 180—179

10 Claims



1. Apparatus for running a vehicle having an automatic transmission at a constant speed, comprising:

vehicle speed signal generating means for generating a signal representative of an actual speed of said vehicle; vehicle speed setting means for presetting a desired vehicle speed in a constant speed running condition of said vehicle; preset vehicle speed signal generating means for holding the output signal of said vehicle speed signal generating means generated when a vehicle speed is preset by said vehicle speed setting means and producing the preset vehicle speed;

vehicle speed compare means for comparing the output signal of said preset vehicle speed signal generating means and the output signal of said vehicle speed signal generating means to produce a signal representative of a compare result;

throttle valve control means for controlling an aperture of a throttle valve in accordance with the output signal of said compare means; and drive means for driving an engine in accordance with the aperture of said throttle valve,

characterized by: preset vehicle maintenance detecting means for comparing the output signal of said vehicle speed compare means with a reference signal determined in accordance with the vehicle speed at the time when said vehicle speed setting means presets the desired vehicle speed, the level of the reference signal being determined by the gear position of said automatic transmission and producing a signal when the output signal of said vehicle speed compare means exceeds the level of said reference; signal and



a shift-down circuit for shifting the automatic transmission into a lower gear in the constant speed running condition in response to the output signal from said preset vehicle speed maintenance detecting means.

4,421,193

## TREAD POWERED SKI

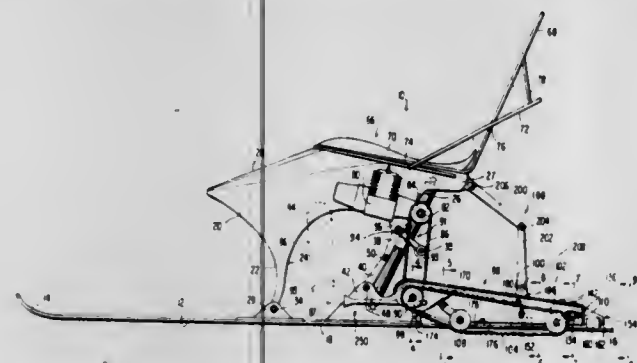
Fred L. Bissett, 1300 Florence St., Aurora, Colo. 80010

Filed Jan. 5, 1981, Ser. No. 222,601

Int. Cl.<sup>3</sup> B62M 29/00

U.S. Cl. 180—192

18 Claims



1. A powered ski apparatus, comprising: a single elongated runner having a forward end portion and a rear end portion; seat means fastened to said runner for supporting a rider thereon; track means for producing powered movement of said runner, said track means including first and second continuous treads disposed on opposite lateral sides of the rear end portion of said runner and adapted for ground engagement to produce said powered movement; engine means for providing a source of power for said track means, said engine means including an output shaft; power train means for connecting said output shaft to said first and second treads; and chassis means for supporting said first and second treads, said chassis means including a forward end and a rear end, said forward end being pivotally mounted to said runner about a chassis pivot axis.

4,421,194

## TUBING ASSEMBLY IN MUTUALLY MOVABLE PORTIONS OF A THREE-WHEELED MOTOR VEHICLE

Katsuyoshi Kawasaki, Mitaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

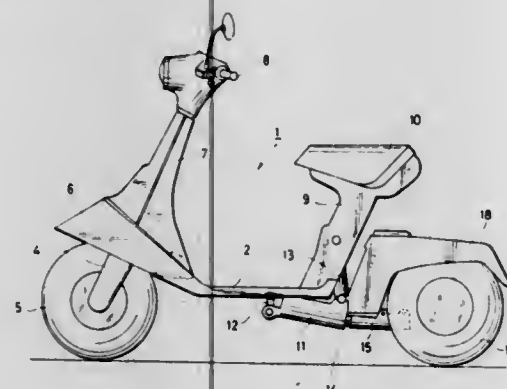
Filed Jan. 6, 1982, Ser. No. 337,549

Claims priority, application Japan, Jan. 27, 1981, 56-9808[U]

Int. Cl.<sup>3</sup> B62K 5/04

U.S. Cl. 180—215

5 Claims



1. A tubing assembly for use in a three-wheeled motor vehicle which includes a front body portion providing a front wheel and a fuel tank, a rear body portion providing a power unit and two opposing drive wheels, and connecting means for

connecting said front and rear body portions, said front body portion being rotatably mounted about said connecting means and being vertically and longitudinally movable relative to said rear body portion, comprising:

- (a) a first flexible tubular member extending substantially vertically and having one end connected to a first rigid tubular member secured to said front body portion and leading to an outlet of said fuel tank;
- (b) a second flexible tubular member extending substantially horizontally and having one end connected to a second rigid tubular member secured to said rear body portion and leading to an inlet of said power unit; and
- (c) a substantially L-shaped intermediate rigid tubular member having each end connected to the other end of one of said first and second flexible tubular members, said first and second flexible tubular members and said intermediate rigid tubular member being outwardly spaced apart from said axial center of said connecting means and positioned at the same longitudinal side of said three-wheeled motor vehicle.

4,421,195

## DEVICE FOR PREVENTING DISPLACEMENT OF AN ENGINE IN A MOTORCYCLE

Yasuaki Aiba, Sakado, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

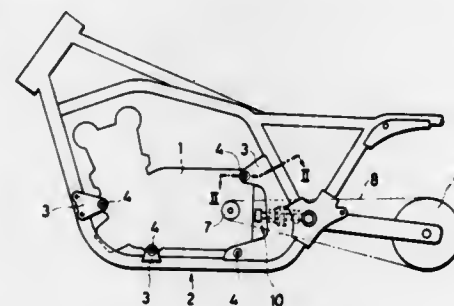
Filed Jan. 6, 1982, Ser. No. 337,548

Claims priority, application Japan, Jan. 9, 1981, 56-1489

Int. Cl.<sup>3</sup> B60K 5/12

U.S. Cl. 180—228

7 Claims



1. In a device for preventing displacement of an engine in a motorcycle having a driving chain adapted to transmit the rotation of said engine to a rear wheel, said engine being mounted on a body frame by a plurality of mounting bolts each extending through one of a plurality of holes formed in said engine, and a plurality of brackets attached to said frame, the improvement which comprises:

a stop supported on said frame behind said engine, said stop including an adjust bolt having a longitudinal axis located on a line joining a center of a sprocket on an output shaft of said engine and a center of a sprocket on the axle of said rear wheel, said longitudinal axis being located in a vertical plane in which said chain lies; and means for damping the vibration of said engine, said damping means being provided on each of said mounting bolts adjacent to each end thereof, and fitted substantially in each of said holes.

4,421,196

## HOMOKINETIC TRANSMISSION JOINT IN PARTICULAR FOR THE DRIVING WHEEL OF A FRONT WHEEL DRIVE VEHICLE

Michel A. Orain, Conflans Ste Honorine, France, assignor to Glaenger Spicer, Poissy, France

Filed Dec. 7, 1981, Ser. No. 328,443

Claims priority, application France, Dec. 19, 1980, 80 27027

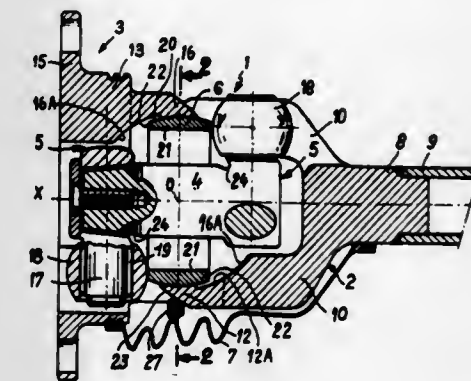
Int. Cl.<sup>3</sup> B60K 17/30

U.S. Cl. 180—257

8 Claims

1. In a homokinetic transmission joint, in particular for a driving wheel of a front wheel drive vehicle, said joint com-

prising a shaft section, a tripod element carried at each of opposite ends of the shaft section, the two tripod elements being angularly offset from each other at 60°, and two forks each defining three pairs of runways having a circular cross-sectional shape, each tripod element comprising three arms on each of which arms is rotatably mounted and displaceable longitudinally of the arm a spherical roller which is disposed in a corresponding pair of said runways; the improvement com-



prising for each fork three internally spherical nose portions which axially extend said each fork between the pairs of runways defined thereby, a ring which surrounds, with clearance, said shaft section between the two tripod elements and has an outer spherical surface, the six nose portions cooperating with said outer spherical surface of said ring, and the six rollers being substantially tangent to two end surfaces of said ring when the joint is straight.

4,421,197

## DEVICE FOR SUPPORTING A STEERING AND DRIVING WHEEL OF AN AUTOMOBILE VEHICLE

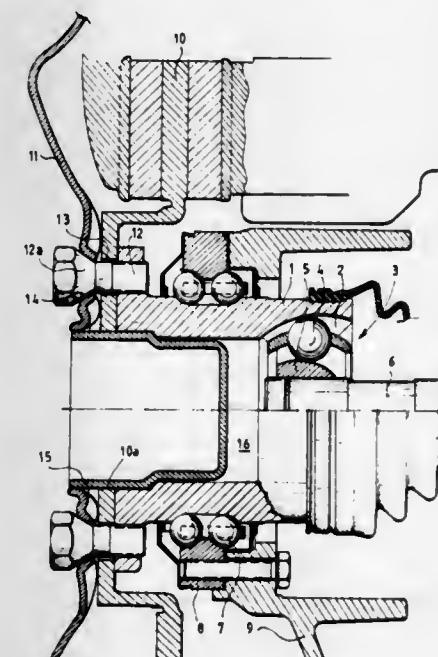
Andre Chandoux, Paris, France, assignor to S.A. Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Nov. 19, 1981, Ser. No. 323,083

Int. Cl.<sup>3</sup> B60K 17/30

U.S. Cl. 180—258

5 Claims



1. A support assembly for a steering and driving wheel of an automotive vehicle, the support comprising: a tubular hub centered on an axis and having an axially outwardly directed face; a drive shaft at the axis; a ball-type universal joint having an inner part on the drive shaft and an outer part on the hub, whereby the joint rotationally couples the shaft to the hub; a brake disk secured to the outer face of the hub and having a hole centered on the axis, the hub having an inside

diameter at the outer face equal substantially to the inside diameter of the hole of the brake disk, the wheel being secured with the brake disk to the outer face of the hub; and

a bowl-shaped sheet-metal seal element fitted snugly into the tube and projecting outwardly therefrom through the hole, the outer diameter of the seal element at the outer face being substantially equal to the inside diameter of the hole and tube, whereby the seal element centers the disk and hub relative to each other.

4,421,198

## VARIABLE FREQUENCY VACUUM ACTUATED SEISMIC ENERGY SOURCE

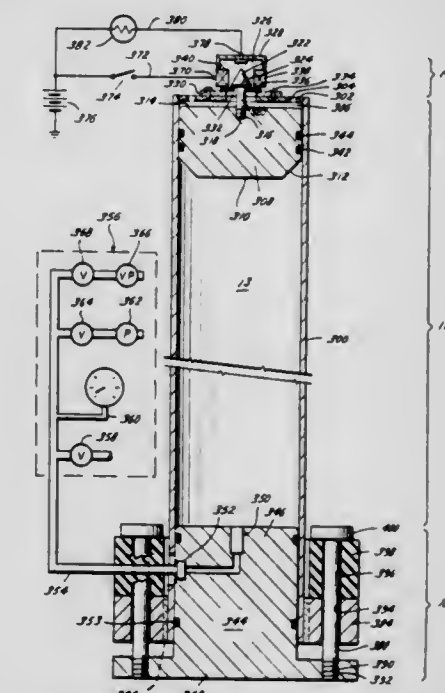
Norvel L. Miller, 11713 Possum Hollow La., Houston, Tex. 77009

Continuation-in-part of Ser. No. 183,800, Sep. 4, 1980, abandoned. This application Nov. 27, 1981, Ser. No. 325,386

Int. Cl.<sup>3</sup> G01V 1/147

U.S. Cl. 181—121

11 Claims



1. A thumper-type frequency tunable seismic energy source comprising:

a uniform bore tube open at its top and bottom ends; a slidably movable free piston disposed within said tube, said piston movable through the interaction of air pressure and gravity, said piston including piston sealing means for maintaining an annular hermetic sealing contact between the perimeter of said piston and the bore of said tube; restraining means for releasably holding said free piston proximate the top end of said tube; a base plate plug slidably disposed at, and extending beyond and outside the bottom end of said tube, said plug including sealing means for maintaining an annular hermetic sealing contact between the perimeter of said plug and the bore of said tube; frequency adjusting means for varying the rate of kinetic energy transfer between said free piston and said base plate plug with respect to the generation of separate seismic pulses, said frequency adjusting means comprising vacuum application means for selectively creating a pressure lower than atmospheric pressure in said uniform bore tube between said free piston and said base plate plug; compression control means for preventing the escape of air from said uniform bore tube when said piston falls toward said base plate; contact pressure application means for biasing the bottom end of said uniform bore tube against the ground in a direction along the longitudinal axis of said tube; and tube rotation means for adjustably rotatably varying the



angle of inclination of the longitudinal axis of said uniform bore tube with respect to the ground.

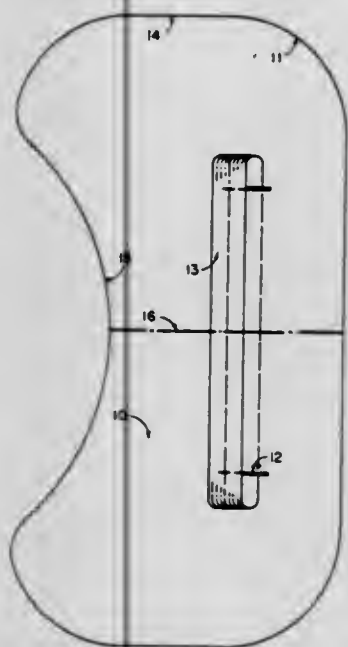
4,421,199

## SOUND REFLECTOR TYPE HEARING AID

Charles K. Vrana, 60 Helen La., Ft. Myers Beach, Fla. 33931  
Filed Mar. 4, 1982, Ser. No. 354,887  
Int. Cl.<sup>3</sup> G10K 11/10

U.S. Cl. 181-136

2 Claims



1. An audio sound reflector type hearing aid device comprising a single broad sheet of sound reflecting type material, an endless expansion type holding strap to engage around the head, said holding strap inserted through slots in (a) said single sheet of audio sound reflecting material, said sound reflecting sheet to be positioned around the back of the head, said sound reflecting sheet having a cutaway curve at the lower part of said sound reflector sheet to generally conform with the shape of the neck, said sound reflecting sheet having sound reflecting wings extending outward beyond the ears starting at the approximate point where said endless holding strap enters and leaves said slot in said sound reflector.

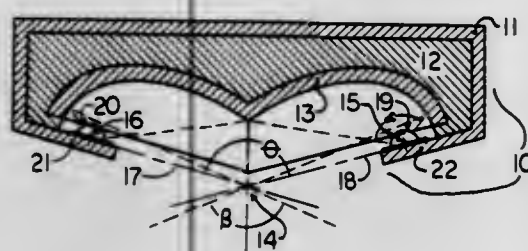
4,421,200

## ELLIPTICALLY SHAPED TRANSDUCER ENCLOSURE

Michael W. Ferralli, 4055 W. 30th St., Erie, Pa. 16506, and  
David R. Moulton, 556 Temple Rd., Dunkirk, N.Y. 14048  
Filed Dec. 16, 1981, Ser. No. 331,179  
Int. Cl.<sup>3</sup> H05K 5/00

U.S. Cl. 181-144

7 Claims



1. An enclosure which comprises, in combination, a number of sound transducers coupled so as to produce sound in phase with one another, and an acoustically reflective shell which is shaped substantially as the envelope of at least sections of at least a number of ellipsoids of revolution equal to the number of transducers, all of which have the identical length of major axis, wherein said ellipsoids of revolution are radially oriented with respect to one another so that their respective major axes all intersect at the same point at various angles with respect to one another and such that said point of intersection is coincident with one focal point of each of said ellipsoids, such focal point thereby being common to all said ellipsoids, and with the other focal point of said ellipsoids being distinct from one another and being radially distributed about this common focal point, and wherein said transducers are located so that at least one such transducer is placed at each distinct focal point, said transducer oriented so that the sound produced by it is directed substantially toward that section of the acoustically reflective shell shaped by the section of the ellipsoid of revolution to which said distinct focal point belongs, so that sound produced by each of the transducers is directed to the above specified portion of the acoustically reflective shell, reflected by it and thence directed, focused and concentrated at the aforementioned common focal point, said sound from all the transducers contained within the enclosure arriving at this common focal point with the same phase.

dent with one focal point of each of said ellipsoids, such focal point thereby being common to all said ellipsoids, and with the other focal point of said ellipsoids being distinct from one another and being radially distributed about this common focal point, and wherein said transducers are located so that at least one such transducer is placed at each distinct focal point, said transducer oriented so that the sound produced by it is directed substantially toward that section of the acoustically reflective shell shaped by the section of the ellipsoid of revolution to which said distinct focal point belongs, so that sound produced by each of the transducers is directed to the above specified portion of the acoustically reflective shell, reflected by it and thence directed, focused and concentrated at the aforementioned common focal point, said sound from all the transducers contained within the enclosure arriving at this common focal point with the same phase.

4,421,201

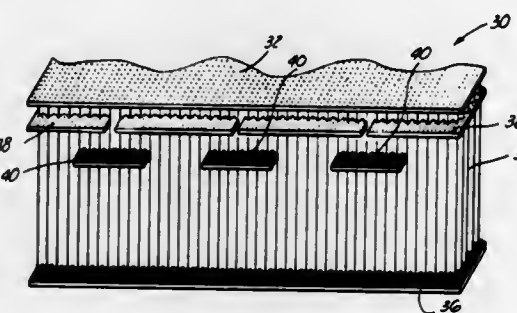
## HIGH EFFICIENCY BROADBAND ACOUSTIC RESONATOR AND ABSORPTION PANEL

Murray D. Nelsen, Goddard; Robert K. Kunze, Jr., Wichita, both of Kans.; Robert F. Olsen, Woodinville, and Ira B. Rushwald, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1981, Ser. No. 306,677  
Int. Cl.<sup>3</sup> B64D 33/00

U.S. Cl. 181-214

5 Claims



1. A sound attenuating panel for installation in the high velocity air flow region of an engine nacelle and other applications requiring acoustic treatment, the panel comprising: a single layer of cellular honeycomb core; a first sheet of permeable facing material attached to the top surface of the core; a first acoustic perforated septum formed internally in the core and parallel to the first sheet, the first septum made up of a plurality of strips having a width  $W_1$  and gap  $G_1$  therebetween; a second acoustic septum formed internally in the core and parallel to the first septum, the second septum disposed in a spaced relationship below the first septum and made up of a plurality of strips having a width  $W_2$  and gap  $G_2$  therebetween, the width  $W_2$  of the second septum being greater than the gap  $G_1$  with the strips of the second septum indexed below the gaps  $G_1$  of the first septum.

4,421,202

## SOUND ATTENUATOR

Robert W. Hoy, Warsaw, Ind., assignor to Peabody ABC Corporation, Warsaw, Ind.

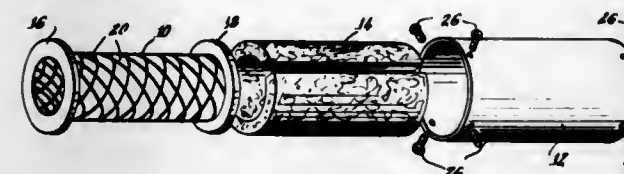
Filed Mar. 20, 1981, Ser. No. 245,903  
Int. Cl.<sup>3</sup> F01N 1/10

U.S. Cl. 181-252

13 Claims

1. A sound attenuator comprising: a tubular inner member having an interior and comprising a lattice of reinforcing strand material coated with solidified resin, said strand material being formed in two opposed generally helical patterns that intersect at a plurality of points, said strand material of one said helical pattern being intimately bonded by said solidified resin to said strand material of said other generally helical pattern at

substantially each said point of intersection, said lattice having a plurality of open areas between said strand material; a tubular outer member having a diameter greater than the diameter of said tubular inner member;



means for retaining said tubular members in concentric relationship to provide a space therebetween; and sound absorbing material positioned in said space, said sound absorbing material being in communication with said interior of said tubular inner member through said open areas to provide for sound attenuation.

4,421,203

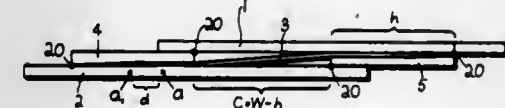
## ROLL-OUT LAYERED EXPANSIBLE MEMBRANES (ROLEM)

John V. W. Bergamini, 520 N. Gilbert St., Iowa City, Iowa 52240

Filed Aug. 25, 1982, Ser. No. 411,264  
Int. Cl.<sup>3</sup> E04B 1/74

U.S. Cl. 181-284

10 Claims



1. A device which can be unrolled and erected (or expanded) so as to serve as a transparent or otherwise electromagnetic radiation limiting, sound and heat insulating building panel comprised of:

- (a) roughly flat components which, when assembled, are adequately flexible to be rolled up and which in cross section resemble a flattened parallelogram,
- (b) multiple extruded membranes layered one on top of another whose extreme members constitute, in cross section, two roughly parallel line segments of said parallelogram,
- (c) two sidewalls which, in cross section, constitute the other two roughly parallel segments of said parallelogram,
- (d) a means for a provision to attach securely said sidewalls of the device to a structural frame as in, for example, a flange running the length of a sidewall providing a surface to fasten the sidewalls to a building frame,
- (e) a means of securely attaching intentionally positioned layered membrane edges to one sidewall and the other layered membrane edges to the other sidewall in such a way that when the device is expanded or erected the distance between subsequent roughly parallel membranes and the tension applied to these membranes between the two sidewalls will be predictable, wherein said tension being design-variable by slightly varying the distance between the membranes' attachments to the sidewalls, and thereby varying the extent to which they will stretch when the device is erected or expanded, assuming none are allowed to sag,

(f) a means of hinging the membranes where they attach to the sidewalls so they hinge at least 90° to the sidewalls so that if the device were unrolled and laid flat, resembling a flattened parallelogram in cross section with the membranes lying one on top of another, then the device could be erected or expanded by turning the sidewalls so they would be roughly perpendicular to the multiple membranes and allowing air into the cavities between the

membranes, thereby creating a panel with multiple roughly parallel membranes separated by air spaces and bounded perpendicularly by the sidewalls.

4,421,204

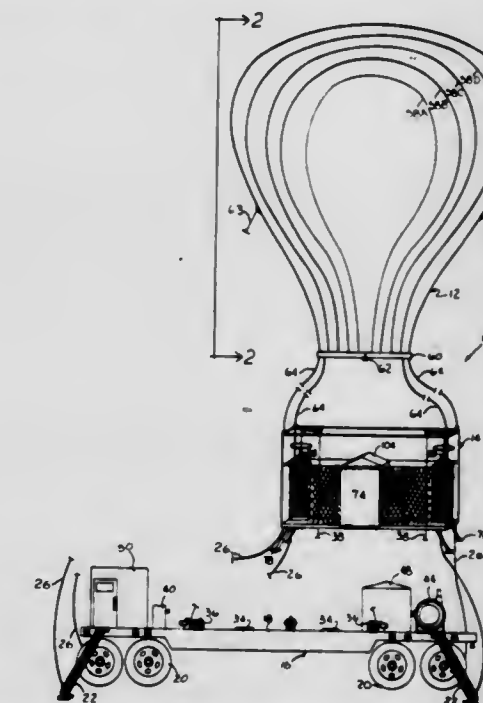
## FIRE RESCUE SYSTEM

Bernard L. Lawrence, 901 Yuma, Independence, Mo. 64056, assignor to La Donna Lawrence, Independence Mo.

Int. Cl.<sup>3</sup> A62B 1/02

U.S. Cl. 182-50

6 Claims



1. A fire fighting and rescue unit for use in conjunction with high rise buildings, said unit comprising: trailer means for transporting equipment over the road; a balloon having a capacity for lifting objects from the ground, said balloon comprising a plurality of inflatable compartments disposed one in side of the other, each of said compartments being independent of the other, said compartments having a capacity for a quantity of gas such that if some of said compartments are deflated the remaining inflated compartments will continue to carry said load; a gondola for transporting people and equipment to and from an elevated location; means coupling said balloon with said gondola for raising and lowering the balloon relative to the gondola; means coupled with said gondola and operable from said trailer for raising and lowering people and equipment to and from said gondola when the latter is in an elevated location; and means for coupling said gondola with said trailer while said gondola is raised to a working level by said balloon.

4,421,205

## MAGNETIC SHIP'S HOG LINE HOLDER

John M. Vranish, Crofton, and Charles E. Maggelet, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 1, 1982, Ser. No. 344,450  
Int. Cl.<sup>3</sup> E04G 3/10

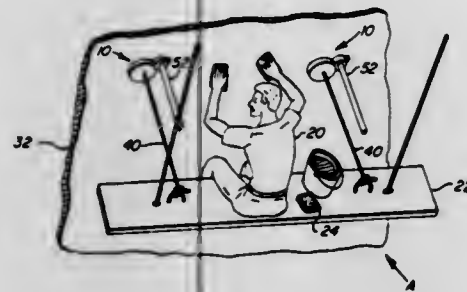
U.S. Cl. 182-82

11 Claims

1. A magnetic holder for securing a platform lowered from the deck of a ship to the surface of the hull of the ship for allowing personnel to service the hull comprising: a permanent magnetic for creating a magnetic holding force, a body member containing said magnet, the magnet adapted to secure said body member to the surface of the hull of the ship, said body member including an extension rigidly



attached to its periphery at a location on said body members' longitudinal axis displaced from the magnets' magnetic center of gravity for receiving an external force for removing said body member from the hull surface, said body member including said extension define a lever arm, with which said external force, when applied to the extension, define a turning moment providing a substantial mechanical advantage for overcoming the magnetic hold-



ing force; thereby causing release of the body member from the hull's surface with reduced effort, a flexible resilient member attaching the platform to body member at the magnetic center of gravity of said magnet, said resilient member adapted to prevent the transmission of impulse forces exerted by the platform to the holder by dissipating the forces through controlled stretching of said resilient member.

#### 4,421,206 LADDER

Walter Kümmerlin, Bietigheim-Bissingen, In den Fressäckern 6, Fed. Rep. of Germany

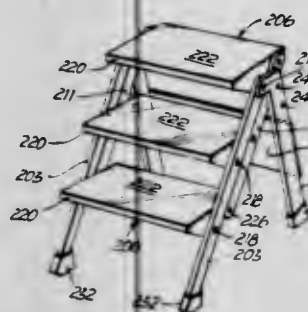
Filed Jan. 27, 1981, Ser. No. 228,833

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003854; May 21, 1980, 3019345; Sep. 24, 1980, 3035955

Int. Cl.<sup>3</sup> E06C 1/16

U.S. Cl. 182-156

15 Claims



1. In a stepladder, with two legs which are connected with each other swingably around an axis in the region of an upper end of the legs, at least one of the legs has transverse support members which are supported by a first pair of stiles, and arranged spaced apart from each other in the longitudinal direction of the first pair of stiles to form the treads, said transverse support members being developed as board-shaped treads which, when the legs are spread apart a predetermined maximum distance, the standing surface of the transverse support members is horizontal and lies in horizontal planes, the treads being connected swingably about axes parallel to each other, to the first pair of stiles and to respective link members which are parallel to the first pair of stiles, the improvement comprising

a mutual supporting relationship between the first pair of stiles and the link members upon a predetermined maximum spread of the legs so as to increase the resistance to bending of the first pair of stiles and limit the swingability of the treads around their axis in a first direction of swing, the treads projecting beyond one side edge of the first pair of stiles facing away from the other leg such that stepping upon the treads causes a moment of rotation in a second direction which brings the link members towards the first

pair of stiles, and the depth of the treads and the difference in height between two successive treads is within a predetermined dimensional range customary for stairs, the respective link members are associated with respective stiles of said first pair and the other said leg comprises a second pair of stiles, a double-armed swing lever being supported for swinging on at least one of the two stiles of the first pair for movement about an axis parallel to the axis of swing of the legs, one arm of said swing lever being pivoted to the link member associated with said one stile of said first pair and the other arm of said swing lever being connected to a corresponding stile of said other leg, the swing lever includes a driver and the other leg includes a slot guide engaged by said driver.

#### 4,421,207 COMBINATION ANTI-FRICTION BEARING AND FORCE-GENERATING MECHANISM

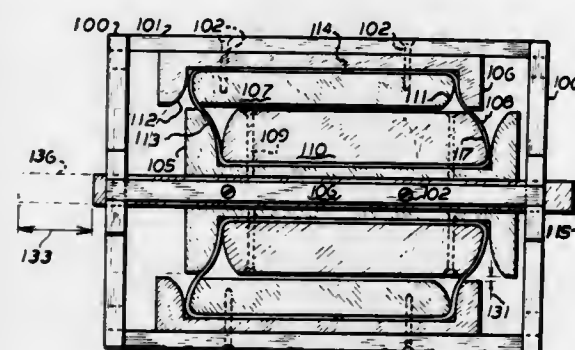
David G. Falconer, 4673 S. 34 St., Arlington, Va. 22206

Filed Nov. 10, 1981, Ser. No. 319,910

Int. Cl.<sup>3</sup> F03G 3/06; F16F 1/26

U.S. Cl. 185-29

9 Claims



1. In a linear bearing and force generating mechanism, an outer frame having a first set of cams attached thereto, an inner shaft having a second set of cams attached thereto, flexible pendulums connecting and partially wrapping around said first and said second set of cams, the contours of said first set of cams and said second set of cams being so shaped that said flexible pendulums are formed and constrained by contact around said contours that the swinging movement of said flexible pendulums cause said shaft to move in a non-arcuate and linear manner.

#### 4,421,208 UPRIGHT FORK LIFT TRUCK

Richard H. Robinson, Jr., Kalamazoo, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 9, 1981, Ser. No. 232,762

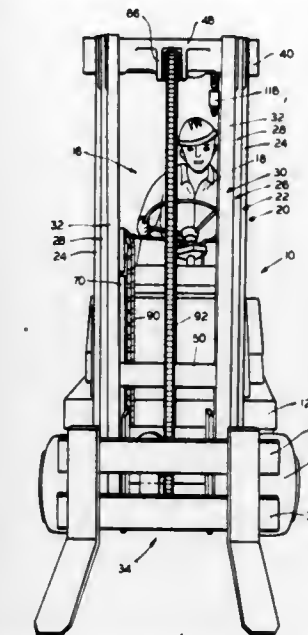
Int. Cl.<sup>3</sup> B66B 9/20

U.S. Cl. 187-9 E

40 Claims

1. An upright structure for lift trucks and the like having a fixed upright section, a first telescopic upright section mounted for elevation relative to said fixed section, a second telescopic upright section mounted for elevation relative to said first telescopic section and elevatable load carrier means mounted for elevation relative to said second telescopic section, the improvement comprising a first lift cylinder means secured to support means, a second lift cylinder means secured to said support means, first flexible lifting means operatively connecting said first cylinder means to said load carrier means for elevating said load carrier means on said second telescopic upright section independently of said second cylinder means, and second flexible lifting means operatively connecting said

second cylinder means to one of said telescopic upright sections, said second cylinder means and second flexible lifting



means being operatively connected in the upright structure to elevate said first and second telescopic upright sections.

#### 4,421,209 LIFT APPARATUS

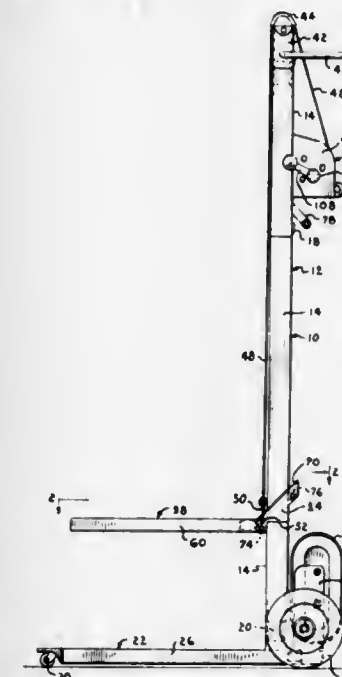
Howard H. Vermette, and Andrew H. Daugherty, both of Hammond, Ind., assignors to Vermette Machine Company, Inc., Hammond, Ind.

Filed Jan. 25, 1982, Ser. No. 342,653

Int. Cl.<sup>3</sup> B66B 9/20

U.S. Cl. 187-9 R

8 Claims



1. A lift apparatus which includes a base, a post mounted upright on said base, said post having a forward side, a back side and opposing lateral sides relative to said base, a cable return sheave mounted on said post, a winch device provided on said back side of said post, means on said post moveable along said post, said means having one end extending forward of said forward side of said post and an opposing other end at said back side of said post, a lift table supported at said one end of said means, said lift table extending horizontally from said forward side of said post, a cable connected at one end to said winch device and at the other end to said means and moveable over said cable return sheave for moving said means and said lift table along said post, wherein the improvement thereof comprises:

a cross bar connected to said post spaced from said back side thereof;

said means and said lift table being pivotable on said post from a horizontal position to a vertical position; and said other end of said means formed to extend rearward of said back side of said post at an incline so as to clear said cross bar when said lift table extends horizontally from said post, and engage said cross bar at said incline when said lift table and said means are pivoted from the horizontal toward the vertical when said means is moved along said post adjacent said cross bar.

#### 4,421,210 WHEEL STOP APPARATUS

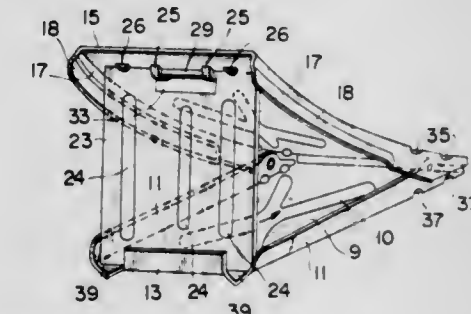
Yoshiharu Sugino, Nagoya, Japan, assignor to Sugino Press Co., Ltd., Japan

Filed Jul. 22, 1981, Ser. No. 285,859

Int. Cl.<sup>3</sup> B60T 3/00

U.S. Cl. 188-32

3 Claims



1. Wheel stop apparatus, comprising:  
a bottom plate having a pair of lateral sides;  
a ramp board having a pair of lateral sides;  
means pivotably interconnecting said ramp board to said bottom plate adjacent respective lateral sides of said bottom plate and ramp board;  
a check plate hingedly connected to the underside of said ramp board adjacent the lateral side opposite said pivotable interconnection;  
said check plate having a pair of mutually spaced apart end edges, and having an open portion adjacent one said end edge so as to form an axle between said one end edge and said open portion;  
a pair of separate and mutually spaced apart axle bearing members each formed on the underside of said ramp board and extending downwardly and around said axle of said check plate, so that said axle and said pair of bearing members comprises said hinged interconnection between check plate and ramp board; and  
a pair of checking protrusions formed on the underside of said ramp board;  
said checking protrusions respectively flanking said pair of axle bearing members and located in relation to said check plate axle so as to be engaged by said one end of the check plate when said ramp board and bottom plate are pivotably opened and said check plate is pivoted to extend away from the ramp board underside;  
so that the other said end edge of said check plate engages said plate to maintain said pivotable separation of ramp board and bottom plate; and  
said checking protrusions, by engaging the check plate, stabilize said hinged interconnection of ramp board and check plate.



# 4,421,211 CONNECTION MECHANISM FOR AUTOMATIC SLACK ADJUSTER

Fred W. Hoffman, Brunswick, and Raphael A. Barrios, Elyria, both of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

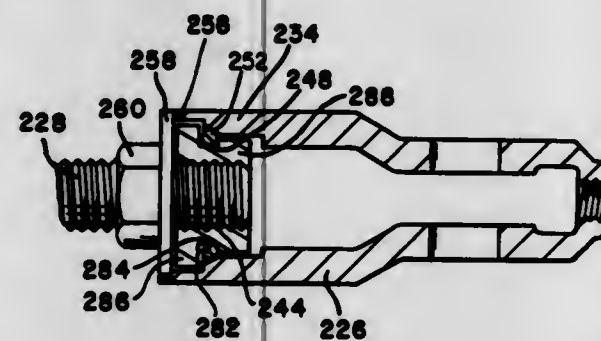
Continuation of Ser. No. 841,266, Oct. 12, 1977, abandoned.

This application Nov. 24, 1978, Ser. No. 963,252

Int. Cl.<sup>3</sup> F16D 65/52

U.S. Cl. 188—79.5 K

6 Claims



1. In a vehicle braking system, a brake actuating lever, a yoke pivotally connected to said lever, a thrust rod, a fluid pressure responsive actuator connected to said thrust rod for urging the latter in a brake application effecting and brake releasing directions and means attaching said yoke to said thrust rod, said yoke including a recess having an entrance through which one end of said thrust rod extends, said attaching means including an adapter movable axially on said thrust rod and located in said recess, first connecting means carried by said yoke and projecting into said recess for engagement with said adapter to define a connection between said yoke and said adapter which does not transmit braking thrust, and second connecting means carried by said thrust rod and cooperating with said yoke to transmit braking thrust to the lever when a brake application is effected, said yoke defining first and second transverse thrust-receiving surfaces circumscribing said thrust rod, said second connecting means including first thrust transmitting means carried by said thrust rod for engagement with the first thrust-receiving surface, and second thrust transmitting means carried by said adapter for engagement with the second thrust-receiving surface.

# 4,421,212 BRAKE CONTROL VALVE ARRANGEMENT

Franz Fleck, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

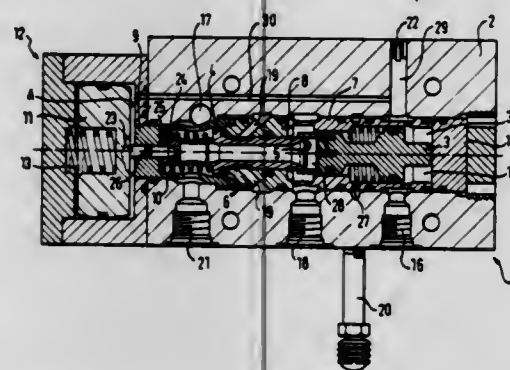
Filed Nov. 19, 1981, Ser. No. 322,825

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047814

Int. Cl.<sup>3</sup> B60T 11/10

U.S. Cl. 188—152

15 Claims



1. An arrangement for controlling the pressure of hydraulic braking fluid supplied in dependence on the position of a brake actuating member, especially a brake pedal, to at least one brake actuating cylinder of a hydraulic braking system including a low-pressure supply reservoir, a control pressure source

responsive to movement of the brake actuating member, and an actuating pressure source, comprising housing means having an internal bore and supply, control, pressure and relief ports communicating with said bore and, when the arrangement is incorporated in the braking system, with the brake actuating cylinder, the control pressure source, the actuating pressure source, and the supply reservoir, respectively; an elongated hollow valve member received in said bore for axial movement therein and having a first and a second end portion; a control piston axially movably received in said bore at said first end portion of said valve member and having an end face which faces away from said valve member and delimits a control compartment communicating with said control port; first valve means rigid with said first end portion of said valve member and with said control piston for controlling the flow of hydraulic fluid between said supply and relief ports; second valve means rigid with said second end portion of said valve member and with said housing means for controlling the flow of hydraulic fluid between said actuating and supply ports; a compression spring acting on said second end of said valve member in a predetermined direction toward said control piston to urge said valve member toward an end position in which said first valve means is open and said second valve means is closed; and means for reducing the loading of said compression spring in proportion to the magnitude of the pressure supplied by the control pressure source into said control compartment.

# 4,421,213 HYDRODYNAMIC TORQUE-TRANSFER UNIT, ESPECIALLY A HYDRODYNAMIC BRAKE

Klaus Brosius, Heldenheim, and Berthold Herrmann, Gerstetten, both of Fed. Rep. of Germany, assignors to Voith Getriebe KG, Fed. Rep. of Germany

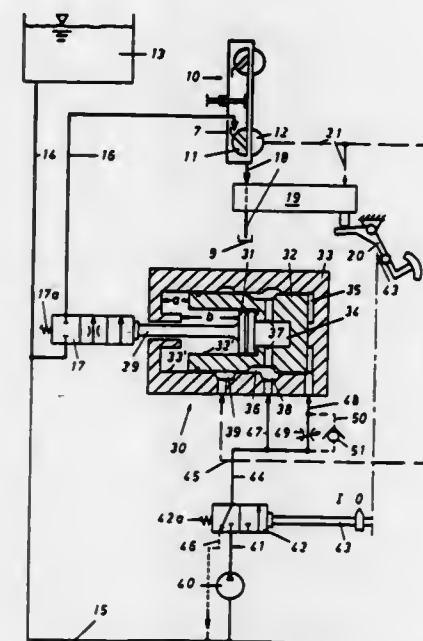
Filed Oct. 29, 1981, Ser. No. 316,524

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040790

Int. Cl.<sup>3</sup> F16D 57/02

U.S. Cl. 188—296

27 Claims



1. A hydrodynamic torque transfer unit, comprising:  
a housing with a working chamber; a stator in the working chamber; a rotor rotatably held in the working chamber, rotatable with respect to the stator and positioned with respect to the stator for torque transfer therebetween in the presence of working fluid in the working chamber;  
a working fluid inlet to the working chamber and a working fluid outlet from the working chamber, such that the selective filling of the working chamber through the inlet and the removal of working fluid therefrom through the outlet establishes the torque to be transferred through the working chamber;

an inlet valve connected to the inlet for regulating the amount of working fluid to pass through the inlet; the valve having a fully open condition at which it permits passage to the inlet of a larger rate of flow of working fluid and having a partially open condition at which it permits passage to the inlet of a smaller rate of flow of working fluid;  
a control device connected to the valve for moving the valve through its conditions; the control device comprising a first control element connected with the valve for moving the valve, and the first control element being movable from a rest position, through an intermediate activated position at which the valve is in the partially open condition, to a fully activated position at which the valve is in the fully open condition;  
a first pressure chamber behind the first control element such that when the first control element is in the rest position and the first pressure chamber is pressurized, the first control element is initially driven to the fully activated condition;  
a change over device having a pressurizing condition at which it connects the first pressure chamber to a source of pressure medium for first pressurizing the first pressure chamber to move the first control element to the fully activated position; the change over device having a non-pressurizing condition at which it connects the first pressure chamber with the pressure in the working chamber, whereby the pressure in the working chamber acts upon the first pressure chamber, for thereafter discharging the pressure of the first pressure chamber, when the pressure in the working chamber is low enough to enable such discharge, and the discharge from the first pressure chamber being for causing the return of the first control element toward the rest position thereof;  
the change over device including preventing means for preventing the return of the first control element beyond the intermediate activated position toward the rest position;  
an activator operable both for causing pressurization of the first pressure chamber with the change over device in the pressurizing condition and for causing operation of the change over device to the non-pressurizing condition thereof.

# 4,421,214 SYSTEM FOR AUTOMATICALLY RELEASING PARKING BRAKES

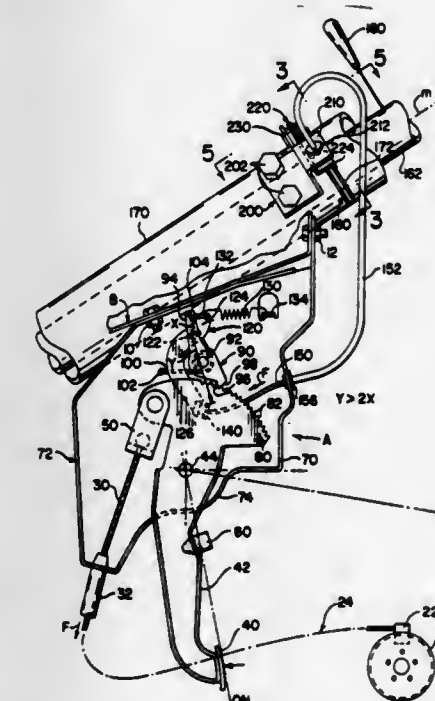
Daniel J. Sellmeyer, Royal Oak, Mich., assignor to Gulf & Western Industries, Inc., Southfield, Mich.

Filed Dec. 16, 1980, Ser. No. 216,945

Int. Cl.<sup>3</sup> B60K 41/26

U.S. Cl. 192—4 A

4 Claims



1. In a system for releasing the parking brakes of a wheeled vehicle having a transmission control manually shiftable be-

tween a non-driving condition and a drive condition, said system including mechanical means for setting the parking brakes in a set condition, mechanical locking pawl means coacting with a toothed sector for retaining the parking brakes in the set condition, a release lever pivoted about an axis between a first inactive position and a second position, means responsive to pivotal movement of said release lever into said second position for releasing said mechanical locking pawl means and allowing the brakes to be released, an elongated flexible element for pivoting said lever from said first position to said second position to release said locking pawl means when said flexible element is pulled in a selected direction, and biasing means pivotally urging said lever into said first inactive position and also urging said flexible element in a direction opposite to said selected direction, the improvement comprising: a device for automatically pulling said flexible element in said selected direction when said transmission control is shifted into a drive condition, said automatic device comprising: a cam sector with a generally arcuate cam surface and pivoted about a given axis generally at the center of said arcuate cam surface as said transmission control is manually shifted between a park, reverse, neutral and drive position, a fixed bracket adjacent said pivotable cam sector, a bell crank pivoted on said bracket about a second axis generally parallel to said given axis and having first and second ends, means for connecting said first end onto said flexible pulling element whereby said element is pulled by said bell crank as said bell crank is pivoted in a first direction, and a cam follower on said second end and riding along and biased against said arcuate cam surface, by said biasing means urging said flexible element in said opposite direction, to position the said lever in and predetermine the said first inactive position thereof; said arcuate cam surface having first and second lobe portions; said first lobe portion for forcing said follower in a direction pivoting said bell crank in said first direction, when said transmission control is in said drive position, to cause the said flexible element to pivot the said release lever to the said second position thereof so as to effect the release of the said locking pawl means and the parking brakes, and said second lobe portion for forcing said follower likewise in a direction pivoting said bell crank in said first direction, when said transmission control is in said reverse position, to similarly effect the release of the said locking pawl means and the parking brakes.

# 4,421,215 PARK LOCK INTERLOCK CONTROL SYSTEM

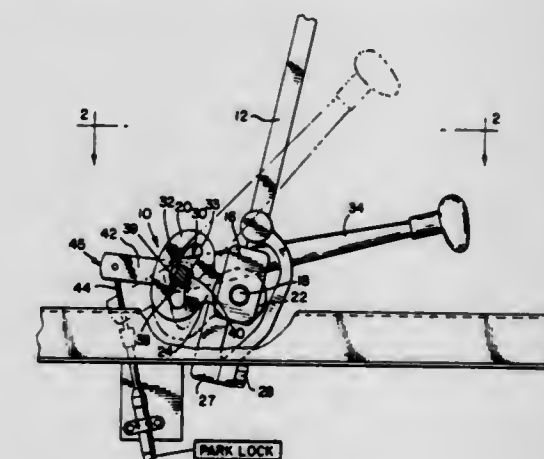
Glen R. Bellah, Bolingbrook; Lawrence M. Sobol, Hinsdale; Lloyd B. Idelman, Evanston, and Vo V. Thanh, Willowbrook, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Sep. 28, 1981, Ser. No. 306,022

Int. Cl.<sup>3</sup> B60K 41/26; G05G 11/00

U.S. Cl. 192—4 A

5 Claims



1. A park lock interlock control system for engagement and



disengagement of a park lock in a vehicle drive train having a range shift transmission, the system comprising:

- a transmission shift lever reciprocally movable between a plurality of gear positions and controlling said transmission, said gear positions including a neutral position;
- said transmission shift lever connected with a transmission pivot shaft;
- a range shift plate integrally attached to said transmission shift lever and movable therewith;
- said plate having a slot means;
- a park lock lever disposed in the vicinity of said transmission shift lever and rigidly secured to a park lock crossover shaft extending transversely thereto and interconnected with said park lock;
- said crossover shaft including a finger projecting through said plate slot means;
- said finger having guiding means permitting said plate to reciprocally and slidably move across said finger;
- said plate means automatically impeding the rotational movement of said finger therewithin;
- said plate slot means having an enlarged section wherein said finger being able to rotate, thereby actuating said park lock for immobilization of the vehicle drive train.

4,421,216

**HOUSING FOR VISCOUS FLUID COUPLING DEVICE**  
Norman Ellis, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England

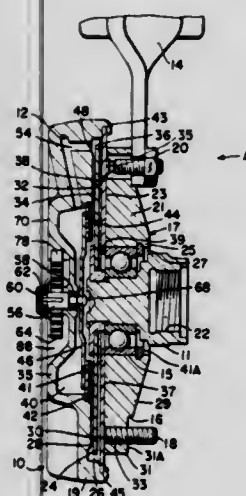
Filed Apr. 24, 1981, Ser. No. 257,079

Claims priority, application United Kingdom, May 3, 1980, 8014906

Int. Cl.<sup>3</sup> F16D 35/00, 43/25

U.S. Cl. 192—58 B

9 Claims



1. A viscous shear fluid coupling comprising:
  - a central shaft having a disk connected thereto;
  - an annular housing having a cover attached thereto and defining therebetween an annular working fluid chamber in which said disk is positioned, said housing comprising a spider member of ferrous material including a hub with a central bore through which said shaft extends and a plurality of integral radially extending arms, each having an arcuate shoulder at the same radial distance from the axis of said housing for mounting a component, said housing further comprising a circular plate of ferrous material abutting one face of the arms for forming a portion of said working fluid chamber, said circular plate having a central opening concentric with and of a diameter less than the bore diameter for forming an abutment; and
  - bearing means positioned in said bore against said abutment for journaling said housing relative to said central shaft.

4,421,217

**PROPULSION SYSTEM FOR A VEHICLE**

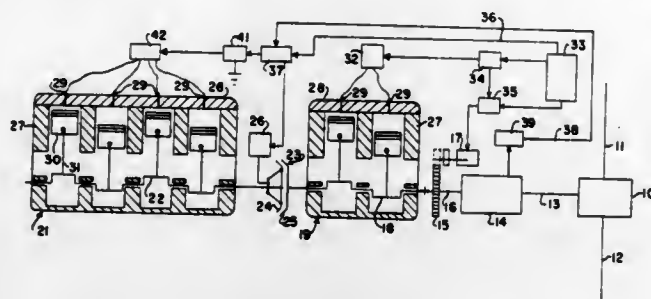
Ernest Vagias, 265 Prospect St., Baden, Pa. 15005

Filed Jan. 6, 1981, Ser. No. 223,022

Int. Cl.<sup>3</sup> B60K 41/02; F01B 21/02; F16D 25/08

U.S. Cl. 192—0.098

5 Claims



1. A propulsion system for a vehicle including the combination of first and second internal combustion engines each having an ignition system and a crankshaft, clutch means to drivingly connect and disconnect the respective crankshafts of said internal combustion engines, said clutch means including a first clutch member mounted onto the crankshaft of said first internal combustion engine and a second clutch member mounted onto the crankshaft of said second internal combustion engine to engage with said first clutch member, switch means to energize the ignition system of said second internal combustion engine when said clutch is engaged and during the time when at least the ignition system for said first internal combustion engine is operating, means including a transmission to deliver torque from said first internal combustion engine when said clutch means is disengaged or from said first and second internal combustion engines when the crankshafts thereof are connected together by said clutch means, means to support said second internal combustion engine for movement toward and away from said first internal combustion engine for engaging and disengaging said clutch means, actuator means to move said second internal combustion engine for engaging said first and second clutch members, and control means responsive to said switch means for energizing said actuator means to engage said first and second clutch members.

4,421,218

**RELIEF VALVE MEANS FOR ROTATABLE FLUID-PRESSURE MECHANISMS**

Robert E. Haight, Waterloo, Iowa, assignor to Deere &amp; Company, Moline, Ill.

Filed Feb. 2, 1981, Ser. No. 230,464

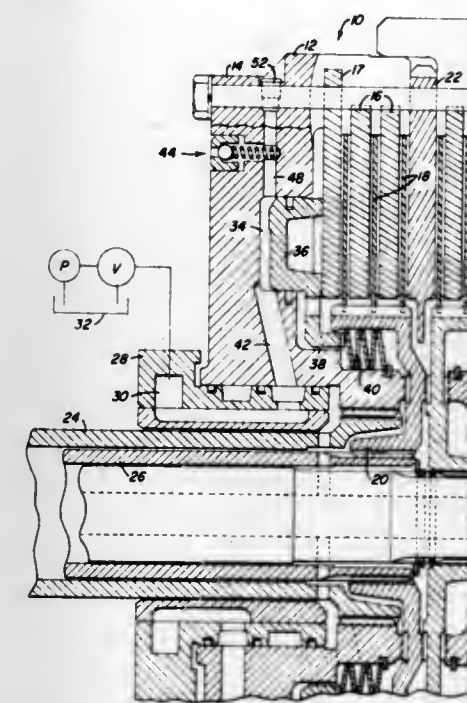
Int. Cl.<sup>3</sup> F16D 25/063

U.S. Cl. 192—106 F

3 Claims

1. Hydraulically-operated, power transmitting mechanism having a housing rotatable about an axis and including a first axially fixed radial wall and a second, axially shiftable radial wall defining between them a chamber whose volume varies in response to control means operative to selectively pressurize and depressurize the chamber, and pressure relief valve means of the centrifugally responsive type including a passage extending through one wall on an axis parallel to and spaced radially from the axis of rotation and leading from the chamber to a dump outlet exteriorly of the chamber, a seat in and coaxial with the passage and a ball closable on the seat via pressurizing of the chamber irrespective of speed of rotation of the housing and unseatable via centrifugal force upon depressurizing of the chamber so as to accelerate the exhaust of fluid from the chamber, characterized in that spring means acts on the ball in its seating direction to retain the ball seated upon depressurizing of the chamber by the control means during speeds of rotation of the housing below a predetermined value and to enable unseating of the ball during depressurizing of the cham-

ber via the control means during speeds of rotation above said value and the chamber is extended radially as a passage inter-



secting the relief passage and the spring means acts between the ball and the intersection of the passages.

4,421,219

**DUAL PRICE CAM SYSTEM FOR TOTALIZING VENDOR**

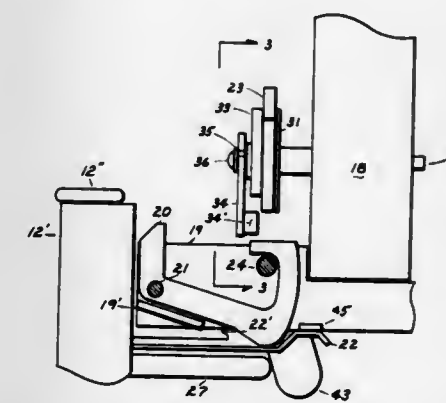
Donald K. Christian, 119 Woodbine Ter., Spartanburg, S.C. 29301

Filed Aug. 31, 1981, Ser. No. 298,204

Int. Cl.<sup>3</sup> G07F 5/20

U.S. Cl. 194—1 L

4 Claims



1. A multiple price system for actuating a vending machine comprising: a housing containing a totalizer with a shaft that incrementally rotates in response to the insertion of coins, a multilobal price cam mounted to rotate with said shaft, a product release means which when allowed to move in a path prevents the vending of products and when restricted from moving in said path allows the vending of products and a price selection device which cooperates with said intermediate link to pivot said link from a first position of non intervention to a second position of intervention along said path of the product release means, wherein said multilobal price cam, incrementally rotated by said totalizer, is so associated with said product release means that prior to a predetermined number of rotational increments said product release means remains unrestricted in said path by any lobe of said price cam and no product is made available or, subsequent to said predetermined number of rotational increments, said product release means is restricted in said path by a first lobe of said multilobal price cam making said product available and; wherein said intermediate link may be pivoted by said price selection device from said first posi-

tion of nonintervention to said second position of intervention along said path of said product release means between a second lobe of said cam and said product release means in such a manner that said product is made available with fewer rotational increments of said price cam than said predetermined number of rotational increments.

4,421,220

**TOKEN MECHANISM WITH MAGNETIC SEPARATION MEANS**

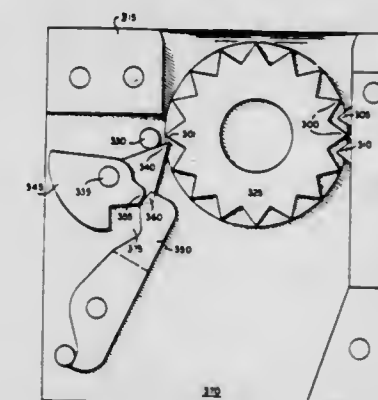
Myron I. Jaffe, Chestnut Hill, Mass., assignor to Sintered Metals, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 321,721, Nov. 16, 1981. This application Nov. 9, 1982, Ser. No. 439,822

Int. Cl.<sup>3</sup> G07D 7/00

U.S. Cl. 194—4 D

6 Claims



1. A token acceptance mechanism for use with a disk-shaped token having a first layer with a notched periphery, and at least one adjacent layer with a smooth periphery and a diameter at least as large as the notched portion of said first layer, comprising,
  - first movable means engageable with said notched periphery,
  - second movable means engageable with said smooth periphery, and
  - means responsive to movement of said first and second means to reject a counterfeit token having a notched portion of a greater diameter than an adjacent layer with a smooth periphery.

4,421,221

**REVOLVING TABLE FOR BOOK-BINDING STACKERS AND THE LIKE**

Giorgio Pessina, and Aldo Perobelli, both of Paderno Dugnano, Milano, Italy

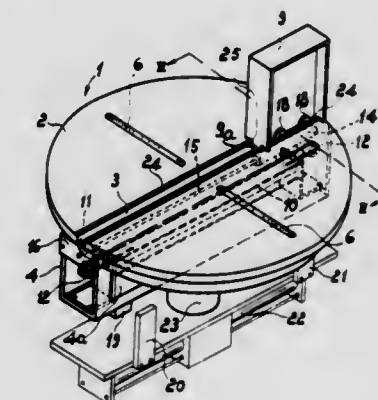
Filed Feb. 3, 1982, Ser. No. 345,416

Claims priority, application Italy, Feb. 6, 1981, 19561 A/81

Int. Cl.<sup>3</sup> B65H 31/30

U.S. Cl. 198—372

6 Claims



1. A revolving table for book-binding stackers and the like, comprising a table body, a movable stack positioner on said



table body, a pusher on said table body for ejecting stacks previously positioned by said stack positioner on said table body, means for moving said pusher and means for stepwise rotating said table body about an axis of said table body to eject said stacks according to selected directions, wherein said means for moving said pusher comprise a diametrical slot in said table body, a hollow beam fastened to said table body below thereof and extending across said axis of said table body parallel to said slot, a cylinder-piston unit arranged within said hollow beam and extending in the direction of said hollow beam, a drive means secured to said pusher and said piston within said hollow beam and operable by said piston, a means for guiding said pusher along said slot, and means arranged centrally of said table body below said cylinder-piston unit and said hollow beam for supplying compressed air to said cylinder-piston unit for reciprocating said drive means across said axis of said table body.

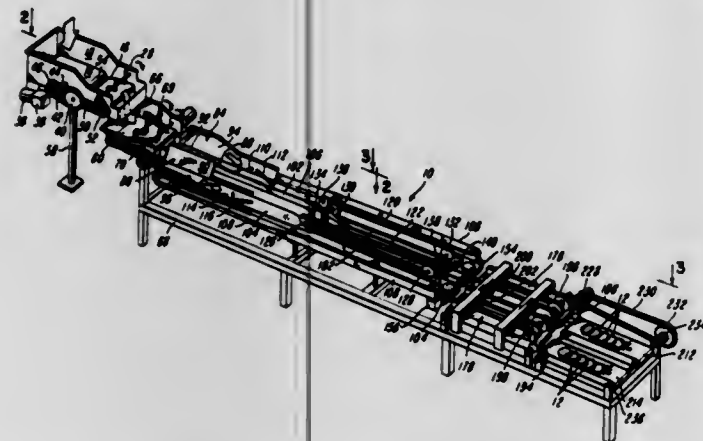
4,421,222

**APPARATUS FOR ARRANGING WORKPIECES IN A PREDICTABLE RELATIONSHIP AND GROUPING**  
Karl H. Stuermer, New Richmond, Ohio, assignor to Planet Products Inc., Cincinnati, Ohio

Filed Aug. 14, 1981, Ser. No. 292,741  
Int. Cl.<sup>3</sup> B65G 47/24

U.S. Cl. 198—382

17 Claims



1. An apparatus for arranging randomly oriented workpieces in a predictable pattern, comprising:

- a pair of downwardly converging surfaces, said converging surfaces being obliquely oriented to the horizontal;
- a first convoluted transport conveyor, said transport conveyor extending through said pair of converging surfaces, said first transport conveyor being in substantially the same plane as the first of said pair of obliquely oriented converging surfaces, said first transport conveyor extending downstream of said converging surfaces and changing planes at a downstream location to a substantially horizontal orientation;
- a second convoluted transport conveyor, said second conveyor extending through said pair of converging surfaces, said second transport conveyor being in substantially the same plane as the second of said pair of obliquely converging surfaces, said second transport conveyor extending downstream of said converging surfaces and changing planes at a downstream location to a substantially perpendicular relationship with respect to said first transport conveyor, said second transport conveyor having a substantially vertical orientation at the location said first transport conveyor has a substantially horizontal orientation;

at least one finger-like guide for flipping said workpieces resting on said second converging surface onto said first convoluted transport conveyor as said workpieces are advanced past said guide by said first and said second convoluted transport conveyors, said guide obliquely extends outwardly in the downstream direction of move-

ment of said first and said second convoluted transport conveyors from said second converging surface; and means for transporting and discharging a plurality of said workpieces into said pair of converging surfaces, said means for transferring and discharging being located upstream of said converging surfaces.

4,421,223

**CONVEYOR SYSTEMS FOR CIGARETTES AND OTHER ROD-LIKE ARTICLES**

Desmond W. Molins; Dennis Hinchcliffe, and Peter A. Clarke, all of London, England, assignors to Molins Limited, London, England

Division of Ser. No. 408,256, Oct. 23, 1973, Pat. No. 4,120,391.

This application May 2, 1978, Ser. No. 902,054

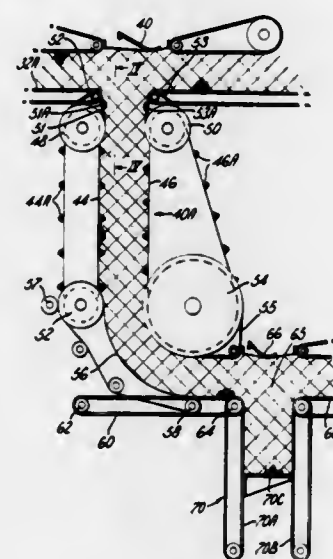
Claims priority, application United Kingdom, Oct. 27, 1972, 49787/72

The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.

Int. Cl.<sup>3</sup> B65G 15/14

U.S. Cl. 198—604

5 Claims



1. A vertical feed for conveying a continuous stack of cigarettes upwards or downwards, comprising a first substantially horizontal conveyor, a pair of spaced parallel conveyors extending upwards from the horizontal conveyor and having their center lines in a vertical plane containing the center line of the horizontal conveyor, a rotatable member around which the stack of cigarettes are conveyed in passing between the first conveyor and the pair of conveyors, a band extending from positions adjacent to but laterally offset from the first conveyor and one of the pair of conveyors, and defining the outer periphery of a curved passage extending part of the way around the rotatable member for the conveyance of the cigarettes between the first conveyor and the pair of conveyors, and means for driving said band at a speed greater than the peripheral speed of said rotatable member.

4,421,224

**DRIVEN ROLLER FOR ACCUMULATOR CONVEYOR**

Robert D. Dingman, 28118 Wildwood Trail, Farmington Hills, Mich. 48018

Filed Nov. 30, 1981, Ser. No. 325,748

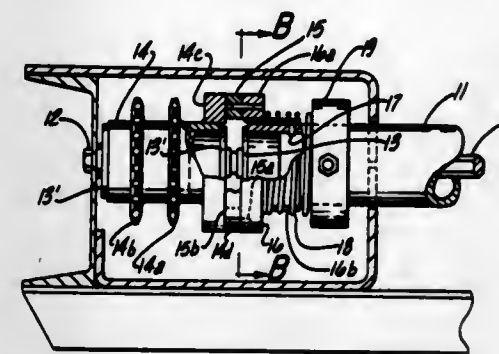
Int. Cl.<sup>3</sup> B65G 13/06

U.S. Cl. 198—781

1 Claim

1. For use in an accumulation type of conveyor with one or more live rollers, a live roller drive mechanism comprising: a driving roller and a driven roller mounted for rotation on a fixed shaft, a driving member mounted on said driving roller and having an axially disposed annular surface, a drive sleeve disposed loosely over the end of the driven roller to permit a limited degree of angular misalignment relative to said driven roller, means coupling said drive sleeve to said driven roller for

imparting rotative motion thereto and for permitting angular and axial motion of the drive sleeve relative to the driven roller, an annular torque transmitting member carried by said drive sleeve having an axially disposed annular surface posi-



tioned in face-to-face opposition with the annular surface on said driving member, and a spring retained on said driven roller and urging the torque transmitting member into face-to-face engagement with said driving member.

4,421,225

**MATERIAL HANDLING APPARATUS**

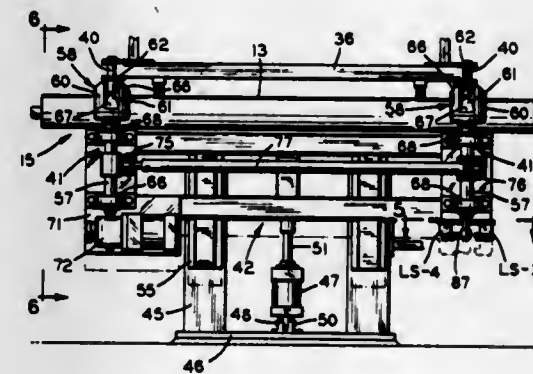
Thomas Hetman, Jr., Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Sep. 8, 1981, Ser. No. 299,933

Int. Cl.<sup>3</sup> B65G 21/20

U.S. Cl. 198—345

5 Claims



1. An apparatus for locating an article on a conveyor roll system comprising: a frame, a conveyor comprised of a series of spaced, rotatable conveyor rolls mounted on said frame for supporting and advancing an article in a substantially horizontal path of movement, means for interrupting movement of said article at a predetermined location on said conveyor, said means including at least two locating heads spaced apart across said path above said conveyor rolls and provided with slots for receiving spaced apart projections extending downwardly from said article for arresting movement of said article on said conveyor rolls, means for rotating said locating heads after receiving said article projections to lock said article in said arrested position on said conveyor rolls, and means for retracting said locating heads below said conveyor rolls to permit continued movement of said article on said conveyor along said path.

4,421,226

**ARTICLE RECEIVING AND DECELERATING DEVICE**  
Otto Zauner, Vineland, N.J., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 30, 1981, Ser. No. 248,669

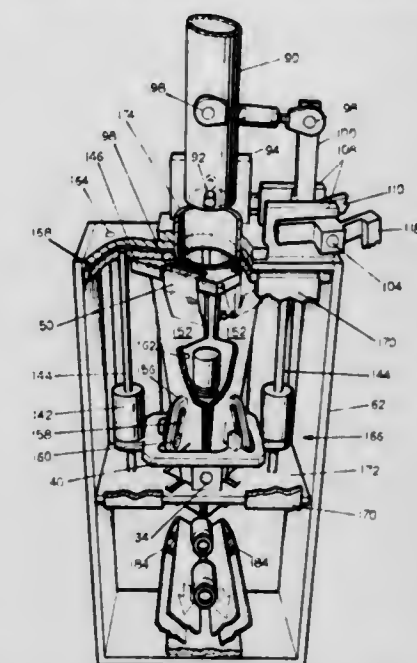
Int. Cl.<sup>3</sup> B05G 47/44

U.S. Cl. 198—534

25 Claims

1. A device for receiving and decelerating articles discharged from moving sites on a machine, comprising, in combination, means for receiving such articles from such moving

sites including a receiving tube having a first end and a second end, said first end including means for pivotally supporting said receiving tube, a plurality of moveable wall segments defining an article receiving chamber, the first end of the receiving tube being located below the moving sites and the second end being located above and adjacent to the chamber, collar means disposed about said wall segments and located near the lower half of wall segments, the collar means being so



4,421,227

**TILTING SHELF, VERTICAL CONVEYOR**

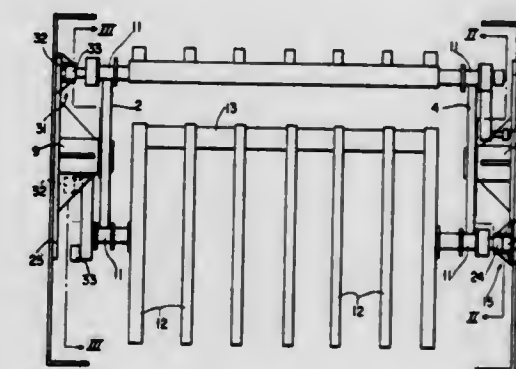
Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed Jun. 16, 1981, Ser. No. 274,471

Int. Cl.<sup>3</sup> B65G 17/18

U.S. Cl. 198—800

5 Claims



1. A tilting shelf, vertical conveyor, comprising: a frame having an upper end, a lower end, a front transfer area, and a rear return area opposed to said front area; two sprockets mounted for rotation about a horizontal axis on said frame at said upper end; two sprockets mounted for rotation about a horizontal axis on said frame at said lower end; two endless chains drivingly engaging and operatively mounted about said respective upper and lower pairs of sprockets for rotation therewith in respective generally vertical parallel planes;



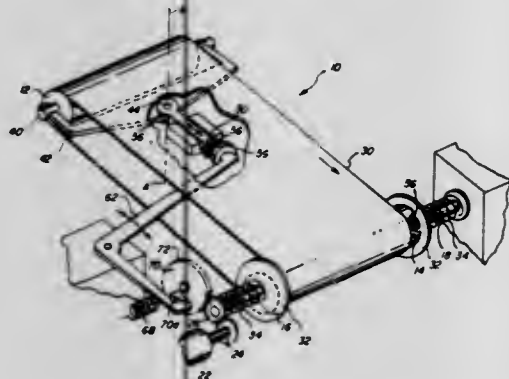
a plurality of shelves pivotally mounted for rotation about respective horizontal axes on said chains to define axially opposed shelf ends and for travel with said chains; said chains and shelves together moving in a generally vertical conveying path between said sprockets in said front area, and further moving in a generally vertical return path between said sprockets in said rear area; a first pair of rollers mounted on one axial end of each shelf respectively for rotation about parallel spaced apart horizontal axes; a second pair of rollers mounted on the other axial end of each shelf respectively for rotation about parallel spaced apart horizontal axes; for each shelf, a line connecting the axes of said first pair of rollers being generally perpendicular to the line connecting the axes of said second pair of rollers; only a single first cam track having opposite terminal ends, being mounted on said frame adjacent said one axial end of said shelves, said first track generally following the path of said chains for only approximately one-half of the chains travel; only a single second cam track having opposite terminal ends, being mounted on said frame adjacent said other axial end of said shelves, said second track generally following the path of said chains for only approximately one-half of the chains travel; said first cam track being located within the front area of said frame, and said second cam track being located within the rear area of said frame; and said first pair of rollers for each shelf engaging in said first cam track throughout the entire conveying path, and the second pair of rollers for each shelf engaging in said second cam track throughout the entire return path, so that said shelves are held in a horizontal position throughout said conveying path and in a vertical position throughout said return path.

4,421,228

**PERIODICALLY ALIGNING AN ENDLESS WEB**  
Carl M. Marsiglio, Spencerport, and John P. Swapeinski, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,577  
Int. Cl.<sup>3</sup> B65G 23/44

U.S. Cl. 198—814



1. Web-tracking apparatus, comprising:  
at least two web-engaging members for supporting an endless web and defining a path along which such web is movable, means for mounting one of said members to impart tension to the web; means cooperating with said tension imparting means for periodically reducing such tension; and means cooperating with said tension reducing means for laterally adjusting the position of the web relative to said members during intervals when web tension is reduced.

4,421,229

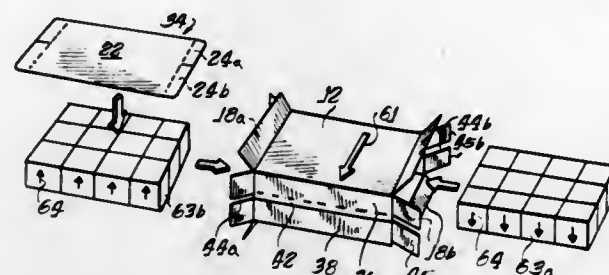
**DOUBLE TRAY CASE**

Peter N. Y. Pan, Minnetonka, and Gregory M. Fulkerson, Maple Plain, both of Minn., assignors to Paxall, Inc., Chicago, Ill.

Filed Jun. 29, 1981, Ser. No. 278,213  
Int. Cl.<sup>3</sup> B65D 5/50, 5/54

U.S. Cl. 206—44 R

14 Claims



1. A double-tray package comprising:  
a top horizontal panel, a bottom horizontal panel and a pair of sidewalls each connected to said top and said bottom panels, one sidewall being horizontally separable and the other sidewall having a horizontal line of weakness extending the length thereof,  
vertical upper end cover means and vertical lower end cover means at each end of said package defining an open horizontal slit entirely across each end of said package, and  
a central partition means having a transverse dimension substantially equal to the transverse dimension of said horizontal panels in order to fit between sidewalls and having glue flaps at each end thereof that extend through said horizontal slits and being folded vertically upward and secured to said upper end cover means and glue flaps at each end that extend through said horizontal slits being folded vertically downward and secured to said lower end cover means, said package having a first tier of product on one side of said central partition means and a second tier of product on the other side of said central partition means, whereby said package may be opened into a pair of joined trays by breaking said separable sidewall and detaching said lower end cover means from said glue flaps secured thereto.

4,421,230

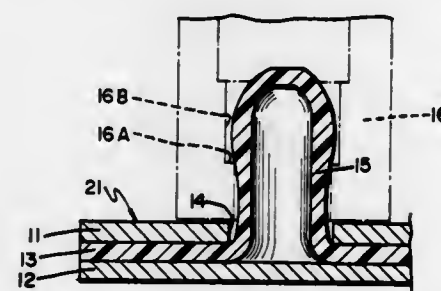
**PACKAGE FOR ARTICLES OF MANUFACTURE**

Allyn K. Stanton, Chicago, Ill., assignor to Easco Corporation, Baltimore, Md.

Filed Jun. 22, 1982, Ser. No. 390,969  
Int. Cl.<sup>3</sup> B65D 85/20, 73/00

U.S. Cl. 206—378

7 Claims



1. A multiple package for distribution and merchandising of wrench sockets, tool accessories, and the like, comprising a bonded laminated planar structure having a substantially rectangular plan outline and including a top layer, a bottom layer, and an intermediate layer, one of the top or bottom layers having a plurality of openings formed therein, the openings being spaced apart from one another and being arranged in respective columns and rows, the intermediate layer being formed from a plastic material and having a plurality of projec-

tions formed integrally therewith, the projections extending through the respective openings in the one layer, whereby the wrench sockets, tool accessories, and the like may be carried by the respective projections and retained by a slight interference fit, and the top and bottom layers being scored both longitudinally and transversely, intermediately of the projections and to a sufficient depth which extends partially into the intermediate plastic layer from at least one side thereof, whereby, as desired, an individual package may be cleanly broken off the multiple package by a "snap action".

4,421,232

**BOTTLE PACKAGING BOX**

Yukio Konaka, Kanazawa, Japan, assignor to Shibuya Machine Company Ltd., Kanazawa, Japan

Filed Jan. 20, 1982, Ser. No. 341,029

Claims priority, application Japan, Aug. 5, 1981, 56-116401[U]

Int. Cl.<sup>3</sup> B65D 75/08, 75/04, 71/00, 5/02  
U.S. Cl. 206—434

5 Claims

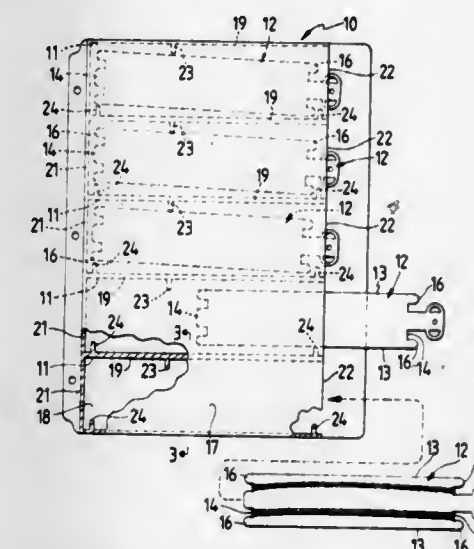


4,421,231  
**DISPLAY AND STORAGE PACKAGE FOR AN ELONGATED FLAT ARTICLE**  
Ellen D. McCarn, Birmingham, Ala., assignor to McCarn Enterprises, Inc., Birmingham, Ala.

Filed Sep. 23, 1982, Ser. No. 421,881  
Int. Cl.<sup>3</sup> B65D 85/00; B65H 54/46, 55/00

U.S. Cl. 206—388

4 Claims



1. In a display and storage package for an elongated flat article having spaced apart longitudinally extending side edges extending generally parallel to each other and formed integrally with end edges with the point of juncture between adjacent side edges and end edges being rounded,

- (a) at least one elongated, generally rectangular pocket-like member defined by superimposed flexible sheets of a width greater than the width of said elongated flat article and joined to each other along spaced apart longitudinal side edges and along one end edge with the other end of said pocket-like member being open for receiving said elongated flat article,
- (b) an intermediate projection extending inwardly of said pocket-like member from one longitudinal side thereof at a location nearer said one end of said pocket-like member than said other end thereof, and
- (c) longitudinally spaced end projections extending inwardly from the other longitudinal side of said pocket-like member at opposite sides of said intermediate projection and spaced from each other a distance substantially equal to the distance between the points of juncture of said side edges with said end edges of said elongated flat article.

4,421,233

**ANTI-STATIC TRAY FOR SEMI-CONDUCTOR DEVICES AND COMPONENTS**

Thomas R. Burnett, Ontario, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 16, 1982, Ser. No. 408,210

Int. Cl.<sup>3</sup> B65D 21/02, 85/30, 81/02, 85/62

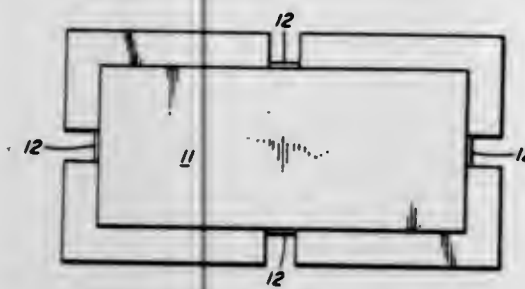
U.S. Cl. 206—503

1 Claim

1. A stackable anti-static tray for leaded semi-conductor devices and components, comprising:  
a rigid rectangular planar metal support member;  
a layer of electrically conducting foam material bonded to an upper surface of said support member, for reception of leads of leaded devices and components;  
a peripherally extending clear margin extending along the edges of the support member;  
at least one downwardly extending leg on each side of said support member, said legs comprising sections severed from said clear margin and bent down out of the plane of



the support member, the legs having a length to provide a clearance between trays for the positioning of devices and



components on said foam material, and positioned to rest on said clear margin of a next lower tray.

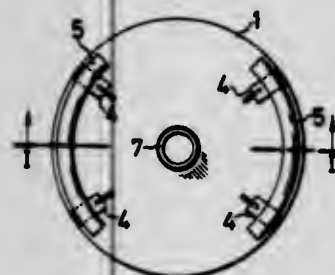
#### 4,421,234 CYLINDRICAL VESSEL WITH A BASE RING AND WITH A COUPLING DEVICE

Robert Gärtner, Langen; Klaus-Dieter Maass, Eppstein, and Georg Senninger, Hattersheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 409,945  
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133316

Int. Cl.<sup>3</sup> B65D 21/02  
U.S. Cl. 206—509

6 Claims



1. In a cylindrical vessel having a base and a head opposite the base, a base ring extending below its base, and a pair of oppositely-disposed support members extending upward from its head; the improvement wherein, to adapt the vessel to be lockably ganged to another like vessel, a bayonet fitting is provided including a pair of guide segments extending circumferentially on an inner side of the base ring and defining circumferential gaps between the guide segments, and a respective pair of ring segments extending radially outward from the respective support members to engage a like cylindrical vessel thereabove between its base and its guide segments.

#### 4,421,235 OXYGEN ABSORBENT-CONTAINING BAG AND CONTAINER SEALING MEMBER HAVING THE SAME

Takehiko Moriya, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Co. Inc., Tokyo, Japan  
Continuation of Ser. No. 119,876, Feb. 8, 1980, abandoned. This application Oct. 21, 1981, Ser. No. 315,660  
Claims priority, application Japan, Feb. 8, 1979, 54-15076; May 7, 1980, 55-60323

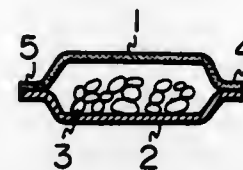
The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B65D 85/84; A61B 17/06  
U.S. Cl. 206—524.2

4 Claims

1. A bag in which an oxygen absorbent is sealed, character-

ized in that at least part of the material constituting the bag is composed of a film having a plurality of fine openings in the



range of 0.01 to 45 microns, and being gas-permeable, but water-impermeable at one atmospheric pressure.

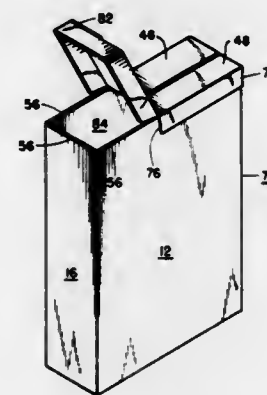
#### 4,421,236 LINERLESS CARTON INCLUDING EASILY OPENABLE POURING SPOUT

Robert E. Lowe, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,760  
Int. Cl.<sup>3</sup> B65D 5/66, 5/10

U.S. Cl. 206—621

13 Claims



1. A carton providing for a recloseable pouring spout for a generally free-flowing bulk commodity or granular, powdered or flaked materials, said carton comprising side and end wall panels; extensions at one end of each of said panels forming bottom closing flaps for said carton, said flaps being inwardly foldable to constitute a carton bottom closure; and extensions at the other end of each of said panels forming top closing flaps for said cartons, said top flaps being inwardly foldable to form a carton top closure, said top closing flaps including outer and inner side flaps and end flaps adapted to underlie said side flaps, a plurality of fold lines being formed on each of said top closing flaps, said fold lines extending in predetermined parallel spaced relationship with the upper ends of said panels, said top closing flaps being foldable outwardly of said carton along said parallel spaced fold lines so as to form a depending flange extending about the upper peripheral edge portions of said panels and in surface contact with the outer surfaces of said panels, a tear line extending between the juncture of the upper edge of said panels and one said end flap and adjoining portions of each adjacent side flap, die cuts extending upwardly through said depending flanges at the ends of said tear line, and a fold line extending across the top closure between the other ends of said die cuts whereby upward pressure exerted on said last-mentioned end flap causes said tear line to sever and facilitate pivotal upward movement of the portion of the top closure encompassed by the tear line about said fold line so as to form said pouring spout, said pouring spout being recloseable responsive to downward pressure being exerted on said raised portion of the top closure and causing sealing engagement between the flange and the outer surfaces of said panels.

#### 4,421,237 ELECTRO-MECHANICAL RETRIEVAL DEVICE FOR RANDOMLY FILED MATERIALS

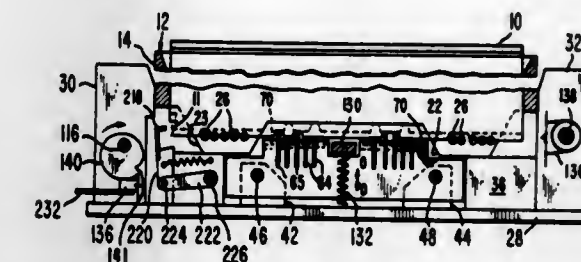
Laurence A. Cross, Jr., Groveville, N.J., assignor to Randomatic Data Systems, Inc., Trenton, N.J.

Filed Aug. 10, 1981, Ser. No. 291,593

Int. Cl.<sup>3</sup> B07C 5/36

U.S. Cl. 209—612

17 Claims



1. A device for retrieving randomly filed cards or the like, comprising:

- (a) a support structure;
- (b) a capsule removably insertable therein and adapted to receive a quantity of randomly filed cards having code notches in one edge thereof;
- (c) a selector slide support block movably mounted in said structure and underlying the capsule;
- (d) a plurality of selector slides mounted on said block for movement between retracted, reset positions and advanced, set positions;
- (e) means for advancing selected ones of the slides, matching the code notches of a wanted card, to their set positions;
- (f) means for vibrating the block;
- (g) means for ejecting a selected card; and
- (h) means for returning to their reset positions those slides which have been advanced to set positions.

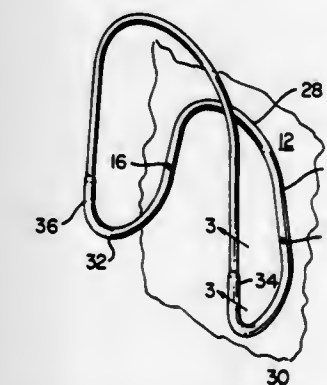
#### 4,421,238 SADDLE RACK

Suzanne Patton, 8055 Buckingham Rd., Cincinnati, Ohio 45243  
Filed Jun. 26, 1981, Ser. No. 277,987

Int. Cl.<sup>3</sup> A47F 5/08

U.S. Cl. 211—87

10 Claims



1. A saddle rack for storing a saddle in a limited space, said rack comprising:

- a U-shaped base member, said member having a first centrally disposed portion forming a first plane, said first centrally disposed portion having means for securely mounting said U-shaped base member to a planar surface, said centrally disposed first portion having two U-shaped hook like portions extending outwardly and away from said plane of said first centrally disposed portion, said two U-shaped hook like portions forming planes perpendicular to said plane of said first centrally disposed first portion, said two U-shaped hook like portions having end portions extending from each in a direction substantially parallel to

said plane of said first centrally disposed portion of said base member and spaced therefrom; and  
a U-shaped retainer member, said member being releasably but securably connected to said end portion of said U-shaped hook portion of said base member, said retainer member forming a plane substantially parallel to said plane of said centrally disposed portion of said base member when releasably but securably connected to said U-shaped hook like portions of said base member, the closed portion of said U-shaped retainer member extending beyond the closed portion of said U-shaped centrally disposed portion of said base member, said U-shaped retainer member being substantially parallel to said U-shaped centrally disposed portion of said base member and spaced therefrom.

#### 4,421,239 KEY FOR USE WITH KNOCK-DOWN SHELVING UNITS

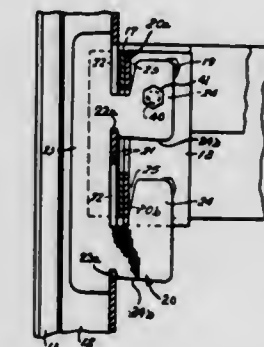
William R. Vargo, Lithonia, Ga., assignor to Husky Systems of Georgia, Inc., Lithonia, Ga.

Continuation-in-part of Ser. No. 67,567, Aug. 17, 1979, abandoned. This application Dec. 18, 1981, Ser. No. 332,147

Int. Cl.<sup>3</sup> A47F 5/00

U.S. Cl. 211—187

6 Claims



1. In a key for use with a knock-down shelving unit which unit is comprised of: a hollow vertical post of sheet metal material of generally rectangular cross-section and having at least a pair of vertically spaced, vertically extending slots along its length and horizontal beams having end plates with similarly spaced and extending slots to be assembled with the post; said key including an elongated shank having an edge of a length greater than the length of one of said slots and adapted to abut against a wall of said post, said key additionally having an upwardly opening hook portion extending from said edge and adapted to project through one of said slots and coact with, on the outside of said post, slots of said beams, said key being preassembled with said post before said horizontal beams are assembled therewith, the improvement which comprises: said hook portion having a lower side with a downwardly opening notch adjacent said edge, said notch having a base with a width slightly less than the thickness of said sheet material and a side slightly diverging from said edge, whereby said key can be easily secured to said post by the walls of said notch while said post is in a disassembled horizontal position.

#### 4,421,240 GOLF CLUB DISPLAY RACK

John F. Connolly, Schaumburg, Ill., assignor to Wittek Golf Range Supply Co., Ill.

Filed Aug. 3, 1981, Ser. No. 289,370

Int. Cl.<sup>3</sup> A47F 7/00

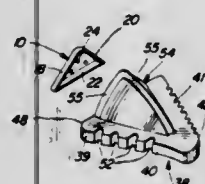
U.S. Cl. 211—60 G

1 Claim

1. A display rack for a set of golf clubs comprising:  
(a) a pair of substantially V-shaped mounting means, each of said means including a rear flat wall and inwardly-extending side and bottom walls, and an offset on said rear wall adjacent said side walls, one of said mounting means being larger than the other in area,



- (b) a substantially horizontally-extending, V-shaped supporting structure having a top wall and side flanges, a bulbous portion extending inwardly from said top wall and medially of said side flanges, of substantially inverted V-shape having a substantially inverted V-shaped rear flange extending inwardly, said bulbous portion tapering on a radius from the rear flange forwardly and sidewardly in both directions to said top wall, a series of spaced, inwardly-extending depressions in said top wall adjacent one side of said bulbous portion to seat the grips of wooden golf clubs, a series of spaced, inwardly-extending depressions on the other side wall adjacent said bulbous portion in said top wall to receive the ends of the shank adjacent iron golf club heads to support the iron club heads above said depressions,
- (c) a second substantially horizontally-extending, V-shaped supporting member larger than said first mentioned mem-



ber having top walls with depending side walls, a bulbous portion extending upwardly from said top walls medially of said side walls, the rear end of said bulbous portion being substantially flat and of substantially inverted V-shaped and having downwardly and inwardly-extending flanges, said bulbous portion tapering radially on a radius from said rear flanges forwardly and sidewardly in both directions to said top walls, one of said top walls having a series of spaced, cylindrical depressions in said top wall to support the sole of wooden golf clubs, a radially-disposed depression in the other of said top walls to support the ends of the grips of iron golf clubs,

whereby, when said mounting means are anchored to a vertical surface in vertical spaced relationship, the substantially inverted V-shaped flanges on the rear of said bulbous portions of said supporting means will each be removably secured one in each of the offset portions in said mounting means to display golf clubs.

4,421,241

## REMOVABLE LIVE MAST AND HOIST UNIT

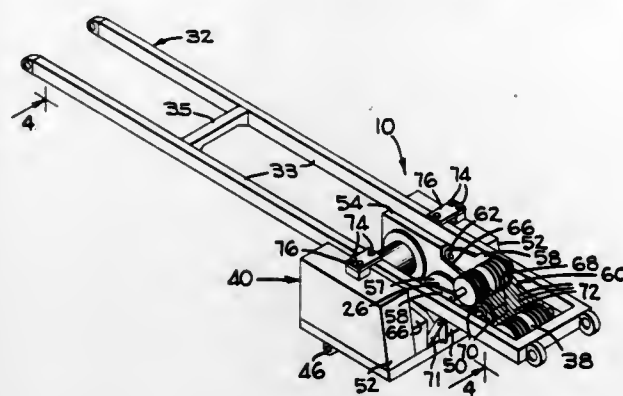
Leroy L. Wittman, Marion, and Lyle B. Jensen, Cedar Rapids, both of Iowa, assignors to FMC Corporation, Chicago, Ill.  
Filed Apr. 24, 1981, Ser. No. 257,067  
Int. Cl.<sup>3</sup> B66C 23/26, 1/12

U.S. Cl. 212-186

4 Claims

1. A removable live mast and boom hoist unit for a crane of the type wherein pivotal movement of the mast causes similar pivotal movement of the crane boom, comprising: a generally U-shaped live mast having a closed end and an open end releasably connected to the crane and to the boom; a bridle journaled on the mast; a boom hoist and counterweight frame releasably connected to the crane and having a cavity therein; a power drive boom winch secured to the frame in the cavity and including a rotatable drum; a bail assembly pivoted to said frame for pivotal movement about a transverse axis and having a bail journaled for rotation thereon and adapted to swing about said axis along an arc of constant radius; reeving trained around said drum, bail, and bridle and disposed between said mast and frame when in an operative boom supporting posi-

tion; said winch being effective to maintain tension on said bail and pivot a portion of said mast into engagement with said frame with said closed end extending beyond said frame when said mast and boom are disconnected; and means for rigidly



securing said mast to said frame with said winch, bail assembly, drum and reeving encircled by said frame and said closed end of said mast; said mast and frame along with the components supported thereon being removable as a unitary structure from the crane when released therefrom.

4,421,242

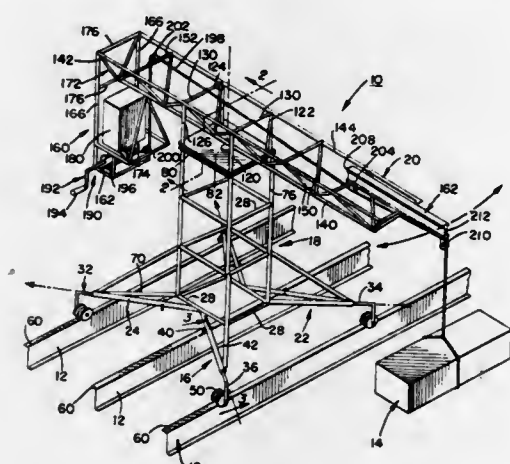
## PANEL LOCATOR

Ralph H. Brueske, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Continuation-in-part of Ser. No. 131,871, Mar. 19, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,874  
Int. Cl.<sup>3</sup> E04D 15/00; B61D 1/00; B66C 23/02

U.S. Cl. 212-218

16 Claims



1. A knockdown panel locator comprising:

- a base section which includes wheels rollably mounted on said base for rolling on roof purlins in a first direction and mounting legs mounting said wheels on said base;
- transfer tracks extending in a second direction, means for attaching said transfer tracks to said purlins, direction change means for changing the direction of said wheels from said first direction to said second direction to permit movement of said panel locator along said transfer tracks;
- a tower section mounted on said base and extending upwardly therefrom;
- a boom section rotatably mounted on said tower section to be elevated above a roof, said boom section including an elongated body having a cage at one end thereof and a panel bundle supporting means on another end thereof;
- leveling means for maintaining the panel locator level on a sloping roof; and
- lifting means on said boom section for lifting panel bundles off a roof.

4,421,243

## CONTAINER, PARTICULARLY FOR MATERIALS IN PARTICLES

Jean-Pierre Taquoy, Soissons, France, assignor to B S L (Bignier Schmid-Laurent), Ivry s. Seine, France

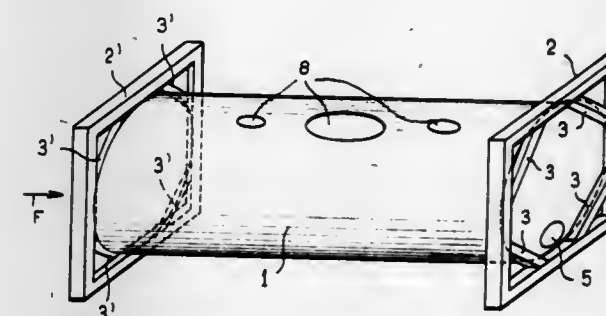
Continuation of Ser. No. 153,139, May 27, 1980, abandoned.

This application May 4, 1982, Ser. No. 374,914

Claims priority, application France, May 29, 1979, 79 13603  
Int. Cl.<sup>3</sup> B65D 88/06, 88/12, 90/12

U.S. Cl. 220-1.5

1 Claim



1. A self-supporting container unit comprising a cylindrical metallic vessel extending between two spaced apart metallic frames, each of said frames having four sides in rectangular configuration, adjacent sides of the frames being connected by ribs with each of the ribs at respective ends thereof being secured to two corresponding said adjacent sides, said vessel being supported by said frames and ribs and being welded to said frames and ribs at the respective end edges of the vessel, said vessel being defined by a cylindrical side wall and end walls welded to the interior side wall and spaced from said end edges, characterized in that the end edges of the side wall are in direct longitudinal abutment against said frames and ribs.

4,421,244

## PLASTIC LID FOR CONTAINERS

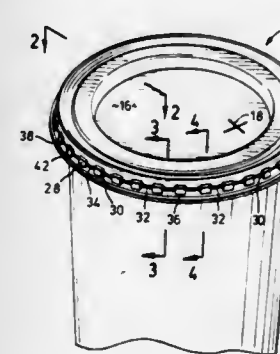
Hubert Van Melle, Etobicoke, Canada, assignor to Amhil Enterprises Ltd., Mississauga, Canada

Filed Sep. 8, 1981, Ser. No. 300,371

Int. Cl.<sup>3</sup> B65D 41/18, 43/03, 43/10

U.S. Cl. 220-306

8 Claims



1. A lid for containers, made of thin, flexible plastic, for mounting on and receiving the bead of a container, comprising: a central panel; a cavity extending around the periphery of the lid and opening downwardly and inwardly to receive the bead of a container to which said lid is fitted; means connecting said cavity to said central panel; a skirt portion extending downwardly from said cavity; said skirt portion having a plurality of outwardly extending projections, each having a substantially vertical face with substantially vertical side edges, and substantially vertical side walls extending inwardly from said face; the portions of said skirt that are between said outwardly extending projections extending inwardly to a waist portion having a plurality of interruptions, one at each projec-

tion, and forming an undercut defining said cavity in said waist portion; said outwardly extending projections and said waist portion all terminating in their lower extremities at a downwardly and outwardly sloped lower band portion; and said outwardly extending projections terminating in their upper extremities at a respective upper, band portion extending inwardly and upwardly from the upper edge of each said respective vertical face and terminating at said cavity in an upper undercut which is higher and less inwardly extending than the undercut of said waist portion, and which defines the peripheral cavity over said outwardly extending projections.

4,421,245

## CLOSURE ASSEMBLY

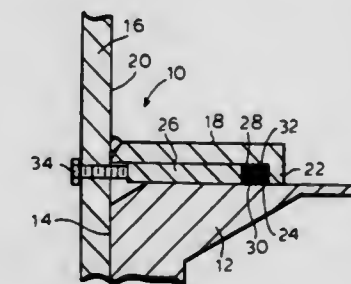
Steven R. Massey, Olathe, Kans., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Feb. 4, 1983, Ser. No. 463,775

Int. Cl.<sup>3</sup> B65D 45/00

U.S. Cl. 220-328

7 Claims



1. A closure assembly comprising: a cover member having an outer surface and an inner surface; a substantially cylindrical retaining member projecting from said inner surface of said cover member; a circumferential flange extending radially with respect to said retaining member; a substantially cylindrical crush ring positioned adjacent to and coaxial with said retaining member, said crush ring being slidable with respect to said retaining member and having an end in opposing relation to said circumferential flange; a sealing ring positioned between said end of said crush ring and said circumferential flange; and tightening means extending through said cover member and capable of moving said crush ring towards said circumferential flange thereby compressing said sealing ring.

4,421,246

## BIOLOGICAL TISSUE CASSETTE

Ronald W. Schultz, and Donald R. Graham, both of Pittsburgh, Pa., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 21, 1982, Ser. No. 390,301

Int. Cl.<sup>3</sup> B65D 39/00, 41/13

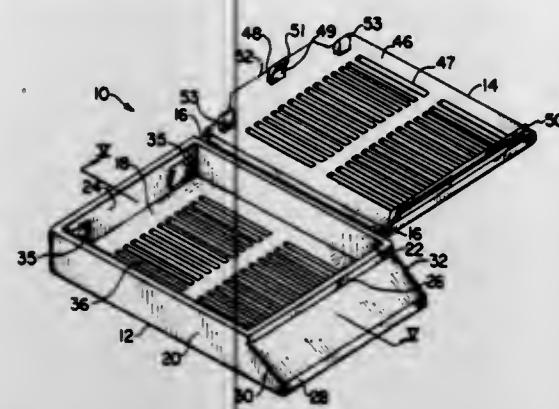
U.S. Cl. 220-307

21 Claims

1. A tissue cassette comprising: (a) an open-topped, perforated base member adapted to receive a tissue specimen,



- (b) a perforated lid member adapted to cover the base member and be secured thereto in a closed position, and



- (c) one or more gates joining the lid member to the base member in an open position wherein said gates will break when flexed.

4,421,247

### TWO-PIECE QUAD-SEAL CLOSURE WITH PLUG SHOCK ABSORBING END PANEL

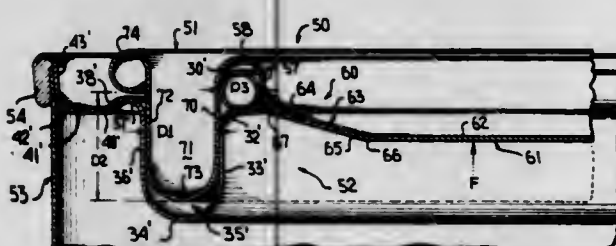
Paul Lombardo, Dolton; Leon Patarini, Palos Hills, and James Imlah, Elmhurst, all of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed May 3, 1982, Ser. No. 374,464

Int. Cl.<sup>3</sup> B65D 43/06

U.S. Cl. 220—354

21 Claims



1. A two-piece shock absorbing closure for use with a container comprising a ring and a plug, said plug including a central generally circular unreinforced concavely axially outwardly opening end panel, an annular axially projecting plug portion bounding said end panel, said ring including an axially opening annular channel adapted to receive said plug portion, said annular channel being defined by inner and outer channel walls and a bight wall therebetween, means radially outboard of said outer channel wall responsive to insertion of said plug portion into said annular channel for radially inwardly deflecting said outer channel wall to bring the same into intimate friction engagement with said plug portion, and wall means between said end panel and said plug portion for effecting the deflection of said end panel from its concave configuration to a convex configuration in response to shock forces imparted to said closure and/or its associated container thereby absorbing such shock forces to prevent plug popping.

4,421,248

### SECURITY APPARATUS AND METHOD FOR A SELF-SERVICE FUEL PUMPING STATION

John R. Porcina, 11799 Lyon Rd., Delta, British Columbia, Canada

Filed Jan. 15, 1981, Ser. No. 273,671

Int. Cl.<sup>3</sup> B67D 5/30

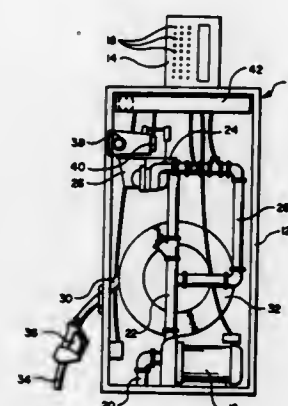
U.S. Cl. 222—25

13 Claims

1. An apparatus adapted to deliver fluid, such as liquid fuel, at a self-service station where there is a record made of fluid delivered, said apparatus comprising:

- (a) a pump to pump fluid from a fluid source;  
(b) a nozzle means to receive fluid from said pump;

- (c) selectively operable switch means to cause said pump to operate;  
(d) counting means responsive to fluid flow and operable to record the same;  
(e) flow detecting means to detect fluid flow to said nozzle;  
(f) shut off control means operatively connected to said flow detecting means and to said counting means to detect a condition where said flow detecting means detects flow to



- said nozzle and said counting means is not operating to record flow, and to shut off fluid flow to said nozzle upon occurrence of said condition, said shut off control means comprising timing means to initiate a timing cycle and to detect a time interval extending from a beginning of fluid flow to operation of said counting means, with said shut off means shutting off fluid flow where said time interval exceeds said timing cycle.

4,421,249

### APPARATUS FOR DISPENSING FLUIDS

Audley B. Williamson; Stewart Banks, and Francis J. Rice, all of Derby, England, assignors to Appor Limited, Derby, England

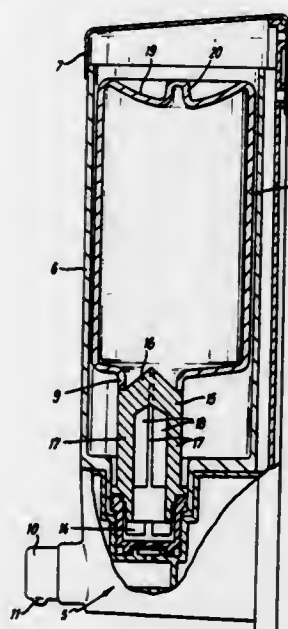
Filed Mar. 31, 1981, Ser. No. 249,325

Claims priority, application United Kingdom, Apr. 2, 1980, 8011066

Int. Cl.<sup>3</sup> B67B 7/28

U.S. Cl. 222—88

6 Claims



1. A dispenser comprising a hollow body defining an internal cavity in which a container of product to be dispensed can be removably located, a dispensing mechanism disposed below the hollow body, and means within the body for puncturing a container of product inserted therein so as to form an outlet for discharge of product from the container via the puncturing means to the dispensing mechanism, wherein the puncturing means also defines the path for passage of product between the

puncturing means and the lower portion of said cavity to form a reservoir of product of predetermined capacity in the latter, said means for puncturing the container comprising an upwardly directed projection having a point for piercing the container, the projection being hollow and openings being provided to define said path which permits product released from the container following puncturing to pass into the lower portion of the cavity, and the container being supported within the cavity by the projection, a lower portion of the hollow body being formed so as to enable viewing of said product forming said reservoir in said lower portion of said cavity from externally of the dispenser, said path enabling product to be supplied to said dispensing mechanism from said reservoir when said container is empty of product, the capacity of the reservoir enabling removal and replacement of the container before the product is exhausted from the dispenser.

4,421,250

### BIN FOR FREE FLOWING MATERIAL

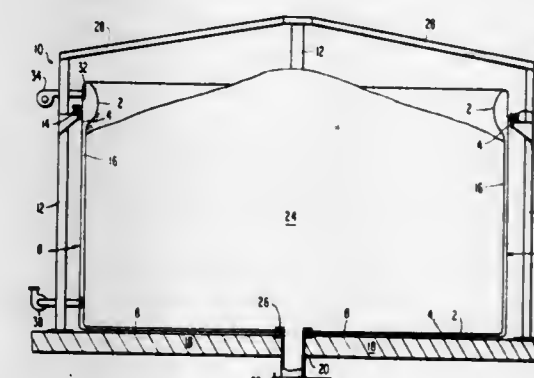
Timothy C. Bonerh, and Vincent C. Bonerh, both of P.O. Box 1997, Buffalo, N.Y. 14219

Filed Apr. 27, 1981, Ser. No. 257,604

Int. Cl.<sup>3</sup> B65D 88/62

U.S. Cl. 222—95

5 Claims



1. A bin for free flowing granular material having a bottom resting on a support member and sides extending upwardly from said bottom, the bin comprising:

- (a) a generally cup-shaped, open top, double walled, flexible bag having an inner membrane and an outer membrane, both of impervious material, forming the double wall;  
(b) framework means for suspending the bag in an open position without providing any lateral support for the outer membrane of the bag, the top of the bag forming the top of the bin;  
(c) clamp means carried by the framework means for clamping the bag adjacent the top edge thereof to thereby support and hang the side walls of the membrane vertically so as to provide side walls without lateral support;  
(d) a closable discharge port in the bottom of said bin extending through said inner membrane and said outer membrane and engaging said inner membrane and said outer membrane to form a substantially air tight space between said inner membrane and said outer membrane said closable discharge port allowing the free flowing granular material to drain from the bin for emptying the same down to the angle of repose of the free flowing granular material when the closable discharge part is opened, thereby creating a void of inverted conical shape within the original mass of the granular free flowing material with the apex of the inverted conical shape at the closable discharge port; and  
(e) air inlet and outlet passages through which air is forced or withdrawn between the inner membrane and the outer membrane;  
(f) means to inflate the closed bag with fluid under controlled pressure so that the bag will expand against the top edge the granular free flowing material remaining after creating the void of inverted conical shape void to force this material into the void and hence down the closable

discharge opening, so that the bag will continue to expand downwardly and inwardly until all of the granular free flowing material is gradually forced into the inverted conical shaped void and out of the closable discharge port.

4,421,251

### MOTORIZED APPARATUS FOR DISPENSING CAKE ICING

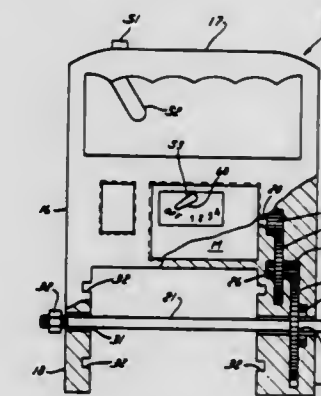
Bahram Namdari, and Kathleen D. Namdari, both of P.O. Box 17366, Milwaukee, Wis. 53217

Filed Oct. 1, 1981, Ser. No. 307,186

Int. Cl.<sup>3</sup> B65D 35/28

U.S. Cl. 222—99

16 Claims



1. Apparatus for dispensing a substance such as cake icing or the like from a collapsible container having a nozzle thereon comprising:

- a hand-holdable power unit including an electric motor;  
a cartridge detachably connectable to said power unit, said cartridge including a rotatable member adapted to be rotatably driven by said motor when said cartridge is connected to said power unit; and  
means for connecting said container to said rotatable member so that said substance is extruded from said nozzle when said member rotates, said container is wound on said rotatable member as the latter rotates and spaced-apart extrusion members on either said power unit or said cartridge between which said container is extendable and against which said container is drawn by said rotatable member to effect extrusion of said substance from said nozzle.

4,421,252

### TOOTHPASTE DISPENSING DEVICE

Howard M. Ylitalo, Rte. 2, Box 101, Cokato, Minn. 55321

Filed Jan. 11, 1982, Ser. No. 338,260

Int. Cl.<sup>3</sup> B65D 35/28

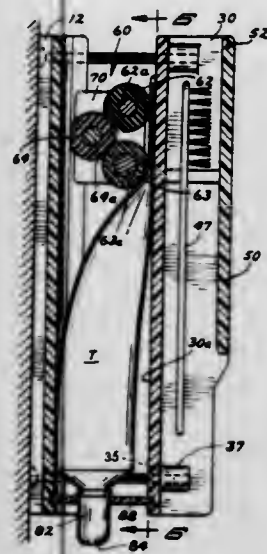
U.S. Cl. 222—102

5 Claims

2. A toothpaste dispensing device, having in combination a mounting back plate member, an overlying top plate member spaced from said mounting plate member, adjustable means spacing said plate members, said mounting plate member having a pair of side ledges, dispensing means disposed between said plate members, comprising a pair of opposed upstanding side plate members extending longitudinally of and being carried by said mounting plate and respectively engaging said ledges, a plurality of resilient rollers journaled between said side plate members in a triangular relationship, said rollers having frictional contact with one another, one of said rollers having a shaft extending outwardly of at least one of said side ledges, manual means secured to said outwardly extending shaft rotating said rollers, at least one of said rollers being adjacent said top plate



adapted to have the end portion of a tube of toothpaste engaged therebetween, plate means disposable at the front end portions of said plate members engaging



a dispensing cap carried by said last mentioned means adapted to be secured to the dispensing outlet of said tube, and said cap having flexible slit outlet portions.

4,421,253

# DISPOSABLE CONTAINER ASSEMBLY FOR LIQUIDS OR SEMI-LIQUIDS IN BULK

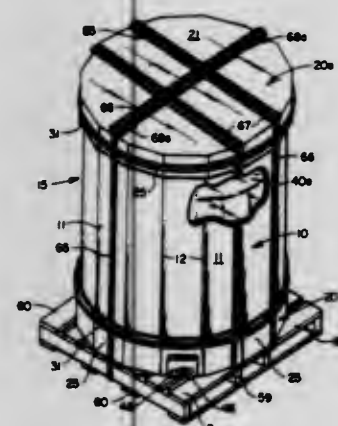
Thomas E. Croley, Worthington, Ohio, assignor to Willamette Industries, Inc., Delaware, Ohio

Filed Feb. 17, 1982, Ser. No. 349,696

Int. Cl.<sup>3</sup> B65D 35/14

U.S. Cl. 222-105

25 Claims



1. A container and support assembly including:  
a disposable fiberboard assembly comprising a tubular body of fiberboard or the like composed of a plurality of vertical panels hinged together at vertical hinge joints to form a multi-sided polygonal body of tubular form open at both its upper and lower ends which is set up from a blank folded flat at opposed hinge joints, a bottom tray of fiberboard or the like with upstanding flanges hinged to a flat disc-like bottom wall which has an outer polygonal periphery corresponding substantially to that of the tubular body and with flanges hinged thereto at horizontal hinge joints and being set-up from a flat blank with the flanges turned upwardly from the disc-like bottom, a surrounding tie-band securing the flanges in upstanding position, said tubular body being telescoped downwardly into the tray with its vertical panels within the corresponding upstanding flanges of the bottom tray and having its lower end resting on the bottom disc-like wall of the tray, a pallet on which said tray disc-like bottom wall rests, a cap of fiberboard or the like with depending flanges hinged to a

disc-like top wall which has an outer polygonal periphery corresponding substantially to that of the tubular body and with flanges hinged thereto at horizontal hinge joints and being set-up from a flat blank with the flanges turned downwardly, a surrounding tie-band securing the flanges in depending position, said cap being telescoped downwardly over the upper end of the tubular body with its depending flanges overlapping the corresponding vertical panels of the body and with its disc-like top wall resting on the upper end of the body; and stabilizing means for securing the fiberboard assembly to the pallet comprising tension members at angularly-spaced positions around the tubular fiberboard container body extending completely vertically around the cap and along the vertical panels of the body and tightened and secured to the pallet to clamp these members axially together; said tubular body having flanges at its lower end hinged to the corresponding panels at horizontal hinge joints and turned inwardly horizontally so they will rest on said disc-like bottom wall of the tray; said stabilizing means also including an upper stabilizing frame in contact with the flat disc-like top wall of the cap, said frame including frame members disposed in angular relationship across said flat top wall of the cap to provide outwardly-extending arms which extend to the edge of the cap, said pallet being of a size to extend to the edge of the tray, said pallet having an upper support surface and spaces therebeneath, said tension members extending vertically completely around the stabilizing frame along the arms thereof and beneath the support surface of the pallet and through the said spaces thereof; said arm-forming frame members comprising a pair of laterally-spaced parallel slats extending across the top wall of the cap and disposed just laterally outwardly of opposed depending flanges thereof, and a single slat disposed at right angles to the pair of slats and extending across the top wall of the cap so that it is intermediate the opposing depending flanges thereof, a single tension member extending over the latter slat and vertically along the corresponding opposed panels of the body as well as beneath the pallet, and a pair of tension members extending over the first-mentioned pair of slats and extending vertically just laterally outwardly of the hinge joints of the opposed panels of the body and beneath the pallet.

4,421,254

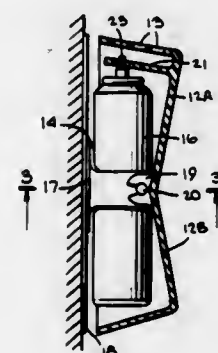
# WALL-MOUNTED AROMATIC LIQUID DISPENSER ASSEMBLY

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087  
Continuation-in-part of Ser. No. 107,625, Dec. 27, 1979, Pat. No. 4,309,011. This application Nov. 17, 1981, Ser. No. 322,086

Int. Cl.<sup>3</sup> B05B 15/00

U.S. Cl. 222-180

7 Claims



1. A wall-mountable aromatic liquid dispenser assembly comprising:  
A. a spray can containing an aromatic liquid and provided at its upper end with an upright actuating pin which when depressed axially acts to spray the liquid upwardly;  
B. a fixture having a flat base attachable to a wall and a yoke

mounted on the base and embracing the can to hold it in an upright position;

C. a single piece cover plate provided with oppositely-inclined upper and lower sections in a rocker formation simulating the appearance of a standard electric toggle switch, the plate being pivotally mounted on the fixture on an axis parallel to the junction line between the sections and covering and concealing the fixture and the can, said plate having vents therein above said actuating pin; and  
D. means operatively linking the cover plate and the pin whereby when the plate is rocked the pin is depressed to discharge the resultant spray through the openings, said means being constituted by a link member cantilevered from the inner wall of the upper section, the free end of the member having a slot therein through which the pin projects.

4,421,255

# DISPENSER FOR PASTY PRODUCTS

Joachim Czech, Jahnstrasse 19, D-8405 Donaustauf, Fed. Rep. of Germany

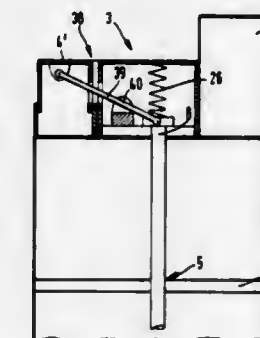
Filed Oct. 31, 1980, Ser. No. 202,725

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945338

Int. Cl.<sup>3</sup> B67D 5/42

U.S. Cl. 222-387

2 Claims



1. A dispensing container for viscous materials comprising: a hollow body that has a side wall and an end wall, a piston which cooperates with said body to define a chamber and which is slidable in one direction in said body in contact with said side wall to force viscous materials in said chamber out of the same through a dispensing outlet in a part of said body, a manually movable actuator located at the end of said body nearest side end wall and accessible at the exterior of said body for manual actuation in a direction against a bias in an opposition direction, an axially movable rod which extends through said end wall, a lever forming a connection between said actuator and said rod that constrains said rod to move in unison with but in an opposite direction from said actuator, whereby actuation of said actuator in said opposite direction imparts motion to said rod in said one direction, motion transmitting means providing a unidirectional driving connection between said rod and said piston whereby said rod is allowed to move relative to said piston in a direction opposite to said one direction, but said piston is constrained to move with said rod in said one direction, and a check valve operatively associated with said dispensing outlet and arranged to permit flow of viscous material out of said chamber but to block flow of air into said chamber so that atmospheric pressure confines said piston against motion in said opposite direction relative to said body.

4,421,256

# SLIDING GATE VALVE HAVING ADJUSTABLE SEAL PRESSURE

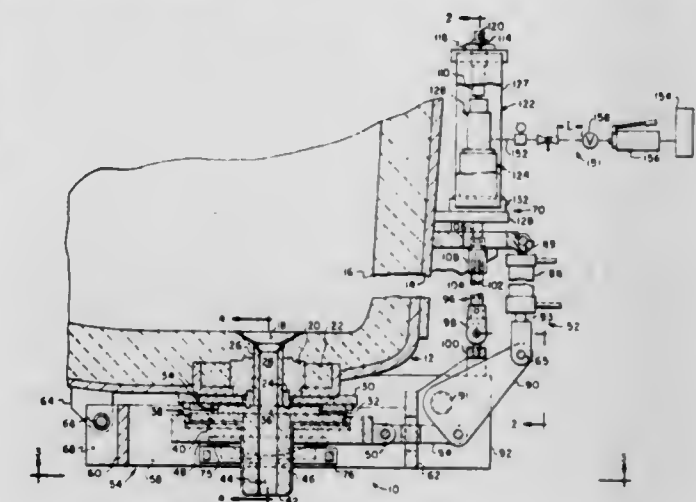
Eugene V. Abarotin, Franklin Township, Westmoreland County, and Leroy V. Bonk, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1981, Ser. No. 307,834

Int. Cl.<sup>3</sup> B22D 41/08

U.S. Cl. 222-600

11 Claims



10. A sliding gate valve apparatus for controlling the flow of molten material from the outlet of a teeming vessel comprising:  
(a) a carrier support having rectangularly arranged walls positioned beneath said outlet and having one end pivotally connected to said vessel;  
(b) a gate carrier containing a refractory plate having a flow control opening cooperable with said vessel outlet mounted in said carrier support;  
(c) slide guides along the side walls of said carrier support having bearing surfaces for sliding engagement with surfaces on said gate carrier that mate with said slide guide bearing surfaces;  
(d) means on said side walls for mounting said slide guides for pivotal movement about axes normal to said side walls;  
(e) said bearing surfaces being formed as segments of a cylinder about an axis parallel with said frame side wall.

4,421,257

# METAL POURING NOZZLE WITH GAS INLET

Anthony Thrower, Woodhouse, near Sheffield, England, assignor to USS Engineers and Consultants, Inc., Pittsburgh, Pa.

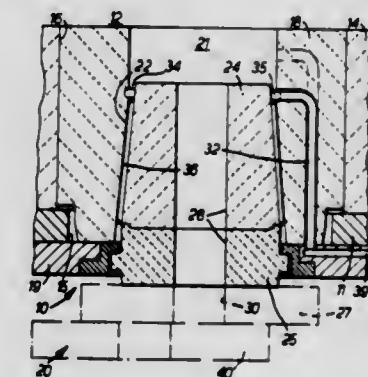
Filed Jan. 29, 1982, Ser. No. 344,092

Claims priority, application United Kingdom, Feb. 12, 1981, 8104359

Int. Cl.<sup>3</sup> B22D 41/08

U.S. Cl. 222-600

6 Claims



1. In combination, a molten metal teeming vessel having a bottom pour opening and a sliding gate valve containing relatively movable apertured plates attached to said vessel about



said pour opening to control the flow of metal from said vessel, said vessel pour opening being defined by a wellblock positioned in the bottom of said vessel and having an axial bore therethrough, an internal nozzle having an axial flow opening for communication with the apertures of said sliding gate valve plates, said flow opening being of less diameter than that of said wellblock bore, said internal nozzle being disposed in the lower portion of said wellblock bore and having its upper end surface open to and axially spaced from the upper end of said wellblock bore, and means for injecting gas into said wellblock bore comprising:

- (a) an annular space between the upper portion of said internal nozzle and the wall of said wellblock bore,
- (b) a gas supply conduit leading into and through said wellblock and having its discharge end opening into said annular space below but adjacent the upper end of said internal nozzle; and
- (c) means between the wall of said internal nozzle and the wall of said wellblock bore to prevent the flow of gas downwardly from said annular space.

4,421,258

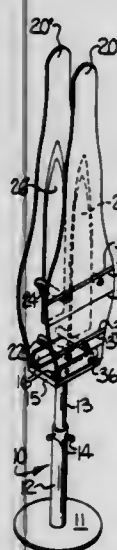
## PANTY HOSE SIZING FORM

Sam C. Safrit, Pfaftown, and William B. Cothran, Burlington, both of N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

Filed Mar. 15, 1982, Ser. No. 358,031

Int. Cl.<sup>3</sup> D06H 3/16

U.S. Cl. 223—75



1. A panty hose sizing form comprising a pair of spaced-apart and identically shaped flat elongate boards, each of said boards including a rounded free end adapted to be engaged by the toe of a panty hose, an opposite end portion adapted to be engaged by the panty portion of the panty hose, means interconnecting and maintaining said boards with their flat sides facing each other and with said opposite end portions of said boards in said spaced-apart relationship, and opposite side edges of said boards being contoured symmetrically, relative to the longitudinal axis of said boards, so that the panty hose can be easily drawn onto and removed from said sizing form, said boards including a foot portion adjacent said free end, a calf portion adjacent said foot portion, a thigh portion adjacent said calf portion, and a lower body portion adjacent said thigh portion, and the transverse width of said boards progressively increasing from the free end to a medial portion of said body portion and then progressively reducing in width throughout the remaining portion of said lower body portion so as to define outwardly bulging portions along opposite sides of said body portion.

#### 4,421,259 METHOD AND APPARATUS FOR HANDLING HOSIERY

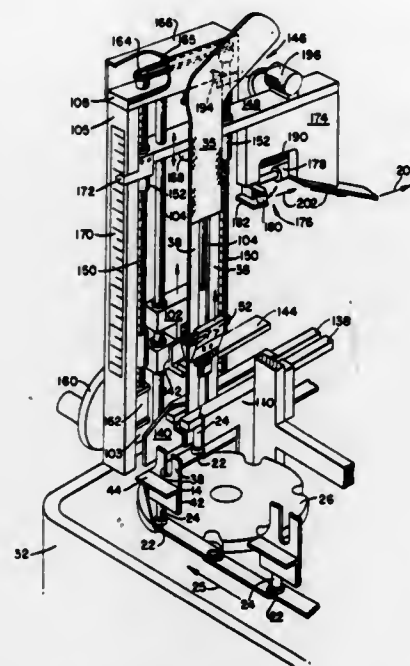
James H. Sewell, Charlotte, N.C.; Hans Gaede, Fort Mill, S.C., and Curtis R. Ritch, High Point, N.C., assignors to Intech Corporation, Charlotte, N.C.

Filed Apr. 3, 1981, Ser. No. 250,636

Int. Cl.<sup>3</sup> D06C 5/00

U.S. Cl. 223—76

39 Claims



1. An apparatus for handling hosiery and the like during processing comprising:  
a form dimensioned to be inserted into hosiery and supported for motion to carry the hosiery during processing;  
clamp means carried with said form, said clamp means being movable upward and downward along the length of said form and between a closed position to secure hosiery to said form and an open position;  
mechanical means discrete from said form for raising said clamp means to a desired height; and  
mechanical clamp actuating means for moving said clamp means between its open and closed positions, said mechanical clamp actuating means being correlated with said mechanical clamp raising means to move said clamp means to its closed position after said clamp means has contacted a bottom of hosiery placed on said form and moved the bottom of the hosiery upward a distance.

4,421,260

## PORTABLE CLOTHES CLOSET

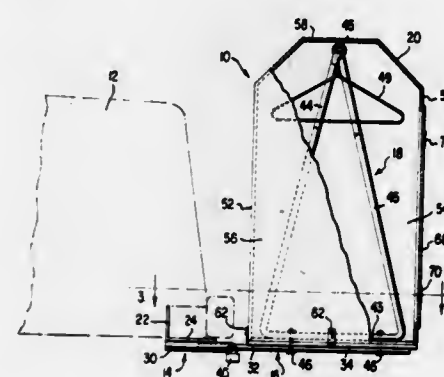
Robert E. DeVore, Rte. 1, Box 451, Picayune, Miss. 39466

Filed Jun. 2, 1981, Ser. No. 269,738

Int. Cl.<sup>3</sup> B60R 9/06

U.S. Cl. 224—42.43

4 Claims



1. A portable apparatus for storing and transporting clothes comprising:  
a waterproof enclosure comprising a bottom, a top, two

upstanding walls, a rear, and a front, said front having an opening and a door for sealingly covering said opening, a bar extending between upper parts of said upstanding walls adapted to receive clothes hangers, and means on said enclosure for cooperating with means on a vehicle for removably attaching said enclosure to the exterior of a vehicle so that said enclosure may be easily detached from said vehicle and for orienting said enclosure in a position wherein said bar is horizontal and above said bottom and wherein said hangers hang downwardly from said bar.

4,421,261

## WEB FEED TRACTOR

Leo J. Hubbard, Somerset, Mass., assignor to Precision Handling Devices, Inc., Assonet, Mass.

Filed Jan. 16, 1981, Ser. No. 225,586

Int. Cl.<sup>3</sup> B65H 17/38

U.S. Cl. 226—74

10 Claims



1. A tractor for feeding perforated webs comprising an endless belt having pins projecting outwardly and drive elements projecting inwardly thereof, a frame of concavo-convex, oblong shape having a pair of juxtaposed side plates, said frame being convexly curved and concavely curved along opposite surfaces thereof, an outwardly open, convexly curved slot defined by said side plates along said convexly curved surface, a concavely curved slot defined by said side plates along said concavely curved surface, said concavely curved slot being at least partially closed, at least one sprocket journaled in said side plates, said belt being disposed between said side plates and around said sprocket with a plurality of said drive elements engaged with said sprocket and with one reach of said belt in said convexly curved slot and guided thereby along a convexly curved path, and the reach of said belt opposite to said one reach being disposed within said concavely curved slot and guided therein along a concavely curved path.

4,421,262

## PAPER TRACTOR

Yoshinori Chida, and Satoru Tada, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1981, Ser. No. 221,978

Claims priority, application Japan, Jan. 22, 1980, 55-6201; Jan. 22, 1980, 55-6202

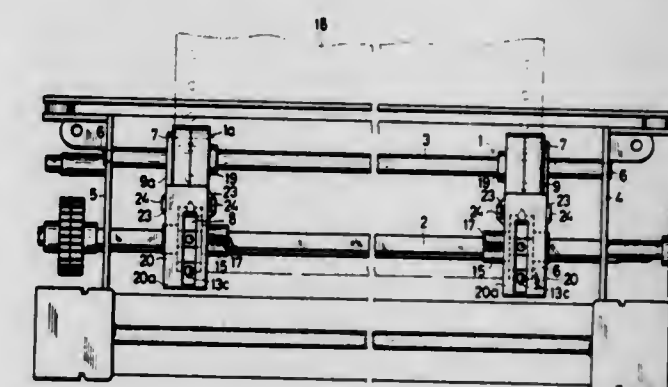
Int. Cl.<sup>3</sup> B65H 17/38; G03B 1/24

U.S. Cl. 226—79

3 Claims

1. In a paper tractor for use in feeding recording paper of different widths in printers or the like, the combination comprising: a rotary drive shaft having a polygonal cross-section; a sprocket wheel having a set of sprockets for engaging in perforations in the recording paper in response to rotation of the sprocket wheel and having two tubular sleeves extending outwardly from opposite lateral portions of said sprocket

wheel and having a center bore shaped to non-rotationally receive therein said drive shaft and through which slidably extends said drive shaft, at least one of said sleeves having a set of spaced slots extending axially along the sleeve to cause the sleeve to resiliently and frictionally engage said drive shaft with a frictional force-fit effective to maintain the sprocket wheel in a predetermined axial position on the drive shaft during use of the paper tractor and effective to enable manual sliding movement of the sprocket wheel on the drive shaft against the resistance offered by the frictional force-fit to adjust the axial position of the sprocket wheel to accommodate recording paper of different widths; a stationary shaft disposed



in spaced apart and parallel relationship with respect to said rotary drive shaft; a paper cover having a tubular portion turnably and slidably received on said stationary shaft thereby mounting said paper cover for turning movement on said stationary shaft between opening and closing positions relative to said sprocket wheel, said paper cover including a retainer plate effective to cover the upper part of said sprocket wheel; and a frame on which is turnably disposed said tubular portion and having a pair of side arms configured to embrace said sprocket wheel from opposite sides of the latter, said side arms having substantially U-shaped bearing bores rotatably receiving respective ones of said sleeves of the sprocket wheel.

4,421,263

## BI-DIRECTIONAL CLUTCHLESS FILM TRANSPORT DEVICE

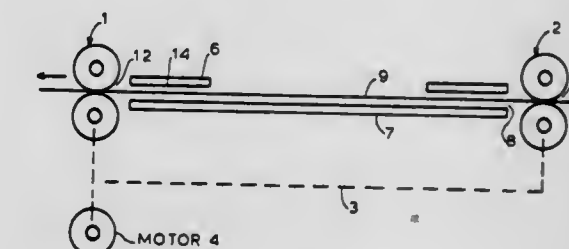
Harry J. Halewijn, Manchester, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 4, 1982, Ser. No. 354,821

Int. Cl.<sup>3</sup> B65H 17/26, 17/22

U.S. Cl. 226—143

28 Claims



1. Film transport device comprising:  
first antibuckling means for pushing against at least a portion of one surface of said film when said film tends to buckle;  
second antibuckling means for pushing against at least a portion of the opposite surface of said film when said film tends to buckle;  
positioning means for providing a separation gap between said first and second antibuckling means less than about 40 mils;  
a first pair of film drive rollers having sufficient compliance



to permit slippage of said film with respect to said first pair of drive rollers;  
 a second pair of film drive rollers having sufficient compliance to permit slippage of said film with respect to said second pair of drive rollers;  
 drive means for producing bi-directional rotation of said first and second pairs of drive rollers at the same angular velocity; and,  
 means for positioning the bytes of said first and second pairs of drive rollers adjacent said first and second antibuckling means adjacent the gaps thereof.

4,421,264

# VARIABLE THICKNESS SET COMPENSATION FOR STAPLER

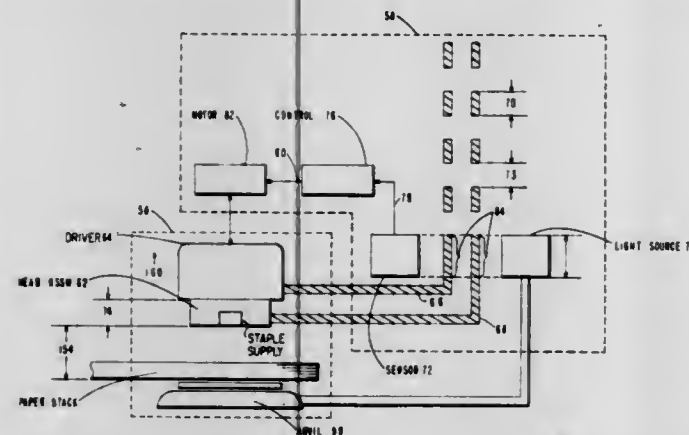
Nelson K. Arter, Longmont; Michael A. Bartholet, Boulder; Roger D. Emeigh, and Marion J. Herman, both of Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1981, Ser. No. 277,755

Int. Cl.<sup>3</sup> B27F 7/17; G03G 15/00

U.S. Cl. 227-2

11 Claims



1. In a stapling device having an anvil means for accumulating and supporting a stack of sheets and head means and coacting driver means for driving a staple into the stack, the improvement comprising:

sensor means coupled to the head means and the driver means for supplying control signals representative of relative motion therebetween; and  
 controller means responsive to said control signals for driving the head means and driver means bidirectionally with variable force.

4,421,265

# WAVE-SOLDERING A MEMBER TO AN ARTICLE

Albert E. Boyer, Peabody; John T. Callahan, Nahant, and Peter P. Filocamo, Methuen, all of Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 10, 1981, Ser. No. 252,766

Int. Cl.<sup>3</sup> B23K 1/08

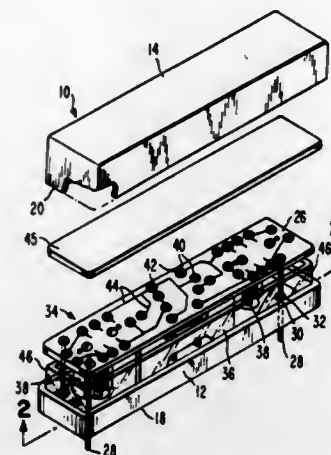
U.S. Cl. 228-180 R

19 Claims

1. A method of soldering a peripheral edge of a cover member to an article, which comprises:

assembling the cover member to the article with opposite side peripheral edge portions of the cover member adjacent respective opposite side portions of the article; and  
 passing the assembled cover member and article over a

solder wave such that the opposite side peripheral edge portions of the cover member engage the solder wave



simultaneously to solder the opposite peripheral edge portions of the cover member to the article.

4,421,266

# HANDLING BODIES CONTAINING BONDING MATERIAL

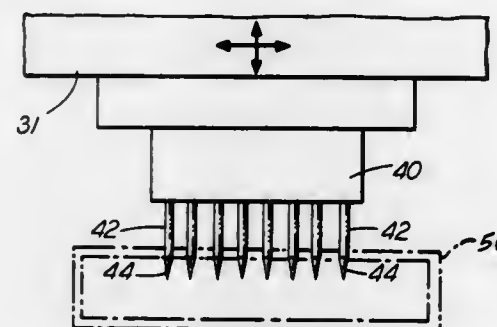
Anne B. Bock, Kutztown, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 29, 1981, Ser. No. 287,971

Int. Cl.<sup>3</sup> B23K 1/12; H05K 1/04

U.S. Cl. 228-180 A

17 Claims



1. Apparatus for substantially simultaneously applying respective ones of bodies containing bonding material to each of an array of bonding sites comprising:

means for holding the bodies in an array corresponding to the array of bonding sites;  
 means for holding an array of pickup pins having pickup ends adapted to frictionally engage the bodies and such array having such pickup ends correspond to the arrays of bodies and sites; and  
 means for manipulating the array of pins in steps, to substantially simultaneously, frictionally engage each of the bodies with a corresponding pickup end of a pin, to substantially simultaneously contact each of the bodies to a corresponding bonding site and to substantially simultaneously disengage the pins from the bodies.

4,421,267

# SELF-LOCKING CONTAINER

Donald F. Wischoff, Fulton, N.Y., assignor to Container Corporation of America, Chicago, Ill.

Filed Dec. 21, 1982, Ser. No. 451,807

Int. Cl.<sup>3</sup> B65D 5/66

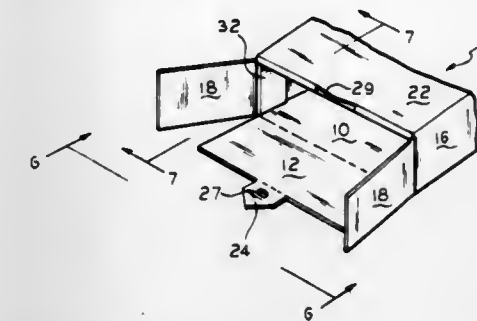
U.S. Cl. 229-44 R

3 Claims

1. A self locking container formed from a unitary blank of foldable sheet material, such as paperboard, comprising:

(a) pairs of opposed major and minor side wall panels foldably joined to each other to form a tubular body open at the ends;

(b) top and bottom end closure flaps joined to end edges of said side wall panels for closing the ends of said tubular body;  
 (c) an integral locking structure for maintaining said container in assembled, erected condition without requiring outside securing means, said locking structure including:



(i) a retaining panel foldably joined to an upper end edge of one of said major side wall panels and folded 180° to lie in face-to-face relation with an inner surface of said one major side wall panel;  
 (ii) a pair of friction-lock flaps foldably joined to opposite end edges of said retaining panel and folded 90° to lie in face-to-face relation with adjacent inner surfaces of respective minor side wall panels.

4,421,268

# INTEGRATED CONTROL SYSTEM USING A MICROPROCESSOR

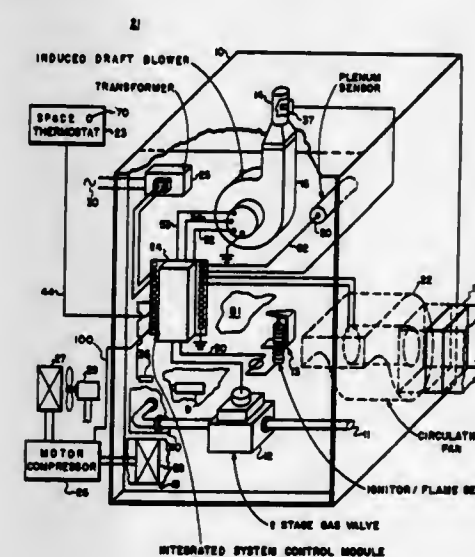
William W. Bassett, Wayzata, and Dean R. Rask, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 17, 1980, Ser. No. 197,842

Int. Cl.<sup>3</sup> F23N 3/00

U.S. Cl. 236-10

9 Claims



1. An improvement in a temperature control system for use with a temperature conditioning apparatus having a power blower delivering exhaust gases from a combustion chamber to an exhaust stack, the improvement comprising

temperature responsive means responsive to the output exhaust gas temperature of the temperature conditioned apparatus,  
 first means connected to said temperature responsive means to respond to a decrease in said exhaust gas temperature from a predetermined temperature,  
 ambient temperature responsive means adapted to respond to the ambient temperature of the temperature conditioning apparatus, and  
 second means connecting said ambient temperature responsive means to said first means whereby said first means responds to a predetermined difference between the temperature of the exhaust gas and ambient temperature.

4,421,269

# SYSTEM FOR CONTROL OF WATER TEMPERATURE

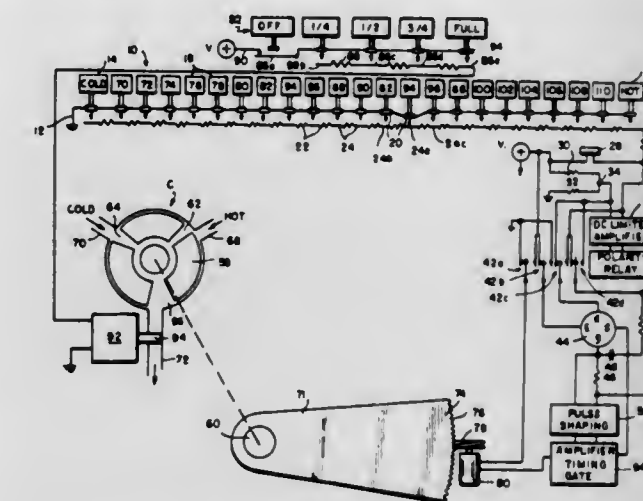
Si-Ling Ts'ao, 3rd Floor, No. 1-1, Alley 16, Ln. 553, Section 4, Chung Hsiao East Rd., Taipei, Taiwan

Filed Jan. 22, 1982, Ser. No. 341,710

Int. Cl.<sup>3</sup> G05D 23/00; F16K 31/02; H01C 10/46

U.S. Cl. 236-12.12

14 Claims



1. A system for control of water temperature from a valve having cold and hot water inlets and a discharge outlet comprising a reversible motor means to shift said valve to one side to decrease the cold water and increase the hot water and to the other side to increase the cold water and decrease the hot water, including a worm gear means to reduce the speed of the motor, a control circuit embodying a plurality of first selectively operable pushbutton means representing a range of water temperature from cold to hot and further including a plurality of resistances corresponding in number to said push-buttons, each pushbutton being operated to produce a resistance value representing said, hence, the desired water temperature, sensor means for detecting the actual temperature of the water from said outlet and also to produce a resistance value, said resistance values of desired water temperature and actual water temperature being combined to produce a signal, signal means, comparison means including a vibrator switch comparing said signals produced by said signal means at regular intervals for detecting their differential, said comparison means also including a polarity relay for detecting the polarity of said differential, hence, the direction of rotation of said reversible motor means, a DC limiter and pulse-shaping means to control the angle of rotation of said valve in a direction to decrease said differential in temperature to a minimum and stabilize at said selected water temperature and indicator means including a lamp lighting up when said differential in temperature becomes a minimum.

4,421,270

# ELECTRONIC TEMPERATURE CONTROL

William F. Raleigh, Valencia, and Patrick J. Keegan, Sepulveda, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 184,638, Sep. 8, 1980, Pat. No. 4,361,274.

This application Nov. 18, 1981, Ser. No. 322,454

Int. Cl.<sup>3</sup> F23N 1/08; G05D 23/00

U.S. Cl. 236-20 R

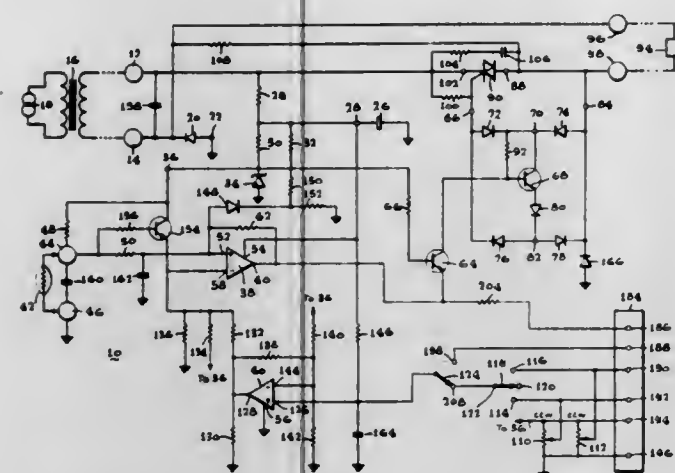
3 Claims

1. An electronic temperature control for use with swimming pool and spa water heaters comprising:

means for sensing the temperature of the water to be heated including a thermistor;  
 means for generating a first electrical signal proportional to the sensed temperature including means for deriving a voltage across the thermistor from a power supply;  
 means for generating a second electrical signal proportional to a desired water temperature;  
 means for comparing the sensed temperature with the de-



sired temperature setting by electronically comparing the first electrical signal with the second electrical signal; and means for limiting the voltage appearing across the thermistor to less than the voltage appearing at the power supply in the event of a single component failure in the electronic



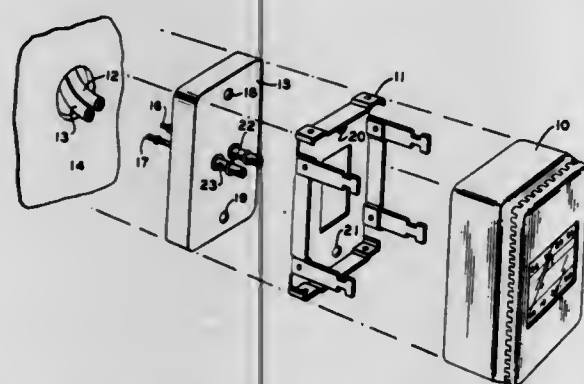
temperature control, including a first current limiting element connected in series with the thermistor to form a series circuit, a second plurality of current limiting elements connected in series between the series circuit and the power supply, and a third plurality of current limiting elements connected in parallel with the series circuit.

**4,421,271**  
**ZERO ENERGY BAND SUBBASE FOR PNEUMATIC THERMOSTATS**  
Gideon Shavit, Highland Park, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 15, 1979, Ser. No. 20,692  
Int. Cl.<sup>3</sup> G05D 23/02

U.S. Cl. 236—82

6 Claims

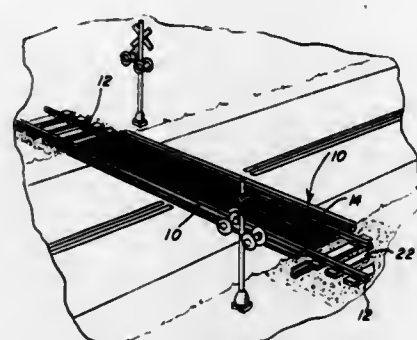


1. A pneumatic subbase for modifying the operation of a pneumatic thermostat, said subbase comprising:  
first connecting means having a first nozzle adapted to be connected to a source of main pressure and a second nozzle adapted to supply a branch output pressure to a controlled apparatus;  
second connecting means comprising a third nozzle adapted to connect the main pressure from said first nozzle to a pneumatic thermostat and a fourth nozzle adapted to receive output pressure from said thermostat; and,  
dwell relay means for connecting directly said first nozzle to said third nozzle and connected to said second and fourth nozzles for providing a dwell period in the branch output pressure of said second nozzle as a function of the output pressure received by said fourth nozzle from said pneumatic thermostat, said dwell relay means comprising first, second and third diaphragm module units and a restriction.

**4,421,272**  
**SPlicing AND GRADE CROSSING CONSTRUCTION**  
Jacob O. Whitlock, Springfield, Ill., assignor to Structural Rubber Products Company, Springfield, Ill.  
Continuation of Ser. No. 84,371, Oct. 12, 1979, abandoned. This application Mar. 4, 1982, Ser. No. 354,883  
Int. Cl.<sup>3</sup> E01C 9/04

U.S. Cl. 238—8

15 Claims



1. A railway crossing surfacing module comprising a web of elastomeric material positionable against a rail and extending normally toward each one of a pair of rails,  
a plurality of gutter portions in the web, some of the gutter portions extending parallel to the rails and some of the gutter portions extending parallel to the edges of the web normal to the rails;  
at least one of the gutter portions including a pocket formed adjacent a web edge normal to the rail and having side walls recessed into the elastomeric material on opposite sides of the gutter;  
a first aperture formed in the web at the end of the gutter portion containing the pocket spaced apart from the web edge and extending from the bottom of the pocket into the elastomeric material,  
the portion of the web forming the aperture being movable toward the web edge by compression of the elastomeric material between the web edge and the aperture, and movable away from the web edge by expansion of the elastomeric material between the web edge and the aperture following compression of the elastomeric material,  
a tread surface portion of the web adapted to engage the wheels of vehicles passing over the crossing and an opposite subgrade surface portion facing the ties beneath the rails, and  
a second aperture formed in the edge of the web adjacent the gutter end containing the pocket and extending from the tread surface portion through the subgrade surface portion,  
said second aperture being spaced apart from the first aperture and adapted to receive a fastening rod extending through the edge of the web into the ties.  
11. The method of joining an adjacent pair of railroad crossing surfacing modules which incorporate an upper tread surface portion of elastomeric material and a pair of pockets adjacent the edges of the modules which meet each other with an anchor bar extending from one pocket to the other and including engagement means extending outwardly from the body portion of the bar which comprises:  
forcing the modules together by compressing one module against the other before installing the anchor bar,  
positioning a first edge of the anchor bar in an edge of each of the pockets,  
rotating the anchor bar in a direction about said first edge to

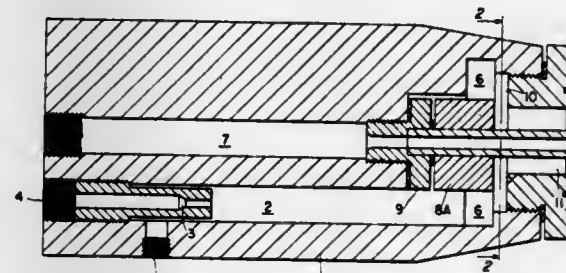
dispose a second edge of the bar opposite the first edge in another edge of each of the pockets,  
disposing the engagement means in the elastomeric material during rotation of the bar, and  
releasing the compression after the anchor bar is installed, whereby the resilient expansion of the elastomeric material to the modules urges the modules into continuous engagement on the engagement means of the anchor bar.

**4,421,273**  
**METHOD AND APPARATUS FOR SUPPLYING OXYGEN GAS FOR FUEL COMBUSTION**  
Per Löfström, Vällingby, Sweden, assignor to AGA Aktiebolag, Lidings, Sweden

Filed Mar. 17, 1978, Ser. No. 887,612  
Claims priority, application Sweden, Mar. 18, 1977, 7703089  
Int. Cl.<sup>3</sup> B05B 7/10

U.S. Cl. 239—8

2 Claims

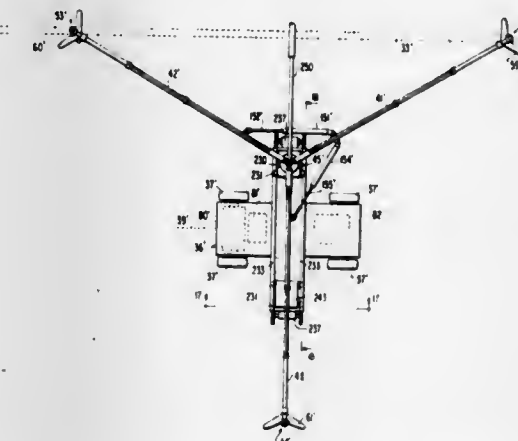


1. A method of supplying oxygen gas for combustion of a sprayed fuel comprising the steps of atomizing fuel within the body of a spray device having a spray aperture, passing the atomized fuel out of the spray aperture of the spray device as a substantially conical spray with the apex of the cone located in the aperture of the spray device, supplying a gas consisting essentially of oxygen from said spray device centrally of the cone while the atomized fuel is being passed out of the spray aperture whereby combustion of the atomized fuel with said oxygen gas takes place in the central part of said cone, and supplying combustion air to the outer surface of the cone such that the temperature generated at said outer surface is lower than that generated in the central part of the cone.

**4,421,274**  
**LAND IRRIGATION SYSTEM AND METHOD**  
Allen T. Noble, Boise, Id., assignor to Noble Linear Irrigation, Inc., Boise, Id.  
Continuation of Ser. No. 170,072, Jul. 18, 1980, abandoned, which is a continuation of Ser. No. 887,792, Mar. 17, 1978, abandoned. This application Apr. 6, 1982, Ser. No. 366,097  
The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> B05B 3/18

U.S. Cl. 239—183

7 Claims



1. For use in connection with a land irrigating system in

which a moving water sprinkler means having water inlet means extends laterally to and moves along the length dimension of a stationary water supply means having a plurality of water outlet valve means at spaced points along the length thereof, an apparatus for successively connecting water outlet valve means of the stationary water supply means with the water inlet means of the sprinkler means comprising conveyance means for moving along the length dimension of the stationary water supply means at the same overall rate of movement as the moving sprinkler means,  
water receiving conduit junction means carried by the conveyance means having water outlet means and water inlet means,  
a plurality of elongated water conduit means each having end portions, the elongated water conduit means each being rigid between its end portions, one end portion of each elongated water conduit means being connected for water flow to the water inlet means of the water receiving conduit junction means,  
the length of each of the elongated water conduit means being substantially less than the distance between adjacent water outlet valve means,  
connecting means associated with the other end portion of each elongated water conduit means for successive water flow connection and disconnection with water outlet valve means on the stationary water supply means,  
water flow control means for closing each elongated water conduit means to control water flow through the respective elongated water conduit means,  
means carried by the conveyance means supporting the water receiving conduit junction means and the associated elongated water conduit means for movement of the water receiving conduit junction means and the connecting means of the associated elongated water conduit means relative to the conveyance means and in a horizontal plane toward and away from successive water outlet valve means,  
articulated connecting water conduit means having a water inlet end portion pivotally connected to the water outlet means of the water receiving conduit junction means and a water outlet end portion pivotally connected to the water inlet means of the sprinkler means for water flow from the water receiving conduit junction means to the water inlet means of the sprinkler means,  
the articulated connecting water conduit means being pivotally jointed intermediate its end portions whereby the distance between the water receiving conduit junction means and the water inlet means of the sprinkler means can vary to accommodate movement of the conveyance means relative to a water outlet valve means to which an elongated water conduit is connected.

**4,421,275**  
**APPARATUS FOR APPLYING REFRACTORY MATERIAL TO REFRACTORY LINED VESSELS**  
Richard A. Gratton, 34 Thorn St., Sewickley, Pa. 15143  
Filed Aug. 17, 1981, Ser. No. 293,604  
Int. Cl.<sup>3</sup> B05B 3/12

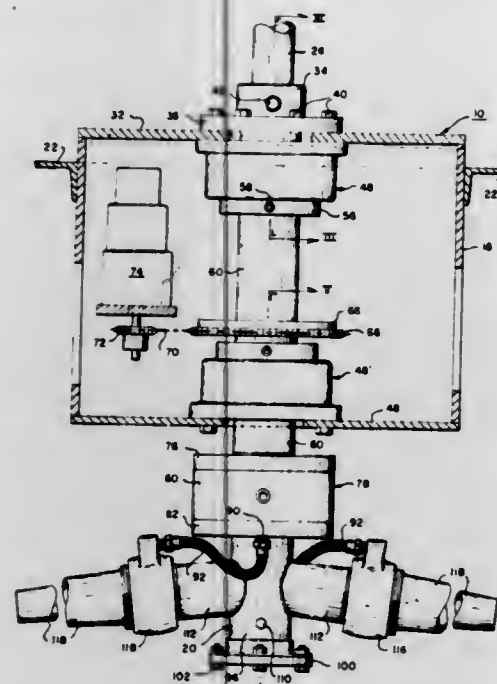
U.S. Cl. 239—226

2 Claims

1. In an apparatus for applying refractory material to the interior surfaces of a vessel adapted to contain molten metal, said apparatus including a pair of concentric conduits for separately conveying granular refractory material and water to at least one rotatable discharge nozzle for mixing therein and application to said surfaces thereby, the improvement comprising:  
a stationary inner conduit for conveying said granular refractory material;  
an outer conduit concentrically disposed about said inner conduit, thereby forming an annular passageway therebetween for conveying said water, and being rotatable about said inner conduit;  
sealing means disposed between said conduits at a location



along the discharge end portion of said stationary inner conduit; and



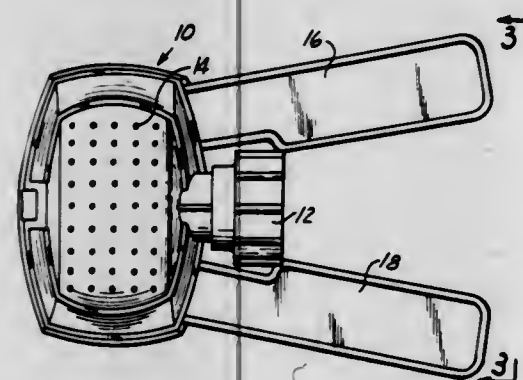
said discharge nozzle being rotatable with said outer conduit and being in communication with said inner and outer conduits.

#### 4,421,276 CONVERTIBLE SPRINKLER

J. Linn Rodgers, 9606 La Serna Dr., Whittier, Calif. 90605  
Filed Nov. 20, 1981, Ser. No. 323,320  
Int. Cl.<sup>3</sup> B05B 15/06

U.S. Cl. 239—273

5 Claims



1. A convertible sprinkler head comprising: a sprinkler head; a pair of paddles having adjacent ends, each said adjacent end connected to said sprinkler head by a longitudinally extending hinge, the longitudinal axis of said hinges being generally parallel to each other such that said paddles can be folded together to form a handle or may be unfolded flat to form a stable base for said sprinkler head.

#### 4,421,277 SPRAY HEAD, SUITED FOR INTERNALLY CLEANING SLAUGHTERED POULTRY

Rudolf J. Tieleman, Broekhuizerweg 6, 6983 BM Doesburg, Netherlands

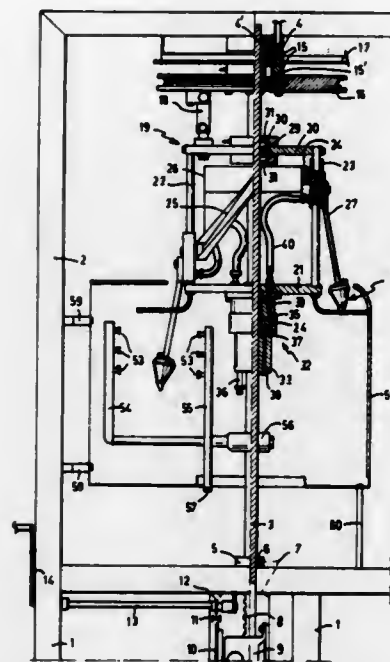
Filed Jul. 13, 1982, Ser. No. 397,744  
Int. Cl.<sup>3</sup> B05B 1/32

U.S. Cl. 239—456

9 Claims

1. Apparatus for internally cleaning slaughtered poultry, comprising, a spray head and means for moving the spray head forwardly into the body of a slaughtered bird which is supported on the apparatus to clean the bird internally, said spray head being formed of two portions connected to each other by

screw threads, at least one said portion being provided with an axial bore for delivering cleaning liquid, said spray head having a peripheral outlet slot which is defined by and located between said portions, said peripheral outlet slot being connected to the axial bore and being located substantially in a plane which is perpendicular to the axis of at least one of the



portions, characterized in that the spray head (28) comprises a truncated conical portion (41) and a conical portion (42), said conical portion and said truncated conical portion having exterior surfaces which converge toward the forward end of the nozzle, said axial delivery bore (44) being formed in the truncated-conical portion and discharging directly into the peripheral outlet slot (46).

#### 4,421,278 INJECTION VALVE

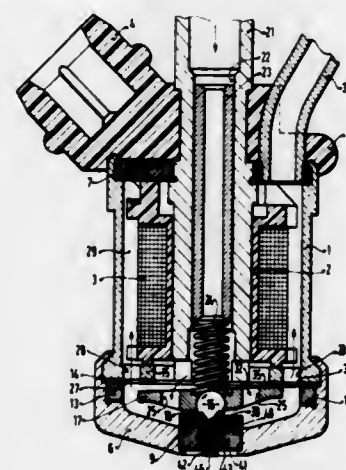
Wolfgang Kienzie, Schwieberdingen, and Rudolf Krauss, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Continuation of Ser. No. 276,126, Jun. 22, 1981, abandoned.  
This application Apr. 1, 1983, Ser. No. 481,178

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023757

Int. Cl.<sup>3</sup> B05B 1/08; F02M 51/08

U.S. Cl. 239—533.12

7 Claims



1. An injection valve for fuel injection systems of internal combustion engines, said injection valve including a movable valve element engageable with a fixed valve seat disposed in a valve seat body, said valve seat body having an axial bore extending downstream of said fixed valve seat,

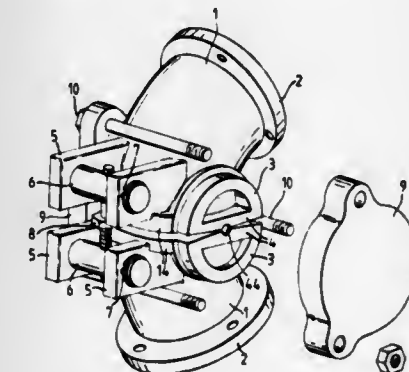
said bore providing an annular wall adapted to receive a charge controlling device comprising an insert having a fluted section consisting of lands and grooves, said insert lands engaging the bore wall to secure the charge controlling device in said bore and said grooves providing a plurality of axially extending fuel flow dividing pathways through said bore, and diversion means downstream of said charge controlling device serving to divert fluid flow from said bore into a fan-type spray for injection into an intake tube of said engine.

#### 4,421,279 ARTICULATED COUPLING PARTICULARLY FOR ADJUSTING THE JET INCLINATION OF IRRIGATORS IN GENERAL

Arno Drechsel, Via Wegggenstein, 29, 39100 Bolzano, Italy  
Filed Apr. 21, 1981, Ser. No. 256,237  
Claims priority, application Italy, May 23, 1981, 46840 A/80  
Int. Cl.<sup>3</sup> B05B 15/08

U.S. Cl. 239—546

10 Claims



1. An articulated coupling for adjusting the jet inclination of irrigators comprising two tubular members in constant direct communication with each other for feeding liquid to an irrigator discharge nozzle, and tubular members comprising, a first tubular member having an end, and a second tubular member having an end, said end of said first tubular member being profiled and comprising a cusp-shaped end face having an apex axis at a diameter of said end, surfaces of said cusp-shaped end face on opposite sides of said apex being chamfered to converge toward said apex axis and being in opposed facing relation to an end face of said second tubular member, coupling means connecting said tubular members together for pivotal movement with respect to each other about a fixed axis corresponding essentially to said apex axis, from a first position in which surfaces of the end faces of the tubular members on one side of the apex axis engage each other, deformable seal means adjacent said end faces for sealing said ends throughout movement between said first and second positions, and adjustment means externally of and connected between said tubular members for selectively pivoting said tubular members about said fixed axis to any selected position between said first and second positions, while liquid is flowing through said tubular members, said adjustment means including means for maintaining said tubular members at the selected position of adjustment.

#### 4,421,280 FUEL INJECTOR

Donald J. Lewis, Troy, and Jack R. Phipps, St. Clair Shores, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 28, 1981, Ser. No. 306,258

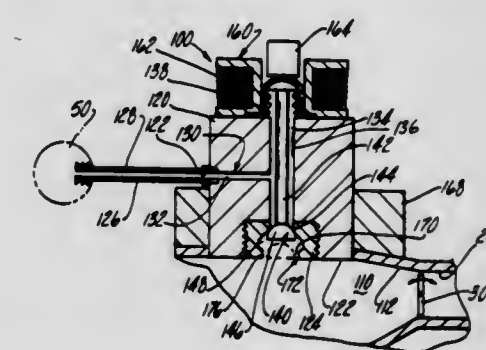
Int. Cl.<sup>3</sup> B05B 1/32

U.S. Cl. 239—585

12 Claims

1. A fuel injector responsive to activation signals comprising:

a body adapted to receive pressurized liquid petroleum gas (LPG) fuel;  
valve means, operatively connected to said body for defining in cooperation with said body an exit orifice and for selectively permitting said fuel to exit therefrom including first means for developing a pressure drop to allow said fuel to vaporize upon ejection therefrom and for causing such vaporization to occur at or beyond said exit orifice for limiting the flow of heat from said fuel injector due to the cooling effect associated with such vaporization;  
a conduit system, within said body, for communicating fuel to said valve means;  
plunger means operatively connected to said valve means for selectively opening and closing said valve means;



electromagnet means, connected to said plunger means for moving said plunger means in response to activation signals input thereto; and

bellows means having an effective bellows area, attached to said body and forming an expandable portion of said conduit system for pressure balancing the effective bellows area and the exit area of said exit orifice so that variations in the pressure within said conduit system will not cause said valve means to prematurely open for pressure balancing the pressure forces applied to said valve means and to said plunger means to maintain the electromagnetic force needed to open said valve means at a relatively constant value and for biasing said plunger means in a direction to close said valve means during non-fuel injecting periods.

#### 4,421,281 CONTAINERS AND HOLDERS THEREFOR FOR USE IN ELECTROSTATIC SPRAYING

Ronald A. Coffee, Haslemere, and Peter C. Bennett, Churt, both of England, assignors to Imperial Chemical Industries PLC, London, England

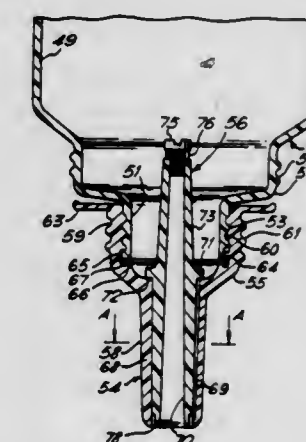
Filed Nov. 3, 1981, Ser. No. 317,852

Claims priority, application United Kingdom, Nov. 11, 1980, 8036174

Int. Cl.<sup>3</sup> B05B 5/02

U.S. Cl. 239—690

6 Claims



1. A container for mounting on a holder for the electrostatic



spraying of liquids said container including a vessel having a neck and an electrically-conductive nozzle in said neck having a body, a mouth for dispensing liquid from the vessel and a permanent predetermined air-bleed for feeding air into the vessel:

- said body comprising vertically aligned co-axial outer and inner tubes, the outer tube being shorter and having a height at least twice its diameter and said inner tube having an upper end extending at least into the neck of the vessel;
- said mouth being formed by the radial gap between adjacent lower ends of the tubes;
- ribs being provided on the surface of one tube to space it from the second tube and to form channels communicating with the vessel to deliver liquid therefrom to the mouth; and
- said air-bleed comprising a bung supported within the bore of the upper end of said inner tube, the bung and the bore co-operating to provide a predetermined non-adjustable extended pathway through which air can enter the vessel.

4,421,282

# APPARATUS FOR FORMING AND PACKAGING MULTISTRAND ROVING

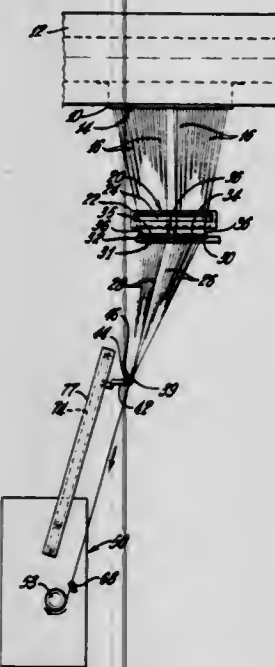
Charles D. McKinney, III, Anderson, S.C., assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Continuation of Ser. No. 287,011, Jul. 27, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 477,596

Int. Cl.<sup>3</sup> B65H 54/02, 54/20

U.S. Cl. 242—18 G

8 Claims



1. Apparatus for packaging a roving comprised of a plurality of strands of fibers comprising, a primary strand guide having means separating the strands and maintaining the strands in spaced relation, a secondary strand guide engaging the strands below the primary guide, a winding apparatus including a rotating collector upon which the roving is wound into a package, an elongated support member arranged in substantial parallelism with the axis of movement of the strands toward the rotating collector, relatively movable means mounted by the elongated support member connected with the secondary guide, said relatively movable means arranged to move the secondary guide from an uppermost position to a lowermost position, a substantially horizontal reciprocable member connected with the elongated member and supporting the elongated member, motive means mounted by the horizontally reciprocable member for moving the secondary guide lengthwise of the elongated support member, a rotatable and reciprocable traverse means disposed adjacent the collector for converging the strands into a roving and distributing the roving lengthwise of the package, and means for laterally reciprocating the elongated support member and secondary guide in synchronism with the reciprocations of the traverse means.

ing the elongated support member and secondary guide in synchronism with the reciprocations of the traverse means.

4,421,283

# STRIP RECOILING APPARATUS

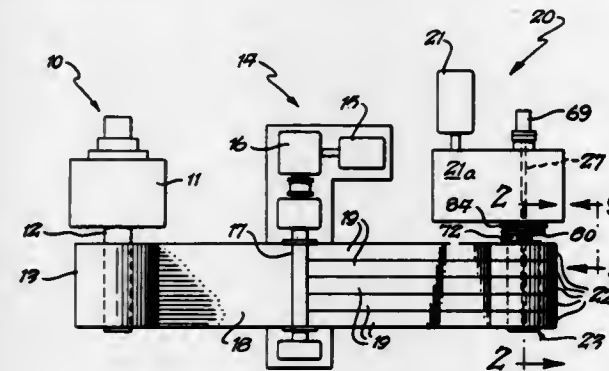
John W. Rippin, Streetsville, Canada, assignor to Pro-Eco Limited, Mississauga, Canada

Filed Jun. 23, 1981, Ser. No. 276,675

Int. Cl.<sup>3</sup> B65H 19/04, 75/24

U.S. Cl. 242—56.9

8 Claims



1. In a strip recoiling drum including sidewalls movable between radially inner and outer positions whereby the circumference of the drum may be varied and further including a longitudinal gripping slot having a movable gripper capable of engaging an end of a strip placed in the slot; the improvement comprising engaging means including first extensible and retractable means capable, while said drum is rotating, of causing said sidewalls to move towards said radial outer position to expand said drum, and also being capable of simultaneously causing said gripper to engage the end of a strip of material; and releasing means including second extensible and retractable means spaced away from said first extensible and retractable means and capable, while said drum is rotating, of causing said sidewalls to move towards said radial inner position to contract said drum, and also being capable of simultaneously causing said gripper to release the end of a strip of material.

4,421,284

# REELING OF CABLE

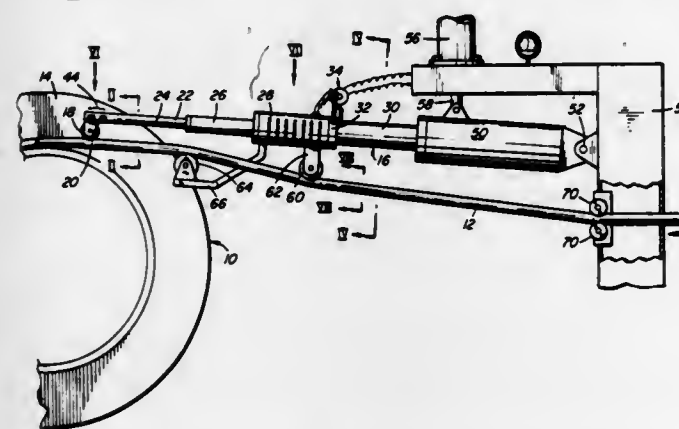
Ali Pan, Storrington, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 19, 1981, Ser. No. 294,405

Int. Cl.<sup>3</sup> B65H 54/28

U.S. Cl. 242—158 R

25 Claims



1. A cable laying apparatus comprising a mounting for a reel in a reel mounting position; means to rotate the mounted reel about its axis; a cable guide mechanism incorporating guide roller means carried upon a support on one side of a pass line

for cable as it is wound onto the reel, and a traversing means to relatively traverse the guide roller means and the reel mounting in one direction to provide one layer of windings and then in the opposite direction to provide a succeeding layer of windings; force applying means to apply a force through the guide roller means and through the feedpath at an angle to both the direction of relative traverse and to a plane normal to the reel axis, said force having a first component opposite to the direction of relative traverse of the guide roller means and a second component inwardly towards said reel axis so as to urge cable as it is wound onto the reel both inwardly of the reel against windings of a previous layer and axially against the previous winding of the layer being formed; and means operable at the end of each traverse to change the direction of traverse and the direction of said force relative to said plane by changing the first component of the force to correspond to the change in the direction of traverse.

4,421,285

# FISHING REEL

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

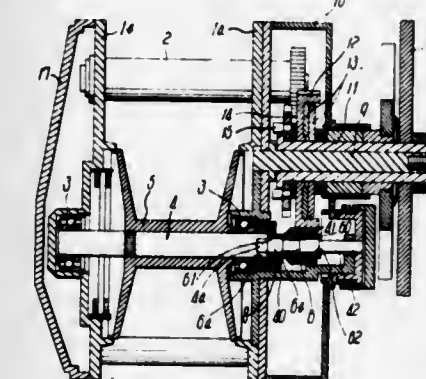
Filed Oct. 27, 1981, Ser. No. 315,459

Claims priority, application Japan, Nov. 15, 1980, 55-163674[U]

Int. Cl.<sup>3</sup> A01K 89/00

U.S. Cl. 242—221

3 Claims



1. A fishing reel comprising: a reel body having a pair of side walls opposite to each other; a spool shaft having a spool shaft journaled to said side walls at said reel body, said spool shaft having a projecting shaft portion projecting axially outwardly from one of said side walls; and drive mechanism for driving said spool shaft, said drive mechanism having a handle bar, a master gear driven by operation of said handle bar, a tubular pinion having a through bore in mesh with said master gear and a clutch means releasably coupling said pinion with said spool shaft so that rotation of said pinion induces rotation of said spool shaft when said pinion and spool shaft are coupled; said pinion being supported axially slidably and rotatably to said projecting shaft portion which passes through said through bore, said clutch means uncoupling said pinion and spool shaft when said pinion slides in a first direction and coupling said pinion and spool shaft when sliding in a second direction, said pinion being provided at an axially intermediate portion of its inner periphery with at least one annular recess and at both axial sides of said recess with at least first and second bearing portions in contact with the outer periphery of said projecting shaft portion, said projecting shaft portion having a first, smaller diameter portion larger in axial length than said first bearing portion at the outer periphery of said projecting shaft portion and at a position opposite to said first bearing portion when said pinion axially slides to allow said spool shaft to freely rotate.

4,421,286

# MOORING SYSTEM

Tibor Laky; William C. Lane, both of Dallas, and Kebbie J. Turner, Sr., Frisco, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

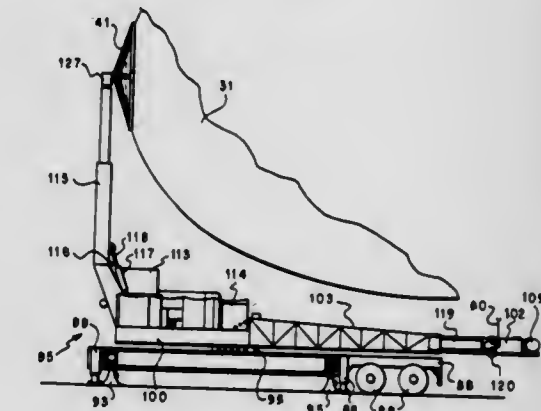
Continuation of Ser. No. 63,059, Aug. 2, 1979, abandoned, which is a continuation of Ser. No. 235,457, Feb. 18, 1981, abandoned.

This application Jul. 6, 1982, Ser. No. 395,116

Int. Cl.<sup>3</sup> B64F 1/14

U.S. Cl. 244—116

17 Claims



1. A mooring system for an aerostat, comprising: a. a platform means supported on a bearing; b. a mast structure extending from the platform means; c. a main winch system mounted on the platform means for releasing and retrieving the aerostat; d. means for rotating the platform on the bearing; e. the mast structure further comprising a vertical section with a nose receptacle mounted thereon, the nose receptacle being adapted to engage the aerostat, outriggers extending horizontally from the platform and spaced radially from each other, and means for securing the aerostat to the outriggers; f. fairlead sheave means for a tether line from the main winch system to the aerostat; and g. movable support means for the fairlead sheave means for adjusting the distance between the mast structure and the fairlead sheave means to accommodate various aerostat sizes.

4,421,287

# HELICOPTER CYCLIC STICK MIDPOSITION FEEL INDICATOR

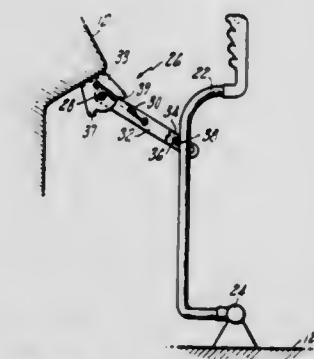
Ronald A. Durno, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 16, 1981, Ser. No. 322,105

Int. Cl.<sup>3</sup> B64C 13/08, 29/02

U.S. Cl. 244—223

2 Claims



1. A helicopter having: a fuselage; a multi-bladed rotor mounted for rotation from said fuselage about an axis of rotation and comprising: a plurality of variable pitch helicopter blades mounted to rotate as part of said rotor to establish the rotor plane



and responsive to cyclic pitch change to selectively tilt the rotor plane to various positions including a horizontal position in which the rotor plane is substantially parallel to the ground when the helicopter is on the ground, and a forward tilt plane position in which the blades sweep close to the ground;

a cyclic control stick operatively connected to vary blade pitch cyclically and mounted for universal motion about a fixed point in said fuselage and having a midposition which causes the rotor plane to be in said horizontal position;

a cyclic stick "feel" position indicator comprising an over-center toggle means pivotally supported in the fuselage so as to be manually pivotable between a first position in which the "feel" position indicator is clear of the cyclic stick sufficiently so that the cyclic stick can be moved without interference throughout its entire motion pattern, and a second position in which the "feel" indicator abuts the cyclic stick when the cyclic stick is in its midposition, such that the cyclic stick is continuously free for only intentional pilot imposed universal motion about said fixed point, said "feel" position indicator having a biasing spring operatively connected to bias the toggle means in each of its first and second positions and being of selected spring rate so that if the pilot inadvertently attempts to move the cyclic stick forward of its midposition when the feel indicator is abutting the cyclic stick, he "feels" the resisting force of the biasing spring, but the spring rate of the biasing spring permits the pilot to overpower that resisting force and move the cyclic stick forward and, hence, cause the rotor to move from its horizontal position to its forward tilt plane position by manually applying sufficient force to the cyclic stick, and further so that pilot imposed motion of the cyclic stick forward of its midposition by a predetermined amount with said "feel" position indicator in its second position, will automatically cause said indicator to move to its first position due to the force applied thereto by the biasing spring member.

4,421,288

## SUCTION CUP

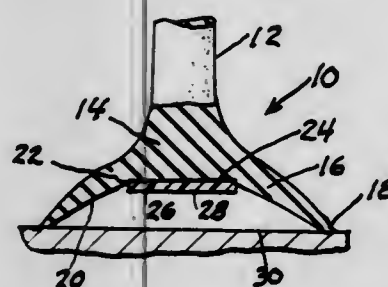
Henry Blaszkowski, P.O. Box 114, Southfield, Mich. 48034

Filed Jan. 19, 1981, Ser. No. 226,074

Int. Cl.<sup>3</sup> F16B 47/00

U.S. Cl. 248—206 R

10 Claims



1. A suction cup formed of a resiliently flexible material and having an upwardly concave side, said concave side having a generally flat central portion surrounded by a depending outwardly flaring annular skirt which forms the major portion of the concave side of the cup, said central portion having a pressure sensitive adhesive surface with an overlying strippable cover sheet thereon, the outer flat face of said cover sheet lying in a plane closely adjacent the surrounding portion of the concave side of the cup so that when the cup, said adhesive surface being substantially flush with the inner face of the suction cup is pressed firmly against a flat face the annular skirt is adapted to be flattened into coplanar relation with the cover sheet (or said adhesive surface if the cover sheet is removed) whereby a minimum of air is trapped between the suction cup and said flat surface and as a result thereof the degree of suc-

tion obtainable with the cup is not diminished by the presence of said adhesive surface with or without the cover sheet.

4,421,289

## SHELF SUPPORT

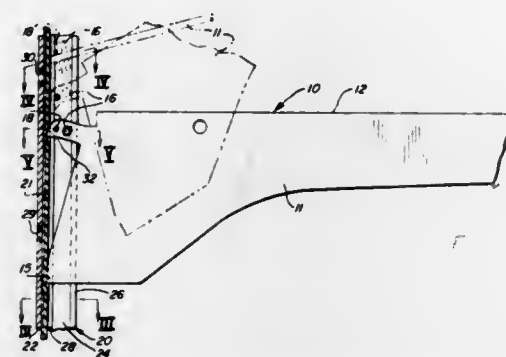
William I. Sturm, Niles, Ill., assignor to SP Industries, Inc., Chicago, Ill.

Filed Feb. 22, 1982, Ser. No. 350,868

Int. Cl.<sup>3</sup> A47G 29/02

U.S. Cl. 248—246

7 Claims



1. A shelf support comprising: a bracket for extending generally horizontally and forwardly from a wall to support a shelf or the like and including first and second support portions at a rearward end thereof, an elongated support adapted to be secured to a wall and defining first and second support portions for engagement with said first and second support portions of said bracket when said bracket is in a shelf support position, a downward force on the forward portion of said bracket being then effective to develop a torque in one direction pressing said first support portion of said bracket against said first support portion of said support while pressing said second support portion of said bracket against said second support portion of said support, and lock means operative in response to movement of said bracket to said shelf support position to lock said bracket in said shelf support position, said lock means being operative to develop a torque acting in said one direction on said bracket independently of and in addition to any torque developed from the weight of said bracket and any force applied by a shelf thereagainst to firmly press said first and second support portions of said bracket into engagement with said first and second support portions of said support, said lock means being releasable upon upward pivotal movement of said bracket away from a shelf support position into a release position in which the forward end thereof is positioned upwardly with respect to said rearward end thereof, said lock means being in the form of an over-center spring device operable when said bracket is above a position intermediate said shelf support and release positions to urge said bracket upwardly and operable when said bracket is below said intermediate position to urge said bracket downwardly toward said shelf-support position.

4,421,290

## SUPPORT LEG FOR MOBILE CONVEYORS

Xaver Frank, Reuthe 86 1, Lengenwang 8951, Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,464

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016035; Dec. 4, 1980, 8032342[U]

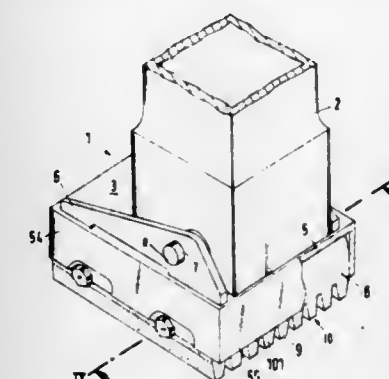
Int. Cl.<sup>3</sup> F16M 13/00

U.S. Cl. 248—558

18 Claims

1. A leg support for a device subject to vibration and movement, said leg support including a substantially flat lower support shoe, a sole member comprising a single block or elastomeric material and including first and second parallel faces, said first and second faces of said block of elastomeric material being adapted to contact said lower support shoe, and said first and second faces of said block of elastomeric material

including substantially uniform treads comprising a plurality of parallel grooves thereacross said grooves including a base portion, whereby upon supporting said device on a surface with said sole member being reversible with either said first or said second face thereof being in contact with said lower support shoe and with said surface, respectively, said sole member may adapt to variations in said surface and to vibrations and movement of said device, support means for detachably maintaining said sole member in a predetermined position in contact



with said lower support shoe, said support means comprising at least one pair of parallel side wall members depending from said lower support shoe so as to encompass said sole member between said side wall members, and support flange means projecting from said lower support shoe and having a pattern corresponding to said grooves in said sole member, whereby said support flange means contacts said base portion of said grooves when said sole member is in contact with said lower support shoe.

4,421,291

## DEVICE TO COMPENSATE FOR CRITICAL SPEEDS OF MACHINES

Martin Schluchter, Birr, and Paul Schröder, Wettingen, both of Switzerland, assignors to BBC Brown, Boveri &amp; Company, Limited, Baden, Switzerland

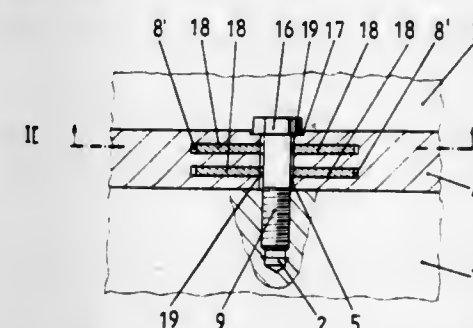
Filed Jul. 1, 1980, Ser. No. 165,061

Claims priority, application Switzerland, Jul. 3, 1979, 6190/79

Int. Cl.<sup>3</sup> F16M 13/00

U.S. Cl. 248—635

4 Claims



1. A vertical electrical machine for compensating for critical speed characteristics thereof comprising:

a base;

a casing;

a flange member having at least one borehole formed therein interconnecting the casing with said base, said flange member having at least one laterally accessible recess formed therein on a side portion of said flange member; at least one plate-shaped elastic element having a borehole formed therein mounted in said at least one recess, the thickness of said elastic element substantially corresponding to the height of the at least one recess; and fastening means extending through said borehole formed in said flange member and the elastic element for pressing said flange member onto said base.

4,421,292

## AIR-OPERATED OIL PRESSURE CONTROL VALVE

Takahiro Matsui, Uji, and Jun Tamura, Yahata, both of Japan, assignors to Kabushiki Kaisha Morita Selsakusho, Kyoto, Japan

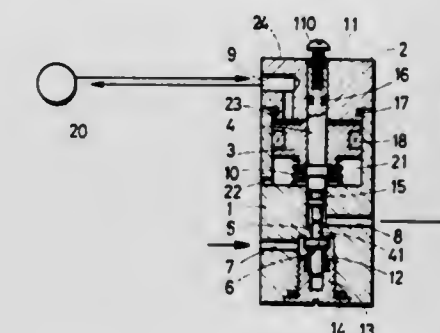
Filed Mar. 31, 1981, Ser. No. 249,387

Claims priority, application Japan, Jun. 18, 1980, 55-85337[U]

Int. Cl.<sup>3</sup> F16K 31/124

U.S. Cl. 251—60

2 Claims



1. An air operated oil pressure control valve for a dental treatment bed comprising:

a valve body;

a cover fixed to said valve body;

a piston slidably provided between the valve body and the valve cover;

a first valve rod fixed to said piston;

a valve stopper operated by said first valve rod which freely opens and closes a valve port provided inside of the valve body;

an oil inlet port and an oil outlet port which respectively are opened by said valve port and are provided in said valve body;

an air inlet port provided in said cover to allow compressed air to act on said piston;

a spring for biasing said piston in a direction reversed to the action of said compressed air;

a regulator means for controlling the vertical stroke of said first valve rod;

a second valve rod provided in said valve body to butt against said first valve rod;

a second valve stopper provided on said second valve rod; and

a second spring provided on said second valve rod for biasing said second valve stopper in a direction to close said valve port;

whereby said valve port closes said oil inlet port and said oil outlet port when compressed air is not applied to said pressure control valve and said oil inlet port and oil outlet port are opened by the opening of said valve port when compressed air is applied so that oil may pass between said oil inlet port and said oil outlet port.

4,421,293

## END CAP ASSEMBLY

Ulrich H. Koch, Chagrin Falls, and Gerald A. Babuder, Mentor, both of Ohio, assignors to Whitey Co., Highland Heights, Ohio

Filed Sep. 28, 1981, Ser. No. 305,966

Int. Cl.<sup>3</sup> F16K 31/126; F16J 3/02

U.S. Cl. 251—61.4

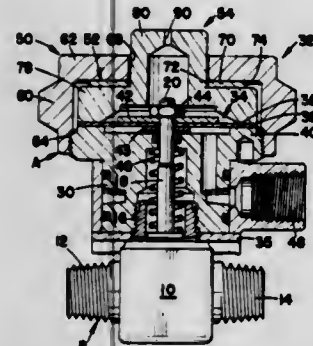
12 Claims

1. In a valve actuator of the type including an actuator body having one end thereof adapted for connection to and communication with a valve body such that an elongated valve operating stem protruding outwardly from the valve body extends from the actuator body one end toward an opposite open end; a flexible diaphragm disposed across the actuator body and adapted for operative connection to a valve operating stem adjacent the outermost end thereof, the diaphragm including a band-like margin adjacent the outer periphery thereof having



one face supported adjacent the actuator body open end; means for introducing a fluid flow to at least one side of the flexible diaphragm for selectively causing diaphragm flexure whereby an associated valve actuating stem is linearly shifted for causing a valve member to be shifted between valve opened and closed conditions; and, an end cap threadedly secured to the actuator body for covering the open end thereof, the improvement comprising:

an end cap assembly including a cup-shaped nut including a side wall having an internally threaded area adapted for threaded receipt by said actuator body open end and a bottom wall having a centrally located aperture extending therethrough; a cap member received in said nut including



a radial flange portion and a central stub, said flange portion including means adapted for engaging the outer face of the diaphragm margin area with said stub extending outwardly through said nut aperture; biasing means interposed between said nut bottom wall and said cap member flange for continuously urging said engaging means axially toward retaining engagement with the margin area other face, said biasing means comprising a conical disc spring received over said stub intermediate said nut bottom wall and said cap member flange portion; and, said nut and cap member being dimensioned such that they are rotatable relative to each other such that said cap member may be retained generally stationary as said nut is threadedly advanced onto an associated actuator body.

4,421,294

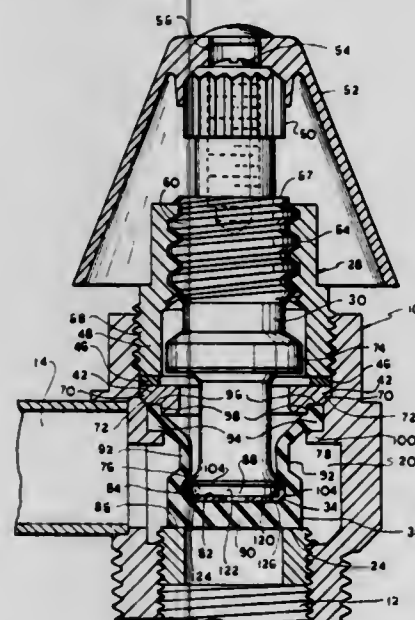
## VALVE DIAPHRAGM

Richard G. Parkison, and Edward G. Hofstetter, both of Louisville, Ky., assignors to American Standard, Inc., New York, N.Y.

Filed Aug. 13, 1981, Ser. No. 292,527  
Int. Cl.<sup>3</sup> F16K 7/16, 25/00

U.S. Cl. 251-86

14 Claims



1. In a valve structure for controlling fluid flow comprising

a valve assembly and a valve housing; said valve housing including a valve chamber incorporating fluid inlet and outlet conduits and a valve seat, and said valve assembly disposed within said housing and comprising a valve stem and stem collar; said valve stem movably engaged within said collar and extending beyond said collar at both ends and having a first intermediate radially expanded flange disposed about the intermediate portion of said valve stem and within said collar and a second radially expanded terminal flange spaced from said first flange and provided about the lower end of said valve stem and below the level of said collar; said intermediate and terminal flanges being connected by a constricted neck; an angular stop ring disposed about said valve stem and in spaced relation thereto below the level of said collar; a swivel bearing cup having a rim abutting said terminal flange of said valve stem; a resilient, compressible, annular valve diaphragm including a radially expanded end closure means, sealing ring and a constricted interconnecting neck, said end closure means being secured about said swivel bearing cup in spaced relation to that portion of said terminal flange encapsulated by said swivel bearing cup, said swivel bearing cup being disposed adjacent to said constricted neck of said valve diaphragm, and said closure means being adapted to seat on said valve seat to impede fluid flow through said valve chamber when said valve assembly is disposed in a closed position; said swivel bearing cup and valve diaphragm end closure means being adapted to move toward and away from said valve seat with corresponding axial movement of said valve stem; said valve stem being adapted to rotate independently of said swivel cup and said diaphragm in affecting said axial movement; said sealing ring being secured to said stop ring and mounted thereon in spaced relation about said valve stem; and said constricted interconnecting neck being adapted to axial expansion and contraction with movement of said stem, said swivel bearing cup and said diaphragm end closure means toward and away from said valve seat; the improvement that comprises a radial space provided between the upper portion of said neck of said valve stem and the inner diameter of said stop ring such that said space comprises up to about 160 percent of the thickness of said diaphragm neck to assist in preventing undue involution or collapse of said constricted neck of said valve diaphragm when said end closure means is withdrawn from said valve seat to prolong the life of said valve diaphragm.

4,421,295

## VALVE DIAPHRAGM

Richard G. Parkison, Louisville, Ky., assignor to American Standard, Inc., New York, N.Y.

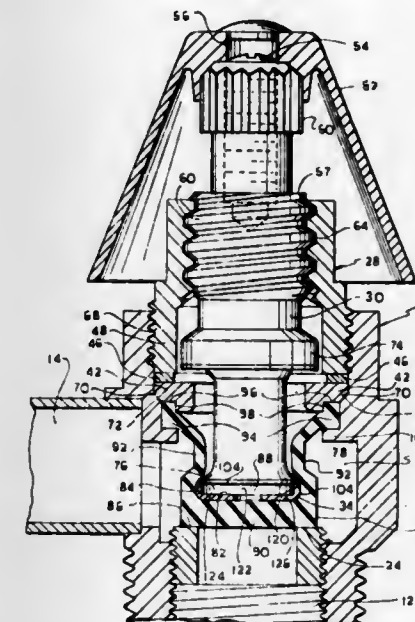
Filed Aug. 13, 1981, Ser. No. 292,595  
Int. Cl.<sup>3</sup> F16K 7/16, 25/00

U.S. Cl. 251-86

17 Claims

1. A valve structure for controlling fluid flow comprising a valve assembly and a valve housing; said valve housing including a valve chamber incorporating fluid inlet and outlet conduits and a valve seat, and said valve assembly disposed within said housing; and comprising a valve stem and stem collar; said valve stem movably engaged within said collar and extending beyond said collar at both ends and having a first intermediate radially expanded flange disposed about the intermediate portion of said valve stem and within said collar and a second radially expanded terminal flange spaced from said first flange and provided about the lower end of said valve stem and below the level of said collar; said intermediate and terminal flanges being connected by a constricted stem neck; an annular stop ring disposed about said valve stem and in spaced relation thereto below the level of said collar; a swivel bearing cup having a rim abutting said terminal flange of said valve stem; a resilient, compressible annular valve diaphragm including a radially expanded end closure means, sealing ring and a constricted interconnecting neck, said end closure means being secured about said swivel bearing cup in spaced relation to that portion of said terminal flange encapsulated by said swivel bearing cup, said swivel bearing cup being disposed adjacent to

said constricted neck of said valve diaphragm, and said closure means adapted to seat on said valve seat to impede fluid flow through said valve chamber when said valve assembly is disposed in a closed position; said swivel bearing cup and valve diaphragm end closure means being adapted to move toward and away from said valve seat with corresponding axial movement of said valve stem; said valve stem being adapted to



rotate independently of said swivel cup and said diaphragm in affecting said axial movement; said sealing ring being secured to said stop ring and mounted thereon in spaced relation about said valve stem; and said constricted interconnecting neck being adapted to axial expansion and contraction with movement of said stem, said swivel bearing cup and said diaphragm end closure means toward and away from said valve seat.

4,421,296

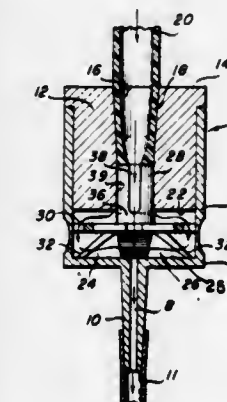
## DISPOSABLE PLASTIC RECIPROCATING VALVE

James W. Stephens, Memphis, Tenn., assignor to Medical Valve Corporation, Memphis, Tenn.

Continuation-in-part of Ser. No. 169,642, Jul. 17, 1980, abandoned. This application Aug. 11, 1981, Ser. No. 291,948  
Int. Cl.<sup>3</sup> F16L 37/28

U.S. Cl. 251-149.7

4 Claims



1. A reciprocating valve comprising,

a generally cylindrical hollow casing enclosing a valve chamber defined between axially-spaced inner walls of said casing, one of which walls constitutes a valve seat, said casing having a bore extending axially therein from one end thereof and through said seat into said chamber, a reciprocating valve comprising a disc disposed in said chamber, said disc having port means therethrough, stem means on one side thereof reciprocable in said bore, and spring leg means on the other side thereof for engaging the other inner wall of said chamber so as normally to force said disc in seating engagement against said seat,

service port means for said chamber, said stem means having an open hollow free end portion constituting a service port for receiving a fluid coupling member, a closed end portion integral with said disc, and port means extending from the hollow free end portion to the periphery of the stem,

said port means through the stem and disc being normally masked by the wall of said bore and said seat, respectively, when said spring legs force the valve in one direction to engage the disc against said seat, and being open when said fitting engages into said stem socket and forces the valve member in the other direction against the forces of said spring legs so as to space the disc from the seat and thereby unmask the port means therethrough while moving the port means in the stem beyond the wall of the bore and thereby unmask the same whereby to establish a fluid path from the socket, the port means in the stem, the space between the disc and the seat, the port means in the disc, the valve chamber, and the service port means for the chamber.

4,421,297

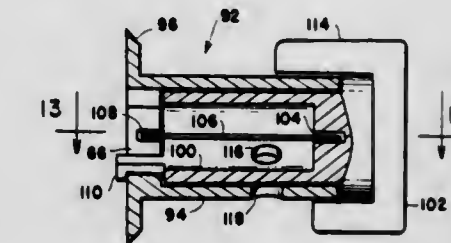
## SELF-CLOSING FLUID DISPENSING VALVES

Robert G. Pongrass, #2A Bulkara Rd., Bellevue Hill, New South Wales, Australia, and Christopher C. Rutter, 24174 Dover La., Hayward, Calif. 94541

Filed Nov. 2, 1981, Ser. No. 317,060  
Int. Cl.<sup>3</sup> F16K 5/00

U.S. Cl. 251-310

3 Claims



1. A self-closing fluid dispensing valve comprising:

a tubular housing having first and second open ends, said first end having a flange in a plane perpendicular to the longitudinal axis of said tubular housing for attaching and sealing said housing to the exterior wall of a fluid container, said housing having a fluid dispensing radial opening through the wall adjacent said second end; a tubular barrel coaxially rotatable within the bore of said tubular housing, said barrel having a first open end within said housing and a second closed end adjacent the second end of said housing, said closed end having attached thereto a manually operable handle for rotation of said barrel, said barrel having a fluid dispensing radial opening positioned for coaxial alignment with the radial opening in said housing; and

resilient means within the bore of said tubular barrel said means having a first end coupled to said tubular housing and a second end coupled to said tubular barrel, said resilient means providing a rotational force for rotating said housing and said barrel to an off position where their respective fluid dispensing radial openings are not aligned.

4,421,298

## Y PATTERN VALVE

Edmund Kujawski, Coleridge Pl., Greenlawn, N.Y. 11740  
Filed Mar. 4, 1981, Ser. No. 240,601

Int. Cl.<sup>3</sup> F16K 31/44

U.S. Cl. 251-368

13 Claims

1. A Y pattern valve for controlling a gas flow, comprising: a valve body having;



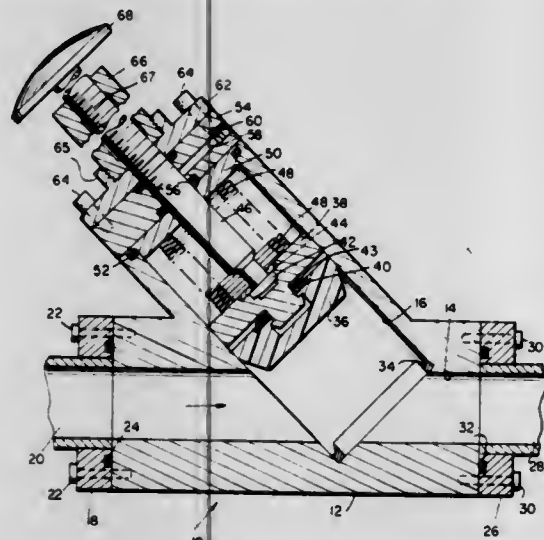
a first inner cylindrical chamber having an inlet port and an outlet port for said gas flow;

a second inner cylindrical chamber intersecting said first inner cylindrical chamber at an oblique angle, said second inner cylindrical chamber having a diameter substantially greater than the diameter of said first inner cylindrical chamber in order to provide ledge means for supporting; valve seat means disposed at said intersection and on said ledge means; and

a substantially rectilinear valve stem coaxially disposed within said second inner cylindrical chamber and having affixed thereto inner terminal valve seal means, whereby inwards axial movement of said valve stem causes said valve seal means to engage said valve seat means so that said gas flow is controlled;

said valve seal means comprising a terminal flexible and resilient valve seal member and a valve plug disposed between the terminus of said valve stem and said valve seal member, said valve plug being mounted to the terminus of said valve stem, said valve seal member being mounted to said valve plug;

said valve seat means having a sharp angled outer edge which engages said valve seal member, so that a portion of said valve seal member rolls over the outer edge or lip of said valve seat means and flows along the inclined surface of said valve seat means, to provide a wiping of said valve seat means by said valve seal member, whereby any solid



particulate matter which has accumulated is removed, and so that the collection of any solid particulate matter on said valve seat means is minimized;

together with a bearing washer and a dished washer, said bearing washer being coaxially positioned on the surface of said valve seal member between said valve seal and said valve plug, said dished washer being coaxially positioned between said bearing washer and said valve plug, with the concave side of said dished washer facing said bearing washer;

so that when said valve seal means engages said valve seat means, said valve seal member enters the interior of said valve seat means, and said dished washer is caused to flatten out, so as to prevent said valve stem from jamming said valve seal member into said valve seat means;

and together with a vacuum sealing closure bellows, said bellows extending coaxially and concentrically about said stem and between said valve plug and a backing plate portion of said valve body, said backing plate portion being disposed at the outer end of said second inner cylindrical chamber and extending transversely to said stem, said vacuum sealing closure bellows providing closure sealing against vacuum loss while permitting axial movement of said stem and appurtenances thereto, with one end of said bellows being attached in a gas-tight manner to said valve plug, and the other end of said bellows being attached in a gas-tight manner to said backing plate portion of said valve body.

4,421,299

## WINDOW CABLE DRIVING MECHANISM

Hans-Peter Hess, Coburg, Fed. Rep. of Germany, assignor to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany

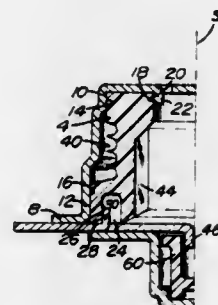
Filed Feb. 25, 1981, Ser. No. 238,142

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008296

Int. Cl.<sup>3</sup> B66D 1/04; E05F 11/48

U.S. Cl. 254—342

4 Claims



1. A window cable driving mechanism particularly for a motor vehicle comprising: a base plate; a cable drum supported at one side of said base plate, said cable drum having an annular configuration with a hollow internal portion provided with a toothed construction; pinion means located in said hollow internal portion engaging in said toothed construction of said cable drum; crank bolt means connected to drive said pinion means; coiled spring brake means located at the side of said base plate opposite said cable drum connecting said crank bolt in driving engagement with said pinion means to drive said cable drum through said pinion means; bracket means attached to said base plate enclosing said cable drum; lug means bent to extend from said bracket means for defining supporting bearing surface means at which said cable drum is rotatably supported, said cable drum further comprising rolling surface means extending parallel to the axial direction of said cable drum for engaging said bearing surface means to rotatably support said cable drum in said driving mechanism; housing means fastened to said base plate on a side thereof opposite said one side, said housing means having said coiled spring brake means located therein; said pinion means extending through said cable drum and being supported at one end thereof on said bracket means and at an opposite end thereof on said base plate, with a centrally located internal bore being provided in said pinion means at said opposite end; said crank bolt means being supported in said housing and extending interiorly thereof into supported engagement in said internal bore of said pinion means.

4,421,300

## VEHICLE RAMP

Phillip L. Lundman, 419 Wheeler Ave., Fredonia, Wis. 53021

Filed Mar. 22, 1982, Ser. No. 360,629

Int. Cl.<sup>3</sup> E02C 3/00

U.S. Cl. 254—88

1 Claim

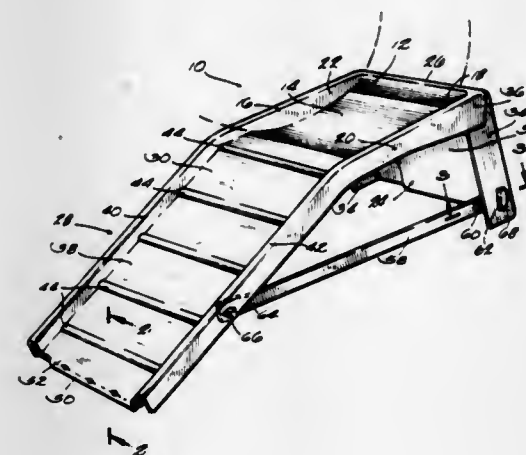
1. A vehicle ramp adapted to rest on a supporting surface and for supporting a vehicle wheel, the vehicle ramp comprising

a platform having a generally horizontal upper surface adapted to support the wheel of a vehicle, said platform having a forward portion and a rearward portion, and said platform including lateral edges extending between said forward portion and said rearward portion, and means for rigidifying each of said lateral edges, said means for rigidifying comprising a channel including an inner elongated vertical side wall having a lower edge joined to said lateral edge of said platform, an outer side wall spaced outwardly from said inner side wall, and a bite portion joining

the upper edges of said inner elongated vertical side wall and said outer side wall,

a single generally vertical leg having an upper end supporting said platform rearward portion, and said vertical leg including opposite generally vertical side walls, said side walls of said leg each including a slot therein,

an inclined ramp adapted to support a vehicle wheel for movement up to said platform, said inclined ramp including a longitudinal axis and having opposite sides, a lower end adapted to engage the ground, and an upper end joined to said forward portion of said platform, said lower end of said inclined ramp including means for engaging the supporting surface as a vehicle wheel engages said lower end of the inclined ramp and applies a downward force on the said lower end and so as to prevent movement of the vehicle ramp away from the wheel as the wheel moves up the inclined ramp, said means for engaging the supporting surface including a blade having a lower edge adapted to engage said supporting surface when weight is placed on said lower end, said blade lower edge extending transversely to the longitudinal axis of said inclined ramp, and said blade being an integral portion of said lower end of said inclined ramp, said inclined ramp including an inclined surface adapted to support a wheel



for movement to said platform and lateral edges generally parallel to the longitudinal axis of said inclined ramp, means for rigidifying each of said lateral edges, said means for rigidifying comprising channels integrally joined to said channels of said platform so as to form continuous elongated reinforcing means,

said platform, said leg, and said inclined ramp having a one piece unitary construction and being integrally joined together and formed from a single continuous stamped sheet metal plate, and means for joining said leg intermediate the opposite ends of said leg to said inclined ramp intermediate said upper end and said lower end of said inclined ramp, said means for joining including an elongated brace member having opposite ends, one of said ends having generally flat portion offset from the longitudinal axis of the brace member in order to be slidably inserted into said slot in one of said side walls of said leg when said elongated brace member is held in a first position and also being adapted to be locked in said slot against removal when said elongated brace is moved from said first position to a second position wherein the opposite end of said brace member engages a side of said ramp, and means for securing said opposite end of brace member to the said side of said ramp.

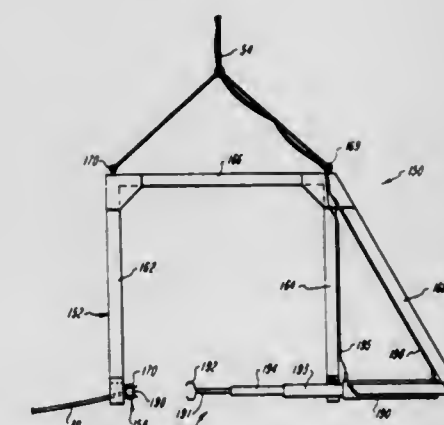
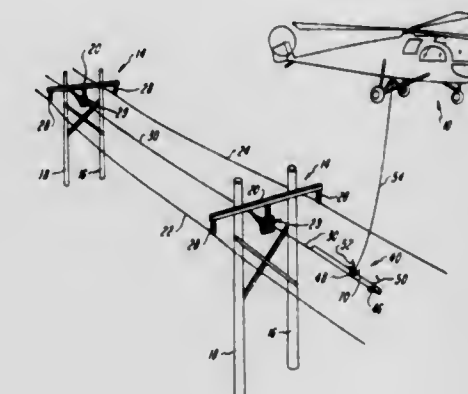
4,421,301

APPARATUS AND METHODS FOR LINE STRINGING  
Claude L. Chapman, 3300 W. Union, Englewood, Colo. 80110  
Division of Ser. No. 103,348, Dec. 13, 1979, Pat. No. 4,328,952.  
This application Apr. 1, 1982, Ser. No. 364,529

Int. Cl.<sup>3</sup> B66D 1/36

U.S. Cl. 254—134.3 R

2 Claims



1. A method of aerially stringing a threading line through a series of towers comprising the steps of:

connecting the lower end of a hoist line to a stringing member to suspend the stringing member from the hoist line and an aircraft;

connecting a threading line to the stringing member and maintaining the threading line taut to keep the stringing member in a generally straight-ahead position while suspended by the aircraft; and

advancing the stringing member and attached threading line through a window-like line-holding structure on a tower by manipulation solely from the upper end of the hoist line while being suspended continuously from above by said hoist line while maintaining the threading line taut without changing the length of the threading line, and repeating said advancing for each successive tower without changing stringing members for each successive tower through which said threading line is advanced.

4,421,302

## PREFABRICATED ADJUSTABLE HANDRAIL ASSEMBLY

William G. Grimm, 29974 Paint Brush Dr., Evergreen, Colo. 80439, and Ronald W. Pott, 730 Crescent La., Lakewood, Colo. 80215

Filed Jan. 30, 1981, Ser. No. 229,888

Int. Cl.<sup>3</sup> F04H 17/14; F16B 9/00; F16C 11/00; F16D 1/12

U.S. Cl. 256—67

14 Claims

1. An adjustable, prefabricated handrail assembly comprising:

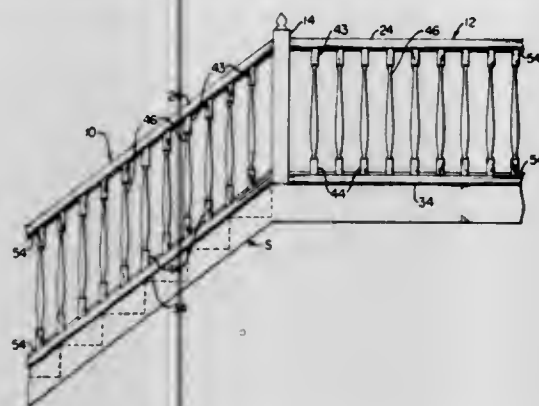
a pair of upstanding end supports;

a rail having a channel portion extending its substantial length;

a plurality of balusters, and means pivotally connecting at



least one end of each of said balusters in spaced relation to one another along the length of said rail in concealed relation within said channel for pivotal movement in a direction lengthwise of said rail; and fastener means interconnecting each end of said rail to one of said end supports such that said balusters extend vertically in spaced parallel relation to one another irrespective of



the pitch of said rail, each said fastener means defined by a bracket affixed to the inner closed end of said channel portion, said bracket including a connecting end portion having an externally curved surface engageable with the side surface of one of said end supports, and a male connector extending through an open slotted portion in each said connecting end portion interconnecting said bracket to said end support.

4,421,303

## COOLING TOWERS

Sydney P. S. Andrew, Hartlepool, England, assignor to Imperial Chemical Industries PLC, London, England

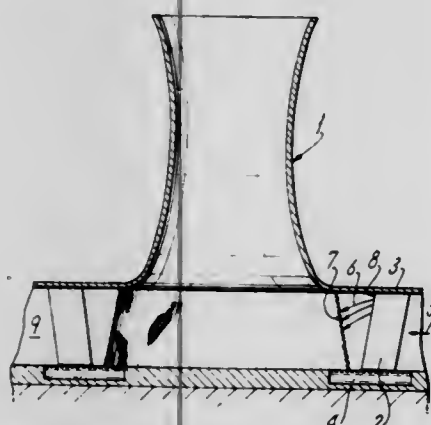
Filed Dec. 1, 1981, Ser. No. 326,413

Claims priority, application United Kingdom, Dec. 10, 1980, 8039610

Int. Cl.<sup>3</sup> B01D 47/00

U.S. Cl. 261—109

4 Claims



1. A cross-flow cooling tower having a packing down which the liquid to be cooled flows disposed as an annulus around a central chimney characterised by a perforate sheet member in which the individual perforations have an area within the range of 0.1 to 1 cm<sup>2</sup>, and a maximum dimension in the range 0.1 to 2 cm, and the total area of the perforations is at least 50% of the total area of the perforate sheet member, said sheet member extending across the air flow path inside the space enclosed by the inner perimeter of said annulus and adjacent to, but spaced from, said packing such that, as the air flow through said packing increases thereby tending to blow liquid flowing down the packing off the packing as a spray, the degree of obscuration of said perforated sheet member increases as a result of said spray encountering said perforate sheet member partially blocking said perforations thereby blocking the air flow path.

#### 4,421,304 APPARATUS FOR CONTROLLED TEMPERATURE ACCUMULATOR FOR ELONGATED MATERIALS

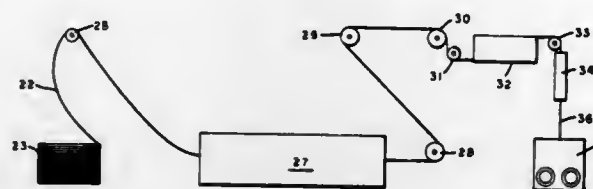
Jerry M. Hesterlee, Carrollton, Ga., assignor to Southwire Company, Ga.

Filed Dec. 21, 1981, Ser. No. 332,991

Int. Cl.<sup>3</sup> C21D 9/36

U.S. Cl. 266—103

8 Claims



1. High speed thermal treatment apparatus for a continuously variable length of a continuously advancing elongated metallic wire material comprising:

- a cylinder having an outer surface, a proximal first end, a distal second end, and a longitudinal axis;
- a predetermined path for the continuously advancing elongated metallic wire material which includes a helical path formed by a continuously variable number of wraps circumferentially contacting said cylinder surface beginning adjacent the proximal end thereof and concluding adjacent the distal end thereof;
- means to rotate the cylinder about its longitudinal axis;
- heat source means for heating said cylinder to a temperature value within a range of predetermined thermal treatment temperature values;
- first guide means for adding a variable number of wraps around the cylinder by directing the continuously advancing elongated metallic material tangentially into contact with the cylinder surface at the proximal end thereof; and
- second guide means for removing a variable number of wraps from around the cylinder by directing the continuously advancing elongated metallic material (tangentially) tangentially away from the cylinder surface at the distal end thereof.

wherein the length of wire wrapped around the accumulating cylinder is continuously variable by rotation of said first and second guide means about the cylinder axis.

4,421,305

## WORKPIECE HOLDING AND ALIGNMENT DEVICE

Wojciech B. Kosmowski, San Juan Capistrano, Calif., assignor to Cooper Industries, Inc., Houston, Tex.

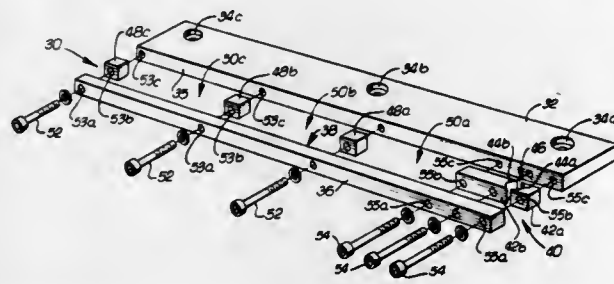
Continuation of Ser. No. 236,847, Feb. 23, 1981, abandoned.

This application May 17, 1983, Ser. No. 494,687

Int. Cl.<sup>3</sup> B23Q 3/00

U.S. Cl. 269—287

3 Claims



1. A device for holding a workpiece which has alignment pins in an aligned position on a worktable, said device comprising:

- a first elongated rectangular bar having at least one substantially straight lengthwise edge, wherein the bar is fastenable to the worktable;
- a second elongated rectangular bar having at least one substantially straight lengthwise edge facing the lengthwise edge of the first bar;

first and second spacer segments of a predetermined width positioned between the first and second bars, each of said spacer segments having a trough-shaped end portion facing the trough-shaped end portion of the other segment to define an alignment hole having the appropriate diameter to snugly accommodate a workpiece alignment pin;

a spacer having the predetermined width positioned between the first and second bars defining an alignment slot having the appropriate width to snugly accommodate another workpiece alignment pin;

a plurality of screws to firmly fasten the second bar to the first bar through the spacer and spacer segments; and

at least one filler plate fastenable to the worktable, wherein the filler plate may be removed from the worktable independent of the first bar to provide access to the worktable without disturbing the position of the alignment hole and alignment slot.

4,421,306

## DOCUMENT FEEDER WITH IMPROVED VACUUM SYSTEM

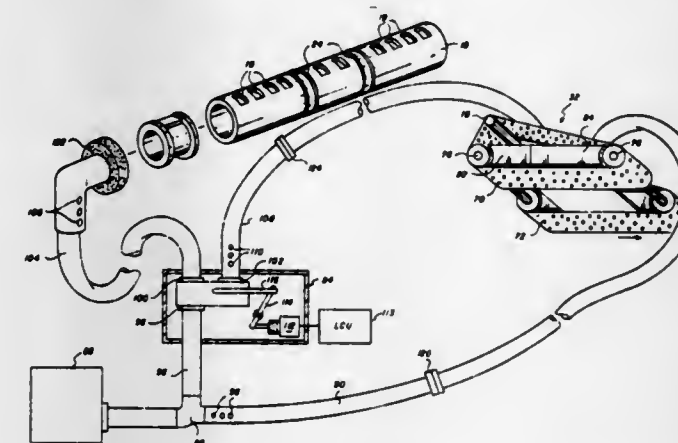
Richard S. Muka, Huntington, Conn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1981, Ser. No. 269,167

Int. Cl.<sup>3</sup> B65H 5/22, 3/10

U.S. Cl. 271—5

3 Claims U.S. Cl. 272—72



1. In a vacuum system for a document feeder, the feeder being useful for feeding seriatim a plurality of document sheets along a path having (1) a first portion extending from a stack of such sheets to an exposure position, wherein the sheets are registered and copied, and (2) a second portion leading away from the exposure position, the feeder having an oscillating vacuum member for removing a sheet from the stack and initiating movement of the removed sheet along the first portion of the path and at least one vacuum belt for receiving a sheet removed by the vacuum member and for advancing the sheet along the first portion of the path toward the exposure position, the improvement comprising:

- a first vacuum plenum and a second vacuum plenum positioned adjacent said belt along the first portion of the sheet path so that a sheet can be attracted to the belt for transport along the first portion of the path when a partial vacuum exists in at least one of said plenums, the first plenum being located along said path between the second plenum and the vacuum member;
- a vacuum blower;
- a control valve having an inlet port coupled to said blower, said valve having a first outlet port coupled to the vacuum member and a second outlet port coupled to said first plenum, said valve being adjustable between (1) a first position wherein the vacuum member is connected to the blower to establish a partial vacuum in the vacuum member and (2) a second position wherein the first plenum is connected to the blower to establish a partial vacuum in the first plenum;
- a conduit interconnecting said blower and said second plenum so that operation of the blower is effective to establish a partial vacuum in said second plenum; and
- control means for operating said valve in a programmed sequence wherein (1) the valve is in its first position to establish a partial vacuum in the oscillating vacuum member for feeding a sheet from a stack and into the first portion of the path and (2) the valve then is adjusted to its second position to establish a partial vacuum in the first plenum to hold the sheet against the belt while the belt moves the sheet along the first portion of the path until the sheet falls under the influence of vacuum in the second plenum.

4,421,307

## FOLDING EXERCISING EQUIPMENT

Ian J. Cunningham, Grouville, and Harold R. Evans, St. Brelade, both of Channel Islands, assignors to Tekron Licensing BV, De Leersum, Netherlands

PCT No. PCT/GB80/00097, § 371 Date Feb. 4, 1981, § 102(e)

Date Jan. 27, 1981, PCT Pub. No. WO80/02647, PCT Pub.

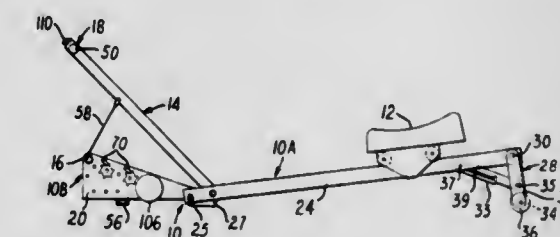
Date Dec. 11, 1980

PCT Filed Jun. 4, 1980, Ser. No. 232,026

Claims priority, application United Kingdom, Jun. 4, 1979, 7919335

Int. Cl.<sup>3</sup> A63B 69/06

9 Claims



1. Exercising equipment comprising an elongate frame, a foot rest mounted on the frame near one end, a seat mounted on the frame at a distance from the foot rest, a handle arranged to be moved by a user of the equipment, and means arranged to oppose such movement of the handle in which the handle comprises a bar which is pivoted at one end to the frame about a horizontal axis transverse to the length of the frame, and carries a handgrip at or near its other end so that said handgrip is constrained to move in a predetermined path with at least a component of movement parallel to the length of the frame, in which the means opposing movement of the handle includes a flexible elongate friction element extending between the handle and the frame, a guide system over which the flexible element slides frictionally upon movement of the handle and tensioning means acting on the flexible element to oppose movement of the handle away from said foot rest, and in which the frame comprises front and rear portions which are connected together by a hinged joint having its axis horizontal and transverse to the length of the frame and close to the pivot axis of the handle so as to be collapsible from an operative position in which they lie generally in alignment and end to end and a storage position in which they partially overlap so as to substantially reduce their overall length.

4,421,308

## BICYCLE EXERCISE STAND

Gerald A. Nagy, 6731 Rockdale, Dearborn Heights, Mich. 48127

Filed Dec. 14, 1981, Ser. No. 330,711

Int. Cl.<sup>3</sup> A63B 69/16

U.S. Cl. 272—73

5 Claims

1. An exercise stand for a bicycle having a driven wheel carried on a rear axle, comprising:

base means including a pair of parallel tubular members spaced a sufficient distance for receiving the driven wheel of the bicycle between them, said tubular members each having respective pin-receiving opening means;

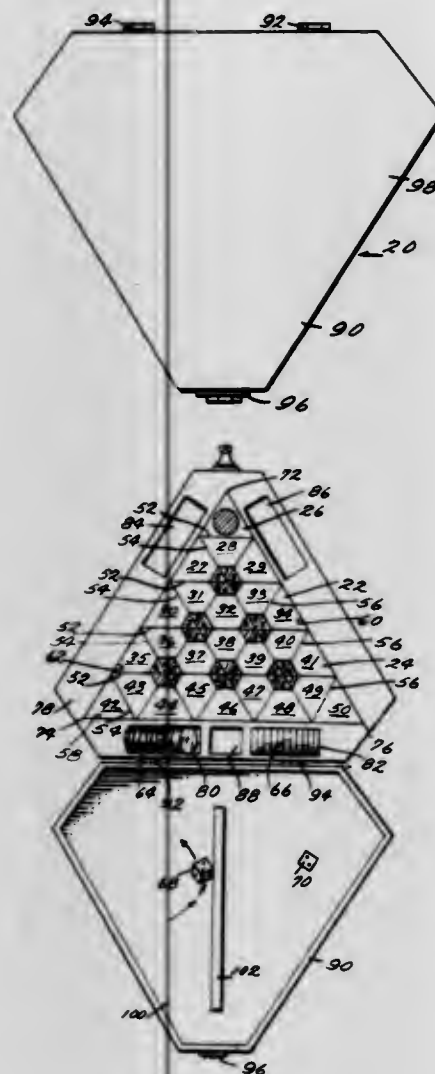






**4,421,314**  
**BOARD GAME APPARATUS**  
 Roger Stancill, 4019 Byrd Rd., Kensington, Md. 20895  
 Filed Jun. 28, 1982, Ser. No. 392,631  
 Int. Cl.<sup>3</sup> A63F 3/00  
 U.S. Cl. 273-249

19 Claims

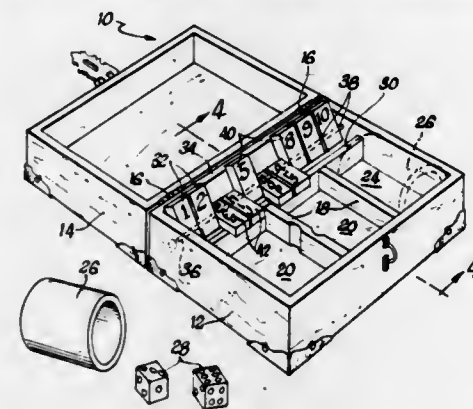


1. Game apparatus, comprising:  
 a game board defining a triangular playing surface;  
 said playing surface defining a predetermined number of triangular areas formed by three groups of spaced parallel lines, each group of lines being parallel to a respective edge of said playing surface;  
 said triangular areas defining a plurality of overlapping hexagons, each of said hexagons formed by six of said triangular areas positioned to have a common apex;  
 each of said hexagons having each of said six triangular areas within said hexagons marked with one of six different numbers;  
 plural sets of distinguishable playing pieces, each player being assigned the pieces from one set; and  
 means for indicating by chance one of said numbers for controlling movement of said playing pieces on said game board in accordance with the rules of said game apparatus.

**4,421,315**  
**GAME**  
 Alfred Cutler, 17657 Pomerado Rd., #252, Rancho Bernardo, Calif. 92128  
 Filed Jan. 3, 1983, Ser. No. 455,072  
 Int. Cl.<sup>3</sup> A63F 3/00  
 U.S. Cl. 273-268  
 1. A Game comprising:  
 a case;  
 a random number generator stored in said case;

5 Claims

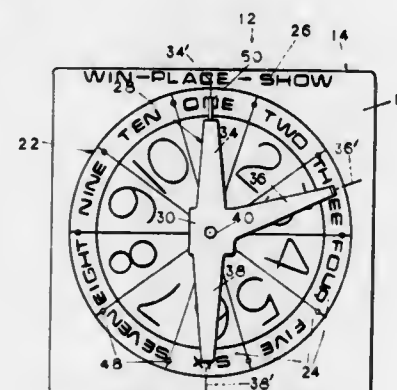
a plurality of paddles whose total number is lesser than the number of letters in the alphabet;  
 said paddles being pivotally mounted in said case in a sequence;  
 said paddles having first and second stable positions in which the first and second sides of same are respectively exposed to the user;  
 said first sides each displaying a numeral such that the aggregate of said numerals are consecutive in said sequence;  
 said second sides each displaying at least one alphabetical letter such that said paddles can be flipped by the player into the second position responsive to numbers obtained



from the random number generator in an attempt to make a word from the letters displayed on the second sides of said flipped paddles; wherein said second sides together display the entire alphabet; and  
 said paddles are limited to ten, and the first side of each of said paddles displays one of the numerals from "1" through "10", the first and last paddle in said paddle sequence displaying the letters "A" and "Z", respectively, and the other paddles in the sequence each displaying three alphabetically sequential letters; and  
 wherein said random number generator comprises at least one die.

**4,421,316**  
**THREE-FINGERED SPINNER GAME OF CHANCE**  
 William F. Brown, 6215 S. Wabash Ave., Apt. 506, Chicago, Ill. 60637  
 Filed Mar. 23, 1981, Ser. No. 246,395  
 Int. Cl.<sup>3</sup> A63F 3/00  
 U.S. Cl. 273-274

1 Claim

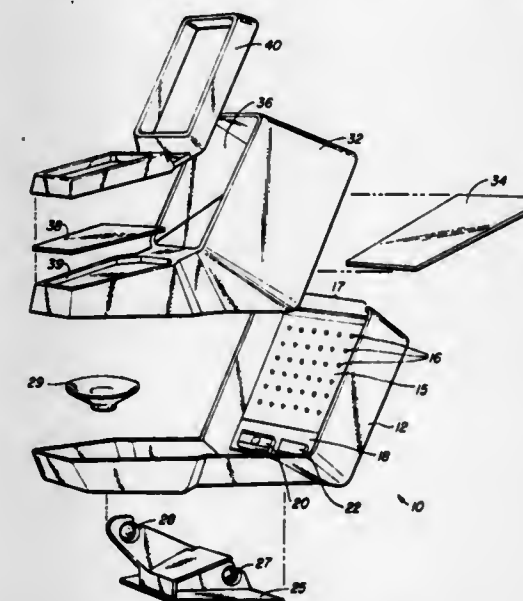


1. A game of chance simulating a horse race and betting thereon comprising,  
 a wheel including a table having a dial thereon with a circumferential series of areas each having indicia thereon identifying a respective one of a plurality of horses,  
 a spinner on the table cooperating with the dial and having a hub, and three fingers extending radially in overlying relation to the indicia identifications of the horses and thereby effective for indicating respective ones of the horses, the fingers extending to positions closely adjacent the periphery of the dial and being angularly spaced apart

for indicating different horses for Win, Place and Show positions, and the spaces between the fingers enabling visualization of the selections by players in a group,  
 a combinations chart of indicia identifying combinations of indicia of horses, each combination including Win, Place and Show horses in correlation to the combinations indicated by the spinner for every position of the spinner, and the combinations of indicia in the combinations chart for Win being arranged in sequence according to the sequence of indicia representing horses on the dial with the combinations for each Place and Show being arranged with respect to Win according to the spacing of the indicia indicated by the fingers of the spinner, the combinations chart being of such size and proportions as to enable players in a group to read it at a glance, and  
 a game board displaying the indicia identification of all the horses and the odds for payment on each, in each Win, Place and Show position, the game board being of such size and proportions as to enable the players to place bets thereon.

**4,421,317**  
**ELECTRONIC GAME APPARATUS USING A THREE-DIMENSIONAL IMAGE**  
 Roger D. Hector, San Jose, and Harry H. Jenkins, Jr., Menlo Park, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.  
 Filed Jan. 6, 1981, Ser. No. 222,839  
 Int. Cl.<sup>3</sup> A63F 9/00  
 U.S. Cl. 273-313

39 Claims



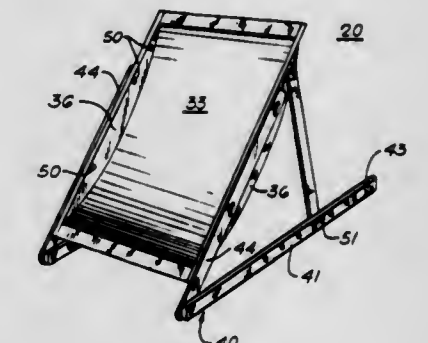
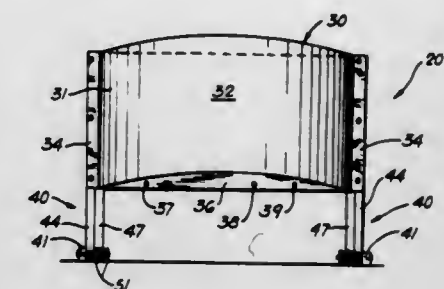
26. Electronic game apparatus comprising:  
 a base including an opening;  
 a three-dimensional image stored on a plate as a hologram;  
 illumination means for angularly illuminating the plate to enable viewing of the three-dimensional image through the opening; and  
 game playing means for controlling the illumination means.

**4,421,318**  
**ADJUSTABLE REBOUND APPARATUS**  
 David Sverdlik, 6428 N. Mozart, and Arnold I. Vodovozov, 2858 W. Touhy Ave., Unit A, both of Chicago, Ill. 60645  
 Filed Apr. 1, 1982, Ser. No. 364,260  
 Int. Cl.<sup>3</sup> A63B 69/00, 71/02  
 U.S. Cl. 273-395

12 Claims

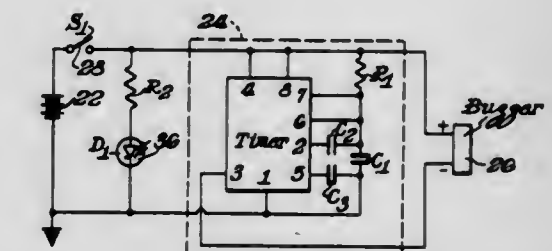
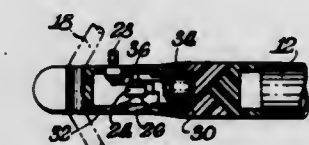
1. A reversible ball rebound apparatus comprising a part-cylindrical rebound member having a continuous, uninterrupted and imperforate concave rebound surface on one side thereof and a continuous, uninterrupted and imperforate, convex rebound surface on the opposite side thereof, means for supporting said rebound member, and means for reversibly securing said rebound member to said supporting means for

selectively supporting same on said supporting means with either said convex rebound surface or said concave rebound



**4,421,319**  
**HUNTING ARROW WITH LOCATING MEANS**  
 Michael R. Murphy, 550 S. DuPont Pkwy., Wilmington, Del. 19720  
 Filed Feb. 1, 1983, Ser. No. 462,937  
 Int. Cl.<sup>3</sup> F41B 5/02  
 U.S. Cl. 273-416

8 Claims



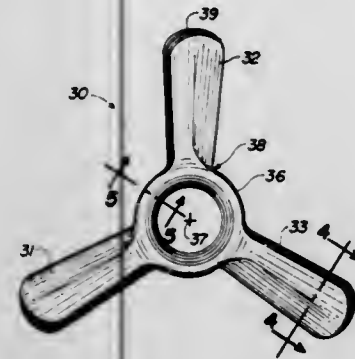
1. A hunting arrow including a nock having a hollow cavity with arrow locating means disposed therein, the arrow locating means including a normally open electrical circuit having a power source, time delay means, means for producing an audible signal upon expiration of the time delay countdown, and switch means adapted to close the electrical circuit extending from inside the cavity to the outer side of the nock whereby upon actuation of the switch means the time delay means starts its countdown and upon expiration thereof the means for producing an audible signal is energized whereby an audible signal pinpoints the location of the arrow.



4,421,320

**BOOMERANG**

David P. Robson, 4602 Schenley Rd., Baltimore, Md. 21210  
Continuation of Ser. No. 110,420, Jan. 7, 1980, abandoned. This application Apr. 13, 1982, Ser. No. 367,847  
Int. Cl.<sup>3</sup> A63B 65/08  
U.S. Cl. 273-425



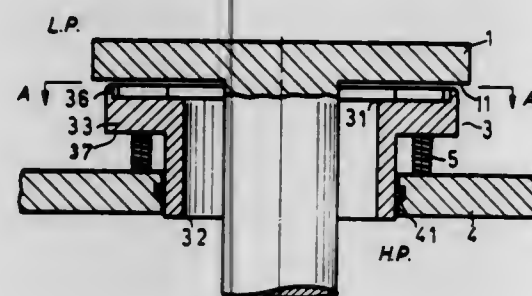
1. In a boomerang with a plurality of airfoil-shaped arms spaced about a central axis and extending outwardly thereabout the improvement wherein:

the boomerang has a top surface and an opposing bottom surface and an airfoil-shaped lift producing control means interconnecting said plurality of arms, said control means being generally open-centered and symmetrical about said central axis, said airfoil-shaped arms providing a net lift toward said top surface, said control means providing a net lift toward said bottom surface for controlling lay down.

4,421,321

**HYDRODYNAMIC NON-CONTACTING SEAL FOR ROTARY MACHINES**

Abraham Lipschitz, 68 Jabotinsky St., Nahariya, Israel 22385  
Filed Mar. 10, 1983, Ser. No. 474,026  
Claims priority, application Israel, Mar. 19, 1982, 65289  
Int. Cl.<sup>3</sup> F16J 15/34  
U.S. Cl. 277-3

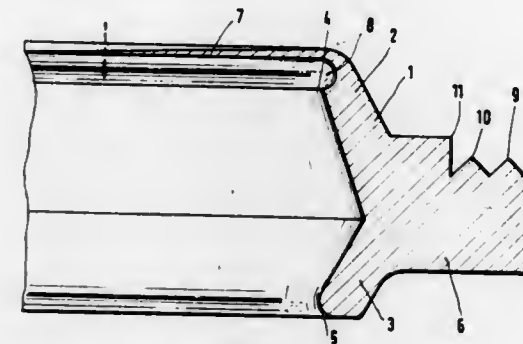


1. A hydrodynamic seal for a rotary machine, adapted to separate a low-pressure space from a high-pressure space in said machine filled with a liquid, said seal comprising: a rotating member having its smooth surface passing across a stator surface in close proximity; said stator surface being provided with a plurality of spaced-apart weirs rising above said stator surface and extending between the low-pressure space and the high-pressure space substantially perpendicular to the velocity vector of said rotating member, said weirs, of a predetermined length and breadth, having their height above said stator surface increasing from a minimum at their upstream side to a maximum at their downstream side, each sector of said stator surface between adjacent weirs being divided into a high-pressure zone and a low-pressure zone by a ridge rising above said stator surface to a height not less than the maximum height of said weirs, and extending from the low-pressure end of each weir to the high-pressure end of the adjacent weir downstream thereof.

4,421,322

**COMBINATION KNIFE-EDGE AND AREAL CONTACT LIP SEAL FOR MOVABLE ELECTRODES**

Jean Ruch, Brilon, and Josef Nelles, Meschede, both of Fed. Rep. of Germany, assignors to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG, Brilon, Fed. Rep. of Germany  
Filed Aug. 20, 1981, Ser. No. 294,697  
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032445  
Int. Cl.<sup>3</sup> F16J 15/06  
U.S. Cl. 277-12



1. In a galvanic metal-air cell having a housing formed with an opening through which a movable electrode extends, the latter having a periphery and an end front surface, an electrolyte chamber being defined partly by the front surface of the electrode and being sealed by an annular lip seal of elastic material which is mounted in said housing engaging sealingly against said electrode, the improvement in said lip seal wherein the lip seal comprises

at least one annular sealing lip with a substantially radially inwardly directed knife-like edge sealing ridge, in an installed condition in the housing, engaging against the periphery of the electrode, and a membrane-like protective lip extending from and in front of said sealing ridge and in the installed condition extending axially into said electrolyte chamber and pressingly engaging with areal contact against a surface area of the periphery of said electrode.

4,421,323

**OIL WELL STRING MEMBER WITH STATIC SEAL**

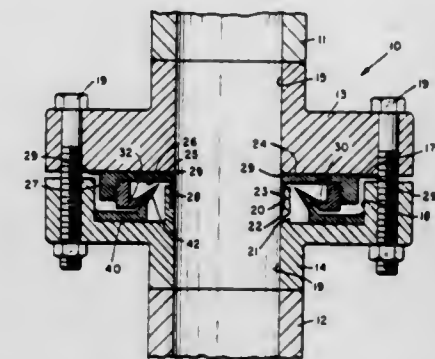
John A. Burke, Rocky River, Ohio, assignor to Greene, Tweed & Co., Inc., North Wales, Pa.  
Filed Aug. 30, 1982, Ser. No. 413,041  
Int. Cl.<sup>3</sup> F16J 15/06; E21B 19/10  
U.S. Cl. 277-12

1. Apparatus comprising a member having a cylindrical outer periphery, said outer periphery having first and second cylindrical surfaces axially spaced and connected by a tapered ramp, said surfaces being radially inwardly of said periphery with said first surface having a smaller diameter than said second surface, a seal assembly along said first surface, an end face of said assembly remote from said ramp being arranged to respond to fluid pressure for moving the assembly across the ramp to the second surface, said assembly being arranged to

4,421,325

**SEAL WITH DUAL METALLIC RINGS HAVING CONTACTING LIPS**

Pellegrino E. Napolitano, Middletown, N.J., assignor to Hudson Engineering Company, Bayonne, N.J.  
Filed Dec. 16, 1982, Ser. No. 450,367  
Int. Cl.<sup>3</sup> F16J 15/28, 15/32, 15/48  
U.S. Cl. 277-27



1. A seal for use with fluid-carrying elements of a fluid system which define a portion of a fluid passageway, said seal comprising:

- (a) a first annular ring secured to one of said elements in substantially fluid-tight relationship therewith and spaced radially outwardly of said flow passageway, said first annular ring including a first inwardly directed lip disposed at an angle to the axis of said passageway;
- (b) a second annular ring secured to the other of said elements in substantially fluid-tight relationship therewith and spaced radially outwardly of said flow passageway, said second annular ring including a second inwardly directed lip disposed at an angle to the axis of said passageway; and
- (c) said first inwardly directed lip contacting said second inwardly directed lip at least at the innermost portion thereof relative to the fluid passageway axis.

4,421,326

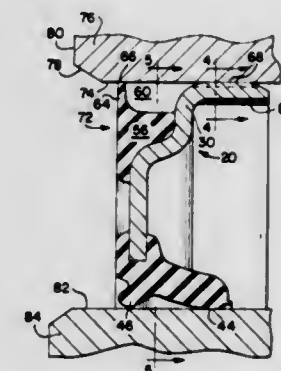
**OIL SEALS WITH MOUNTING SURFACE VENT MECHANISMS**

Gordon T. Drygalski, 5451 N. East River Rd., Chicago, Ill. 60656

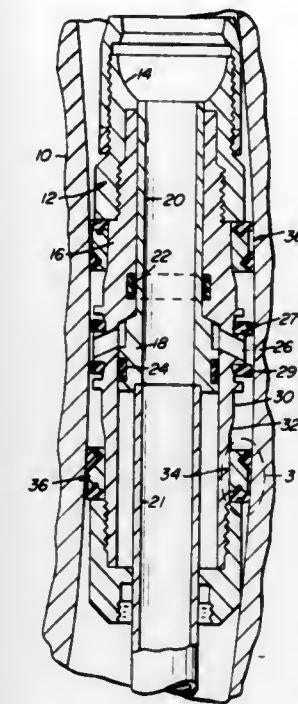
Filed Sep. 29, 1982, Ser. No. 427,826  
Int. Cl.<sup>3</sup> F16C 33/78

U.S. Cl. 277-50

15 Claims



expand in a radially outward direction as it moves across the ramp so that a central portion of its periphery projects beyond



the periphery of said member when said assembly is disposed along said second surface.

4,421,324

**SHAFT SEAL DEVICE FOR SUBMERSIBLE MOTOR**

Sakuei Yamamoto; Hiroshi Inao; Kiyonori Tokumitsu; Mitsuhiko Nishida, and Sadahiro Kumamoto, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

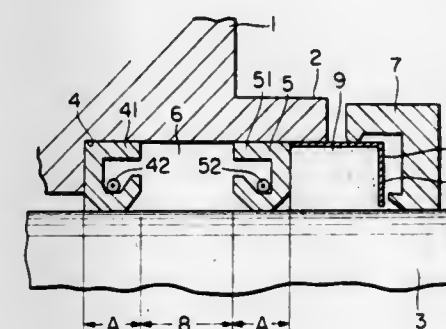
Filed May 9, 1983, Ser. No. 492,673

Claims priority, application Japan, May 14, 1982, 57-71632[U]

Int. Cl.<sup>3</sup> F16J 15/32, 15/40

U.S. Cl. 277-24

5 Claims



1. A shaft seal device for a submersible motor, comprising: a seal box which is provided at an end part of a case of the motor; a pair of lip type shaft sealing members which are disposed between an inner surface of said seal box and a rotary shaft of the motor and whose lips are arranged so as to inwardly face each other with a spacing therebetween; a lubricant which is stored in an interspace defined between said shaft sealing members; an auxiliary refuse remover which adjoins an outer side of one of said shaft sealing members and which is snugly inserted between the inner surface of an end part of said seal box and the rotary shaft of the motor; said auxiliary refuse remover being composed of a fitting, and a soft material member which is received in said fitting and which is snugly positioned on the rotary shaft of the motor; and another refuse remover which is disposed so as to adjoin an outer side of said auxiliary refuse remover.

1. A fluid seal unit comprising, in combination, an annular casing portion and a first annular elastomeric seal body portion, said casing being made at least in part from a relatively rigid material, and having axially and radially extending flanges, with at least a portion of said axial flange being adapted for snug, fluid-tight engagement with an associated portion of a sealed mechanism, and with a portion of said radial flange being a bonding portion to which said first elastomeric seal body is secured, said first seal body including generally frustoconical air and oil side surfaces meeting each other along



a generally circular locus to define a primary seal band adapted to engage a portion of the sealed mechanism with which the seal is associated in use, a second elastomeric seal body attached to at least one of said axial and radial flanges and adapted to form, in combination therewith, and at least partially circumferentially extending manifold groove, a portion of said second body further defining a resilient diaphragm portion of thin cross section which is adapted to be displaced under fluid pressure to move between sealed and opened positions and having a portion adapted to lie in a normally closed position in contact with a portion of said associated sealed mechanism in fluid sealing engagement therewith, and at least one axially extending vent passage formed in an axially extending flange portion of said seal unit and adapted to provide a path of fluid communication between the interior of said sealed region and said manifold groove, whereby fluid pressure in excess of a predetermined level may be released by passage of said fluid through said axial vent, into said manifold, and outwardly therefrom by displacement of said diaphragm portion.

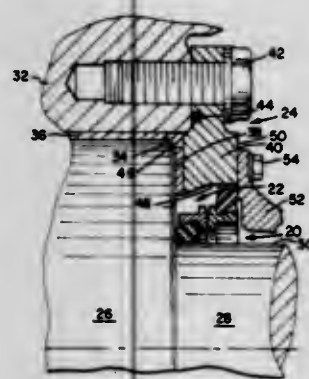
4,421,327

# HEAVY DUTY END FACE SEAL WITH ASYMMETRICAL CROSS-SECTION

James P. Morley, 461 S. Danton, Arlington Heights, Ill. 60005, and Burton K. Olsson, 420 Courtland, Park Ridge, Ill. 60068  
Filed Dec. 17, 1981, Ser. No. 331,680  
Int. Cl.<sup>3</sup> F16J 15/16

U.S. Cl. 277—84

12 Claims



1. A mechanical end face seal assembly comprising, in combination, first and second, relatively rigid, generally annular, primary seal rings, each adapted to cooperate with an associated secondary seal ring to form said mechanical end face seal assembly, each of said primary rings having a body portion which comprises an axially extending flange and a radially extending flange, said flanges being arranged so that said body portion has a generally T-shaped cross-section, with said radial flange having an outer end face surface and a pair of inner end face surfaces, said inner end face surfaces being spaced radially apart from each other, said axial flange having an outer, axially extending, radially outwardly directed surface and an inner, axially extending, radially inwardly directed surface lying parallel to and spaced apart from said outer surface, said outer end face of said radially extending flange on said first primary ring having an exterior portion thereof finished so as to cooperate with an oppositely directed, counterpart surface on said second primary ring to form a primary seal band area, one of said axially extending surfaces on each of said second primary rings cooperating with one of said inner end face surfaces to form a seat defined by substantially perpendicularly related surfaces and being adapted to receive and position therein a portion of a secondary seal ring, and a pair of secondary elastomeric seal rings, each being annular and having a body portion adapted to provide, in use, a combination of radial compressive load and axial end face load to said seal assembly, each of said secondary rings having generally cylindrical, spaced apart, inner and outer diameter surfaces adapted to cooperate respectively with one of said inner and outer axially extending surfaces on said primary seal ring and an associated machine part, said inner and outer surfaces being, in the relaxed condition of said secondary rings, axially offset from each other, said sec-

ondary seal bodies further including axially inner and outer surfaces having inclined portions joined at their ends to said cylindrical surface portions so that at least portions of said seal bodies are of generally parallelogram shaped cross-section, said first and second primary rings and the first and second of said pair of secondary rings being constructed and arranged respectively for association with each other such that said seal bands abut each other and so that one of said secondary seal members extends outwardly from the radially outer axial surface of said primary seal ring and so the other secondary ring extends radially inwardly from the radially inner axial surface of said primary ring, with portions of each of said outer inclined surfaces of said secondary rings being adapted, under load, to engage one of said inner axial surface on its associated primary ring for application of said end face load to said primary seal ring.

4,421,328

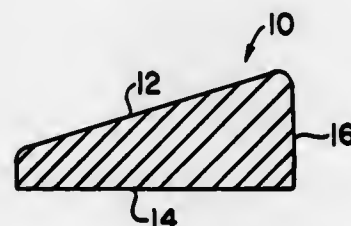
# HALF-KEYSTONE COMPRESSION RING

Kent W. Thurston, Timonium, and Jesse H. Barnes, Severna Park, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 428,215  
Int. Cl.<sup>3</sup> F16J 9/20

U.S. Cl. 277—216

1 Claim



1. An improved half-keystone compression ring for use in an internal combustion engine, the improvement comprising an essentially flat bottom side of said ring when said ring is in the closed operating position, said bottom side forming a nominal angle of between 0° and plus or minus 8° with a horizontal surface.

4,421,329

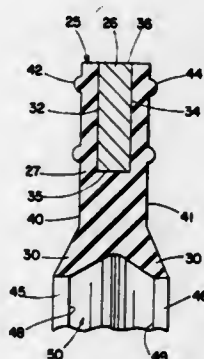
# SPLIT DUAL LIP SEAL FOR GEAR CASE

Jerry G. Jelinek, La Habra, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Sep. 22, 1982, Ser. No. 421,636  
Int. Cl.<sup>3</sup> F16J 15/48

U.S. Cl. 277—178

7 Claims



1. A two-piece sealing member for mounting in a split circular channel surrounding a rotatable shaft, each sealing member piece comprising a metal retainer in a generally half-ring configuration, and an elastomeric seal bonded to said retainer over the full inner periphery thereof, said seal comprising a body portion having a cross-sectional configuration conforming to the shape

of said support channel and adapted for a snug fit therein so as to be constrained against radially outward movement and restrained against circumferential movement relative thereto by said support channel, and a pair of divergent legs disposed radially inwardly of said body portion, said legs having sealing edges at the radially inner ends thereof adapted for engagement with said rotatable shaft, said legs being adapted for deflection axially with respect to said body portion to place a light seating bias on said sealing edges when said split circular channel is moved to a mounting location surrounding said shaft, said legs having projecting portions at either end extending circumferentially greater than 180 degrees so as to engage corresponding projecting portions of said other sealing member piece, whereby said projecting portions may be circumferentially compressed by the constraint of said channel to establish a fluid tight seal about the periphery of said rotatable shaft, said pair of divergent legs being symmetrical with respect to said body portion so that said sealing member is reversible in said channel.

4,421,330

# ANTIFRICTION FLUID SEAL ASSEMBLY

John A. Burke, Rocky River, Ohio, assignor to Greene, Tweed & Co., Inc., North Wales, Pa.

Filed Feb. 8, 1982, Ser. No. 346,701  
Int. Cl.<sup>3</sup> F16L 17/00, 21/08; F16J 15/32

U.S. Cl. 277—188 R

5 Claims



1. A seal assembly for use between inner and outer relatively movable members, wherein one of the members having a circumferentially extending groove defined by spaced radial walls for retaining the seal assembly, said seal assembly comprising:

- an annular sealing ring of resilient deformable material having a hardness in the range of about 60 to about 90 durometer to provide a low pressure seal, and a mating back-up ring of a low-friction material having a slight resilience to provide a high pressure seal;
- said sealing ring having two radially disposed side faces, a first side face defining the pressure side of the assembly, and a second side face on the opposite side of the assembly, said second side face being defined by the radial surface of an axially extending flange of said sealing ring, said radial surface adapted to cooperate with walls of a groove to define a generally rectangular space;
- said sealing ring having one of its peripheral surfaces defined by four contiguous portions, the first portion being generally semi-circular, the second portion being an angled surface extending from said first portion at an angle of between 10° and 40° with respect to a radius of said sealing ring, the third portion being an axially extending surface of said flange, and a fourth portion being a curved surface forming the intersection of said second and third portions;
- said sealing ring in an unstressed condition having a radial thickness greater than the radial thickness of said back-up ring, said sealing ring having a projection extending beyond a radial edge of said back-up ring, said projec-

- tion being defined by the semi-circular portion of the peripheral surface of said sealing ring;
- said back-up ring being trapezoidal in cross-section and radially disposed with respect to the third portion of said sealing ring, a side face of said back-up ring being a surface angled inward between 50° and 70° with respect to the axis of said back-up ring and cooperating with the second and fourth portions of said sealing ring to define a triangular space, with the apex of the triangular space being on a periphery of said assembly;
- said projection of said sealing ring having a volume less than the sum of the volumes of said rectangular space and said triangular space.

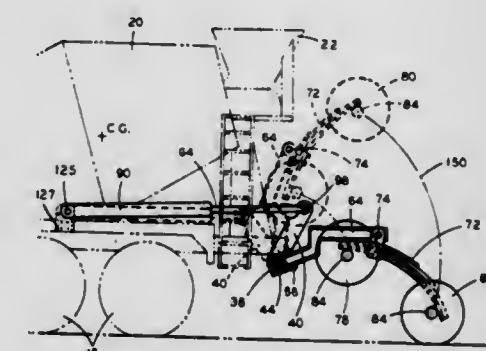
4,421,331

# AUXILIARY LOAD-CARRYING APPARATUS

Tom E. Ferris, 4010 Wyne, Houston, Tex. 77017  
Division of Ser. No. 903,861, May 8, 1978, Pat. No. 4,350,358.  
This application Sep. 2, 1982, Ser. No. 414,461  
Int. Cl.<sup>3</sup> B60P 1/00

U.S. Cl. 280—81 R

14 Claims



1. An auxiliary load-carrying means adapted for mounting on the rear of a vehicle for providing additional load support, comprising independently actuatable load-carrying devices disposed on opposing lateral sides of said vehicle, each of said load-carrying devices including a pair of wheel means, one disposed at the forward end and the other at the rear end of an interconnecting longitudinally extending support beam, linkage means having compound pivotal connections with said vehicle and each of said load-carrying devices to provide a combination of pivotally upward and downward movement of the load supporting device from ground engagement to raised position respectively free articulated movement between the frame and each load-carrying device for tracking during turning of the vehicle about a turning radius, reciprocable power means, one at each side of vehicle, and each including a hinged connection with a respective one of said load-carrying devices and which acts through said compound linkage to effect selectively raising and lowering movements of each of said auxiliary load-carrying devices.

4,421,332

# INDIVIDUAL WHEEL SUSPENSION FOR NON-STEERED WHEELS OF MOTOR VEHICLES, ESPECIALLY AUTOMOBILES

Werner Kosak, Dachau, and Wolfgang Matschinsky, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,606  
Claims priority, application European Pat. Off., Nov. 14, 1980, 80107072.3

U.S. Cl. 280—95 R

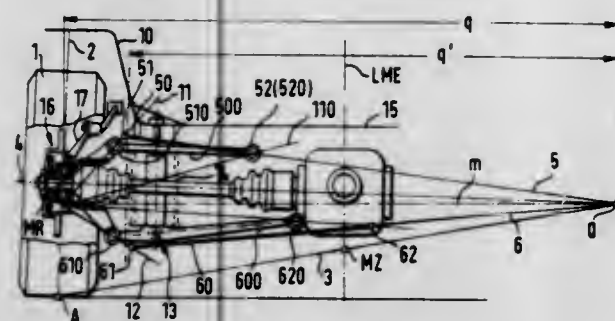
Int. Cl.<sup>3</sup> B60G 3/00

6 Claims

1. An individual wheel suspension for a non-steered wheel of a motor vehicle, such as an automobile, comprising a trailing arm, connected with the vehicle body in an articulated fashion by means of a lengthwise arm disposed in the direction lengthwise of the vehicle and, in the direction transverse to the



vehicle, by two wishbone means, one located above the other, whereby each of the wishbone means includes auxiliary tie-rod means projecting in a transverse plane running vertically through the wheel center, the extension of said tie-rods, directed toward the center of the vehicle, intersecting at a transverse pole located at a distance from the wheel center plane, characterized in that the articulation of the end of each of the auxiliary tie-rod means proximate the wheel are provided in



the vicinity of the wheel center plane at an auxiliary distance from said transverse pole whereby each of the auxiliary tie-rod means is of a length which is shorter than or approximately equal to half the auxiliary distance, and in that the lengthwise arm is disposed so that it points toward the rear of said vehicle, with an articulation of the lengthwise arm to the vehicle body being located near the wheel center plane and beneath the center of the wheel.

4,421,333

#### ASSEMBLY FOR MOUNTING A VEHICLE SPRAY SUPPRESSION DEVICE

James R. Van Dyke, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

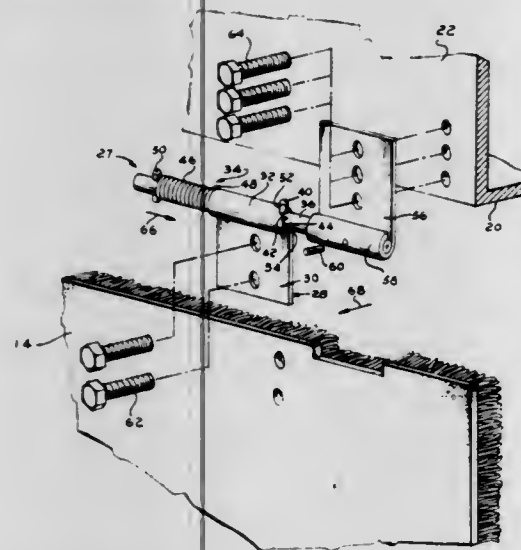
Continuation of Ser. No. 263,520, May 14, 1981, abandoned.

This application Jun. 15, 1983, Ser. No. 504,076

Int. Cl.<sup>3</sup> B62D 25/16

U.S. Cl. 280—154.5 R

1 Claim



1. A spray-suppression apparatus for a tractor-trailer adapted to be mounted on a forward portion of a trailer adjacent the upper outside surface of at least one rear tire of tractor comprising:

a side skirt having a height greater than the distance between the bottom edge of the trailer and the top of said tire; and at least one hinge assembly for mounting said side skirt to said trailer in a position generally parallel to the side of said trailer whereby said side skirt occludes vertical space between said trailer and the top of said tire; said hinge assembly having a horizontal pivotal axis substantially parallel to a side of the trailer said hinge assembly having a spring-loaded cam urging the skirt toward a generally vertical orientation while allowing the skirt to pivot about said axis, wherein the lower edge of the skirt can pivot

outwardly and upwardly toward a raised position when contacted by said tire of the trailer, said hinge assembly also having a detent for holding said skirt in a raised position.

4,421,334

#### HIGH SPEED CYCLE

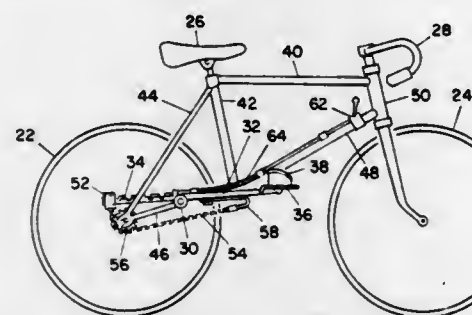
Boris Efros, 920 N. Stanley Ave., Los Angeles, Calif. 90046

Filed Nov. 16, 1981, Ser. No. 321,623

Int. Cl.<sup>3</sup> B62M 1/04

U.S. Cl. 280—236

12 Claims



1. A simplified pedal lever type cycle including positive power ratio changing and locking arrangements comprising: a cycle including at least two wheels, one of which is a drive wheel, a seat, and means for steering the cycle, two chain means for applying power to the drive wheel, a pair of pedal levers each having a forwardly extending portion for receiving a person's foot and a rearwardly extending portion;

means for mounting said pedal levers for operation independently of one another, whereby they may be operated alternately, concurrently or singly at the option of the rider;

slider assembly means mounted on the rearwardly extending portion of each of said pedal levers for varying the power ratio of said bicycle, each slider assembly means being connected respectively to one end of one of said chain means,

the rearwardly extending portion of each of said pedal levers being provided with a set of notches for interaction with the respective associated slider assembly;

each said slider assembly having means for engaging said notches for determining the ratio for the application of power by said pedal levers to said drive wheel;

means for positively locking said slider onto a fixed position along the length of said rearwardly extending portion of said pedal lever;

angled means between said slider and said rearwardly extending portion of said pedal lever for disengaging said slider from a fixed position on said pedal lever;

means for remotely unlocking said locking means and causing movement of said slider assembly to a new position along the length of the rearwardly extending portion of said pedal lever, for remotely selecting the new position of said slider assembly, and for positively locking said slider assembly into its new position; and

means for maintaining each said chain under tension, said means including spring means coupled between the other end of each said chain and the forwardly extending portion of one of said pedal levers.

4,421,335

#### CONTROL MECHANISM FOR A TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

Sadao Makiyama, Akikawa, and Seichi Iwata, Mizuhomachi, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

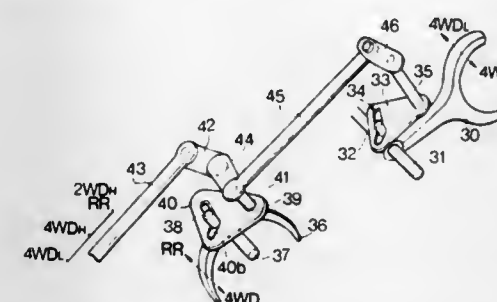
Filed Oct. 27, 1981, Ser. No. 315,561

Claims priority, application Japan, Oct. 31, 1980, 55-154415

Int. Cl.<sup>3</sup> B60K 23/08

U.S. Cl. 280—247

17 Claims



1. A control mechanism for a transmission of a four-wheel drive vehicle, comprising

a driving shaft adapted to be connected to a crankshaft of an engine through a first clutch means, an auxiliary change-speed transmission provided adjacent to said driving shaft,

an input shaft of a main change-speed transmission provided adjacent to said auxiliary change-speed transmission, said auxiliary change-speed transmission including reduction gear trains, a second clutch means manually operable for selecting transmission ratios of said auxiliary change-speed transmission for transmitting the output of said driving shaft to said input shaft, and a first fork means for shifting said second clutch means,

an output shaft provided in parallel with said input shaft, said main change-speed transmission provided on said input shaft and output shaft,

means for transmitting the output of said output shaft to front axles and to rear axles of the vehicle,

a third clutch means provided in said transmitting means for transmitting the output of said output shaft for selectively connecting and disconnecting, respectively, the transmitting of the output to either of the front or rear axles,

a second fork means for shifting said third clutch means, an operation rod axially slidably provided for shifting said second clutch means in said auxiliary change-speed transmission and for shifting said third clutch means,

a rotatable first guide plate for said first fork means, a rotatable second guide plate for said second fork means, said first and second guide plates being operatively connected to said operation rod, each of said guide plates having a guide groove slidably engaged with a part of the corresponding said fork means, whereby by moving said operation rod said first and second fork means may be selectively shifted via said guide plates and said guide grooves.

4,421,336

#### VEHICLE FOR THE PARALYZED

Jerrold S. Petrofsky, Beavercreek, and Roger M. Glaser, Dayton, both of Ohio, assignors to Wright State University, Dayton, Ohio

Filed Sep. 14, 1982, Ser. No. 417,938

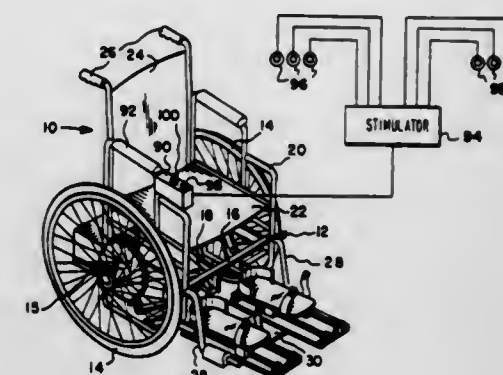
Int. Cl.<sup>3</sup> A61G 5/02; B62M 1/04

U.S. Cl. 280—252

14 Claims

1. A vehicle for transporting a paralyzed person comprising: a support frame for carrying said person; a plurality of wheels for carrying said support frame; limb support means connected to said support frame for supporting a limb of said person; drive means connected between said limb support means and

at least one of said wheels for driving said vehicle in response to movement of said limb; control means for generating a control signal; and



stimulation means responsive to said control signal for stimulating a muscle of said person to cause driving movement of said limb.

4,421,337

#### BICYCLE WITH RESILIENTLY YIELDABLE WHEEL SUPPORTS

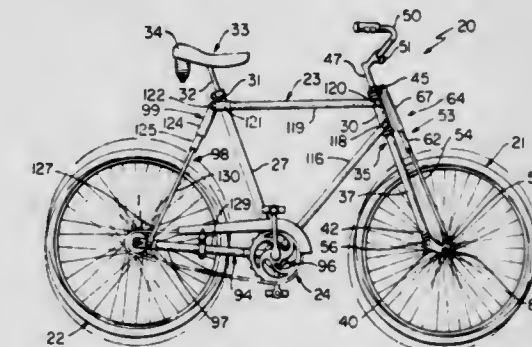
Thomas A. Pratt, 7415 Baywind Dr., Cincinnati, Ohio 45242

Filed Jan. 8, 1982, Ser. No. 338,050

Int. Cl.<sup>3</sup> B62K 25/08, 25/10

U.S. Cl. 280—277

27 Claims



1. In a bicycle comprising; a front wheel; a rear wheel; a frame having a tubular forward portion; means mounting said frame on said wheels; a pedal assembly; a support structure supporting said pedal assembly on said frame; said mounting means comprising; a front axle for rotatably supporting said front wheel, a first fork assembly having a first tubular member rotatably mounted within said tubular forward portion, a first pair of front wheel embracing legs extending from the lower end of said first tubular member, a first pair of toggle links disposed on opposite end portions of said front axle, each toggle link of said first pair of toggle links having an inner end pivotally fastened to the lower end portion of an associated one of said first pair of legs and an outer end having opening means for receiving an associated end portion of said front axle, a top plate detachably fastened to said first tubular member for rotation therewith, a second fork assembly having a second pair of front wheel embracing legs, fastening means pivotally fastening an associated leg of said second fork assembly to an associated toggle link of said first pair of toggle links, attaching means for attaching said front axle to said first pair of toggle links with said front axle having its opposite end portions disposed within said opening means, said second fork assembly comprising a U-shaped singlepiece component having a bight and a pair of parallel legs, a second tubular member fixed to and extending upwardly from the center of said bight, and yielding means operatively connected between said top plate and said second tubular member, said yielding means allowing large and abrupt vertical movements of said front wheel while maintaining said frame comparatively free of said movements;



the improvement comprising a second pair of toggle links also disposed on opposite end portions of said front axle, each toggle link of said second pair cooperating with an associated toggle link of said first pair, each toggle link of said second pair also having an inner end pivotally fastened to the lower end portion of an associated one of said first pair of legs and an outer end having opening means for receiving an associated end portion of said front axle, said fastening means pivotally fastening an associated leg of said second fork assembly to an associated toggle link of said first pair of toggle links also serving to pivotally fasten the associated leg of said second fork assembly to an associated toggle link of said second pair of toggle links, and said attaching means also serving to attach said front axle to said second pair of toggle links with said front axle also having its opposite end portions disposed within said opening means in said toggle links of said second pair.

4,421,338

# STRUCTURE OF AN UPPER FORK ASSEMBLY OF A MOTORCYCLE

Tokio Isono, Tokyo, and Osami Tanaka, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

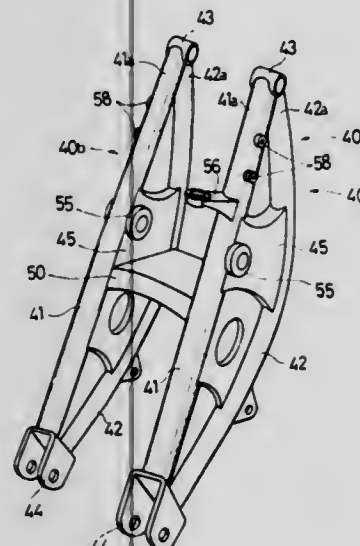
Filed Oct. 6, 1981, Ser. No. 309,017

Claims priority, application Japan, Oct. 9, 1980, 55-141802

Int. Cl.<sup>3</sup> B62K 19/10, 21/02

U.S. Cl. 280—279

4 Claims



1. An upper fork for a front fork assembly of a motorcycle, comprising:

- a pair of fork member units, and a bridge for interconnecting said pair of fork member units;
- each of said fork member units including a substantially vertically extending front member formed of a pipe, a rear member extending along said front member and welded at upper and lower ends thereof to upper and lower ends of said front member, and a cross member welded to mid portions of said front member and said rear member to interconnect said front and rear members;
- said bridge being welded to said front members, said rear members and said cross members of said pair of fork member units;
- each of said cross members being formed as a closed hollow body with at least two plates; and
- said bridge being formed to have a closed hollow body.

4,421,339  
ARTICULATED VEHICLE, PARTICULARLY A BUS  
Faust Hagin, Munich, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

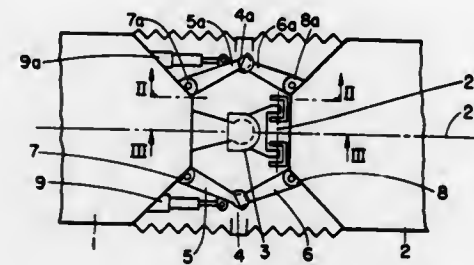
Filed Jul. 27, 1981, Ser. No. 287,294

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030015

Int. Cl.<sup>3</sup> B60D 5/00

U.S. Cl. 280—460 R

6 Claims



1. In an articulated vehicle, such as a bus, including a lead car and a trailer; a central ball joint arranged in the central plane of the vehicle coupling said lead car to said trailer; the improvement comprising: a shackle pivotally mounted about a horizontal transverse axis at the trailer and connecting said trailer to the ball joint; a pair of arms being arranged respectively, on either side of the central ball joint on the lead car and on the trailer for rotation about a vertical axis and further ball joints on each side of the vehicle for interconnecting the arms of the lead car and of the trailer, said further ball joints being arranged at the same level.

4,421,340

# COUPLING MEANS COMPRISING A CENTERING DEVICE AND A LOCKING MECHANISM FOR A MOTOR DRIVEN UTILITY UNIT HAVING A COMPLEMENTARY UNIT

Volker Kramer, Erdmannhausen, and Günter Helsper, München, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

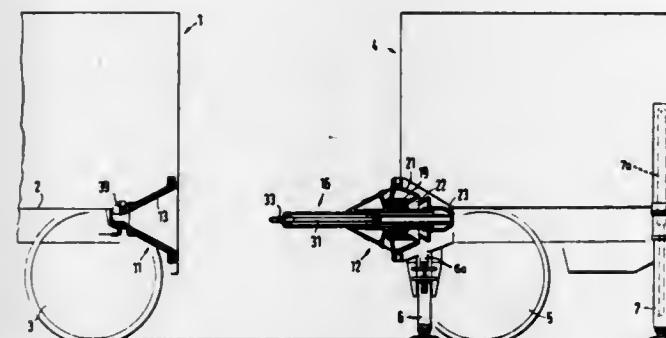
Filed Oct. 29, 1981, Ser. No. 316,533

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042160

Int. Cl.<sup>3</sup> B60D 1/00

U.S. Cl. 280—478 B

15 Claims



1. A vehicle of the type having a motor driven vehicle unit and a wheeled complementary unit couplable thereto, comprising:

- (a) a towing and coupling means between the vehicle unit and the wheeled complementary unit for enabling towing of the complementary unit by the vehicle unit, and operable to draw same together, said towing and coupling means being connected, at a first end, to said complementary unit by an elastic means for enabling pivoting thereof, wherein said elastic means is disposed between a retaining member and a draft element;
- (b) a locking means for securing a second, opposite end of

said towing and coupling means to said vehicle unit and forming a pivotal interconnection therebetween;

(c) drawing means mounted to said complementary unit for displacing the towing and coupling means, when it is secured to said locking means, between a first, extended, position, wherein said complementary unit is towable behind said vehicle unit in an articulated manner and a second, retracted, position, wherein said complementary unit is drawn adjacent said vehicle unit and is towable rigidly coupled to said vehicle unit;

(d) centering means for centering said vehicle unit relative to said auxiliary hook-up unit, said centering means comprising a first and a second mating conical surfaced centering member which interengage positively, said first centering member being disposed on the vehicle unit, said second centering member being disposed on the complementary unit, said first centering member being operable to guide said towing and coupling means, and said second centering member is securable to said locking means; and

(e) securing means for fixedly securing said towing and coupling means in said retracted position and for rendering said elastic means inactive, after said complementary unit has been drawn adjacent said vehicle unit.

4,421,341

# SAFETY SKI BINDING

Erwin Krob, and Helmut Bauer, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

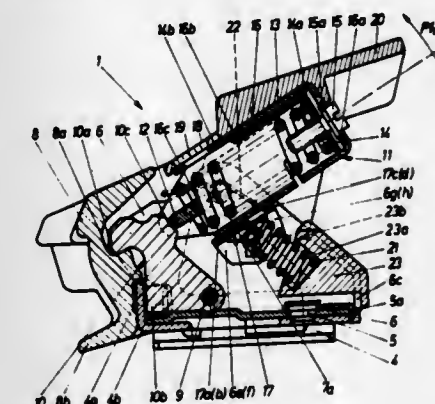
Filed May 21, 1981, Ser. No. 265,750

Claims priority, application Austria, May 23, 1980, 2769/80

Int. Cl.<sup>3</sup> A63C 9/08

U.S. Cl. 280—628

27 Claims



1. In a safety ski binding having a sole holder supported on a support member for pivotal movement about a horizontal first axis, said support member being supported on a base for pivotal movement about a vertical second axis, locking means for yieldably maintaining said sole holder in a downhill skiing position holding a ski shoe, said locking means including cooperating locking elements and yielding only when release forces applied to said sole holder exceed predetermined limits, at least one said locking element being provided on a carrier, the improvement comprising wherein said carrier is a locking lever pivotally supported on said support member and having on a side thereof remote from said one locking element a control surface, including a release lever supported on said support member for pivotal movement about a third axis, a release spring supported on said release lever, a slide member movably supported on said release lever and biased toward said control surface by said release spring, and wherein said release lever is pivotal against the force of a centering spring having one end supported on one of said support member and said locking lever and the other end supported on said release lever.

4,421,342

# ROTARY ACTUATION DEVICE

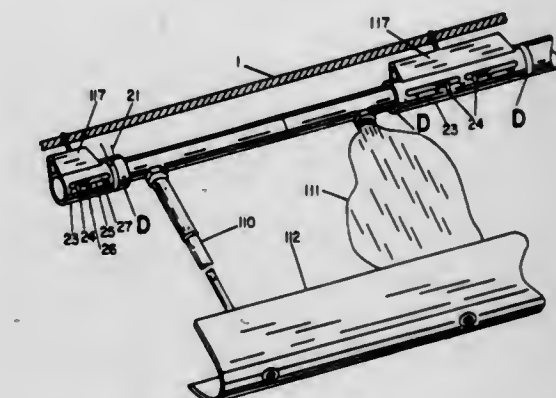
Milton F. Brown, Jr., 2035 Echo Cove, Virginia Beach, Va. 23454

Continuation of Ser. No. 12,569, Feb. 15, 1979, abandoned. This application Jul. 22, 1981, Ser. No. 285,814

Int. Cl.<sup>3</sup> B60R 21/06

U.S. Cl. 280—740

16 Claims



1. An emergency rotary actuation device, including:

- a. a pressure tube having a sealed chamber secured to one end thereof;
- b. a piston positioned within said pressure tube, said piston having a shaft extending therefrom to the other end of said pressure tube;
- c. a source of gas pressure contained within said chamber;
- d. condition responsive electrically fired explosive means for initiating the substantially complete release of gas pressure from said chamber into said piston tube for longitudinally moving said piston within said pressure tube;
- e. a first concentric tube extending from said other end of said pressure tube, at least a portion of said shaft extending into said first concentric tube, and said first concentric tube having a slot formed in the wall thereof and extending along a substantial portion thereof;
- f. a second concentric tube concentrically mounted with respect to said first concentric tube, said second concentric tube having a slot formed in the wall thereof extending along the portion of the length thereof overlying the slot portion of the length of said first concentric tube;
- g. one of said slots being straight and the other of said slots being helical;
- h. at least one lug carried by said shaft and extending radially outwardly and engaging both of said slots;
- i. means for preventing rotation of one of said tubes;
- j. cylinder housing means concentrically and rotatably mounted about said pressure tube, said sealed chamber, and said condition responsive electrically fired explosive means;
- k. rotation responsive operator means secured to said cylinder housing means, and
- l. whereby upon actuation of said electrically fired explosive initiating means, said gas pressure forces said piston along said pressure tube and said shaft and said lug and cause relative rotation of said concentric tubes and operation of said operator means.

4,421,343

# KNEE PANEL FOR FRONT SEAT AND KNEE PANEL MOUNTING STRUCTURE FOR VEHICLE

Noritada Yoshitsugu, and Atsuo Ando, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 11, 1980, Ser. No. 215,336

Int. Cl.<sup>3</sup> B60R 21/04

U.S. Cl. 280—752

4 Claims

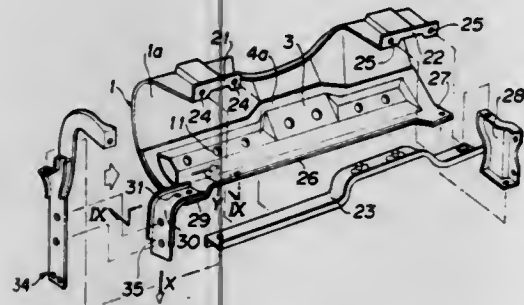
1. A knee panel for a front seat of a vehicle, comprising:

- (a) a substantially horizontally extending panel element, having a substantially convex shape when viewed in a



longitudinal cross section of the vehicle, the convex outer surface of said element facing the front seat of the vehicle in the rearward direction of the vehicle, said panel element being securely fixed at an upper portion thereof to the lower portion of an instrument panel of the vehicle; of an instrument panel of the vehicle;

- (b) a substantially horizontally extending, substantially rigid one-piece reinforcing member substantially longitudinally coextensive with said panel element, said reinforcing member having substantially a dish shape when viewed in a longitudinal cross section of the vehicle, said reinforcing member being securely fixed at its peripheral edges to the lower inner surface of said panel element; and
- (c) a knee panel mounting structure comprising,
- (i) a side bracket securely fixing and supporting said knee panel element at the outer side end of the lower edge thereof;



- (ii) an L-shaped bracket having horizontal and vertical mounting portions, said horizontal mounting portion of said L-shaped bracket being securely fixed to the inner side end of the lower edge of said knee panel element;
- (iii) a floor bracket attached to the floor of the vehicle at a center line portion thereof; and
- (iv) a center line brace attached to said floor bracket, said center line brace being securely fixed to said vertical mounting portion of said L-shaped bracket,
- said reinforcing member and said knee panel mounting structure cooperating to provide substantially rigid support to said knee panel element so that local deformation of said knee panel element upon impact with the knees of vehicle occupants is eliminated and the movement of the vehicle occupants' knees upon impact with the knee panel is thereby restricted.

4,421,344

# **PRESSURE-SENSITIVE RECORD COLOR-DEVELOPING SHEET**

Hideo Ikezawa, Yoshiyuki Takahashi, and Hideaki Hashimoto, all of Tokyo, Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 184,465, Sep. 5, 1980, abandoned. This application Jul. 9, 1982, Ser. No. 396,849

Claims priority, application Japan, Sep. 5, 1979, 54-112776

Int. Cl.<sup>3</sup> B41M 5/22

U.S. Cl. 282—27.5

6 Claims

1. A pressure-sensitive record color-developing sheet comprising a substrate layer and a color-developing layer which has been formed by coating a surface of said substrate with an aqueous solution-dispersion which contains (A) an acid color-developing agent consisting of at least one member selected from the group consisting of activated clay and aluminum silicate, (B) an agent for promoting color-development and preventing color-fading, and (C) a binder, and which has a pH of from 6.5 to 10.0,

which sheet is characterized in that said color development-promoting, color fading-preventing agent comprises 1% to 100%, based on the weight of said acid color-developing agent, of at least one thiourea compound and 1% to 100%, based on the weight of said acid color-developing agent, of at least one zinc compound selected from the group consisting of zinc oxide and zinc hydroxide, the

molar ratio of said thiourea compound to said zinc compound being in the range of from 0.5:1 to 20:1.

4,421,345

# **FLEXIBLE PIPELINE JOINTS**

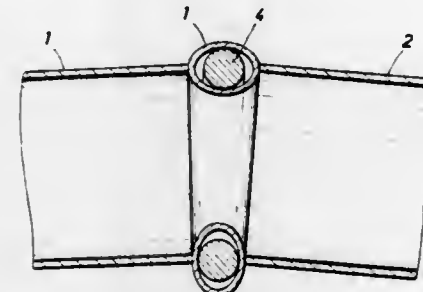
Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 27, 1980, Ser. No. 163,557

Int. Cl.<sup>3</sup> F16L 27/10

U.S. Cl. 285—223

4 Claims



1. A flexible length of pipe comprising at least two pipe ends flexibly joined with a flexible metallic element which is circumferentially continuous toroidal shell-shaped and filled with a solid insert which limits deformation of the toroidal shell element caused by axial or bending loads in the pipe, said insert being a ring of varying cross-sectional area around the circumference thereof.

4,421,346

# **TUBE CONNECTOR**

Alfred J. Seiler, 1700 Dumas-Vermont, Ville-de-Laval, Quebec, Canada

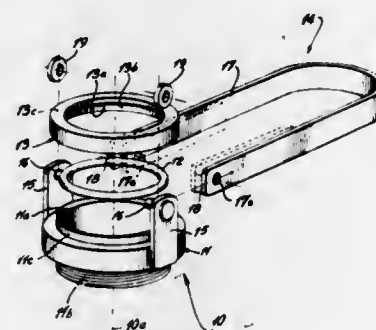
Filed Feb. 6, 1981, Ser. No. 232,211

Claims priority, application Canada, Feb. 7, 1980, 345354

Int. Cl.<sup>3</sup> F16L 21/04, 55/00, 5/00, 19/00

U.S. Cl. 285—346

20 Claims



1. A connector means for use in interconnecting a tube, or the like to a further member, said connector means having a central longitudinal axis extending and defining a path there-through and comprising in combination:

- (a) a first annular member having a first seal accommodating face thereon said face being inclined so as to face toward said central longitudinal axis;
- (b) an "O" ring or the like seal, abutting said face;
- (c) a second annular member having a second seal accommodating face thereon for abutting said seal, said second seal accommodating face being inclined toward said central longitudinal axis; and
- (d) clamping means having an overcenter type clamping action for clamping said first and second annular member together to thereby compress said seal between said seal accommodating faces and in view of their inclinations, displace said seal in a direction radially inwardly of said annular members toward said central longitudinal axis,

said clamping means having a handle with a pair of terminal ends, said terminal ends having a bearing face directly engaging said second annular member for use in providing said clamping action.

4,421,347

# **PIPE COUPLING**

Itzhak Kantor, Menashe, Israel, assignor to Plasson Maagan Michael Industries Ltd., Menashe, Israel

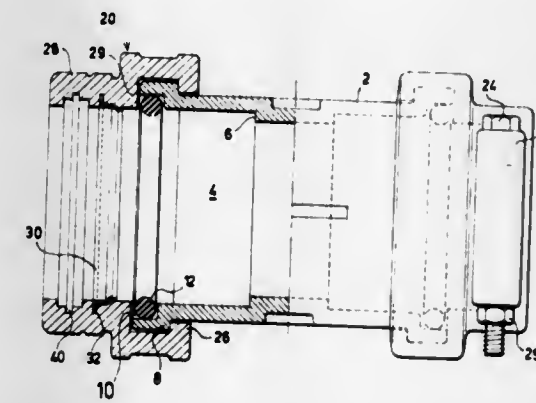
Filed Nov. 20, 1981, Ser. No. 323,532

Claims priority, application Israel, Nov. 27, 1980, 61576

Int. Cl.<sup>3</sup> F16L 17/00, 25/00, 21/00

U.S. Cl. 285—369

9 Claims



1. A pipe coupling including a housing having a bore for receiving the end of a pipe, and clamping means for clamping the pipe to the housing, characterized in that said clamping means is formed on its inner face with a first circumferentially-extending recess of substantially inverted-L-section to receive a first clamping ring of corresponding section, and with a second circumferentially-extending recess axially spaced from said first recess and of substantially T-section to receive a second clamping ring of corresponding section and of a lower hardness than the first clamping ring, to thereby enable the coupling to be used for coupling pipes of different hardnesses by selecting the appropriate clamping ring and inserting it into its respective recess.

4,421,348

# **DOOR GUARD**

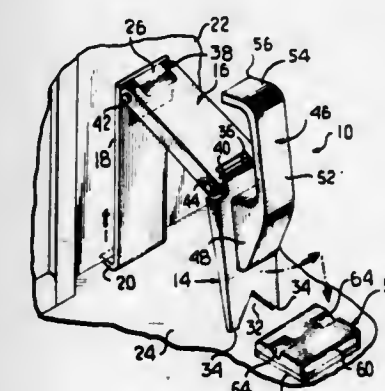
Robert S. Kahn, 220 San Vicente Blvd., Santa Monica, Calif. 90402

Continuation of Ser. No. 44,717, Jun. 1, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,301

Int. Cl.<sup>3</sup> E05C 19/18

U.S. Cl. 292—339

1 Claim



1. A door guard for holding a swinging door in a closed position; said door guard comprising three members including a door engaging member, a floor anchoring member and a locking member, first pivot means connecting said locking member to said door engaging member in angular relation and second pivot means pivotally connecting said floor anchoring member to said locking member in end to end relation, and

cooperating means on said floor anchoring member and locking member for limited pivoting thereof to a straight line aligned coplanar relationship wherein said floor anchoring member and said locking member form a rigid arrangement, said cooperating means being in the form of a generally U-shaped handle having one end fixedly anchored to a selected one of said floor anchoring member and said locking member and a second end forming a stop for engaging an intermediate portion the other of said floor engaging member and said locking member when said floor engaging member and said locking member are in said straight line aligned coplanar relationship, said floor engaging member having a generally wedge shaped free end, said wedge shaped free end being bifurcated to define two spaced apart prongs, and an anchoring pad having a friction base for frictionally engaging the floor, and said anchoring pad having separate seats for separately receiving said prongs.

4,421,349

# **COWLING LATCH**

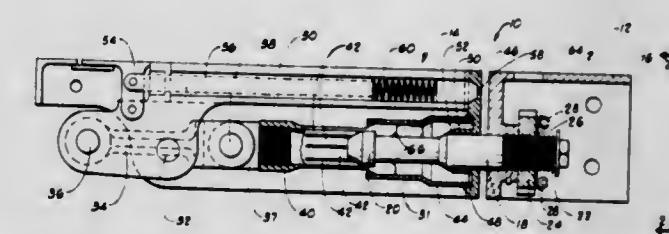
Alfred H. Grellert, Jr., Valley Center, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1981, Ser. No. 335,224

Int. Cl.<sup>3</sup> E05C 9/00, 19/06, 19/14

U.S. Cl. 292—19

5 Claims



3. A cowl latch for an engine nacelle or the like, the latch comprising:

- a keeper assembly having a pin extending outwardly therefrom, the pin having a pin head at one end thereof;
- a latch assembly having a latch handle pivotally mounted thereon, the latch assembly having a collet expander end plated mounted on one end of the assembly and adjacent the keeper assembly when the assemblies are disposed adjacent each other, the end plate having an aperture for receiving a portion of the pin and the pin head therethrough, the end plate having a circular cam surface around the aperture; and
- a collet assembly mounted in the latch assembly and including a collet linked to the latch handle, the collet having collet fingers extending outwardly therefrom and received in a circular hollow collet guide, a portion of the pin and the pin head received inside the collet guide when the ends of the collet fingers are secured around the pin head and the latch handle is in a closed position, the ends of the collet fingers engaging the cam surface of the end plate when the latch handle is in an opened position and the cam surface expanding the fingers outwardly for releasing the pin head received in the collet guide.

4,421,350

# **FOOT-OPERATED, LATCH RELEASING MECHANISM FOR AUTOMOBILE DOORS**

Yasuo Gotomyo, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jun. 16, 1980, Ser. No. 159,924

Claims priority, application Japan, Jun. 18, 1979, 54-77196; Jun. 18, 1979, 54-83816[U]

Int. Cl.<sup>3</sup> E05C 3/30

U.S. Cl. 292—123

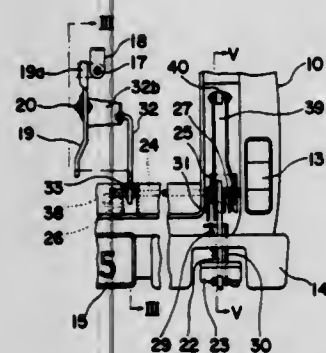
11 Claims

1. A foot-operated, latch releasing mechanism for a door assembly having at least one door supported for movement between opened and closed positions, a releasable door latch assembly for latching the door in the closed position when and



after the door has been moved thereto, said door latch assembly including a claw member operatively supported for movement between latched and unlatched positions, and a striker engageable with the claw member when the door is moved to the closed position to latch the door in the closed position in cooperation with the claw member in the latched position, said foot-operated, latch releasing mechanism comprising, in combination:

- a generally elongated foot-operated member supported for pivotal movement between inoperative and operated positions and having one end adapted to receive a treadling force necessary to move said foot-operated member from the inoperative position towards the operated position;
- a return biasing means for urging the foot-operated member towards the inoperative position;
- a latch release lever supported by the door for movement between first and second operative positions and operable to move the claw member from the latched position towards the unlatched position when said latch release lever is pivoted from the first operative position towards



the second operative position, said latch release lever being normally biased to the first operative position, an operating rod having one end pivotally connected to the latch release lever and the other end protruding to the outside of the door, a substantially intermediate portion of said operating rod being axially movably supported by the door, an actuating means supported for rotation in first and second directions opposite to each other, said actuating means being operable to move the operating rod in a direction required to cause the latch release lever to move from the first operative position towards the second operative position as said actuating means is rotated in the first direction, and a motion transmitting means for causing the actuating means to rotate in the first direction in response to the movement of the foot-operated member from the inoperative position towards the operated position; and

a forced door opener including an opener lever supported for pivotal movement between retracted and kicked positions, said opener lever being pivoted from the retracted position towards the kicked position in response to the release of the door latch assembly for forcibly opening the door.

#### 4,421,351 ARRANGEMENT FOR LIMITING BUMPER MOVEMENT

Ulrich Bruhnke, Ehningen; Roman Schöppel, Sindelfingen, and Bernd Harloff, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 21, 1981, Ser. No. 313,505  
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039674

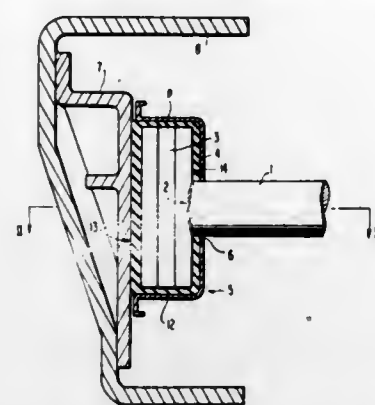
Int. Cl.<sup>3</sup> B60R 19/04, 19/06

U.S. Cl. 293—132

11 Claims

1. A bumper arrangement for supporting a bumper on a motor vehicle, the arrangement including an impact body, an elastic bearing means surrounding the impact body, and further means for enabling a mounting of the impact body and

bearing means on the motor vehicle, characterized in that the impact body includes a first contact area facing the bumper, a second contact area facing the further means, the first and second contact areas are disposed opposite to one another and are formed as convex surfaces, the bearing means includes a



top side, a bottom side, a front side facing the bumper, and a back side facing the further means, and in that portions of the top side, bottom side, front side, and back side, have a predetermined minimum thickness so as to enable the bumper to only carry out rotatable movements about an axis extending vertically relative to the motor vehicle.

#### 4,421,352 LOOP AS WELL AS SLING FORMED THEREOF OR LOOP MAT FORMED THEREOF

Karl M. Raue, Falsterbo, Sweden, and Hans-Otto von Danwitz, Karst, Fed. Rep. of Germany, assignors to Spanset Inter AG, Basel, Switzerland

PCT No. PCT/EP81/00005, § 371 Date Sep. 9, 1981, § 102(e) Date Sep. 9, 1981, PCT Pub. No. WO81/02151, PCT Pub. Date Aug. 6, 1981

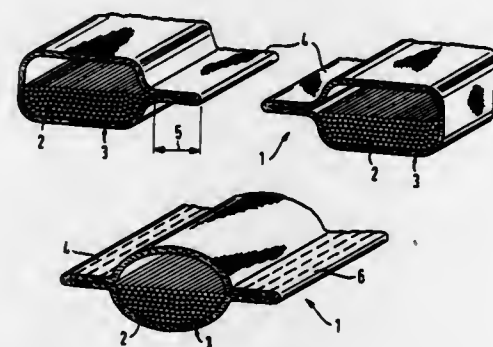
PCT Filed Jan. 21, 1981, Ser. No. 302,474

Claims priority, application Sweden, Jan. 21, 1980, 8000451; Fed. Rep. of Germany, Oct. 30, 1980, 8028911[U]

Int. Cl.<sup>3</sup> B66C 1/12

U.S. Cl. 294—74

19 Claims



1. A sling comprising:

- a core formed of at least one yarn skein;
- a seamless, woven protective sheath having internal and external surfaces, said sheath being in the form of an endless tube which entirely encloses said core, the threads of said skein being arranged in said tube to be movable relative to one another and the internal surface of said sheath; and
- at least one flat rib woven to said sheath along its entire length and projecting outwardly from the external surface thereof;

wherein said sheath and rib woven thereto together have first and second section juxtaposed with respect to each other to form an intermediate region of the sling having opposite ends, with the portion of the rib associated with said first section overlapping and connected to a portion

of the rib associated with said second section; and said sheath and rib woven thereto together have third and fourth sections each connected to a respective one of said ends and forming respective hanging eyes.

16. A mat comprising:

- a plurality of cores each formed of at least one yarn skein;
  - a plurality of seamless, woven protective sheaths each having internal and external surfaces, each said sheath being in the form of an endless tube which entirely encloses a respective one of said cores, the threads of each said skein being arranged in a respective one of said tubes to be movable relative to one another and the internal surface of the respective sheath;
  - a plurality of flat ribs woven to a respective one of said sheaths along its entire length and projecting outwardly from the external surface thereof;
- wherein a section of each said sheath and rib woven thereto is arranged to be in juxtaposition with a section of another said sheath and rib woven thereto so that the respective ribs of such juxtaposed sections overlap each other and are connected together.

#### 4,421,353 PALLET PULLER

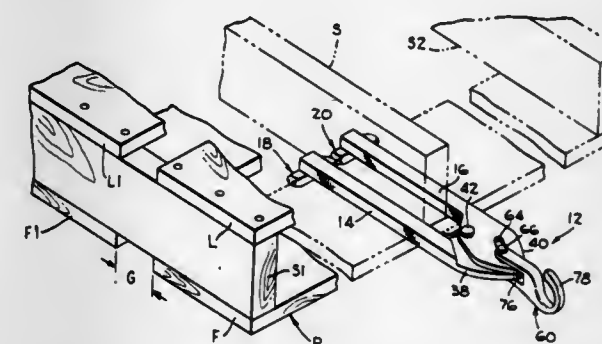
James P. Smith, Jr., 630 Masonic Way, Apt. B, Belmont, Calif. 94002

Filed May 12, 1980, Ser. No. 149,231

Int. Cl.<sup>3</sup> B66C 1/48

U.S. Cl. 294—82 R

11 Claims



1. A pallet puller for engaging a pallet of the type that includes a plurality of foot boards having a given thickness and an upper surface, a plurality of stringers extending transversely of said foot board and secured thereto, said stringers each having a lower surface that abuts the upper surfaces of said foot boards on a plane, and a plurality of load supporting boards mounted on the upper side of said stringers opposite said foot boards, said stringers having a thickness so as to define a space between said foot boards and said load supporting boards that corresponds to said thickness of said stringers, one of said foot boards being an edge foot board and having an outer edge surface coextensive with a peripheral edge of the pallet and an inner edge surface interior of said outer edge surface and spaced apart from the next adjacent foot board by a gap, said pallet puller comprising an elongate rigid arm sized to fit into said space and having an inner end and an outer end, said elongate rigid arm having a support surface adapted to reside upon the upper surface of said edge board, a cross piece secured to said support surface adjacent said inner end and having a gripping projection protruding downward from said support surface and laterally outward of said arm so that said projection resides on or below said support surface, said gripping projection having a thickness less than said given thickness of said foot board so that said gripping projection can be disposed within said gap beneath said plane and said stringer in engagement with the inner edge surface of said foot board, and means on the outer end of said arm for effecting engagement with said arm.

#### 4,421,354 AIR FOIL CONSTRUCTION

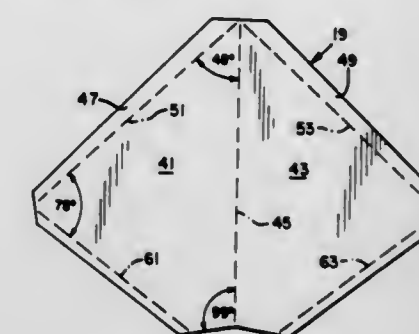
Glenn A. Lemaster, Vancouver, Wash., assignor to Sepco Enterprises, Inc., Portland, Oreg.

Filed Jan. 7, 1982, Ser. No. 337,741

Int. Cl.<sup>3</sup> B62D 35/00

U.S. Cl. 296—1 S

6 Claims



1. An air foil for the cab of a highway tractor having a box-like trailer:

- a foil structure having a pair of panels disposed at a substantial acute angle relative to one another to provide a substantially straight edge for cleaving into the air traveled by the vehicle,
- means for mounting the air foil structure on the roof of the tractor cab with the edge facing forwardly but at an acute angle to the horizontal and to the vertical,
- the rear edges of said panels lying in a vertical plane,
- said air foil structure having an opening formed in its nose portion to facilitate entry of air into said air foil structure,
- the rear margins of said panels terminating in outwardly flaring flanges for deflecting air laterally,
- said flanges tapering in width so as to decrease in size from the upper portions thereof to the lower portions, so that air deflection increases as the displacement of the flange from the sides of the trailer increases.

#### 4,421,355 ILLUMINATED VISOR ASSEMBLY

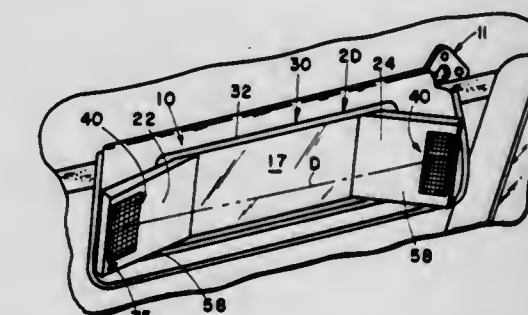
Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Jul. 23, 1981, Ser. No. 286,339

Int. Cl.<sup>3</sup> B60J 3/02

U.S. Cl. 296—97 H

9 Claims



1. A visor assembly for a vehicle comprising:

- a generally rectangular visor body having a length in a longitudinal direction greater than its width in a transverse direction;
- means for mounting said visor body to a vehicle for movement between a stored position and an operative sun screening position;
- a mirror mounted to said visor body for use by a vehicle occupant;

and door means pivotally mounted with respect to said visor body for movement about an axis generally orthogonal to said longitudinal direction and between a closed position covering said mirror and an open position uncovering said



mirror, and wherein said door means includes light means for directing illumination away from said visor when said door means is in said open position.

4,421,356

# SUPPORT STRUCTURE FOR A PIECE OF FURNITURE

Mark Singer, 1663 Cambridge St., Cambridge, Mass. 02138

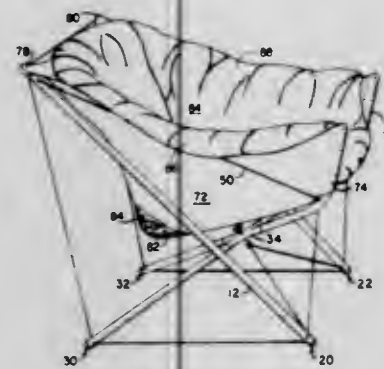
Continuation-in-part of Ser. No. 236,756, Feb. 23, 1981,

abandoned. This application Dec. 21, 1981, Ser. No. 332,371

Int. Cl.<sup>3</sup> A47C 4/02

U.S. Cl. 297-16

10 Claims



1. A substantially rigid support structure, comprising a pair of transversely spaced generally parallel rigid columnar struts, the axes of said struts being inclined with respect to the horizontal,
- an integral generally X-shaped rigid member, oppositely inclined with respect to the horizontal and positioned intermediate and spaced from said struts,
- a flexible tension member connecting each lower end of each strut with one lower end of the X-shaped rigid member at the side adjacent said strut,
- a flexible tension member connecting each lower end of each strut with one upper end of the X-shaped rigid member at the side adjacent said strut,
- a flexible tension member connecting each upper end of each strut with one lower end of the X-shaped rigid member at the side adjacent said strut,
- a flexible tension member connecting each upper end of each strut with one upper end of the X-shaped rigid member at the side adjacent said strut,
- and means for maintaining the upper end of said struts spaced apart from each other.

4,421,357

# SADDLE SUPPORT DEVICE FOR A BICYCLE

Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 21, 1981, Ser. No. 256,238

Int. Cl.<sup>3</sup> B62J 1/00

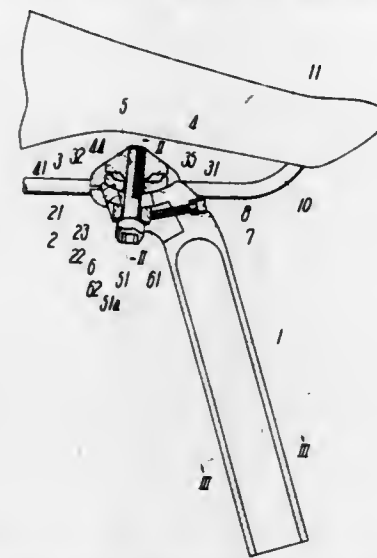
U.S. Cl. 297-195

7 Claims

1. A saddle support device for supporting a saddle having a saddle frame to the upper portion of a seat post of a bicycle, said seat post having a streamlined, non-round, cross-sectional shape, said saddle support device comprising:

- (a) a support member fixed to the upper portion of said seat post, said support member having an upper surface, a lower surface, and a through bore penetrating said upper and lower surface, said upper surface having a spherical profile around said through bore;
- (b) a clamping mechanism supported to the upper surface of said support member for clamping said saddle frame in position, said clamping mechanism comprising a receiving member, a holding member, a washer and a locking member comprising a headed bolt which has a lengthwise axis and which presses said holding member against said receiving member and fixes said receiving member to said support member, said receiving member having a lower surface seated on the upper surface of said support member and an upper surface opposite to said holding member

and being formed to permit said locking member to penetrate through the central portion of said receiving member, said receiving member and holding member receiving between them a portion of said saddle frame, said lower surface of said receiving member having a spherical profile to mate with the spherical surface of said support member, so that said saddle having its frame clamped by said clamping mechanism is rotatable around the lengthwise axis of said locking member and is adjustable in its



vertical angle both longitudinally and laterally of a frame of said bicycle, said washer being interposed between the head of said bolt and the lower surface of said support member, said washer having an upper surface opposite to the lower surface of said support member and a lower surface opposite to said bolt head, said seat post having at an upper portion thereof a holding mechanism for engaging with said washer to maintain said clamping mechanism in its adjusted position with respect to said support member.

4,421,358

# ARM REST CONSTRUCTION

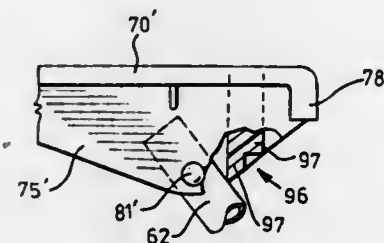
James A. Lehnen, 84 Roosevelt Ave., Waterloo, Ontario, Canada

Continuation-in-part of Ser. No. 35,513, May 3, 1979, Pat. No. 4,252,371. This application Sep. 29, 1980, Ser. No. 191,525

Int. Cl.<sup>3</sup> A47C 504, 7/12, 7/54

U.S. Cl. 297-421

5 Claims



1. In a lounge chair construction having a seat portion and a back portion hinged together along a common edge, each said portion having sides substantially normal to said common edge, an arm rest member pivoted at its rearward end to a side edge of the back portion and pivoted near its forward end to a support member which in turn is pivoted to the corresponding side edge of the seat portion; the arm rest member, the support member and parts of the said side edges of the seat and back portions defining an approximate parallelogram:

the provision of a forward overhang on the arm rest member whereby the forward extremity projects forwardly from the location at which the arm rest member is pivoted to the support member, said location being under a top surface of the arm rest member, the support member terminating under said top surface, and a protective wall forming part of the arm rest member and positioned forwardly

of said location below said top surface; such that, as the arm rest member moves rearwardly with the back portion, thus causing the angle which it defines with the support member to become larger, the said protective wall can come into contact with the support member below the said location whereby to prevent the arm rest member and support member from reaching a position in which the user's fingers become trapped between the support member and the forward part of the arm rest member.

4,421,359

# VEHICULAR ANTI-LOCK BRAKE DEVICE

Tsutomu Hayashi, Hoya; Masae Kato, Musashino, and Mitsuru Saito, Koganei, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

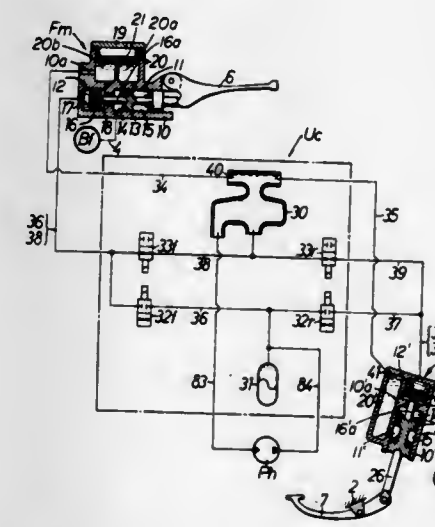
Filed May 29, 1981, Ser. No. 268,133

Claims priority, application Japan, Jun. 13, 1980, 55-79727

Int. Cl.<sup>3</sup> B60T 8/26

U.S. Cl. 303-6 A

16 Claims



1. A vehicular anti-lock brake device comprising a first master cylinder including a cylinder body having a pair of serially aligned first and second cylinder bores divided by a partition; an operating piston slidable in said first cylinder bore and defining therein a brake chamber for applying brake oil pressure to said operating piston to produce a brake torque for a front wheel of the vehicle; a control piston slidable in said second cylinder bore and defining therein a control chamber for applying control oil pressure to said control piston; a piston rod extending through said partition between said first and second cylinder bores and operably connecting said control piston to said brake piston for applying a retracting force to said brake piston to reduce the brake torque when operating oil is introduced into said control chamber to prevent locking of the front wheel; and an oil tank having an interior partition of given height dividing the tank into a first oil reservoir for feeding operating oil to said brake chamber and a second oil reservoir; a second master cylinder including a cylinder body, an operating piston, a control piston and an oil tank, said operating piston of said second master cylinder defining a second brake chamber for applying brake oil pressure to the operating piston of said second master cylinder to produce brake torque for a rear wheel of the vehicle, said control piston of the second master cylinder defining a control chamber in said cylinder body of the second master cylinder for applying control oil pressure to said control piston to prevent locking of the rear wheel, said brake chambers of the first and second master cylinders being hydraulically disconnected from one another to form independent brake systems for the front and rear wheels, an auxiliary oil tank connected to the oil tanks of the first and second master cylinders, a hydraulic pump having an inlet and an outlet, said auxiliary oil tank being connected to the inlet of said hydraulic pump; first and second normally open control valves and first and second normally closed control valves, said outlet of said hydraulic pump being connected through said normally closed first and second control

valves respectively to said control chambers of said first and second master cylinders, said auxiliary oil tank being connected through said normally closed first and second control valves respectively to said control chambers of said first and second master cylinders.

4,421,360

# RELAY VALVE ASSEMBLY

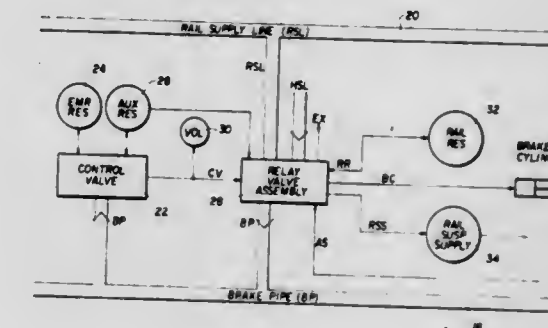
Ronald O. Newton, Adams, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 14, 1981, Ser. No. 224,932

Int. Cl.<sup>3</sup> B60T 8/18

U.S. Cl. 303-22 A

4 Claims



1. A variable load relay valve for use in a fluid brake control system having a first fluid supply, a second fluid supply, control valve means responsive to a brake command to provide a fluid control signal from said first fluid source and means for providing a sensed load signal comprising:
  - a control port for receiving a fluid control signal;
  - an exhaust port connected to the atmosphere;
  - a brake cylinder port for providing fluid to a brake cylinder;
  - a first fluid supply port for receiving fluid from a first fluid supply;
  - a second fluid supply port for receiving fluid from a second fluid supply;
  - a piston valve means for interconnecting said brake cylinder port with said exhaust port and said second fluid supply port to determine the degree of braking;
  - first piston means movable in response to a fluid control signal at said control port;
  - load means interconnecting said piston valve means and said first piston means for varying the effect that said fluid control signal on said first piston means produce on said piston valve means as a function of a sensed load signal; and
  - second piston means movable in response to pressure on said first fluid supply port for controlling the operation of said piston valve independent of said load means to apply pressure from said second fluid supply port to said brake cylinder port when the pressure on said first fluid supply port is less than a predetermined value.

4,421,361

# BRAKE FLUID PRESSURE CONTROL APPARATUS IN SKID CONTROL SYSTEM

Tetsuro Arikawa, and Hideyuki Yamada, both of Yokosuka, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Dec. 8, 1981, Ser. No. 328,697

Claims priority, application Japan, Dec. 10, 1980, 55-173956; Dec. 15, 1980, 55-176775

Int. Cl.<sup>3</sup> B60T 17/18, 8/02

U.S. Cl. 303-92

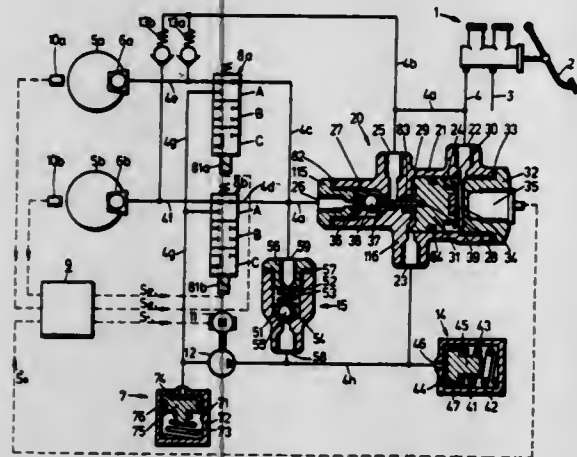
20 Claims

1. A brake fluid pressure control apparatus in a skid control system for a vehicle having at least one wheel and a brake for the wheel comprising:

- (A) a control unit for measuring the skid condition of the wheel;
- (B) a fluid pressure control valve device arranged between a master cylinder and a wheel cylinder of a brake for the



- wheel, said fluid pressure control valve device receiving control signals of said control unit to control the brake fluid pressure to said wheel cylinder;
- (C) a hydraulic reservoir which, when the brake fluid pressure to said wheel cylinder is decreased with control of said fluid pressure control valve device, reserves the brake fluid discharged through said fluid pressure control valve device from said wheel cylinder;
- (D) a pressure fluid supply conduit connecting said master cylinder with said fluid pressure control valve device;
- (E) a fluid pump with motor receiving a pump drive signal of



- said control unit for returning the brake fluid from said hydraulic reservoir into said pressure fluid supply conduit;
- (F) switching means for detecting operation of said fluid pump with motor, and generating an operation detecting signal when said fluid pump with motor effectively operates; and
- (G) pump fail detecting means receiving said pump drive signal of the control unit and the output of said switching means, said pump fail detecting means generating a pump fail detecting signal when said switching means, after and when receiving said pump drive signal, does not generate said operation detecting signal.

4,421,362

## ANTI-SKID BRAKE CONTROL SYSTEM FOR WHEELED VEHICLES

Kenji Shirai, and Fumio Nakagawa, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

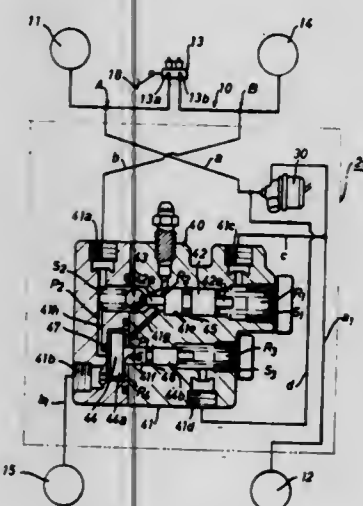
Filed Oct. 29, 1981, Ser. No. 316,276

Claims priority, application Japan, Nov. 10, 1980, 55-158459

Int. Cl.<sup>3</sup> B60T 8/02

U.S. Cl. 303—115

5 Claims



1. An anti-skid brake control system for a wheeled vehicle having dual hydraulic braking circuits connecting a tandem master cylinder to the left and right rear-wheel brake cylinders, and an electronic anti-skid brake control apparatus incorporated with one of said hydraulic braking circuits for decreasing the pressure applied to one of said rear-wheel brake cylinders from said master cylinder in response to an electric signal indicative of a predetermined wheel locking condition, the anti-skid brake control system comprising a modulator valve assembly incorporated with the other hydraulic braking circuit to cooperate with said anti-skid brake control apparatus, said modulator valve assembly including a housing provided with inlet and outlet ports respectively in connection to said master cylinder and the other rear-wheel brake cylinder through the other hydraulic braking circuit, a balance piston axially movable within said housing and being exposed at its opposite ends to the pressure respectively applied to said rear-wheel brake cylinders to be moved in an axial direction by the difference in pressure between said rear-wheel brake cylinders, a check valve arranged within said housing to cooperate with said balance piston, said check valve being opened under inoperative condition of said balance piston to permit the flow of pressurized fluid between said inlet and outlet ports and being closed upon movement of said balance piston in the axial direction to interrupt the fluid communication between said inlet and outlet ports, a communication passage formed between said check valve and said outlet port, a bypass passage for providing a direct fluid communication between said inlet and outlet ports, and a change-over valve disposed within said communication passage and being responsive to the respective pressures of said hydraulic braking circuits to permit the flow of pressurized fluid through said communication passage and close said bypass passage under normal condition of said hydraulic braking circuits and to close said communication passage and open said bypass passage in response to braking operation under damage of the one of said hydraulic braking circuits.

4,421,363  
ROLLING BEARING FOR LENGTHWISE MOVEMENT  
HAVING RESILIENT GUIDE ELEMENT

Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eusenheim, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

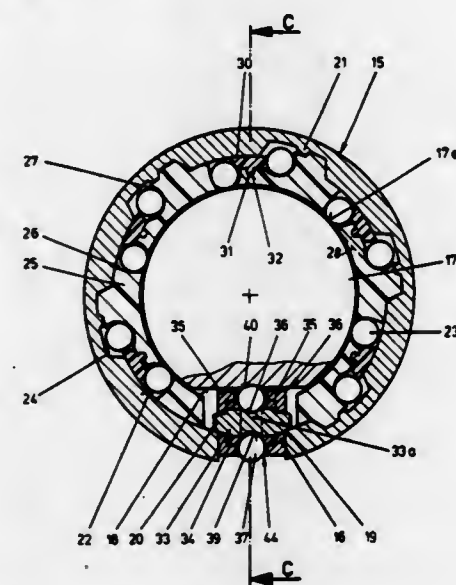
Filed Mar. 19, 1981, Ser. No. 245,518

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012018

Int. Cl.<sup>3</sup> F16C 29/06

U.S. Cl. 308—6 C

11 Claims



1. In a rolling bearing for lengthwise movement between a slide element and a rail element, including at least one cage between the slide element and rail element and at least one endless row of rolling bodies positioned in the cage, the slide element and rail element having opposed lengthwise directed races between which the loaded rolling bodies of the row roll, the cage having a longitudinal first guide for loaded rolling

bodies, a longitudinal second guide for unloaded rolling bodies, and a pair of turn-around guides joining the ends of the first and the second guides of the respective rows; the improvement wherein an elastic guide means is provided adjacent at least one side of at least one of said first and second guides and positioned to resiliently urge rolling elements in said one guide toward one of said races, said guide means being a plastic material filled with lubricating oil and being adapted to release lubricant.

4,421,364

AUTOMATON FOR DEALING OUT FOOD AND DRINK  
Tauno K. Takaniemi, Nissilinnankatu 30 B 31, SF-33200 Tampere 20, Finland

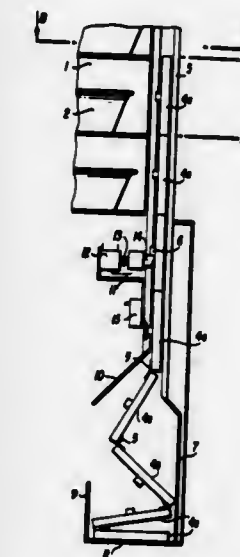
Continuation of Ser. No. 50,846, Jun. 20, 1979, This application Oct. 16, 1981, Ser. No. 312,048

The portion of the term of this patent subsequent to Oct. 27, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> A47F 3/02; B65D 83/08

U.S. Cl. 312—35

9 Claims



1. An apparatus for dispensing products, comprising: a plurality of product receiving shelf spaces arranged one above the other;
- door means, including a plurality of interconnected panels for closing said product receiving shelf spaces, said door means being arranged for movement due to the effects of gravity, downward past said shelf spaces; and
- means for (1) selectively releasing said door means for downward movement from an initial, upper position, to open and to permit removal of a product from a first one of said shelf spaces which was closed by said door means in said initial upper position and (2) for subsequently arresting said door means from further downward movement beyond said first one of said shelf spaces, to prevent removal of another product from a second, still lower one of said shelf spaces which also was closed by said door means in said initial position.

4,421,365

## MOVABLE STORAGE CABINET

Genshi Taniwaki, Kumamoto, Japan, assignor to Kongo Co., Ltd., Japan

Continuation of Ser. No. 166,111, Jul. 3, 1980, abandoned, which is a continuation of Ser. No. 925,750, Jul. 18, 1978, abandoned.

This application Feb. 16, 1982, Ser. No. 349,160

Claims priority, application Japan, Oct. 3, 1977, 52-132898

Int. Cl.<sup>3</sup> A47B 53/02

U.S. Cl. 312—198

1 Claim

1. A movable storage cabinet supported on wheels for movement along rails installed on a floor and having a cabinet depth and an incremental cabinet length at least one incremental cabinet length making up an entire frontage length of the

cabinet and the cabinet expandable in frontage length by said incremental cabinet length, said cabinet comprising:

- a plurality of inverted U-shaped channels (8) forming saddles extending, in spaced relationship to each other, parallel to the depth of the cabinet, the flanges of said channels having aligned apertures (15, 13) for receiving wheel bearing shafts adjacent each end of said saddles with the number of said saddles equal to one more than the number of incremental cabinet lengths making up the entire frontage length of the cabinet;
- wheel shafts (22, 26) engaged through said apertures;
- wheels (24, 27) mounted on said shafts and in each of said channels to engage said rails and support said channels;
- a fixture plate (11) connected to each end of said saddles with at least two openings (10) therein;
- pairs of C-shaped connection members (9) with upper and lower flanges embraced around and secured to opposite ends of adjacent saddles and interconnecting adjacent pairs of said saddles having a length to extend across the space between adjacent saddles and substantially equal to said incremental cabinet length;
- said connection members (9) each having at least one opening (19) aligned with one of said fixture plate openings (10) respectively, said connection members secured to said saddles by bolts extending through said aligned openings and a number of said pairs of connecting members chosen to form a desired entire frontage length of the cabinet, each saddle at each cabinet end in the frontage length direction having an outer channel flange thereof covered by an end of said connecting members at opposite ends of the cabinet;



- each saddle other than said end saddle, connected to two pairs of connecting members each;
- said saddles and an upper flange of each of said connection members formed with holes (12, 18) at the top thereof;
- stanchions (3) extending through said top holes;
- shelves (5) supported on said stanchions;
- side plates (7) secured to the opposite ends of said cabinet;
- a handle shaft rotatably mounted through one side plate of said cabinet;
- a rotatable handle (33) secured to said shaft;
- a bearing (21) connected between at least one wheel shaft (22) of each saddles at one common side of each saddle with said one wheel shaft extending beyond said bearing on both sides thereof; and
- a reduction gearing interconnecting said handle shaft and said one wheel shaft (22) at said one common side of each saddle;
- said reduction gearing comprising an intermediate shaft (29) rotatably mounted through the one of said saddles adjacent said one side plate carrying said handle shaft and between said wheels mounted on said wheel bearing shaft (22, 26) of said one of said saddles, a pulley (31) on said intermediate shaft, a pulley (25) on one of said one wheel bearing shafts (22) of said one saddle, and a belt (32) connecting said pulleys for rotation, each of said one wheel shafts (22) of said one common side of each of said saddles connected to each other through pipes (23);
- whereby the cabinet can be increased in frontage length by connecting an additional pair of connection members (9), an additional saddle (8) and an additional pipe (23) at one end of the cabinet;
- pairs of said connection members at opposite ends of the



cabinet having a length greater than pairs of said members intermediate the cabinet ends by one half the width of said saddles;

each fixture plate (11) of each saddle including at least two pairs of openings (10), each connection member (9) having at least one pair of openings (19) at each end thereof, each saddle other than said end saddles having each pair of openings thereof connected to one pair of openings from two adjacent pairs of connection members.

4,421,366

## SELF-ASSEMBLY FURNITURE

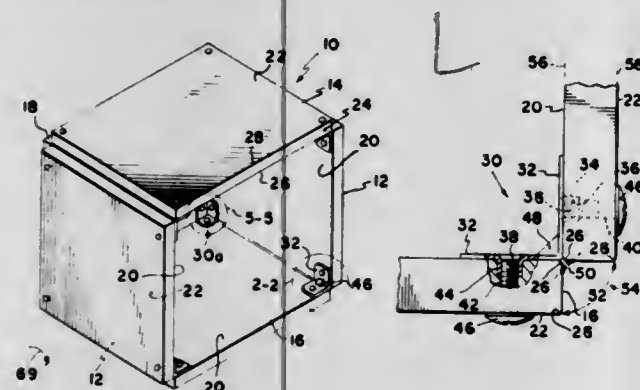
Chester Niziol, 91 Yonge St., Suite 401, Toronto, Ontario, Canada M5C 1S8

Filed Jul. 28, 1980, Ser. No. 173,115

Int. Cl.<sup>3</sup> A47B 43/00, 48/00

U.S. Cl. 312—257 A

16 Claims



1. An article of furniture which can be assembled and disassembled, comprising:

a plurality of generally planar, angularly related panels, each having

first and second generally parallel side faces; and  
a first plurality of bolt-receiving bores adjacent the edge portions of said panels extending from said first side face to said second side face;

corner connector means which detachably couples said panels together in a predetermined angular relationship but with adjacent border edge portions of adjacent panels being in spaced-apart relation that provides gaps between adjacent edges of adjacent panels, each comprising:

a plurality of individual bracket members independent of each other bracket member, each bracket member including angularly related integral flange members, each having an inner surface and an outer surface abutting one of said panel side faces;

each of said flange members including an annular projection extending outwardly from said outer surface of said flange member and received by said bolt-receiving bores in said panels;

each of said projections having an internally threaded bolt-receiving bore therethrough; and

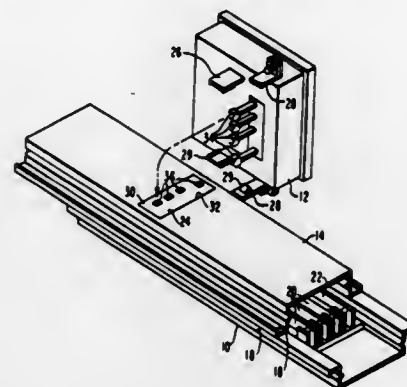
bolt means, received by said bolt-receiving bores in said panel and threadedly coupled to said bolt-receiving bores of said projections, which releasably clamps said flange members to said panels;

the length of said bracket members in a direction parallel to the panel edge portion to which it is coupled, being substantially less than the length of the panel edge portion to which it is coupled whereby unobstructed openings are provided between the adjacent border edge portions of adjacent panels substantially the length of said edge portions.

4,421,367  
GROUNDING SPRING FOR BUS DUCT PLUG-IN UNITS  
Bill M. Shannon, Rochester Township, Beaver County, and Charles L. Weimer, Patterson Heights, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Jul. 29, 1981, Ser. No. 287,842  
Int. Cl.<sup>3</sup> H01R 4/66

U.S. Cl. 339—14 R

2 Claims



2. A bus duct assembly, comprising:

a bus duct section having top and bottom walls and opposite side walls so as to form a housing;

a bus bar supported within said housing;

an opening on said bottom wall for providing external access to said bus bar;

a tap box detachably attached at said opening, and having a terminal there-within for connection to said bus bar; and  
a pair of spaced apart grounding means connected to said tap box each for cooperating with the other by making compressive electrical contact with opposite side walls of said bus duct section before said terminal makes contact with said bus bar.

4,421,368  
LEAD-RECEIVING SOCKET, MULTI-SOCKET ASSEMBLY INCORPORATING SAME AND METHOD OF EFFECTING CIRCUIT INTERCONNECTIONS THEREWITH

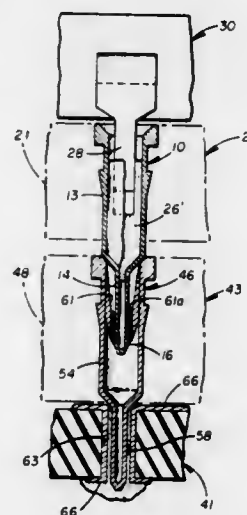
John F. Saban, Lyons, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 31, 1981, Ser. No. 289,019

Int. Cl.<sup>3</sup> H01R 13/28

U.S. Cl. 339—17 CF

6 Claims



1. An interconnected composite circuit package comprising: a multi-leaded circuit module having a plurality of leads extending therefrom;

a circuit board having a plurality of pre-formed holes therein and associated circuitry formed on one surface thereof;

at least one primary socket assembly including at least one predetermined array of primary sockets permanently

secured to said circuit board, each of said primary sockets having an upper female portion with internally confined precious metal contacts adapted to receive and releasably electrically engage an associated male-type pin, and further having a lower terminal portion adapted to be received within one of said plurality of preformed holes and soldered to said associated circuitry on said circuit board, and

at least one auxiliary multi-socket assembly interposed between said circuit module and said primary socket assembly, said auxiliary socket assembly including a non-conductive block, and a plurality of low profile circuit-module lead-receiving auxiliary sockets supported by, and extending through, said block in at least one predetermined spaced array corresponding to the array of sockets in said primary socket assembly, each of said auxiliary sockets comprising a conductive shell having an upper female portion of sufficient inside cross-section to receive both a pre-formed solder insert and one of said circuit module leads therewithin, and further having a lower male-type pin portion, with at least a selected area therealong being precious metal plated so as to be releasably received within, and to establish precious metal-to-precious metal contact with, said contacts confined within said female portion of an aligned one of said primary sockets, said pre-formed solder insert in each of said auxiliary sockets being adapted, upon subsequently being heated to a molten state and then allowed to re-solidify, after an aligned circuit module lead has been nested therein, to fill the interstices between the inner wall of the female portion of said associated socket shell and such a nested lead, along at least substantial, co-extensive axial lengths thereof.

4,421,369

## PANEL MOUNTED CONNECTOR

Reidar Myking, P.O. Box 45, N-5100 Isdalst, Norway

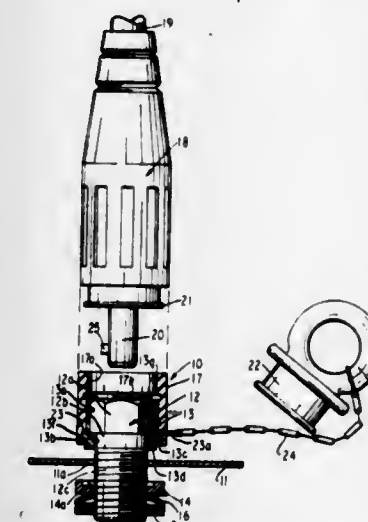
Filed Jul. 20, 1981, Ser. No. 285,062

Claims priority, application Norway, Jul. 25, 1980, 802246

Int. Cl.<sup>3</sup> H01R 13/74

U.S. Cl. 339—36

10 Claims



1. Contact-forming coupling means for cooperatively engaging coupling means connected to a current conductor cable for electrode welding and comprising a current conductor portion, first and second clamp members formed from an electrical insulating material and adapted to engage each other to support said current conductor portion on a fastening plate, said first clamp member being arranged to be fastened non-turnably to said current conductor portion and to form an abutment against one side of said fastening plate and said second clamp member being arranged to be secured via said current conductor portion in abutment with the opposite side of said fastening plate, said first clamp member having a fastening portion surrounding said current conductor portion while projecting endways outwardly from said fastening plate, a sleeve com-

posed of elastically yielding material surrounding and permanently connected to said fastening portion, said sleeve having a portion which projects a distance endways outside said current conductor portion and radially spaced from the latter.

4,421,370

## CONTACT ARRAY

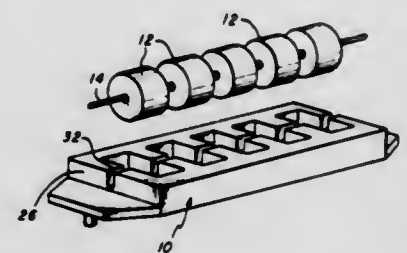
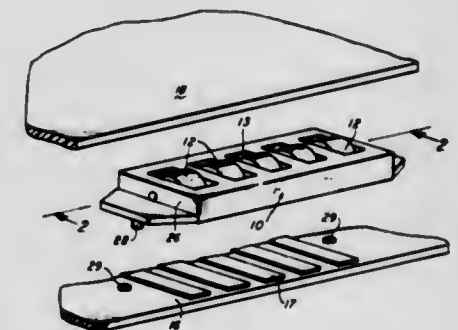
Paul W. Treake, Atkinson, and Edward W. Cielakie, London-derry, both of N.H., assignors to Accutest Corporation, Chelmsford, Mass.

Filed Jul. 16, 1981, Ser. No. 283,956

Int. Cl.<sup>3</sup> H01R 9/09

U.S. Cl. 339—59 M

17 Claims



1. A contacting elastomeric array comprising: an electrically insulating support means, comprising a plastic boat having a plurality of vertically extending through slots, a plurality of electrically conductive elastomeric contacts, said plastic boat slots for accommodating the elastomeric contacts in a spaced array, and means supporting the elastomeric contacts in said through slots of the support means with each contact being supported with limited compressive movement relative to the support means, said contacts, each including a substantially cylindrical contact having an axial hole for receiving the means supporting the elastomeric contacts and orienting the contacts for receiving compressive forces against the arcuate sides thereof rather than at flat ends.

4,421,371

## ELECTRICAL SELF-ALIGNING CONNECTOR

Keith H. Clark, Decatur, and Donald R. Scott, Athens, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 168,995, Jul. 15, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 432,057

Int. Cl.<sup>3</sup> H01R 13/12, 13/62

U.S. Cl. 339—64 M

2 Claims

1. A self-aligning electrical connector device comprising: a receptacle having a conically contoured interior tapered downwardly from an open end toward a remote end of said interior;

a plug having a correspondingly conically contoured body receivable in said contoured interior of said receptacle,



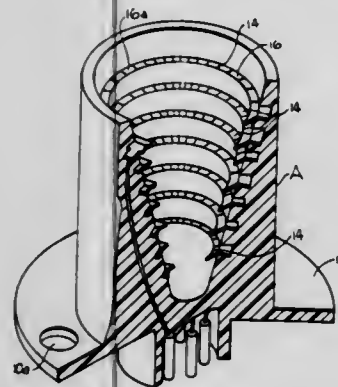
said plug body being tapered from one end to another in the same direction as said interior of said receptacle; said plug including a plurality of spaced conductive ring elements adapted for electrical connection to an outside source, each said ring element of said plug having a mating conductive face around the circumference of said ring element;

said plug ring elements having progressively smaller diameters decreasing in the direction of taper of said plug body;

said receptacle including a plurality of correspondingly spaced conductive ring elements secured within said contoured interior of said receptacle component having progressively smaller diameters decreasing in the direction of taper of said contoured interior of said receptacle corresponding with the diameter of said receptacle ring elements;

each said receptacle ring element including a plurality of individual segmented portions around the circumference of said ring element;

said segmented portions of each ring element being separately deflectable downwardly in the direction of taper of said contoured interior of said receptacle;



said segmented portions of each said ring element being defined by slits so that adjacent segments of said ring are in edge-to-edge contact when said segments are in an undeflected position and form a continuously closed ring element when said ring is disengaged from said receptacle component;

said segmented portions of each said receptacle ring element having a deflected position wherein said segmented portions separate from one another and bend downwardly when said plug is inserted in said receptacle, said segmented ring element extending into said interior at such an angle that upon deflection a biasing force is asserted against said ring elements of said plug for positive electrical contact around the circumference of said ring elements; and

said segment portions in said deflected position exerting an axial ejection force against said plug body in a direction opposite to said direction of taper of said plug body to urge said plug body outwardly from said receptacle when said plug and receptacle components are released for disengagement facilitating disengagement without exterior force so that said receptacle and plug may separate with reduced damage to electrical connections.

4,421,372

#### INSERTION-WITHDRAWAL MECHANISM FOR RACK MOUNTED CIRCUIT BOARDS

Raymond Golden, Willowick, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 13, 1979, Ser. No. 48,282

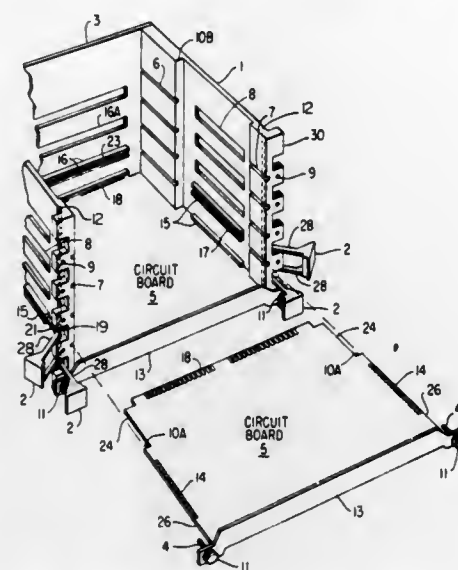
Int. Cl.<sup>3</sup> H01R 13/54

U.S. Cl. 339—75 MP

5 Claims

1. In a mechanism for the insertion into or withdrawal from a support structure of a circuit board having an array of male contacts mounted along a lateral edge for engagement with a mating array of zero insertion force female contacts mounted in the support structure, a linear cam expanding said female

contacts to receive said male contacts when moved to a first position and contracting said female contacts into engagement with said male contacts when moved to a second position, a detent in the support structure and a pawl operatively con-



nected to said cam adapted to engage said detent when said cam is in said first position whereby movement of said cam from said first to said second position is inhibited when said pawl engages said detent.

4,421,373

#### ELECTRICAL CONNECTOR HAVING MEANS FOR SEALING AGAINST MOISTURE

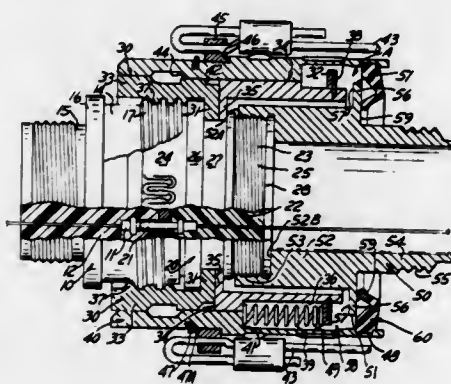
Lloyd G. Ratchford, Oneonta, and Dee A. Werth, Afton, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 28, 1981, Ser. No. 334,869

Int. Cl.<sup>3</sup> H01R 13/52

U.S. Cl. 339—94 M

5 Claims



1. An electrical connector having means for sealing against moisture, the electrical connector of the type including a pair of electrical connector members (10, 20) having their forward end portions (14, 24) mated; a duality of electrical contacts (11, 21) carried by said connectors and forming an electrical interconnection in the mated connectors; means (40, 30, 35, 37, 17) for releasably coupling the connector members, the releasable coupling means being carried by one connector member for connection to the other connector member and including a sleeve (40) having an interior wall (49) circumsposed about a spring retainer (35) and mounted for movement rearwardly of said forward end portions; and means (39) disposed in the retainer for resisting rearward movement of the sleeve and for normally biasing the sleeve forwardly, the means for sealing against moisture characterized by:

said sleeve (40) having an annular recess (48) circumsposed around the interior wall (49);

a sealing adapter (50) mounted to said one connector member and including a radial collar (56) defining oppositely disposed first and second end faces (57, 59); and

a moisture seal (60) carried by the sleeve (40), said moisture seal comprising an outer ring portion (62) sized to fit the annular recess (48), an inner ring portion (66) adapted to contact and seal about the radial collar (56) and a resilient skirt (64) interconnecting said ring portions (62, 66), said skirt (64) including first and second skirt portions (70, 72) with said first skirt portion (70) extending from its connection to the outer ring portion (62) and said second skirt portion (72) extending from its connection to the inner ring portion (66).

4,421,374

#### TRIFURCATED INSULATION-PENETRATING TERMINAL

Lino M. Montilla, Jr., and Alexander Uchuck, both of Baltimore, Md., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 5, 1980, Ser. No. 184,565

Int. Cl.<sup>3</sup> H01R 11/20

U.S. Cl. 339—97 P

12 Claims



1. A terminal for electrical conductors, said terminal being made from an electrically conductive material and capable of being mounted in an aperture of a supporting block that is made of a dielectric material with portions of said terminal extending beyond a surface of the block to which the aperture opens to permit the connection of conductors, said terminal comprising:

a generally planar base portion; and

a trifurcated portion which is connected to said base portion, said trifurcated portion being generally coplanar and unitary with said base portion and comprising;

a center furcation including a projecting key adapted to be received in a recess of an aperture of the supporting block in which said terminal is mounted; and

a lateral furcation which is disposed adjacent to each side of said center furcation with adjacent portions of each lateral furcation and said center furcation forming therebetween a conductor-receiving slot and an elongated associated opening that communicates with an inner end of the associated conductor-receiving slot and that extends substantially to said base portion, said projecting key of said center furcation being formed substantially along a line which is transverse of a longitudinal axis of said terminal and which extends through the intersections of said conductor-receiving slots and said elongated openings and being adapted to cooperate with a portion of the supporting block which defines said recess substantially to prevent movement of said center furcation toward one of the lateral furcations when a conductor is inserted into the slot which is defined by the center furcation and the other lateral furcation.

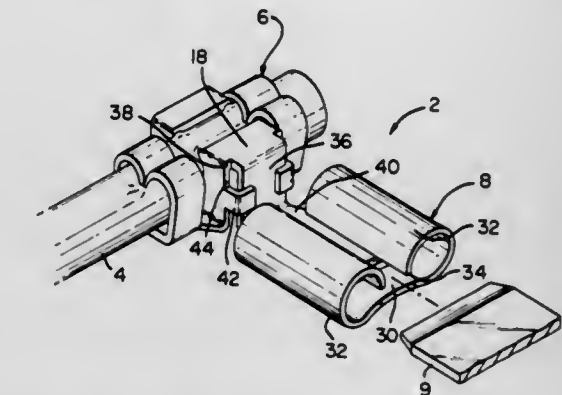
4,421,375  
FLAG-TYPE TERMINAL HAVING INSULATION  
DISPLACEMENT WIRE CONNECTION  
Daniel R. Coldren, Enola, Pa., assignor to AMP Incorporated,  
Harrisburg, Pa.

Filed Mar. 29, 1982, Ser. No. 362,772

Int. Cl.<sup>3</sup> H01R 4/24

U.S. Cl. 339—97 R

7 Claims



1. A flag-type terminal of the type having a wire connecting portion and a contact portion which extends laterally of the wire connecting portion, the terminal being characterized in that:

the wire connecting portion comprises a pair of spaced apart aligned plate-like members, each of the members having a first end and a second end, the first ends being connected by spaced apart connecting straps, aligned wire-receiving slots extending into the plate-like members from the first ends whereby a wire can be moved between the connecting straps, and into the wire-receiving slots, the contact portion being integral with, and extending laterally from, one of the connecting straps.

4,421,376

#### SNAP-ON CABLE CLAMP

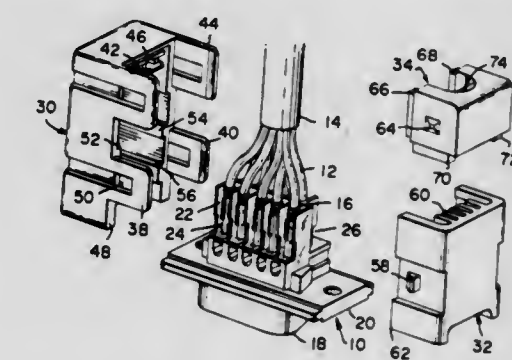
Pete Cosmos, and Earl W. McCleery, both of Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 9, 1981, Ser. No. 319,348

Int. Cl.<sup>3</sup> H01R 13/58

U.S. Cl. 339—103 M

7 Claims



1. A snap-on cable clamp assembly providing 90° or 180° cable exiting from an electrical connector, said cable clamp assembly comprising:

first and second mating housing members of substantially rectangular configuration defining therebetween a connector receiving cavity, said housing members having like width and depth but substantially different lengths to define an enlarged cable exit opening from the assembled housing members in two directions normal to each other, each said housing member having a cable gripping profile directed towards said cable exit, and means to latchingly engage said housing members; and

a cable clamp having a width and depth equal to said housing members and length equal to the difference in length of said housing members.



housing members, said cable clamp having a cable gripping profile on a first side, and adjacent housing members engaging second and third sides, and means to latchingly engage said first and second housing members, whereby with said second side engaging said first housing member and said third side engaging said second housing member 180° cable exiting is achieved while with said second side engaging said second housing member and said third side engaging said first housing member 90° cable exiting is achieved.

4,421,377

## CONNECTOR FOR HF COAXIAL CABLE

Georg Spinner, Am Eichberg 12, D-8155 Westerham, Fed. Rep. of Germany

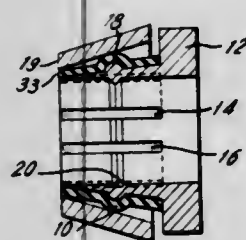
Filed Sep. 23, 1981, Ser. No. 304,821

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036215

Int. Cl.<sup>3</sup> H01R 17/18

U.S. Cl. 339—177 R

16 Claims



1. A connector for a coaxial cable which includes an inner conductor, a dielectric layer around the inner conductor and an outer conductor supported by the dielectric layer, the connector comprising:

a bushing for making mechanical contact with the outer conductor;

the bushing having an inner surface and an outer surface, and at least one slot extending axially along the bushing and passing between the inner surface and the outer surface; the slot lying in a plane tangential to the inner surface of the bushing; the bushing being emplaceable over the outer conductor, and the slot therein being for receiving a cut leading edge of the outer conductor, and the bushing and slot being configured so that a portion of the outer conductor having the cut leading end thereof received in the slot passes through the slot upon relative rotation of the bushing and the coaxial cable.

4,421,378

## ELECTRICAL CONTACT RETENTION INSERT AND MEANS FOR MOLDING SAME

Richard Sanford, Maryland, and Normand C. Bourdon, Unadilla, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 92,132, Nov. 7, 1979, abandoned. This application May 3, 1982, Ser. No. 373,906

Int. Cl.<sup>3</sup> H01R 13/434

U.S. Cl. 339—217 R

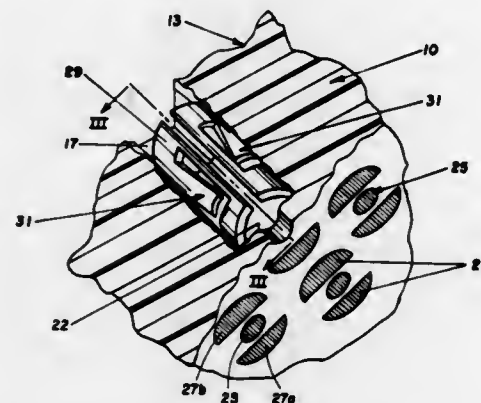
10 Claims

1. In an electrical connector insert for removably receiving an elongated electrical contact of the type having a retention section defining forward and rearward facing shoulders, said insert having an axial passage therethrough from a front face to a rear face to removably receive a resilient contact retention clip, said contact being removably secured within the passage by means of the resilient clip being received within said passage, said clip being longitudinally split to permit diametrical reduction and including resilient means to engage the rearward facing shoulder of the contact, the improvement wherein said insert comprises a dielectric body which has integrally formed therewith:

retention means disposed at opposite ends of said passage for

retaining the retention clip within the insert, said retention means including a first vertical wall adjacent to said rear face for engaging one end of the clip and a second vertical wall adjacent to said front face for engaging the other end of the clip and the forward facing shoulder of said contact, said first vertical wall including at least two angularly spaced vertical wall portions;

constriction means extending radially inward into the passage for reducing the retention clip diameter, said constriction means including each said first vertical wall comprising a pair of flat surfaces which intersect with



each other to form a concave V-shaped constriction, the flat surfaces forming the V-shaped constriction being coaxial with the passage and adapted to engage and bear against the outer clip wall to reduce the diameter of the clip;

support means adjacent to said front face for supporting a forward mating section of the contact; and

means defining an opening in one of said vertical walls for receiving a release tool to diametrically reduce the clip diameter and thereby permit removal of the clip through the constriction, said opening being defined by said angularly spaced vertical wall portions.

4,421,379

## MULTIPLE HOLOGRAPHIC LENS

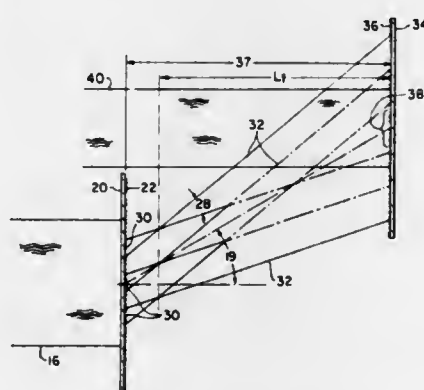
Alex Grumet, Whitestone, N.Y.; Abe Wolf, Sun City West, Ariz., and Gaspar J. Calderone, Lake Grove, N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,279

Int. Cl.<sup>3</sup> G02B 5/32

U.S. Cl. 350—3.72

11 Claims



1. A method of fabricating a multiple holographic lens comprising the steps of:

fabricating an off-axis fly's eye lens with a plurality of non-overlapping lenslets, each such lenslet having a predetermined f-number and covering a non-negligible area on the lens;

inserting the fly's eye lens in a first beam of light from a coherent source to provide a plurality of refracted beams in one to one correspondence with the lenslets of the fly's eye lens;

positioning a holographic recording medium so that an area thereon is illuminated simultaneously by each of the refracted beams; directing a second beam of light from the coherent source toward the area of the holographic recording medium illuminated by the refracted beams; exposing the holographic recording medium simultaneously to the second beam and the refracted beams; developing the holographic recording medium to form the multiple holographic lens therefrom.

4,421,380

## FULL-COLOR HOLOGRAM

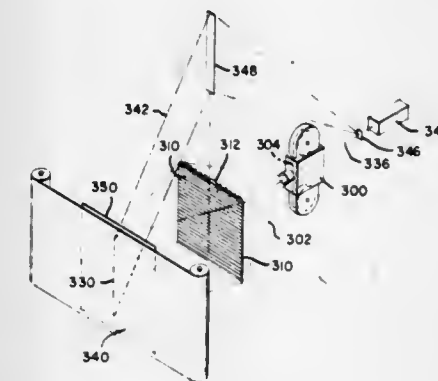
Stephen P. McGrew, 1717 Columbus Pl., Santa Clara, Calif. 95051

Filed Oct. 6, 1980, Ser. No. 194,438

Int. Cl.<sup>3</sup> G03H 1/30

U.S. Cl. 350—3.78

10 Claims



1. A multicolor hologram comprising:

a first group of small areas of a recording medium, said group bearing diffractive patterns substantially corresponding to a spatially sampled, first hologram recorded in a first color and bearing an image having horizontal parallax, substantially no vertical parallax, and a finite degree of vertical diffuseness;

first color filter means proximate said first group of small areas to limit reconstruction of an image from said first group of areas to a predetermined first color;

a second group of small areas of said recording medium non-overlapping with said first group of small areas and distributed on said surface, said second group bearing diffractive patterns substantially corresponding to a spatially sampled, second hologram recorded in a color different from that of said first hologram and bearing an image with horizontal parallax, substantially no vertical parallax, and a finite degree of vertical diffuseness; and second color filter means located proximate said second group of small areas to limit reconstruction of the image from said second group of areas to a predetermined second color.

4,421,381

## MECHANICAL VIBRATING ELEMENT

Toshitsugu Ueda, and Fusao Kohsaka, both of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corp., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,627

Claims priority, application Japan, Apr. 4, 1980, 55-44383; May 22, 1980, 55-69112

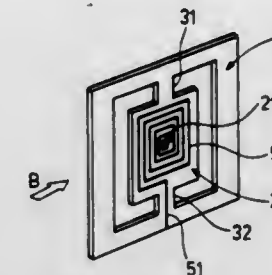
Int. Cl.<sup>3</sup> G02B 7/18; G01R 13/38

U.S. Cl. 350—6.6

12 Claims

1. A mechanical vibrating element characterized: in that a frame and a moving portion supported by said frame are constructed of a single insulating substrate; in that said moving portion is formed with one or more coils or conductive patterns; in that both the formations of said frame and said moving portions and the formations of said coils or said conductive patterns are made by photolithographic and etching techniques

and in that a current is fed to said coils or conductors, while imparting a magnetic field in the same direction as the plane



direction of said insulating substrating, so that said moving portion may be mechanically vibrated.

4,421,382

## FIBER RETAINING DEVICE FOR POWER LASER

Yuzuru Doi, Niza; Teruyuki Kakeda, and Noriaki Kawamura, both of Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

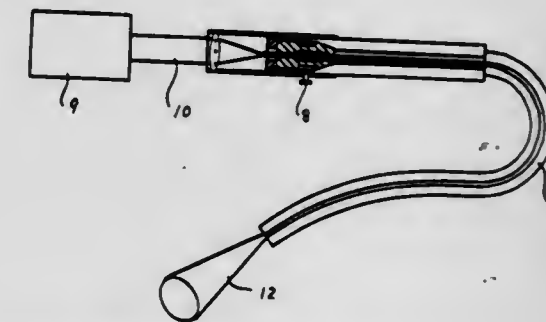
Filed Mar. 6, 1981, Ser. No. 241,440

Claims priority, application Japan, Apr. 1, 1980, 55-43223[U]

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.20

1 Claim



1. A medical laser scalpel comprising:

a cylindrical lens mount guide sleeve, a lens mounted proximate a first end of said sleeve, a cylindrical tube received in a second end of said sleeve and slidably retained therein, said tube being formed with a through-hole having a frusto-conical section formed at an intermediate section thereof and having internal threads formed proximate one end thereof,

an integrally molded fiber retainer positioned within the through-hole of said cylindrical tube for holding and accurately centering a bundle of optic fibers, said fiber retainer including a cylindrical centering member having a central hole, a frusto-conical chucking member spaced from said centering member having a central hole aligned with the central hole in said centering member and a plurality of slits extending along the length thereof and inwardly from the surface thereof,

a holding ring coupled to said cylindrical member having external threads formed thereon enmeshed with the internal threads formed in the cylindrical member securing said retainer in said cylindrical tube and for urging said frusto-conical chucking member into engagement with the frusto-conical portion of said through-hole to urge the sides of said frusto-conical member together to retain and accurately center a bundle of fibers in said retainer and said tube.



4,421,383

## OPTICAL FIBER CONNECTORS

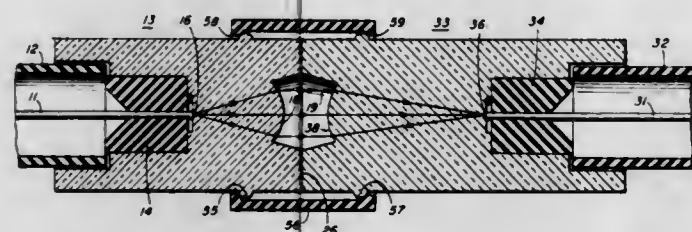
W. John Carlsen, Boston, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 112,991, Jan. 17, 1980, abandoned. This application Nov. 8, 1982, Ser. No. 440,139

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.21

29 Claims



15. In combination,

(A) a first optical fiber connector for a first optical fiber having a first diameter comprising

(1) an optical fiber connector body molded of optical quality transparent plastic having

(a) a planar, annular, reference surface,

(b) a lens having a convex surface molded into said connector body, recessed inward from said reference surface,

(c) a third surface forming a focal plane of said lens, and having a point thereon one focal length from said lens surface, said third surface being parallel to said reference surface, and

(d) a substantially cylindrical cavity, having a second diameter, recessed from a fourth surface, and a smaller cavity further recessed therewithin terminating at said third surface, said point lying on an axis of said cylindrical cavity, and

(2) a precision molded elastomeric optical fiber holder, for holding said first optical fiber, said fiber holder comprising a molded cylindrical piece of elastic material having a third diameter and having an axial hole of a fourth diameter from one end of said piece to another end thereof, said molded piece having said hole tapered to a fifth diameter near one only of said ends,

wherein said fifth diameter is greater than each of said first diameter and said fourth diameter, and wherein, prior to insertion of said first fiber, said fourth diameter is smaller than said first diameter;

(B) a second optical fiber connector for a second optical fiber having a sixth diameter comprising

(1) an optical fiber connector body molded of optical quality transparent plastic having

(a) a planar, annular, reference surface adapted to engage with said first optical fiber connector body reference surface,

(b) a lens having a convex surface molded into said second connector body, recessed inward from said second body reference surface,

(c) a seventh surface forming a focal plane of said second connector body lens, and having a point thereon one focal length from said second connector body lens surface, said seventh surface being parallel to said second connector body reference surface, and

(d) a substantially cylindrical cavity, having a seventh diameter, recessed from an eighth surface, and a smaller cavity further recessed therewithin terminating at said seventh surface, said seventh surface point lying on an axis of said second connector body cylindrical cavity, and

(2) a second precision molded elastomeric optical fiber holder, for holding said second optical fiber, said second fiber holder comprising a molded cylindrical piece of elastic material having an eighth diameter and having an axial hole of a ninth diameter from one end of said second fiber holder piece to another end thereof, said second fiber

holder piece having its axial hole tapered to a tenth diameter near one only of its said ends,

wherein said tenth diameter is greater than each of said sixth diameter, and said ninth diameter, and

wherein, prior to insertion of said second fiber, said ninth diameter is smaller than said sixth diameter; and

(C) means for joining said first optical connector to said second optical connector so that said first optical connector planar annular reference surface engages with said second optical connector planar annular reference surface.

4,421,384

## FIBER OPTIC TRANSDUCER

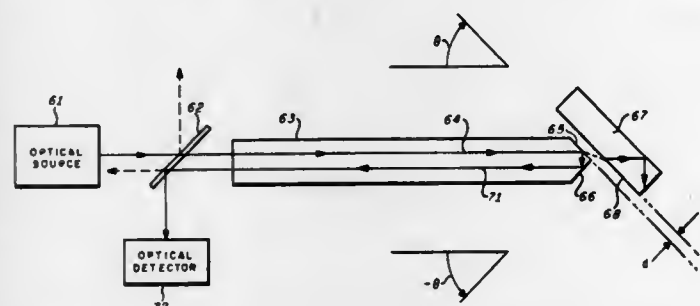
Donald H. McMahon, Carlisle, Mass., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 63,504, Aug. 3, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 286,812

Int. Cl.<sup>3</sup> G02B 5/14; G01D 5/34

U.S. Cl. 350—96.29

7 Claims



1. A fiber optic transducer for sensing ambient conditions comprising:

first and second optical fibers constructed of optical transparent material with substantially equal refractive indices  $n_1$ , each having a longitudinal axis and a planar end face oriented at a preselected angle with respect to said longitudinal axis;

means for positioning said optical fibers with said longitudinal axes in substantial alignment and said end faces in substantially parallel relationship with a separation space having a variable separation distance therebetween that changes as a function of said ambient conditions; and

an optical transparent medium with refractive index  $n_2$  less than  $n_1$  substantially spanning said variable separation space, said refractive indices  $n_1$  and  $n_2$  and said preselected angle chosen such that optical signals propagating in said first optical fiber are incident to said planar end face thereof at angles of incidence that are at least equal to a critical angle  $\theta_c$ , defined by  $\sin \theta_c = n_2/n_1$ , such that optical signals incident to said planar end face of said first optical fiber with wavelengths shorter than said variable separation distance are substantially totally reflected and optical signals incident to said planar end face with wavelengths greater than said variable separation distance are coupled across said variable separation distance to propagate in said second optical fiber with an intensity level that varies inversely with said variable separation distance.

4,421,385

## POLYGON MIRROR FOR USE WITH LASER BEAM SCANNING APPARATUS INCLUDING MEANS FOR HANDLING AND STORING THE MIRROR

Ryoji Yamaguchi, Yutakamachi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 30, 1981, Ser. No. 280,051

Claims priority, application Japan, Aug. 4, 1980, 55-109740; Aug. 4, 1980, 55-109741; Oct. 8, 1980, 55-141006

Int. Cl.<sup>3</sup> G02B 7/18

U.S. Cl. 350—299

8 Claims

1. A polygon mirror for use with laser beam scanning apparatus comprising:

4,421,387

## EXTENDED THIN FILM LIGHT MODULATOR/SCANNER

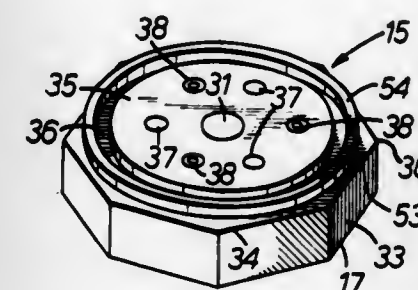
Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 12, 1981, Ser. No. 224,243

Int. Cl.<sup>3</sup> G02F 1/03

U.S. Cl. 350—356

7 Claims



a ring also coaxial with said aperture and also extending upwardly from the upper surface of said body and surrounding said circular projection, said circular projection and said ring being separated by a groove, one wall of said groove forming at least a portion of the surface of the circular projection; and

wherein said circular projection and said ring have substantially the same height.

4,421,386

## STRESS-FREE WINDOW FOR LASER APPLICATIONS

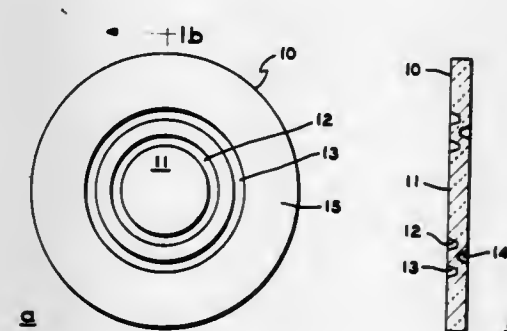
Theodore J. Podgorski, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 3, 1982, Ser. No. 354,415

Int. Cl.<sup>3</sup> G02B 5/00

U.S. Cl. 350—319

2 Claims



1. A stress-free optical element for laser applications comprising:

a unitary disc-like transparent optical element having both a relatively stress-free central area for transmission of a light beam as well as a surrounding mounting area near the periphery;

a plurality of concentric grooves formed in the element surface on one side of the element; and,

at least one further concentric groove formed in the element surface on the opposite side of the element and of radius different from the intermediate said plurality of concentric grooves, said grooves forming a spring-like portion in said unitary optical element to effectually mechanically decouple said stress-free central area from said surrounding area.

4,421,388

## ACOUSTO-OPTIC TIME INTEGRATING FREQUENCY SCANNING CORRELATOR

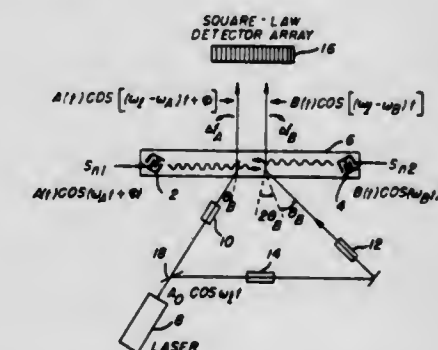
Norman J. Berg, Irwin J. Abramovitz, both of Baltimore; Michael W. Casseday, Greenbelt, and John N. Lee, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 6, 1981, Ser. No. 251,605

Int. Cl.<sup>3</sup> G02F 1/11

U.S. Cl. 350—358

8 Claims



1. A two-dimensional frequency scanning correlator for correlating first and second signals which are shifted in frequency or time with respect to each other, comprising:

acousto-optic interaction means for diffracting light by sound;

first, second, third and fourth acoustic transducer means disposed on said acousto-optic interaction means for converting electrical signals to sound;

means for applying first and second modulated carrier high frequency A.C. signals respectively to said first and second transducer means, the modulation of said first A.C. signal corresponding to said first electrical signal and the



modulation of said second A.C. signal corresponding to said second electrical signal;

means for applying third and fourth high frequency A.C. signals respectively to said third and fourth transducer means;

laser means for providing a coherent light beam, from which first, second, third and fourth coherent light beams are derived;

means for directing said first and second light beams across said acousto-optic interaction means for interaction respectively with said first and second A.C. signals in a first dimension of an orthogonal coordinate system;

means for directing said third and fourth light beams across said acousto-optic interaction means for interacting respectively with said third and fourth A.C. signals in a second dimension which is perpendicular to said first dimension;

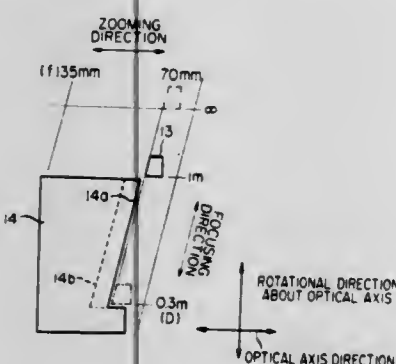
time integrating photodetector means for detecting the interference of the light beams;

means for directing beams derived from said third and fourth beams at said photodetector means after said third and fourth beams interact with said third and fourth A.C. signals; and

wherein said acousto-optic interaction means is comprised of first, second and third discrete acousto-optic interaction media elements, said first and second elements having said first and second modulated carrier A.C. signals respectively applied thereto, and said third element having said third and fourth A.C. signals applied thereto.

**4,421,389**  
**MACRO ZOOM LENS BARREL**

**Takeshi Muryoi, Chigasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**  
**Filed Oct. 2, 1981, Ser. No. 308,110**  
**Claims priority, application Japan, Oct. 8, 1980, 55-139931**  
**Int. Cl.<sup>3</sup> G02B 7/10**  
**U.S. Cl. 350—429**

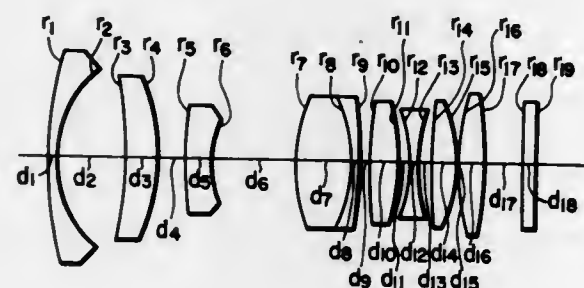


1. A zoom lens barrel having a single operating ring for effecting focusing by rotating operation of the operating ring about the optical axis with respect to a fixed portion and zooming by moving operation of the operating ring in the direction of the optical axis, said zoom lens barrel comprising:  
means provided between said operating ring and said fixed portion for limiting said operations by said operating ring, said means impeding said focusing with respect to an object lying at a shorter distance than a predetermined distance when said operating ring is in a position corresponding to a short focal length with a predetermined focal length longer than said short focal length as the boundary and impeding the zooming to said short focal length when said operating ring is in a position corresponding to the focusing with respect to the object lying at said shorter distance.

**4,421,390**  
**BRIGHT WIDE-ANGLE LENS FOR COMPACT COLOR**  
**VIDEO CAMERAS**

**Kyosuke Amano, Kurume, Japan, assignor to Asahi Kagaku  
Kogyo Kabushiki Kaisha, Tokyo, Japan**  
Filed Jan. 8, 1981, Ser. No. 223,535  
Claims priority, application Japan, Feb. 5, 1980, 55-12807  
Int. Cl.<sup>3</sup> G02B 9/64, 13/04

**U.S. Cl. 350—459** **3 Claims**



1. A wide-angle lens system comprising nine lenses grouped in eight lens components, a first lens component including a negative meniscus lens convex toward the object, a second lens component including a positive meniscus lens concave toward the object, a third lens component including a negative meniscus lens convex toward the object, a fourth lens component including a positive cemented lens composed of a positive lens and a negative lens, a fifth lens component including a positive lens, a sixth lens component including a negative lens, a seventh lens component including a positive lens, and an eighth lens component including a positive lens wherein:  
Aperture ratio 1:1.4 F=100 View angle 70.8°

r <sub>1</sub>	470.236	d <sub>1</sub>	15.97	N <sub>1</sub> /v <sub>1</sub>	1.62230/53.2
r <sub>2</sub>	155.922	d <sub>2</sub>	104.44		
r <sub>3</sub>	-649.982	d <sub>3</sub>	49.95	N <sub>2</sub> /v <sub>2</sub>	1.80518/25.4
r <sub>4</sub>	-297.714	d <sub>4</sub>	49.15		
r <sub>5</sub>	535.971	d <sub>5</sub>	36.86	N <sub>3</sub> /v <sub>3</sub>	1.61800/63.4
r <sub>6</sub>	113.778	d <sub>6</sub>	131.96		
r <sub>7</sub>	217.689	d <sub>7</sub>	86.01	N <sub>4</sub> /v <sub>4</sub>	1.70514/41.2
r <sub>8</sub>	-190.178	d <sub>8</sub>	14.01	N <sub>5</sub> /v <sub>5</sub>	1.71736/29.5
r <sub>9</sub>	-565.632	d <sub>9</sub>	15.36		
r <sub>10</sub>	841.143	d <sub>10</sub>	44.60	N <sub>6</sub> /v <sub>6</sub>	1.65830/53.4
r <sub>11</sub>	-260.312	d <sub>11</sub>	16.46		
r <sub>12</sub>	-172.018	d <sub>12</sub>	13.52	N <sub>7</sub> /v <sub>7</sub>	1.80518/25.4
r <sub>13</sub>	218.193	d <sub>13</sub>	20.89		
r <sub>14</sub>	801.641	d <sub>14</sub>	38.09	N <sub>8</sub> /v <sub>8</sub>	1.67790/55.3
r <sub>15</sub>	-200.659	d <sub>15</sub>	1.23		
r <sub>16</sub>	276.716	d <sub>16</sub>	37.60	N <sub>9</sub> /v <sub>9</sub>	1.74400/44.7
r <sub>17</sub>	-880.978	d <sub>17</sub>	61.44		
r <sub>18</sub>	∞	d <sub>18</sub>	20.89	N <sub>10</sub> /v <sub>10</sub>	1.49782/66.8
r <sub>19</sub>	∞				

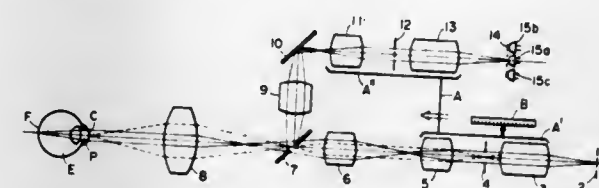
$$F_{1.2.3} = -158.900$$

Backfocus = 179.002 where:

$r_1, r_2, \dots, r_{19}$  is the radius of curvature of each lens surface;  $d_1, d_2, \dots, d_{18}$  is the lens thickness or the distance between the respective adjacent lenses;  $N_1, N_2, \dots, N_{10}$  is the refractive index of each lens;  $\nu_1, \nu_2, \dots, \nu_{10}$  is the Abbe number of each lens; and  $\phi$  is the face plate of the television camera tube.

**4,421,391**  
**AUTO EYE-REFRACTOMETER**

**Isao Matsumura, Yokosuka; Yasuyuki Ishikawa, Kawaguchi;  
Reiji Hirano, Yokohama; Shigeo Maruyama, Machida, and  
Yoshimi Kobayakawa, Yokohama, all of Japan, assignors to  
Canon Kabushiki Kaisha, Tokyo, Japan**  
Filed Sep. 26, 1980, Ser. No. 191,003  
Claims priority, application Japan, Oct. 5, 1979, 54-128751  
Int. Cl.<sup>3</sup> A61B 3/10



1. An auto eye-refractometer comprising:
  - marking means for forming linear marks orientated in at least three directions;
  - projection optical means for projecting the measuring beams emerging from said linear marks onto the fundus of an eye to be examined and having a projecting optical path;
  - first adjusting means disposed on said projecting optical path to move images of said linear marks along said projecting optical path;
  - receiving optical means for receiving the measuring beams emerging from said linear marks reflected from the fundus and having a receiving optical path;
  - detecting means having linear detecting areas for detecting each of the measuring beams passed through said receiving optical means;
  - second adjusting means disposed on said receiving optical path to focus the measuring beams on said linear detecting areas;
  - first beam limiting means disposed in said projecting optical path to limit the beams and having a light transmitting area provided on the optical axis; and
  - second beam limiting means disposed in said receiving optical path to limit the beams and having a light shading area provided on the optical axis.

**4,421,392**  
**APPARATUS FOR DETECTING VISUAL FIELD**  
**DEFECTS OF THE EYE**

**Ronald Pitts Crick, and Jonathan C. Pitts Crick, both of Pembroke House, Pembroke Rd., Sevenoaks, Kent, England**  
Filed Sep. 11, 1979, Ser. No. 74,809  
Claims priority, application United Kingdom, Sep. 12, 1978,  
36450/78



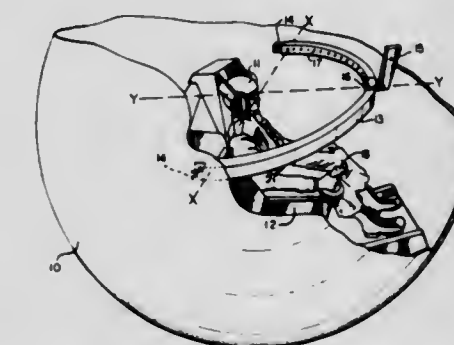
1. An apparatus for detecting visual field defects of an eye of a patient, said apparatus comprising:  
means for displaying to a patient a visual stimulus comprising a plurality of spots having predetermined positions in the field of vision of the patient, each said spot having ill-defined edges to an extent such that said spot is incapable of being viewed by the patient as a sharply defined and

outlined pattern regardless of the patient's visual acuity, said spots being characterized by stimuli which lack high frequency components and which contain only those frequencies necessary to give adequate separation of the closest stimuli.

4,421,393

**VISUAL FIELD PERIMETER AND PSYCHOMOTOR TRACKING PERFORMANCE MEASURING APPARATUS**  
Malcolm M. Cohen; James J. Palumbo, both of Philadelphia;  
David C. Johanson, Warminster, and John G. Nelson, New-  
town, all of Pa., assignors to The United States of America as  
represented by the Secretary of the Navy, Washington, D.C.  
Filed Apr. 27, 1981. Ser. No. 257,683

U.S. Cl. 351-224



1. Apparatus for simultaneously measuring a subject's visual field perimeter and psychomotor tracking ability, comprising, in combination:

first control means providing a first analog signal indicative of a preselected constant rate of change of the subject's angle of view;

second control means formed to be manipulated by the subject for providing a second analog signal indicative of the force applied thereto;

control means connected to receive said first and second signals for providing a third digital signal indicative of the integrated sum of said first and second signals;

display means having a curved array of lights formed to subtend the subject's angle of view at equiangular positions about the angle bisector with opposed pairs of lights connected in parallel, and connected to receive said third signal for illuminating opposed pairs of said lights in response thereto.

## 4.421.394

# DISPLACEMENT SYSTEM FOR AN OPHTHALMOLOGIC EXAMINATION UNIT

Romuald Schön, 5, Werner-Seelenbinder-Str., Jena-Lobeda, District of Gera; Manfred Doms, 5, Zenkerweg; Peter Vorberg, 35, Luise-Seidler-Str., both of Jena, District of Gera, and Horst Schröder, 13, Bibraer-Landstr., Kahla, District of Gera, all of German Democratic Rep.

Filed Dec. 22, 1981, Ser. No. 330,679  
Claims priority, application German Democratic Rep., Mar.  
13, 1981, 228421

U.S. Cl. 351—245

1. A displacement system for an ophthalmologic examination unit particularly for use in ophthalmologic examinations for displacing a base section relative to an accessory section, comprising

the base section having a top face and a leading edge,

the accessory section for mounting at least two ophthalmologic devices,

said accessory section having a bottom face and a leading edge.







(g) automatic control means for said regulating means operative to maintain the latter in said first position until the fluid from said second container is heated to a predetermined temperature, said control means also being operative to move said regulating means to said second position when the fluid from said second container reaches the predetermined temperature.

#### 4,421,400 FOLDED BEAM ADJUSTMENT

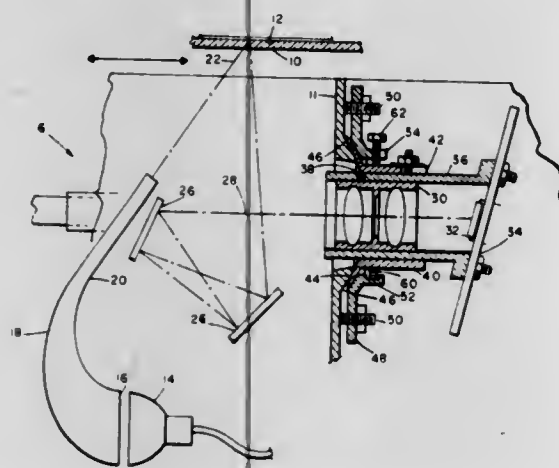
Hugh St. L. Dannatt, Bethel, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 14, 1982, Ser. No. 378,038

Int. Cl.<sup>3</sup> G03B 27/00

U.S. Cl. 355—1

3 Claims



1. In an optical scanning system for scanning an original document to be copied, said system including (a) a carriage, (b) an array of fiber optics for illuminating said original document with a line of light, (c) a first mirror, (d) a second mirror opposing said first mirror and forming an acute angle therewith, said mirrors being separated by a predetermined distance, whereby one end of said mirrors is more open than the other end of said mirrors and input light rays enter at the more open end of said mirrors upon said first mirror at a predetermined angle, and wherein said light rays are reflected off each of said mirrors a predetermined multiplicity of times and exit said mirrors at the more open end by reflecting off said second mirror at the same predetermined angle the input rays make with said first mirror, and (e) a lens cell for focusing said line of light upon a light sensitive surface, an improved adjustment mechanism for said lens cell, said improved adjustment mechanism comprising:

- an inner barrel member surroundingly engaging said lens cell;
- an outer barrel member slidably retaining said inner barrel member, said outer barrel member having a flared end;
- a two dimensionally contoured ring surface on said carriage on which said flared end of said barrel member is seated;
- means for longitudinally sliding said inner barrel member within said outer barrel member; and
- means for swivelling the outer barrel member vertically and laterally.

4,421,401

#### IMAGE RECORDING APPARATUS

Kazuo Kagiura, Tokyo; Hiroyuki Miyake, Inagi; Nobuhiro Kasama, Yokohama; Seiji Sagara, Kawasaki; Nobukazu Sasaki, Tokyo, and Takaji Yonemori, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

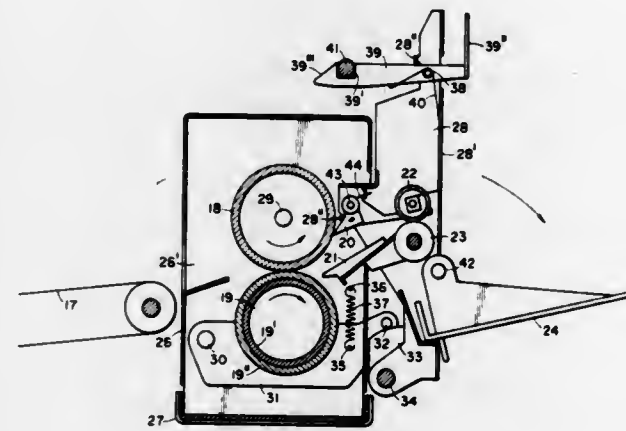
Filed May 12, 1981, Ser. No. 262,955

Claims priority, application Japan, May 16, 1980, 55-65710

Int. Cl.<sup>3</sup> G03G 15/20

U.S. Cl. 355—3 FU

23 Claims



1. An image recording apparatus comprising:
  - imaging means for forming a toner image corresponding to information to be recorded on an image supporting material;
  - first and second rotatable members, having a nip therebetween, for fixing said toner image while carrying said image supporting material in said nip;
  - a first power transmitting member mechanically connected with said first rotatable member for rotating the same when said first power transmitting member is driven;
  - a second power transmitting member shiftable between an operative position in which said second power transmitting member co-operates with said first power transmitting member and an inoperative position in which said second power transmitting member is separated apart from said first power transmitting member, said second power transmitting member being adapted to transmit a driving force from a source of power to said first power transmitting member when said second power transmitting member is in said operative position;
  - discharge means selectively shiftable between a normal position in which the image supporting material fed from the nip between said first and second rotatable members is discharged by said discharge means and a temporal position in which said discharge means is retracted from said normal position;
  - cooperating means for transmitting the shift movement in said discharge means to said second power transmitting member, said cooperating means being adapted to shift said second power transmitting member between said operative and inoperative positions correspondingly when said discharge means is shifted between said normal and temporal positions; and
  - a manually operable member mechanically connected to at least one of said first and second rotatable members to allow manual rotation of at least one of said first and second rotatable members.

4,421,402

#### ELECTROPHOTOGRAPHIC DEVICE

Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

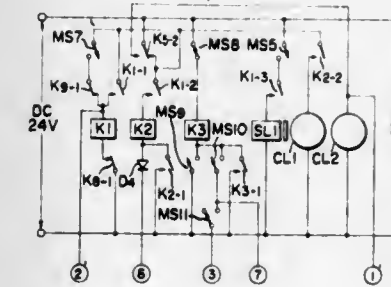
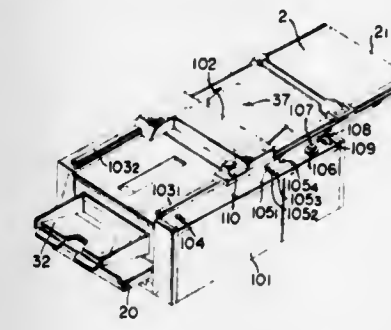
Continuation of Ser. No. 908,827, May 23, 1978, abandoned, which is a division of Ser. No. 778,180, Mar. 16, 1977, Pat. No. 4,185,909, which is a continuation of Ser. No. 600,860, Jul. 31, 1975, Pat. No. 4,017,170, which is a continuation of Ser. No. 348,092, Apr. 5, 1973, abandoned. This application May 6, 1980, Ser. No. 147,175

Claims priority, application Japan, Jun. 20, 1972, 47-7296119; Apr. 13, 1972, 47-3728819; Apr. 15, 1972, 47-3814919

Int. Cl.<sup>3</sup> G03G 15/22, 15/28

U.S. Cl. 355—8

13 Claims



1. A copying apparatus for performing a duplicating operation of an original document comprising:
  - a. an original document scanning means for scanning and transmitting an image of an original document to be duplicated, said scanning means comprising movable means for reciprocal movement along a scanning path defined by the limits of image transmission, wherein said movable means moves in a first direction for scanning the original and in a second direction opposite to the first direction, said movable means moving faster in the second direction than in the first direction;
  - b. receptor means for receiving said transmitted image and producing an intermediate image of the original document in response thereto, said receptor means comprising an endless surface moving cyclically along a fixed path, on which surface said intermediate image is produced;
  - c. a copy sheet feed means for presenting copy sheets to said surface containing said intermediate image in order to transfer said intermediate image of said original document onto said copy sheets;
  - d. detection means disposed in a predetermined position along the scanning path of said movable means for producing a detection signal in response thereto, said detection means including switch means actuable by said movable means from a first state to a second state when said movable means moves in the first direction;
  - e. control means for moving said movable means in the first direction for scanning operation; and
  - f. means for actuating a copy sheet feed means in response to actuation of said switch means from the first state to the second state when said control means is in operation during the movement of said scanning means in the first direction.

4,421,403

#### ORIGINAL IMAGE PROJECTING APPARATUS

Tadashi Sato, Kokubunji; Haruo Tsunoi, Kawasaki, and Hiroshi Kishi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

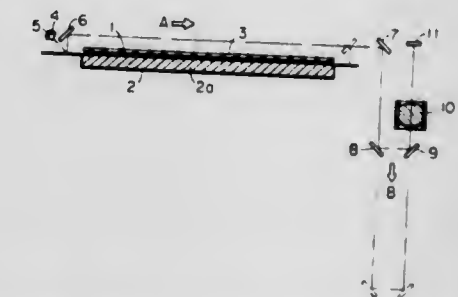
Continuation of Ser. No. 152,735, May 23, 1980, abandoned.

This application Feb. 24, 1982, Ser. No. 351,992  
Claims priority, application Japan, May 29, 1979, 54-66658; May 29, 1979, 54-66659; May 29, 1979, 54-66660; May 29, 1979, 54-66662

Int. Cl.<sup>3</sup> G03G 15/04

U.S. Cl. 355—8

14 Claims



1. An original image projecting apparatus of the type in which an original is scanned and an image of the original is projected onto a photosensitive element, said apparatus comprising:
  - original supporting means for supporting an original thereon with a surface to be scanned of the original facing upwardly;
  - a scanning mirror for scanning the surface of the original;
  - a transparent plate for holding the original on said original supporting means and engageable on the surface of the original;
  - guide means for supporting one end of said scanning mirror, said guide means mounting said scanning mirror for movement in a scanning direction and for pivoted movement toward and away from an original supported on said original supporting means; and
  - means for focusing the image of an original on the photosensitive element.

4,421,404

#### JOB RECOVERY TECHNIQUE IN A DOCUMENT COPIER MACHINE

Douglas J. Conly, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1982, Ser. No. 374,848

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 CU

9 Claims



1. The method of job recovery from a paper jam in a document copier machine with an automatic document feed device for feeding original documents from a stack of documents serially to a processing station for production of images thereof, said machine having a copy paper path, a plurality of image bearing copy sheets being simultaneously transportable serially through said path, said sheets carrying diverse images, said machine having a control system capable of detecting the number of recopies needed for each original when the machine is shut down due to a paper jam or other work stoppage, and the number of originals needed to be recopied, comprising the steps of:
  - clearing said copy paper path of all copy sheets present in



said path when a paper jam or other work stoppage occurs;  
inhibiting further activity by said automatic document feed device, serially inserting N number of originals to be recopied into said processing station, N being a number greater than one;  
producing the required number of recopies from each of said N number of originals to be recopied; and  
automatically reactivating said automatic document feed device upon the production of the last of the required number of recopies to resume the job suspended by the paper jam or other work stoppage and the recovery therefrom.

4,421,405

## MULTIPLE MODE COPYING APPARATUS

Yasumori Nagahara, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

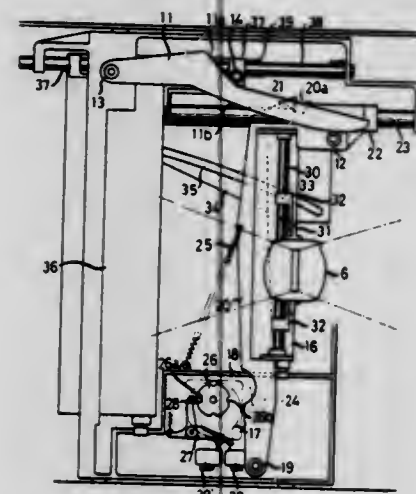
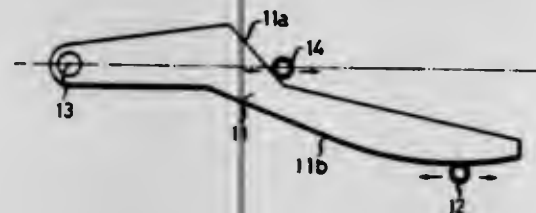
Filed May 26, 1982, Ser. No. 382,100

Claims priority, application Japan, May 27, 1981, 56-79150

Int. Cl.<sup>3</sup> G03B 27/36

U.S. Cl. 355—58

2 Claims



1. A multiple mode copying apparatus comprising:  
drive means for moving a lens in the direction of a principle light beam;  
conversion cam means for converting the distance covered by the movement of said lens into a rotational angle; and  
mirror moving means for moving mirrors in accordance with said rotational angle;  
wherein the improvement resides in that said conversion cam means comprises a cam member formed with a first cam surface for deciding the distance to be covered by the movement of said mirrors, and a second cam surface for following up the distance covered by the movement of said lens, said second cam surface being profiled such that it is in the form of an arc such that when a cam follower moves past a point of contact of the cam follower for effecting copying without magnification and reduction, the direction of movement of the cam member is reversed by starting at said point of contact.

4,421,406

## MOBILE COPIER

Sidney Feinleib, 87 Oakley Rd., Belmont, Mass. 02178

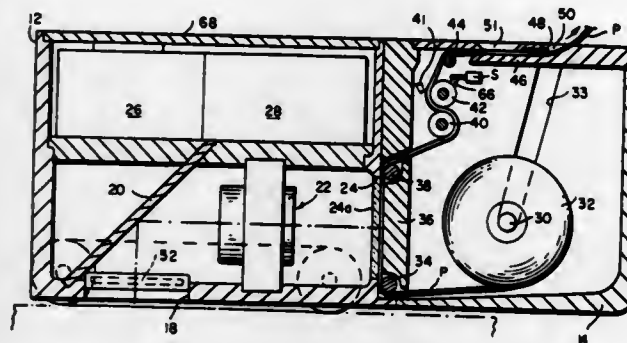
Continuation of Ser. No. 119,933, Feb. 8, 1980, abandoned. This

application Jun. 17, 1982, Ser. No. 389,570

Int. Cl.<sup>3</sup> G03B 27/48, 27/50, 27/70

U.S. Cl. 355—84

5 Claims



1. A mobile copier comprising a housing, rotatable means mounted to the housing with a portion thereof forming a surface movable in contact with the matter to be copied to traverse the housing relative to the matter to be copied, a printable paper, a fixing medium, means operative by movement of the housing as it is traversed across the matter to be copied to move corresponding lengths of the paper into position for exposure and an optical train including a reflector for receiving and focusing successive increments of the material to be copied as successive lengths of the printable paper are moved into position to expose the latter to the image of the matter to be copied, wherein the housing comprises two separable sections, wherein the rotatable means is mounted to one of the sections and one of said sections contains the optical train, the printable paper and the fixing medium, and wherein the module containing the printable paper embodies a blade and means for guiding the paper over the edge of the blade.

4,421,407

## IMAGE COMBINING SEXTANT OR THE LIKE

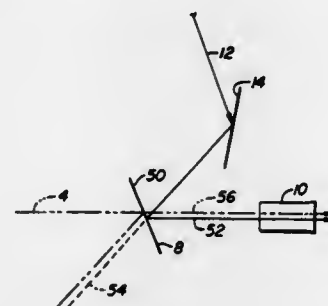
Angus MacDonald, Oakland, Calif., assignor to Davis Instruments, San Leandro, Calif.

Continuation of Ser. No. 75,869, Sep. 17, 1979, abandoned. This application Apr. 22, 1981, Ser. No. 256,464

Int. Cl.<sup>3</sup> G01C 1/08

U.S. Cl. 356—144

8 Claims



1. In a sextant for measurement of the angle between distant objects of the type wherein said sextant includes a first optical path means for receiving light from a first horizon object, a second optical path means from receiving light from a second celestial body object at a vertical angular distance from said first object, said first and second optical path means each including means for producing images of said respective objects and for measuring the angle therebetween, and means for registering the respective images of said objects to obtain accurate measurement of the angle between said objects, the improved registering means comprising:

a spectrally selective beam combining mirror that is at least partially transmissive to enable light from said horizon object to combine with reflected light from said second

celestial body object so that the joint output of said beam combining mirror is a superimposed image of said respective first and second objects covering the full field of view;

said beam combining mirror having predominately reflective characteristics in the blue-green-yellow range corresponding to wavelengths from said second celestial body object, and predominately transmissive characteristics to visible light in all other ranges above and below the blue-green-yellow range from said first horizon object whereby there is produced an enhanced superimposed image of said first and second objects over the full field of view.

4,421,408

## HALOGEN MASS FLOW RATE DETECTION SYSTEM

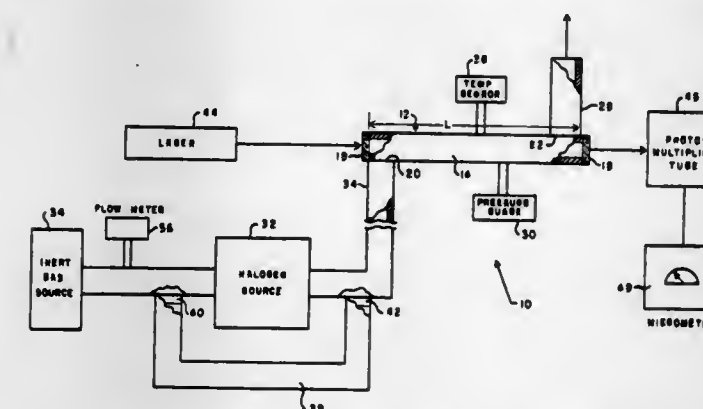
Steven J. Davis, and Leonard Hanks, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 23, 1981, Ser. No. 237,021

Int. Cl.<sup>3</sup> G01N 1/22, 21/85

U.S. Cl. 356—246

10 Claims



1. A halogen mass flow rate detection system comprising an absorption cell, means connected to said absorption cell for passing either an inert gas or a halogen entrained inert gas thereto, means connected to said absorption cell for passing either said inert gas or said halogen entrained inert gas out of said absorption cell, means adjacent one end of said absorption cell for providing a beam of electromagnetic radiation at a predetermined wavelength and for passing said beam of radiation through said absorption cell, said wavelength being in the bound-continuum region and said radiation being at a predetermined power, means adjacent the other end of said absorption cell for receiving said beam of electromagnetic radiation passing through said absorption cell and for detecting the intensity thereof, and means operably connected to said absorption cell for measuring the pressure of said inert gas passing there-through, whereby a relationship between the detected intensity of said electromagnetic beam of radiation passing through only said inert gas and the detected intensity of said electromagnetic beam of radiation passing through said halogen entrained inert gas can be established, so as to then determine said halogen mass flow rate.

4,421,409

## OPEN AREA RATIOMETER

Fred M. Dickey, Derby, and Darrell M. Postlethwaite, Wichita, both of Kans., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 14, 1980, Ser. No. 196,689

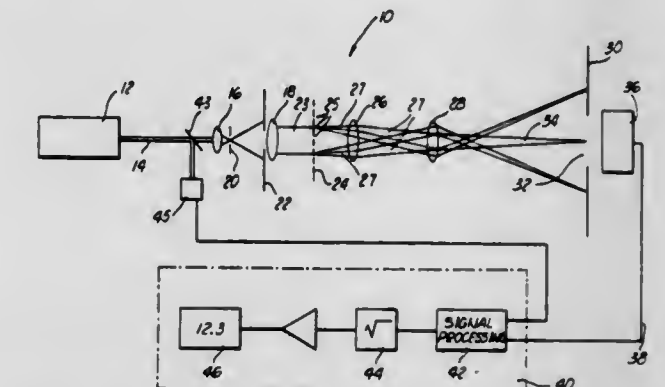
Int. Cl.<sup>3</sup> G01B 9/02

U.S. Cl. 356—354

7 Claims

1. An improved apparatus for optically measuring the percent of open area in a perforated sheet, the apparatus comprising:  
a quasi-monochromatic light source for directing a light outwardly therefrom;

means for collimating the light received from the light source and disposed in front of the light source;  
a light diffraction optical lens disposed in front of and in a spaced relationship from the light collimating means so the perforated sheet can be received therebetween, the lens receiving diffracted light which is passed through the perforations in the perforated sheet;  
a relay magnifying optical lens disposed in front of the light diffraction lens for receiving and magnifying the diffracted light therefrom;  
a light diffraction aperture plate disposed in front of the relay magnifying lens for receiving the magnified dif-



fracted light therefrom, the size of the aperture in the light diffraction aperture plate being small enough to receive only a small central portion of the diffracted light from the perforated sheet;  
a first light detector mounted in front of the aperture in the light diffraction aperture plate for receiving the small central portion of the diffracted light received there-through; and  
electronic means electrically connected to the first light detector for receiving and measuring electrically the amount of diffracted light of the small center portion and converting electronically this amount to a percent of open area in the perforated sheet.

4,421,410

## METHOD AND APPARATUS FOR INSPECTING PRINTED WIRING BOARDS

Koichi Karasaki, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

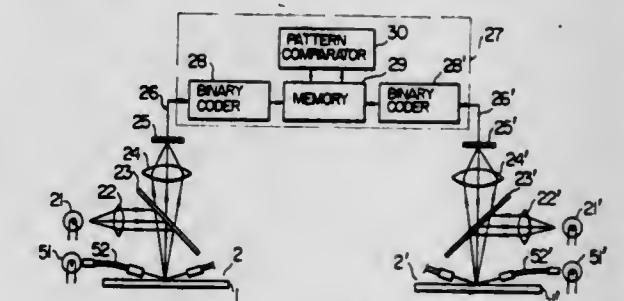
Filed Jul. 22, 1980, Ser. No. 171,265

Claims priority, application Japan, Jul. 23, 1979, 54-92676

Int. Cl.<sup>3</sup> G01B 11/00, 11/24

U.S. Cl. 356—378

14 Claims



1. An apparatus for inspecting printed wiring boards wherein a wiring pattern on a printed wiring board is inspected by detecting light reflected from a wiring surface of the printed wiring board, said apparatus comprising:  
first illuminating means for illuminating the wiring surface of the printed wiring board with light substantially normal to the wiring surface;  
second illuminating means for illuminating the wiring surface of said printed wiring board with light at a large incident angle; and



means for deciding whether a defect exists in a wiring pattern on said wiring surface by receiving the light reflected from said wiring surface as a result of the light illumination by the first and second illuminating means.

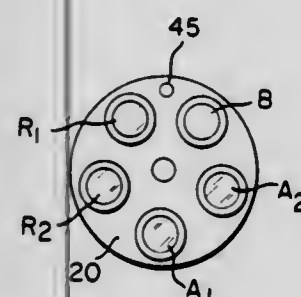
#### 4,421,411 PHOTOMETRIC ANALYZER

Edward S. Ida, Newark, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 7, 1981, Ser. No. 261,483  
Int. Cl.<sup>3</sup> G01J 3/48; G01D 5/36

U.S. Cl. 356—418

4 Claims



1. In a spectral photometer including a filter wheel driven by a synchronous motor, the improvement comprising speed changing means between the motor and filter wheel for rotating the filter wheel one revolution in the time required for an odd number of power half-cycles to the motor.

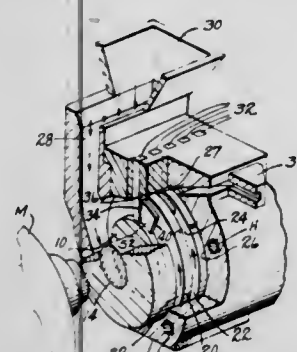
#### 4,421,412 PROCESS AND APPARATUS FOR PROCESSING PLASTIC AND POLYMERIC MATERIALS

Peter Hold, Milford, Conn.; Zehev Tadmor, Haifa, Israel, and Lefteris N. Valsamis, West Haven, Conn., assignors to USM Corporation, Farmington, Conn.

Continuation-in-part of Ser. No. 971,332, Dec. 20, 1978, abandoned. This application Nov. 24, 1982, Ser. No. 444,497

Int. Cl.<sup>3</sup> B01F 5/12, 7/10; B29B 1/06, 3/02  
U.S. Cl. 366—76

34 Claims



1. Apparatus for processing particulate materials which become liquids in the course of processing, and which comprises:

- a rotatable element carrying at least one annular processing channel including opposed side walls having inner wall surfaces;
- a stationary element providing a coaxial surface cooperatively arranged with the processing channel to form an enclosed annular processing passage, the stationary element also having associated with it an inlet for feeding particulate material to the passage, an outlet spaced apart from the inlet for discharging material from the passage, a member providing an end wall surface positioned near the outlet of the passage, a first restraining member having side surfaces positioned between the inlet and the end wall surface and providing a particulate material restraining surface and shaped to provide a clearance between the sides of the first restraining member and inner wall sur-

faces of the processing channel, the end wall surface and the restraining surface being positioned in the passage to provide a space for collecting a pool of liquid material between the end wall surface and the restraining surface which can at least wet sufficient area of the inner surfaces of the processing channel to generate discharge pressure; means positioned in the space for collecting a pool of liquid material for occupying a predetermined portion of the space to provide a pool space of predetermined geometry designed to provide preselected discharge pressure characteristics for liquid material collected in the pool space; and means to rotate the rotatable element in a direction from the inlet toward the first restraining member.

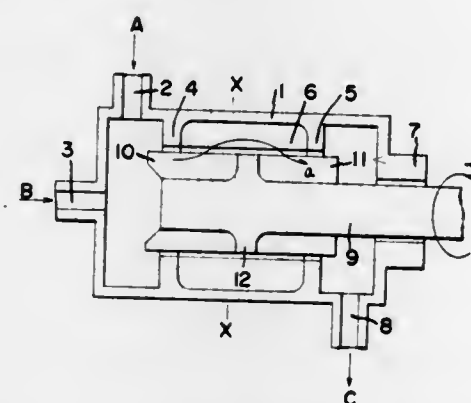
#### 4,421,413 APPARATUS FOR CONTINUOUSLY EMULSIFYING THE LIQUIDS

Hideo Sekiguchi, Maebashi, Japan, assignor to Sekiguchi Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 306,628  
Int. Cl.<sup>3</sup> B01F 7/02

U.S. Cl. 366—307

3 Claims



1. Apparatus for continuously emulsifying water and fuel oil comprising a casing having inlets for water and fuel oil in one end thereof and an emulsified fuel outlet at the other end thereof, a plurality of circumferential ribs formed on the inner wall of said casing longitudinally spaced from one another, a plurality of radially equidistant protrusions formed on the inner surface of said casing, each of said protrusions extending in a longitudinal direction and having the same inner diameter as that of said circumferential ribs, said protrusions intersecting said circumferential ribs to thereby provide a plurality of deep slits in said inner wall of said casing, and an impeller rotatably and concentrically disposed in said casing, said impeller consisting of a rotating shaft and at least a first and second plurality of circumferentially spaced-apart agitator blades mounted on said rotating shaft forming a deep impeller space between each two blades, said first plurality of agitator blades being longitudinally spaced from said second plurality of agitator blades, said agitator blades having an outer diameter slightly smaller than the inner diameter of said circumferential ribs thus providing gaps between said blades and said ribs, said impeller having at least one disc element disposed between said first and said second plurality of agitator blades, said disc element having an outer diameter corresponding to the outer diameter of said agitator blades, said disc element having a radial length substantially equal to the radial length of said agitator blades, said disc element having a longitudinal width less than the longitudinal length of said deep slits on said casing, whereby liquid passes between said deep impeller space in said impeller and said deep slits in said casing in a generally zigzag manner without increasing the flow resistance of the liquid passing therethrough.

#### 4,421,414 HIGH EFFICIENCY MIXING METHOD

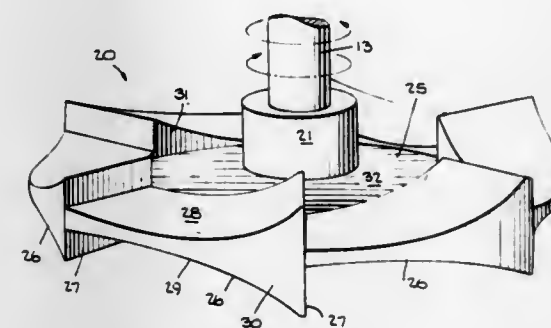
Darrell Holupko, Fairport, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 134,019, Mar. 5, 1980, abandoned. This application Dec. 31, 1981, Ser. No. 336,120

Int. Cl.<sup>3</sup> B01F 7/16

U.S. Cl. 366—348

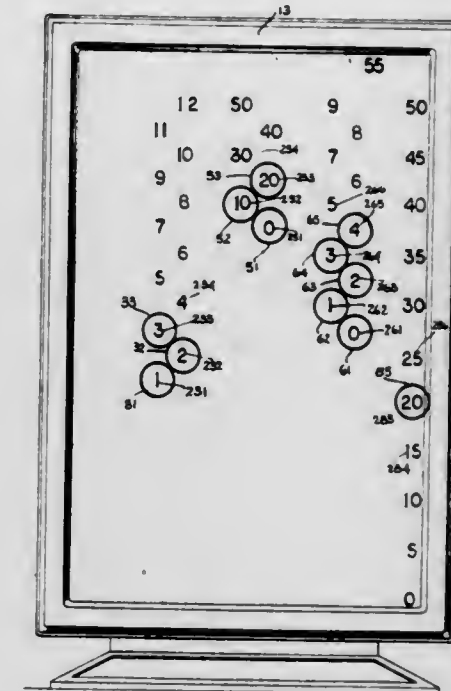
1 Claim



1. A process for agitating liquids having different viscosities by an impeller driven at substantially the same given speed for either direction of rotation comprising the steps of:

- (a) agitating a liquid of relatively light viscosity by rotating the impeller in a given direction at said given speed, the impeller having a plurality of blades substantially longer than they are wide disposed in end-to-end relationship about the periphery of a disc of the impeller, the blades having first longitudinal arcuate flow inducing surfaces for inducing flow primarily when the impeller is rotated in said given direction and second flat end flow inducing surfaces for inducing flow primarily when the impeller is rotated in the opposite direction,
- (b) introducing a substance into the liquid, whereby its viscosity is increased,
- (c) changing the direction of rotation of the impeller upon increase in the viscosity of the liquid to render the second flat end flow inducing surface primarily effective to induce flow rather than said first longitudinal arcuate flow inducing surface to reduce load on the impeller when rotated at said given speed in said opposite direction,
- (d) whereby load on the impeller is reduced at said increased viscosity of the liquid upon changing the direction of rotation of the impeller to prevent overload of the impeller, without requiring reduction in the speed of rotation of the impeller.

made conspicuous by such a token held behind it in the associated channel; and



synchronously driven apparatus for delivering such tokens to the channels, at a substantially constant rate, for accumulation therein.

#### 4,421,416 SPEECH SYNTHESIZER TIMEPIECE WITH A SINGLE COMMAND SWITCH

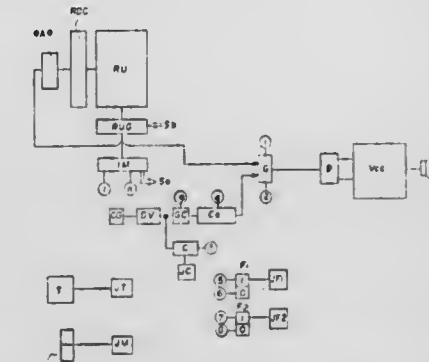
Shintaro Hashimoto, Ikoma; Akitaka Morita, Nara, and Hiroshi Tsuda, Uji, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1981, Ser. No. 236,067

Claims priority, application Japan, Feb. 19, 1980, 55-20873[U]  
Int. Cl.<sup>3</sup> G04B 21/08; G04F 8/00

U.S. Cl. 368—63

2 Claims



1. A speech synthesizer timepiece capable of providing an audible indication of time information comprising in combination:

- a timekeeping means for performing a timekeeping operation;
- a speech synthesizer means for providing an audible indication of the results from said timekeeping means; and
- a singular key switch means which, upon first actuation, starts a stop watch mode of operation with the development of an audible message and which, upon a second or subsequent actuation, delivers an audible readout of the elapsed time in the form of said preceding audible message.

#### 4,421,415 COIN CLOCK

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356  
Filed Feb. 11, 1982, Ser. No. 347,941

Int. Cl.<sup>3</sup> G04B 19/00

U.S. Cl. 368—62

20 Claims

1. A clock mechanism for use with counting tokens and comprising:  
means defining generally vertically disposed channels adapted to guide and hold visible accumulations of such tokens;  
time indicia associated with and in front of the channels, each indicium adapted to be generally inconspicuous when no such token is behind it, and each indicium adapted to be



4,421,417

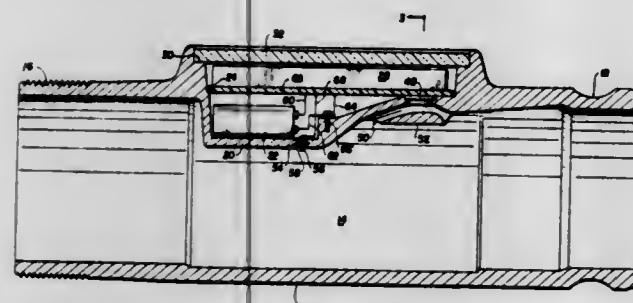
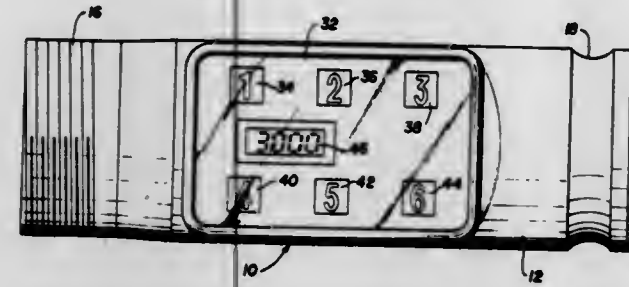
## FLUID DELIVERY MONITOR

Thomas F. McQuade, 11 Windham Loop, Staten Island, N.Y. 10314

Filed Sep. 19, 1980, Ser. No. 188,850  
Int. Cl.<sup>3</sup> G04B 1/26; G04F 8/00

U.S. Cl. 368—65

2 Claims



1. A fluid delivery monitor comprising:
  - a housing including a flow channel;
  - flow sensor means in said housing for providing a flow signal in response to fluid flow in said flow channel;
  - accumulative means having a count input, reset terminal and store terminal responsive to said flow signal from said flow sensor means for accumulating the elapsed time of said flow signal;
  - clock means having an output connected to said count input of said accumulative means; and
  - code means for controlling said accumulative means in response to receipt of a preselected code, wherein said accumulative means includes a display and a logic decoding section and said code means enables said accumulator means in response to a receipt of a first preselected code to display said accumulated elapsed time and said logic decoding section of said accumulator means controls said reset terminal and said store terminal, and wherein said code means resets said accumulator means in response to receipt of a second preselected code.

4,421,418

## CLOCK ADJUSTMENT SWITCH SYSTEM

Hideki Morishima, Saitama, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan

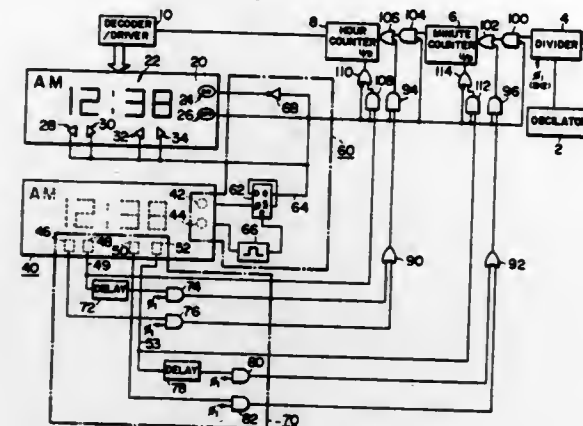
Filed Apr. 2, 1982, Ser. No. 364,678  
Claims priority, application Japan, Apr. 6, 1981, 56-50012[U];  
Apr. 9, 1981, 56-51789[U]; Apr. 10, 1981, 56-52462[U]  
Int. Cl.<sup>3</sup> G04C 17/00, 9/00; G06F 3/14

U.S. Cl. 368—69

6 Claims

1. A clock adjustment switch system for a clock having a display panel covered by a transparent cover, comprising:
  - a clock adjustment means for adjusting a function of said clock and having least one clock adjustment switch constituted as a transparent touch-switch provided on said transparent cover,
  - a clock adjustment means control means for selectively making said clock adjustment means operative or inoperative,
  - at least one luminous indicator means formed as a character or symbol provided on said display panel at a position corresponding to the position of said at least one clock

adjustment switch, said luminous indicator means being lit to indicate the position of said clock adjustment switch



only when said clock adjustment means control means makes said clock adjustment means operative.

4,421,419

## ELECTRONIC TIMEPIECE

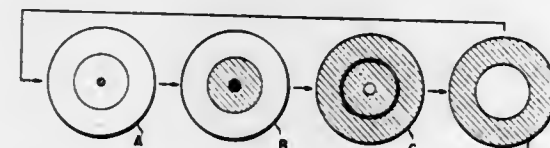
Morio Morishige, Hachioji, and Hironao Sone, Kodaira, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 202,861, Oct. 31, 1980, abandoned.

This application Apr. 21, 1983, Ser. No. 486,452

Claims priority, application Japan, Nov. 12, 1979, 54-145365  
Int. Cl.<sup>3</sup> G04B 23/02; G04C 17/02

U.S. Cl. 368—73

14 Claims



1. An electronic timepiece with dynamic pattern display comprising:
  - time counting means for dividing a reference clock signal and for providing time data;
  - display means coupled to said time counting means and having a plurality of optical display elements arranged in a geometric pattern for displaying time in an analog fashion, said displayed time being based on said time data from said time counting means;
  - alarm signal output means coupled to said time counting means for generating a first alarm signal when said time data from said time counting means reaches a predetermined first time and for generating a second alarm signal when said time data from said time data counting means reaches a predetermined second time;
  - sound producing means coupled to said alarm signal output means for producing an alarm sound in response to an output signal from said alarm signal output means; and
  - display control means coupled to said display means and to said alarm signal output means, and which is responsive to said first alarm signal for causing said display means to produce an alarm display as a first dynamic pattern display mode which differs from a normal time display mode, said display control means being responsive to said second alarm signal from said alarm signal output means for causing said display means to produce an alarm display of a second dynamic pattern display mode which differs from said normal time display mode and which also differs from said first dynamic pattern display mode.

4,421,420

## ELECTRONIC TIMEPIECE WITH ANIMATION

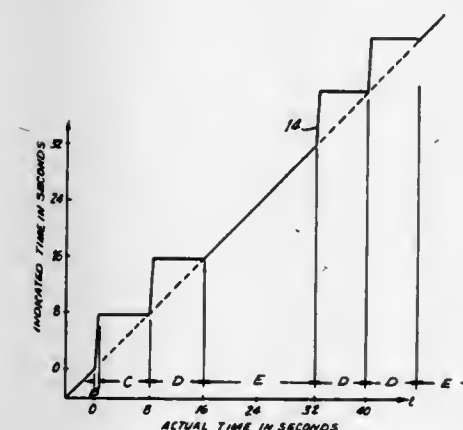
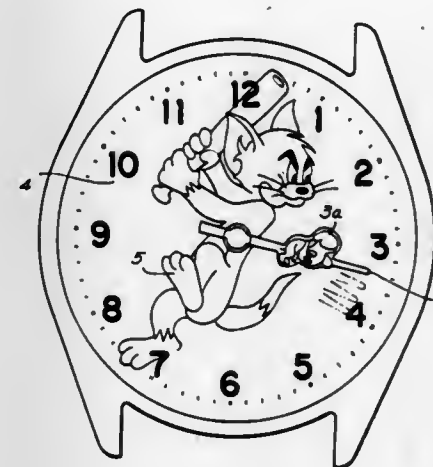
Kenichi Ushikoshi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,156

Claims priority, application Japan, Jul. 9, 1980, 55-96362[U]  
Int. Cl.<sup>3</sup> G04B 19/06, 25/06

U.S. Cl. 368—229

15 Claims



1. In an electronic timepiece having a source of high frequency standard signals, a timekeeping divider circuit dividing down said high frequency standard signals to a timekeeping signal of a lower frequency, a motor, means for driving said motor in response to said timekeeping signals, a display including hands driven by said motor, the improvements therein comprising:
  - a dial and a second hand having illustrations thereon;
  - means for obstructing passage of said timekeeping signals to said motor driving means;
  - means for generating and inputting a secondary signal to said motor driving means, said timekeeping signals being obstructed, said secondary signals causing said motor to drive at an erratic rate, at least said secondary signals outputting a stop signal with a period longer than that of said timekeeping signal, said hands being stationary during said stop period, and a quick feed signal with a constant period shorter than that of said timekeeping signal;
  - total motion of said second hand produced by said stop signal and said quick feed signal causing said second hand to indicate the same accurate second display position as if driven over the same elapsed time by said timekeeping signal,
  - switch means for selecting one of said timekeeping signals and said secondary signals, at least one of said hands selectively moving with an erratic motion when said secondary signals are selected.

4,421,421

## KINETIC CLOCK SCULPTURE

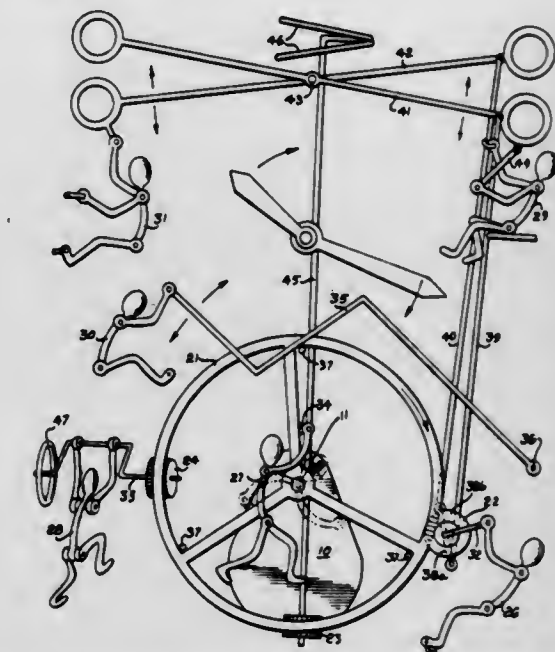
Gordon E. Bradt, Kinetic Center, Busch, Ark. 72620

Filed Feb. 23, 1982, Ser. No. 351,414

Int. Cl.<sup>3</sup> G04B 19/06

U.S. Cl. 368—229

21 Claims



1. In a clock including minute and hour hands journaled for rotation in clockwise directions in vertical planes about a common axis, that is horizontally disposed and extends normally of said vertical planes and of the action of gravity, and a timekeeping mechanism means for simultaneously driving said minute and hour hands at 1/60 rpm and 1/170 rpm, respectively, about said common axis, including a drive shaft therefor, means for rotating said drive shaft about its axis to drive same, and driving and driven gear wheel means intercoupled with said drive shaft and said minute and hour hands respectively for rotating same about their said common axis at their said respective speeds in said clockwise direction, the improvement comprising a kinetic sculpture arrangement therefor comprising:
  - a drive gear wheel having an axis of rotation paralleling that of said common axis and driven by the drive shaft and about said axis of said drive gear wheel,
  - a driven gear wheel journaled for rotation about its axis and being coupled to said drive gear wheel for rotation thereby,
  - said kinetic sculpture arrangement driven gear wheel rotationally driving a crank about a horizontal axis, to move up and down in one direction in a circular path that is vertically disposed,
  - said drive gear wheel being relatively large and said driven gear wheel being relatively small,
  - and a drive gear wheel actuated mechanical linkage of miniature stick figure form articulated to said crank whereby said crank and said linkage comprise a kinetic sculpture device,
  - said linkage defining a stick figure comprising:
    - a stick figure body including a head at one end thereof, a shoulder cross pin carried by said body adjacent said head, and a hip cross pin paralleling said shoulder cross pin and carried by said body at the other end thereof,
    - a pair of stick figure arms carried by said shoulder cross pin, one on either side of said body, and at like ends of said arms,
    - and a pair of stick figure legs carried by said hip cross pin, one on either side of said body, and at like ends of said legs,
    - with the said linkage being disposed in upright relation adjacent to and at the level of said crank and having the other ends of said stick figure legs thereof anchored below said crank and the other ends of said stick figure arms



being articulated to said crank for following the rotation of same about said circular path, said crank having a throw leverage that is a fraction of the radius of said kinetic sculpture arrangement drive gear wheel but exceeds that of said kinetic sculpture arrangement driven gear wheel, and with said stick figure body, arms, and legs of said linkage being contoured, anchored and articulated in place for simulating front to back human like motion, in following the rotation of said crank about said circular path, suggestive of that said stick figure is assisting in driving said timekeeping mechanism means.

4,421,422

**ELECTRONIC TIMEPIECE WITH VARIABLE MELODY ALARM FACILITIES**

Kiyoshi Kumata, Tsuzuki, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

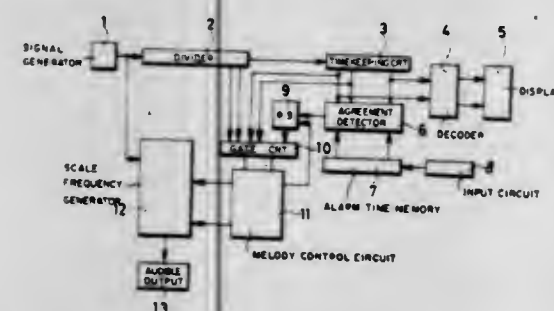
Continuation of Ser. No. 116,889, Jan. 30, 1980, abandoned. This application Nov. 23, 1981, Ser. No. 323,874

Claims priority, application Japan, Jan. 31, 1979, 54-11157

Int. Cl.<sup>3</sup> G04B 21/00; G10F 1/00

U.S. Cl. 368—273

10 Claims



1. An electronic timepiece comprising: alarm time sensing means for generating an alarm signal at a preselected time of day; tune storage means for storing information indicative of the frequency and duration of each of a desired series of musical notes, said tune storage means providing a series of note frequency and duration signals in response to the generation of an alarm signal by said alarm time sensing means; input means for altering the information stored in said tune storage means in response to an operator initiated input; a frequency generator for generating a high frequency time standard signal; divider means for producing a multiplicity of frequency from said high frequency time standard signal; means for selecting a desired frequency produced by said divider means corresponding to each desired musical note and responsive to its associated note frequency and duration signal produced by said tune storage means; means for enabling said means for selecting for a time duration for each desired note responsive to its associated note frequency and duration signal; and an audio generator for generating an audible musical note upon application of each desired frequency generated by said divider means for a time duration determined by said means for enabling; wherein time storage means includes: an  $M \times N$  line matrix array means, said  $M$  lines corresponding in number and interconnected with the outputs of said divider means, said  $N$  lines corresponding in number to the number of note frequency and duration signals to be produced and thus to the notes of a desired melody to be generated, said  $M \times N$  line matrix array means decoding said digital timing count into sequentially produced duration signals generated on said  $N$  lines and corresponding to the duration of said notes; and  $K \times L$  line matrix array means, said  $L$  line corresponding in number and interconnected with said  $N$  lines of said

$M \times N$  line matrix array, said  $K$  lines corresponding to individual scale notes, said  $K \times L$  line matrix array means coding note frequency information into said duration signals to form the note frequency and duration signals;

said  $M \times N$  line matrix array means decoding more than one count of said digital timing count into a single duration signal on a signal  $N$  matrix line.

4,421,423

**WATERTIGHT WRIST-WATCH CASING**

Marc Lederrey, Le Landeron, Switzerland, assignor to Montres Rado S.A., Switzerland

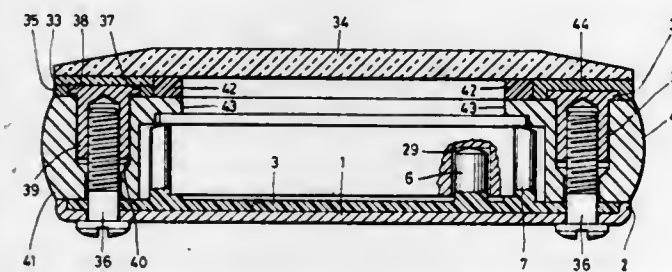
Filed May 4, 1982, Ser. No. 374,690

Claims priority, application Switzerland, May 1, 1981, 2858/81

Int. Cl.<sup>3</sup> G04B 37/08, 37/00

U.S. Cl. 368—291

6 Claims



1. In a watertight wrist-watch casing including a caseband and an independent bottom removably secured to said caseband by means of screws crossing the bottom and causing a gasket of elastomeric material to be compressed between the caseband and the bottom so as to form a tight seal between these two pieces, the arrangement of a bottom comprising an outer metallic piece and a thin elastomer inner layer lining at least the peripheral part of the inner face of said outer metallic piece to which it strongly adheres by a metal/elastomer junction, said screws pressing a portion of said thin layer against the caseband lower face, wherein said metallic bottom piece has its edges bent upwards so as to come in abutting engagement with the lower caseband face, said thin inner layer having an upwardly projecting rim at its periphery being adjacent to said bent up edges of the metallic bottom piece and extending, when at rest, beyond said bent up edges, the part of said rim so extending beyond said bent up edges being flattened out by the caseband lower face down to the level of said bent up edges, when the casing is closed, the amount of said rim which extends beyond said bent up edges, when at rest, being determined so that closing the casing does not generate in said thin layer a stress exceeding its limit of elasticity.

4,421,424

**INSTRUMENT AND METHOD FOR CONTROL TESTING OF VULCANIZED RUBBER**

Keith Price, Rixensart, Belgium, and Michael Mathews, Swindon, England, assignors to Monsanto Europe S.A.

Filed Jan. 21, 1982, Ser. No. 341,391

Claims priority, application United Kingdom, Jan. 29, 1981, 8102774

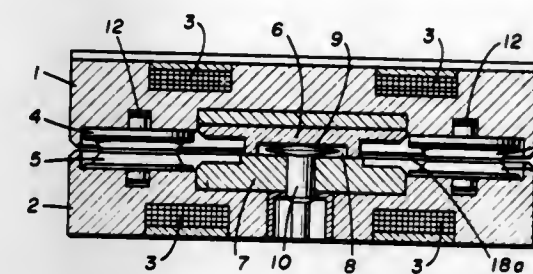
Int. Cl.<sup>3</sup> G01N 3/32

U.S. Cl. 374—48

5 Claims

1. Apparatus comprising a curemeter having first dies maintainable at a substantially uniform vulcanization temperature, the said first dies being arranged to be separable and for closure, and which when closed define a cavity for accommodating a sample of compounded rubber, means for subjecting the sample of compounded rubber to oscillating shear strain and means for obtaining a signal derived from such oscillation and correlating with the degree of vulcanization of the sample characterized in that the apparatus also includes other separable dies maintainable at the same substantially uniform vulcani-

zation temperature as the first said dies, which other separable dies when closed define at least one cavity for accommodating a further sample of the compounded rubber for vulcanization under static conditions, the apparatus further including means



for effecting the substantially simultaneous closure of the first dies forming the cavity in which the sample of rubber is subjected to oscillating shear strain and of each set of the other dies forming a cavity in which a further sample of rubber is vulcanized under static conditions.

4,421,425

**FIXED PAD THRUST BEARING**

Gerard Foucher, Tremblay les Gonesse, and Michel Hermand, Le Blanc Mesnil, both of France, assignors to Alsthom-Atlantique, Paris, France

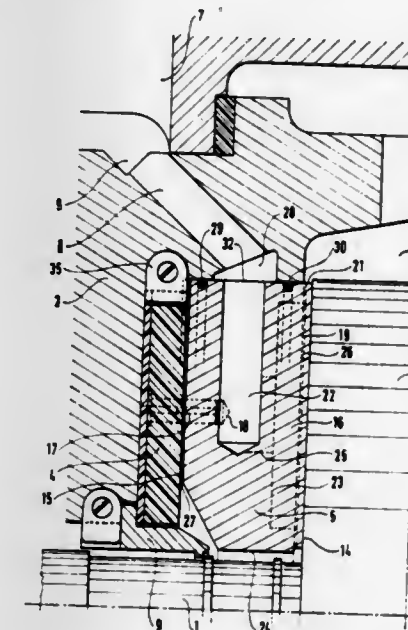
Filed May 17, 1982, Ser. No. 379,198

Claims priority, application France, May 15, 1981, 81 09706

Int. Cl.<sup>3</sup> F16C 17/04, 27/02

U.S. Cl. 384—123

3 Claims



1. A fixed pad thrust bearing for a turbomachine, said turbomachine comprising a rotor, a stator surrounding said rotor, said thrust bearing comprising a thrust collar integral with said rotor, a ring having radial grooves defining fixed sector-shaped pads disposed at various points around said rotor, deformable means on which a rear surface of said ring bears at various points, said stator comprising a fixed cage containing said ring and said deformable means, oil feed means discharging into said fixed cage, and an annular oil recovery chamber, one or more passages in the lower part of said fixed cage, whence oil is evacuated by gravity, and wherein each pad is delimited by first and second lateral edges, said first lateral edge being in advance of said second lateral edge in the direction of rotation of said collar, each pad having a front surface facing said collar and an outer edge facing a wall of said cage, each pad having in its front surface an opening adjacent said first lateral edge, which is delimited by first and second inner edges, said opening terminating radially short of the inner and outer edges of the pad, and a passage in the pad receiving oil charging through an orifice in its outer edge and feeding said opening, said front surface of each pad diverging from said rear surface

of said ring in the direction away from said first inner edge, said grooves extending completely across said ring, and said wall of said cage facing said orifice in said outer edge of each pad incorporating a space to which oil is fed by said oil feed means.

4,421,426

**THRUST BEARING DEVICE**

Yoshio Furukawa, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

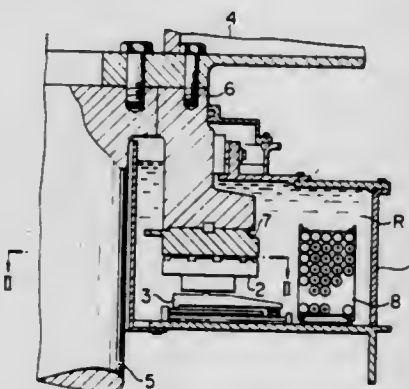
Filed Oct. 21, 1981, Ser. No. 313,502

Claims priority, application Japan, Oct. 29, 1980, 55-150738

Int. Cl.<sup>3</sup> F16C 17/06

U.S. Cl. 384—219

5 Claims



1. A thrust bearing device comprising: a plurality of bearing shoes arranged around a rotary shaft for slidably journaling a rotary member, said bearing shoes each being segmental in shape; support means for resiliently supporting each of said bearing shoes for free pivotal movement; and a bearing oil tank containing a lubricating oil and enclosing said bearing shoes and said support means; wherein the improvement resides in said support means comprising underlying pressure receiving members each formed on its upper surface with a portion for pivotally supporting the associated bearing shoe and on its undersurface with two spread-apart legs each located at one of opposite ends thereof, and resilient members each located beneath one of said pressure receiving members, one of said legs of each of said pressure receiving members being constructed to bear a lower thrust load than the other leg and each of said resilient members being located beneath the leg for bearing the lower thrust load.

4,421,427

**SHORTHAND MACHINE HAVING ELECTRIC PLATEN ADVANCEMENT**

Richard A. Michals, Skokie; Frank H. Mozer, Hoffman Estates, and Ralph E. Zum Bahlen, Chicago, all of Ill., assignors to Stenograph Corporation, Skokie, Ill.

Division of Ser. No. 195,923, Oct. 10, 1980, Pat. No. 4,363,558.

This application Sep. 29, 1982, Ser. No. 426,861

Int. Cl.<sup>3</sup> B41J 3/26, 23/34, 23/08

U.S. Cl. 400—94

6 Claims

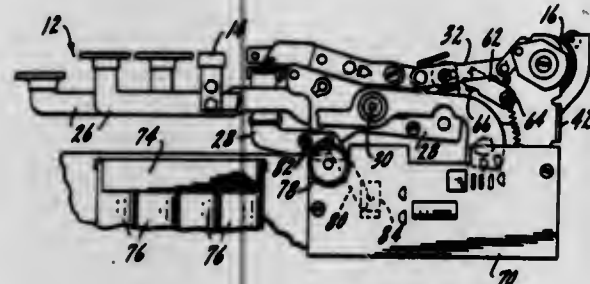
1. In a shorthand machine of the type having a set of keys wherein numerals, or words or parts of words, are generated by a stroke which comprises depressing and releasing a key or combination of keys, and a universal member mounted for engagement by the keys and movable in response to a stroke of the keys, the improvement comprising:

a. mechanical drive means for mechanically advancing the platen in response to a stroke of the keys, said mechanical drive means including clutch means mechanically coupled to the platen and movable from a rest position to an advanced position, said movement effecting rotation of the platen, said clutch means when in said rest position being



positioned in the path of movement of said universal member, whereby said clutch means may be engaged and moved by said universal member from said rest position to said advanced position to effect rotation of the platen in response to each stroke of the keys,

- b. electrical drive means operable independently of said mechanical drive means for electrically advancing the platen in response to a stroke of the keys,



- c. selecting means including a locking mechanism for selectively moving said clutch means from its rest position to its advanced position and holding said clutch means in its advanced position out of the path of movement of said universal member whereby said mechanical drive means may be selectively rendered inoperative.

4,421,428

## THERMAL PRINTER

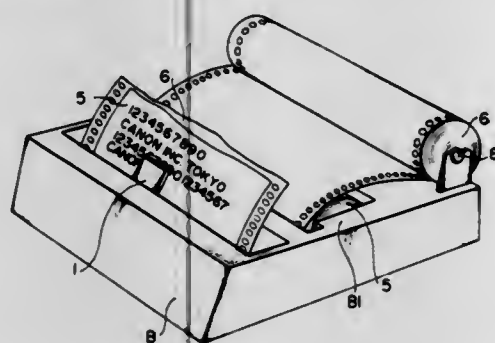
Atsushi Noda, and Takayoshi Hanakata, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 16,984, Mar. 2, 1979, abandoned. This application Nov. 14, 1980, Ser. No. 207,195

Claims priority, application Japan, Mar. 8, 1978, 53-26184; Mar. 9, 1978, 53-27048; Mar. 9, 1978, 53-27049; Mar. 9, 1978, 53-27050; Mar. 9, 1978, 53-27055; Mar. 9, 1978, 53-27056; Mar. 9, 1978, 53-27057; Apr. 14, 1978, 53-43508

Int. Cl.<sup>3</sup> B41J 3/20, 15/20

U.S. Cl. 400—120

3 Claims



1. A thermal printer comprising:

a thermal head  
a first recording medium having perforations;  
a second recording medium superimposed on said first recording medium and of a width less than that of said first recording medium, said second recording medium consisting of unperforated paper having a layer of heat sensitive material on its front surface and a layer of heat fusible ink on its rear surface the front surface being adjacent said thermal head;  
a first shaft disposed in the immediate vicinity of an imprinting station provided by said thermal head;  
sprocket roller means disposed at opposite ends of said first shaft for engaging the perforations in said first recording medium to feed it;  
rubber roller means disposed on said first shaft and located intermediate said sprocket roller means for driving said first and said second recording medium simultaneously;

second shaft means for supporting a roll of said first recording medium rolled thereon; and  
third shaft means for supporting a roll of said second recording medium rolled thereon, said third shaft means being disposed between said first and second shaft means.

4,421,429

## RESISTIVE SUBSTRATE FOR THERMAL PRINTING RIBBONS COMPRISING A MIXTURE OF THERMOSETTING POLYIMIDE, THERMOPLASTIC POLYIMIDE, AND CONDUCTIVE PARTICULATE MATERIAL

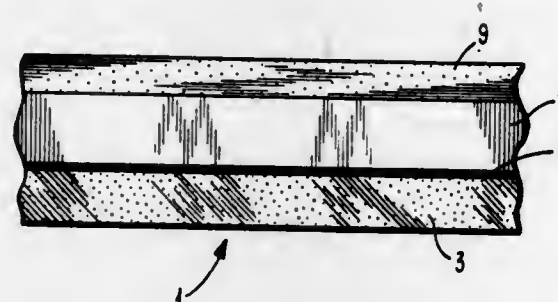
Arthur E. Graham, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,348

Int. Cl.<sup>3</sup> B41J 31/00

U.S. Cl. 400—120

12 Claims



1. A ribbon for non-impact thermal transfer printing comprising a thermal transfer layer and a resistive substrate which comprises a thorough mixture of a thermosetting polyimide, a thermoplastic polyimide, and an electrically significant amount of conductive, particulate material.

4,421,430

## DOT PRINTER

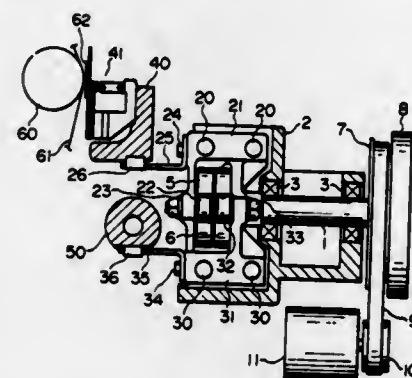
Yoshikane Matsumoto; Tsuneki Kobayashi; Makoto Kurosawa, and Minoru Seino, all of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan  
Filed Apr. 12, 1982, Ser. No. 367,518

Claims priority, application Japan, Apr. 13, 1981, 56-55796

Int. Cl.<sup>3</sup> B41J 3/10

U.S. Cl. 400—121

5 Claims



1. A dot printer, comprising:

a rotatable cam shaft, and means for driving said cam shaft;  
a pair of cams mounted on said cam shaft in a manner such that the major diameters thereof are orthogonal with one another;  
a pair of first and second sliders reciprocable in opposite directions and perpendicularly to said cam shaft, said sliders being in contact with cam surfaces of said pair of cams and on both sides of said cam shaft;  
hammer bank means including a plurality of printing hammers, and a hammer bank coupled to said first slider so that said hammer bank is reciprocated along a printing line; and  
a counterweight coupled to said second slider so that said

counterweight is reciprocated in a direction opposite the direction of reciprocation of said hammer bank, said counterweight having a weight which is substantially equal to that of said hammer bank; and said hammer bank and said counterweight being coupled to said pair of sliders in a manner such that a line connecting the center of gravity of said hammer bank to the center of gravity of one of said pair of sliders and a line connecting the center of gravity of said counterweight to the center of gravity of the other slider cross another.

4,421,431

## METHOD FOR DOT MATRIX PRINTING AT SELECTED UNIFORM DOT COLUMN SPACING

Klaus Dorffub, Furth, and Werner Krausser, Nuremberg, both of Fed. Rep. of Germany, assignors to Triumph-Adler A.G. fur Büro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Continuation of Ser. No. 254,123, Apr. 14, 1981, abandoned.

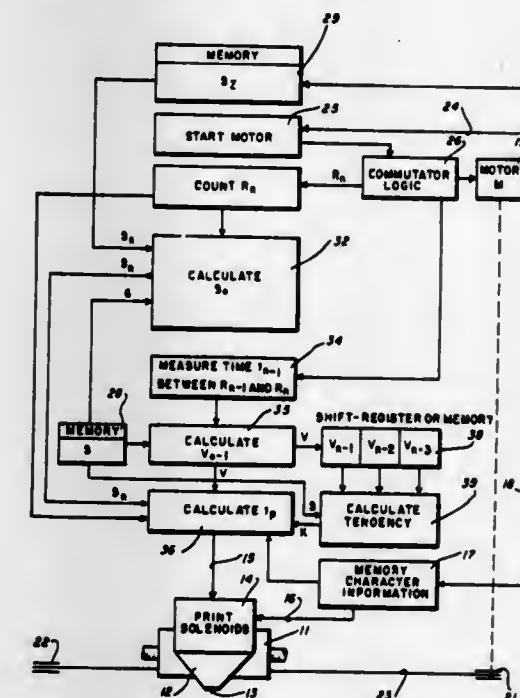
This application Mar. 4, 1983, Ser. No. 472,204

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014338

Int. Cl.<sup>3</sup> B41J 3/12

U.S. Cl. 400—124

2 Claims



1. In a dot matrix printer having a column array of print wires mounted on a movable carriage, a method for printing dot columns at selectable uniformly spaced distances, comprising the steps of

selecting a desired uniform dot column spacing,  
generating control pulses at intervals representing carriage movement through a known distance greater than the distance occupied by a plurality of printed dot columns at the selected uniform dot column spacing,  
determining the distances to all of the plurality of dot column printing positions possible at the selected uniform dot column spacing from a given control pulse to the next following control pulse,  
measuring the time between said given control pulse and its preceding control pulse,  
computing the velocity of said carriage from said known distance and measured time, and  
from said predetermined distances and computed velocities calculating the times for energizing said print wires to print dot column information at the desired uniform spacing in the interval following a given control pulse.

1037 O.G.—39

4,421,432

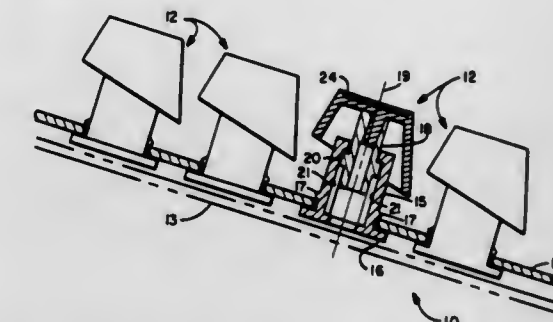
KEY SWITCH CAP MOUNTING ARRANGEMENT  
M. Jeremy Lieb, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 4, 1981, Ser. No. 299,356

Int. Cl.<sup>3</sup> B41J 5/12

U.S. Cl. 400—492

13 Claims



1. Key switch actuator apparatus having a key cap mountable in either of two angular relationships relative to a supporting column comprising:

a column having an end with a cylindrical socket therein aligned with a first axis which forms a predetermined acute angle with a second longitudinal axis of said column;  
a key cap having an outer surface adapted for operator contact, said outer surface generally defining a plane; and  
a cylindrical post on an inner surface of said key cap configured to be snugly received in the socket and aligned with a third axis which forms an acute angle substantially equal to the predetermined acute angle with a fourth axis perpendicular to the plane defined by the outer surface of said cap, whereby said column and said key cap can be assembled in a first angular relationship in which the first and second axes coincide with the third and fourth axes respectively so that the plane defined by the outer surface of said cap is substantially perpendicular to the longitudinal axis of said column, or in a second angular relationship in which said column and said key cap are rotated 180° relative to one another about the first and third axes so that the plane defined by the outer surface of said key cap is inclined from its first angular relationship by an angle equal to twice the predetermined acute angle.

4,421,433

## HYGIENIC TOOTHBRUSH COMPRISING A CONTAINER FOR DENTIFRICE SUBSTANCES

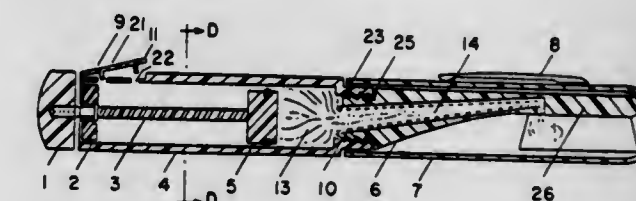
Gilberto M. Villanueva, Calle de Carnero No. 5384 Guadalajara, Jalisco Mexico

Filed Nov. 26, 1980, Ser. No. 210,641

Int. Cl.<sup>3</sup> A46B 11/02

U.S. Cl. 401—175

10 Claims



1. A hygienic toothbrush comprising:

a hollow handle portion for storing dentifrice having a generally cylindrical interior and two open ends;  
a cover for a first of said open ends, having first securing means thereon for securing said cover to said handle portion, and a first aperture therein;  
a threaded bar passing through said first aperture into said interior of said handle portion and having a portion exterior thereof;  
a knob rigidly secured to said exterior portion of said bar;  
a plunger movably secured to said interior portion of said



bar, and having a threaded interior to complement the thread of said bar;

a vent comprising a first and a second orifice through which first and second pins extend, said first pin being larger than said second pin, and of sufficient length to contact said plunger, said second pin being of insufficient length to contact said plunger, and further comprising a rod connecting said first and second pins, said rod being flexibly secured to said handle; and

a brushing member removably secured to said handle portion by a second securing means located within said second open end of said handle portion, said brushing member comprising a brushing surface and a conduit leading from said second open end of said handle portion to said brushing surface.

4,421,434

## CLAMP MEMBERS

Bengt Magner, Mellösa, Sweden, assignor to Opto-Systems Ltd., United Kingdom

PCT No. PCT/SE80/00128, § 371 Date Jan. 17, 1981, § 102(e) Date Nov. 14, 1980, PCT Pub. No. WO80/02587, PCT Pub. Date Nov. 27, 1980

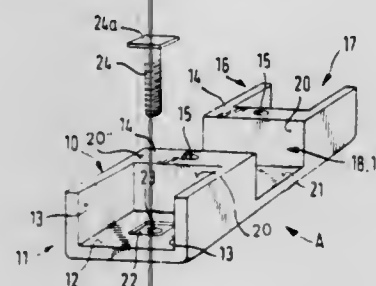
PCT Filed Apr. 30, 1980, Ser. No. 224,524

Claims priority, application Sweden, May 17, 1979, 7904328

Int. Cl.<sup>3</sup> F16B 7/00

U.S. Cl. 403—175

29 Claims

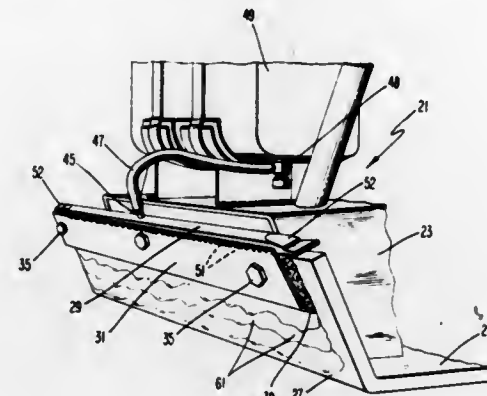


1. A clamp member being together with other equally shaped and differently shaped clamp members and with the aid of fixing means assemblable to different types of clamp assemblies for uniting at least two elongated elements such as rods or tubes with the identical cross-section, said clamp member comprising at least one first part defining a portion of a recess for engaging a non-flanged and non-slotted end portion of one elongated element, and one second part defining a portion of a through-channel for engaging any non-flanged and non-slotted portion of another elongated element disposed at right angles to the afore-mentioned elongated element, each of said first and second parts being limited by outer walls having internal and external faces, wherein said internal faces are free of projections and each of said first parts recesses are inside the clamp member terminated by a transverse block spanning the whole recess portion and having one top face and two opposite side faces, one of said transverse block side faces defining an end wall face of said respective first part recess and constituting thus a dead-end-socket for the said end portion of the one said elongated element, and the second of said transverse block side faces defining a portion of a side wall face of said through-channel, said fixing means being located inside the clamp member between said first part and said second part, and arranged in the central axial region of said transverse block.

4,421,435  
METHOD AND APPARATUS FOR APPLYING A THIN LIQUID FILM TO A VIBRATORY PLATE  
Wayne P. Zemke, Port Washington; Clyde M. Maki, Hartford, and Brian J. Smith, Port Washington, all of Wis., assignors to Koehring Company, Brookfield, Wis.  
Filed Mar. 17, 1981, Ser. No. 244,625  
Int. Cl.<sup>3</sup> E01C 19/38

U.S. Cl. 404—113

1 Claim



1. An apparatus for applying a thin film of liquid to a vibratory plate arranged on an edge of a vibratory compactor comprising:

container means fixed to the plate for holding a liquid adjacent to the plate;

inlet means for admitting the liquid to the container means;

means for maintaining intimate contact between a thin film of the liquid and a front surface of the vibratory plate over substantially an entire width of the plate as the thin film moves downwardly under the influence of gravity, said means for maintaining intimate contact being arranged within the container means, the means for maintaining intimate contact comprising a serrated rubber mat arranged adjacent the surface of the plate and open cell urethane foam rubber arranged within the container means at an edge of the serrated rubber mat adjacent to both the plate and the outlet means; and

outlet means arranged along substantially the entire width of the plate for permitting a low velocity laminar flow of a thin liquid film to emanate from the container means along the surface of the plate in the form of a liquid sheet which remains in contact with the plate surface due primarily to surface tension as the sheet moves downwardly.

4,421,436

## TENSION LEG PLATFORM SYSTEM

Robert B. Burns, Huntington, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,385

Int. Cl.<sup>3</sup> E02B 15/04

U.S. Cl. 405—60

12 Claims

1. A tension leg platform system for use in an offshore body of water to drill wellbores into the ocean floor, and for confining an uncontrolled flow of effluent issuing from an opening at the ocean floor, and which system includes;

a semi-submersible marine vessel holding wellbore drilling equipment,

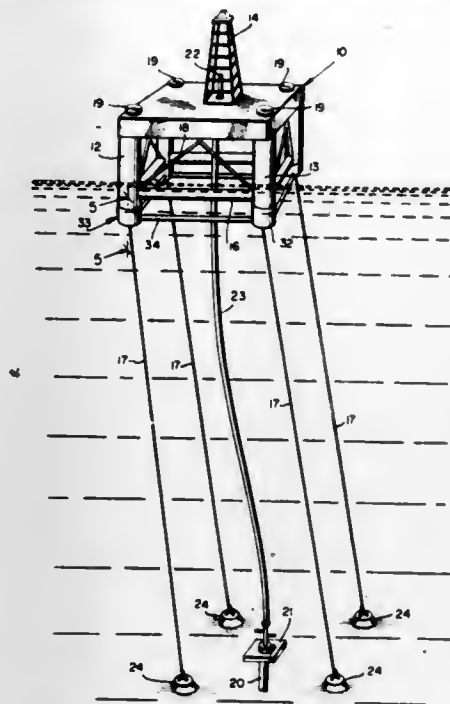
a plurality of positioning anchors resting on the ocean floor and disposed about said opening,

cable means extending between said semi-submersible marine vessel and said respective positioning anchors, and being adjustable to vary the cable tension whereby to draw the said vessel to a predetermined water depth,

a submersible hull defining a vertical passage therethrough and being adapted to operably engage the respective cable means,

a canopy removably positioned on said submersible hull to form a substantial closure across said vertical passage, whereby said submersible hull can be guidably pulled down

along said respective cable means, and located above said opening which is emitting the uncontrolled effluent flow to



thereby receive said effluent flow within said canopy forming said enclosure.

4,421,437

## CORRUGATED BUCKLE ARRESTOR

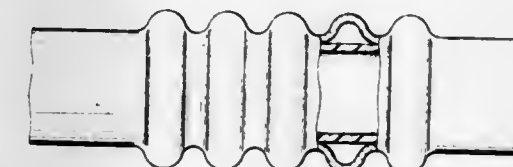
Carl G. Langner, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 970,849, Dec. 19, 1978, abandoned, which is a continuation of Ser. No. 848,847, Nov. 7, 1977. This application Jun. 25, 1980, Ser. No. 162,719

Int. Cl.<sup>3</sup> F16L 1/00

U.S. Cl. 405—166

9 Claims



1. An underwater pipeline which is resistant to collapse via a propagating buckle comprising essentially uniform cylindrical pipe having integral corrugated section means along the length of the pipeline at predetermined intervals, the corrugated section means being substantially more resistant to collapse than the pipe and functionable to arrest or prevent a propagating buckle.

4,421,438

## SLIDING LEG TOWER

Barry J. Abbott, Concord, and William H. Silcox, San Francisco, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 17, 1981, Ser. No. 235,274

Int. Cl.<sup>3</sup> E02B 17/00

U.S. Cl. 405—227

7 Claims

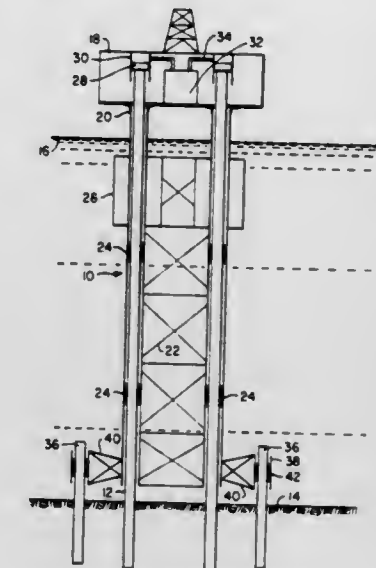
1. An offshore drilling and producing structure, which comprises:

a rigid platform;

a plurality of open-ended sleeves affixed to the platform and extending downwardly therefrom for a substantial distance below the water surface, in a substantially vertical orientation;

an equal plurality of axial piles secured to the sea floor which

extends upwardly into said open-ended sleeves to at least a position near the surface of the water; buoyant means affixed to said sleeves below the water line for supporting most of the platform weight and for providing righting stability; and



means for supporting the remaining platform weight from the plurality of axial piles said means permitting simultaneous vertical movement of each of said sleeves with respect to each of said piles to permit a desired degree of compliancy of rotation about the sea floor.

4,421,439

## SUPPORTING FABRIC FOR BEARING BULK MATERIAL AND A METHOD OF BUILDING A ROAD, DIKE OR DAM EMBANKMENT

Antonius W. M. ter Burg, and Gerrit den Hoedt, both of Arnhem, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

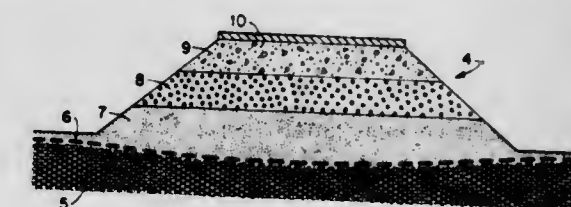
Filed Aug. 25, 1980, Ser. No. 180,785

Claims priority, application Netherlands, Sep. 3, 1979, 7906585

Int. Cl.<sup>3</sup> E02D 5/00

U.S. Cl. 405—258

17 Claims



1. A supporting fabric having a width of at least 30 cm, and containing warp and weft yarns of a synthetic material, for bearing one or more layers of sand, gravel, stones, clay, loam or similar bulk or other material to a height of at least 10 cm, wherein the yarns extending in the warp direction of the fabric consist of straight warp yarns having a tensile strength of at least 0.2 kN and binder warp yarns, said straight warp yarns each having a higher strength than and at least five times the linear density of said binder warp yarns, the construction being such that when the fabric is subjected to a tensile load in the warp direction, the straight warp yarns bear a higher proportion of the tensile load than the binder warp yarns.



# 4,421,440 PROCESS AND APPARATUS FOR APPLYING PILE PLANKING

Joseph G. B. Scheepers, Maastricht, Netherlands, assignor to Maascom B.V., Maastricht and Laura Metaal B.V., Eindhoven, both of, Netherlands

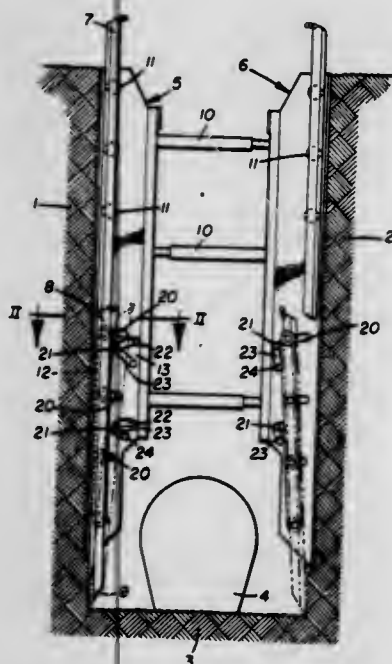
Filed May 6, 1981, Ser. No. 260,184

Claims priority, application Netherlands, May 14, 1980, 8002788; European Pat. Off., Mar. 31, 1981, 81200359.8

Int. Cl.<sup>3</sup> E02D 17/04

U.S. Cl. 405-282

13 Claims



2. An apparatus for lining an excavation comprising: at least two substantially vertical guide means erected along-side and spaced apart from one another on an excavation wall; two pile planking elements, with one element placed substantially vertically on top of the other in a common plane, said two elements being inserted between two adjacent guide means; a common guide for guiding the two planking elements; and a supporting means on which said common guide is mounted for supporting the lower pile planking element, wherein at least the upper portion of said supporting means being displaceably mounted onto the guide means so that the upper portion of the lower pile planking element is movable away from the excavation wall.

# 4,421,441 CYCLIC DRILLING MACHINE

Noboru Hirose, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

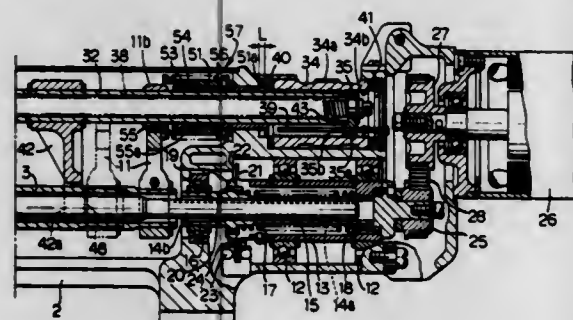
Filed Oct. 23, 1981, Ser. No. 314,475

Claims priority, application Japan, Oct. 29, 1980, 55-151644

Int. Cl.<sup>3</sup> B23B 47/34

U.S. Cl. 408-17

6 Claims



1. A drilling machine comprising: a frame;

a quill reciprocally mounted in the frame; a spindle rotatably mounted in the quill and having a tool at one end thereof; a motor operatively connected with the spindle for rotating the same; pneumatic feed means for reciprocating the quill in forward and backward directions; feed control means for controlling feed speed of the quill, including a rod member which is regulated of its forward movement speed at a predetermined value by regulating means and biasing means for always biasing said rod in backward direction, and engaging means for engaging the quill with the rod member in the course of forward movement thereof; a slidable member movably disposed within a predetermined distance in movement direction of the rod member; coupling means for coupling the slidable member to the rod member to move the slidable member with the rod member by the predetermined distance when the rod member moves in forward direction of the quill and thereafter for permitting the rod member to forwardly move relatively to the slide member, said coupling means having means to couple said slidable member to the rod member to move the former with the latter by the predetermined distance when the rod member moves in backward direction by the biasing means and then to stop backward movement of the rod member; and operation control means for controlling the pneumatic feed means to make the quill repeat a drilling cycle wherein the quill once returns on the way of drilling operation and advances again for resuming the drilling operation.

# 4,421,442 DOWELING JIG

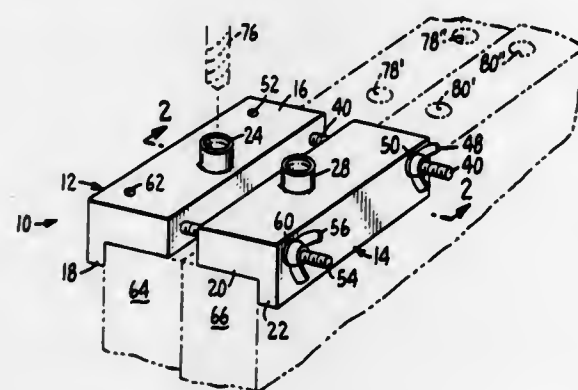
Cyril M. Lindblad, 1533 East Ave., Napa, Calif. 94558

Filed Nov. 9, 1981, Ser. No. 319,469

Int. Cl.<sup>3</sup> B23B 47/28, 45/14

U.S. Cl. 408-115 R

3 Claims



1. A doweling jig, comprising: a first jaw assembly comprising a first work clamping face and a first drill guide the axis of which is fixedly positioned at a predetermined distance from said first work clamping face; a second jaw assembly comprising a second work clamping face and a second drill guide the axis of which is fixedly positioned at a predetermined distance from said second work clamping face; and screw means associated with said jaw assemblies for maintaining said first and second work clamping faces substantially parallel to each other and maintaining said drill guide axes between said work clamping faces and substantially parallel to said work clamping faces, and for drawing said work clamping faces together so as to clamp together in side-by-side relation two work pieces which are to be joined by a dowel joint, whereby holes drilled by a bit passing through said drill guides when said work pieces are thus clamped in side-by-side relation are aligned

axially for receiving a dowel when said work pieces are abutted edge-to-edge.

# 4,421,443

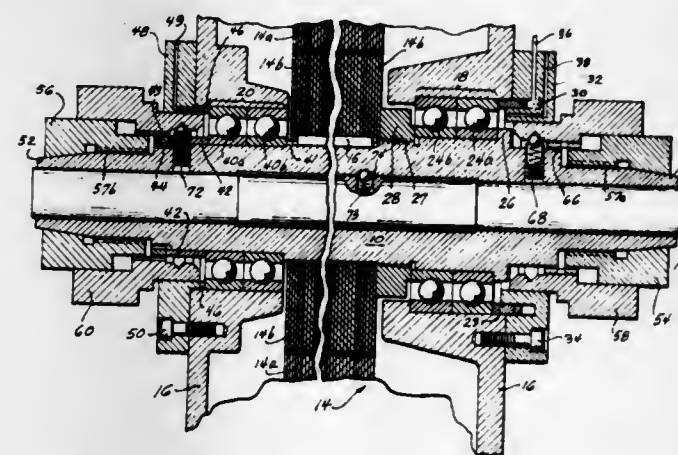
HIGH SPEED MACHINE TOOL SPINDLE ASSEMBLY  
Robert T. Woythal, West Allis, and Philip J. Finet, Milwaukee, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Oct. 29, 1981, Ser. No. 316,212

Int. Cl.<sup>3</sup> B23C 9/00; B23Q 1/08

U.S. Cl. 409-232

8 Claims



1. A high speed machine tool spindle assembly for firmly retaining a cutting tool therein notwithstanding machine tool vibration comprising: a spindle having an axially extending bore therethrough and having a first and second set of tool gripping collets extending from a first and second spindle end, respectively; first and second collet nuts each in threaded engagement with said spindle adjacent to a separate one of said first and said second collets, respectively, for urging a separate one of said first and said second collets, respectively, radially inward against the shank of a cutting tool disposed within the bore of said spindle; first and second collet nut driver means each carried on said spindle adjacent to a separate one of said first and second collet nuts, respectively, each of said first and second collet nut driver means being slidable along the axis of said spindle from a first position to second position to jointly engage a separate one of said first and said second collet nuts, respectively, and said spindle; and first and second retention means each threaded into said spindle adjacent to a separate one of said first and second spindle ends, respectively, and extending radially therefrom to engage a separate one of said first and second collet nut driver means when said respective one of said first and second collet nut driver means is slid along the axis of said spindle from said first to said second position.

# 4,421,444 METHOD OF ATTACHING CLOSURE MEMBER TO FILTER HOUSING

William Hanley, Pawtucket, R.I., assignor to Fram Corporation, East Providence, R.I.

Division of Ser. No. 156,882, Jun. 5, 1980, Pat. No. 4,314,903.

This application Oct. 28, 1981, Ser. No. 315,764

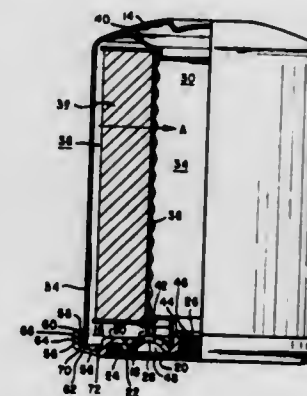
Int. Cl.<sup>3</sup> B21D 51/00

U.S. Cl. 413-4

3 Claims

1. The method of making an oil filter housing comprising the steps of providing a cup-shaped housing member having a side wall defining an open end, said open end having a marginal edge defining the opening into said cup-shaped member, forming a bead at the marginal edge of said cup-shaped member, providing a closure member for the open end of said cup-shaped member, said closure member defining a marginal edge, the marginal edge of said closure member being of substantially the same thickness at the rest of said closure member, the

thickness of said closure member being substantially greater than the thickness of said side wall of the cup-shaped member, bending said marginal edge into an annular rim, forming an annular bead-receiving cavity in said rim, installing the bead on the marginal edge of said cup-shaped member into said cavity,



bending said rim into permanent engagement with said bead while maintaining the thickness of said rim of said closure member substantially equal to the thickness of the rest of the closure member and substantially greater than the thickness of said side wall.

# 4,421,445

## OPERATING ARM FOR A MANIPULATOR WITH LENGTH ADJUSTMENT BY TELESCOPING MEANS

Georg Böhme, Weingarten; Wolfgang Köhler, Karlsruhe, and Manfred Salaske, Eggenstein, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe G.m.b.H., Karlsruhe, Fed. Rep. of Germany

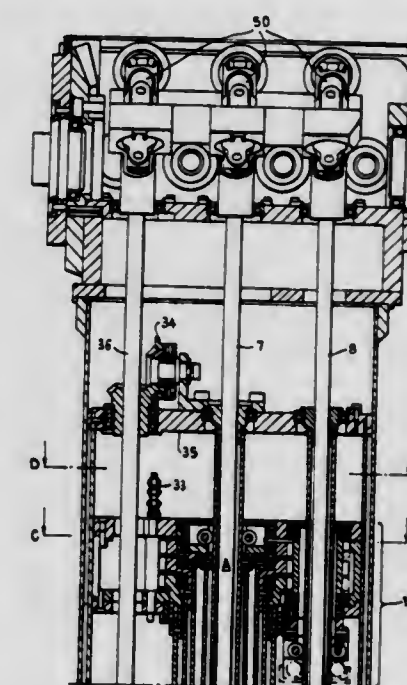
Filed Dec. 21, 1981, Ser. No. 332,447

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049577

Int. Cl.<sup>3</sup> B25J 3/00

U.S. Cl. 414-4

7 Claims



1. An operating arm for a manipulator with length adjustment by telescoping means having an inner structure including a number of concentric tubes for transmitting the various functions of the operating arm, said concentric tubes being rotatably supported at their upper ends by antifriction bearings which are supported coaxially and on top of each other within a transmission carriage which itself is slidably disposed in an outer tube of an upper portion of the telescoping means, and which has roller housings rotatably supported thereon and



drive shafts disposed outside the center of the carriage and slidably extending through the roller housing but being operatively associated therewith so as to transmit their rotation to said roller housings while sliding therein, said roller housings having spur gear structures associated therewith, and said concentric tubes having spur gear structures at their upper ends in engagement with the spur gear structures of the respective drive shafts for rotating said concentric tubes, said transmission carriage consisting of a housing with top and bottom covers, the upper side of said top cover having one end of a chain connected thereto, said chain extending over a driven sprocket which is mounted on an intermediate support sheet arranged above the transmission carriage in the outer telescopic tube and operatively connected to an additional drive shaft disposed in the outer telescopic tube to permit upward and downward movement of the transmission carriage, said transmission carriage having a recess formed at its circumference and a counterweight slidably supported in the outer telescopic tube by means of a rail extending in axial direction through said recess and guiding said counterweight during movement thereof counter to the movement of said carriage, said counterweight being engaged with said rail by rollers and being connected to the other end of said chain.

4,421,446

## BAR FEED MECHANISM

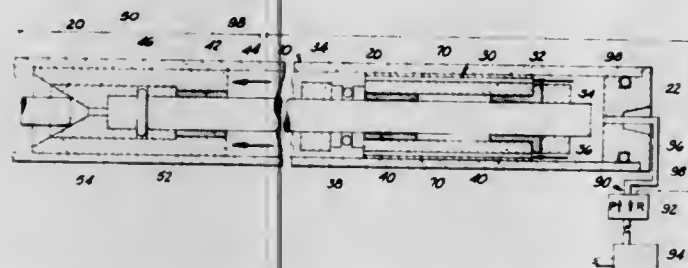
Theodor P. C. Leon, and Joseph F. Berns, Jr., both of Cincinnati, Ohio, assignors to Manurhin Automatic Division of Mitac, Inc., Cincinnati, Ohio

Filed Jul. 23, 1981, Ser. No. 286,363

Int. Cl.<sup>3</sup> B23B 13/10

U.S. Cl. 414-17

17 Claims



1. A bar feed mechanism for a machine tool, comprising a cylindrical tube, a piston movable axially within said tube, a shaft rotatably secured to said piston and projecting therefrom toward said machine tool, a centering sleeve rotatably mounted on said shaft and axially movable thereon, center means secured to said shaft at the end thereof remote from said piston, said center means having a concave surface for engaging the trailing end of a bar, a bushing at the end of said tube adjacent said machine tool, said bushing having an orifice which permits passage of said center means therethrough but retains said centering sleeve, a pressure inlet for admitting pressure fluid behind said piston to cause movement thereof in a feeding direction, said inlet being connected to a source of hydraulic pressure, means to admit hydraulic pressure fluid between said piston and said centering sleeve, said centering sleeve being axially movable on said shaft at all times between said piston and said center means, and pressure relief means to permit discharge of pressure fluid from said tube between said piston and centering sleeve when said sleeve abuts said bushing whereby to permit continued movement of said piston, shaft and center means in said feeding direction.

4,421,447

## ELEVATOR TRANSFER AND SUPPORT SYSTEM

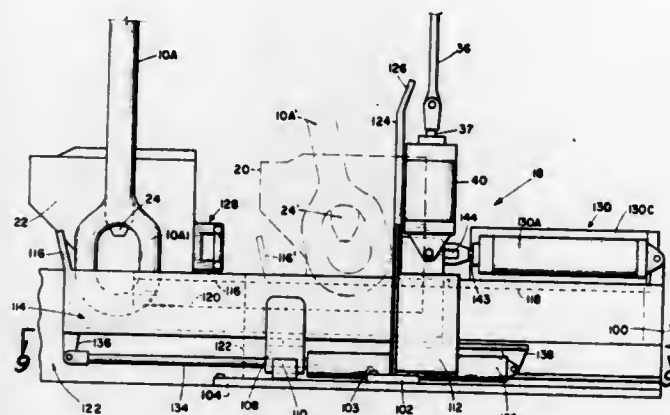
Howard S. Gudgel, and William E. Guier, both of Tulsa, Okla., assignors to Zena Equipment, Inc., Tulsa, Okla.

Filed Mar. 9, 1981, Ser. No. 241,508

Int. Cl.<sup>3</sup> E21B 19/06

U.S. Cl. 414-22

14 Claims



1. In a rotary drilling apparatus having a rotary table, a link control means attached to the links of a lifting means such as a travelling block, the travelling block being supported from a crown block in the tower of the drilling apparatus, the link control means serving to control the lateral position of two bales or links hanging from the travelling block, and two substantially identical elevators, each adapted to be carried separately by said bales, the improvement providing setback platform means to support the two elevators in two working positions, and to facilitate the engagement or disengagement of said links to or from each of the elevators comprising:

a cylindrical stool having a sidewall and having a vertical, axial opening therethrough for receiving drill pipe, the stool being supported on and rotatably attached to the rotary table;

a frame means adapted to be supported in a selected position in close proximity to the rotary table of the drilling apparatus;

a pair of parallel troughs supported from said setback platform means and spaced apart so as to straddle and extend along the opposite sides of said rotary table, said troughs being dimensioned to receive the bottom ends of said two links therein when said links are spread apart and are lowered, the troughs providing guiding force both inwardly and outwardly with respect to said stool to properly position said links to engage said elevators;

said setback platform means having a horizontal deck at the same height as the top of said stool, when positioned on top of said rotary table, said deck and said stool having a colinear longitudinal groove or keyway cut into said deck and the top of said stool, adapted to receive a corresponding key on the bottom of each of said elevators;

means attached to said setback platform means to move an elevator from a first position over said stool; to a setback second position on said deck, and vice versa; and, including means to traverse said troughs longitudinally along said frame.

4,421,448

## SELF-DUMPING BIN

Berthold Sonnenberg, R.R. #3, Waterford, Ontario, Canada (N0E 1Y0)

Filed Mar. 3, 1981, Ser. No. 240,056

Claims priority, application Canada, Mar. 14, 1980, 347667

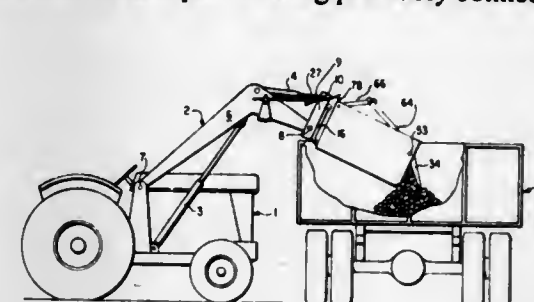
Int. Cl.<sup>3</sup> B65G 65/66

U.S. Cl. 414-411

9 Claims

1. A self-dumping produce bin adapted to be transported on a fork pivotally mounted on the free ends of a pair of tractor mounted arms movable between raised and lowered positions, the fork being mounted to permit a bin carried by it to be

movable between a produce bin lifting position, a produce bin transporting position and a produce bin dumping position, a door on the side of the bin which door is self closing when the bin is moved from its produce dumping position to its produce transporting position, a horizontal shaft extending between the sides of the bin, the bin door being pivotable about said shaft; a bin door opening mechanism mounted on the bin, the opening mechanism having two pairs of links, one pair being located adjacent each side of the bin, the two links forming each pair being pivotably interconnected at adjacent ends, the free end of one link of each pair of being pivotably connected to the



bin door adjacent the upper edge of the bin door, a rotatable shaft secured between the walls of the bin adjacent the upper edge of the bin opposite, and parallel to, the bin door, the free end of the other link of each pair being fixed to said rotatable shaft a gravity operated door tripping mechanism mounted on said one of said tractor mounted arms, the tripping mechanism being arranged to engage means fixed to said rotatable shaft to engage with said door tripping mechanism to rotate said shaft to shorten the distance between the free ends of each pair of arms to thereby positively pivotally open the bin door when said produce bin is moved from a produce transporting position to a produce dumping position.

4,421,449

## VEHICLE LIFT ATTACHMENT

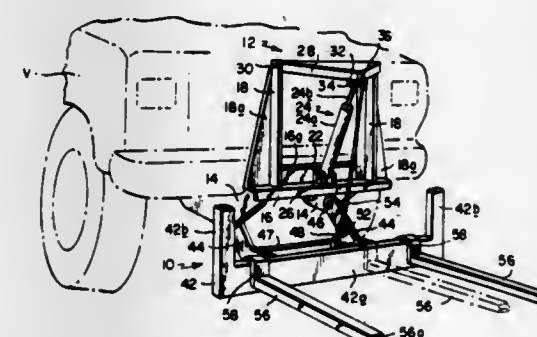
Vernon Cotton, Pond St., Groveland, Mass. 01834

Filed Oct. 27, 1981, Ser. No. 315,511

Int. Cl.<sup>3</sup> E01H 5/06; B66F 9/00

U.S. Cl. 414-685

4 Claims



1. A lift attachment for a vehicle comprising  
A. a snow plow lift mounted to the front of the vehicle;  
B. a rigid cross frame member;  
C. a pair of tongues, said tongues having  
(1) one end attached to the cross frame member at laterally spaced-apart locations thereon, and  
(2) an opposite end arranged to be pivotally connected to the vehicle chassis;  
D. a plurality of tines, said tines each having one end provided with a bracket to enable the tine to be engaged on the cross frame member so the tine projects forwardly of that member, and  
E. means connected between the cross frame member and the snowplow lift enabling the lift to swing the cross frame member from a lower position adjacent the ground to an elevated position above the ground.

4,421,450

## CARGO HANDLING APPARATUS

Toshio Kouno, c/o Dainichikiko Kabushikikaisha 774 Nakano, Ebina-shi, Kanagawa-ken, Japan

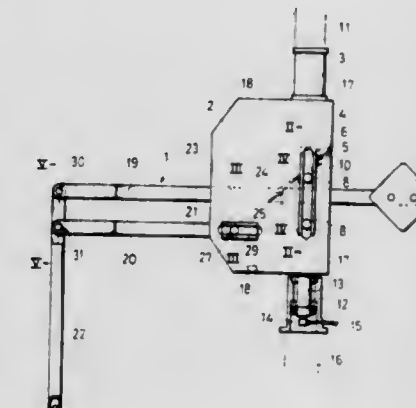
Continuation of Ser. No. 903,828, May 8, 1978, abandoned. This application Feb. 24, 1982, Ser. No. 351,971

Claims priority, application Japan, May 13, 1977, 52-55713; Aug. 3, 1977, 52-93162; Aug. 30, 1977, 52-104462

Int. Cl.<sup>3</sup> B66F 11/00

U.S. Cl. 414-719

7 Claims



1. A load handling apparatus comprising a lift structure adapted to be moved along a vertical axis, a pair of parallel supporting side plates disposed about said lift structure to rotate in fixed position around said vertical axis, a first horizontal arm extending through a space defined between said supporting side plates, said first horizontal arm being pivotally connected to said lift structure and having one end portion provided with a counterweight and the other end portion pivotally connected to a vertically extending arm, a second horizontal arm extending below and in parallel with said first horizontal arm and having one end portion pivotally connected to said vertical arm, a vertical link arranged between the lift structure and the vertical arm for pivotally connecting said first and second horizontal arms so as to define a parallelogram together with said vertical arm, first guide means provided at the pivotal connection between said vertical link and said second horizontal arm, said first guide means being adapted to be slidably received in a vertical slot formed in each of said supporting side plates and extending perpendicularly to said horizontal slots, actuator means for moving said lift structure in response to a load on said vertical arm to maintain said first and second horizontal arms and said vertical arm and vertical link in parallel relationship during movement with the load and counterweight balanced, comprising a fluid actuated piston and cylinder, a source of fluid under pressure and a fluid circuit for operating said actuating means, said fluid circuit comprising a pilot regulator having a primary flow path for feeding said fluid to said cylinder and a secondary flow path for exhausting said fluid from said cylinder, each path having a manually operable valve and a throttle valve for regulating the velocity of the fluid, at least said primary flow path having a check valve preventing flow of fluid back to said source, said manually operable valves being actuable to maintain the pressure of fluid in the primary and secondary paths equal to the pressure of the fluid in the cylinder.

4,421,451

## WORKPIECE GRIPPING MECHANISM FOR INDUSTRIAL ROBOTS

Bobby L. Higgins, Dallas, Tex., assignor to Thermwood Corporation, Dale, Ind.

Filed Mar. 23, 1982, Ser. No. 361,858

Int. Cl.<sup>3</sup> B66C 1/42

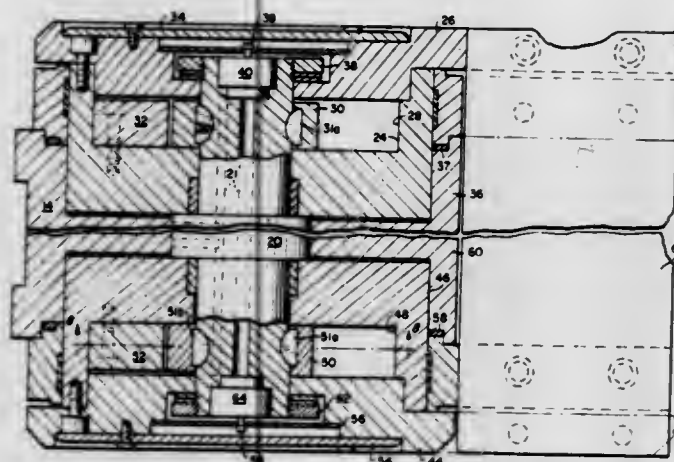
U.S. Cl. 414-739

16 Claims

9. A workpiece gripping mechanism for an industrial robot comprising a support member, a shaft rigidly mounted on said support member, first and second jaw assemblies pivotally



mounted on said shaft, each of said jaw assemblies having an annular chamber disposed concentrically relative to said shaft, each of said chambers having a partition element rigidly mounted on said jaw assembly and disposed in sealing engagement



ment with said shaft, and a vane element rigidly mounted on said shaft and disposed in sealing engagement with said jaw assembly, defining a fluid-actuated motor operable for pivoting said jaw assembly relative to said shaft.

4,421,452

## STATION FOR COLLECTING WIND ENERGY

Raoul Rougemont, Basse Bergerie, Francueil, F-37150 Blere, France

PCT No. PCT/FR80/00141, § 371 Date May 28, 1981, § 102(e) Date May 28, 1981, PCT Pub. No. WO81/00887, PCT Pub. Date Apr. 2, 1981

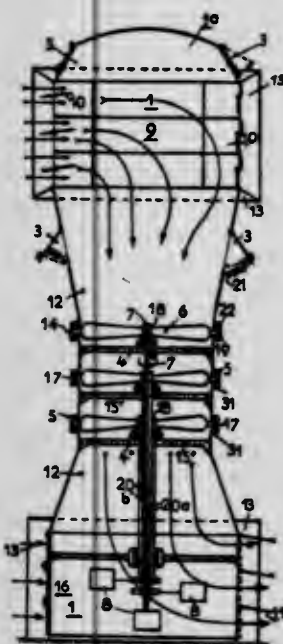
PCT Filed Sep. 26, 1980, Ser. No. 268,992

Claims priority, application France, Sep. 28, 1979, 79 24285; Jun. 4, 1980, 80 12382

Int. Cl.<sup>3</sup> F03D 7/04

U.S. Cl. 415-4

12 Claims



1. A fixed station for wind energy conversion, regardless of wind direction, comprising:

wall means providing an upright tubular column that is fixed in regard to translation, rotation and tilt, said column having means providing an upper inlet, a lower outlet and a transmission conduit extending between the inlet and the outlet;

a plurality of inlet valve means angularly distributed about the periphery of the column inlet, each such inlet valve being constructed and arranged to admit wind impacting the column exterior to enter the column, but prevent wind which has entered the column from exiting the column, so

that the wind which enters the column is directed to the transmission conduit;

a wind energy conversion system comprising: a plurality of shafts coaxially journaled for independent rotation in said column; each shaft having a wind energy conversion device mounted thereon which, when impacted by the wind is caused to turn, thus rotating the corresponding shaft; and rotary-power take-off means operatively connected to said shafts;

said wind energy conversion devices being located in said transmission conduit;

a plurality of outlet valve means angularly distributed about the periphery of the column outlet, each such outlet valve being constructed and arranged to exhaust wind impacting it from the column interior, and to prevent wind impacting the column exterior from entering the column;

a plurality of normally-biased-closed safety-valve means provided in the column wall means, for dumping excess wind pressure from the transmission conduit to prevent the impact of excessive wind pressure on the wind energy conversion devices;

auxiliary power means operatively connected with at least one of the wind energy conversion devices for overcoming inertia and thus initiating rotation of the respective wind energy conversion devices should the impacting wind be insufficiently strong to do so;

flywheel means journaled for rotation on the column; and clutch means for selectively engaging the flywheel means with the wind energy conversion system for storing the effect of wind power above a predetermined threshold power, and for utilizing the stored excess power to rotate said shafts when said shafts would otherwise rotate more slowly.

4,421,453

## CENTRIFUGAL OIL PUMP

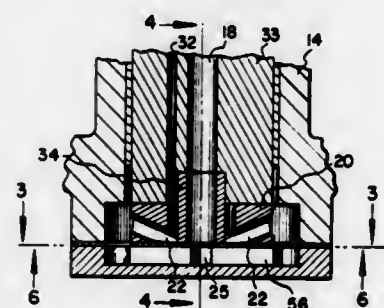
Herbert L. Hoff, Holmen, and Daniel C. Leaver, La Crosse, both of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Feb. 18, 1982, Ser. No. 349,798

Int. Cl.<sup>3</sup> F04B 39/02

U.S. Cl. 415-88

12 Claims



7. A centrifugal pump impeller comprising a body having a generally cylindrical section for operating in a sump to capture and propel fluid outwardly from said body, said section having a substantially flat bottom surface with a plurality of discrete fluid scooping inlet openings therein, and an outlet opening disposed in the perimeter of said body for each of said inlet openings; and a tunnel extending angularly upward and radially outward from each of said inlet openings to an outlet opening, with the regions of said body remaining between adjacent tunnels having substantially triangular configurations along the plane of said substantially flat bottom surface, and functioning as vanes between said inlet openings.

4,421,454

## TURBINES

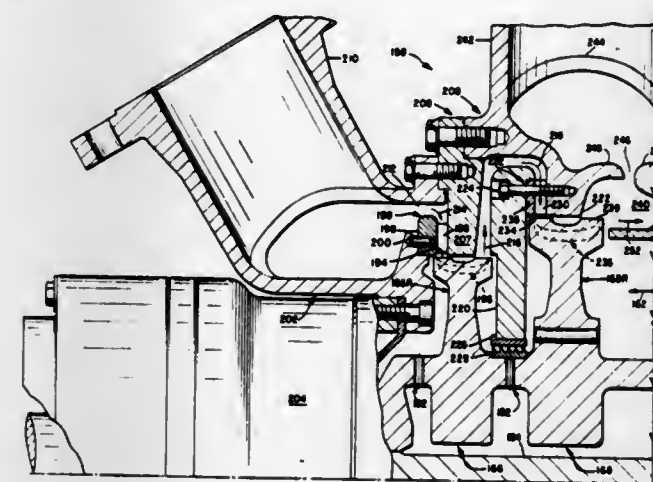
Leon R. Wosika, El Paso, Tex., assignor to Solar Turbines Incorporated, San Diego, Calif.

Division of Ser. No. 79,584, Sep. 27, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,778

Int. Cl.<sup>3</sup> F10D 1/02

U.S. Cl. 415-117

13 Claims



11. A dual pressure turbine comprising: a high pressure section having at least one radial impulse turbine stage; a low pressure section having at least one axial flow stage; means for introducing a working fluid at one pressure into said high pressure section; means for introducing working fluid at a second, lower pressure into said low pressure section; and means for mixing working fluid exhausted from the high pressure section with the lower pressure working fluid prior to introducing the working fluid into the low pressure turbine section, said last-mentioned means comprising: an annular exhaust plenum on the downstream side of the high pressure section, said exhaust plenum having an annular outlet communicating with the low pressure section of the turbine; an annular, working fluid inlet manifold surrounding said exhaust plenum; an annular flow passage between said inlet manifold and said exhaust plenum; and means through which working fluid can be introduced into said inlet manifold at said lower second pressure.

4,421,455

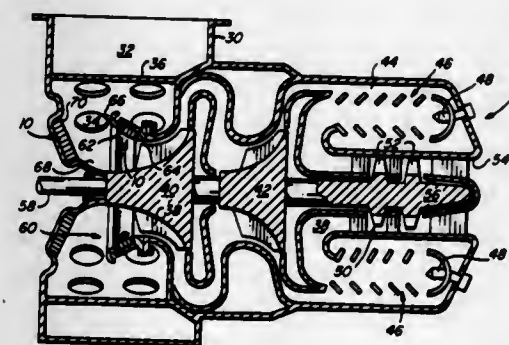
## DUCT LINING

Raymond H. Tomren, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 22, 1981, Ser. No. 333,491

Int. Cl.<sup>3</sup> F01N 1/02; F03B 11/00; F04D 29/66; B32B 3/12  
U.S. Cl. 415-119

39 Claims



1. A noise attenuating duct lining comprising: a first lamina of relatively nonrigid air-permeable filamentary cloth which is substantially liquid impermeable at atmospheric pressure; a second lamina of relatively rigid perforate material secured to said first lamina to support the latter, said second lamina being fluid-permeable; a third lamina of means for defining a multitude of cells

opening to said second lamina, said second lamina being secured to said third lamina and arranged to span the openings of said cells of said third lamina.

34. The method of making a noise attenuating duct lining comprising the steps of:

providing a first layer of air-permeable wire cloth, said wire cloth defining a pair of opposite faces, one of said opposite faces of said wire cloth being substantially smooth and impermeable to liquid at atmospheric pressure;

providing a second layer of perforate metal sheet adjacent the other face of said wire cloth, said perforate sheet defining a multitude of spaced perforations communicating therethrough;

electron diffusion bonding said first layer to and said second layer,

providing a third layer of honeycomb structure, said honeycomb structure defining a multitude of cells extending therethrough, said multitude of cells opening at one end thereof to said perforate sheet;

providing a fourth layer of impermeate sheet closing the other ends of said multitude of cells; and

adhesive by bonding said second and said fourth layers to said third layer of honeycomb structure to seal said multitude of cells from direct communication with one another.

36. Noise attenuating apparatus particularly for turbo machinery, said noise attenuating apparatus comprising a first layer of noise attenuating material said first layer communicating with a noise-containing environment associated with said turbo machinery; and a second layer of air-permeable and acoustically conductive fibrous cloth interposed between said first layer and said noise-containing environment, said fibrous cloth being substantially impervious to a liquid at atmospheric pressure from the group composed essentially of water, turbo machinery lubricating oils, turbo engine fuel oils, and combinations thereof, said second layer of fibrous cloth transmitting noise from said noise-filled environment to said first layer while substantially preventing transmission of said liquids thereto.

4,421,456

## CENTRIFUGAL PUMP ASSEMBLY

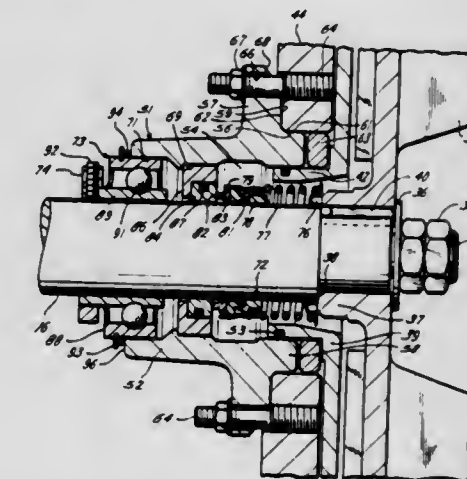
Robert R. Huffman, Houston, Tex., assignor to C T Manufacturing, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 357,993, Mar. 15, 1982. This application Jul. 26, 1982, Ser. No. 401,659

Int. Cl.<sup>3</sup> F01D 11/00

U.S. Cl. 415-170 A

10 Claims



1. In a centrifugal pump of the end suction type and having casing means defining an annular chamber, a rotatable pump shaft in the chamber and aligned with the fluid inlet, an impeller mounted by a threaded nut at the end of the pump shaft within the chamber and a shaft mounting structure including a pedestal cover secured to the casing, the improvement comprising:



- (a) said cover having a central opening providing an annulus located concentrically with said shaft;
- (b) a removable bearing and seal carrying stuffing box seated by stepped surfaces in said central opening and releasably secured to said pedestal cover;
- (c) said box having a cylindrical passageway concentric with the rotational axis of said shaft and said passageway having outwardly and inwardly facing step surfaces;
- (d) a mechanical sealing member mounted against said inwardly facing step surface about said shaft within said cylindrical passageway of said box;
- (e) an antifriction bearing mounted against said outwardly facing step surface on said shaft and having an external cylindrical surface adapted to seat within said outwardly facing step surface within said cylindrical passageway of said box thereby restraining lateral shaft deflections; and
- (f) locking means for securing said bearing in fixed operative position onto said shaft;
- whereby said box can be released from said cover and moved axially along said shaft to facilitate removal and replacement of said bearing and said mechanical sealing member.

4,421,457

## DIFFUSER OF CENTRIFUGAL FLUID MACHINE

Yoichi Yoshinaga, Minorimachi; Hiromi Kobayashi, Shimoinayoshi; Shinjiro Ueda, Kashiwa; Yoshihiro Takada, Dejima, and Hideo Nishida, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

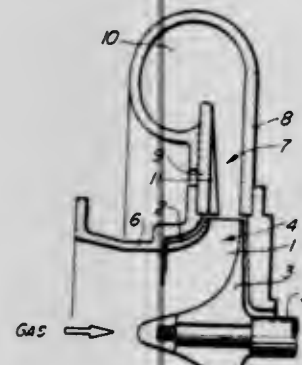
Filed Feb. 6, 1981, Ser. No. 232,007

Claims priority, application Japan, Feb. 8, 1980, 55-13718

Int. Cl.<sup>3</sup> F04D 29/30

U.S. Cl. 415—211

16 Claims



1. A diffuser of a centrifugal fluid machine having an inlet and an outlet and comprising a pair of opposed diffuser plates, and a fluid channel defined between said pair of opposed diffuser plates, such diffuser being characterized by further comprising a plurality of guide vanes formed on at least one of said diffuser plates extending along the flow of a fluid in said fluid channel, said guide vanes each having a height smaller than one-half the width of said fluid channel and gradually decreasing in going from the inlet of the diffuser toward the outlet thereof, whereby a distorted flow at the inlet of the diffuser will be brought into a substantially uniform flow pattern in an inlet portion of the diffuser and generation of secondary flow in an outlet portion of the diffuser will be avoided, by said guide vanes.

4,421,458

## WIND POWERED TURBINE

John Allan, Bembridge, and Peter J. Musgrove, Reading, both of England, assignors to Sir Robert McAlpine & Sons (Trade Investments) Limited, London, England

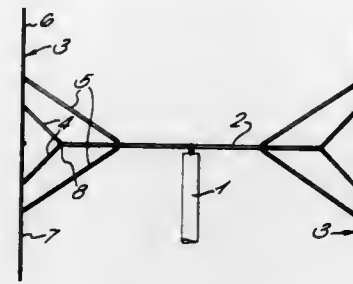
Filed Oct. 6, 1981, Ser. No. 309,105

Claims priority, application United Kingdom, Oct. 7, 1980, 8032238

Int. Cl.<sup>3</sup> F03D 7/06

U.S. Cl. 416—117

12 Claims



1. A wind powered turbine comprising:
- a supporting member,
  - a rotor member rotatable on the supporting member about a vertical rotation axis,
  - a plurality of rotor blades carried by the rotor member at positions spaced around and equidistant from the rotation axis, each blade comprising two half blade portions of aerofoil section, each half blade portion defining the total width of the rotor blade, and means at or adjacent a central region of each half blade portion mounting each half blade portion for pivotal movement as a whole relative to the other half blade portion,
  - and reefing means capable of pivoting the half blade portions in opposite directions so as to move them from a position parallel to the rotation axis to a position at which they form an angle to the rotation axis while remaining in the plane defined by the axis of rotation and the rotor member.

4,421,459

## FLUID LEVEL CONTROL APPARATUS

Ernest Frey, 314 S. 45th W. Ave., Sand Springs, Okla. 74127

Filed Sep. 11, 1981, Ser. No. 301,427

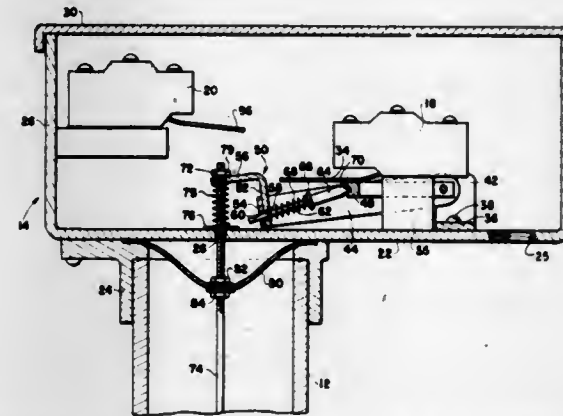
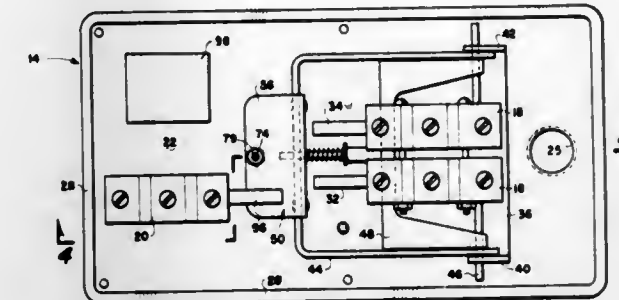
Int. Cl.<sup>3</sup> F04B 49/00

U.S. Cl. 417—38

12 Claims

1. Fluid level control apparatus for a fluid reservoir and comprising switching means, calibrated weight means operably connected with the switching means and suspended within the fluid reservoir, pressure sensing means interposed between the weight means and the switching means and responsive to the effective weight variances of the weight means resulting from fluid level differentials for activation of the switching means for selective actuation of a fluid input source and a discharge pump means for alternately stopping the flow of fluid to the reservoir and simultaneously discharging fluid therefrom and initiating the addition of fluid to the reservoir depending upon the fluid level within the reservoir, wherein the switching means comprises a pair of associated micro switches, first pivotal lever means disposed in the proximity of the associated micro switches, second pivotal lever means secured inboard of the first pivotal lever means and engageable with the associated micro switches for actuation thereof, bracket means connected between the first pivotal lever means and the pressure sensing means for pivoting of the first pivotal lever means in response to fluid level fluctuations, and con-

necting means secured between the first and second pivotal lever means whereby pivoting of the first pivotal lever means



transmits pivoting to the second pivotal lever means for actuation of the associated switches.

4,421,460

## METHOD OF OPERATING A MOTOR COMPRESSOR UNIT

John J. Jacobs, Pulaski, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 7,868, Jan. 31, 1979, Pat. No. 4,281,972.

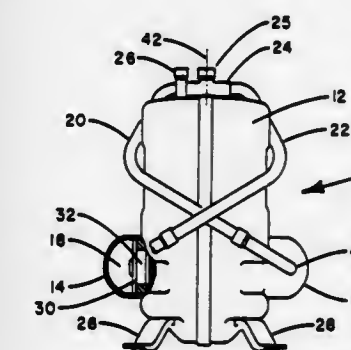
This application Feb. 2, 1981, Ser. No. 230,571

The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> F04B 35/04

U.S. Cl. 417—53

1 Claim



1. A method of compressing gas in a motor compressor unit enclosed within a hermetically sealed shell and having a plurality of compression cylinders with a reciprocating piston located within each compression cylinder and a corresponding plurality of suction plenums, which comprises the steps of:
- passing suction vapor exteriorly of the compressor shell from a common source of suction vapor to the plurality of suction plenums through a corresponding number of equal length suction vapor conduits extending from the common source of the suction vapor to the suction plenums;
  - periodically pulsing the pressure in the suction plenums and the equal length vapor conduits by reciprocating the pistons within the cylinders, to attain a minimum pressure

in said suction plenums when the pistons are substantially at bottom dead center;

periodically discharging the compressed vapor from the compression cylinders into the interior of the shell of the compressor unit; and

supercharging the cylinders with suction gas by periodically admitting suction vapor from the suction plenums into the compression cylinders of the compressor, substantially at the time of a maximum pressure pulse in the suction plenums.

4,421,461

## WAVE-POWERED DESALINATION OF SEAWATER

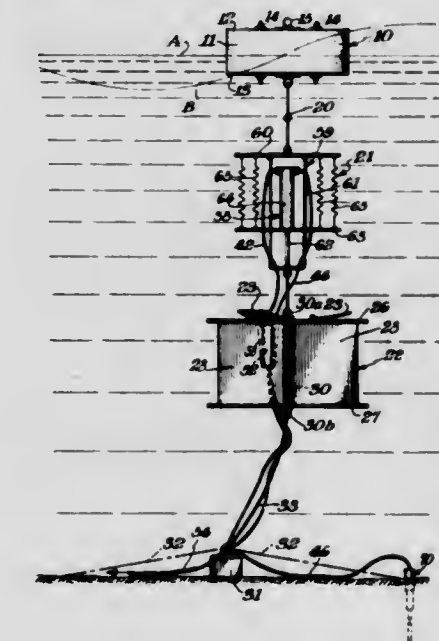
Douglas C. Hicks, Newark, Del., and Charles M. Pleass, Havre de Grace, Md., assignors to University of Delaware, Newark, Del.

Continuation-in-part of Ser. No. 76,217, Sep. 17, 1979, abandoned. This application May 26, 1981, Ser. No. 266,660

Int. Cl.<sup>3</sup> F03B 3/12

U.S. Cl. 417—53

4 Claims



3. The process of pumping seawater employing a wave-powered pumping device comprising:

- (a) a non-Archimedean wave follower connected in sequence from top to bottom with
- (b) a piston pump having a cylinder within which is mounted a reciprocatory piston;
- (c) attachment means connecting one of the pair consisting of said cylinder and said reciprocatory piston with said wave follower and the other of said pair with mooring selected from anchors, alone or in combination with a reaction unit;

wherein the product of the effective waterline plane area and the wave height divided by the product of the piston area and the required pressure is between 50 and 200.

4,421,462

## VARIABLE DISPLACEMENT PUMP OF VANE TYPE

Takeshi Ohe, Matsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1980, Ser. No. 208,454

Claims priority, application Japan, Dec. 10, 1979, 54-160106; Sep. 29, 1980, 55-135485

Int. Cl.<sup>3</sup> F04B 49/02, 49/08; F04C 2/00, 15/02

U.S. Cl. 417—310

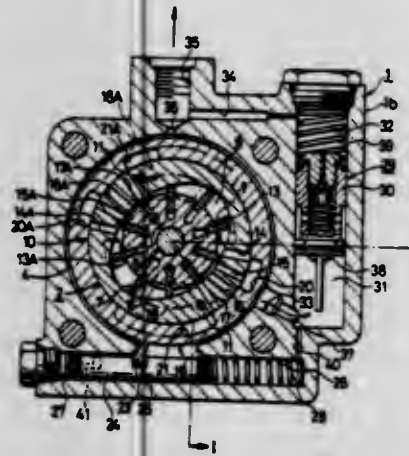
15 Claims

1. In a variable displacement vane pump including a rotor which is driven for rotation by a drive shaft, a plurality of vanes displaceably disposed in radial grooves formed in the rotor, a pair of sideplates which abut against the opposite ends of the rotor and the vanes, a cam ring located between the both sideplates and against which the outer end of the vanes abut in



sliding contact therewith, at least one intake port which permits a flow of a fluid into a vane chamber defined between a pair of adjacent vanes as the volume of the vane chamber increases, at least one discharge port which permits a flow of the fluid out of the vane chamber as the volume thereof decreases, a low pressure chamber disposed for communication with the intake port, and a high pressure chamber disposed for communication with the discharge port;

the improvement wherein the pump is of a balanced pressure type including a pair of pump sections which are located symmetrically to each other with respect to the drive shaft, each said pump section including at least two sets of



intake and discharge ports, in each pump section the spacing between an intake port and a discharge port of the first set as well as the spacing between an intake port and a discharge port of the second set being chosen to be in substantial coincidence with the spacing between a pair of adjacent vanes, either the intake or the discharge ports of the second set being disposed intermediate the intake ports and the discharge ports of the first set, further including control means which controls a communication between selected intake port or ports and the low pressure chamber and a communication between a selected discharge port or ports and the high pressure chamber.

#### 4,421,463 DOWNHOLE PUMP

Bert Lee, Salt Lake City, Utah, assignor to Jeff D. Morgan, Edmond, Okla.

Filed Jul. 8, 1981, Ser. No. 290,835  
Int. Cl.<sup>3</sup> F04B 47/08

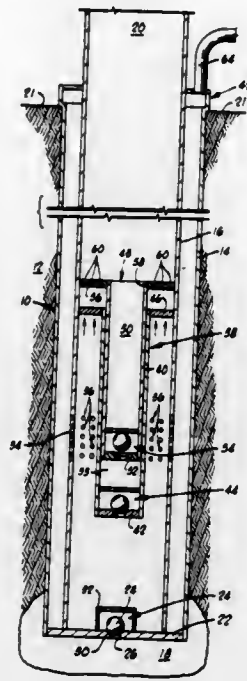
U.S. Cl. 417—383

7 Claims

1. A downhole pump for lifting fluid from an underground chamber comprising:

- a casing extending upwardly from the chamber;
- a tubing coaxially aligned within said casing, said tubing including holes located adjacent the lower end thereof;
- a floor mounted on the bottom of said casing, said floor including a check valve for permitting upward flow only into said tubing;
- a movable bucket having a cylindrical side, a bottom, and an open top, said bucket being positioned over said floor and including a check valve for permitting upward flow only mounted on the bottom thereof; an annular fin extending from the side of said bucket, said fin being of a size which constrains said bucket to vertical movement along the tubing axis;
- an annular plunger over which said bucket slides, said plunger being positioned over said bucket and including a bottom having a check valve mounted thereon for permitting only upward fluid flow; and

plunger support means mounted on said tubing wall for fixedly supporting said plunger;



said tubing holes permitting fluid flow between said casing and said tubing during bucket movement.

#### 4,421,464

##### LIQUID HELIUM PUMP

Kurt Schmidt, Karlsruhe-Waldstadt, and Klaus Jentsch, Stutensee, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

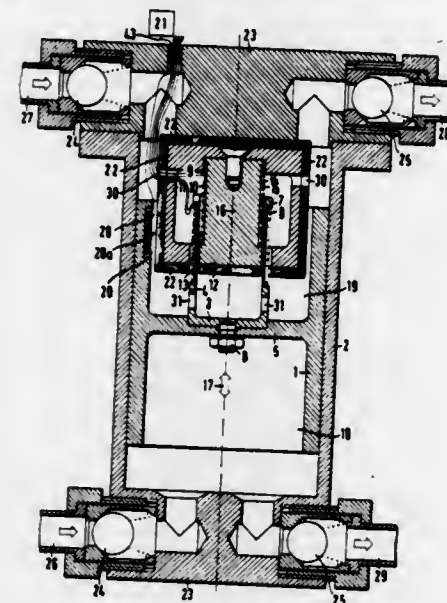
Filed Apr. 11, 1980, Ser. No. 139,695

Claims priority; application Fed. Rep. of Germany, Apr. 14, 1979, 2915199

Int. Cl.<sup>3</sup> F04B 17/04, 45/02

U.S. Cl. 417—412

9 Claims



1. In a pump for driving liquid helium, including a pump housing having means defining a pump inlet and a pump outlet; a pumping member arranged in the housing for reciprocating motion parallel to a pump axis for drawing liquid helium into the pump through the pump inlet and driving liquid helium out of the pump through the pump outlet; and an electromagnetic drive means contained in its entirety in the pump housing for generating an axially oriented force applied to the pumping member to reciprocate the same; the improvement wherein said electromagnetic drive means comprises:

- (a) a stationary electromagnet supported in said pump housing and including
- (1) non-magnetic first and second coil carriers fixedly

supported in said pump housing and surrounding said axis; said second coil carrier coaxially surrounding said first coil carrier and defining therewith an annular clearance constituting an air gap surrounding said axis and having a length dimension parallel to said axis;

- (2) first, second, third and fourth superconductive energizing solenoids carrying an energizing current to generate a magnetic flux in said air gap; said first and second energizing solenoids being mounted in an axially spaced relationship on said first coil carrier; said third and fourth energizing solenoids being mounted in an axially spaced relationship on said second coil carrier; said first energizing solenoid being in radial alignment with said third energizing solenoid and said second energizing solenoid being in radial alignment with said fourth energizing solenoid;
- (b) a non-magnetic third coil carrier attached to said pumping member to move therewith as unit; said third coil carrier surrounding said axis and having a travelling path passing through said air gap and being parallel to said axis;
- (c) a superconductive cylindrical moving coil carrying a control current and being mounted on said third coil carrier coaxially with said first, second, third and fourth energizing solenoids for traversing the magnetic flux in said air gap whereby an electromagnetic force parallel to said axis is exerted on said moving coil for displacing said moving coil, said third coil carrier and said pumping member as a unit; said moving coil having an axial length which is at least approximately equal to the axial distance between said first and second energizing solenoids; and
- (d) means for supplying first, second, third and fourth energizing solenoids and said moving coil with said energizing current and said control current, respectively.

#### 4,421,465

##### APPARATUS PROVIDING UNIFORM RESIN DISTRIBUTION IN A COEXTRUDED PRODUCT

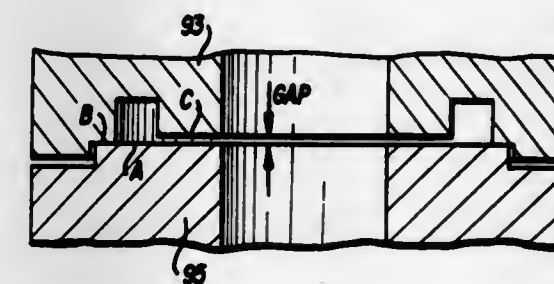
Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 201,688, Oct. 30, 1980, Pat. No. 4,344,907. This application Mar. 18, 1982, Ser. No. 359,554

Int. Cl.<sup>3</sup> B29F 3/06

U.S. Cl. 425—133.1

1 Claim



1. A die for coextruding first and second molten streams of resin comprising:

- a first flow channel for one of said resin streams, a second flow channel for the other of said resin streams, said first and second channels terminating in a molten resin junction region, and a flow channel coupling said junction region to an extrusion orifice, at least one of said first and second flow channels being defined by first and second opposing die surfaces, each respectively provided on first and second die members, said first and second die members engaging with one another at respective planar engaging faces, the planar engaging face of said first die member being offset from and in parallel with at least a portion of the opposing die surface of said first die member and the planar engaging face of second die member being in parallel with at least a portion of the opposing die surface of said second die member said offset defining the gap size of

said at least one flow channel and said parallel arrangement insuring no significant gap error in said channel.

#### 4,421,466

##### APPARATUS FOR MOLDING CONCRETE ARTICLES AND THE LIKE

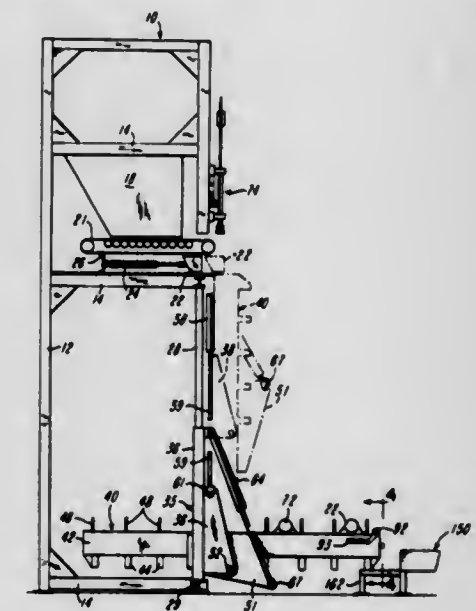
Charles J. Heitzman, Honolulu, HI., assignor to Auto-Cast International, Ltd., Honolulu, HI.

Filed Jun. 29, 1981, Ser. No. 278,173

Int. Cl.<sup>3</sup> B28B 21/90

U.S. Cl. 425—125

21 Claims



1. In apparatus for molding articles of self-hardening moldable material and including a mold box defining a molding cavity, means supporting said mold box for tilting movement between a generally vertical filling position and a generally horizontal stripping position, means for supplying the moldable material to said mold box when in said filling position to form a molded article within said mold box, means for receiving a molded article from said cavity after said mold box is moved to said stripping position, and means for stripping the molded article from said mold box, the improvement wherein said means supporting said mold box comprise a movable carriage having pivot means supporting an intermediate portion of said mold box for tilting movement, linear guide means supporting said carriage for generally vertical movement, power actuating means for tilting said mold box relative to said carriage, and power actuated means for moving said carriage vertically before said mold box is tilted completely to said filling position.

#### 4,421,467

##### INJECTION MOLDING MACHINE DIAGNOSTIC SYSTEM

Dennis W. Richmond, Loveland, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Filed Mar. 11, 1982, Ser. No. 357,185

Int. Cl.<sup>3</sup> B29G 5/00

U.S. Cl. 425—136

15 Claims

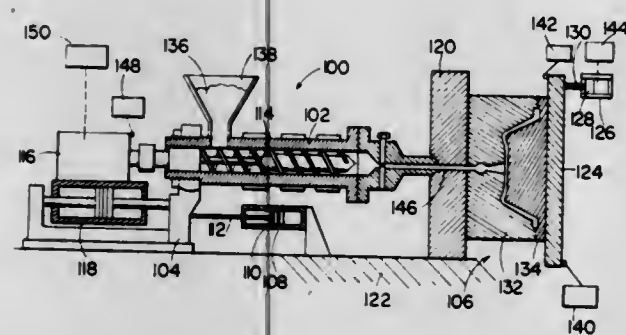
1. In an injection molding machine having clamp means for opening and closing a mold, an extruder having a rotatable plasticizing screw, and injection means for axially moving the screw to inject plasticizing material into a mold, said clamp means, extruder and injection means each comprising a plurality of components which normally assume a given proper state during the cycling of the machine through its operating sequence comprising a plurality of major operating steps, it being necessary for a respective given plurality of components to assume their proper states for the machine to accomplish each major operating step; a diagnostic monitoring system for monitoring the opening and closing of the mold by the clamp means, the operation of the extruder and the injection of the



material into the mold by the injection means as the injection molding machine cycles through its major operating steps in its operating sequence comprising:

a plurality of monitor switch means,  
a plurality of means respectively connected between said monitor switch means and the components of the clamp means, extruder and injection means for activating each said monitor switch means when the pertaining component assumes its proper state during the operation of the clamp means, extruder or injection means with which it is associated and for deactivating each said monitor switch means when the pertaining machine component fails to assume its proper state during the operation of the clamp means, extruder or injection means with which it is associated,

a plurality of visual indicators physically grouped in a plurality of sequentially arranged sets wherein each set comprises a plurality of said indicators and each set is spatially set apart from the other sets so that it can be readily distinguished from the other sets, each set corresponding to a major operating step of the machine and comprising a plurality of indicators that pertain to the components that are required to assume their proper states before the machine can perform the pertaining major operating step,

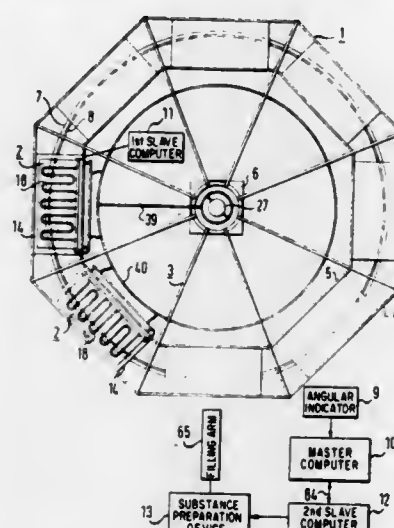


**4,421,468**  
**FOAM MOLDING MACHINE**  
Horst Bokelmann, Grödenbach, Fed. Rep. of Germany, assignor to Metzeler Schaum GmbH, Munich, Fed. Rep. of Germany  
Filed May 18, 1982, Ser. No. 379,293  
Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120519

Int. Cl.<sup>3</sup> B29D 27/04

U.S. Cl. 425—143

6 Claims



1. Foam molding apparatus, comprising a rotatable table, a plurality of molds disposed on said table, means for heating and cooling each of said molds, means being fixed in place relative to said table for filling a specific quantity of foamable reaction mixture having several components into each of said molds, means for opening and closing each of said molds, means disposed in vicinity of said table for indicating an angular position of said table and said molds by generating signals representing the angular position of said table and for initiating functions of the apparatus corresponding to the position of said table, stationary master computer means disposed outside said table and connected to said indicating means for coordinating operations of the apparatus by receiving said signals from said indicating means and determining time periods based on said angular position, first slave computer means disposed on and rotatable with said table, said first slave computer means being connected to and controlled by said master computer means and being connected to said opening and closing means and to said heating and cooling means for opening and closing each of said molds in dependence on the position thereof and for controlling the heating and cooling of each of said molds in dependence on time, stationary second slave computer means disposed outside said table, said second slave computer means being connected to and controlled by said master computer means and being connected to said filling means for controlling said filling means in dependence on the position of said molds, said filling means including a separate metering pump for dispensing each of the reaction mixture components.

**4,421,469**  
**INJECTION MOLDING MACHINE ASSEMBLY HAVING MEANS FOR SELECTIVELY CHANGING AT LEAST TOOL UNIT OR A PLASTICIZING AND EJECTION UNIT**  
Caspar Egger, Glarus; Rudolf Krebs, Schübelbach, and Hans Leuzinger, Netstal, all of Switzerland, assignors to Netstal-Maschinen AG, Switzerland

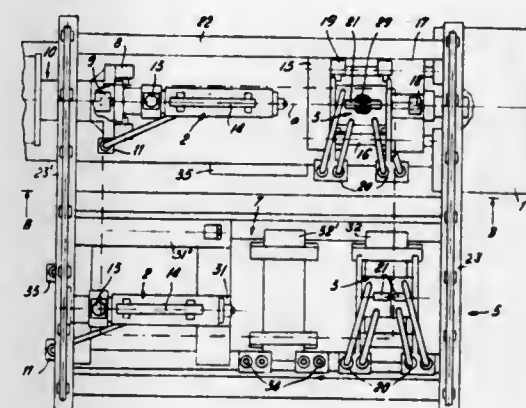
Filed Jun. 23, 1982, Ser. No. 391,289  
Claims priority, application Switzerland, Jul. 2, 1981, 4374/81  
Int. Cl.<sup>3</sup> B29F 1/00

U.S. Cl. 425—183

7 Claims

1. An injection molding machine assembly for use with an operating injection machine, comprising a tool unit mounting support adjacent the injection machine, a plasticizer and ejection unit mounting support adjacent said tool unit mounting support, first operating and securing coupling means associ-

ated with said tool unit mounting support for connecting a tool unit, second operating and securing coupling means associated with said ejection unit mounting support for connecting a plasticizer and ejection unit, magazine means defining at least one of an additional plasticizer and ejection unit mounting support which is substantially the same as said plasticizer and ejection unit mounting support, the first ejector and plasticizer



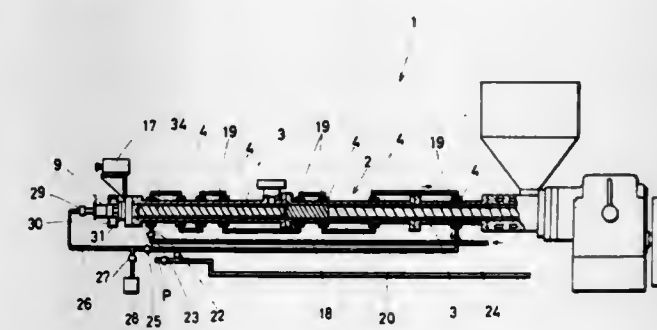
associated with said injection unit mounting support, a first tool unit associated with said tool unit mounting support, said first ejector and plasticizer associated with said magazine means, and transport means movable between said magazine, said plasticizer and ejection unit mounting support for transporting said first ejector and plasticizer between said plasticizer and ejection unit mounting support and said magazine means.

**4,421,470**  
**RESIN PELLET PRODUCING MACHINE**  
Kensaku Nakamura, 271-1, Bessho-cho, Matsubara, Osaka-Pref., Japan

Filed Mar. 4, 1982, Ser. No. 354,641  
Int. Cl.<sup>3</sup> B29C 17/14

U.S. Cl. 425—311

2 Claims



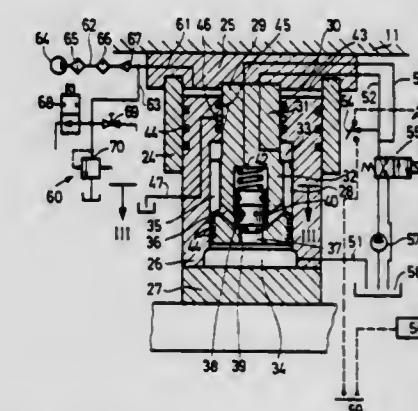
1. In a resin pelletizing apparatus, comprising an extruding barrel comprising an elongated cylinder tube having an entrance end and an exit end and through which resin is processed; heating means disposed about said barrel and comprising interconnected pipe means with an inlet and an outlet; means for supplying hot water to said inlet of said interconnected pipe means to supply heat to said heating means; die means positioned at said exit end of said extruder barrel for producing strands of extruded resin said die means having an outer surface area; cutter means mounted on the outer surface area of said die means for cutting said strands into pellets; and means for cooling the resulting pellets of said extruded resin; wherein the improvement comprises a recirculating pipe means connected to said outlet of said interconnected pipe means and connected to said cooling means, whereby the water used to heat said barrel after exposure to said heating means is used to cool said pellets after cutting by said cutting means.

**4,421,471**  
**VIBRATING HYDRAULIC PRESS**  
Willy Vogt, Zürich, Switzerland, assignor to Bucher-Guyer A.G., Niederweningen, Switzerland  
Division of Ser. No. 250,233, Apr. 2, 1981. This application Sep. 23, 1982, Ser. No. 421,951

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3014068

Int. Cl.<sup>3</sup> B28C 21/50; B29C 3/00  
U.S. Cl. 425—421

12 Claims



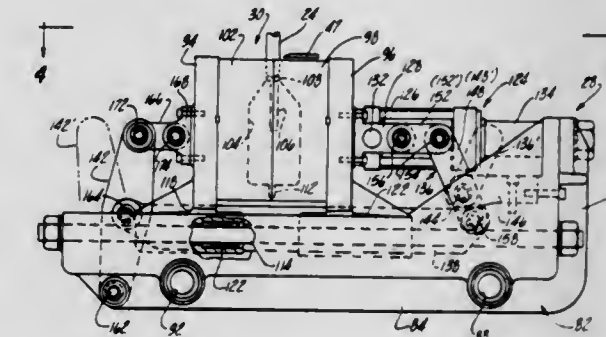
1. A press for the manufacture of fire bricks, comprising in combination:  
a mold, including a bottom normally open on top, and adapted to receive ceramic material,  
a main piston disposed normally in an initial position above said mold, and forming a cover surface of said mold when entering the top of the mold,  
drive means in driving connection with said main piston for urging said main piston to exert a non-oscillatory pressure onto said ceramic material, said main piston being displaceable by said drive means from said initial position in a direction towards the bottom of said mold, said drive means being hydraulic and being associated with pneumatic energy storage means for urging said main piston toward the bottom of the mold, the hydraulic drive means also being connected for urging the main piston in a direction away from the bottom of the mold and control means for controlling fluid supplied by said hydraulic drive means to provide oscillating pressure on said main piston.

**4,421,472**  
**CLAMP FOR BLOW MOLDING MACHINE**  
Merritt W. Martin, Jr., Saline, Mich., assignor to R & B Machine Tool Company, Saline, Mich.

Filed Aug. 31, 1981, Ser. No. 297,589  
Int. Cl.<sup>3</sup> B29C 17/07, 17/12

U.S. Cl. 425—527

10 Claims



1. In a blow molding machine of the type comprising: at least one work station adapted to support a workpiece, first and second platens adapted to carry first and second mold sections, respectively, and a clamp supporting the platens for movement along a



clamping axis to close and open the mold sections with respect to the workpiece, the improvement wherein said clamp comprises: an elongate body extending in the direction of said clamping axis, actuating means disposed between said body and said first platen for moving said first platen along said clamping axis, a first lever being pivotally coupled with said body and with said first platen, a second lever being pivotally coupled with said body and with said second platen, and a pull bar being pivotally coupled with said first lever and said second lever, pivotal couplings on said levers being spaced so that movement of said first platen along said clamping axis imparts equal and opposite movement to said second platen.

4,421,473

# APPARATUS FOR OPERATING A BURNER AT AN OPTIMAL LEVEL

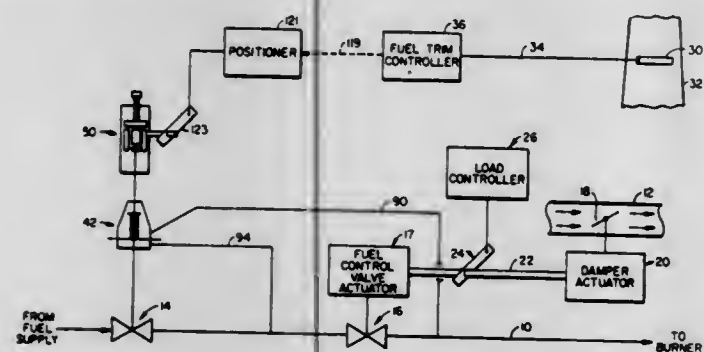
Steve B. Londerville, Half Moon Bay, Calif., assignor to Coen Company, Inc., Burlingame, Calif.

Filed Jul. 27, 1981, Ser. No. 287,383

Int. Cl.<sup>3</sup> F23N 5/00

U.S. Cl. 431-76

6 Claims



1. In a system for controlling the flow of a fuel and air mixture to a burner wherein both the fuel and air flow rates are adjusted in a substantially fixed ratio in response to load changes on the burner, and wherein the fuel flow rate is adjusted by a fuel control valve mounted in a fuel supply line, an apparatus for marginally adjusting the fuel flow to the burner to maintain a combustion characteristic in the burner at a desired value, the apparatus comprising:

- a self-adjusting valve mounted in the fuel supply line and upstream of the fuel control valve said self-adjusting valve including means for sensing the differential pressure across the fuel control valve and means for maintaining the pressure differential at a set point;
- set means for changing the setting of the self-adjusting valve to thereby vary the set point and the differential pressure across the control valve;
- means for monitoring the combustion characteristic; and
- means for operating the set means in response to a monitored change in the combustion characteristic to adjust the set point so that the combustion characteristic is returned to the desired value.

4,421,474

# HYDROGEN GAS BURNER

Stanley A. Meyer, 2222 Marlane Dr., Grove City, Ohio 43213

Filed Aug. 25, 1982, Ser. No. 411,245

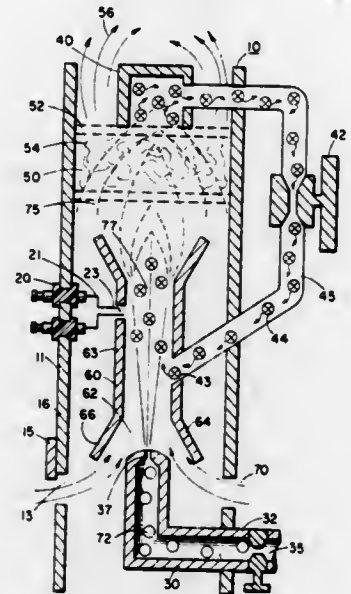
Int. Cl.<sup>3</sup> F23L 7/00

U.S. Cl. 431-115

13 Claims

1. A hydrogen gas burner for utilization as a heat source comprising: a housing having a double open-end combustion chamber positioned therein, a source of hydrogen gas and a nozzle connected thereto for

directing the hydrogen gas into one end of said combustion chamber, ambient air intake means in said housing positioned to direct ambient air into said combustion chamber, and a source of a non-combustible gas, return line means for returning said non-combustible gas to said combustion chamber for mixing with said hydrogen gas and said ambient air,



an ignitor for igniting said mixture of gasses, a barrier positioned adjacent to other open-end of said combustion chamber, said ignited mixture of gasses superheating the air in said housing and directing the same to said barrier, said barrier further comprising a heat dissipating surface to disperse heated air to the utilization means.

4,421,475

# BURNER FOR THE COMBUSTION OF LIQUID FUELS IN THE GASEOUS STATE

Adolf Frick, Balzers, Fed. Rep. of Germany, assignor to Stoeblich AG, Schaan, Fed. Rep. of Germany

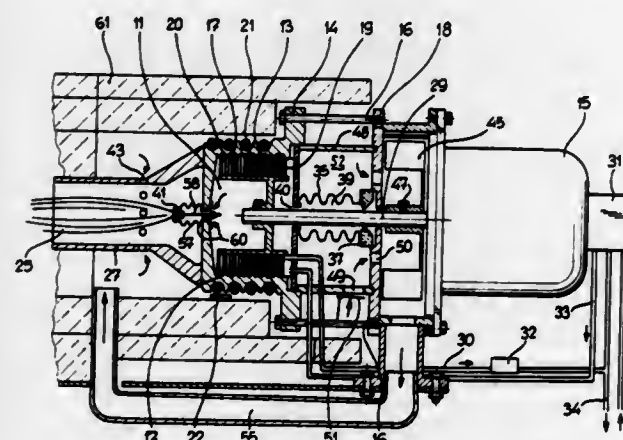
Filed Mar. 9, 1981, Ser. No. 241,976

Claims priority, application Switzerland, Mar. 14, 1980, 2001/80

Int. Cl.<sup>3</sup> F23D 11/44

U.S. Cl. 431-207

26 Claims



1. A burner for the combustion of liquid fuel in the gaseous state, said burner comprising: a gasification chamber having at least one heatable wall heatable by heating means; means for creating a relatively high pressure in the gasification chamber to prevent air from flowing into said gasification chamber and to discharge gasified fuel at a relatively high pressure;

means for permitting fuel to be introduced into said gasification chamber; means for permitting gasified fuel to exit from said gasification chamber; wiping means for cleaning said heatable wall of said gasification chamber; and, motor means located outside of the gasification chamber for actuating said wiping means inside of said gasification chamber to remove deposits from the gasification chamber walls so that said deposits exit from said gasification chamber with said gasified fuel.

4,421,476

# GASIFICATION BURNER

Peter Gulden; Alfred Michel, both of Erlangen, and Hana Kostka, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

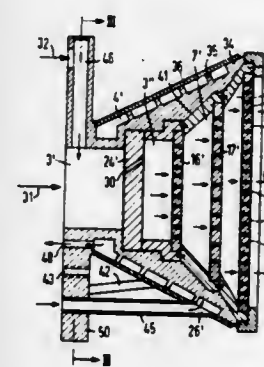
Continuation of Ser. No. 77,041, Sep. 19, 1979, abandoned. This application May 10, 1982, Ser. No. 376,569

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841105

Int. Cl.<sup>3</sup> F23D 13/14, 13/42

U.S. Cl. 431-243

11 Claims U.S. Cl. 431-325



1. In a gasification burner comprising: a primary air feed stub; an antechamber for mixing an at least partly evaporated liquid fuel with primary air, having an inlet for evaporated liquid fuel and a primary air inlet; a catalytic device downstream of the antechamber for converting the fuel vapor air mixture into a fuel gas; a mixing chamber downstream of the catalytic device, and having inlets for said fuel gas and secondary air, for mixing the fuel gas with secondary air to form a fuel-gas mixture; means defining an annular space concentrically surrounding the antechamber, the catalytic device, the mixing chamber, said annular space separated from the antechamber by a ring wall, and having an inlet coupled to said primary air feed stub; a conically flared combustion chamber terminated by a perforated burner plate of porous material; an ignition chamber arranged between the combustion chamber and the mixing chamber coupling the combustion chamber to the mixing chamber such as to feed the fuel gas-air mixture from the mixing chamber to the combustion chamber, said annular space also surrounding said ignition chamber; a front chamber, located upstream of the antechamber, which changes into a ring canal which surrounds the inlet for evaporated liquid fuel of the antechamber completely and the annular space and the catalytic device at least over part of their length; a fuel inlet coupled to the end of said ring canal remote from said front chamber; a heat source contained in said annular space for preheating the primary air during the starting process and for aiding in the event of load changes; radial canals contained in said ring wall forming the primary air inlet to said antechamber and connecting said annular space to said antechamber; homogenizing devices, arranged in said antechamber and in said mixing chamber; and means separating said ignition chamber from said mixing chamber such as to prevent backfiring, the improvement comprising:

(a) the annular space also enclosing the conically flared

combustion chamber in ring fashion and extending up to the immediate vicinity of the burner plate; (b) the primary air feed stub opening into the annular space in the immediate vicinity of the burner plate; and (c) baffles disposed in said annular space conducting the primary air stream being fed in from said primary air feed stub to the radial canals of the ring wall in a winding flow path about the combustion chamber and the ignition chamber.

4,421,477

# COMBUSTION WICK

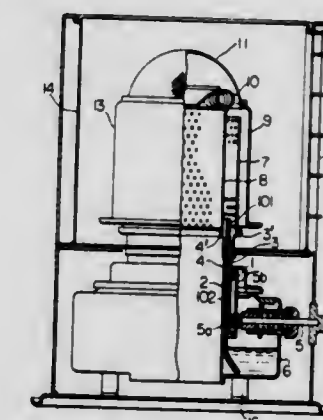
Kinichi Adachi, Takarazuka; Hisanori Shimoda, Neyagawa; Yasushi Hirata, Nara, and Yoshimi Ohmukai, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 7, 1982, Ser. No. 366,168

Claims priority, application Japan, Apr. 13, 1981, 56-56072; May 14, 1981, 56-73057; Aug. 19, 1981, 56-129950; Aug. 20, 1981, 56-131150; Oct. 26, 1981, 56-170909; Nov. 4, 1981, 56-176872; Nov. 9, 1981, 56-179454

Int. Cl.<sup>3</sup> F23D 3/18

7 Claims



1. A combustion wick comprising a fuel suck-up portion where liquid fuel is sucked up and a fuel gasifying portion provided above said fuel suck-up portion, wherein of said fuel suck-up and fuel gasifying portions, at least the fuel gasifying portion is formed from silica-alumina type ceramic fibers with an organic binder, with at least a part of said portion being impregnated with a coating material composed principally of an inorganic pigment, silicic anhydride and a surface active agent.

4,421,478

# HIGH EFFICIENCY FUEL BURNER

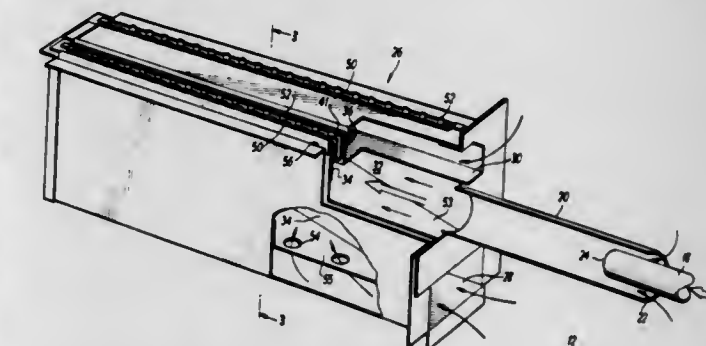
Bruce R. Maik, Westerville; Carl S. Fladt, and Frank E. Lavelly, both of Galloway, all of Ohio, assignors to Magic Chef, Inc., Cleveland, Tenn.

Filed Aug. 3, 1981, Ser. No. 289,283

Int. Cl.<sup>3</sup> F23D 15/00

U.S. Cl. 431-351

7 Claims



1. In a burner having an air supply chamber and means for



maintaining a predetermined air pressure in said chamber, the improvement comprising:

- a fuel tube having an open end in said air supply chamber and a fuel supply conduit extending into said tube and having a fuel discharge orifice in said fuel tube;
- a burner assembly adjacent said supply chamber and comprising a housing having at least three burner chambers therein;
- said fuel tube opening into a first of said burner chambers and plural burner ports communicating with said first burner chamber;
- a separate metering port from said air supply chamber to each of the second and third burner chambers; and
- each of said second and third burner chambers communicating with secondary air ports disposed closely adjacent said plural burner ports whereby a mixture of fuel and primary air is directed through said first burner chamber to said plural burner ports and metered secondary air is directed through said second and third burner chambers to positions closely adjacent said plural burner ports to provide a flame spread over an area of heating surface.

4,421,479

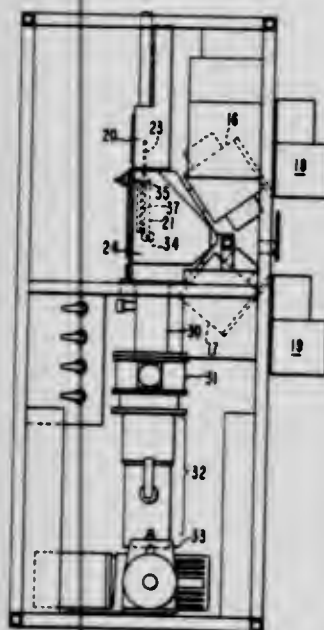
#### PROCESS FOR TREATING A SEMICONDUCTOR MATERIAL BY BLACKBODY RADIATION SOURCE WITH CONSTANT PLANAR ENERGY FLUX

Richard S. Muka, Topsfield, and Carl J. Russo, Ipswich, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif. Division of Ser. No. 262,838, May 12, 1981. This application Apr. 1, 1983, Ser. No. 481,206

Int. Cl.<sup>3</sup> F27B 17/00

U.S. Cl. 432—31

6 Claims



1. A process for thermally treating a semiconductor material, comprising:
  - introducing said material into a processing chamber;
  - producing a vacuum condition in said processing chamber;
  - heating said material in said chamber by a blackbody source having a constant planar energy flux characteristic, said wafer being positioned in essentially parallel planar alignment with said blackbody source.

#### 4,421,480 CEILING BEAM CONSTRUCTION FOR HEATING FURNACE

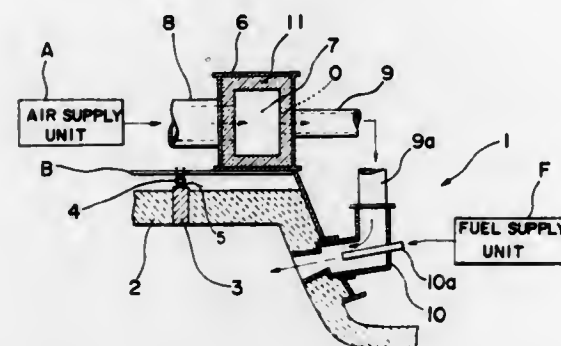
Tetsuya Tokitsu, Takarazuka; Saburo Harada, Nara; Jiro Yamasaki, and Akihiro Nakama, both of Oita, all of Japan, assignors to Chugai Ro. Kogyo Co., Ltd., Osaka and Nippon Steel Corp., Tokyo, both of Japan

Filed Dec. 28, 1981, Ser. No. 335,276

Int. Cl.<sup>3</sup> F27D 1/12; F23M 5/06; F27B 3/00

U.S. Cl. 432—238

7 Claims



1. A ceiling for a heating furnace having side walls extending in widthwise and lengthwise directions comprising:
  - a ceiling portion for covering the interior of the furnace, ceiling beam means, including a plurality of widthwise extending, lengthwise spaced beams, for vertically supporting said ceiling portion above the side walls of the furnace; said beams having closed cross sections, the interiors of said beams comprising means for transporting gas flow within said furnace so as to reduce the space required in the furnace for separate gas ducts.

4,421,481

#### FURNACE FOR HEATING SLABS, BILLETS, ROUGH CASTINGS AND THE LIKE

Peter Holz, Essen; Heinrich Patalon, Bochum, and Edgar Hartkopf, Mülheim, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

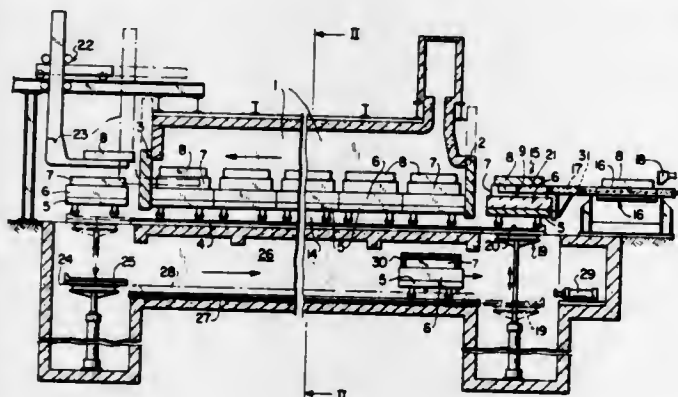
Filed Dec. 17, 1981, Ser. No. 331,816

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101230; Aug. 17, 1981, 3132373

Int. Cl.<sup>3</sup> F27D 3/00; F27B 9/26

U.S. Cl. 432—239

15 Claims



1. A furnace for heating all sides of products such as slabs, billets, rough castings and the like, said furnace comprising:
  - a furnace chamber having a charging end and a discharging end;
  - support means for supporting products to be heated within said chamber, said support means comprising a plurality of carriages positioned throughout the length of said furnace chamber for sequential movement therethrough from said charging end thereof to said discharging end thereof, each said carriage including a support bench having extending upwardly therefrom support members for supporting a

product to be heated, said support members extending longitudinally in the direction of movement of said carriages through said furnace chamber;

a charging station located adjacent said charging end of said furnace chamber for loading a product to be heated onto a said carriage and introducing the thus loaded carriage into said furnace chamber, thereby displacing loaded said carriages within said furnace chamber toward said discharging end and discharging a downstream-most said loaded carriage from said discharging end of said furnace chamber, said charging station including a grate formed of elongated finger-like projections extending in said direction, said projections being positioned to fit between adjacent said support members, each said projection having mounted thereabove a roller having a rotational axis extending in said direction, the distance between adjacent said rollers being at least equal to the distance between adjacent said support members;

unloading means, located adjacent said discharging end, for unloading a heated product from said carriage discharged from said discharging end;

a return chamber exterior of said furnace chamber and extending from adjacent said unloading means to said charging station to enable said carriage unloaded by said unloading means to be returned to said charging station; and heat insulation means within said return chamber for reducing heat loss from said unloaded carriage while said unloaded carriage is in said return chamber.

4,421,482

#### CONVEYOR ROLL FOR CONVEYING HEATED GLASS SHEETS

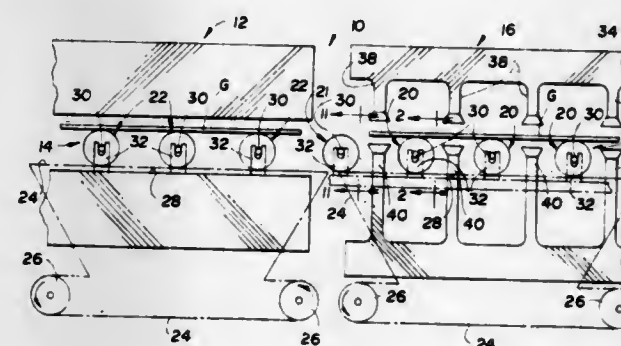
Ronald A. McMaster, 420 Water St., Woodville, Ohio 43469

Filed Jan. 7, 1982, Ser. No. 337,790

Int. Cl.<sup>3</sup> B21B 31/08; F27B 9/00; F27D 3/00

U.S. Cl. 432—246

20 Claims



20. In hot glass sheet handling apparatus including a generally rigid member, the improvement comprising: a support on the rigid member having an outer surface of uncoated aromatic polyamide fibers which are stable at a sufficiently high temperature to directly engage and support glass sheets heated to a temperature of about 1100 to 1200 degrees Fahrenheit.

4,421,483

#### DELIVERY SYSTEM FOR DENTAL INSTRUMENTS OR THE LIKE

Helmut Pietschmann, Karlsruhe; Manfred Schmidt, Karlsruhe, and Emil Hirth, Malsch, all of Fed. Rep. of Germany, assignors to Sybron Corporation, Rochester, N.Y.

Filed Mar. 4, 1981, Ser. No. 240,486

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013882

Int. Cl.<sup>3</sup> A61G 1/14

U.S. Cl. 433—77

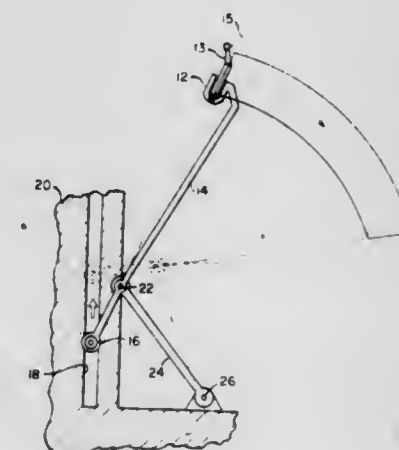
1 Claim

1. In a dental unit having a plurality of nests, each nest releasably supporting a dental treatment instrument and being movable between a stored position and a readiness position, the improvement comprising:

(a) a movable support mechanism connecting each of said nests to the dental unit for moving said nest and dental

instrument through an arcuate path of travel between said storage and readiness positions, each said mechanism including an elongated swivel arm connected at one end thereof to a nest and pivoted at the other end thereof for rotational movement by which said nest is moved through said arcuate path, said mechanism acting to control the orientation of said nest such that the axis of said instrument assumes a generally horizontal attitude and said path of travel assumes a generally downward direction as said readiness position is approached; and

(b) selection means operatively connected to said movable support mechanism for initiating movement of a selected nest towards said readiness position, said selection means being located on said dental unit beneath said readiness position, wherein said support mechanism is further defined as:



- (i) said elongated swivel arm having one end slidably captured in a vertical groove formed in a wall of said unit and a free end;
- (ii) said instrument nest on said free end arranged to hold an instrument such that said instrument forms an extension of said swing arm with the axis of said instrument extending in generally the same direction as said arm;
- (iii) a link having one end pivoted to said unit and a second end journaled to said swivel arm intermediate the ends thereof; and
- (iv) said swivel arm being oriented in a generally upright position when said nest is in a stored position and said captured end moving vertically upward in said groove as said nest is brought to a readiness position.

4,421,484

#### DIGITAL SIMULATION APPARATUS

Antony J. Wakeling, Fleet; Alan D. Thompson, Farnborough, and Roy W. Sumner, Hartley Wintney, all of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Mar. 17, 1980, Ser. No. 130,810

Claims priority, application United Kingdom, Mar. 21, 1979, 7909896

Int. Cl.<sup>3</sup> G09B 9/00

U.S. Cl. 434—3

3 Claims

1. Digital simulation apparatus for simulating a terrain-representative display of the kind produced by a movable scanning-type display device, comprising:

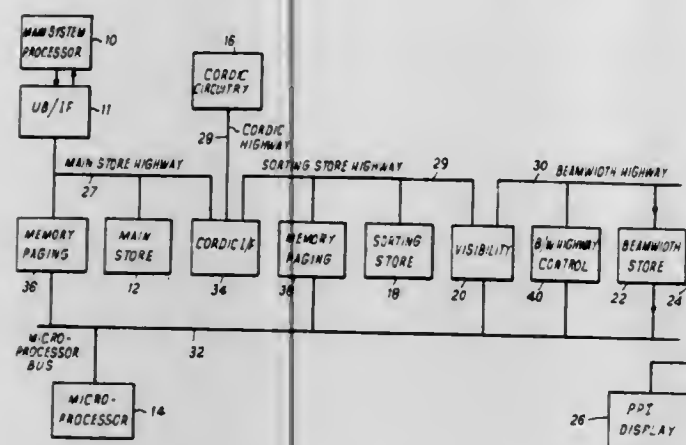
a main store for storing data representative, in a first co-ordinate form, of the terrain in a predetermined area, said data being divided into groups corresponding to respective contiguous zones of said area;

means for producing a signal representative of the current position of the scanning-type display device;

co-ordinate conversion means for converting data in the first co-ordinate form into data in a second co-ordinate form suitable for use in the scanning-type display device, said



first and second co-ordinate forms being different from each other;  
a further store for receiving the converted data; and means for generating the simulated display from the converted data in the further store;  
wherein the means for producing the position-representative signals is also arranged to produce successive signals respectively representative of successive segments of scan of the scanning-type display device;



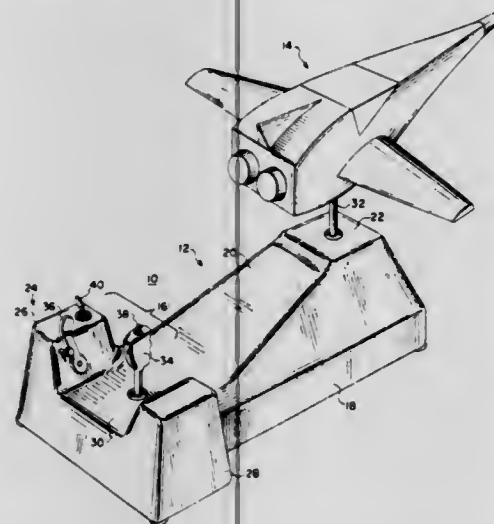
and wherein there is provided means responsive to the position-representative signals and the scan-segment-representative signals to select from the main store only groups of data corresponding to zones of said area determined by the current position and current scan segment and to apply the selected data to the co-ordinate conversion means for conversion therein.

4,421,485

**MODEL FLIGHT SIMULATOR**

Mark J. Geschwender, 1550 S. 51st St., Lincoln, Nebr. 68506  
Filed Mar. 3, 1981, Ser. No. 240,188  
Int. Cl.<sup>3</sup> G09B 9/08; A63H 27/04  
U.S. Cl. 434—32

11 Claims



1. Apparatus for movably mounting a model to simulate positions of a vehicle comprising:  
a support column adapted to have said model mounted to it;  
a control stick adapted to be manually manipulated by an operator;  
housing means having at least one rigid mounting element;  
means for mounting said control stick at a first control-stick mounting point on said control stick to a first location on said mounting element with freedom to pivot at said first control-stick mounting point in all directions and to rotate therein;  
means for mounting said support column at a first support-column mounting point on said support column to a second location on said mounting element with freedom to pivot at said first support-column mounting point in all directions and to rotate therein, whereby said first con-

trol-stick mounting point and first support-column mounting point are held at a fixed distance while permitting rotation and pivoting of said control stick and support column;

linkage means, connected to said control stick at a second control-stick mounting point on said control stick and to said support column at a second support-column mounting point on said support column, for holding said second control-stick mounting point and said second support-column mounting point at a fixed distance from each other;

said linkage means including mounting means for mounting said second control-stick mounting point and second support-column mounting points with freedom to pivot in all directions and to rotate;

said model being of a vehicle, whereby said control stick controls the attitude of said vehicle;

said linkage means including first and second elongated rigid members movable with respect to each other;

said first elongated rigid member has first and second ends; said first end being movable in first and second directions with respect to said second control-stick mounting point; said second end being movable in first and second directions with respect to said second support-column mounting point;

said second elongated rigid member has first and second ends;

said first and second elongated rigid member being movably mounted in two directions with respect to said second control-stick mounting point;

said second end of said second elongated rigid member being movably mounted in two directions with respect to said second support-column mounting point;

said mounting means for mounting said second control-stick mounting point and second support-column mounting points includes first and second arms;

said first arm being mounted to said control stick at said second control stick mounting means at an angle to the longitudinal axis of said control stick;

said second arm being mounted to said support column at said second support-column mounting point at an angle to the longitudinal axis of said support column;

one of said first and second rigid elongated members being connected at one end to said one arm; and

one of said first and second rigid elongated members being connected to said second arm, whereby rotation of said control stick within said first control-stick mounting point causes rotation of said support column within said first support-column mounting point.

4,421,486

**FIELD OF VIEW TEST APPARATUS**

Dorothy M. Baldwin, Lake Monroe; Frank J. Oharek, Maitland, and Archer M. Spooner, Orlando, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1982, Ser. No. 362,829

Int. Cl.<sup>3</sup> F41J 9/00

U.S. Cl. 434—44

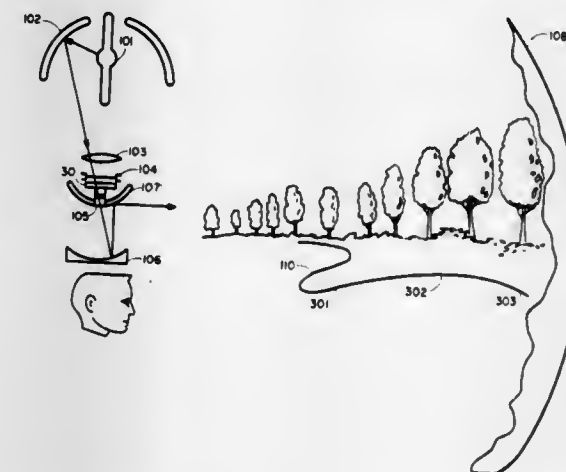
11 Claims

1. An apparatus for determining field of view requirements of visual simulator designs comprising:

means for projecting a wide angle visual image such that it may be seen by a test subject, including means for optically varying the resolution of said projected image by an independent masking means to form a high resolution area of interest bounded by an instantaneous field of view having a lesser resolution such that the operational parameters of said area of interest may be determined; means for tracking eye position of said subject while viewing said image, outputting an electrical position indicating signal; means for varying the position of said area of interest on said

projected image in accordance with said position indicating signal; and  
means for selectively delaying said position indicating signal within a range of delays operably connected between said tracking means and said position varying means such that maximum allowable operational delays may be determined.

8. A method of determining field of view requirements of a visual simulator design comprising the steps of:  
projecting a wide angle image on a screen, said projecting step including optically varying the resolution of said image by masking said image to form a pattern having an area of interest of high resolution bounded by an instantaneous field of view of lower resolution;



placing a test subject in a position to view said image;  
assigning said subject a visual task related to said simulator design;  
correlating the position of said area of interest with the line of sight of said test subject;  
evaluating said test subject's performance of said assigned task as a function of the resolution pattern formed;  
changing the variation of resolution of said image to form a new pattern;  
repeating said task and evaluation;  
repeating said pattern changing and task evaluation steps a plurality of times; and  
selecting the most suitable pattern based on said plurality of evaluations.

4,421,487

**ELECTRONIC LEARNING AID AND GAME**

Thomas C. Laughon, and Michael I. Philpott, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 55,081, Jul. 5, 1979, abandoned. This application Oct. 7, 1981, Ser. No. 309,619

Int. Cl.<sup>3</sup> G09B 7/02, 19/00

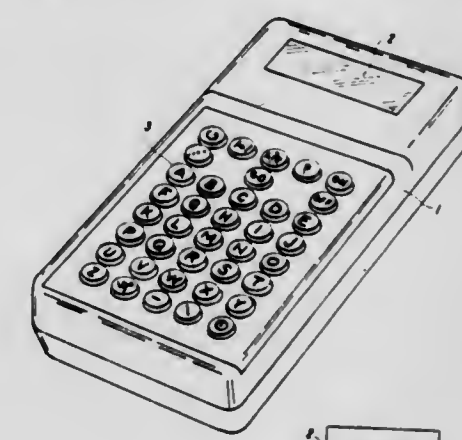
U.S. Cl. 434—169

8 Claims

1. An electronic handheld learning aid comprising:  
memory means for storing digital data representative of the letters of the alphabet, the digital data being arranged so as to be representative of the correct spellings of a plurality of words in a human language;  
random access generating means for randomly selecting digital data representative of a selected one of said plurality of words stored in said memory means;  
presentation means for providing at least an indication as to the identity of said selected one of said plurality of words;  
operator input means for receiving an input from an operator of the learning aid representative of a plurality of letters of the alphabet as an attempt to spell said selected word chosen by said random access generating means;  
said memory means being operatively coupled to said operator input means for storing digital data representative of certain letters of the alphabet arranged so as to be representative of the spelling of a word in a human language

corresponding to the input from an operator as received by said operator input means;  
means enabling alternatively said random access generating means or said memory means to store digital data representative of the spelling of a word corresponding to the input from an operator as received by said operator input means;

digital logic means including comparator means coupled to said random access generating means, said operator input means, said memory means and said presentation means for alternatively comparing the input received by said operator input means from an operator with said selected word chosen by said random access generating means or the input received by said operator input means from



another operator with the word represented by said digital data stored in said memory means corresponding to the input from a first operator as received by said operator input means and for providing a difference signal indicative of any difference therebetween; and  
said presentation means being responsive to the presence or absence of said difference signal for providing a presentation indicative of the appropriateness of the input received by said operator input means with respect to said selected word chosen by said random access generating means or the word represented by the digital data stored in said memory means depending upon which one of said random access generating means and said memory means is enabled.

4,421,488

**AID FOR CURING OR MITIGATING STAMMERING**

Paul Parleni, Perhans Vag 11A, Hovas S-4308, and Ingemar H. G. Almslätt, Skattkarr 2, S 43370 Partille, both of Sweden  
PCT No. PCT/SE81/00057, § 371 Date Nov. 6, 1981, § 102(e)  
Date Nov. 6, 1981, PCT Pub. No. WO81/02513, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 3, 1981, Ser. No. 321,170

Claims priority, application Sweden, Mar. 10, 1980, 8001848  
Int. Cl.<sup>3</sup> G09B 5/04

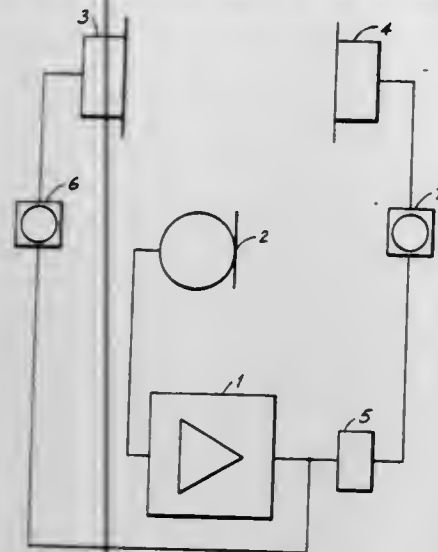
U.S. Cl. 434—185

5 Claims

1. A device for curing or mitigating stammering of a person, comprising: at least one microphone, an amplifier operatively connected to said microphone, two earphones operatively connected to said amplifier, and a delay unit in the connection between said amplifier and one of said earphones for delaying a signal from the amplifier to said one earphone in relation to the signal from the amplifier to the other earphone so that the



signal transmitted without delay to one ear of the person via said other earphone is perceived faster to the dominating cere-



bral hemisphere of the person than to the other cerebral hemisphere to thereby at least mitigate stammering.

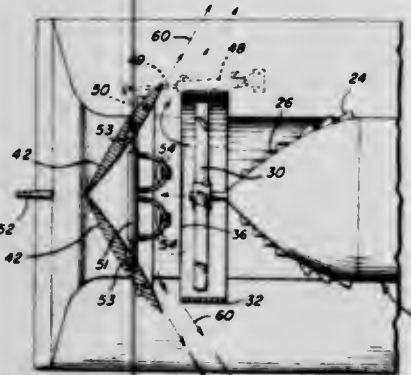
#### 4,421,489 PROPELLER DRIVEN VEHICLE WITH FORWARD AND REVERSE CONTROL AIR RUDDERS

John Van Veldhuizen, 25975 SW. 182nd Ave., Homestead, Fla. 33030

Filed Apr. 20, 1981, Ser. No. 255,810  
Int. Cl.<sup>3</sup> B63H 7/00

U.S. Cl. 440—37

9 Claims



1. In combination with a vehicle to be propelled by a rearward discharge of fluid therefrom and including fluid jet developing means for discharging a rearward jet of fluid along a predetermined path, a steering, reversing and forward aggregate thrust nullifying control means including a pair of upstanding steering vanes mounted from said vehicle for oscillation about upstanding axes spaced transversely apart and disposed on opposite sides of the center line of said path and fixed relative to said vehicle, said control means including means operative to simultaneously similarly angularly displace said vanes about said axes, said vanes extending rearward of said axes distances greater than one-half the distance between said axes, said control means including first remotely operable and reversible motor means connected between said vehicle and one vane operative, only, to selectively angularly displace said one vane about its axis of oscillation relative to said vehicle and parallelogram link means supported solely from and connected between said vanes for substantially simultaneously and equally angularly displacing the other vane about its axis of oscillation relative to said vehicle responsive to angular displacement of said one vane by said first motor means, said parallelogram link means including second remotely operable and reversible motor means operative to vary the effective length of said link means whereby to effect angular displacement, only, of said other vane relative to said vehicle and one vane.

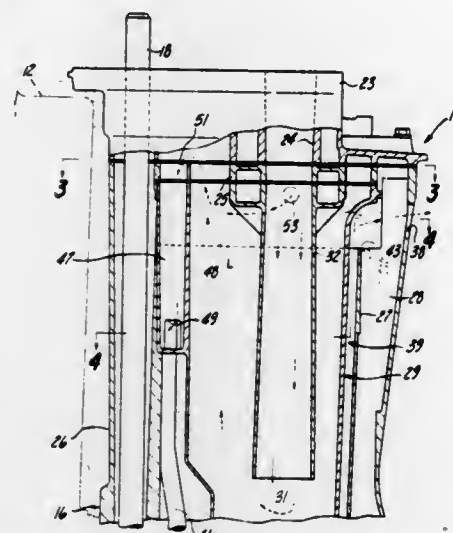
#### 4,421,490 EXHAUST SILENCER STRUCTURE FOR OUTBOARD ENGINES

Ryoji Nakahama, Iwata, Japan, assignor to Yamaha Motor Co., Ltd. and Sanshin Industries Co., Ltd., both of Japan  
Filed Feb. 4, 1982, Ser. No. 345,716

Claims priority, application Japan, Feb. 23, 1981, 56-25282  
Int. Cl.<sup>3</sup> B63H 21/26

U.S. Cl. 440—89

7 Claims



1. In an exhaust system for an outboard engine or the like having an expansion chamber, means for delivering exhaust gases from the engine to said expansion chamber, a high speed exhaust outlet extending from said expansion chamber to a point beneath the water level in which said engine is operated, and a low speed exhaust outlet communicating with the atmosphere above the water level, the improvement comprising means forming a water reservoir having an exhaust gas inlet in communication with said reservoir above normal water level therein and an exhaust discharge at a predetermined level below said normal level and providing the only communication of said exhaust gas inlet with said low speed exhaust outlet for effecting low speed discharge of exhaust gases only through the water level in the water reservoir.

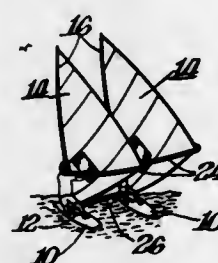
#### 4,421,491 LINKING SAILBOARDS

Charles M. Pleass, Havre de Grace, Md. 21708

Filed Jun. 22, 1981, Ser. No. 275,722  
Int. Cl.<sup>3</sup> B63B 1/20

U.S. Cl. 441—74

17 Claims



1. A sailboat assembly comprising at least two sailboards, each of said sailboards having a hull with a daggerboard extending downwardly from said hull and with a deck plug extending upwardly from said hull and with a mast plug connected by a universal joint to said deck plug and with a mast connected to said mast plug and with a sail mounted to said mast and with a boom connected to said sail whereby the user may control the position of said sail by manipulating said boom, at least one semi-rigid link connected at each end to a respective sailboard whereby each link joins two sailboards together with the sailboards being capable of being spaced from each other, swivel means connecting each end of said link

to its respective sailboard, said swivel means comprising a freely rotating collar mounted below said universal joint, and connecting means detachably connecting said collar to a respective end of said link.

#### 4,421,492 ADJUSTABLE FIN SYSTEM

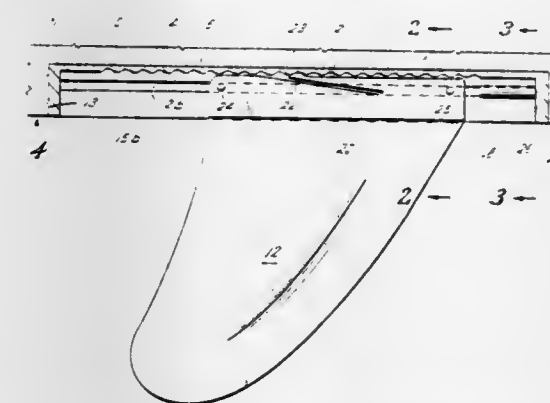
Donn W. Leva, Box 166 B-101, Galveston, Tex. 77551

Filed Jun. 16, 1981, Ser. No. 274,298

Int. Cl.<sup>3</sup> A63C 15/05

U.S. Cl. 441—79

8 Claims



1. A fin attachment for surfboard and sailboards comprising: means defining the ear undersurface as a channel along the longitudinal axis of the board wherein said channel has a ribbed inner surface; a resilient finger provided on the base of the fin for coacting with said ribbed surface to slidably position and secure the fin along the longitudinal axis of said ribbed surface of such channel; said fin provided with a slot cut at an angle to the base of the fin to form said resilient finger; and means to receive and retain said fin base in said channel which allows for longitudinal movement of the fin in the channel.

#### 4,421,493 METHOD OF MAKING PHOTOFLASH LAMP

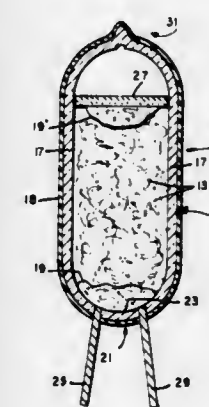
Andre C. Bouchard, Peabody, and Robert F. Craig, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 1, 1982, Ser. No. 353,302

Int. Cl.<sup>3</sup> F21K 5/02

U.S. Cl. 445—28

7 Claims



1. A method of making a photoflash lamp, said method comprising: providing an elongated, light-transmitting tubular member having opposing open ends; sealing a first open end of said tubular member, said sealed first end including a pair of lead-in wires secured therein each having an end portion having access to the interior of said tubular member; positioning a first quantity of primer material within said

tubular member through an opposing, second open end thereof, said first quantity of primer material electrically connected to said end portions of said lead-in wires; positioning a predetermined quantity of combustible, light-producing material within said tubular member through said opposing, second open end thereof; positioning a thin member within said tubular member through said opposing, second open end thereof, said thin member having located thereon a second quantity of primer material, said thin member being positioned within said tubular member such that said second quantity of primer material is positioned immediately adjacent said combustible material; and sealing said second end of said tubular member to define and envelope.

#### 4,421,494 TRIPOD TYPE CONSTANT VELOCITY UNIVERSAL JOINT

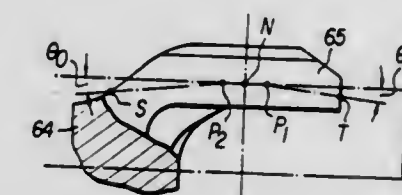
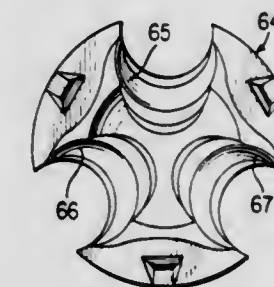
Yoshisumi Futamura, Toyota; Shigeki Komeiji, Okazaki; Shuhei Noro, Aichi; Junzo Hasegawa, Obu; Fumio Matsunari, Nagoya, and Toshiaki Ikeda, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Toyota Chuo Kenkyusho Kabushiki Kaisha, both of Aichi, Japan

Continuation-in-part of Ser. No. 73,872, Sep. 10, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,464  
Claims priority, application Japan, Sep. 14, 1978, 53-113122; European Pat. Off., Sep. 14, 1979, 79103455.6

Int. Cl.<sup>3</sup> F16D 3/30

U.S. Cl. 464—111

14 Claims



1. A tripod type constant velocity universal joint comprising: a driving part having an axis of rotation; a driven part having an axis of rotation; a spider member, integral with one of said parts, having a concentrated portion and three roller supporting rods extended radially from said concentrated portion thereof with an angle of 120 degrees formed therebetween; three roller elements respectively rotatably supported on said roller supporting rods and slidable along said roller supporting rods in the axial directions of said rods; and a pot member, integral with the other of said parts, defining three pairs of longitudinal roller raceways and respectively receiving said three roller elements between said pairs of roller raceways, each pair of roller raceways having a top end side and a base side with a central portion therebetween along a longitudinal axis thereof, said longitudinal axis of said each pair of roller raceways having an internal surface approaching, along straight lines, a rotational axis of said pot member on both of said top end side and said base side, and the distances R be-



tween the longitudinal axis of said each pair of roller raceways and the rotational axis of said pot member on said both sides being shorter than the distance  $R_0$  therebetween at said central portion thereof, and said longitudinal axis of said each pair of roller raceways being symmetrically configured with respect to a central point in said central portion of each said pair of roller raceways in their longitudinal direction, said central point being a symmetry point, whereby an approach quantity  $\delta$  of the longitudinal axis of said roller raceways, defined by the difference between said distances  $R_0$  and  $R$  at both ends thereof, with respect to the rotational axis of said pot member, and the variation of the approach quantity in response to the position of said roller elements moving in the longitudinal axis of said roller raceways, are decreased by said straight lines, thereby decreasing the quantity of nonconstant rotational velocity thereof and decreasing the length thereof in their longitudinal direction to reduce the size and weight thereof.

4,421,495

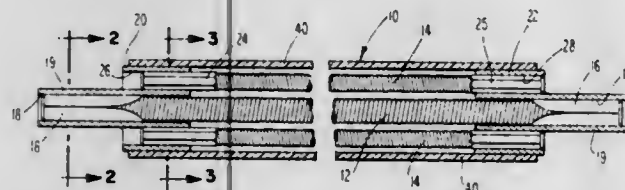
# BALANCED COMPOSITE FLEXIBLE SHAFT ASSEMBLY CAPABLE OF OPERATING IN A TIGHT RADIUS

Walter Kulischenko, East Brunswick, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 22, 1982, Ser. No. 360,544  
Int. Cl.<sup>3</sup> F16D 3/66

U.S. Cl. 464—51

15 Claims



1. An assembly of flexible shafts including a central flexible shaft and outer flexible shafts rotating in a tight radius of curvature while transmitting high torques comprising:  
a pair of end fittings each of which receives one end of each of said flexible shafts, each of said end fittings having an axial bore therethrough and a plurality of outer bores disposed symmetrically around said axial bore, said central flexible shaft having each end thereof affixed within one of said axial bores, said outer flexible shafts having their ends received within said outer bores to provide substantially symmetrical disposition of said outer flexible shafts about said central flexible shaft along entire length thereof, and means for rotating said assembly in said tight radius wherein said outer flexible shafts free float in at least one of said end fittings while rotating to thereby maintain said substantially symmetrical disposition of said shafts.

4,421,496

# DRIVE COUPLING

Reginald S. Emerson, 34 Highlands Rd., and Norman Morris, 21 Poplars Rd., both of Buckingham, Buckinghamshire, England  
Continuation of Ser. No. 162,663, Jun. 24, 1980, abandoned.

This application Jul. 16, 1982, Ser. No. 399,191  
Claims priority, application United Kingdom, Jun. 29, 1979, 7922650

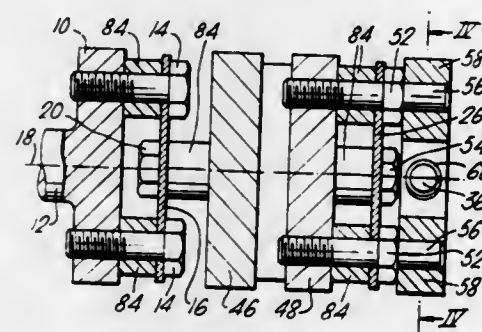
U.S. Cl. 464—95

Int. Cl.<sup>3</sup> F16D 3/50

4 Claims

1. A drive coupling for connecting a drive shaft to a driven shaft, said coupling being constructed to lie in an axial gap between the two shafts and comprising:  
(a) a first flexible disc connected by a first pair of connecting bolts to means on one of said shafts;  
(b) a first solid member spaced from said first flexible disc and connected thereby to a second pair of connecting

bolts, said second pair of connecting bolts being at different angular positions to said first flexible disc with respect to said first pair of connecting bolts, and said first solid member having a transversely-extending groove therein;  
(c) a second flexible disc spaced from said first solid member and connected thereto by a third pair of connecting bolts, said third pair of connecting bolts being at the same angular positions as said second pair of connecting bolts, and said second flexible disc being disposed on that side of said first solid member remote from said first flexible disc;  
(d) a second solid member spaced from said second flexible disc and connected thereto by a fourth pair of connecting



bolts, said fourth pair of connecting bolts being at the same angular positions as said first pair of connecting bolts, and said second solid member being shaped as a bar which is received within said transversely-extending groove of said first solid member to permit sufficient relative movement between said first and second solid members to allow said flexible discs to flex; and  
(e) a pair of jaws connected to said fourth pair of connecting bolts on that side of said second flexible disc remote from said second solid member, said pair of jaws being adapted to clamp onto dogs associated with the other one of said two shafts.

4,421,497

# FIBER-REINFORCED DRIVE SHAFT

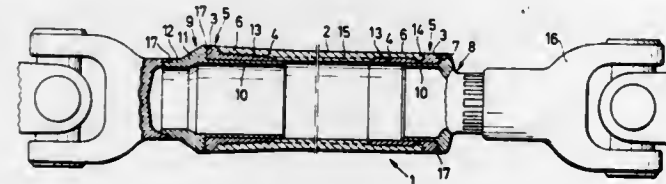
Helmut Federmann, Bergisch Gladbach, and Joachim Bausch, Duerscheid, both of Fed. Rep. of Germany, assignors to Felten & Guillaume Energietechnik GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 203,669  
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946530

Int. Cl.<sup>3</sup> F16C 3/00, 3/16

U.S. Cl. 464—181

10 Claims



1. Drive shaft, particularly for motor vehicles, comprising a tubular shaft composed of fiber-reinforced synthetic plastic resin and including a plurality of wound layers of resin-impregnated fibers, with the windings of the inner and outer layers being helical and having a low pitch, but for intermediate layers with a pitch angle of about 30°-60° and with the windings of successive layers crossing one another; a metallic end pieces at each axial end of said tubular shaft and having a smaller-diameter inner anchoring portion received in the respective axial end and bonded thereto, and a larger-diameter outer ring portion of one piece with the anchoring portion, said ring portion having an axial end face facing toward and bonded to the adjacent end faces of said tubular shaft so as to protect the same against ambient influences.

4,421,498

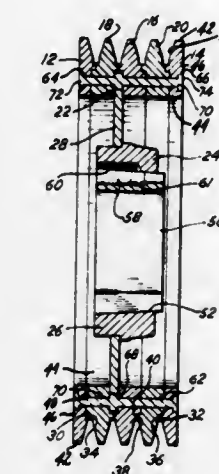
# MODULAR SHEAVE

Robert P. DeLeu, Mishawaka, and Robert G. Thompson, Osceola, both of Ind., assignors to Reliance Electric Company, Mishawaka, Ind.

Filed May 13, 1981, Ser. No. 263,301  
Int. Cl.<sup>3</sup> F16H 55/36

U.S. Cl. 474—182

14 Claims



1. A modular V-belt sheave comprising two end modules of similar shape and construction, each module having a plurality of holes for alignment with corresponding holes in the other end module and having at least one angular peripheral surface for engagement with a belt, at least one intermediate module having a plurality of holes for alignment with the holes in said end modules and having two angular annular peripheral surfaces for engagement with belts on opposite sides thereof, a hub having a cylindrical body with an outer surface defined by an outer diameter and a radial means joined to said outer surface of said body and extending outwardly therefrom for connection with at least one of said modules, said end modules being defined by an outer wall, an inner wall and a pair of side walls, said inner wall having a diameter sufficiently larger than the outer diameter of said body of said hub wherein the inner wall is radially spaced outwardly of said outer surface of said body and tying means having members extending through the holes in said modules for securing said modules together in axial alignment with one another and in supported relationship with said radial means of said hub.

4,421,499

# TUBE FORMING SHOE AND METHOD OF FORMING A FLEXIBLE WEB INTO A SHOE

Peter Kuipers, Taylors, S.C., assignor to Nordson Corporation, Amherst, Ohio

Continuation of Ser. No. 85,044, Oct. 15, 1979, Pat. No. 4,295,322. This application Jul. 20, 1981, Ser. No. 285,435  
The portion of the term of this patent subsequent to Oct. 20, 1996, has been disclaimed.

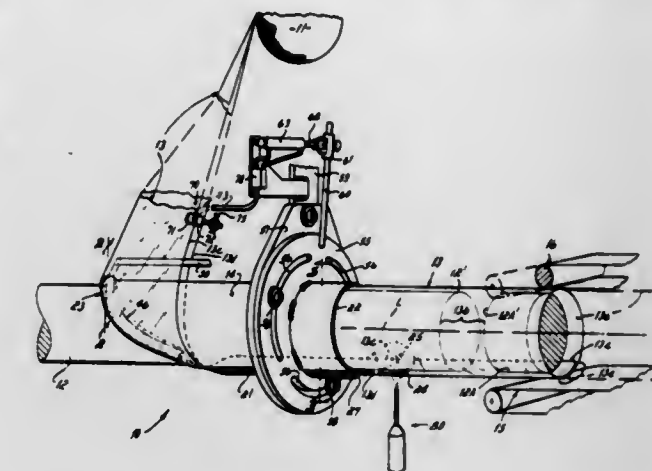
Int. Cl.<sup>3</sup> B31B 1/38

U.S. Cl. 493—23

8 Claims

1. A method of forming a flat flexible film web into a tube-shaped film having a longitudinal seam, said method including the steps of:  
introducing said web to one end of a rotatable tube forming shoe at an angle with respect to a longitudinal rotational axis of said shoe,  
bending said film around a curved brake edge of said shoe, drawing said film across said brake edge of said shoe and guiding said film into a tubular shape while pulling said film through said shoe,  
blowing fluid from said edge against said film to hold said film away from said brake edge as said film is bent around said brake edge and pulled through said shoe, and

including the further step of sensing changes of position of an edge of said film prior to said bending and rotating said



shoe in response to the change of position of said edge to adjust film position in said shoe.

4,421,500

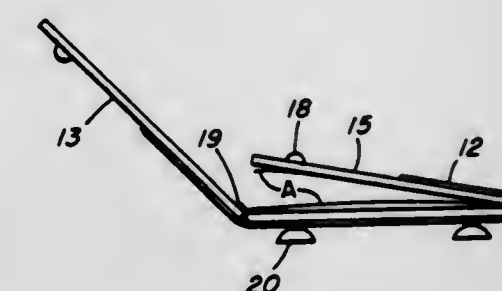
# MANUALLY OPERABLE FOLDING GUIDE

Samuel C. Smith, 210 Hartman Rd., Newton Centre, Mass. 02159

Filed Jul. 6, 1982, Ser. No. 395,280  
Int. Cl.<sup>3</sup> B65H 45/00

U.S. Cl. 493—405

9 Claims



1. A folder assembly for an elongated work-piece comprising a relatively flat and rigid panel provided with at least one straight edge and at least one self-retractable flap provided with a matching straight edge located along the straight edge of the panel and elastic means hinged connecting the flap to the panel across the matching straight edges, including an elastic sheet material secured to a back surface of the flap and panel wherein the work-piece is folded along the matching straight edges and the elastic sheet provides both a hinge and a spring action.

4,421,501

# WEB FOLDING APPARATUS

Bruce A. Scheffer, 3919 W. 90th Ct., Merrillville, Ind. 46410  
Filed Jan. 18, 1982, Ser. No. 340,421

Int. Cl.<sup>3</sup> B65H 45/22

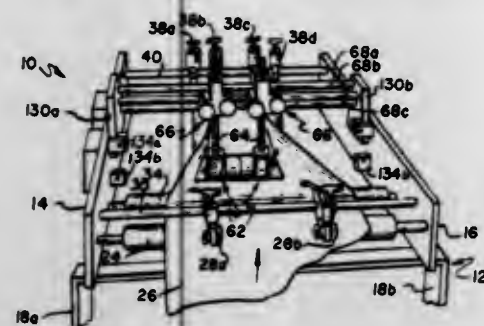
U.S. Cl. 493—439

33 Claims

1. In apparatus for folding web material which includes a frame, an entrance roller supported by said frame transversely thereof, an exit roller supported by said frame in parallel spaced relation from said entrance roller, and a plow folder supported intermediate said entrance and exit rollers and cooperative therewith to effect longitudinal folding of web material moved longitudinally from said entrance roller to said exit roller, the improvement wherein said plow folder includes a fold forming member having its longitudinal axis oriented substantially normal to the direction of web movement and having a cylindrical outer peripheral surface portion, said forming member having an end thereof formed by an axially



outwardly facing generally planar fold surface lying in a plane subtending an acute angle with a plane transverse and normal to the longitudinal axis of said fold forming member, said fold forming member being cooperative with the web material so as to effect folding thereof at the area of intersection of said



cylindrical surface portion with said fold surface as said web material is passed from said entrance to said exit rollers, said fold surface being operative to limit the extent of folding of said web material at said fold forming member during longitudinal movement of said web material.

4,421,502

**WORM CENTRIFUGE**

Willy Jacobs, Cologne, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

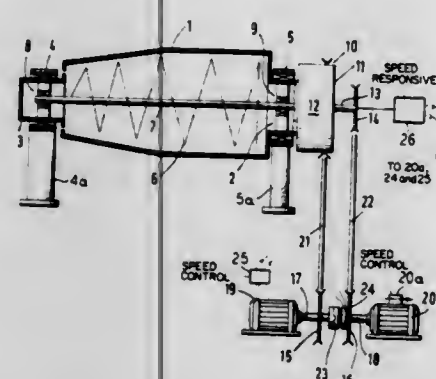
Filed Jan. 28, 1982, Ser. No. 343,403

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1981, 3103029

Int. Cl.<sup>3</sup> B04F 9/02

U.S. Cl. 494—7

10 Claims



1. A worm-type centrifuge comprising in combination:
  - a rotatably mounted drum for containing material to be centrifuged;
  - a conveying screw rotatably mounted within the drum for coaxing with the drum in processing of said material;
  - first and second drives respectively connected to drive the drum and the screw in rotation;
  - first and second power means respectively connected to drive said first and second drives;
  - and releasable clutch means located between the power means for interconnecting the power means and drives to drive the screw and drum in unison at start-up and for being disconnected for independent driving of the drum and screw during normal operation.

4,421,503

**FLUID PROCESSING CENTRIFUGE AND APPARATUS THEREOF**

Allen Latham, Jr., Jamaica Plain, and Donald W. Schoendorfer, Brookline, both of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Filed Jul. 9, 1981, Ser. No. 281,655

Int. Cl.<sup>3</sup> B04B 5/00

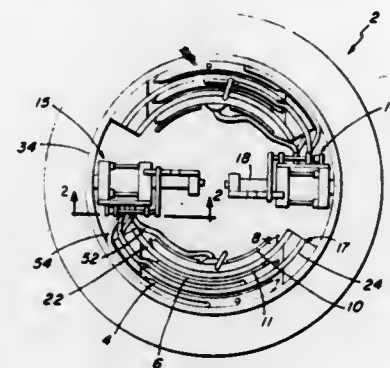
U.S. Cl. 494—17

39 Claims

1. Apparatus for processing fluids in a centrifugal force field

to separate constituent components of such fluids comprising in combination:

- (a) a centrifuge having a rotor adapted to rotate at a sufficient speed to cause said components to separate;
- (b) a flexible bag adapted to contain a first fluid;
- (c) a receiver container adapted to receive at least one component of said first fluid;



- (d) mass means disposed nearer the center of rotation of the rotor than the flexible bag and adapted to move and contact a surface of said bag, said mass being sufficient to at least initiate a flow from said bag to said container of component fluid separated in said bag.

4,421,504

**LUBRICATING OBJECT INJECTOR UTILIZING A SINGLE PLUNGER**

Larry H. Kline, 18 Broad St., Suite 805, Charleston, S.C. 29401

Continuation-in-part of Ser. No. 300,028, Sep. 8, 1981, Pat. No. 4,341,211. This application Jul. 21, 1982, Ser. No. 400,468

Int. Cl.<sup>3</sup> A61F 13/20

U.S. Cl. 604—12

41 Claims



1. A device for placing an object into a body cavity comprising:

- a. an applicator body comprising an elongated body within which said object is placed, said elongated body having a plurality of fixed first openings, with continuous outer perimeters which are open to said applicator body and to the exterior of said elongated body, and through which said exterior of said elongated body may be lubricated by a lubricating material placed within said applicator body in said elongated body;
- b. lubricating means moveably secured within said applicator body; and
- c. movement means, moveably secured within said applicator body, sized and shaped to fit within said applicator body, wherein said movement means may move said object out of said applicator body when said device is utilized, said movement means and said lubricating means comprising a single plunger,

whereby when said device is placed within said body cavity, said object may be moved into said body cavity.

4,421,505

**WOUND IRRIGATION SYSTEM**

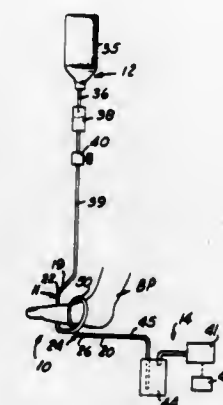
Nathan H. Schwartz, 2205 Haverhill Ct., Marietta, Ga. 30067

Continuation-in-part of Ser. No. 345,003, Feb. 2, 1982. This application May 20, 1982, Ser. No. 380,108

Int. Cl.<sup>3</sup> A61M 1/00

U.S. Cl. 604—28

9 Claims



1. A method of irrigating a wound in a body part with a treatment fluid comprising the steps of:
  - placing a plurality of pieces of tubing in the body part, each of said pieces of tubing having a perforated section therein so that all of the perforated sections are located in the vicinity of the wound in the body part to be irrigated with the perforated section of each piece of tubing being shifted axially with respect to the perforated sections in the other pieces of tubing and with opposite ends of each piece of tubing projecting out of the body part;
  - connecting one end of each of the pieces of tubing to a source of treatment fluid so that the pieces of tubing are connected to the source of treatment fluid in parallel with each other and so that the treatment fluid passes through the pieces of tubing into the body part and is discharged into the wound through the perforated sections; and
  - connecting the opposite ends of the pieces of tubing to a vacuum source so that the pieces of tubing are connected to the vacuum source in parallel with each other and so that the vacuum is imposed through the pieces of tubing on the treatment fluid passing into the body part through the pieces of tubing and through the perforated sections on fluids in the body part surrounding the perforated sections in the pieces of tubing.

4,421,506

**FLOW-REGULATING ENTERIC FEEDING PUMP**

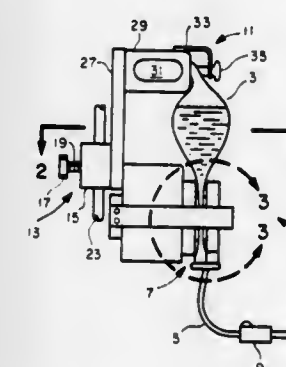
Hal C. Danby, Palo Alto, and Carl Ritson, San Jose, both of Calif., assignors to Anatron Corporation, San Jose, Calif.

Filed Jan. 8, 1982, Ser. No. 338,012

Int. Cl.<sup>3</sup> A61M 5/00; F04B 43/08

U.S. Cl. 604—34

23 Claims



1. A flow-regulating pump for controlling the flow rate of fluid along a serial fluid flow path extending through said pump from a reservoir located above said pump at the upstream end of said flow path, especially for use in an apparatus for administering a fluid internally to the human body for the

purpose of enteric feeding, said fluid flow path being bounded over a certain region therealong by generally thin flexible walls, said flow-regulating pump comprising:

- pump frame means to engage and support said reservoir above said region bounded by flexible walls;
- first occlusion means to compress said flexible walls together to occlude said flow path within a first region extending transversely thereacross, said occlusion means being selectively operable between a closed position in which said first region is fully occluded and an open position in which said first region is at least partially unoccluded;
- second occlusion means to compress said flexible walls together to occlude said flow path within a second region extending transversely thereacross, said second region being adjacent to said first region but spaced therefrom in a direction toward said reservoir to define between said first and second regions an unoccluded pumping region, said second occlusion means being selectively operable between a closed position in which said second region is fully occluded and an open position in which said second region is at least partially unoccluded; and,
- pump actuating means to sequentially operate said first and second occlusion means in the following cycle: occlude first region, open second region, occlude second region, open first region, said pump actuating means including pumping means to compress said pumping region to express any fluid contained therein, and;
- means to produce a first higher pressure within said second region when closed, and means to produce a second lower pressure within said first region following the closure of said second region and prior to the opening of said first region, wherein said pumping means compresses said pumping region sufficiently to overcome said second lower pressure and open said first region.

4,421,507

**PLUG-TYPE FLUID ACCESS DEVICES**

Jack C. Bokros, Austin, Tex., assignor to Carbomedics, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 220,101, Dec. 24, 1980, abandoned. This application Nov. 23, 1981, Ser. No. 324,040

Int. Cl.<sup>3</sup> A61M 5/00

U.S. Cl. 604—52

20 Claims



1. In combination a device to provide access to a fluid-containing internal region of a living body, a plug and an adaptor; said device comprising an access tube providing a first passageway for communication with the internal region and means to anchor said tube in the living body, said access tube having an outer end which is proportioned to extend above the skin when said device is anchored in the living body;
- said plug being proportioned to be received in said access tube and including an inner sealing member which blocks said first passageway and an outer portion which provide a surrounding vacant region within said first passageway, whereby surfaces of said access tube outward of said sealing member can be washed by injecting a cleaning solution into said vacant region when said plug is blocking said first passageway;
- said adaptor comprising a tubular section providing a second passageway for alignment with said first passageway and a chamber portion for receiving said plug when it is withdrawn from said access tube, connecting means for joining one end of said adaptor to said outer end of said access



tube, and side passageway means in communication with said second passageway and located between said one end of said adaptor and said chamber portion through which fluid can flow when said plug is withdrawn from said first passageway and located in said chamber portion.

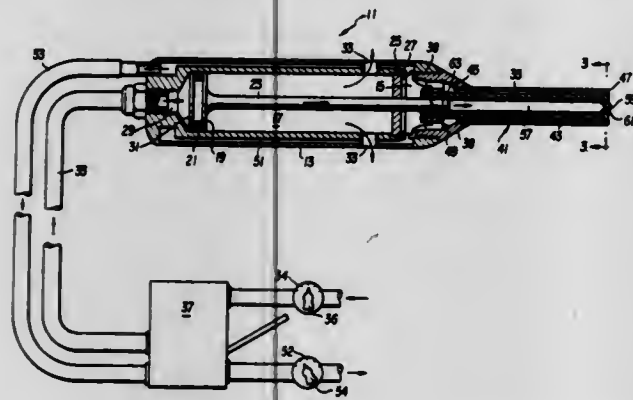
4,421,508

## VACUUM-COMPRESSION INJECTOR

Edgar C. Cohen, 4123 Vincennes Pl., New Orleans, La. 70125  
Continuation-in-part of Ser. No. 237,563, Feb. 24, 1981. This application Jul. 8, 1981, Ser. No. 281,436  
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.  
Int. Cl.<sup>3</sup> A61M 5/30

U.S. Cl. 604—70

12 Claims



1. A needleless vacuum-compression injector comprising: a continuous vacuum chamber and a pressurized gas chamber;
- means for drawing a continuous vacuum in said vacuum chamber;
- means for supplying pressurized gas to said pressurized gas chamber;
- means for holding a medicament;
- a nozzle having a passageway connected to said means for holding said medicament and for having said medicament expressed therethrough;
- tissue immobilizing means including an outwardly extending surface spaced from and surrounding said nozzle wherein said nozzle substantially terminates in the plane of said surface;
- said tissue immobilizing means further including an annular suction means formed in an annular region of said outwardly extending surface and spaced from and surrounding said nozzle, said annular suction means being in continuous communication with said vacuum chamber, said tissue immobilizing means, when positioned against said tissue, being operative to continuously draw said tissue toward said annular region and thereby immobilize and hold said tissue taut over said nozzle without puncturing said tissue and without substantially displacing said tissue from its initial condition;
- means adapted to express said medicament through said passageway and into said tissue upon application of said pressurized gas to said pressurized gas chamber; and, wherein said outwardly extending surface is non-circular shaped.

4,421,509

## LEG BAG FOR URINARY INCONTINENCE

Barry L. Schneider, Deerfield, and David V. Beddow, Lake Villa, both of Ill., assignors to Hollister Incorporated, Libertyville, Ill.

Filed Jun. 15, 1981, Ser. No. 273,363

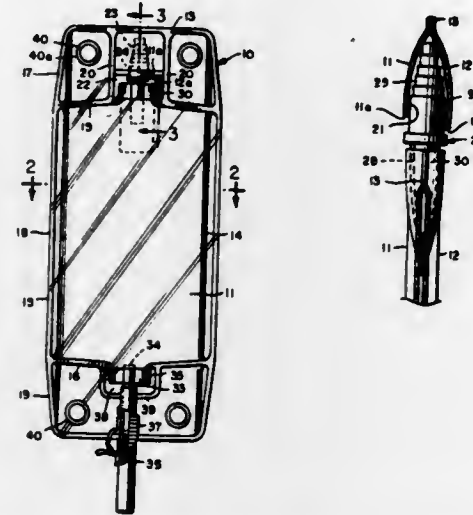
Int. Cl.<sup>3</sup> A61M 1/00

U.S. Cl. 604—317

22 Claims

1. A generally flat, elongated, expandable bag formed of flexible thermoplastic material and adapted to be secured to a patient's leg for the collection of urine with the longitudinal

axis of said elongated bag normally disposed vertically; said bag having inner and outer walls that are peripherally joined together and are generally parallel when the bag is empty; said bag also having upper, central, and lower sections; said inner and outer walls being provided with aligned openings together defining an aperture extending through said upper section immediately above said central section and being sealed together along a transverse seal line across said bag and defining the lower limits of said aperture; an inlet tube secured to said



bag along said transverse seal line and communicating with the interior of said central section below said aperture; said inlet tube including an elongated inlet nozzle projecting upwardly into and beyond said aperture and overlying the outer wall of said upper section; said inlet nozzle being adapted for connection to a urinary drainage tube; and a pair of laterally-spaced fasteners provided by each of said upper and lower sections; said pair of fasteners of said upper section being located above said transverse seal line.

4,421,510

## URINE DRAINAGE DEVICE PERMITTING TRAINING OF THE BLADDER

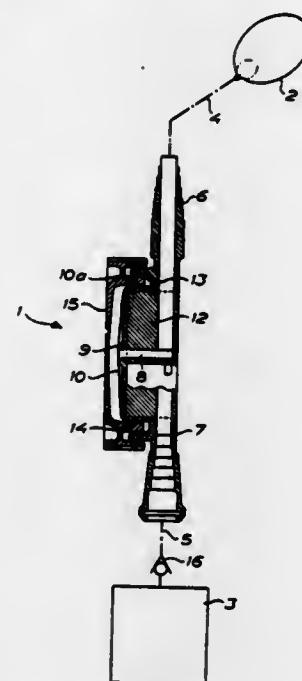
Stig G. Ahlbeck, Västanväg 28, S-213 16 Malmö, Sweden  
PCT No. PCT/SE80/00013, § 371 Date Sep. 18, 1980, § 102(e)  
Date Sep. 18, 1980, PCT Pub. No. WO80/01454, PCT Pub. Date Jul. 24, 1980

PCT Filed Jan. 17, 1980, Ser. No. 204,371

Int. Cl.<sup>3</sup> A61M 1/00

U.S. Cl. 604—323

11 Claims



1. For use in a urine drainage device which includes a catheter

ter insertable into a bladder and a collection bag in fluid communication with the catheter, a valve for bladder control adapted to be interposed to the fluid communication path between the catheter and the collection bag, said valve comprising:

- (i) a housing having an inlet adapted to communicate with the bladder and an outlet adapted to communicate with the collection bag;
- (ii) a closure element mounted to said housing; and
- (iii) means for pulling said closure element taut over said inlet to resiliently seal said inlet, said closure element being movable between a first position in which said inlet is closed by said closure element and a second position in which said inlet and said outlet are in fluid communication, wherein said closure element has a first fluid contacting surface area responsive to fluid pressure in the bladder when in said first position and a second fluid contacting surface area responsive to fluid pressure in the bladder when in said second position, said second fluid contacting surface area being substantially greater than said first fluid contacting surface area, such that the bladder fluid pressure required to maintain said closure element in said second position is substantially less than the bladder fluid pressure required to move said closure element from said first position to said second position.

4,421,511

## FEMALE INCONTINENCE DEVICE

Peter L. Steer, and John V. Edwards, both of East Grinstead, England, assignors to Craig Medical Products Limited, Sussex, England

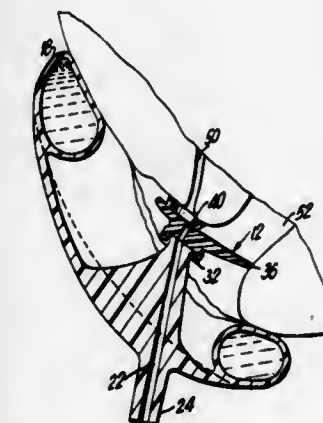
Filed Feb. 25, 1981, Ser. No. 238,189

Claims priority, application United Kingdom, Mar. 6, 1980, 8007738; Oct. 15, 1980, 8033222

Int. Cl.<sup>3</sup> A61F 5/44

U.S. Cl. 604—329

4 Claims



1. A female incontinence device comprising an external resilient pad having a peripheral portion in the form of a hollow tube, said tube filled with a liquid silicone fluid, the tube being designed to make sealing engagement with that portion of the user's anatomy which is external to the labia majora, a mount forming part of the pad, and a funnel carried by the mount and shaped and dimensioned so that a rim thereof can

engage that portion of the user's anatomy which immediately surrounds the meatus of the urethra.

4,421,512

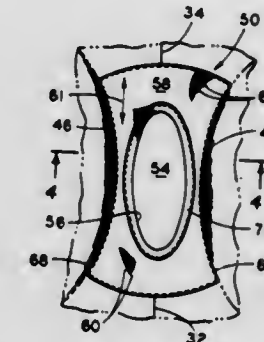
## PANTYHOSE WITH SANITARY NAPKIN HOLDER

Elissa D. Papajohn, 65 Montague St., Brooklyn, N.Y. 11201  
Filed Nov. 23, 1981, Ser. No. 323,915

Int. Cl.<sup>3</sup> A61F 13/16

U.S. Cl. 604—396

1 Claim



1. In combination, a pantyhose comprised of a panty having a front, rear and opposite sides cooperating to define a lower torso garment having a waist opening and edges bounding right and left leg openings and of left and right leg-receiving stockings respectively attached as extensions from said right and left leg openings, elastomeric yarns secured along said waist and leg openings to urge edges bounding the latter into gripping contact with the user's legs to contribute to an optimum sealed confinement for a sanitary napkin during wearing service of such pantyhose, and a sanitary napkin compartment formed of plies of fluid-tight material disposed in facing, superposed relation to each other in the crotch area of said pantyhose, the upper ply of said compartment being oriented to extend between the front and rear of said portion of said pantyhose and in substantial spanning relation between said elastomeric yarns bounding said leg openings, said compartment upper ply being further adapted to receive thereunder as a sanitary napkin a fluid absorbent material that is exposed to the interior of said panty portion of said pantyhose and having an oblong edge bounding an opening therein extending for a substantial portion of the length of said compartment and for a width of said compartment sufficient to receive fluids discharged from the body of the user without side leakage from said compartment, said compartment upper ply being constructed of elastomeric yarns oriented substantially parallel to the elastomeric yarns of said leg openings and having a non-stretchable strip secured about said oblong edge thereof so as to retain the sides of said compartment upper ply about the absorbent material in said compartment without adverse effect on said seal of said elastized leg openings, said panty portion of said pantyhose supporting said compartment in position on the user such that the opening is restrained from movement relative to the body so that the compartment opening will remain in position to enable the absorbent material to receive the discharged body fluids.



# CHEMICAL

## 4,421,513 PROCESS FOR PRODUCING FIBRILLATED POLYESTER

Su Tien-Kuei, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.  
Division of Ser. No. 1,993, Jan. 8, 1979, Pat. No. 4,331,724, which is a continuation-in-part of Ser. No. 907,920, May 22, 1978, abandoned. This application Oct. 2, 1981, Ser. No. 307,993  
Int. Cl.<sup>3</sup> D06M 5/12

U.S. Cl. 8—130.1

6 Claims

1. A process for producing a fibrillated polyester textile formed of a plurality of polyester filaments in which said filaments have a curvature to provide a convex side portion and a concave side portion and the fibrillation occurs at the convex side portion of said filament extending away from the body portion of said textile material comprising the steps of:

swelling a polyester filament by immersion of a polyester textile material containing said filament in a liquid polyester swelling agent; and,  
ultrasonically agitating said liquid polyester swelling agent while said polyester textile material is immersed therein, for an effective amount of time and at an effective power to fibrillate said polyester filament.

## 4,421,514 ANTISTATIC LAUNDRY TREATMENT

Robert A. Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.  
Filed Aug. 3, 1982, Ser. No. 404,721  
Int. Cl.<sup>3</sup> D06M 13/20; B08B 3/04, 3/08

U.S. Cl. 8—137

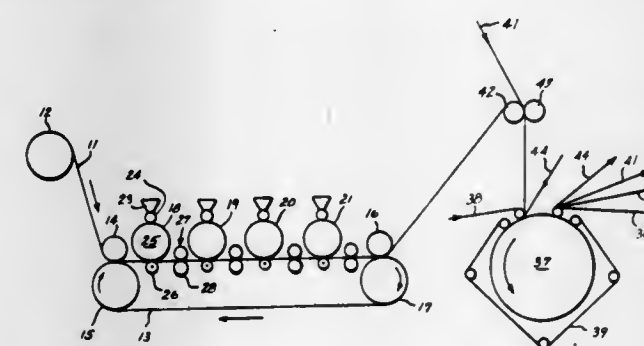
7 Claims

1. A method of imparting antistatic properties to fabrics during laundering, which comprises separately adding an antistatic amount of isostearic acid to the wash water containing a nonionic detergent at a maximum pH of about 8.

4,421,515  
PRINTING PROCESS  
Emery J. Gorondy, Chadds Ford, Pa., assignor to E.I. Du Pont de Nemours & Co., Wilmington, Del.  
Filed Jun. 28, 1982, Ser. No. 392,787  
The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.  
Int. Cl.<sup>3</sup> D06P 5/20

U.S. Cl. 8—444

7 Claims



1. A process for dyeing a disperse dyeable textile material comprising the steps of:  
forming a latent magnetic image in a magnetic imaging member comprising a ferromagnetic material imposed on an electrically conductive support;  
developing the latent magnetic image by applying thereto a ferromagnetic toner comprising a ferromagnetic component, a dye component containing a dye that is substantially sublimable from 160° C. to 215° C., and a resin which is substantially encapsulates the ferromagnetic component and the dye component;  
transferring the developed image from the magnetic imaging member to a first surface of a thermally stable, sublimable-dye-permeable first polymeric film;

covering the image with a layer of a material, bringing said polymeric film into contact on a second surface thereof with the disperse dyeable textile material to be dyed, such that the developed image on the first surface of the polymeric film is on the opposite side of the polymeric film from the second surface in contact with the disperse dyeable textile material;  
heating the disperse dyeable textile material and the polymeric film to cause substantial sublimation of the dye of said dye component, thereby transferring said dye image from the first surface of the polymeric film through the polymeric film to form a dye image on the disperse dyeable textile material.

4,421,516  
PROCESS FOR PREPARING DISCHARGE RESIST  
PRINTS ON HYDROPHOBIC TEXTILE MATERIALS  
Theo Stahl, Frankfurt am Main, and Ulrich Bühler, Schöneck, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany  
Filed Mar. 10, 1983, Ser. No. 473,783  
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 3209327

Int. Cl.<sup>3</sup> D06P 5/15

U.S. Cl. 8—464

16 Claims

1. In the process for preparing discharge prints on textile materials containing hydrophobic fibers wherein at least one disperse dyestuff dischargeable to white is applied to the textile material in the form of a dyeing liquor or print paste and is also contacted by a pattern-applied discharge resist print paste, and then the material is heat treated at 100° to 230° C., the improvement comprises said discharge resist print paste having under the heat treatment conditions a pH value of zero to 3.

4,421,517  
PRINTING PROCESS  
Emery J. Gorondy, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.  
Filed Jun. 28, 1982, Ser. No. 392,783  
The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.  
Int. Cl.<sup>3</sup> D06P 5/20

U.S. Cl. 8—471

9 Claims



1. A process for printing a disperse dyeable textile material with a dye comprising the steps of:  
forming a latent magnetic image in a magnetic imaging member comprising a ferromagnetic material on an electrically conductive support;  
developing the latent magnetic image by applying a ferromagnetic toner comprising a ferromagnetic component, a dye component which is substantially sublimable at from 160° C. to 215° C., and a resin which substantially encapsulates the ferromagnetic component and the dye component;  
transferring the developed image to a substrate comprising a continuous belt formed of thermally stable, dielectric, non-dye-receptive material;  
transferring the developed image to a first film of a thermally stable resin which is permeable to said dye component by the application of heat and pressure;  
applying a second polymeric film or paper web to the side of the first film bearing the image to form a laminate;  
then bringing the laminate bearing the image into contact with a disperse dyeable textile material to be dyed while



the laminate and the disperse dyeable textile material are rotated upon a heated drum, with the disperse dyeable textile material facing the side of the first film which does not bear the image, to thereby transfer said dye component from the first film to the disperse dyeable textile material; and separating the disperse dyeable textile material from the laminate.

4,421,518

## PRINTING PROCESS

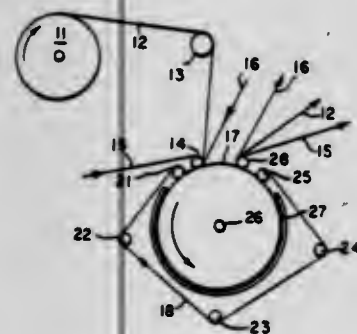
Emery J. Gorondy, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 28, 1982, Ser. No. 392,785

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> D06P 5/20

U.S. Cl. 8-471



1. A process for printing a disperse dyeable textile material with a dye comprising the steps of:  
forming an image comprising a dye component which is substantially sublimable at from 160° C. to 215° C. on a film of a thermally stable resin which is permeable to said dye component by the application of heat and pressure; covering the side of the film bearing the image with a web of paper or a resinous material to form a laminate, then bringing the laminate into contact with a disperse dyeable textile material to be dyed while the laminate and disperse dyeable textile material are rotated upon a heated drum, with the disperse dyeable textile material facing the side of the film in the laminate which does not bear the image, to thereby transfer said dye component through the film to the disperse dyeable material; and separating the disperse dyeable textile material from the laminate.

4,421,519

MIXTURES OF CATIONIC DYES: NAPHTHO-LACTAM AND OXAZINE DYES FOR POLYACRYLONITRILES  
Peter Loew, Münchenstein, and Rudolf Zink, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,596

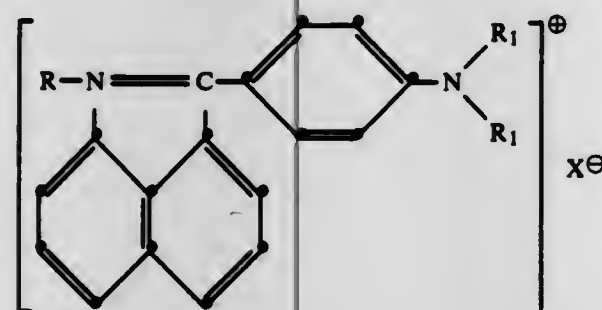
Claims priority, application Switzerland, Jun. 16, 1981, 3957/81

Int. Cl.<sup>3</sup> D06P 3/76; C09B 57/06

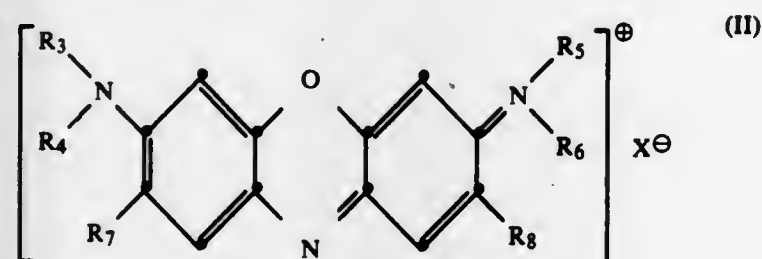
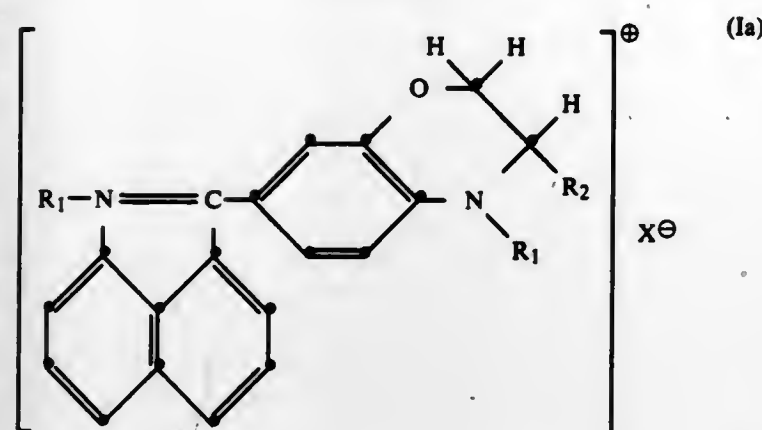
U.S. Cl. 8-644

16 Claims

1. A process for dyeing and printing polyacrylonitrile materials or mixed fabrics containing polyacrylonitrile materials, in which process there is used a mixture of the dyes of the formula I and II or Ia and II



-continued



wherein

R is a C<sub>1</sub>-C<sub>4</sub>-alkyl group, which is substituted by CN, COO-alkyl-C<sub>1</sub>-C<sub>4</sub>, CONH<sub>2</sub>, CONH(alkyl-C<sub>1</sub>-C<sub>4</sub>) or CON(alkyl-C<sub>1</sub>-C<sub>4</sub>);

R<sub>1</sub>'s independently of one another are each an unsubstituted C<sub>1</sub>-C<sub>4</sub>-alkyl group or a C<sub>1</sub>-C<sub>4</sub>-alkyl group which is substituted by CN, OH, C<sub>1</sub>-C<sub>4</sub>-alkoxy, COO-alkyl-C<sub>1</sub>-C<sub>4</sub>, CONH<sub>2</sub>, CONH(alkyl-C<sub>1</sub>-C<sub>4</sub>), CON(alkyl-C<sub>1</sub>-C<sub>4</sub>), or the two R<sub>1</sub>'s in the formula I form together with the N atom a heterocyclic 5- or 6-membered ring;

R<sub>2</sub> is hydrogen, an unsubstituted or substituted C<sub>1</sub>-C<sub>4</sub>-alkyl group, or an unsubstituted or substituted aryl group;

R<sub>3</sub> and R<sub>5</sub> independently of one another are each hydrogen, a C<sub>1</sub>-C<sub>4</sub>-alkyl group, which is unsubstituted or substituted by CN, OH, aryl, halogen or a C<sub>1</sub>-C<sub>4</sub>-alkoxy group, or an alkenyl group having 3 or 4 carbon atoms;

R<sub>4</sub> and R<sub>6</sub> independently of one another are each a C<sub>1</sub>-C<sub>4</sub>-alkyl group, which is unsubstituted or substituted by CN, OH, aryl, halogen or a C<sub>1</sub>-C<sub>4</sub>-alkoxy group, or are an alkenyl group having 3 or 4 carbon atoms, or R<sub>4</sub> and R<sub>6</sub> independently of one another are each an unsubstituted phenyl group, or a phenyl group which may be substituted by a C<sub>1</sub>-C<sub>4</sub>-alkyl group, by a C<sub>1</sub>-C<sub>4</sub>-alkoxy group or by halogen, and R<sub>6</sub> can moreover be hydrogen;

R<sub>7</sub> and R<sub>8</sub> independently of one another are each hydrogen, a C<sub>1</sub>-C<sub>4</sub>-alkyl group or a C<sub>1</sub>-C<sub>4</sub>-alkoxy group, and X is an anion.

4,421,520

## REDUCING THE TENDENCY OF DRIED COAL TO SPONTANEOUSLY IGNITE

J. David Matthews, Denver, Colo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 21, 1981, Ser. No. 333,146

Int. Cl.<sup>3</sup> C10L 5/24, 5/32

U.S. Cl. 44-6

6 Claims

1. In a method for producing a dried particulate coal fuel having a reduced tendency to spontaneously ignite wherein crushed mined coal is heated in a drying zone with a hot gas to vaporize water from the coal and dry the coal to a moisture content of less than about 20 percent by weight of water and wherein the dried coal is removed from said drying zone, the improvement comprising contacting and intimately mixing said removed dried coal particles with a water-base dispersion comprised of water and latex paint type solids, whereby an elastic film is formed on said dried coal particles.

4,421,521

## PROCESS FOR AGGLOMERATING CARBON PARTICLES

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Division of Ser. No. 223,122, Jan. 7, 1981. This application Sep. 8, 1981, Ser. No. 299,969

Int. Cl.<sup>3</sup> C10L 5/12, 5/40; C01B 25/01

U.S. Cl. 44-16 R

2 Claims

1. A process for agglomerating carbon particles for use as reducing carbon in phosphorus furnaces which comprises:  
a. mixing reducing carbon particles of less than 1/4 inch size with orthophosphoric sludge acid and water;  
b. adding the mixture from (a) to a rotating cylinder;  
c. ammoniating and tumbling said particles in the cylinder to thereby cause agglomeration;  
d. indurating the agglomeration by heating to cause drying.

4,421,522

## DIESEL FUEL COMPOSITION

Paul D. Seemuth, Oak Park, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 6, 1982, Ser. No. 433,160

Int. Cl.<sup>3</sup> C10L 1/22

U.S. Cl. 44-53

5 Claims

1. Liquid fuel adapted for use in a diesel engine, said fuel being selected from the group consisting of liquid hydrocarbons of the diesel boiling range, alcohols and mixtures thereof, and said fuel containing a cetane number increasing amount of a fuel soluble 4-morpholine alkanol nitrate.

4,421,523

## CONTROL OF BED HEIGHT IN A FLUIDIZED BED GASIFICATION SYSTEM

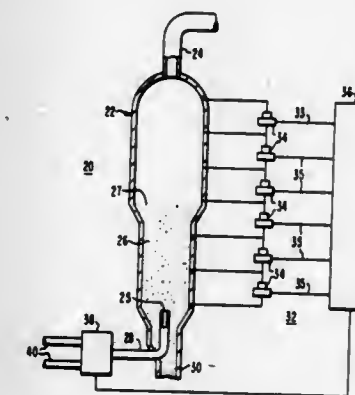
Gautam I. Mehta, Greensburg, and Lynn M. Rogers, Export, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 11, 1982, Ser. No. 377,231

Int. Cl.<sup>3</sup> C10J 3/54

U.S. Cl. 48-197 R

6 Claims



1. A method for use in a fluidized bed apparatus comprising a vessel having a bottom, a first substance to be fluidized, a second substance for fluidizing said first substance in a fluidized bed within said vessel, said second substance being a fluid, said fluidized bed having an upper surface and a bed height within said vessel which is the vertical distance from the bottom of the vessel to said upper surface, a controlling means for controlling the flow of at least one of said first or second substance, said controlling means being regulatable by a signal, and a differential pressure detecting system, said system comprising a plurality of differential pressure detectors connected in series, each detector having a high pressure tap connected to said vessel and a low pressure tap connected to said vessel, and adjacent detectors having a common tap to said vessel which

serves as said high pressure tap for one detector and said low pressure tap for an adjacent detector, said vessel tap connections for each detector defining a horizontal zone within said vessel corresponding to each said detector, said method for controlling said fluidized bed height comprising the steps of:

- determining the differential pressure sensed by each detector substantially simultaneously;
- repeating step (a), periodically;
- averaging periodically a predetermined number of the latest differential pressures determined for each of said detectors to compute an average differential pressure for each said zone;
- dividing each average differential pressure by the vertical distance in the vessel of each corresponding zone to calculate a fluidized bed density corresponding to each said zone;
- averaging continuously a predetermined number of the most recent fluidized bed densities calculated for each of said zones to obtain an average fluidized bed density for each said zone;
- disregarding any zones for which the most recently calculated average fluidized bed density was non-positive and reserving the zone closest to the bottom of said vessel which was also adjacent to a zone for which the most recently calculated average bed density was non-positive, and for all remaining zones, calculating a weighting factor for each zone by the formula:

$$\text{Weight factor for zone A} = \frac{\text{Average bed density zone B}}{\text{Average bed density zone A}}$$

where zone A is adjacent to and above zone B;

- calculating the height of the bed within the reserved zone by dividing the fluidized bed density of the reserved zone by the fluidized bed density of the zone adjacent to and below the reserved zone, and multiplying by the vertical height of the reserved zone and the last weighting factor calculated for the reserved zone;
- producing said signal representative of said height of said bed within said reserved zone; and
- regulating said controlling means with said signal.

4,421,524

## METHOD FOR CONVERTING ORGANIC MATERIAL INTO FUEL

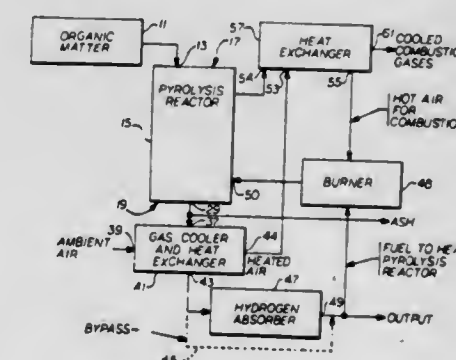
Donald E. Chittick, Newberg, Ore., assignor to Pyrenco, Inc., Prosser, Wash.

Continuation of Ser. No. 169,400, Jul. 16, 1980, abandoned, which is a continuation of Ser. No. 18,118, Mar. 7, 1979, Pat. No. 4,268,275. This application Feb. 4, 1982, Ser. No. 345,787

Int. Cl.<sup>3</sup> C10J 3/00

U.S. Cl. 48-209

5 Claims



1. A process for converting organic material into a high quality fuel gas, wherein the process is carried out in a chamber which includes upper and lower adjacent vertical portions, the process comprising the steps of:  
introducing an initial charge of charcoal, into the lower portion of the chamber;



heating the charcoal to a reaction temperature; introducing organic material into the upper portion of the chamber after the charcoal has been heated to the reaction temperature, such that the lowermost portion of the organic material comes into contact with the uppermost portion of the heated charcoal; decomposing the organic material by heating the organic material to a pyrolysis temperature within the range of 450 degrees C. and 750 degrees C., the resulting pyrolysis reaction being characterized by a lack of combustion sufficiently rapid to result in a flame, the products of the pyrolysis reaction consisting of char, and pyrolysis volatiles consisting of hydrogen, carbon monoxide, water vapor and tars; decomposing the water vapor and tars to essentially pure hydrogen and essentially pure carbon monoxide by passing the water vapors and tars through the heated charcoal, wherein the reaction temperature of the charcoal is substantially higher than 700 degrees, and wherein the charcoal is arranged and maintained so that substantially all of the pyrolysis volatiles come into contact with the heated charcoal such that the gas exiting from the lower portion of the chamber comprises hydrogen and carbon monoxide with virtually no tars; replenishing the organic material as it is consumed; replacing the charcoal consumed during the process by the char produced by the pyrolysis reaction of the organic material in the upper portion of the chamber

4,421,525

#### ALUMINA COATED COMPOSITE SILICON NITRIDE CUTTING TOOLS

Vinod K. Sarin, Lexington; Sergej-Tomislav Buljan, Acton, and Charles D'Angelo, Southboro, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 20, 1982, Ser. No. 380,379  
Int. Cl.<sup>3</sup> B24D 11/00

U.S. Cl. 51—295

13 Claims

1. A coated composite ceramic cutting tool comprising a composite silicon nitride substrate body having at least one adherent coating layer; said substrate body consisting essentially of particles of a hard refractory material uniformly distributed in a matrix consisting essentially of a first phase of silicon nitride and a refractory second phase comprising silicon nitride and an effective amount of a densification aid selected from the group consisting of yttrium oxide, hafnium oxide, the lanthanide rare earth oxides, and mixtures thereof; said adherent coating layer consisting essentially of aluminum oxide.

4,421,526

#### POLYURETHANE FOAM CLEANING PADS AND A PROCESS FOR THEIR MANUFACTURE

Robert L. Strickman, and Melvyn B. Strickman, both of Bridge-ton, N.J., assignors to Sherwood Research and Development Partnership, Englewood Cliffs, N.J.

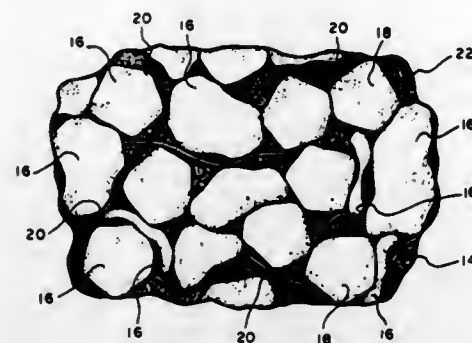
Continuation-in-part of Ser. No. 305,870, Nov. 13, 1972, abandoned. This application Oct. 30, 1978, Ser. No. 955,877  
Int. Cl.<sup>3</sup> B29D 27/04; C11D 17/04; B24D 3/32

U.S. Cl. 51—296

22 Claims

1. A dry synthetic resilient foamed polyurethane hydrophilic pad produced by reacting a prepolymer urethane resin and an aqueous catalyst mixture, the pad containing an additive selected from the group consisting of abrasives, water soluble detergents, and combinations thereof dispersed uniformly therein in the ratio of between 0.25 to 2.0 parts additive per part prepolymer, and having a densely structured polyurethane cellular matrix of 6 to 30 lbs./ft.<sup>3</sup>, said matrix comprised of abnormal and normal polyurethane cells, the matrix also containing fibrous polyurethane strands which are interwoven through the abnormal and normal cells as a consequence of the shear forces during mixing, said abnormal cells being ruptured, collapsed, swollen and distorted, said pad being produced by

slowly mixing the resin and catalyst mixture to hinder foam formation, thereafter adding the additive and then further



mixing to form a uniform reacting mixture prior to allowing volumetric expansion of the mixture.

4,421,527

#### HIGH FLUORIDE COMPATIBILITY DENTIFRICE ABRASIVES AND COMPOSITIONS

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 862,384, Dec. 20, 1977, abandoned.

This application May 23, 1979, Ser. No. 41,952

The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C04B 31/16; C09C 1/68

U.S. Cl. 51—308

9 Claims

1. An abrasive composition comprising a precipitated amorphous silicon dioxide prepared from a fresh water alkali metal silicate solution by acidulation, said silicon dioxide having been intimately reacted with a compound of an alkaline earth metal so as to have present therein and intimately associated therewith, about 10-300 parts per million of alkaline earth metal ions, said amorphous silicon dioxide exhibiting a Radioactive Dentin Abrasion value of at least 40, a pack density of about 0.24 to 0.55 grams per milliliter, an oil absorption of about 70-95 cc/100 grams, a BET surface area of about 100-250 m<sup>2</sup>/g, and a percent loss on ignition of about 4-6%, said abrasive composition, when incorporated into toothpaste compositions containing a fluoride therapeutic agent, providing a toothpaste composition which exhibits minimal loss of soluble fluoride upon storage at normal temperatures, and providing a fluoride compatibility value to the toothpaste of at least 90%.

4,421,528

#### PROCESS FOR MAKING A MODIFIED SILICON ALUMINUM OXYNITRIDE BASED COMPOSITE CUTTING TOOL

Sergej-Tomislav Buljan, Acton, and Vinod K. Sarin, Lexington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 20, 1982, Ser. No. 380,361

Int. Cl.<sup>3</sup> B24D 3/02

U.S. Cl. 51—309

20 Claims

1. A process for obtaining an abrasion resistant cutting tool having a hard refractory material distributed in a homogeneous matrix containing a modified silicon aluminum oxynitride comprising: mixing from about 20 to about 90 volume percent silicon nitride, from about 5 to about 60 volume percent aluminum oxide, and from about 20 to about 25 volume percent of a modifier to form a mixture; reacting said mixture at a temperature from about 1400° C. to about 1800° C. for a period of time from about one to about eight hours in a non-oxidizing atmosphere to form a reacted mixture; comminuting a blend comprising from about 40 to about 95 volume percent of said reacted mixture and from about 5 to

about 60 volume percent of a hard refractory material to form a composite blend; and densifying said composite blend to form a homogeneous matrix of said reacted mixture having a dispersed phase of said hard refractory material throughout said homogeneous matrix, said densifying being sufficient to obtain a density greater than 98 percent of theoretical density of said composite blend.

4,421,529

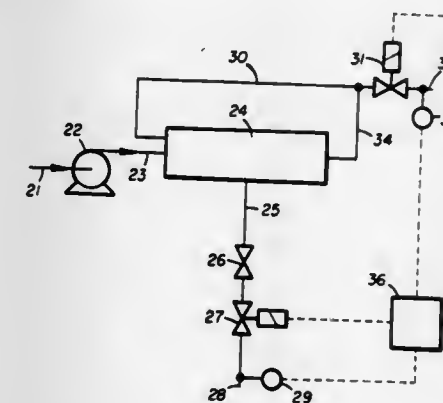
#### MEMBRANE SYSTEM FOR INTERMITTENT GAS SEPARATION

Timothy T. Revak, and Robert T. Krueger, both of Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 2, 1982, Ser. No. 394,954  
Int. Cl.<sup>3</sup> B01D 53/22

U.S. Cl. 55—16

7 Claims



1. In a process for separating gases from a mixture using a device containing a hollow fiber membrane preferentially permeable to at least one component of the gas mixture wherein the separation process is intermittent and the device is to be used in at least 1000 operating cycles separated by periods of non-use, the improvement wherein the pressure on the feed stream side of the membrane is maintained essentially constant or is varied relatively slowly during cycling between periods of non-use and initiation of gas separation such that after 1000 cycles of operation the selectivity of the membrane at the operating flow rate and other conditions of operation is at least 20 percent greater than that of an otherwise identical membrane which has been subjected to a pressure change of 75 psi in a period of 15 seconds at the start of each cycle of operation.

4,421,530

#### PROCESS FOR REMOVING OXYGEN FROM MIXED GAS STREAMS USING A SWING ADIABATIC ABSORPTION-ISOTHERMAL DESORPTION CYCLE

Augustine I. Dalton, Jr., Allentown, Pa.; John J. Sheridan, III, Somerville, N.J., and David A. Zagnoli, Fleetwood, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 13, 1982, Ser. No. 417,296

Int. Cl.<sup>3</sup> B01D 53/04

U.S. Cl. 55—26

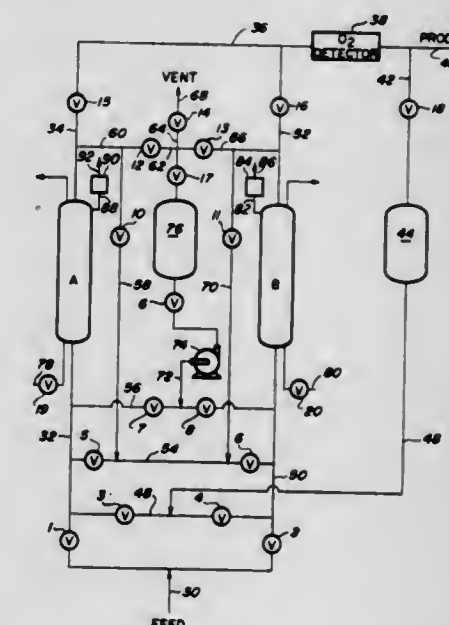
11 Claims

1. A process for removing oxygen from an inert gas stream containing oxygen by adiabatic absorption of the oxygen on a dioxygen absorbent and isothermal desorption of the oxygen during dioxygen absorbent regeneration wherein the process is designed to operate below the temperature of decomposition of the absorbent comprising the steps of:

- introducing an oxygen-containing inert gas stream into a first bed of a dioxygen absorbent at a temperature chosen on an isotherm of the particular dioxygen absorbent so as to allow adiabatic absorption to proceed without reaching the temperature of degradation of said absorbent;
- adiabatically absorbing essentially all of the oxygen content of said inert gas stream on said dioxygen absorbent,

while removing an essentially oxygen-free inert gas from said bed;

- terminating said absorption on said first bed before oxygen therethrough in said bed;
- switching the flow of the inert gas stream to a second dioxygen absorbent bed for adiabatic absorption of the oxygen content of said stream, while removing an essentially oxygen-free inert gas from said bed;
- desorbing said first bed isothermally by supplying a high temperature heat exchange fluid to said bed to drive absorbed oxygen off said dioxygen absorbent;
- cooling said first bed to the initial absorbent temperature;
- representing said first bed with essentially pure oxygen-



free inert gas from the downstream flow of product gas from said second bed;

- terminating said absorption on said second bed before oxygen breakthrough in said bed;
- switching the flow of the inert gas stream back to the first bed, while desorbing the second bed as described in step (e) above;
- cooling said second bed to the initial absorbent temperature;
- repressurizing the second bed with essentially pure oxygen-free inert gas from the downstream flow of product gas from said first bed;
- cyclically repeating steps (a) through (k) for the production of an essentially oxygen-free inert gas.

4,421,531

#### ADIABATIC PRESSURE SWING ABSORPTION PROCESS FOR REMOVING LOW CONCENTRATIONS OF OXYGEN FROM MIXED GAS STREAMS

Augustine I. Dalton, Jr., Allentown, Pa.; John J. Sheridan, III, Somerville, N.J., and David A. Zagnoli, Fleetwood, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 13, 1982, Ser. No. 417,297

Int. Cl.<sup>3</sup> B01D 53/04

U.S. Cl. 55—26

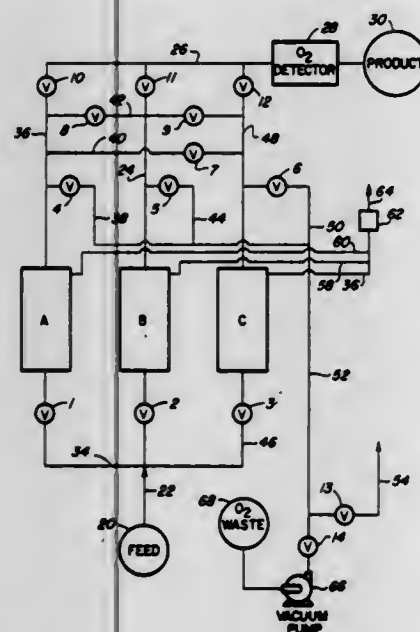
19 Claims

1. A process for removing oxygen from an oxygen-containing inert gas stream by absorption of the oxygen into a dioxygen absorbent in an adiabatic pressure swing absorption process wherein the process is designed to operate below the temperature of decomposition of the absorbent, comprising the steps of:

- introducing an oxygen-containing inert gas stream into a first bed of a dioxygen absorbent at a temperature on the isotherm of the particular absorbent which will allow for adiabatic absorption without degradation of the absorbent;
- adiabatically absorbing the oxygen content of said inert



- gas stream of said dioxygen absorbent, while removing an essentially oxygen-free inert gas from said bed;
- (c) terminating said absorption on said first bed before oxygen breakthrough in said bed;
- (d) switching the flow of the inert gas stream to a second dioxygen absorbent bed for adiabatic absorption of the oxygen content of said stream while removing an essentially oxygen-free inert gas from said bed;
- (e) desorbing said first bed adiabatically by reducing the pressure in said bed and by utilizing the heat of absorption to drive absorbed oxygen off of said dioxygen absorbent;



- (f) repressurizing said first bed with essentially pure oxygen-free inert gas from the downstream flow of product gas from said second bed;
- (g) terminating said absorption on said second bed before oxygen breakthrough in said bed;
- (h) switching the flow of the inert gas stream back to the first dioxygen absorbent bed, while desorbing the second bed as described in step (e) above;
- (i) repressurizing the second bed with essentially pure oxygen-free inert gas from the downstream flow of product gas from said first bed;
- (j) cyclically repeating steps (a) through (i) for the production of an essentially oxygen-free inert gas.

4,421,532

#### PROCESS FOR REMOVING AND RECOVERING VOLATILE ORGANIC SUBSTANCES FROM INDUSTRIAL WASTE GASES

Massimo Sacchetti, Via Azalee; Giovanni Aguzzi, P.zza Napoli, both of 11 Milano; Gianvittorio Bianchi, Frazione Alperolo, Albuzzano (Pavia), and Giuseppe Caroprese, Via Matteotti, 40/70, Arese (Milano), all of Italy

Filed Jul. 27, 1981, Ser. No. 287,038

Claims priority, application Italy, Aug. 8, 1980, 24105 A/80  
Int. Cl.<sup>3</sup> B01D 53/04

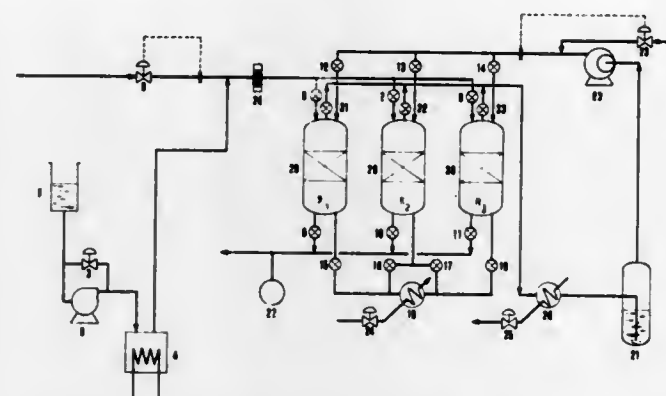
U.S. Cl. 55—28

7 Claims

1. A process for removing and recovering a volatile organic substance from an industrial waste gas comprising

- (1) passing an industrial waste gas containing a volatile organic substance over a solid adsorbent for said volatile organic substance to adsorb said volatile organic substance therein;
- (2) desorbing the sorbed solid adsorbent with a hot steam-free inert desorption gas circulating in a closed cycle, the desorbing operation comprising the steps of:
- (a) heating a steam-free inert desorption gas,
- (b) circulating the heated steam-free inert desorption gas through the sorbed solid adsorbent to be regenerated,
- (c) cooling the circulated desorption gas now enriched with said volatile organic substance at a temperature suitable

- for condensation of most of said organic substance to form a condensate,
- (d) separating said condensate from the remaining circulated desorption gas,
- (e) purifying the desorption gas by passing said gas through the same adsorbent through which said industrial waste gas has passed in the adsorption step (1), said adsorbent being regenerated with the same desorption gas circulating in a closed cycle, and



- (f) recycling the purified desorption gas to heating step (a), and
- (3) recovering a portion of said volatile organic substance by cooling said hot steam-free inert desorption gas containing said volatile organic substance and recovering the remainder of said volatile organic substance by reabsorbing said volatile organic substance in said inert gas on said solid adsorbent.

4,421,533

#### METHOD OF REMOVING OZONE AND COMPOSITION THEREFOR

Hiroshi Nishino, Osaka, and Masayuki Suzuki, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 209,707, Apr. 17, 1979, abandoned.

This application Mar. 24, 1982, Ser. No. 361,488

Claims priority, application Japan, Mar. 27, 1978, 53-35820; Apr. 5, 1978, 53-40580; Apr. 17, 1978, 53-45712

Int. Cl.<sup>3</sup> B01D 53/04

U.S. Cl. 55—68

6 Claims

1. A method for removing ozone from an ozone-containing gas which comprises contacting an ozone-containing gas with an activated carbon composition supported with (1) about 0.1 to 10 parts by weight as Mn based on 100 parts by weight of activated carbon of a manganese nitrate and (2) about 0.1 to 10 parts by weight as a metal element based on 100 parts by weight of activated carbon of sodium nitrate, potassium nitrate or a mixture thereof.

4,421,534

#### TOWER FOR REMOVING ODORS FROM GASES

James D. Walker, Aurora, Ill., assignor to Welles Products Corporation, Roscoe, Ill.

Continuation of Ser. No. 482,484, Jun. 24, 1974, abandoned.

This application May 26, 1976, Ser. No. 690,004

Int. Cl.<sup>3</sup> B01D 53/18; C02F 3/04

U.S. Cl. 55—73

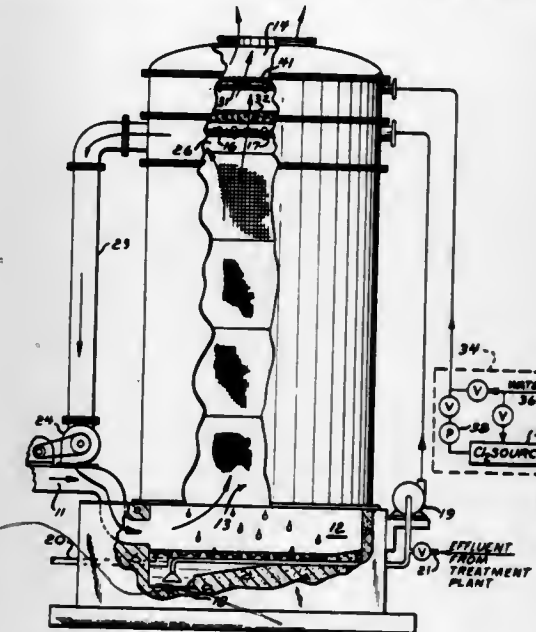
4 Claims

1. The method of removal of odor from gas including passing the gas through a column of contact media while trickling through the column a liquid promoting growth of bio-slimes, characterized in that said method includes:

- (a) the step of recirculating a portion of the gas which has passed upwardly through the column, by passing it through the same column again whereby on the average repeated flow of the gas through the same media is provided;
- (b) and distributing to media so positioned in the column that

the gas passes through it, after passing through and leaving the portion through which said recirculated liquid trickles, a fresh, nonrecirculated chemically active odor-removal liquid.

4. Apparatus for removal of odor from gases including a column of contact media having at least 60 square feet of contact surface per cubic foot of media, a housing surrounding



said column and providing a gas entry chamber, a gas discharge passage and a sump, and distribution means for distributing over a cross-section of the media at a high level thereof a liquid promoting the growth of bio-slimes for trickling through the column to the sump, characterized in that: the contact media has successive sections, two of relatively fine media, and one between them of relatively coarse media of the same nature.

4,421,535

#### PROCESS FOR RECOVERY OF NATURAL GAS LIQUIDS FROM A SWEETENED NATURAL GAS STREAM

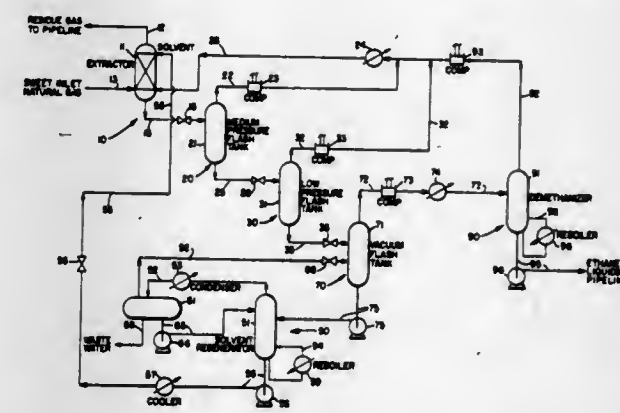
Yuv R. Mehra, Odessa, Tex., assignor to El Paso Hydrocarbons Company, Odessa, Tex.

Filed May 3, 1982, Ser. No. 374,270

Int. Cl.<sup>3</sup> F25J 1/02

U.S. Cl. 62—17

25 Claims



1. A continuous process for separating water and hydrocarbons heavier than methane from a natural gas stream at pipeline pressures, comprising removing said water and said hydrocarbons heavier than methane as a C<sub>1</sub>+ mixture to substantially any selected degree, including the following steps:

- A. extracting said natural gas by flowing countercurrently to the natural gas stream a solvent consisting essentially of polyalkylene glycol dialkyl ethers at said pipeline pressures and at a rate sufficient to produce rich solvent containing water, methane, ethane, and hydrocarbons heavier than ethane, and residue natural gas of pipeline quality;
- B. returning said residue natural gas to a pipeline and flash-

ing said rich solvent at a medium pressure to produce a C<sub>1</sub>-rich gas fraction and a medium-pressure liquid mixture of said water, said solvent, and a C<sub>1</sub>+ mixture of hydrocarbons;

- C. flashing said medium-pressure liquid mixture at low pressure to produce a C<sub>1</sub>-rich gas fraction having a lower methane content than said gas fraction of step B and a low-pressure liquid mixture of said water, said solvent, and a C<sub>2</sub>+ mixture of hydrocarbons containing minor amounts of methane;
- D. flashing said low-pressure liquid mixture at a pressure of up to approximately atmospheric pressure to produce a gas mixture of essentially all C<sub>1</sub>+ hydrocarbons, and an atmospheric-pressure liquid mixture of said water, said solvent, and minor amounts of hydrocarbons;
- E. regenerating said solvent solely by removing said water and said minor amounts of hydrocarbons from said atmospheric pressure liquid mixture and returning the regenerated solvent to said extracting and returning said minor amounts of hydrocarbons to step D;
- F. compressing and cooling said C<sub>1</sub>-rich gas fractions produced in step B and step C and returning said cooled gas fractions to said extracting in step A; and
- G. compressing, condensing, and cooling said gas mixture from step D to produce a liquid product.

4,421,536

#### PROCESS FOR PRODUCING KRYPTON AND XENON

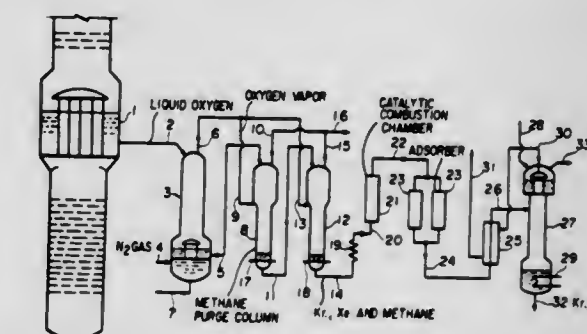
Tatsuo Mori, Yokohama, and Juichi Ishii, Sakura, both of Japan, assignors to Nippon Sanso K.K., Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,151

Claims priority, application Japan, Aug. 29, 1980, 55-119441  
Int. Cl.<sup>3</sup> F25J 3/04

U.S. Cl. 62—18

9 Claims



1. A process for producing krypton and xenon, comprising the steps of:

- supplying to a first concentrating column liquid oxygen containing small concentrations of krypton, xenon, and hydrocarbons including methane accumulated in a main condensation section of an air separation plant;
- rectifying and concentrating said liquid oxygen in the first concentrating column in which concentrations of said Kr, Xe and hydrocarbons are increased;
- introducing the concentrated liquid into a methane purging column;
- maintaining operation conditions within the purging column below explosive limits solely by bringing said concentrated liquid into countercurrent contact with oxygen gas introduced into the purging column in the absence of extraneous argon gas, and purging the methane with the oxygen from the top of the purging column;
- bringing out of the methane purging column and vaporizing the concentrated liquid remaining in the bottom of the purging column;
- thereafter effecting combustion of the vaporized concentrated liquid in a catalytic combustion reactor;
- absorbing and removing water and carbon dioxide produced from the combustion for producing a purified gas mixture; and



separating a mixture of krypton and xenon from the purified gas mixture in a second concentrating column.

4,421,537

**HELIUM GAS LIQUEFYING APPARATUS**

Yasuo Kuraoka, Sapporo, Japan, assignor to Hoxan Corporation, Sapporo, Japan

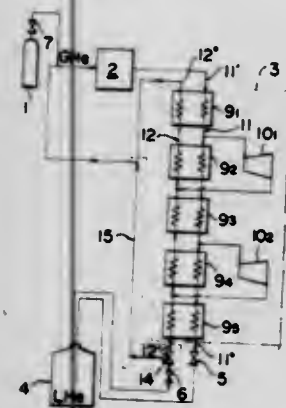
Filed Sep. 20, 1982, Ser. No. 419,824

Claims priority, application Japan, Oct. 9, 1981, 56-161226

Int. Cl.<sup>3</sup> F25J 3/00, 3/06, 5/00

U.S. Cl. 62—22

1 Claim



1. A helium gas liquefying apparatus, comprising:
  - (a) a liquefied helium reservoir (4);
  - (b) a compressor (2) with inlet means receiving a helium gas stock and connected to said reservoir;
  - (c) a plurality of heat exchangers (9<sub>1</sub>, 9<sub>2</sub>) connected in series with each other via a series liquefying line (11);
  - (d) a plurality of expansion engines (10, 10<sub>2</sub>), connected in parallel with corresponding heat exchangers;
  - (e) a Joule-Thompson valve (5) connected from the outlet of said liquefying line to said reservoir;
  - (f) a series return line (12) with an inlet (12'), said series return line being disposed in reverse flow of said heat exchangers to said liquefying line and connected to said compressor inlet means;
  - (g) a return valve (6) connected to said reservoir;
  - (h) means for eliminating a temperature rise in the helium gas exhausted from a series liquefying line to the Joule-Thompson valve including a three-way valve having one passage connected to said return line inlet (12') from said return valve, and a second passage branched therefrom connected to the inlet of said compressor inlet means; and,
  - (i) an additional line connected from the inlet of said compressor to said three-way valve.

4,421,538

**DEVICE FOR THE MANUFACTURE OF GLASS FILAMENTS**

Osama Demaschque, Hochheim, Fed. Rep. of Germany, assignor to Eglasstrek Patent Promotion & Awarding GmbH, Hochheim, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 259,823

Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017374

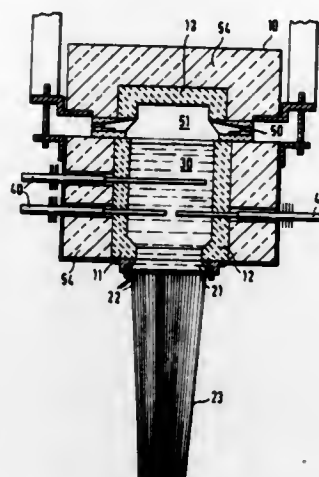
Int. Cl.<sup>3</sup> C03B 37/025

U.S. Cl. 65—1

11 Claims

1. A device for making glass filaments, comprising:
  - a forehearth forming an elongate chamber connected to a supply of molten glass, said chamber being bounded by a pair of parallel sidewalls and having a floor with a plurality of longitudinally spaced-apart passages constituting entrance apertures for underlying bushings provided with filament-shaping bores; and
  - heating means including a multiplicity of rod-shaped electrodes extending into said chamber above solid portions of said floor adjoining and separating said passages, said electrodes being distributed throughout the length of said chamber below the level of a mass of molten glass of high

specific electrical resistivity contained therein, each of said electrodes being connected at one end to a current



source and having a free opposite end located within said chamber for directly heating said mass.

4,421,539

**METHOD OF PRODUCING ROD-SHAPED BASE MATERIAL FOR OPTICAL TRANSMISSION FIBER**

Tadao Edahe, Tookai; Kazuaki Yoshida; Kunio Ogura, both of Ichihara; Seiji Shibuya, and Hiroshi Murata, both of Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and The Furukawa Electric Co., Ltd., both of Tokyo, Japan

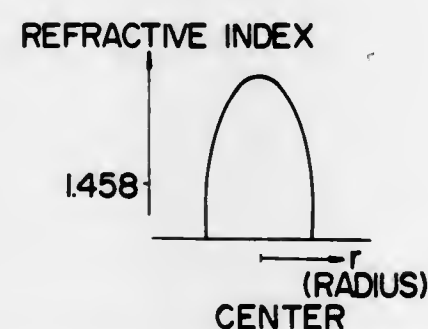
Filed Aug. 13, 1981, Ser. No. 292,676

Claims priority, application Japan, Aug. 22, 1980, 55-115493

Int. Cl.<sup>3</sup> C03B 37/025

U.S. Cl. 65—3.12

3 Claims



1. In a method of producing a rod-shaped base material by a vapor phase axial deposition process, said rod-shaped base material being used as part of an optical transmission fiber, the steps of:
  - (a) introducing and reacting into a bulb-shaped reaction zone having an elongated cylindrical portion, a glass soot-forming gas by an oxidation reaction while simultaneously introducing a dopant gas for varying the refractive index of glass;
  - (b) longitudinally accumulating soot containing said dopant thus produced thereby forming a soot-containing rod-shaped unit having a different dopant concentration which gradually decreases from the axial center of the produced rod toward the outer peripheral surface thereof;
  - (c) thereafter heating and sintering the glass soot-containing unit thus formed at a temperature of the order of 1500° C., so as to produce a transparent glass rod having a refractive index gradually decreasing from the axial center toward the outer peripheral surface thereof;
  - (d) removing within a range of 0.15% to 0.03% of the outer peripheral part of the transparent glass rod thus obtained so as to remove a flared part formed by the bulb shape of the reaction zone; and
  - (e) covering the outer periphery of the glass rod thus formed

with a tubular layer of glass quartz material and then thermally spinning the covered rod-shaped item thus formed so as to produce an optical transmission fiber.

4,421,540

**SYSTEM FOR PRODUCING AN OPTICAL FIBER PREFORM WITH GAS VOLUME CONTROL**

Motohiro Nakahara, Mito; Tetsuo Miyajiri, Kanagawa; Naoki Yoshioka, Kanagawa, and Toru Kuwahara, Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of Japan

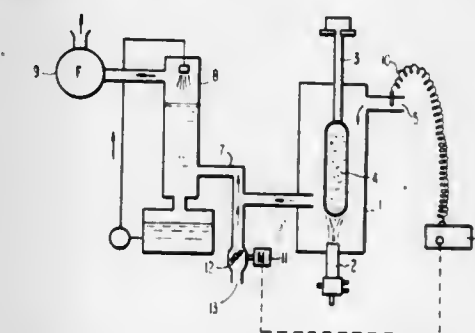
Filed Dec. 11, 1981, Ser. No. 329,915

Claims priority, application Japan, Dec. 12, 1980, 55-174730

Int. Cl.<sup>3</sup> C03B 19/00, 37/07; C03C 23/00

U.S. Cl. 65—3.12

5 Claims



4. A process for producing an optical fiber preform in a muffle furnace by hydrolyzing a gaseous glass forming material with a flame from an oxyhydrogen burner and depositing the resulting soot in a rod shape, wherein a gas is supplied to the muffle furnace other than from said burner, holding the volume supply of said gas constant by controlling the amount of a control gas supplied into an intermediate portion of an exhaust pipe through which the gases formed in the muffle furnace and the fine glass particles that do not deposit in a rod shape are discharged.

4,421,541

**PROCESS AND DEVICE FOR THE MANUFACTURE OF GLASS BY FLOTATION**

Gaston Eischen, Stolberg, Luxembourg; Thomas Eulenberg, Aachen; Helmut Göwert, Wurselen, both of Fed. Rep. of Germany; Rainer Grablowitz, Kelms, and Michel Pernet, Brussels, both of Belgium, assignors to Saint Gobain Industries, Neuilly-sur-Seine, France

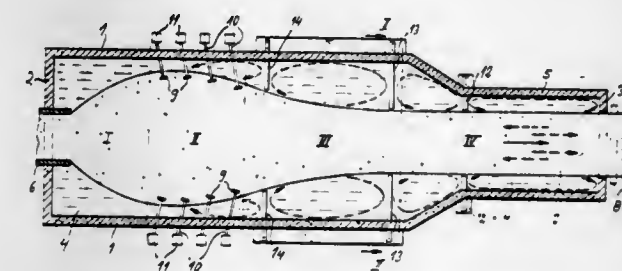
Filed Dec. 22, 1980, Ser. No. 218,709

Claims priority, application France, Dec. 21, 1979, 79 31477

Int. Cl.<sup>3</sup> C03B 18/18

U.S. Cl. 65—99.3

15 Claims



1. A process for the manufacture of plate glass including the step of pouring molten glass onto a bath of molten metal contained in a tank to form a glass ribbon and where the tank has an inlet end wall, an outlet end wall, side walls and a glass drawing zone, the step of advancing the glass ribbon on the molten bath from the upstream end wall in a downstream direction towards the outlet end wall, and the step of extracting the ribbon in the glass drawing zone by applying acceleration forces thereto whereby the feeding action of the ribbon causes a downstream flow of molten metal to form beneath the ribbon and reflect to in turn form a cooler upstream flow of

molten metal towards said inlet wall end between said side walls and the edges of the ribbon; the improvement comprising the additional step of restricting the upstream flow of said cooler molten metal between the edges of the ribbon and said side walls by applying a plurality of pairs of side barriers symmetrically along the ribbon and between the side walls and edges of the ribbon in the glass drawing zone where the barriers extend into the bath of molten metal while at the same time leaving the downstream flow of molten metal unrestricted whereby any continuous upstream flow of cooler molten metal between the edges of the glass ribbon and said side walls between adjacent pairs of side baffles over the length of the drawing zone is substantially eliminated to in turn reduce turbulence in the bath due to temperature differences.

6. Apparatus for the manufacture of plate glass comprising a tank for holding a bath of molten metal having an inlet end wall, an outlet end wall and side walls, feed means for feeding molten metal at a controlled rate to said bath adjacent the inlet wall end, advance means for advancing the molten glass on the surface of said bath to form a glass ribbon, and draw means in a glass drawing zone of the tank for drawing the glass ribbon; the improvement comprising in having an unobstructed space between the bottom surface of the ribbon and the bottom of the tank and in having a plurality of pairs of baffles symmetrically arranged on each side of the ribbon in a glass drawing zone where the baffles extend into the bath and from the side walls to substantially the edges of the glass ribbon to prevent upstream flow of molten metal in the direction of the inlet end wall between the edges of the glass ribbon and said side walls between adjacent pairs of baffles over the length of the drawing zone whereby turbulence in the bath due to temperature differences is reduced.

4,421,542

**AUTOMATIC GLASSWARE FORMING MACHINE WITH AUTOMATIC DOWN AND/OR STUCK WARE REJECTION**

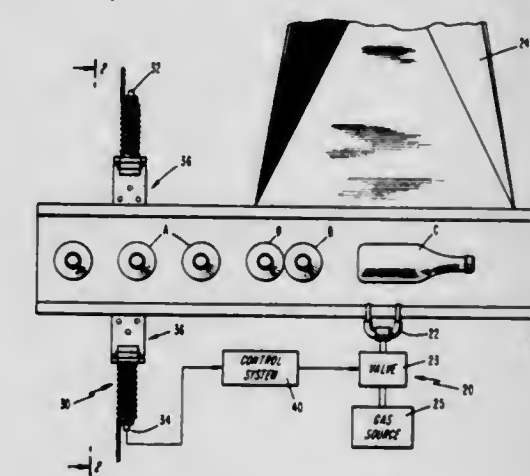
William J. Poas; Urbano J. De Santis, and Lewis W. McFadden, all of Brockway, Pa., assignors to Brockway Glass Company, Inc., Brockway, Pa.

Continuation-in-part of Ser. No. 259,568, May 1, 1981, Pat. No. 4,354,865. This application Sep. 28, 1982, Ser. No. 426,226

Int. Cl.<sup>3</sup> C03B 35/00

U.S. Cl. 65—158

5 Claims



1. In combination, an automatic glassware forming machine comprising a conveyor on which a single line of normally upright, still-plastic wares having a thickened base and a greater length than diameter are transported for further processing in spaced relationship with respect to each other, and automatic stuck and down ware rejection apparatus comprising:
  - detecting means for sensing the passage of normal ware, stuck ware and down ware past an inspection location comprising:
    - source means for producing first and second spaced radii



ant energy beams, said radiant energy beams being directed transversely across the transport path of the wares so as to be interrupted by the passage of normal, stuck and down ware, and being in coplanar alignment perpendicular to the transport path of the wares, and said first beam being disposed at an elevation in alignment with the bases of upright wares and said second beam being disposed at an elevation above said first beam; and

sensor means for sensing said radiant energy beams and producing a first signal for each item of sensed normal ware, stuck ware or down ware as long as either of said beams is interrupted by the sensed ware;  
means responsive to each of said first signals for producing a second signal having a predetermined duration corresponding to the time required for a normal upright and spaced ware to be conveyed past said inspection location;  
means responsive to each of said first and second signals for producing a reject signal when said first signal exceeds said second signal in duration, which corresponds to the detection of stuck ware or down ware; and  
removal means responsive to said reject signal for removing the stuck ware or down ware which generated said reject signal.

4,421,543

# **NUTRIENT FOR MUSHROOM GROWTH PROCESS FOR PRODUCING SAME**

R. Barry Holtz, Los Gatos, Calif., assignor to Spawn Mate, Inc., San Jose, Calif.

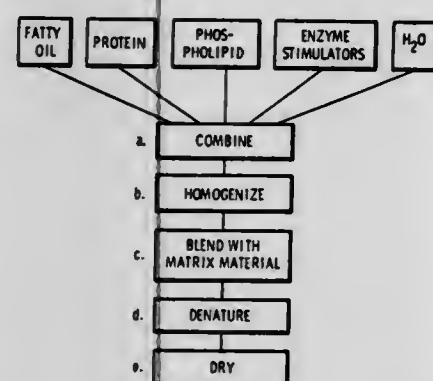
Division of Ser. No. 251,108, Apr. 6, 1981, Pat. No. 4,370,159.

This application Sep. 28, 1982, Ser. No. 425,479

Int. Cl.<sup>3</sup> C05F 11/00

U.S. Cl. 71-5

16 Claims



1. A method of preparing a nutrient particle for growing fungus, in steps comprising:

- combining fatty oil material, activated protein material, phospholipid material, enzyme stimulator material and water;
- homogenizing the combination of step a. into microencapsulated droplets "having an activated protein outer shell";
- blending the homogenized droplets of step b. with a particulate anhydrous protein based matrix material to form a slurry of conglomerate particles;
- treating the resulting conglomerate particles of step c. with a denaturing agent over a predetermined period of time to denature the protein of the matrix material; and
- drying the denatured conglomerate particles of step d. to a predetermined moisture content range, to provide said droplets entrapped within the matrix material.

4,421,544

# **LEGUME-INOCULATING COMPOSITION**

James L. Jones, Columbus; E. Glen Keyser, Grove City, and James C. Phillips, Plain City, all of Ohio, assignors to Agri-genetics Corporation, Columbus, Ohio

Filed Jun. 1, 1982, Ser. No. 383,586

Int. Cl.<sup>3</sup> C05F 11/08

U.S. Cl. 71-7

6 Claims

1. A legume-inoculating composition comprising, as essential ingredients:

- a viable fungus of the genus *Arthrobotrys*,
- a bacterium of the genus *Rhizobium*, and
- a nutrient for said fungus and said bacterium selected from the class consisting of a monosaccharide, a disaccharide, a polysaccharide, glycerol and cornmeal; the *Arthrobotrys* fungus being present in an amount equal to at least one propagule per gram of said composition and the *Rhizobium* bacterium being present in an amount equal to at least one million cells per gram of said composition.

4,421,545

# **HIGH STRENGTH MELAMINE-UREA FERTILIZER GRANULES**

George M. Crews, Baton Rouge, La., assignor to Melamine Chemicals, Inc., Donaldsonville, La.

Filed Jan. 13, 1982, Ser. No. 339,201

Int. Cl.<sup>3</sup> C05C 9/00

U.S. Cl. 71-30

6 Claims

1. A method for preparing a melamine/urea granular agglomerate adapted to use as a source of nitrogen for fertilizing applications consisting of:

- forming a mixture of from 60 to 85 parts by weight melamine crystals and correspondingly from 40 to 15 parts of urea powder,
- contacting said mixture with a spray of water or an aqueous solution of urea,
- agglomerating the moistened mixture to form predominantly agglomerates having a nominal size of from 1 mm to 10 mm,
- drying the agglomerates at less than 93° C.,
- annealing the dried agglomerates by heating between 135° C. and 149° C., and
- cooling the agglomerates whereby annealed melamine-urea fertilizer agglomerates are provided having increased crush strength.

4,421,546

# **AQUATIC METHOD**

Kenneth W. Burow, Jr., Indianapolis, and Roger L. St. Clair, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 334,410, Dec. 24, 1981, Pat. No. 4,354,030.

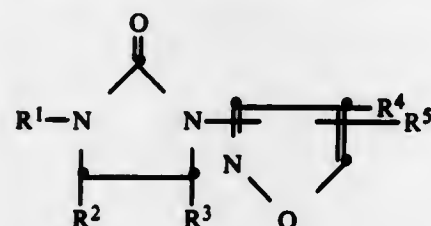
This application Jul. 29, 1982, Ser. No. 403,209

Int. Cl.<sup>3</sup> A01N 37/100

U.S. Cl. 71-66

24 Claims

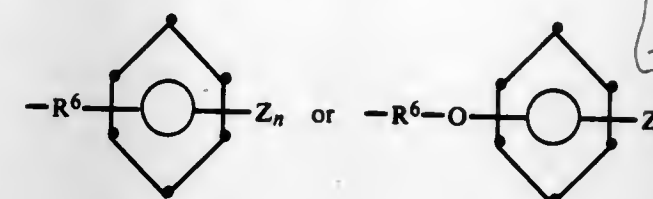
1. A method for controlling the growth of aquatic plants comprising contacting the plants or the water in which the plants are growing with an aquatic herbicidally-effective amount of a compound of the formula:



wherein:

- R<sup>1</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl or allyl;  
R<sup>2</sup> is hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl, allyl, or hydroxy;  
R<sup>3</sup> is hydroxy or halo;

R<sup>4</sup> is hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl, halo, cyano, or nitro;  
R<sup>5</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>2</sub>-C<sub>6</sub> alkenyl, C<sub>2</sub>-C<sub>6</sub> alkynyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, C<sub>1</sub>-C<sub>3</sub>alkyl-C<sub>3</sub>-C<sub>7</sub> cycloalkyl, halo-C<sub>1</sub>-C<sub>6</sub> alkyl, -R<sup>6</sup>-O-R<sup>7</sup> or -R<sup>6</sup>-S-R<sup>7</sup>,  
where R<sup>6</sup> is C<sub>1</sub>-C<sub>6</sub> alkylene and  
R<sup>7</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl; or R<sup>5</sup> is



wherein:

Z is nitro, halo, or R<sup>7</sup>, and n is 0, 1, 2 or 3;  
provided that R<sup>2</sup> is allyl or hydroxy when R<sup>1</sup> is allyl, R<sup>3</sup> is hydroxy, and R<sup>5</sup> is alkyl, cycloalkyl, alkylcycloalkyl or haloalkyl.

4,421,547

# **4-HYDROXY-5-ISOPROPYL-2-METHYLPHENYL TRIMETHYLAMMONIUM, 1-PIPERIDINE CARBOXYLATE SALT OF**

N-PHOSPHONOMETHYLGLYCINE AND ITS USE AS A HERBICIDE

Michael P. Prisbylla, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

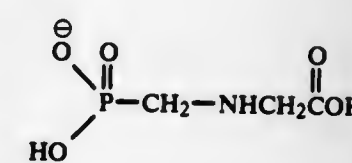
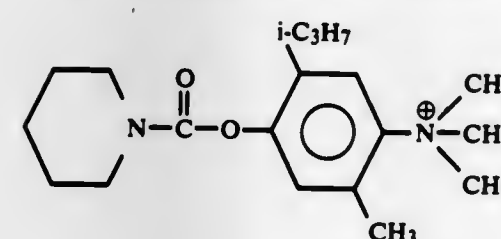
Filed Apr. 6, 1982, Ser. No. 364,397

Int. Cl.<sup>3</sup> C07D 295/18; C07F 9/65, 9/38; A01N 57/20, 57/24, 37/46

U.S. Cl. 71-86

3 Claims

1. A compound having the formula



4,421,548

# **HERBICIDALLY ACTIVE 2-SUBSTITUTED 5-PENOXYPHENYLPHOSPHONIC ACID DERIVATIVES**

Ludwig Maier, Arlesheim, and Dieter Dürr, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 117,167, Jan. 31, 1980, Pat. No. 4,322,375.

This application Dec. 28, 1981, Ser. No. 334,861

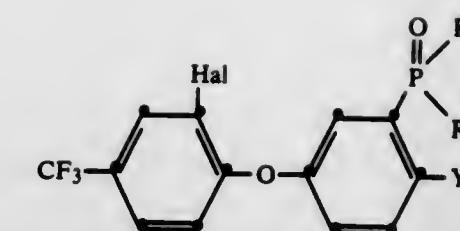
Claims priority, application Switzerland, Feb. 6, 1979, 1147/79

Int. Cl.<sup>3</sup> A01N 57/14

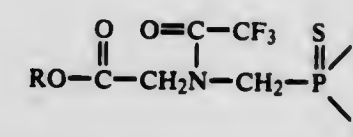
U.S. Cl. 71-86

9 Claims

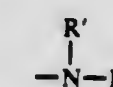
1. A method of controlling weeds in crops of monocotyledonous or dicotyledonous cultivated plants which comprises applying thereto, either prior to emergence of said plants or after emergence of said plants, in an amount sufficient to destroy said weeds but insufficient to cause harm to said cultivated plants, a compound of the formula



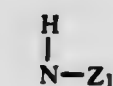
wherein Hal is chlorine, bromine or iodine,  
each of R<sub>1</sub> and R<sub>2</sub> is hydroxy, lower alkoxy, lower alkylthio, (lower alkyl) amino, di(lower alkyl) amino, chlorine, benzyloxy or benzylthio, and  
Y' is halogen, nitro or cyano.



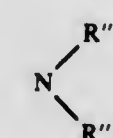
wherein R is a member of the group consisting of alkyl of from 1 to 8 carbon atoms, chloroalkyl of from 1 to 4 carbon atoms and from 1 to 3 chlorine atoms and alkoxyalkyl containing from 3 to 7 carbon atoms and wherein each Z is the same member of the class consisting of: a. -NHR' and



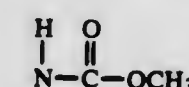
wherein each R' is individually selected from the class consisting of C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>2</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, benzyl or phenyl; b. a heterocyclic group selected from the class consisting of morpholine, pyrrolidine or piperidine; and c.



group wherein Z<sub>1</sub> is a -NHR'' or



group wherein R'' is C<sub>1</sub>-C<sub>4</sub> alkyl or phenyl group; or a



group.



4,421,550

## HERBICIDAL TRIAZOLE UREAS

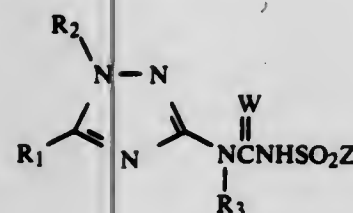
Thomas P. Selby, Hockessin, Del., and Anthony D. Wolf, Elkton, Md., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 282,174, Jul. 10, 1981, abandoned. This application May 28, 1982, Ser. No. 382,711 Int. Cl.<sup>3</sup> A01N 47/36; C07D 249/12, 249/14, 401/12

U.S. Cl. 71-92

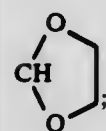
42 Claims

1. A compound of the formula:



wherein

R<sub>1</sub> is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>4</sub> alkynyl, SR<sub>4</sub>, OR<sub>5</sub>, CH<sub>2</sub>OR<sub>6</sub>, CH<sub>2</sub>CH<sub>2</sub>OR<sub>6</sub>, CF<sub>3</sub>, CF<sub>2</sub>CF<sub>3</sub>, Cl, NHCH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, CH(OCH<sub>3</sub>)<sub>2</sub> or



R<sub>2</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>4</sub> alkynyl, CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>SCH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>SCH<sub>3</sub> or C<sub>1</sub>-C<sub>4</sub> alkyl substituted with 1-3 F atoms;

R<sub>3</sub> is H or CH<sub>3</sub>;

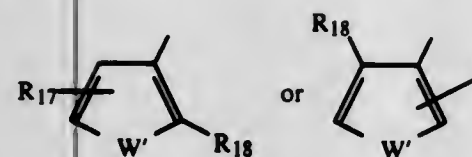
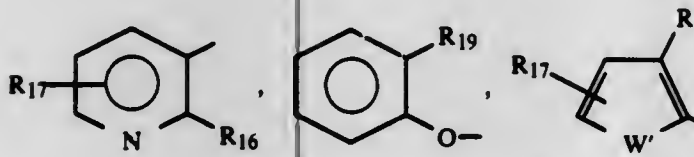
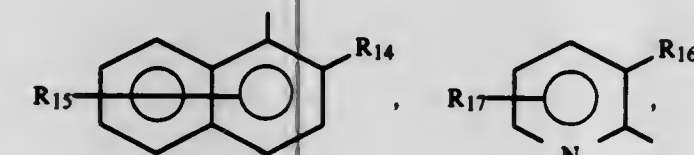
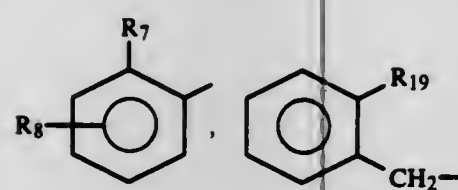
R<sub>4</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>4</sub> alkynyl, CH<sub>2</sub>CO<sub>2</sub>R<sub>6</sub> or CH(CH<sub>3</sub>)CO<sub>2</sub>R<sub>6</sub>;

R<sub>5</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>4</sub> alkenyl, C<sub>3</sub>-C<sub>4</sub> alkynyl, CH<sub>2</sub>CO<sub>2</sub>R<sub>6</sub>, CH(CH<sub>3</sub>)CO<sub>2</sub>R<sub>6</sub> or CH<sub>2</sub>CF<sub>3</sub>;

R<sub>6</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;

W is O or S;

Z is



R<sub>7</sub> is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, F, C(O)NR<sub>21</sub>R<sub>22</sub>, Cl, Br, NO<sub>2</sub>, CF<sub>3</sub>, CO<sub>2</sub>R<sub>9</sub>, SO<sub>2</sub>NR<sub>10</sub>R<sub>11</sub>, C(O)SR<sub>10</sub>, SO<sub>2</sub>N-(OCH<sub>3</sub>)CH<sub>3</sub>, QSO<sub>2</sub>R<sub>12</sub>, S(O)<sub>n</sub>R<sub>13</sub>, CH<sub>2</sub>CO<sub>2</sub>R<sub>20</sub>, CH(CH<sub>3</sub>)CO<sub>2</sub>R<sub>20</sub>, CH<sub>2</sub>S(O)<sub>n</sub>R<sub>13</sub>, CH(CH<sub>3</sub>)S(O)<sub>n</sub>R<sub>13</sub>, C<sub>1</sub>-C<sub>4</sub> alkenyloxy, C<sub>3</sub>-C<sub>4</sub> alkynyloxy, C<sub>1</sub>-C<sub>2</sub> alkyl substituted with either OCH<sub>3</sub> or OC<sub>2</sub>H<sub>5</sub>, or C<sub>1</sub>-C<sub>3</sub> alkoxy substituted with either (a) 1-5 atoms of Cl, Br or F or (b) OCH<sub>3</sub> or OC<sub>2</sub>H<sub>5</sub>;

R<sub>8</sub> is H, F, Cl, Br, CF<sub>3</sub>, NO<sub>2</sub>, C<sub>1</sub>-C<sub>3</sub> alkyl or C<sub>1</sub>-C<sub>3</sub> alkoxy;

R<sub>9</sub> is C<sub>1</sub>-C<sub>6</sub> alkyl, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>3</sub>, C<sub>3</sub>-C<sub>6</sub> alkenyl, C<sub>3</sub>-C<sub>6</sub> alkynyl or C<sub>1</sub>-C<sub>3</sub> alkyl substituted with 1-3 atoms of Cl or F;

R<sub>10</sub> and R<sub>11</sub> are independently C<sub>1</sub>-C<sub>3</sub> alkyl;

R<sub>12</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub> or C<sub>1</sub>-C<sub>4</sub> alkyl substituted with 1-3 atoms of F, Cl or Br;

R<sub>13</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, allyl, C<sub>1</sub>-C<sub>3</sub> alkyl substituted with 1-5 atoms of F, Cl or Br;

n is 0, 1 or 2;

Q is O or NCH<sub>3</sub>;

R<sub>14</sub> is H, CH<sub>3</sub>, OCH<sub>3</sub>, F, Cl, Br, NO<sub>2</sub>, SO<sub>2</sub>NR<sub>10</sub>R<sub>11</sub>, SO<sub>2</sub>N-(OCH<sub>3</sub>)CH<sub>3</sub>, OSO<sub>2</sub>R<sub>12</sub> or S(O)<sub>n</sub>R<sub>13</sub>;

R<sub>15</sub> is H, Cl, Br, CH<sub>3</sub>, OCH<sub>3</sub> or NO<sub>2</sub>;

R<sub>16</sub> is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, F, Cl, Br, CF<sub>3</sub>, CO<sub>2</sub>R<sub>20</sub>, SO<sub>2</sub>NR<sub>10</sub>R<sub>11</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub> or S(O)<sub>n</sub>R<sub>13</sub>;

R<sub>17</sub> is H, F, Cl, Br, CH<sub>3</sub> or OCH<sub>3</sub>;

W' is O or S;

R<sub>18</sub> is H, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, F, Cl, Br, NO<sub>2</sub>, CO<sub>2</sub>R<sub>20</sub>, SO<sub>2</sub>NR<sub>10</sub>R<sub>11</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub> or S(O)<sub>n</sub>R<sub>13</sub>;

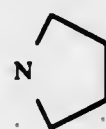
R<sub>19</sub> is Cl, NO<sub>2</sub>, CF<sub>3</sub>, CO<sub>2</sub>R<sub>9</sub>, SO<sub>2</sub>N(OCH<sub>3</sub>)CH<sub>3</sub>, SO<sub>2</sub>NR<sub>10</sub>R<sub>11</sub>, QSO<sub>2</sub>R<sub>12</sub>, S(O)<sub>n</sub>R<sub>13</sub> or C<sub>1</sub>-C<sub>3</sub> alkoxy substituted with 1-5 atoms of Cl or F;

R<sub>20</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl, CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>Cl or CH<sub>2</sub>CH=CH<sub>2</sub>;

R<sub>21</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl or C<sub>6</sub>H<sub>5</sub>;

R<sub>22</sub> is C<sub>1</sub>-C<sub>3</sub> alkyl; and

R<sub>21</sub> and R<sub>22</sub> may be taken together to be



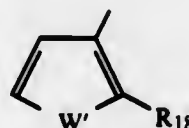
provided that

(1) the total number of carbon atoms of R<sub>10</sub> and R<sub>11</sub> is less than or equal to 4;

(2) the total number of carbon atoms of R<sub>1</sub> and R<sub>2</sub> is less than or equal to 6;

(3) when W' is O, then R<sub>18</sub> is H, Cl, Br, CH<sub>3</sub> or CO<sub>2</sub>R<sub>20</sub>;

(4) when W' is O and R<sub>18</sub> is H, Cl, Br or CH<sub>3</sub>, then Z is



(5) when W is S, then R<sub>3</sub> is H;

(6) when R<sub>7</sub> is H, then R<sub>8</sub> is H; and

(7) R<sub>14</sub> and R<sub>15</sub> may not both be NO<sub>2</sub>.

29. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,421,551

## PROCESS FOR PREPARING ROTUND PARTICLES OF SALT-COATED MAGNESIUM OR MAGNESIUM ALLOY

Udo Mueller, Stavern, Norway, assignor to Norsk Hydro a.s., Oslo, Norway

Filed Jan. 29, 1982, Ser. No. 344,059

Claims priority, application Norway, Feb. 5, 1981, 810385

Int. Cl.<sup>3</sup> C22C 1/04

U.S. Cl. 75-0.5 B

21 Claims

1. A process for preparing rotund particles of salt-coated magnesium or magnesium alloy, which comprises:

adding a molten metal selected from the group consisting of magnesium and a magnesium alloy to a substantially non-hygroscopic salt melt, having a viscosity of from 1.5 to 5.0 cps containing at least 50% by weight of at least one

anhydrous alkali metal chloride, the density of said salt melt being substantially the same as the density of said molten metal;

stirring said molten metal and salt melt with a stirrer operating at a tip speed always below 450 meters per minute, at a temperature of from 660° to 730° C., to obtain a dispersion of said molten metal in said salt melt containing up to 60% by weight of said molten metal;

cooling said dispersion to solidify the molten metal and salt melt; and

disintegrating the resultant solid product to obtain rotund particles of said salt-coated magnesium or magnesium alloy.

4,421,552

## DEAD ROAST-OXIDE FLASH REDUCTION PROCESS FOR COPPER CONCENTRATES

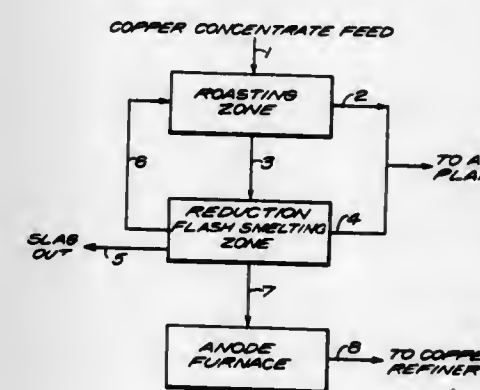
James E. Hoffmann, South Plainfield, N.J., and Kohur N. Subramanian, Houston, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 16, 1982, Ser. No. 369,074

Int. Cl.<sup>3</sup> C22B 15/00

U.S. Cl. 75-9

14 Claims



1. A method of obtaining blister copper from a copper calcine comprising: providing a finely divided copper calcine having a particle size less than about 60 mesh; and charging said calcine into a reduction flash smelting zone for reduction therein, said calcine being charged into said zone with an oxygen-containing gas and a reductant, said gas and reductant being present in amounts sufficient to effect reduction of said calcine whereby blister copper is obtained.

4,421,553

## PROCESS FOR OPERATING A BLAST FURNACE

Nikolas Ponghis, Neuville-en-Condroz, Arthur Poos, Embourg, and Roland Vidal, Grivegnies, all of Belgium, assignors to Centre de Recherches Metallurgiques, Liege, Belgium

Filed Mar. 24, 1981, Ser. No. 247,018

Claims priority, application Belgium, May 6, 1980, 6/47178

Int. Cl.<sup>3</sup> C21B 4/00

U.S. Cl. 75-41

11 Claims

1. In a method of continuously controlling a blast furnace wherein iron ore is reduced in the furnace to form pig iron having a temperature of 1300°-1600° C. and a Si % up to 2% and at least one reactor is used for heating a reducing gas, which reducing gas is introduced through at least one tuyere, the improvement comprising the steps of adjusting the composition and the temperature of the reducing gas in order to simultaneously control the following parameters: the coke rate; and temperature and Si content of the pig iron; wherein the temperature range of the reducing gas is between 1500°-2800° C. and the composition of the reducing gas is primarily CO, H<sub>2</sub>, and possibly N<sub>2</sub>, and small amounts of CO<sub>2</sub> and H<sub>2</sub>O, the amount of H<sub>2</sub>O+CO<sub>2</sub> being up to 193 Nm<sup>3</sup>/mtHM;

(a) to control the coke rate within a value of between 50

kg/mt HM and 350 kg/mt HM of pig iron produced, the amount of at least one of the following components of the reducing gas selected from the group consisting of CO<sub>2</sub> or H<sub>2</sub>O, and the temperature of the reducing gas is adjusted; for increasing the coke rate, the amount of said components and the temperature of the reducing gas are increased, and for decreasing the coke rate, the amount of said components and the temperature of the reducing gas are decreased; and

(b) to control the temperature and Si content of the pig iron, the amount of said components and the temperature of the reducing gas are adjusted; for increasing the temperature and Si content of the pig iron, the temperature of the reducing gas is increased and the amount of said components of the reducing gas is decreased, and for decreasing the temperature and Si content of the pig iron, the temperature of the reducing gas is decreased and the amount of said components of the reducing gas is increased.

4,421,554

## PRODUCTION OF STEEL IN A BASIC CONVERTER EMPLOYING LIQUID CONVERTER SLAG

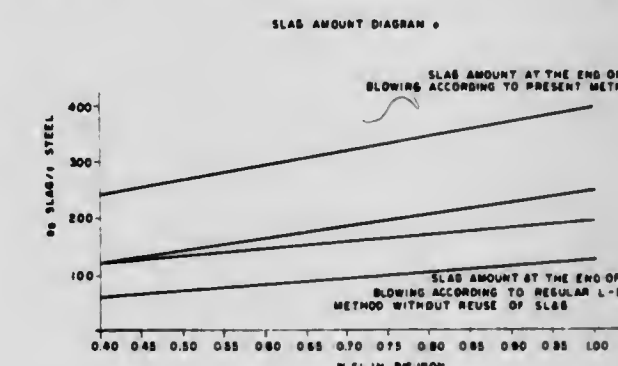
Gustav Mahn; Dieter Nolle, both of Wolfenbüttel, and Ulrich Eulenburg, Salzgitter, all of Fed. Rep. of Germany, assignors to Stahlwerke Peine-Salzgitter AG, Salzgitter, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,674

Int. Cl.<sup>3</sup> C21C 7/00

U.S. Cl. 75-52

37 Claims



1. A method for production of steel in a basic converter employing liquid converter slag comprising providing a start-up melt run by charging a converter with an iron material and a flux material; blowing an oxidizing agent into the melt until the iron material is sufficiently decarburized to provide a steel composition and until the flux is converted into a slag; retaining from about one third to two thirds of the slag material from a preceding charge in the converter; adding to the slag material before or about beginning of blowing together with a flux material for slag formation an amount of from about 5.0 to 9.5 kilogram magnesium oxide material for each ton of steel depending on the silicon contents of the pig iron material; charging the pig iron material into the converter; making a first step addition of lime into the converter; making an addition of scrap and a second step addition of lime such that the first step addition of the lime is an amount of from about 20 to 50 weight percent of the total addition of the lime in the first and second step addition and the second step addition of the lime is an amount of from about 50 to 80 weight percent of the total addition of the lime in the first and second step addition of the lime and where the second step addition of the lime is at a point in time of up to about 30 percent of the total blowing time; blowing an oxidizing agent into the melt until the pig iron material is sufficiently decarburized and the flux materials are converted into a slag material such that after the termination of the blowing depending on the silicon contents in



the pig iron material of from 0.4 to 1 weight percent relative thereto a slag amount of from about 120 to 390 kilogram for each ton of steel is obtained.

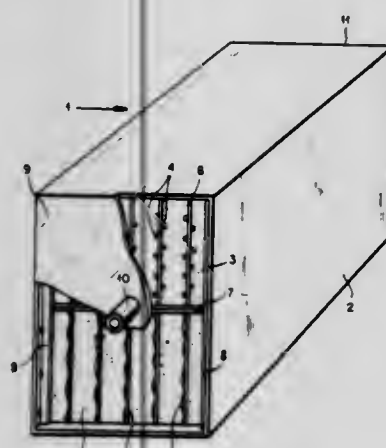
#### 4,421,555 METHOD OF AND APPARATUS FOR METALLURGICAL TREATMENT OF A MELT

Paul Metz; Edouard Legille; Francois Schleimer, and Antoine Weiner, all of Grand-Duchy, Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Mar. 22, 1982, Ser. No. 360,815  
Claims priority, application Luxembourg, Mar. 23, 1981, 83247

Int. Cl.<sup>3</sup> C22C 33/08  
U.S. Cl. 75—53

7 Claims



1. A method of treating a metal melt comprising the steps of: containing said melt in a vessel having below the level of said melt a gas-pervious wall portion defined by ceramic blocks defining narrow channels preventing the passage of molten metal therethrough; suspending finely divided treatment solids in a gas; and introducing the suspension through said wall portion into said melt and reacting said melt with said solids.

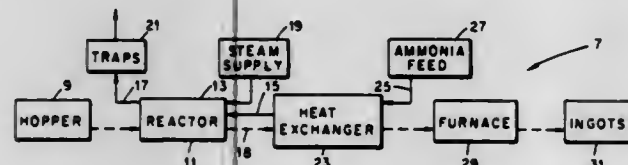
#### 4,421,556 METHOD FOR DECONTAMINATION OF NICKEL-FLUORIDE-COATED NICKEL CONTAINING ACTINIDE-METAL FLUORIDES

Norman F. Windt, and Joe L. Williams, both of Paducah, Ky., assignors to the United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1982, Ser. No. 453,983  
Int. Cl.<sup>3</sup> C22B 23/06, 60/02

U.S. Cl. 75—63

9 Claims



1. A process for decreasing the concentration of actinide-metal contaminants present in particulate nickel having a surface coating of nickel fluoride and containing nickel oxide, said process comprising:

contacting said nickel with gaseous ammonia in a reaction zone at a temperature promoting nickel-catalyzed dissociation of said ammonia into hydrogen and nitrogen to effect hydrogen-reduction of said nickel fluoride and nickel oxide, heating the nickel so contacted to form a melt and a slag and to effect transfer of at least some of said actinide-metal contaminants from said melt into said slag, and

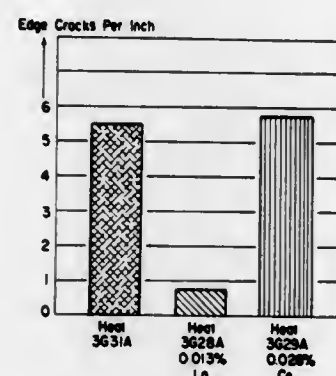
separating the resulting melt from said slag.

#### 4,421,557 AUSTENITIC STAINLESS STEEL

Paul A. Rossomme, Midland; John J. Eckenrod, Coraopolis; Curtis W. Kovach, and Kenneth E. Pinnow, both of Pittsburgh, all of Pa., assignors to Colt Industries Operating Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 170,364, Jul. 21, 1980, abandoned. This application Oct. 26, 1982, Ser. No. 436,873  
Int. Cl.<sup>3</sup> C22C 38/16, 38/20, 38/22, 38/42  
U.S. Cl. 75—125

9 Claims



1. An austenitic stainless steel having good corrosion resistance in chloride environments at relatively low nickel and molybdenum levels, said steel consisting essentially of, in weight percent, carbon 0.01 to 0.1, manganese 12 max., silicon 1 max., chromium 15 to 25, nickel greater than 16 to 25, molybdenum 3 to 7, a rare earth element consisting of lanthanum 0.005 to 0.05, nitrogen 0.1 to 0.50 and balance iron.

7. An austenitic stainless steel having good corrosion resistance in chloride environments at relatively low nickel and molybdenum levels, said steel consisting essentially of, in weight percent, carbon 0.01 to 0.1, manganese 12 max., silicon 1 max., chromium 15 to 25, nickel greater than 16 to 20, molybdenum 3 to 5.5, a rare earth element consisting of lanthanum 0.005 to 0.05, nitrogen 0.1 to 0.50 and balance iron.

#### 4,421,558 IRON-BASED HEAT-RESISTANT CAST ALLOY

Toshiaki Morichika; Junichi Sugitani, both of Hirakata, and Takao Kobayashi, Nara, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Jan. 5, 1981, Ser. No. 222,629  
Claims priority, application Japan, Jan. 10, 1980, 55-1684  
Int. Cl.<sup>3</sup> C22C 38/48

U.S. Cl. 75—128 E

4 Claims

1. An iron based, heat resistant cast alloy consisting essentially of, by weight %:  
0.10 to 0.16 carbon  
 $1.0 \leq \text{Si} > 0$ ,  
 $1.5 \leq \text{Mn} > 0$ ,  
17 to 23 chromium, 28 to 35 nickel, 0.3 to 2.0 niobium,  
 $0.1 \leq \text{Mo} \leq 0$ ,  
 $0.08 \leq \text{N} \leq 0$ , 0.001 to 0.010 calcium, and the balance iron.

#### 4,421,559 JET PRINTING INK COMPOSITION

Akio Owatari, Shiojiri, Japan, assignor to Epson Corporation, Nagano, Japan

Filed Oct. 26, 1981, Ser. No. 315,129  
Claims priority, application Japan, Oct. 27, 1980, 55-150281  
Int. Cl.<sup>3</sup> C09D 11/02

U.S. Cl. 106—20

7 Claims

1. A jet printing ink composition comprising:  
at least one humectant selected from the group consisting of diethylene glycol, triethylene glycol, tetraethylene glycol, polyethylene glycol, glycerol and mixtures thereof;

a freezing point lowering agent including urea and ethylene glycol;  
a water-soluble dye; and  
water.

#### 4,421,560 THERMOCHROMATIC MATERIALS

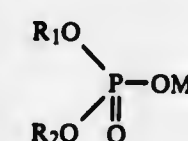
Tutomu Kito, Nagoya; Norikazu Nakasui, Aichi; Takashi Kataoka, Kasugai; Hiroshi Inagaki, Aichi, and Yutaka Shibahashi, Nagoya, all of Japan, assignors to Pilot Ink Company Ltd., Nagoya, Japan

Filed Apr. 8, 1982, Ser. No. 366,514  
Claims priority, application Japan, Apr. 8, 1981, 56-52579  
Int. Cl.<sup>3</sup> C09D 11/00, 11/02

U.S. Cl. 106—21

4 Claims

1. A reversible thermochromic material comprising:  
(A) one or more electron-donating chromatic organic compounds selected from the group consisting of diaryl phthalides, indolyl phthalides, polyaryl carbinols, leuco auramines, acyl auramines, aryl auramines, Rhodamine B lactam, indolines, spiropyrans and fluorans, and  
(B) one or more acidic phosphoric acid ester compounds of the following general formula (I):



wherein R<sub>1</sub> and R<sub>2</sub>, which may be the same or different, each represents hydrogen, an alkyl group having from 1 to 22 carbon atoms, a branched alkyl group having from 3 to 20 carbon atoms, an alkenyl group having from 3 to 20 carbon atoms, a cycloalkyl group having from 5 to 24 carbon atoms or an aryl group having from 6 to 20 carbon atoms in proviso that R<sub>1</sub> and R<sub>2</sub> do not represent hydrogen at the same time, and M represents hydrogen, sodium, potassium, lithium, calcium, zinc, zirconium, aluminum, magnesium, nickel, cobalt, tin, copper, iron, vanadium, titanium, lead or molybdenum, the ratio of Component (A) to Component (B) being 1:1/10 to 50 by weight, said thermochromic material undergoing reversible metachromatism at a temperature within the range of from 40° C. to 120° C.

#### 4,421,561 WATER BASED INK COMPOSITIONS USING ORGANIC ACID

Darryl W. Brixius, Upper Macungie Township, Lehigh County, Pa., assignor to Tarkett AB, Ronneby, Sweden  
Division of Ser. No. 278,250, Jun. 29, 1981, Pat. No. 4,369,065, which is a continuation of Ser. No. 152,205, May 22, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,990  
Int. Cl.<sup>3</sup> C09D 11/06

U.S. Cl. 106—27

12 Claims

1. Process for chemically embossing heat-foamable and expandable resinous material which comprises applying to selected, predetermined portions of the surface of heat-foamable and expandable resinous material containing a foaming or blowing agent capable of causing said resinous material to grow and to expand upon heating, an aqueous, growth-controlling printing ink composition having a pH of from about 8 to about 12 and being capable of controlling the growth and expansion of said resinous material as a result of said heating, said foam-growth-controlling printing ink composition comprising the product of mixing together in an aqueous medium:  
(a) at least one acid component selected from the group consisting of:  
(i) organic carboxylic acid containing from 2 to 12 carbon atoms and having at least two carboxyl groups or at least one carboxyl group and one amino or hydroxy group;

(ii) anhydride of such acid; and  
(iii) acid halide of such acid;  
(b) aqueous printing ink composition;  
(c) basic neutralizing agent in an amount sufficient to neutralize the acid component; and  
(d) pH controlling agent sufficient to maintain the pH of the foam-growth-controlling ink composition between about 8 and about 12;  
and heating said heat-foamable and expandable resinous material whereby said selected, predetermined portions to which said aqueous, foam-growth-controlling printing ink composition was applied attain heights differing from those other portions to which said aqueous, foam-growth-controlling printing ink composition was not applied.

#### 4,421,562 MANUFACTURING PROCESS FOR HOLLOW MICROSPHERES

Bruce W. Sands, Malvern, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Continuation of Ser. No. 253,139, Apr. 13, 1980, abandoned.  
This application Mar. 23, 1983, Ser. No. 478,006  
Int. Cl.<sup>3</sup> C04B 31/00

U.S. Cl. 106—75

6 Claims

1. In a hollow microsphere with a shell consisting of an alkali metal silicate and a "polysalt" the improvement consisting of 0.5 to 5.0 parts by weight of a water-miscible porosity reducing organic liquid having a boiling point of at least 100° C. selected from the group consisting of polyhydric alcohols, and the mono- and dialkyl ethers of alkylene glycol or poly (alkylene) glycols being present in said shells for each 100 parts by weight of silicate and "polysalt" solids.

#### 4,421,563 PRODUCTION OF CEMENT CLINKER

Paul Cosar, Paris, France, assignor to Fives-Cail Babcock, Paris, France

Filed Apr. 21, 1982, Ser. No. 370,540  
Claims priority, application France, May 15, 1981, 81 9692  
Int. Cl.<sup>3</sup> C04B 7/44

U.S. Cl. 106—100

6 Claims

1. A process of producing cement clinker from a dry raw material in a rotary kiln, which comprises the steps of:  
(a) preheating the raw material in heat exchange with combustion gases exhausted from the rotary kiln,  
(b) furnishing at least a portion of the calories required for producing the cement clinker by a solid fuel,  
(c) gasifying the solid fuel to produce said calories,  
(d) contacting the gasified fuel with a fraction of the preheated raw material until it has been desulfurized,  
(e) separating the reaction products of the desulfurization from the gasified fuel, and  
(f) burning the desulfurized gasified fuel to deliver at least a portion of the calories required for producing the clinker.

#### 4,421,564 HEAT COAGULABLE PAPER COATING COMPOSITION WITH A SOY PROTEIN ADHESIVE BINDER

Paul M. Graham, Ballwin, Mo., and Thomas L. Krinski, Granite City, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Apr. 14, 1982, Ser. No. 368,190  
Int. Cl.<sup>3</sup> C08L 89/00; A23J 1/12

U.S. Cl. 106—154 R

24 Claims

1. A process for producing a heat coagulable paper coating composition containing a soy protein adhesive binder comprising:  
(a) solubilizing a soy protein isolate to form a proteinaceous adhesive binder for said coating;  
(b) mixing said adhesive binder with a mineral pigment to provide a slurry having a solids level of at least about 36% by weight of said slurry,



(c) controlling the pH of the slurry to between about 5.7 to 6.2 and adding to said slurry a material consisting essentially of a salt selected from the group consisting of Zinc Acetate and Zinc Formate in an amount effective to cause heat coagulation of said slurry at a temperature of 40°-60° C. upon heating thereof.

#### 4,421,565 THIXOTROPIC AGENTS FOR ORGANIC SOLVENT-BASED SURFACE-COATING COMPOSITIONS AND SURFACE-COATING COMPOSITIONS CONTAINING SAME

Eugene P. DiBella, Piscataway, N.J., assignor to Nuodex Inc., Piscataway, N.J.

Filed Jul. 29, 1982, Ser. No. 402,879

Int. Cl.<sup>3</sup> C08L 1/08; C09F 5/08; C08K 5/11

U.S. Cl. 106—180

14 Claims

1. A thixotropic agent for organic solvent-based surface-coating compositions that is the product of the reaction of (a) a polyentaerythritol component that contains at least 70% by weight of trientaerythritol and more than 90% by weight of trientaerythritol and higher polyentaerythritols with (b) a saturated aliphatic monocarboxylic acid component that contains at least 70% by weight of acids having 20 to 22 carbon atoms, in amounts that provide from 0.70 mole to 0.90 mole of carboxyl groups per mole of hydroxyl groups.

#### 4,421,566 WARP SIZE

Michael J. Hasuly, South Plainfield; Daniel B. Solarek, Somerville, and Wadym Jarowenko, Green Brook, all of N.J., assignors to National Starch And Chemical Corporation, Bridge-water, N.J.

Filed Sep. 17, 1982, Ser. No. 419,397

Int. Cl.<sup>3</sup> C08B 31/08; D06B 3/10, 3/32

U.S. Cl. 106—213

5 Claims

1. A warp sizing composition comprising 100 parts water; 3-50 parts of a cationic starch derivative comprising a high amylose starch containing more than 50% amylose, having a water fluidity viscosity within the range of 65 to 80 and a nitrogen content of 0.5 to 0.9% (dry basis); and 0.5-10% by weight of the cationic starch derivative of a softener.

#### 4,421,567 SEPARATORY PROCESS USING ORGANIC BOUND ADSORBENTS

Santi Kulprathipanja, Hoffman Estates, and Armand J. deRoset, Clarendon Hills, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 160,521, Jun. 18, 1980, Pat. No. 4,337,171.

This application Apr. 5, 1982, Ser. No. 365,434

Int. Cl.<sup>3</sup> B01J 20/18; C13D 3/12, 3/14

U.S. Cl. 127—46.3

8 Claims

1. A process for the separation of one sugar component from a feed stream comprising an aqueous solution of a blend of sugar components, which process comprises:

- contacting said aqueous solution with an adsorbent comprising a mixture of a Type X or Type Y zeolite, from about 20.0 wt% to about 35.0 wt% of an alkali or alkaline earth exchange resin and from about 20.0 wt% to about 35.0 wt% of a water permeable organic polymer binder, wherein the weight ratio of said Type X or Type Y zeolite to said alkali or alkaline earth exchange resin is from about 1.0 to about 3.0, said mixture exhibiting an adsorptive selectivity toward one of said components, thereby selectively adsorbing said component from said blend;
- separating the solution from said adsorbent; and
- thereafter recovering said adsorbed component by desorption thereof from said adsorbent.

#### 4,421,568 PROCESS FOR MAKING L-SUGARS AND D-FRUCTOSE

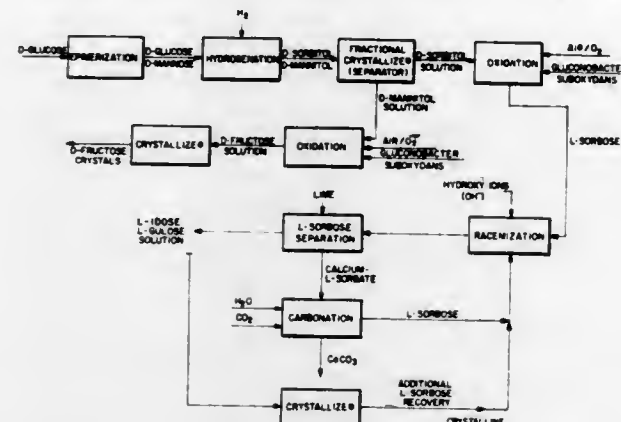
Derk T. A. Huibers, Pennington, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Aug. 26, 1981, Ser. No. 296,403

Int. Cl.<sup>3</sup> C07H 3/02; C13K 13/00; C13D 3/02

U.S. Cl. 127—48

10 Claims



1. A method for producing L-sugars including L-idose and L-gulose and D-fructose from D-glucose which comprises the steps of:

- epimerizing D-glucose to a mixture of D-glucose and D-mannose;
- hydrogenating said D-glucose mixture to provide L-sorbitol and D-mannitol;
- separating said D-mannitol from said D-sorbitol;
- oxidizing separately said D-sorbitol and D-mannitol to provide L-sorbose and D-fructose, respectively;
- racemizing said L-sorbose to provide a mixture of L-sorbose, L-idose and L-gulose; and
- precipitating the remaining L-sorbose with lime from a dilute solution of said mixture of L-sorbose, L-idose, and L-gulose.

#### 4,421,569 CORROSION PROTECTION OF STEEL PIPES

Michael Dichter, and Carl Horowitz, both of Brooklyn, N.Y., assignors to Sharon Tube Corp., Sharon, Pa.

Filed May 7, 1982, Ser. No. 376,549

Int. Cl.<sup>3</sup> C23C 1/10

U.S. Cl. 148—6.14 R

10 Claims

1. Composition which when cured in contact with a steel object forms a coating thereon to protect the steel object against corrosion, said composition comprising an aqueous emulsion of:

- hydroxyethyl or hydroxypropyl methacrylate, methyl, ethyl or butyl acrylates or methacrylates, dimethylamino or diethylamino, ethylacrylates or methacrylates, or vinyl pyrrolidone, or mixtures thereof, as monomer,
- epoxy resins based on bisphenol A and epichlorohydrin, phenol based or cresol based poly functional epoxy novolac resins, water reducible epoxy esters, water reducible urethane prepolymers or hydroxyl terminated or carboxyl terminated acrylic prepolymers, as prepolymer,
- a silver, ferric ferrous, cupric or cobalt salt or mixtures thereof as graft initiator,
- a peroxide or persulfate as catalyst, and
- water.

7. Method for protecting the surface of a steel object, which comprises applying the composition of claim 1 to the surface of the steel object and curing said composition in contact with said surface.

#### 4,421,570 MAKING MOLDS FOR CONTINUOUS CASTING

Horst Gravemann, Osnabrück, Fed. Rep. of Germany, assignor to Kabel und Metallwerke Gutehoffnungshütte AG, Hanover, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,683

Int. Cl.<sup>3</sup> C22F 1/08

U.S. Cl. 148—11.5 C

9 Claims

1. A method of making tubular, curved or straight molds for continuous casting, comprising the steps of providing an age-hardening copper alloy; making a tube from the alloy; solution heat-treating the tube material; subsequently age-hardening the tube at from 400° C. to 600° C. for at least 15 minutes for obtaining internal precipitation; and cold-working the tube by explosion-forming in order to obtain its final size as to its interior serving as a mold cavity.

#### 4,421,571 PROCESS FOR MAKING HIGH STRENGTH DEEP WELL CASING AND TUBING HAVING IMPROVED RESISTANCE TO STRESS-CORROSION CRACKING

Takeo Kudo, Suita; Yasutaka Okada, Nishinomiya; Taishi Moroishi, Kobe; Akio Ikeda, Hyogo; Hiroo Ohtani, Kobe, and Kunihiko Yoshikawa, Suita, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 17, 1982, Ser. No. 389,568

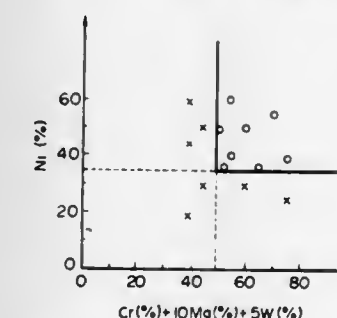
Claims priority, application Japan, Jul. 3, 1981, 56-104111; Jul. 3, 1981, 56-104112; Jul. 3, 1981, 56-104113; Jul. 10, 1981, 56-106913; Jul. 10, 1981, 56-106914; Jul. 10, 1981, 56-106915; Jul. 13, 1981, 56-108985; Jul. 13, 1981, 56-108986; Jul. 13, 1981, 56-108987

Int. Cl.<sup>3</sup> C22C 19/05

U.S. Cl. 148—11.5 R

18 Claims

BATH TEMP. 150°C  
BASIC ALLOY COMPOSITION:  
C Si Mn P S N  
0.01 0.2 0.6 0.005 0.005 0.012



1. A process for manufacturing high strength deep well casing and tubing having improved resistance to stress corrosion cracking, which comprises preparing an alloy composition which is:

C	≤0.05%	Si	≤1.0%
Mn	≤2.0%	P	≤0.030%
S	≤0.005%	N	0-0.30%
Ni	25-60%	Cr	15-35%
Mo	0-12%	W	0-24%
Cr (%) + 10Mo (%) + 5W (%) ≥ 50%			
1.5% ≤ Mo (%) + 1/2 W (%) ≤ 12%			
Cu	0-2.0%	Co	0-2.0%
Rare Earths	0-0.10%	Y	0-0.20%
Mg	0-0.10%	Ti	0-0.5%
and incidental impurities			
balance;			

applying, after hot working, the solid solution treatment to the alloy at a temperature of from the lower limit temperature (°C.) defined by the following empirical formula:  $260 \log C(\%) + 1300$  to the upper limit temperature (°C.) defined by

the following empirical formula:  $16Mo(\%) + 10W(\%) + 10Cr(\%) + 777$  for a period of time of not longer than 2 hours; and applying cold working to the resulting alloy with a reduction in thickness of 10-60%.

#### 4,421,572 THERMOMECHANICAL TREATMENT OF ALLOYS

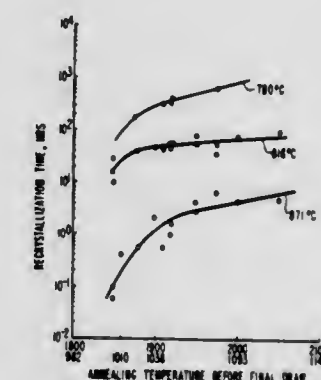
John F. Bates, Ogden, Utah; Howard R. Brager, Richland, Wash., and Michael M. Paxton, Gaithersburg, Md., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 18, 1982, Ser. No. 359,549

Int. Cl.<sup>3</sup> C21D 8/00, 8/10

U.S. Cl. 148—12 E

7 Claims



1. The method of treating an article composed of the alloy having the following composition in weight percent:

Chromium	17.00-18.00
Nickel	13.00-14.00
Carbon	0.040-0.060
Molybdenum	2.00-3.00
Manganese	1.50-2.00
Nitrogen	0.010 maximum
Aluminum	0.050 maximum
Arsenic	0.030 maximum
Boron	0.0010 maximum
Cobalt	0.050 maximum
Columbium	0.050 maximum
Copper	0.04 maximum
Phosphorous	0.020 maximum
Silicon	0.50-0.75
Sulphur	0.010 maximum
Tantalum	0.020 maximum
Vanadium	0.200 maximum
Iron	Balance

so as to reduce swelling under neutron bombardment, the said method comprising cold working said article in repeated steps, reducing the size of said article during each step so that it has predetermined final dimensions, said article being annealed, prior to each size-reduction step, by being heated to an annealing temperature within a predetermined temperature range and for a predetermined interval of time, and after said interval cooling said article, the said annealing temperature range for at least one of said annealing and reduction processes being such that swelling of an article treated by the method, under irradiation by neutron flux, is minimized while the time interval of continuous heating of the article at an elevated temperature, following treatment of the article by this method, after which recrystallization occurs, is at least of the order of 5000 hours.



4,421,573

**METHOD FOR PRODUCING HOT-ROLLED DUAL-PHASE HIGH-TENSILE STEEL SHEETS**

Toshio Irie; Toshiyuki Kato, both of Chiba, and Isao Takahashi, Kurashiki, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

PCT No. PCT/JP81/00281, § 371 Date Jun. 9, 1982, § 102(e) Date Jun. 9, 1982, PCT Pub. No. WO82/01379, PCT Pub. Date Apr. 29, 1982

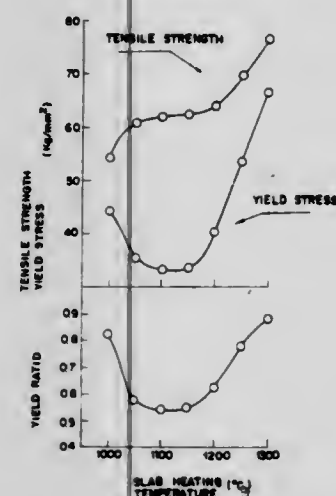
PCT Filed Oct. 14, 1981, Ser. No. 394,999

Claims priority, application Japan, Oct. 14, 1980, 55-143435

Int. Cl.<sup>3</sup> C21D 8/02, 9/46; C22C 38/34

U.S. Cl. 148—12 F

5 Claims



1. A method for producing a hot-rolled dual-phase high-tensile steel sheet having a structure consisting essentially of ferrite and martensite phases, which comprises preparing a slab comprising, by weight, 0.03–0.15% C, 0.5–1.0% Mn, more than 1%, up to 2.0% Si, 0.6–2.0% Cr, 0.01–0.1% Al, the balance being essentially Fe and accompanying impurities, heating said slab at a temperature of 1,050°–1,220° C., hot rolling the heated slab, completing the hot rolling at a temperature of 800°–900° C., cooling the resultant hot-rolled sheet to a temperature of 350°–500° C., and winding the sheet into a coil at the temperature of 350°–500° C.

4,421,574

**METHOD FOR SUPPRESSING INTERNAL OXIDATION IN STEEL WITH ANTIMONY ADDITION**

Grigory Lyudkovsky, Hammond, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Sep. 8, 1981, Ser. No. 299,807

Int. Cl.<sup>3</sup> H01F 1/04

U.S. Cl. 148—111

20 Claims

1. In a process employing hot rolling and cold rolling for making a rolled steel product containing iron, carbon and at least one uncombined additional alloying element having an affinity for oxygen greater than that of iron, with said steel product being intended for subjection, in its cold rolled state, to at least one heating operation which causes oxidation of said uncombined alloying element in an internal oxidation layer adjacent the surface of said steel product, and wherein said uncombined alloying elements comprise silicon and aluminum included in said steel product to improve the magnetic properties thereof, a method for reducing the depth of said internal oxidation layer, said method comprising:

providing the steel product with an antimony content of at least about 0.02 wt.% and which will form, upon the performance of such a heating operation, an antimony-enriched layer at, and immediately adjacent, the surface of said steel product;

and minimizing the surface cleaning of said steel product before the completion of said cold rolling to minimize diminution of the antimony content before the perfor-

mance of the first such heating operation after said completion of the cold rolling there being no annealing step prior to the completion of cold rolling.

4,421,575

**METHOD OF COOLING STEEL PIPES**

Kyohei Murata, Kitakyushu; Heiji Morise, Fukuma; Yoichi Yazaki, Kitakyushu; Kazushi Maruyama, Kitakyushu; Haruyuki Nagayoshi, Kitakyushu, and Etsuji Kajiki, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

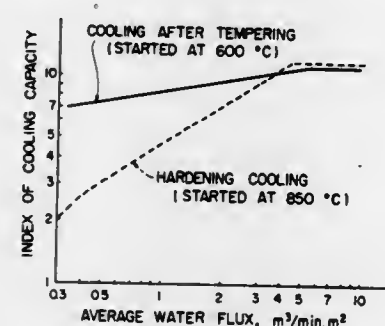
Filed Jan. 9, 1981, Ser. No. 223,924

Claims priority, application Japan, Jan. 16, 1980, 55-2588

Int. Cl.<sup>3</sup> C21D 9/08

U.S. Cl. 148—153

3 Claims



1. In a method of cooling a hardened steel pipe after holding the pipe at a tempering temperature for a given period of time, the improvement which comprises the steps of:

spraying cooling water from outside onto the external surface of the pipe which is being conveyed in the direction of the longitudinal axis thereof, said water being sprayed at a rate of not lower than 0.05 m³/min.m² and not higher than 2 m³/min.m²;

starting the cooling at a pipe temperature between 400° C. and 700° C.; and

continuing the cooling at a rate of not lower than 5° C./sec and not higher than 40° C./sec until the pipe temperature drops to between room temperature and 350° C., thereby causing an appropriate amount of circumferential residual tensile stress to arise at the inside surface thereof to enhance the collapse strength of the pipe.

4,421,576

**METHOD FOR FORMING AN EPITAXIAL COMPOUND SEMICONDUCTOR LAYER ON A SEMI-INSULATING SUBSTRATE**

Stuart T. Jolly, Yardley, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 302,196

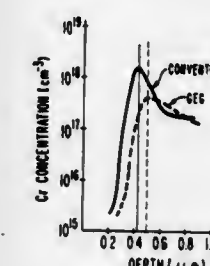
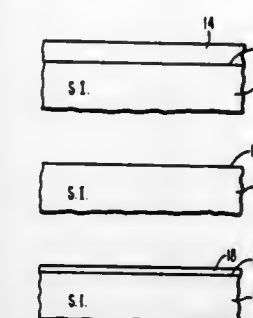
Int. Cl.<sup>3</sup> H01L 21/20, 21/306

U.S. Cl. 148—175

7 Claims

1. A method for forming a III-V type compound semiconductor film in a vapor phase deposition system, comprising: epitaxially forming a first III-V type compound semicon-

ductor layer on a surface of a substrate, which is doped so as to be semi-insulating; completely removing said layer; and



epitaxially forming a second III-V type compound semiconductor layer on said surface.

4,421,577

**METHOD FOR MAKING SCHOTTKY BARRIER DIODES WITH ENGINEERED HEIGHTS**

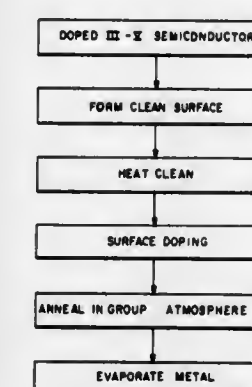
William E. Spicer, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford, Junior University, Stanford, Calif.

Filed Nov. 10, 1980, Ser. No. 205,452

Int. Cl.<sup>3</sup> H01L 21/26

U.S. Cl. 148—187

6 Claims



1. A method of fabricating a semiconductor device including group III elements and group V elements of the periodic table and having a metal contact thereon comprising the steps of:

- (1) forming a semiconductor body including a first dopant of a first conductivity type and having a clean surface with minimal defects;
- (2) introducing a second dopant into said surface;
- (3) exposing said surface to an atmosphere including the group V element of the semiconductor body, and
- (4) providing a metal contact on said surface.

4,421,578

**CASTABLE HIGH EXPLOSIVE COMPOSITIONS OF LOW SENSITIVITY**

Wallace E. Voreck, Jr., Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 19, 1982, Ser. No. 399,391

Int. Cl.<sup>3</sup> C06B 45/00

U.S. Cl. 149—2

9 Claims

1. A castable high explosive composition comprising a mixture of about from:

- 2 to 57 wt. % ammonium nitrate
- 2 to 50 wt. % ethylenediamine dinitrate
- 1 to 10 wt. % potassium nitrate
- 1 to 80 st % nitroguanidine.

4,421,579

**METHOD OF MAKING SOLID POLYMER ELECTROLYTES AND ELECTRODE BONDED WITH HYDROPHYLIC FLUOROCOPOLYMERS**

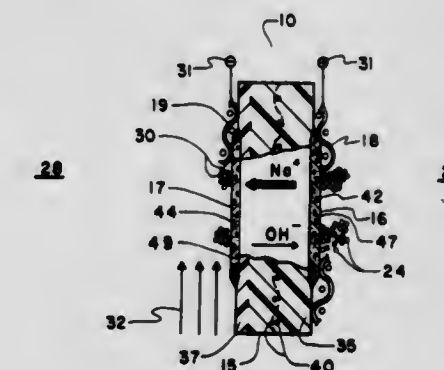
Michael J. Covitch, Cleveland Heights; Donald L. DeRespiris; Leo L. Benezra, both of Mentor, and Elvin M. Vauss, Cleveland, all of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jun. 26, 1981, Ser. No. 277,918

Int. Cl.<sup>3</sup> C25B 1/00

U.S. Cl. 156—60

7 Claims



1. A method for making a copolymeric perfluorocarbon solid polymer electrolyte comprising the steps of:

- (i) blending copolymeric perfluorocarbon in an equivalent weight range of from about 900 to about 1500 with a solvating dispersion media;
- (ii) heating the blend to a temperature of between about 50° C. and 250° C.;
- (iii) maintaining that temperature until a desired quantity of copolymer becomes solvated;
- (iv) cooling sufficiently to form a gelatinous dispersion and forming said dispersion into a desired shape;
- (v) cooling further until some of said dispersion media separate from the dispersion by syneresis, forming droplets within the dispersion;
- (vi) continuing to cool at least until said droplets crystallize within said dispersion;
- (vii) removing at least a portion of the unseparated dispersion media at a temperature below the melting point of the crystallized droplets;
- (viii) hydrolyzing the shaped dispersion; and
- (ix) removing the crystallized droplets to leave a porous, shaped, copolymeric perfluorocarbon solid polymer electrolyte.

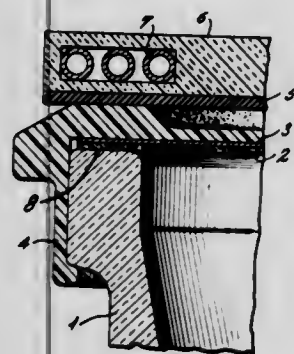


# 4,421,580 PREPARATION OF GLASS CONTAINER FOR THERMOPLASTIC CLOSURE

Michael T. Dembicki, and William J. Poad, both of Brockport, Pa., assignors to Brockway Glass Company, Inc., Brockway, Pa.

Division of Ser. No. 339,340, Jan. 15, 1982, Pat. No. 4,389,266, which is a continuation-in-part of Ser. No. 233,056, Feb. 10, 1981, Pat. No. 4,324,601, which is a continuation-in-part of Ser. No. 86,398, Oct. 19, 1979, Pat. No. 4,260,438. This application Jan. 17, 1983, Ser. No. 458,705  
Int. Cl.<sup>3</sup> B67B 3/00; B32B 17/10  
U.S. Cl. 156—69

9 Claims



1. A method for sealing a rim-like opening in a glass container, said rim-like opening having a sealing surface, comprising:

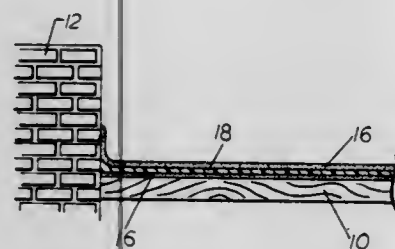
- removing any contaminant material, if present, from the sealing surface,
- treating said surface with a chemical agent comprising at least one metal oxide precursor selected from the group consisting of tin oxide and titanium oxide precursors and mixtures thereof and forming, respectively, a tin or titanium oxide or a mixture thereof coating on said surface, overcoating said tin or titanium oxide or a mixture thereof coating on said surface by
- applying a chromium (III) organic metallic complex to said surface, and
- pressing a membrane comprising a thermoplastic material against said sealing surface at a temperature above the softening point but below the melting point of the plastic.

# 4,421,581 SINGLE PLY ROOFING SYSTEM

Thomas O. Olsen, P.O. Box 18361, Wichita, Kans. 67218  
Filed Apr. 14, 1982, Ser. No. 368,120  
Int. Cl.<sup>3</sup> E04B 2/00

U.S. Cl. 156—71

1 Claim



1. A method of constructing a waterproof roofing covering over a substrate, said method comprising:
- spraying a solution of RTV silicone rubber on said substrate;
  - laying a membrane of silicone rubber impregnated glass fiber fabric over said silicone rubber layer before the latter has fully cured; and
  - spraying said fabric with a second layer of RTV silicone rubber solution, said solution of RTV silicone rubber comprising silicone rubber and a solvent therefore with a solids content of 50% to 70% by weight and a quantity of

SiO<sub>2</sub> comprising 90 to 110% by weight of the combined silicone rubber and solvent, said SiO<sub>2</sub> having a particle size of 45 microns or less.

# 4,421,582 SELF-HEATING ARTICLE WITH DEFORMABLE ELECTRODES

David A. Horsma, Palo Alto, and Stephen H. Diaz, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

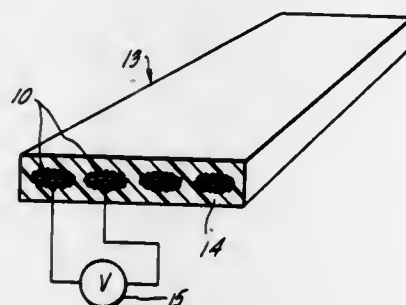
Continuation-in-part of Ser. No. 735,958, Oct. 27, 1976, abandoned, which is a continuation of Ser. No. 601,549, Aug. 4, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,711

Claims priority, application United Kingdom, Aug. 3, 1976, 32378/76

The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.

Int. Cl.<sup>3</sup> H05B 3/12; B29C 27/00; H05B 3/38  
U.S. Cl. 156—86

46 Claims



1. A heat-recoverable article which comprises:

- (a) a heat-recoverable, continuous member which comprises an organic polymer having sufficient finely divided electrically conductive particles dispersed therein to render the member conductive; and
- (b) at least two electrodes which are in contact with said member and spaced from each other and which when connected to a source of electrical power cause current to flow through said member, and at least one of which electrodes is a deformable electrode which comprises a plurality of pliable electrically conductive elements and which, when said article is heat-recovered, undergoes a dimensional change in the direction of heat-recovery of said article without substantially impeding recovery of said article.

46. A process for providing a substrate with a covering which comprises:

- (1) placing adjacent to the substrate a heat-recoverable article which on recovery will cover said substrate and which comprises:
  - (a) a heat-recoverable, continuous member which comprises an organic polymer having sufficient finely divided electrically conductive particles dispersed therein to render the member conductive; and
  - (b) at least two electrodes which are in contact with said member and spaced from each other and which when connected to a source of electrical power cause current to flow through said member, and at least one of which electrodes is a deformable electrode which comprises a plurality of pliable electrically conductive elements and which, when said article is heat-recovered, undergoes a dimensional change in the direction of heat-recovery of said article without substantially impeding recovery of said article; and
- (2) connecting said electrodes to a source of electrical power, thereby causing said article to recover.

# 4,421,583 MAN-MADE FILAMENTS AND METHOD OF MAKING WOUND DRESSINGS CONTAINING THEM

Fred C. Aldred, Cumbria, and Charles R. Moseley, Coventry, both of England, assignors to Courtaulds Limited, London, England

Continuation of Ser. No. 220,042, Dec. 18, 1980, abandoned.

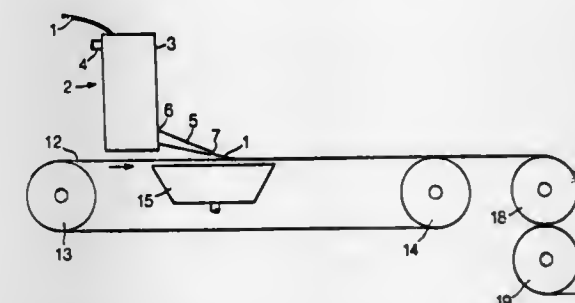
This application Sep. 22, 1982, Ser. No. 421,231

Claims priority, application United Kingdom, Apr. 18, 1979, 7913392

Int. Cl.<sup>3</sup> D04H 3/16

U.S. Cl. 156—167

5 Claims



1. A process for making a non-woven alginate fabric useful as a wound dressing comprising forming a tow of continuous calcium alginate filaments by extruding an alginate solution which has been treated with an oxidising agent into an aqueous solution of a calcium salt, stretching the tow of continuous calcium alginate filaments while still wet with calcium salt solution in an atmosphere of steam, spreading in a flow of water the tow of stretched continuous calcium alginate filaments which have been water washed but not dried, overfeeding the spread filaments onto a water pervious support so that the filaments cross over each other, and drying the filaments by suction while they are on the water-pervious support to such extent that the filaments become self-bonded to each other at their points of contact where they cross over each other in the absence of an adhesive or heat.

# 4,421,584 PROCESS FOR THE PRODUCTION OF SHEET-LIKE MATERIAL COMPRISING SPLIT FIBERS AND APPARATUS THEREFOR

Hiroshi Kitagawa; Masaaki Sato, both of Nagoya, and Shoji Shuto, Oita, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

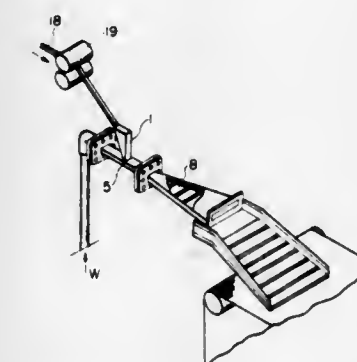
Filed Apr. 13, 1982, Ser. No. 368,233

Claims priority, application Japan, Apr. 13, 1981, 56-55207; Apr. 15, 1981, 56-56437

Int. Cl.<sup>3</sup> D01D 11/02

U.S. Cl. 156—178

16 Claims



1. A process for producing a sheet-like material composed of split fibers, comprising:
- introducing a plurality of continuous fiber bundles into a liquid contained in an inclined splitting unit which is gradually extended in width toward the lower end thereof, said unit being divided into a plurality of grooves so that each fiber

bundle travels with the liquid flowing in the corresponding groove;

splitting each fiber bundle by the action of liquid flowing in the groove while gradually extending the flow width toward the lower end of the groove;

uniformly arranging the resulting split fibers in a subsequent inclined splitting frame; and

continuously placing the thus arranged split fibers on a rotating conveyor to form the sheet-like material.

5. An apparatus for the production of a sheet-like material composed of split fibers, comprising:

a liquid tank from which a plurality of continuous fiber bundles are to be fed, said tank having a slit-like flow outlet provided at a lower portion of a side wall thereof, said bundles passing from said tank together with the liquid;

an inclined splitting unit which is gradually widened toward the lower end thereof, said unit being divided into a plurality of inclined grooves gradually widening toward the lower end of the unit, and plates forming walls of the groove being provided with a plurality of projections in a direction perpendicular to the flow-direction of the liquid; and

a subsequent inclined splitting unit which is gradually increased in width toward the lower end thereof, said unit being provided with a plurality of projections on a bottom plate thereof in a direction perpendicular to the flow direction of the liquid.

# 4,421,585 METHOD FOR PREPARING COVERING SHEETS OR STRIPS IN CREPE RUBBER, FOR USE IN THE PRODUCTION OF SHOES

Camille Boulter, Saint-Amand-Montrond, France, assignor to Chaussures Labelle, France

Filed Jun. 30, 1982, Ser. No. 393,602

Claims priority, application France, Jul. 2, 1981, 81 13030

Int. Cl.<sup>3</sup> B32B 1/00

U.S. Cl. 156—209

1 Claim

1. Method for preparing covering sheets or strips in crepe rubber, wherein the creped appearance is retained in the finished product such as shoes made from such sheets or strips, said method consisting in introducing substantially parallelepipedal and relatively flat pieces of natural rubber of around half a cubic decimeter, between the cylinders of an external mixer, turning at different tangential speeds, the relative space between the cylinders being reduced after each run therethrough of the resulting rubber coagulum, process wherein:

the relative tangential speed of the cylinders and the variation of the space between them are so adjusted as to obtain the formation of "crepe" or "crinkled" natural rubber without breaking the "nerve" of the material,

the pieces thus mechanically mixed, form a sort of a "tongue" or coagulum which, immediately its rear end drops out of the cylinder, is re-introduced therethrough by its front end;

various ingredients, preferably in pulverulent form, such as sulphur, coloring materials, accelerator, are sprayed over the coagulum, on at least some of these runs through the cylinders and penetrate into the rubber by the conjugated mild actions of compression and differential friction exerted by the cylinders;

and the colored, sulphurated and accelerated coagulum thus treated, whose thickness is between 10 and 15 mm, is calendered on smooth and permanently cooled rollers turning at the same tangential speed, in a plurality of successive runs, the distance between these calendering rollers being progressively reduced until the thickness of the resulting strip or sheet is between 1 and 5 mm depending on the use it is wanted for;

and finally, wherein the shoe or other product is mounted with the side strips and sole sheets cold-creped as indicated hereinabove, then it is vulcanized in an autoclave in conditions of temperature, pressure and duration appropriate to the special nature of the basic rubber used.

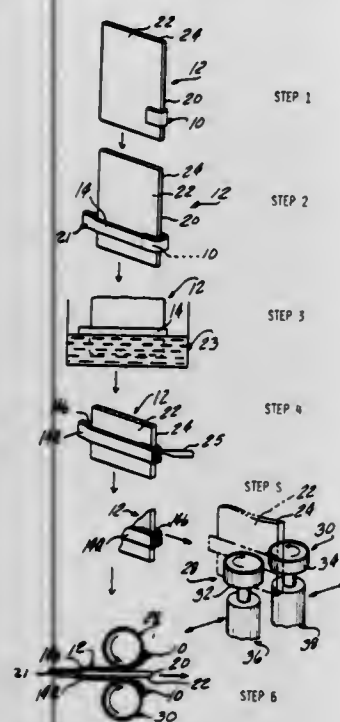


**4,421,586**  
**PROCESS, DISPOSABLE ROLLER COVER, AND MASKING PREFORM FOR REMOVING ADHESIVE TAPE**

Ronald Bargman, 1517 Ferris, Royal Oak, Mich. 48067  
 Filed Sep. 20, 1982, Ser. No. 419,907  
 Int. Cl.<sup>3</sup> B32B 31/00

U.S. Cl. 156-247

5 Claims



1. A process for applying and removing pressure sensitive tape from opposite side surfaces of a generally planar body having edge surfaces comprising the steps of:  
 installing a masking preform on one edge of said body, said preform being frictionally secured by a pair of sides deflected upon installation to generate a spring force urging said sides into frictional engagement with a respective side surface, said sides overlying localized areas adjacent either side of said one edge;  
 applying a length of pressure sensitive tape to said planar body by wrapping about said edge and over said masking preform and extending along said side surfaces;  
 severing said masking preform and said tape along said edge; and  
 stripping said severed lengths by lifting off said severed ends overlying said severed portions of said preform and pulling said tape lengths free from said side surfaces.

**4,421,587**  
**LABEL FEEDER FOR FAN FOLDED DOCUMENTS**  
 Kenneth L. Guenther, Park Ridge; Edward H. Zemke, Chicago, both of Ill., and Gerald D. Warden, Easton, Pa., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jul. 19, 1982, Ser. No. 399,605

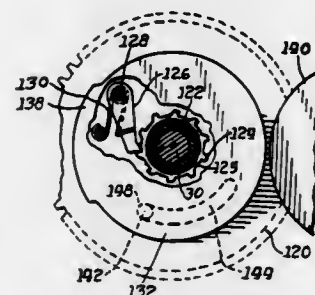
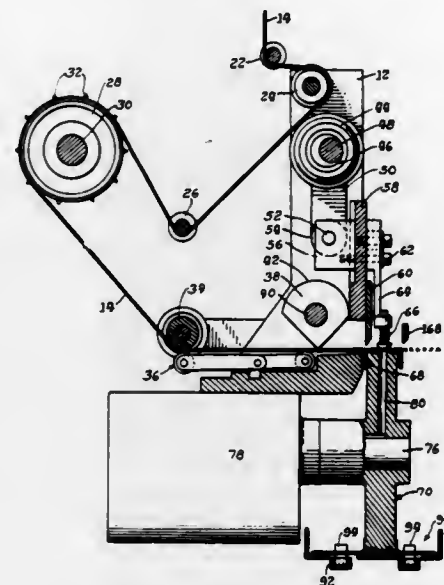
Int. Cl.<sup>3</sup> B32B 31/18, 35/00

U.S. Cl. 156-256

29 Claims

1. A method for preparing and feeding address labels on a web wherein the address labels are arranged in a column, with each address label equal in size to adjacent address labels, and non-addressed areas at equally spaced distances along the web, with the non-addressed areas separated by the address labels, the method comprising:  
 automatically feeding the web a first or second distance, the first distance equal to the desired height of a single label, and the second distance equal to the height of the non-addressed area plus the height of a single label;  
 feeding the web the first distance when only an address label is to be cut from the web and feeding the web the second distance when an address label and adjacent non-addressed area are to be cut from the web;

cutting the address label from the web after the web has been fed the first or second distance;  
 cutting the non-addressed area from the address label if the web was fed the second distance, so that all the address labels are substantially the same size when applied to the mail pieces;



removing the label after it is cut from the web;  
 applying the removed label to a mail piece at a label application location;  
 synchronously moving the mail piece through the label application location with the web advancing and cutting regardless of whether the web was fed the first or second distance.

**4,421,588**  
**PLASTICS ALLOY COMPOSITIONS**  
 Glyndwr J. Davies, Uxbridge, England, assignor to AEPLC, England

Filed Oct. 22, 1982, Ser. No. 435,970

Claims priority, application United Kingdom, Oct. 22, 1981, 8131821

Int. Cl.<sup>3</sup> B32B 31/20

U.S. Cl. 156-308.2

11 Claims

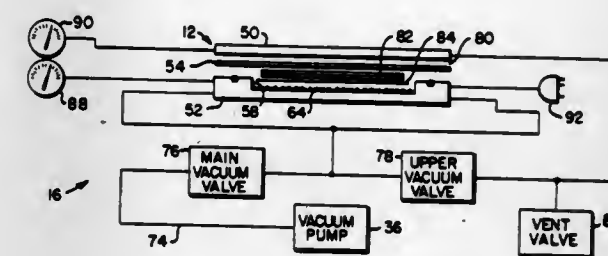
1. A method of making a plain bearing comprising a plastics alloy bearing layer and a metal backing, the method including the steps of mixing together a polyarylene sulphide and a polyether ketone to form an alloy, applying said alloy to said metal backing and bonding said alloy to said backing.  
 5. A method according to any one of claims 1 or 4 wherein said alloy is applied to said backing as a sheet and roll bonded.

**4,421,589**  
**LAMINATOR FOR ENCAPSULATING MULTILAYER LAMINATE ASSEMBLY**

Anthony J. Armini, Bedford, and Michael J. Nowlan, Woburn, both of Mass., assignors to Spire Corporation, Bedford, Mass.  
 Filed Jul. 13, 1982, Ser. No. 397,824  
 Int. Cl.<sup>3</sup> B29C 17/00; C12H 1/00

U.S. Cl. 156-382

10 Claims



1. A laminator featuring a double-vacuum system and comprising:  
 (a) a chamber;  
 (b) means for opening and closing said chamber;  
 (c) means operatively associated with said chamber for creating a vacuum therein;  
 (d) a plurality of heaters surrounding said chamber;  
 (e) cooling means mounted in between said plurality of heaters;  
 (f) control means disposed on the front of said laminator for setting the processing parameters of said laminator, wherein said cooling means comprises a plurality of metal strips removably clamped between said plurality of heaters.

**4,421,590**  
**APPARATUS FOR THE SPLICING OF SHEET MATERIAL, PARTICULARLY FOR THE CONTINUOUS FEEDING OF FAST PRINTING MACHINES**

Luciano Meschi, Leghorn, Italy, assignor to Wully S.A., Panama

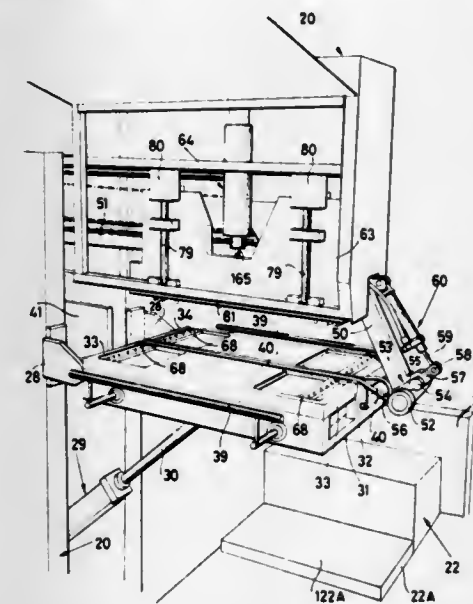
Filed Jun. 22, 1981, Ser. No. 276,014

Claims priority, application Italy, Jun. 23, 1980, 22961 A/80; Jan. 26, 1981, 19335 A/80

Int. Cl.<sup>3</sup> B31F 5/00; G03D 15/04

U.S. Cl. 156-506

19 Claims



1. Apparatus for the continuous feeding of individual forms from a plurality of single forms to a fast printing machine, wherein the individual forms are assembled into respective packages in which said single forms therein are united among themselves at least along two side margins, the apparatus splic-

ing the last form of one package to the first form of another package, the apparatus comprising  
 a splicing plane;  
 means for temporarily retaining respective sheets disposed on said splicing plane with respective edges thereof disposed in edge abutting relationship;  
 means for feeding a tape;  
 means for application of a splicing adhesive tape, said means for application being movable between a pick up position of the tape fed by said means for feeding and a position in which the adhesive tape is registered with respect to the edge abutting splicing edges; and  
 means for cutting and trimming the adhesive tape in correspondence to prefixed and adjustable positions; and  
 presser means dimensioned and configured to engage the two adjacent edge abutting edges to be spliced and press them against the adhesive face of the adhesive tape, the tape having a notched or bored line to separate by tearing the two spliced sheets.

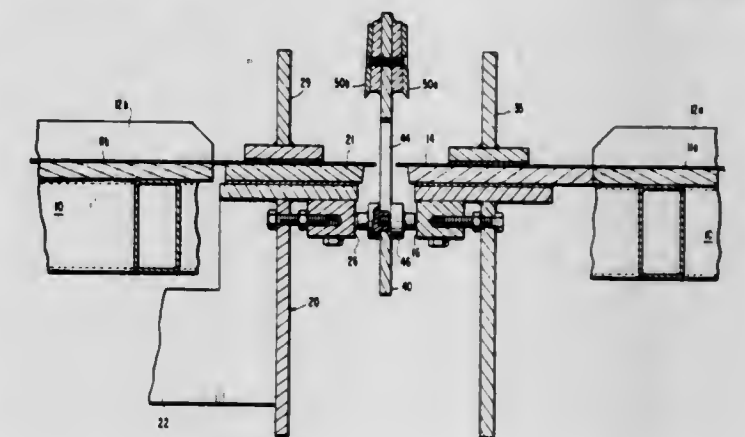
**4,421,591**  
**VENEER BUTT-END SPLICER**  
 John DeLigt, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 9, 1982, Ser. No. 356,491

Int. Cl.<sup>3</sup> B31F 5/00; G03D 15/04

U.S. Cl. 156-508

5 Claims



1. An apparatus for end splicing two wood veneer sheets of substantially the same thickness, said apparatus comprising:  
 a. first and second bed knives having parallel cutting edges disposed in a common table plane;  
 b. carriage means supporting said first bed knife for reciprocatory movement parallel with said table plane and transversely of said cutting edges;  
 c. table clamping means respective to each of said bed knives for securing the position of respective veneer sheets in said table plane over respective bed knife cutting edges, table clamping means respective to said first bed knife being supported by and movable with said carriage means;  
 d. shear plate means supporting first and second shear knives having cutting edges in parallel, spaced apart, first and second shear planes, said second shear plane respective to said second shear knife cutting edge being fixed to include the cutting edge of said second bed knife, said shear plate means being movably mounted to simultaneously translate said shear knife cutting edges transversely across said table plane in a substantially linear shearing motion from above said table plane to below said table plane; and  
 e. spacing means carried by and slidably disposed within a confinement portion of said shear plate means that extends below said table plane when said shear knives are poised above said table plane for engaging abutment surfaces below and respective to each of said bed knives, such engagement being effective for limiting the movement of said first bed knife toward said second bed knife to a position whereat the cutting edge of said first shear knife is coplanar with the



cutting edge of said first bed knife during the translation of said shear knife edges past said bed knife edges.

#### 4,421,592 PLASMA ENHANCED DEPOSITION OF SEMICONDUCTORS

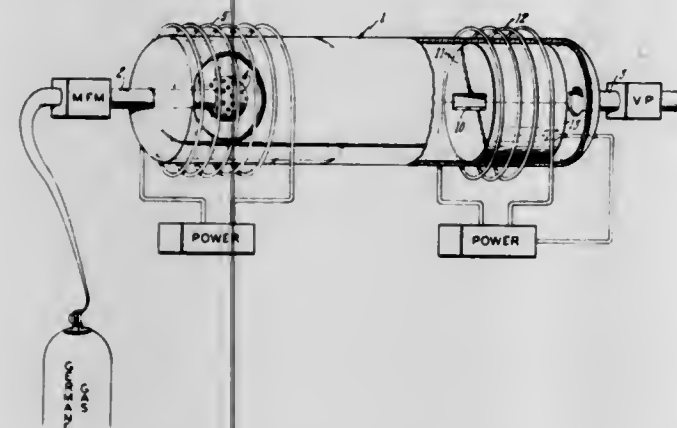
Alexander J. Shuskus, West Hartford, Conn., and Melvyn E. Cowher, East Brookfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 22, 1981, Ser. No. 266,545

Int. Cl.<sup>3</sup> C30B 25/10

U.S. Cl. 156—613

4 Claims



1. A method for depositing large single crystal semiconductor thin films on alkali halide substrates which comprises:
  - a. providing a reaction and chamber means associated therewith for maintaining said chamber at a controllable low pressure;
  - b. providing means for generating a plasma within at least a portion of the reaction chamber, said plasma zone having a primary zone and a secondary zone;
  - c. providing a single crystal alkali halide substrate within the reaction chamber within the plasma zone, said substrate closely matching the semiconductor material to be applied in crystal structure and lattice parameter but having a melting point which is less than the melting point of the semiconductor to be applied, said substrate having associated means for maintaining said substrate at a controllable elevated temperature;
  - d. maintaining the substrate at an elevated temperature and introducing at least one semiconductor precursor gas into the reaction chamber and causing at least a substantial part of the at least one gas to flow through the plasma zone and over the substrate, and then removing said at least one precursor gas from the reaction chamber; while maintaining the reaction chamber at a pressure of from 0.1 to 10 torr;

whereby the semiconductor precursor gas will be largely decomposed in the plasma zone and the semiconductor will be deposited epitaxially on the alkali halide substrate while the substrate is held at a lower temperature than would be required if thermal decomposition was employed to decompose the precursor gas, thereby minimizing contamination of the deposited semiconductor by the substrate material.

#### 4,421,593 REVERSE ETCHING OF CHROMIUM

Bernard J. Curtis, Gattikon, and Martin Ebnoether, Birmensdorf, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,876

Int. Cl.<sup>3</sup> C23F 1/02; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643

16 Claims

1. A process of reverse etching a layer of chromium on a substrate comprising:

(a) forming a layer of resist material on the chromium layer;

- (b) irradiating and developing the resist layer thereby exposing a portion of the chromium layer;
- (c) plasma treating an assembly comprising said substrate and a backing plate comprised of a material resistant to liquids capable of etching chromium for a time sufficient to form a passivating coating on the exposed chromium by back-scattering material from said backing plate, but insufficient to remove all of said resist material;
- (d) removing the remaining resist material, thus exposing the unpassivated portion of the chromium layer; and
- (e) etching the unpassivated chromium layer with a liquid etchant.

#### 4,421,594 METHOD OF AND APPARATUS FOR PRODUCING GRANULATED PRODUCTS FROM A SUSPENSION

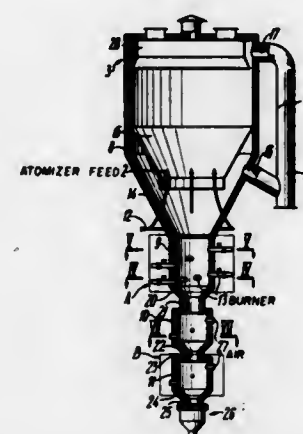
Viktor L. Bildjukevich, ulitsa Surganova, 8, kv. 37; Leonid N. Turovsky, ulitsa Brestskaya, 86, kv. 36; Vyacheslav J. Melshko, proezd Golodeda, 9, kv. 6; Dmitry T. Yakimovich, ulitsa Knorina, 10b, kv. 33; Valentina A. Lebedkova, ulitsa Odoevskogo, 36/7, kv. 92; Boris K. Demidovich, 2 pereulok R. Ljuxemburg, 3-a, kv. 120; Gennady Z. Plavnik, ulitsa Ya. Kolasa, 74, kv. 2; Nikolai N. Dubrovsky, ulitsa R. Ljuxemburg, 193, kv. 55; Evgeny A. Proskolovich, ulitsa R. Ljuxemburg, 178, kv. 12, and Alexandr I. Pivovarov, ulitsa gaya, 38, korpus 2, kv. 5, all of Minsk, U.S.S.R.

Filed Aug. 10, 1981, Ser. No. 291,489

Int. Cl.<sup>3</sup> B01D 1/14, 1/18

U.S. Cl. 159—4 R

8 Claims



1. A method of producing granulated products from a suspension, comprising spraying a suspension in a suspension spraying zone, introducing a heat-carrier in the form of a spiral flow into a thermal treatment zone beneath the suspension spraying zone, drying the suspension by flowing the suspension concurrently relative to the heat-carrier and then countercurrently relative to the heat-carrier, simultaneously separating a fine fraction of the dried suspension by the heat-carrier flow and feeding the fine fraction to the suspension spraying zone, withdrawing spent heat-carrier after drying of the suspension, thermally treating suspension granules produced in the course of drying the suspension by flowing them in a spiral path counter-current to the heat-carrier in the thermal treatment zone up to a temperature sufficient to ensure the desired product properties, and withdrawing the thermally treated granules from the thermal treatment zone.

#### 4,421,595 PROCESS FOR PREPARING THERMOMECHANICAL PULP WITH HEAT RECOVERY

Erkki Huusari, Kaipola, Finland, assignor to Yhtyneet Paperitehtaat oy Jylhavaara, Valkeakoski, Finland

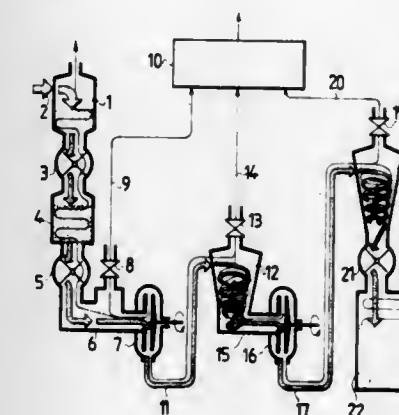
Continuation of Ser. No. 110,747, Jan. 9, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,624

Claims priority, application Finland, Jan. 12, 1979, 790106

Int. Cl.<sup>3</sup> D21B 1/12; D21C 11/06

U.S. Cl. 162—23

3 Claims



1. An improved process for preparing thermomechanical pulp from wood chips, comprising:
  - (a) heating wood chips with process-generated steam in a storage reservoir at atmospheric pressure, and conducting the heated chips through a first lock feeder into a pressurized steaming chamber countercurrent to the steam flow, which further heats said chips in said pressurized chamber to a temperature of 100°–125° C.;
  - (b) passing the further heated chips from said pressurized chamber through a second lock feeder into feeding means for supplying the chips into an enclosed hot refiner, and producing wood pulp and pressurized steam therein at a refining temperature not less than about 135° C.;
  - (c) discharging a first portion of the steam from said refiner in complete countercurrent fashion to the chip flow successively back through said feeding means, second lock feeder, pressurized steaming chamber, first lock feeder and storage reservoir to progressively heat the chips, throttling a second portion of the steam to maintain the desired steam pressure and temperature in the hot refiner, and passing the throttled second portion of the steam to a heat exchanger for recovery of process heat;
  - (d) passing wood pulp along with a third portion of pressurized steam from said first refiner to a first cyclone separator, and passing separated steam from said first cyclone separator throttled to lower pressure to said heat exchanger for recovering process heat; and
  - (e) passing the remaining wood pulp to a second refiner, from which the wood pulp and accompanying steam are passed to a second cyclone separator, from which recovered steam is throttled to a lower pressure and passed to said heat exchanger, and the pulp is passed through a third lock feeder to a container from which the remaining steam is vented to the atmosphere to prevent air from entering the process.

#### 4,421,596 METHOD RELATING TO DISSOLVING MOLTEN SMELT

Ebbe T. Högborg, Karlstad, Sweden, assignor to Billerud Udeholm Aktiebolag, Sjöfö, Sweden

Filed Mar. 18, 1982, Ser. No. 359,491

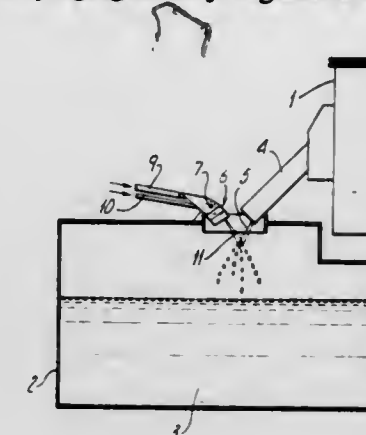
Claims priority, application Sweden, Mar. 23, 1981, 8101843

U.S. Cl. 162—30.11

10 Claims

1. A method comprising dissolving molten smelt from the smelt spout in a chemical recovery apparatus in a sulphate pulp

plant, characterized therein that the molten chemicals, which are discharged from the chemical recovery boiler, are caused to form a free falling stream, that a jet of air-water mist is formed by impinging an air jet against a water jet, and that the



air-water mist jet is directed against the smelt stream such that the molten material is disintegrated into smaller droplets with reduced risk of violent reactions caused by water-smelt contact whereafter said droplets fall down into a bath (3), and the smelt is dissolved in an aqueous solution to produce green liquor.

#### 4,421,597 METHOD FOR RECOVERING HEAT IN AN ALKALINE PULP DIGESTING PROCESS

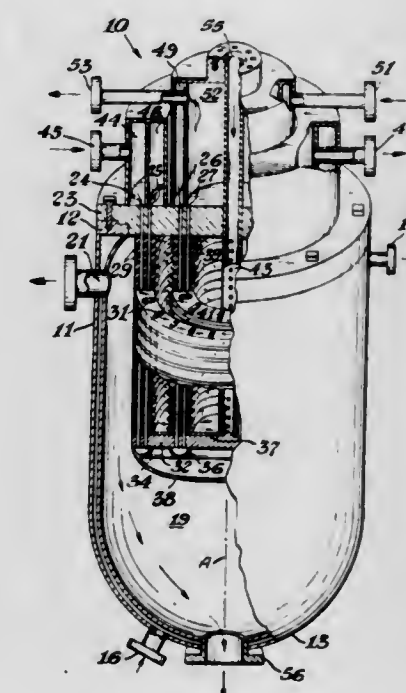
A. Douglas Armstrong, Duluth; Vernon B. Bodenheimer, Dunwoody, both of Ga., and Tom O. Rytter, Crossett, Ark., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Dec. 8, 1981, Ser. No. 328,528

Int. Cl.<sup>3</sup> D21C 7/08, 11/06

U.S. Cl. 162—47

36 Claims



1. A method for recovering heat in an alkaline pulp digesting process comprising the steps of:
  - (a) blowing a pulp and liquor mixture from a digester to a receiving container wherein the pressure in said receiving container rises above atmospheric pressure and vapor flashes from the mixture;
  - (b) controlling the transfer of the flash vapor from said receiving container in accordance with the pressure of said flash vapor by:
    - (i) transferring flash vapor from said receiving container to a pressure accumulator for accumulating the flash vapor therein at a pressure above atmospheric pressure when the pressure of the flash vapor rises to a predetermined pressure sufficiently above atmospheric pressure



- to raise the temperature of a processing liquid in the pressure accumulator; and
- (ii) transferring flash vapor from said receiving container to an atmospheric accumulator for heat recovery when the pressure of said flash vapor drops below the predetermined pressure; and
- (c) mixing the flash vapor transferred to the pressure accumulator with the processing liquid at a pressure above atmospheric pressure to raise the temperature of the processing liquid.

4,421,598

### BLEACHING PROCEDURE USING CHLORINE DIOXIDE AND CHLORINE SOLUTIONS

Douglas W. Reeve, Toronto, Canada, assignor to Erco Industries Limited, Islington, Canada

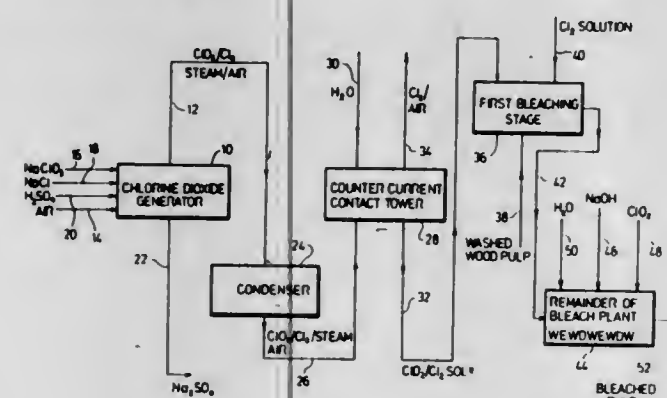
Continuation-in-part of Ser. No. 293,592, Aug. 17, 1981, which is a continuation of Ser. No. 98,524, Nov. 29, 1979, Pat. No. 4,299,653, which is a continuation-in-part of Ser. No. 30,557, Apr. 16, 1979, abandoned. This application Mar. 22, 1982, Ser. No. 360,595

The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C01B 11/02; D21C 9/14

U.S. Cl. 162—88

13 Claims



1. A method of bleaching pulp using chlorine dioxide, which comprises:

- (a) continuously forming a gaseous mixture of chlorine dioxide, chlorine and steam by:
- (i) continuously feeding a sodium chlorate solution to an aqueous acid reaction medium present in a unilocal reaction zone,
- (ii) continuously feeding sulphuric acid to said aqueous reaction medium in an amount to maintain the total acid normality of the reaction medium in the range of about 2 to about 4.8 normal,
- (iii) continuously feeding sodium chloride, hydrochloric acid or a mixture of sodium chloride and hydrochloric acid to said aqueous reaction medium,
- (iv) continuously maintaining said reaction medium at a temperature of about 55° to about 85° C. while maintaining said reaction zone under a subatmospheric pressure of about 80 to about 300 mm Hg to cause the formation of chlorine dioxide and chlorine and the evaporation of water from the reaction medium,
- (v) continuously depositing anhydrous neutral sodium sulphate from the reaction medium in said reaction medium in said reaction zone once the reaction medium becomes saturated thereby after start up, and
- (vi) continuously removing the gaseous mixture of chlorine dioxide, chlorine and steam from the reaction zone;
- (b) continuously cooling said gaseous stream to a temperature of about 3° to about 60° C. to cause condensation of at least a substantial proportion of the steam therefrom to provide a chlorine dioxide- and chlorine-containing gas stream;
- (c) continuously contacting the latter gas stream with water having a temperature of about 0° to about 22° C. at a flow rate sufficient to form an aqueous solution of chlorine

dioxide and chlorine containing chlorine in an amount of 6 to 10% of the available chlorine of the solution, and a gaseous chlorine stream; and

- (d) bleaching a cellulosic fibrous material pulp for about 10 to about 60 minutes at a temperature of about 35° to about 70° C. in an aqueous suspension having a consistency of about 2 to about 16% by weight of pulp and containing no more dissolved organic material than up to about 2% by weight TOC on pulp at an overall equivalent chlorine concentration of about 2 to about 10% by weight of the pulp, by:

- (i) subjecting said suspension to a first bleaching step at an acid pH value using at least part of said aqueous solution of chlorine dioxide and chlorine formed in step (c), and
- (ii) without an intermediate washing step, subjecting the suspension to a second bleaching step at an acid pH using a chlorine solution formed from at least part of the gaseous chlorine stream from Step (c) and commencing about 5 seconds to about 10 minutes after commencement of said first bleaching step,

the chlorine dioxide in said aqueous solution of chlorine dioxide and chlorine constituting about 20 to about 90% of the total available chlorine used in said first and second bleaching steps.

4,421,599

### FIBROUS MATERIALS

Shinichi Kuzuoka, Yokohama; Yoshinori Tachibana, Kawagoe; Goro Saito, Saitama, and Nobuyuki Kitajima, Hino, all of Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Nov. 30, 1981, Ser. No. 326,055

Claims priority, application Japan, Aug. 24, 1981, 56-132382

Int. Cl.<sup>3</sup> D21H 5/12

U.S. Cl. 162—100

7 Claims

1. A method of manufacturing a fibrous material containing large amounts of inorganic fine powders or inorganic short fibers comprising impregnating raw fibrous material with a polymer flocculant in the amount ranging from 0.01 to 5%, calculated as dry solids; drying the fibrous material impregnated with the polymer flocculant at a temperature lower than the denaturing temperature of the polymer flocculant; loosening the fibrous material into a bulky fibrous material, press-molding the bulky fibrous material at a pressure of 5 to 50 kg/cm<sup>2</sup> thereby forming a compact fibrous material; dispersing and disintegrating said compact fibrous material in water such that said impregnated polymer flocculant is released into the water; adding 98% to 50% by weight of the inorganic fine powders or inorganic short fibers to 2 to 50% by weight of said fibrous material to said dispersed and disintegrated fibrous material; and thereafter forming a fibrous material containing large amounts of inorganic powders or inorganic short fibers.

4,421,600

### TRI-NIP PAPERMAKING SYSTEM

Ronald E. Hostetler, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Jul. 6, 1981, Ser. No. 280,752

Int. Cl.<sup>3</sup> D21H 5/24

U.S. Cl. 162—111

8 Claims

1. A method for manufacturing a bulky, soft and absorbent paper web comprising the steps of:

- positioning a wet web of principally lignocellulosic fibers on a first dewatering felt;
- conveying the wet web while positioned on the first dewatering felt through a first nip formed by said first dewatering felt and a second dewatering felt to provide overall mechanical compaction of said web and partially dewater said web to an overall fiber consistency of from about 22% to about 35%;
- conveying said partially dewatered and overall mechanically compacted web to a second nip formed between a dewatering felt and an open mesh imprinting fabric formed of woven filaments, said fabric having spaced

compaction elements and defining voids between the filaments;

while the partially dewatered, overall mechanically compacted web is in said second nip, rebulking said overall mechanically compacted web by impressing said web against said fabric whereby from about 5% to about 50% of said web will be compacted by said compaction elements and from about 50% to about 95% of said web will be impressed into said voids and displaced from the portion of the web compacted by said compaction elements; retaining the rebulked web on said imprinting fabric after the rebulked web passes through said second nip; and removing the rebulked web from the imprinting fabric before final drying thereof by applying the rebulked web to a creping surface at a third nip location, said third nip being formed between the creping surface and the imprinting fabric, and said rebulked web being retained on the imprinting fabric in an essentially undisturbed condition during retention thereof on said imprinting fabric between said second and third nips.

4,421,602

### LINEAR BASIC POLYMERS, THEIR PREPARATION AND THEIR USE

Fritz Brunnmueller, Limburgerhof; Rolf Schneider; Michael Kroener, both of Mannheim; Hans Mueller, Ludwigshafen, and Friedrich Linhart, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,234

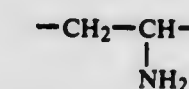
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128478

Int. Cl.<sup>3</sup> C08F 22/36; D21H 3/38

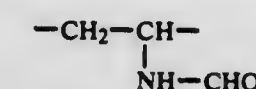
U.S. Cl. 162—168.2

8 Claims

1. A linear basic polymer containing from 90 to 10 mole % of units of the formula



and from 10 to 90 mole % of units of the formula



and having a Fikentscher K value of from 10 to 200 (measured in 0.5% strength aqueous sodium chloride solution at 25° C.).

4,421,601

### WATER-INSOLUBLE AZO-PURIMIDINE PIGMENTS AND THEIR USE IN COLORING SUBSTRATES

Günter Stephan, Schildgen, and Karl H. Schünderhütte, Opladen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 792,607, May 2, 1977, abandoned, which is a continuation of Ser. No. 703,012, Jul. 6, 1976, abandoned,

which is a continuation of Ser. No. 513,486, Oct. 9, 1974, Pat. No. 4,014,863. This application Jan. 3, 1978, Ser. No. 866,538

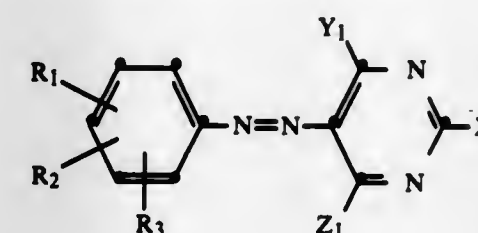
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1973, 2351294

Int. Cl.<sup>3</sup> C09D 1/00, 11/02, 17/00; D06P 1/44

U.S. Cl. 162—162

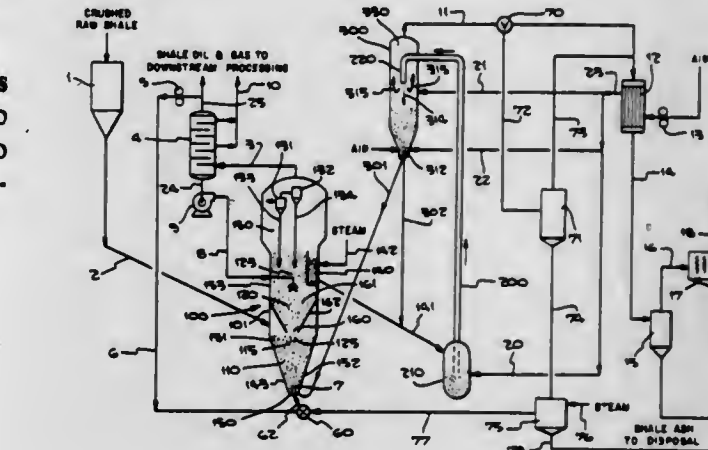
18 Claims

1. In a process wherein a finely divided pigment is added to a substrate material to be colored in an amount sufficient to obtain a predetermined coloration of said material, the improvement comprising employing a dyestuff of the formula:



wherein

- X<sub>1</sub> denotes amino, cyanamino, acetylamino, guanidino, ureido or hydroxyl;
- Y<sub>1</sub> and Z<sub>1</sub> denote hydroxyl or amino, with the proviso that at most 2 of the 3 radicals X<sub>1</sub>, Y<sub>1</sub> and Z<sub>1</sub> denote hydroxyl;
- R<sub>1</sub> represents hydrogen, nitro, chlorine, bromine, C<sub>1</sub>–C<sub>4</sub>-alkyl, C<sub>1</sub>–C<sub>4</sub>-alkoxy, nitrile, C<sub>1</sub>–C<sub>4</sub>-alkylsulphonyl, trifluoromethyl, phenylsulphonyl, benzylsulphonyl, phenoxy, carbo-C<sub>1</sub>–C<sub>4</sub>-alkoxy, carbophenoxy, carbonamido, C<sub>1</sub>–C<sub>4</sub>-alkylcarbonamido, benzoylamino, sulphonamido, or carbonamido or sulfonamide monosubstituted or disubstituted by C<sub>1</sub>–C<sub>4</sub>-alkyl, phenyl, or benzyl; and
- R<sub>2</sub> and R<sub>3</sub> represent hydrogen; chlorine C<sub>1</sub>–C<sub>4</sub>-alkyl, carbo-C<sub>1</sub>–C<sub>4</sub>-alkoxy, carbonamido; carbonamido monosubstituted or disubstituted by C<sub>1</sub>–C<sub>4</sub>-alkyl, phenyl, or benzyl, or C<sub>1</sub>–C<sub>4</sub>-alkoxy.



1. A method for pyrolyzing carbonaceous materials which comprises pyrolyzing solid carbonaceous particles in a pyrolysis zone having a first pyrolysis stage and a second pyrolysis stage, said pyrolysis zone being located within a single pyrolysis retort, both of said pyrolysis stages having an inverted frusto-conical shape with an apex and an open base, said pyrolysis stages being vertically oriented within said pyrolysis retort so that said second pyrolysis stage is located above said first pyrolysis stage, the apex of the second pyrolysis stage having an inlet in fluid communication with the base of said first pyrolysis stage, said pyrolysis comprising (i) forming, in said pyrolysis zone, a fluidized mixture of said solid carbonaceous particles and attrition resistant solid heat-carrying bodies in a fluidizing non-combusting gas having sufficient velocity to form said fluidized mixture of solid carbonaceous particles and solid heat-carrying bodies, the amount and temperature of said heat-carrying bodies being sufficient to heat said solid carbonaceous particles to their pyrolysis temperature; and (ii) uni-



formly pyrolyzing said fluidized solid carbonaceous particles within said pyrolysis zone by flowing said fluidized mixture upward through said first pyrolysis stage, through said inlet and upward through said second pyrolysis stage to form carbonaceous pyrolysis vapors and spent pyrolyzed solid carbonaceous particles containing inorganic material and residual carbon, separating said vapors from said spent solid particles and removing said vapors and said spent solid particles from said pyrolysis zone.

4,421,604

## PROCEDURE TO CONTROL QUALITY OF COAL

Wilhelm Weskamp, Wattenscheid; Gerd Nashan, Oberhausen, and Wilhelm Stewen, Dortmund, all of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany

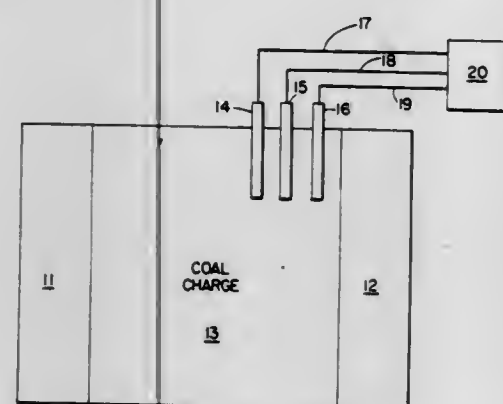
Filed Oct. 23, 1981, Ser. No. 314,259

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040331

Int. Cl.<sup>3</sup> C10B 47/06, 47/28, 57/06, 57/10

U.S. Cl. 201-1

11 Claims



1. A method for producing coke of a desired quality from coal in a coking cycle, comprising the steps of: charging a portion of said coal into a coke oven; obtaining temperature measurements of the portion of said coal charged into a coke oven during the coking cycle of said coal, said temperature measurements being taken incrementally from the coke oven chamber wall towards the center of said oven chamber; determining a temperature contour of the portion of said coal charge during the coking cycle of said charge, said temperature contour being based on said incremental temperature measurements; measuring the width of a plastic zone in said coal as reflected in said temperature contour; comparing said measured plastic zone width with a predetermined plastic zone width that is known to result in the production of coke of a desired quality; adjusting at least one characteristic of a further portion of said coal so as to result in a change in the width of the plastic zone of said coal when said further portion is charged into the coke oven, said adjustment resulting in a plastic zone, having a width that more nearly resembles said predetermined plastic zone width; charging said adjusted further portion of coal into the coke oven; and heating said adjusted further portion of charged coke to produce coke of the desired quality.

4,421,605

## DISTILLATION APPARATUS UTILIZING THERMOCOMPRESSOR PRINCIPLES

Esko Huhta-Koivisto, Espoo, Finland, assignor to Oy Finn-Aqua Ltd., Finland

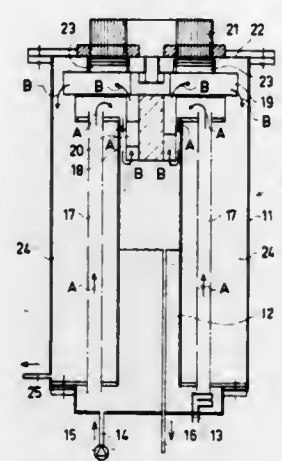
Filed Mar. 19, 1982, Ser. No. 359,924

Claims priority, application Finland, Mar. 27, 1981, 810965

Int. Cl.<sup>3</sup> B01D 1/06, 1/28, 3/04, 3/42

U.S. Cl. 202-181

11 Claims



1. In distilling apparatus for operation according to the thermocompressor principle including a housing, a boiling chamber at least partially defined by a wall situated within the housing and adapted to contain the liquid to be distilled, means for heating the liquid to be distilled contained in the boiling chamber to produce a vapor, feed line means for conducting liquid to be distilled into the boiling chamber, means for imparting additional energy to the vapor produced in the boiling chamber having an inlet side to which the vapor formed in the boiling chamber is directed and an outlet side from which the vapor is discharged at an increased temperature, and distillate removal line means for withdrawing distillate from the distilling apparatus, the improvement comprising:

at least one heat exchange tube provided within the housing of the distilling apparatus and arranged such that a mixture composed of liquid to be distilled and a vapor flows therethrough;

droplet separation means provided within said housing, said droplet separation means being situated so as to define a gap between it and a wall defining the boiling chamber, and through which gap the mixture of liquid to be distilled and vapor discharging from said at least one heat exchange tube is adapted to flow;

said droplet separation means being arranged such that after the mixture of liquid to be distilled and vapor flows through said gap, the vapor flows through said droplet separator into said means for imparting additional energy to the vapor; and

wherein said means for imparting additional energy to the vapor is constituted by blower means situated within said distillation apparatus.

4,421,606

## PROCESS FOR DISTILLING WATER

Kenji Tsumura, Nishinomiya, and Masayuki Yamashita, Osaka, both of Japan, assignors to Oriental Metal Mfg. Co., Amagasaki, Japan

Division of Ser. No. 129,740, Mar. 12, 1980, Pat. No. 4,329,205.

This application Oct. 26, 1981, Ser. No. 315,236

Claims priority, application Japan, Mar. 22, 1979, 54-34051; Aug. 11, 1979, 54-102576

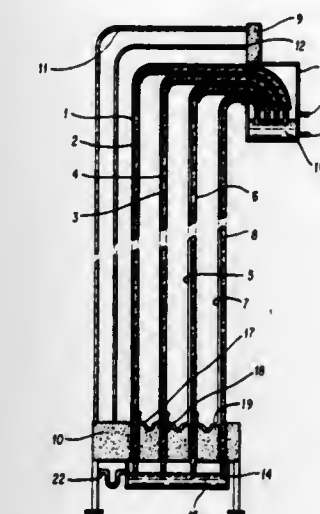
Int. Cl.<sup>3</sup> B01D 3/02

U.S. Cl. 203-10

3 Claims

1. A process for distilling water which comprises providing a mirror-like heat-reflective surface on one side of a plurality of cooling plates, heating one side of a heat receiving plate mem-

ber, evaporating water to be treated which is held on the other side of said heat receiving plate member, condensing the resulting water vapor on the heat-reflective condensing surface of a cooling plate member which is the cooling plate member adjacent to said heat receiving plate member among a plurality of cooling plate members provided at a space to each other and in



parallel with said heat receiving plate member, repeating the evaporation of water to be treated which is held on the opposite side of each cooling plate member to the condensing surface and the condensation of the resulting water vapor on the condensing surface of the next adjacent cooling plate member, said evaporation being caused by the latent heat of said condensation, and collecting the condensed water.

4,421,607

## PROCESS FOR EXTRACTIVE DISTILLATION OF PLURAL HYDROCARBON MIXTURES

Shunichiro Ogura, Tokyo, Japan, assignor to Nippon Zeon Co. Ltd., Tokyo, Japan

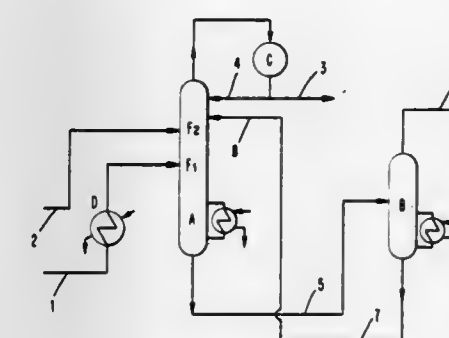
Filed Feb. 1, 1983, Ser. No. 463,049

Claims priority, application Japan, Feb. 2, 1982, 57-15329

Int. Cl.<sup>3</sup> B01D 3/40; C07C 7/08

U.S. Cl. 203-60

5 Claims



1. A process of extractive distillation for separating components easily soluble in a polar solvent from at least two hydrocarbon mixtures having different contents of the easily soluble components by extractive distillation using said polar solvent, which comprises feeding a hydrocarbon mixture containing a larger amount of the easily soluble components, as a gas, into the middle or lower portion of an extractive distillation column, feeding a hydrocarbon mixture containing a smaller amount of the easily soluble components, as a liquid, to the upper portion of the extractive distillation column, and subjecting them to extractive distillation.

4,421,608

## METHOD FOR STRIPPING PEEL APART CONDUCTIVE STRUCTURES

Donald G. McBride, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,310

Int. Cl.<sup>3</sup> C25D 1/04, 7/06; C23F 1/02

U.S. Cl. 204-12

8 Claims

1. A method for stripping a peel apart structure, said peel apart structure having an electrolytic plated copper first layer in a predetermined superimposed and peelably adhered relationship with an electrolytic copper foil carrier second layer, said first and second layers having an average bond strength therebetween of approximately two to four psi, said method comprising the steps of:

providing water for reducing said average bond strength between said first and second layers approximately thirty to forty percent,

mechanically peeling apart said first and second layers, and applying said water in a chemically inert manner between said first and second layers during the peel apart operation between said first and second layers.

5. In a method for making printed circuit boards, said method using at least one peel apart conductive flexible planar sheet structure having an electrolytic plated copper first layer in a predetermined superimposed and peelably adhered relationship with an electrolytic copper foil carrier second layer, said first and second layers having an average bond strength therebetween of approximately two to four psi, and a metal release agent third layer disposed between said first and second layers, said first and second layers having an average bond strength therebetween of approximately two to four psi, said method further including a step for mechanically peeling said second layer from said first layer, the combination therewith comprising the steps of:

providing deionized water for reducing said bond strength between said first and second layers approximately thirty to forty percent, and

applying said deionized water in a chemically inert manner between said first and second layers during said peeling step.

4,421,609

## PROCESS FOR PRODUCING ELECTRODE WITH CURRENT OUTLETS

Francois Gerard, and Jean-Yves Machat, both of Clermont-Ferrand, France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 166,027, Jul. 7, 1980, Pat. No. 4,336,124.

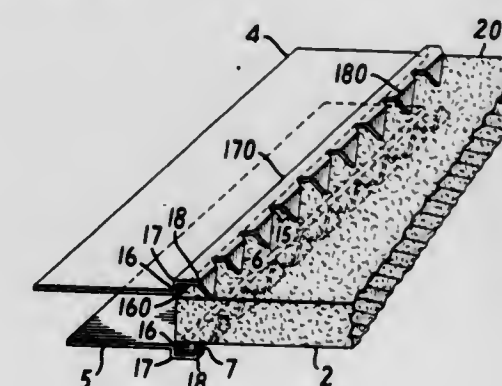
This application Jan. 15, 1982, Ser. No. 339,485

Claims priority, application France, Jul. 16, 1979, 79 18549

Int. Cl.<sup>3</sup> C25D 5/02

U.S. Cl. 204-16

4 Claims



1. A process for producing an electrode comprising, on the one hand, at least one body formed at least in part of an electron-conductive porous skeleton with two main faces and, on the other hand, at least one current outlet, characterized by:



- (a) making the current outlet with at least one electron-conductive plate having roughnesses, said roughnesses having, for each plate, main faces arranged substantially in a plane, the ratio  $R_d = (S_r/S)$  being at least equal to 25% and at most equal to 70%,  $S_r$  representing the sum of the areas of these main faces for all the roughnesses of the outlet, and  $S$  representing the area of the cross-section of the skeleton in the vicinity of the roughnesses of said outlet, the cross-section being taken along a plane parallel to the plane or planes of said main faces of the roughnesses,  $S_r$  including the areas of any openings in the main faces of each plate;
- (b) causing the roughnesses to penetrate into the skeleton;
- (c) clamping the skeleton by pressure where it is in contact with the plate to result in a decrease  $\Delta e$  of the original thickness "e" of the skeleton, the ratio  $R_S = (\Delta d/e)$  being at least equal to 5% and at most equal to 50%;
- (d) electrolytically depositing a metal in the skeleton and firmly connecting the plate to the skeleton by means of the electrolytic metallic deposit which adheres both to the skeleton and to the plate, said deposit being inert under the conditions of use of the electrode.

4,421,610

## ELECTROLYTIC COLORING PROCESS

Dionisio Rodriguez, General Mola, 74-8a, Planta, Madrid - 6, Spain

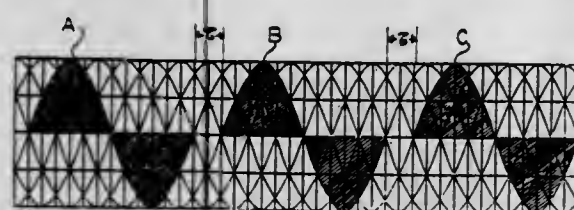
Filed Apr. 16, 1981, Ser. No. 254,589

Claims priority, application Spain, Jan. 16, 1981, 498.578

Int. Cl.<sup>3</sup> C25D 11/22

U.S. Cl. 204—35 N

3 Claims



1. An electrolytic coloring process for aluminum or aluminum alloy sections which have been previously subjected to anodic oxidation, characterized by the following stages:

- (a) subjecting an aluminum or aluminum alloy section which has been previously subjected to anodic oxidation to electrolytic treatment, in the absence of metal salts, in an electrolyte of a low power of dissolution having a concentration in  $H^+$  equivalent to an  $H_2SO_4$  solution of less than 4 gm/lit. by applying an alternating current having a peak voltage of between 55 and 85 volts and a current density of less than 0.3 amp/dm<sup>2</sup>, said current being derived from the secondary branches of a polyphase transformer wherein the current is controlled so that a first phase is connected to apply one cycle of alternating current to the section, the first phase is disconnected and a second phase, which is the next consecutive phase after the first phase, is connected to apply one cycle of alternating current, the second phase is disconnected and a third phase is connected, and so on until each phase of the polyphase current has been sequentially connected to apply one cycle of alternating current to the section, said one cycle being composed of a positive half cycle and a negative half cycle, and wherein the positive and negative half cycles have the same conduction angle; and
- (b) electrolytically coloring the treated section in an acid electrolyte containing a metal salt or salts, using alternating current at a peak voltage of between 55 and 85 volts, obtained from the same source of current use in the electrolytic treatment stage.

4,421,611  
ACETYLENIC COMPOSITIONS AND NICKEL PLATING BATHS CONTAINING SAME

James C. Cameron, Lakewood, Ohio, assignor to McGraw-Hill, Inc., Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 431,102

Int. Cl.<sup>3</sup> C25D 3/16, 3/56; C07C 33/04

U.S. Cl. 204—43 T

32 Claims

1. 3-(2-propynoxy)-2-propenoic acid.
2. A method of preparing 3-(2-propynoxy)-2-propenoic acid which comprises reacting propiolic acid with propargyl alcohol in an aqueous alkaline solution and thereafter acidifying the reaction mixture.
3. An acetylenic composition prepared by a process comprising the steps of
  - (a) reacting propargyl alcohol with an alkali metal permanganate in an aqueous alkaline solution,
  - (b) filtering the reaction mixture, and
  - (c) acidifying the filtrate with acid.
4. An aqueous acidic plating bath for the electrodeposition of nickel or a nickel-iron alloy on a substrate which bath comprises nickel ions, or a mixture of nickel ions and iron ions, and as a brightening and leveling agent, an effective amount of 3-(2-propynoxy)-2-propenoic acid.

4,421,612

## PROCESS FOR THE PREPARATION OF A DARK-COLORED, WAVE-LENGTH SELECTIVE OXIDE FILM ON ALUMINUM

Ketil Videm, Kjeller, Norway, assignor to Institutt for Energiteknikk, Kjeller, Norway

PCT No. PCT/NO80/00036, § 371 Date Jun. 29, 1981, § 102(e)

Date Jun. 29, 1981, PCT Pub. No. WO81/01424, PCT Pub.

Date May 28, 1981

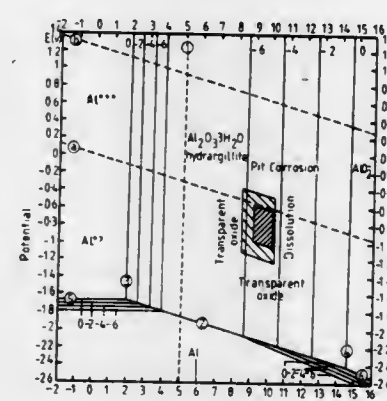
PCT Filed Nov. 7, 1980, Ser. No. 279,973

Claims priority, application Norway, Nov. 9, 1979, 793621

Int. Cl.<sup>3</sup> C23F 7/06; C25D 11/04

U.S. Cl. 204—58

17 Claims



Potential-pH-area for blackening of Al in basic aluminum chloride solutions shown in a Pourbaix-diagram  
 Area with strong blackening  
 Area with some blackening  
 Diagram validity up to ca 50°C

1. A process for providing a dark colored, wavelength selective oxide film on a piece of aluminum which comprises the steps of

- (1) providing a piece of cleaned aluminum,
- (2) providing an aqueous treatment bath which contains 1 to 100 g/l of  $NH_4Cl$ , has a temperature of between 20° and 100° C. and has a pH of 8.9 to 10.9,
- (3) immersing said piece of cleaned aluminum in said aqueous treatment bath for up to 45 minutes while concurrently subjecting said piece of cleaned aluminum to an electrode potential of between -1.1 and -0.6 volts relative to a saturated calomel electrode, and
- (4) removing said piece of cleaned aluminum from said aqueous treatment bath.

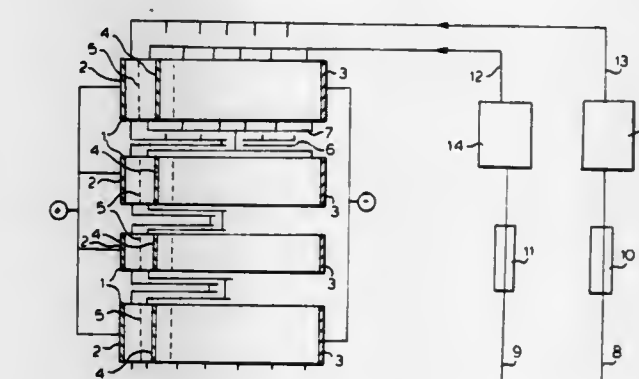
4,421,613  
PREPARATION OF HYDROXY COMPOUNDS BY ELECTROCHEMICAL REDUCTIONFrancis Goodridge, Newcastle-upon-Tyne; Anthony J. Montgomery, Brentwood, and Alan R. Wright, Walsend, all of England, assignors to Bush Boake Allen, London, England  
Continuation of Ser. No. 222,997, Jan. 6, 1981, abandoned. This application Jul. 21, 1982, Ser. No. 400,470

Claims priority, application United Kingdom, Jan. 7, 1980, 8000423

Int. Cl.<sup>3</sup> C25B 3/04

U.S. Cl. 204—74

14 Claims



1. A method for the preparation of an organic hydroxy compound of the formula ROH, wherein R represents a terpenoid group, by electrochemical reduction of a substituted hydroxylamine of the formula  $RONR'_2$  wherein each  $R'$  is hydrogen or a hydrocarbon or substituted hydrocarbon group or  $NR'_2$  represents a nitrogen-containing organic heterocyclic ring in an electrolytic cell comprising a cathode, a catholyte at a pH of from 3 to 6.5 in contact with the cathode, an anode, an anolyte in contact with the anode and a membrane separating the catholyte from the anolyte and in which the catholyte is electrically conducting and consists essentially of an organic carboxylic acid and a solution of the substituted hydroxylamine and the organic hydroxy compound is recovered from the catholyte.

4,421,614

## METHOD OF BYPASSING ELECTRIC CURRENT OF ELECTROLYTIC CELLS

Kenzo Yamaguchi, Tokyo; Yoshinari Take, and Akiyoshi Manabe, both of Okayama, all of Japan, assignors to Chlorine Engineers Corp. Ltd., Tokyo, Japan

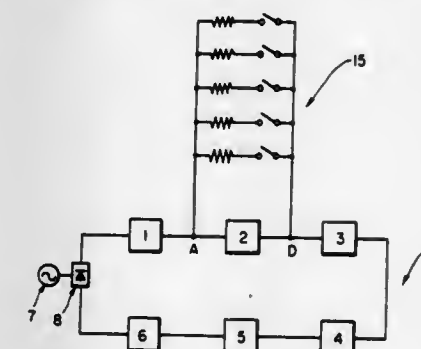
Filed Dec. 2, 1981, Ser. No. 326,624

Claims priority, application Japan, Dec. 3, 1980, 55-169640

Int. Cl.<sup>3</sup> C25F 1/34, 15/00

U.S. Cl. 204—98

1 Claim



1. A method of bypassing the electric current of at least one electrolytic cell in an electrolytic apparatus comprised of a plurality of electrolytic cells having an alkaline metal halogenide aqueous solution connected in series to an electrolytic power source and operating with a rated current, comprising connecting an electric current bypass unit in parallel to at least one of said electrolytic cells which is to be bypassed, said

bypass unit being comprised of a plurality of series combinations of a resistor and a switch connected in parallel with each other, and closing said switches in sequence to reduce the current in said at least one electrolytic cell in a step-wise manner thereby permitting a current smaller than the current flowing during the electrolysis to flow in the same direction as the current flows during electrolysis.

4,421,615

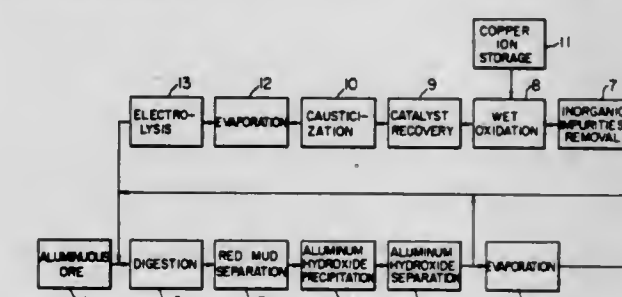
PROCESS FOR PRODUCING METALLIC GALLIUM  
Koichi Yamada; Takuo Harato, both of Niihama; Yasuo Shinya, Seto, and Hisakatsu Kato, Niihama, all of Japan, assignors to Sumitomo Aluminium Smelting Company, Limited and Sumitomo Chemical Company, Ltd., both of Osaka, Japan  
Filed Sep. 23, 1982, Ser. No. 421,838

Claims priority, application Japan, Sep. 30, 1981, 56-156467

Int. Cl.<sup>3</sup> C25G 1/00

U.S. Cl. 204—105 R

5 Claims



1. A process for producing metallic gallium from a gallium-containing alkali aluminate solution circulating in the Bayer process, comprising:

- (a) removing inorganic impurities from the alkali aluminate solution by cooling the solution after the aluminum hydroxide separation step in the Bayer process, thereby precipitating crystals of the inorganic impurities, and thereafter removing the precipitate from the solution;
- (b) removing organic impurities from the alkali aluminate solution by means of an oxidation treatment; and
- (c) subjecting the purified alkali aluminate solution thus obtained to electrolysis.

4,421,616

## METHOD OF PRODUCING ZINC FROM CHLORIDE SOLUTIONS WHICH CONTAIN CHIEFLY IRON, COPPER AND ZINC

Arne Bjune, Skjetten; Gunnar H. Boe, Kristiansand, and Tore Danielssen, Vaagsbygd, all of Norway, assignors to Elkem a/s, Oslo, Norway

Continuation-in-part of Ser. No. 255,475, Apr. 20, 1981, abandoned, which is a continuation of Ser. No. 137,569, Apr. 7, 1980, abandoned. This application May 11, 1981, Ser. No. 262,299

Claims priority, application Norway, Apr. 17, 1979, 791261

Int. Cl.<sup>3</sup> C25L 1/16; C01G 9/00

U.S. Cl. 204—115

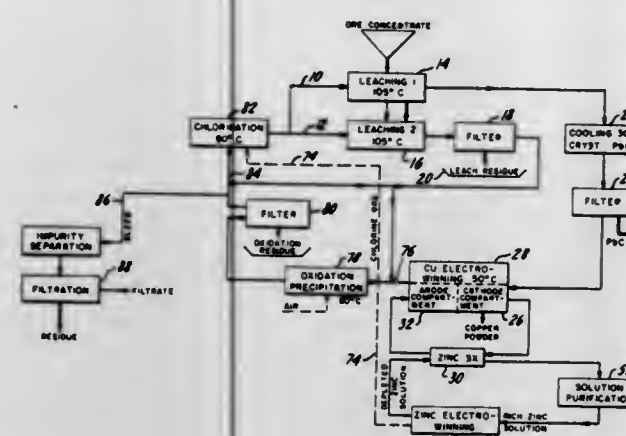
5 Claims

1. Method for producing zinc metal from chloride solutions containing iron, copper and zinc by liquid-liquid extraction and electrolysis which comprises the steps of:

- (a) forming a chloride solution containing iron, copper and zinc chlorides in which solution the iron chloride is essentially ferrous chloride and the copper chloride is essentially cuprous chloride,
- (b) contacting said chloride solution with tri-n-butylphosphate which selectively extracts and removes zinc chloride from the ferrous chloride and cuprous chloride in said solution,



- (c) separating zinc chloride from said tri-n-butylphosphate, and

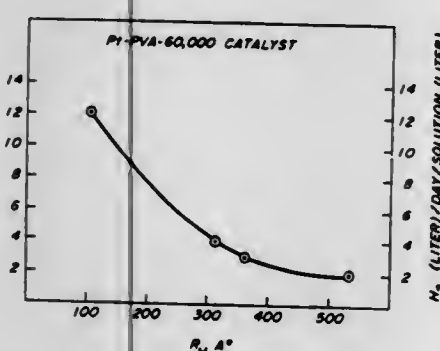


- (d) feeding the separated zinc chloride in aqueous solution into an electrolytic cell in which zinc metal is deposited at the cathode by electrolysis and removed from the cell.

#### 4,421,617 PHOTOLYTIC PRODUCTION OF HYDROGEN FROM WATER

Michael Gratzel, and John Kiwi, both of Vaud, Switzerland, assignors to Engelhard Corporation, Iselin, N.J.  
Division of Ser. No. 184,673, Sep. 5, 1980, Pat. No. 4,394,293.  
This application Sep. 21, 1982, Ser. No. 421,003  
Claims priority, application United Kingdom, Sep. 8, 1979, 7931250; Jul. 8, 1980, 8022338

Int. Cl.<sup>3</sup> B01J 19/12  
U.S. Cl. 204—157.1 R



1. In the photolytic method for producing hydrogen from water by treatment with a reducing species capable of donating electrons to water, the improvement which comprises: conducting the reduction step in the presence of a stabilized and finely dispersed catalyst of particle size no greater than 500 Å which comprises one or more Noble metals in finely divided form in intimate admixture with a water permeable protective agent adsorptive to said metal and selected from the group consisting of:

- (1) a homopolymer derived from an acyclic olefin of 2-3 carbon atoms substituted by hydroxy, carboxy, lower alkyleneoxy or an ester or amide derivative;
- (2) a copolymer derived from the reaction of an aralkene with an unsaturated acyclic dicarboxylic acid or a lower alkylene oxide;
- (3) an hydrocarbyl moiety of 10-20 carbon atoms substituted by one or more polar groups; and
- (4) a polysaccharide.

#### 4,421,618 PHOTOISOMERIZATION OF TRANS-CYCLOPROPANE-NITRILES

Kingsley Salisbury, Sittingbourne, United Kingdom, assignor to Shell Internationale Research Maatschappij B. V., The Hague, Netherlands

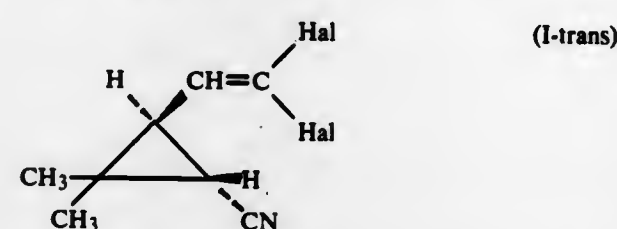
Filed Jul. 8, 1982, Ser. No. 396,428  
Claims priority, application United Kingdom, Jul. 22, 1981, 8122651

Int. Cl.<sup>3</sup> B01J 19/12

U.S. Cl. 204—158 R

9 Claims

1. A process for the conversion of a trans-cyclopropane-nitrile of the following general formula



to the corresponding cis-compound, wherein each Hal is a halogen atom, comprising:

irradiating the trans-compound (I-trans) with light of wavelength in the range 260 to 450 nanometers in the presence of a photosensitizer the triplet state energy of which is in the range 220 to 330 kilojoules per mole.

#### 4,421,619 ACRYLIC PLASTISOLS AND ORGANOSOLS AND PHOTOSENSITIVE COMPOSITIONS AND ELEMENTS MADE THEREFROM

Boynton Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.  
Division of Ser. No. 952,467, Oct. 18, 1978, Pat. No. 4,309,331, which is a continuation of Ser. No. 780,085, Mar. 22, 1977, abandoned. This application Nov. 2, 1981, Ser. No. 317,365

Int. Cl.<sup>3</sup> C08F 2/50; C08J 3/28

U.S. Cl. 204—159.16

9 Claims

1. A composition containing thermally coalescible acrylic resin plastisol or organosol dispersion comprising particles having a mean diameter in the range of 0.1 to 20 μm of a single-phase, surfactant-free, homopolymer, random copolymer or triopolymer of acrylic monomer(s) selected from the group consisting of ethylacrylate, methyl methacrylate and methacrylic acid dispersed in a surfactant-free medium that comprises a compatible liquid plasticizer that is nonvolatile at room temperature and is not a monomer of any of the polymeric components, the weight ratio of said particles to said plasticizer being from 40/60 to 90/10, and, in addition, a non-volatile photopolymerizable ethylenically unsaturated monomeric compound which is not a monomer of any of the polymeric components and at least one photoinitiator.

#### 4,421,620 PROCESS FOR PRETREATING AND COATING METALLIC SUBSTRATES ELECTROPHORETICALLY

Alan J. Kaylo, Glenshaw, and Nicholas T. Castellucci, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 11, 1982, Ser. No. 347,844

Int. Cl.<sup>3</sup> C25D 13/06, 13/08, 13/20

U.S. Cl. 204—181 C

10 Claims

1. A process for preparing a corrosion-resistant metallic substrate; said process comprises steps of:

- (i) passing an electric current between the substrate, acting as an anode, and a cathode, in contact with an electrophoretic composition; followed by
- (ii) passing an electric current between the substrate, acting as a cathode, and an anode, in contact with the electrophoretic composition;

the electrophoretic composition comprises an aqueous dispersion of a composition of matter containing a cationic salt and an ungelled reaction product of:

- (a) an epoxy material;
- (b) a tannin.

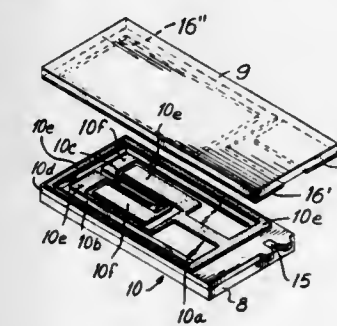
#### 4,421,621 QUARTZ CRYSTAL OSCILLATOR

Hirofumi Fujii, Suwa; Joji Shimakawa, Minowa; Yukio Hara, Minowa, and Masatoshi Kobayashi, Minowa, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Matsushimokogyo Kabushiki Kaisha, Nagano, both of Japan  
Division of Ser. No. 58,331, Jul. 17, 1979, abandoned. This application Oct. 1, 1981, Ser. No. 307,692

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 C

11 Claims



- (vi) depositing a second film layer of said stoichiometric metal oxide on said substrate.

#### 4,421,623 APPARATUS FOR GUIDING MATERIAL IN STRIP FORM

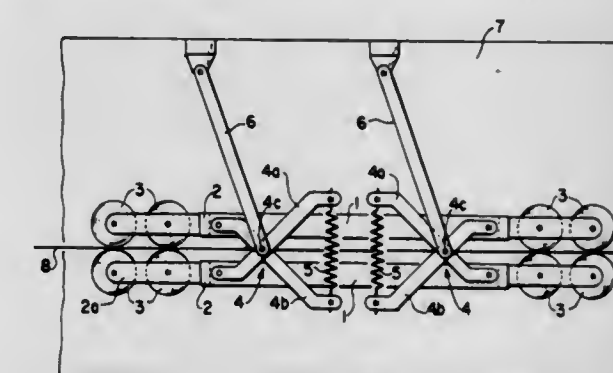
Friedbert Koch, Witten, and Bernhard Schweinsberg, Bochum, both of Fed. Rep. of Germany, assignors to C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany  
Filed Nov. 22, 1982, Ser. No. 444,049

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1981, 3146850

Int. Cl.<sup>3</sup> C25D 17/00

U.S. Cl. 204—206

7 Claims



1. A method for manufacturing a quartz crystal oscillator comprising:

- forming a quartz crystal vibrator plate having first and second opposed substantially planar surfaces, said plate defining a tuning fork vibrator having a base, two vibratory tines extending from the base and a frame integrally extending from the base and surrounding the tines and through means in the base of said plate for electrically connecting electrodes on one surface of said vibrator to the opposed surface;
- disposing thin-film surface electrodes on said surfaces of each tine;
- placing said vibrator between a pair of cooperating case members, one of said case members having two external oscillator electrodes disposed on the same surface;
- sealing said vibrator between said case members in the region of the base and frame; and
- disposing a coupling electrode in said through means.

#### 4,421,622 METHOD OF MAKING SPUTTERED COATINGS

Dennis R. Hollars, Franklin, Tenn., assignor to Advanced Coating Technology, Inc., Franklin, Tenn.

Filed Sep. 20, 1982, Ser. No. 419,988

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—192 P

14 Claims

1. A method of making a low emissivity architectural glass panel comprising:

- (a) depositing a silver film on a substrate, said silver film having a resistivity of from 2 to 20 ohms per square;
- (b) reactively sputtering a metal oxide film over said silver film comprising:
  - (i) providing a low pressure atmosphere containing a predetermined amount of oxygen and an ionizing gas;
  - (ii) establishing a plasma in the atmosphere adjacent a sputtering target formed of said metal;
  - (iii) reacting the target metal with the oxygen to form a stoichiometric metal oxide coating on the substrate;
  - (iv) depositing a first film layer of stoichiometric metal oxide on said substrate having a thickness of from 20-80 angstroms;
  - (v) discontinuing exposure of said first oxide film to the plasma for at least a brief interval; and,

#### 4,421,624 APPARATUS FOR CONTINUOUSLY PROCESSING A BAND-SHAPE MATERIAL

Yasuo Kimoto, Fujiidera; Masahiko Yamamoto, Nishinomiya; Katsunori Tamiya, Kobe; Yoshihito Sakai, Sakai; Akio Komura; Shoichi Honda, both of Osaka; Hidehiko Maehata, Suita; Hiroshi Kamada, Takatsuki; Tomohiko Suzuki, Ibaraki, and Tomoya Inoue, Kawasaki, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Mar. 17, 1981, Ser. No. 244,619

Claims priority, application Japan, Mar. 25, 1980, 55-38488; Mar. 25, 1980, 55-38489; Mar. 25, 1980, 55-38490; Mar. 25, 1980, 55-38491; Mar. 25, 1980, 55-38492; Mar. 25, 1980, 55-39776[U]; Mar. 31, 1980, 55-42684

Int. Cl.<sup>3</sup> C25D 17/00, 21/10

U.S. Cl. 204—209

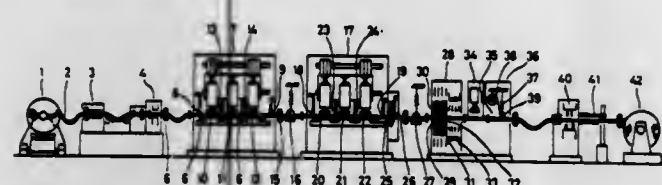
10 Claims

1. An apparatus for continuously processing a band-shape material comprising:

- transverse sliding shafts disposed on a base table, a basal board which freely slides transversely along said transverse sliding shafts,
- transverse-feeding means by which said basal board is quickly and/or slowly moved transversely,
- vertical sliding shafts disposed on said basal board, a tool of abrasion in combination with electrolytic polishing



which freely slides vertically along said vertical sliding shafts, vertical-feeding means by which said tool is moved vertically against said basal board, and



a polishing head which is disposed on said tool and composed of electrodes for electrolysis and abrasive matters for abrasion and by which continuously sent band-shape material is polished.

4,421,625

**LOWER PART OF A FUSED SALT ELECTROLYTIC CELL**  
Werner K. Fischer, Venthorne, and Ernst Bosshard, Fällanden, both of Switzerland, assignors to Swiss Aluminum Ltd., Chippis, Switzerland

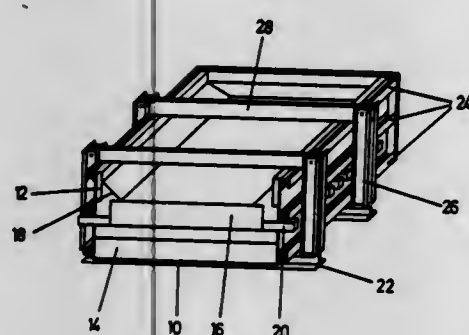
Filed May 14, 1982, Ser. No. 378,238

Claims priority, application Switzerland, May 20, 1981, 3287/81

Int. Cl.<sup>3</sup> C25C 3/00

U.S. Cl. 204—243 R

21 Claims



1. In an electrolytic cell used in the production of aluminum comprising an outer steel tank, a thermal insulating layer and an electrically conductive inner carbon lining, the improvement which comprises a metal framework for supporting the lower portion of said cell comprising:

at least one side section on the longitudinal sides of said cell and running the full length thereof;  
a plurality of cradles enclosing said side section, each of said cradles having a lower supporting section running under said cell, an upper bracing section running over said cell and a pair of side posts on either longitudinal side of said cell, each of said posts being secured to one end of said lower supporting section and said upper bracing section; and  
means associated with said cradles and said side section for counteracting the forces produced in said cell.

4,421,626

**BINDING LAYER FOR LOW OVERVOLTAGE HYDROGEN CATHODES**

John Z. O. Stachurski, Amherst; Dirk Pouli, Williamsville; John A. Ripa, Lancaster, and Gerald F. Pokrzyk, Lewiston, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 104,235, Dec. 17, 1979, Pat. No. 4,354,915. This application Jul. 20, 1981, Ser. No. 284,851

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C25B 11/06

U.S. Cl. 204—290 R

7 Claims

1. A cathode for use in electrolytic processes comprising a

substrate material, an intermediate binding layer applied to the substrate, and a surface layer applied to the binding layer, said surface layer comprising a codeposit of a first metal selected from the group consisting of iron, cobalt, nickel, and mixtures thereof, a second metal or metal oxide selected from the group consisting of molybdenum, manganese, titanium, tungsten, vanadium, indium, chromium, their oxides and combinations thereof, and from about 0.5 to about 25 atomic percent of a substantially nonleachable third metal selected from the group consisting of cadmium, mercury, lead, thallium, bismuth, and mixtures thereof, said intermediate binding layer comprising a codeposit of said first metal and said second metal or metal oxide applied to the substrate from an electroplating solution containing an alkali metal thiocyanate or thiourea.

4,421,627

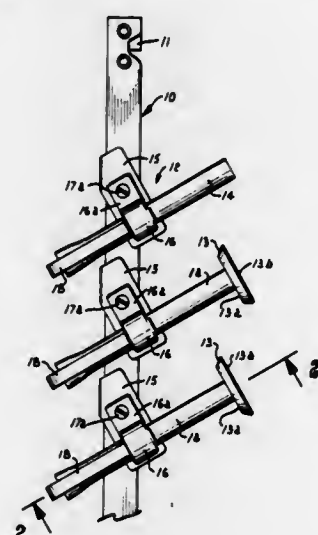
**ARTICLE HOLDER FOR ELECTROPLATING PROCESS**  
Marc LeBaron, Lincoln, Nebr., assignor to Lincoln Plating Company, Lincoln, Nebr.

Filed May 24, 1982, Ser. No. 381,410

Int. Cl.<sup>3</sup> C25D 17/08

U.S. Cl. 204—297 W

8 Claims



1. Apparatus for use in an electroplating bath, comprising: an electrically conductive hanger bar for immersion in the bath and having a major lengthwise upright axis;  
a plurality of article holders secured to said hanger bar and spaced at intervals along said bar;  
each said article holder comprising an electrically non-conductive hollow tube open at both ends and having a tube axis;  
each said tube arranged so that the tube axis is oriented at an acute angle with respect to the bar axis thus to define an upper and lower end for each tube;  
an electrical connector extending between said bar and into the inside lower end of each tube through the open lower end, said connector covered against contact with the bath except inside the tube;  
said tube adapted to receive through its upper end a stem of an article to be electroplated with the stem in electrical contact with the connector inside the tube; and  
means providing access to the interior of the tube by the bath liquid through the upper and lower ends of said tubes.

4,421,628

**RECTANGULAR TARGET PLATE FOR CATHODE SPUTTERING APPARATUS**

Hans Quaderer, Schaan, Liechtenstein, assignor to Balzers Aktiengesellschaft, Liechtenstein

Filed Mar. 15, 1983, Ser. No. 475,479

Claims priority, application Switzerland, Mar. 22, 1982, 1735/82

Int. Cl.<sup>3</sup> C23C 15/00

U.S. Cl. 204—298

2 Claims

1. A target for cathode sputtering apparatus, comprising a

rectangular plate having a surface to be sputtered with a longitudinally elongated groove therein, a plurality of recesses located in the groove at spaced locations and intended for securing purposes being located along a center line extending parallel to the longer side of said surface, the recesses being provided in the bottom of said groove and extending along the center line of said plate.

4,421,629

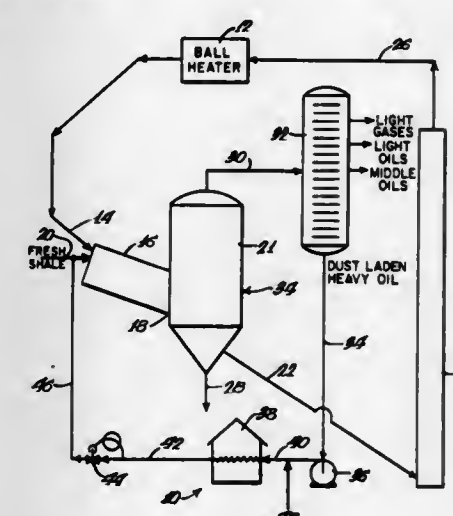
**DELAYED COKING AND DEDUSTING PROCESS**  
Earl D. York, Engelwood, Colo.; Kamil F. Rustam, Naperville, and Robert D. Hall, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 8, 1981, Ser. No. 271,570

Int. Cl.<sup>3</sup> C10G 1/00; C10B 53/00

U.S. Cl. 208—8 R

20 Claims



1. A process for use in making synthetic fuels, comprising the steps of:

introducing said hydrocarbon-containing material into a retort;

introducing solid heat carrier material into said retort;

retorting said solid hydrocarbon-containing material by contacting said solid hydrocarbon-containing material with said solid heat carrier material at a sufficient retorting temperature in said retort to liberate an effluent product stream of hydrocarbons containing entrained particulates derived from said solid hydrocarbon-containing material;

separating a dust laden oil fraction containing normally liquid oil and a substantial portion of said entrained particulates from said effluent product stream;

pumping said dust laden oil fraction through a furnace, via a furnace inlet line and a furnace outlet line;

substantially minimizing coking and buildup of carbon in said furnace and said furnace outlet line by injecting steam into said dust laden oil fraction in said furnace inlet line in a sufficient amount to increase the velocity of said dust laden oil fraction through said furnace without substantially stripping said hydrocarbons from said dust laden oil fraction;

substantially minimizing the amount, rate and temperature of solid heat carrier material being introduced into said retort by heating said dust laden oil fraction at a pressure to minimize vaporization of said normally liquid oil in said furnace and at a temperature ranging from 800° F. to less than the retorting temperature in said retort, after said steam has been injected into said dust laden oil fraction; feeding all of said dust laden oil fraction to said retort after said dust laden oil fraction has been heated in said furnace; and thereafter,

thermal cracking said dust laden oil fraction in said retort by contacting said entire dust laden oil fraction with said solid heat carrier material in said retort to liberate lighter hydrocarbons from said oil fraction and form a coked

residual material having a greater concentration of said particulates than said dust laden oil fraction.

4,421,630

**PROCESS FOR COAL LIQUEFACTION IN STAGED DISSOLVERS**

George W. Roberts, Emmaus; Edwin N. Givens, Bethlehem, and Ronald W. Skinner, Allentown, all of Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Oct. 5, 1981, Ser. No. 308,639

Int. Cl.<sup>3</sup> C10G 1/00

U.S. Cl. 208—8 LE

15 Claims

1. In a process for the solvent refining of coal wherein a slurry of finely ground coal in recycle process solvent is passed through a preheater to a coal liquefaction stage in the presence of hydrogen-rich gases at elevated temperatures and pressures, the improvement wherein said coal liquefaction stage comprises passing the slurry from the preheater in series through a first dissolver and a second dissolver, the process being controlled so that said first dissolver is operated at a higher temperature than said second dissolver, said first and second dissolvers not containing a fixed or ebullated catalyst bed and being operated in an adiabatic mode without the addition of significant external heat, the higher operating temperature of said first dissolver being more favorable for the liquefaction reactions of desulfurization and solvent production, and the lower operating temperature of said second dissolver being more favorable thermodynamically for solvent hydrogenation.

4,421,631

**HYDROCARBON TREATMENT PROCESS**

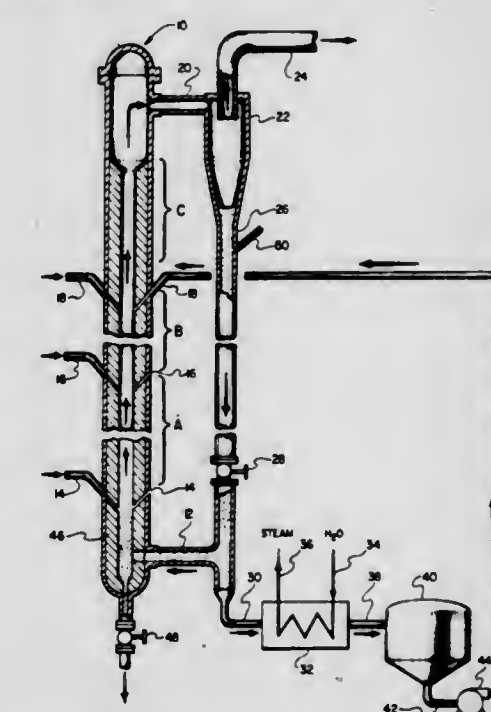
Jaime P. Ampaya, Thousand Oaks; Laszlo A. Heredy, Canoga Park, and Arthur L. Kohl, Woodland Hills, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 2, 1981, Ser. No. 308,079

Int. Cl.<sup>3</sup> C10G 9/34

U.S. Cl. 208—8 R

12 Claims



1. A continuous process for treating a hydrocarbon material in the presence of a molten salt wherein the improvement comprises the sequential steps of:

introducing a molten salt containing carbon into a heat generation zone located in a lower portion of an upwardly extending, elongated reactor, said reactor comprising a single continuous chamber;

introducing a source of oxygen into said lower portion of said reactor in an amount sufficient to react with said



carbon and heat said molten salt to a temperature of at least 700° C. while forming gaseous combustion products; flowing the resulting mixture of gaseous combustion products and heated molten salt upwardly through said reactor with a gas phase velocity of at least 1.5 meters per second to a hydrocarbon material reaction zone located above said heat generation zone; introducing the hydrocarbon material to be treated into said reaction zone to produce gaseous reaction products and unreacted carbon entrained in said flowing molten salt; reducing the temperature of said molten salt to less than about 650° C.; withdrawing said molten salt from said reaction zone and said reactor, and introducing it into a gas removal zone and separating gaseous reaction product therefrom; withdrawing molten salt containing unreacted entrained carbon from said gas removal zone and returning it to said heat generation zone.

4,421,632

## PROCESS FOR HYDROGENATION OF COAL

Helmut Würfel, Zur Wolfsfels 21, 6685 Blieskastel, Fed. Rep. of Germany

Filed Sep. 4, 1980, Ser. No. 183,797  
Int. Cl.<sup>3</sup> C10G 1/06

U.S. Cl. 208—10

11 Claims

1. Process for the hydrogenation of coal in which substantially undried coal is mixed with emulsifier oil to form a slurry, the coal slurry is pumped to reaction pressure, heated and subjected to catalytically accelerated hydrogenation in the presence of hydrogen in a hydrogenation reactor, characterized in that at least a portion of the hot product gases occurring in the hydrogenation reactor are separately drawn off from the reactor without cooling and directly communicated for admixture with coal slurry which has been pumped to reaction pressure, direct heat exchange between the hot product gases and the coal slurry causing the condensation heat of said hot product gases to be released to the coal slurry, said released heat being sufficient to heat, dry and at least partially degasify the coal slurry, and that the gases are separated from the resultant mixture consisting of gases, liquids and solids, and that the remaining product consisting of solids and liquids are directly communicated to the reactor for hydrogenation.

4,421,633

## LOW PRESSURE CYCLIC HYDROCRACKING PROCESS USING MULTI-CATALYST BED REACTOR FOR HEAVY LIQUIDS

Stuart S. Shih, and Donald Milstein, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 13, 1981, Ser. No. 243,414  
Int. Cl.<sup>3</sup> C10G 69/02, 45/08, 47/04

U.S. Cl. 208—59

9 Claims

1. A catalytic hydrocracking process for direct conversion at low pressure of high-boiling point residua, comprising heteroatoms, metals, sulfur and asphaltenes, to distillate and naphtha, said process comprising cyclic operation of a multi-catalyst bed reactor, containing large-pore catalysts and small-pore catalysts which are Al<sub>2</sub>O<sub>3</sub> impregnated with tungsten and nickel oxides, said large-pore catalysts having a pore size distribution which is characterized by the majority of pores therein being larger than 100 Angstroms in diameter, and said small-pore catalysts having a pore size distribution which is characterized by substantially all pores therein being no more than 80 Angstroms in diameter, wherein said small-pore catalysts have about twice as much NiO and WO<sub>3</sub> as said large-pore catalysts, have a surface area which is about the surface area of said large-pore catalysts, have a pore volume which is about 70% of the pore volume of said large-pore catalysts, and have an average pore diameter that is about 1/3 of the average pore diameter of said large-pore catalysts, at a pressure of 200–1000 psig, a temperature of 700°–900° F., and a LHSV of 0.1–1.10 by admixing said process-generated distillate, after recycling

thereof, with said residua to form solvent-diluted residua and then catalytically hydrocracking, demetalizing, desulfurizing, and decarbonizing said solvent-diluted residua in a single pass-through operation through said reactor in which said large-pore catalysts and said small-pore catalysts are sequentially contacted, said recycled process-generated distillate boiling at about 400°–700° F., so that said operation:

- (1) converts said high-boiling point residua to low-boiling point hydrocarbons by forming said distillate and said naphtha while removing said heteroatoms, said metals, and carbon residuals from said high-boiling point residua;
- (2) hydrodesulfurizes said high-boiling point residua; and
- (3) minimizes metals deposition on said catalysts and blocking of said catalysts pores by said asphaltenes, whereby said catalysts remain usable for runs of commercially acceptable length.

4,421,634

## CATALYTIC DEWAXING WITH A HYDROGEN FORM ZEOLITE L CATALYST

Christopher Olavesen, Sarnia, Canada, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 381,225, May 24, 1982, abandoned, which is a continuation of Ser. No. 865,956, Dec. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 781,884, Mar. 28, 1977, abandoned. This application Feb. 25, 1983, Ser. No. 469,932

Int. Cl.<sup>3</sup> C10G 45/54, 45/64

U.S. Cl. 208—111

31 Claims

1. A process for catalytically dewaxing an asphalt free, wax-containing hydrocarbon oil which comprises contacting said oil at elevated temperature and pressure and in the presence of hydrogen with a catalyst comprising a Zeolite L crystalline aluminosilicate that has been partially decationized to the hydrogen form and which contains at least one catalytic metal component selected from the group consisting of Group VI and Group VIII metals, their oxides, sulfides and mixtures thereof, to hydrocrack the wax components of said oil in preference over the oil components of said oil to hydrocarbons boiling below the initial boiling point of the oil and recovering an oil having a reduced wax content and reduced pour point.

4,421,635

## PROCESS FOR SIMULTANEOUSLY CRACKING HEAVY HYDROCARBONS INTO LIGHT OILS AND PRODUCING HYDROGEN

Tadashi Murakami, Kurashiki; Tetsuo Suzuka, Toda; Yukio Inoue, Toda, and Shirou Aizawa, Toda, all of Japan, assignors to Research Association for Residual Oil Processing, Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,542

Claims priority, application Japan, Feb. 13, 1981, 56-20708  
Int. Cl.<sup>3</sup> C10G 47/04, 11/04

U.S. Cl. 208—112

4 Claims

1. A process for simultaneously cracking heavy hydrocarbons to form light oils and producing hydrogen, which comprises

- a first step wherein steam and heavy hydrocarbons are simultaneously contacted with a catalyst in a reduced state, containing at least 30% by weight iron in the form of iron oxide, at a temperature of from 500° to 800° C., to produce hydrogen, cracked gases, and cracked light oils, to convert the reduced-state catalyst into an oxidized-state catalyst, and to deposit coke on the catalyst, and
- a second step wherein the oxidized-state catalyst with the coke deposited thereon is contacted with an oxygen-containing gas insufficient for achieving complete combustion of the coke, at a temperature of from 750° to 950° C., to partially combust the coke on the catalyst, to convert the oxidized-state catalyst into a reduced-state catalyst, and to fix a sulfur compound contained in the coke as iron sulfide

with a part of the reduced-state catalyst, wherein the improvement comprises that:

- (1) a major portion of the catalyst is recycled between the first step and second step; and
- (2) there is provided a third step wherein a part of the reduced-state, iron sulfide-containing catalyst formed in the second step is contacted with an oxygen-containing gas in a reducing atmosphere at a temperature of from 600° to 1,000° C. to effect combustion of iron sulfide in the catalyst, the catalyst after combustion being recycled to the second step or the first step, or to both the second and first steps.

4,421,636

## INERT GAS ENRICHMENT IN FCC UNIT REGENERATORS

Michael J. Dolan, Laurel Springs; Stephen J. McGovern, Deptford, and Peter J. Owens, West Deptford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 298,404, Sep. 1, 1981, Pat. No. 4,395,325. This application Apr. 9, 1982, Ser. No. 366,951  
Int. Cl.<sup>3</sup> C10G 11/18; B01J 37/14

U.S. Cl. 208—113

12 Claims

1. In a catalytic cracking process comprising: contacting a hydrocarbonaceous feed with a cracking catalyst to produce cracked hydrocarbon vapors and deactivated catalyst containing carbonaceous deposits; separating the deactivated catalyst from the hydrocarbon vapors and conducting the deactivated catalyst to a regeneration vessel; regenerating the deactivated catalyst under fluidized bed conditions in the regeneration vessel by means of an oxygen-containing gas introduced into the regeneration vessel, thereby forming a flue gas comprising oxygen, sulfur dioxide, sulfur trioxide, carbon monoxide and carbon dioxide; the improvement wherein the oxygen-containing gas is admixed with a stream of an inert gas, prior to the introduction of the oxygen-containing gas into the regeneration vessel, in the amount sufficient to maintain apparent catalyst bed density in the regeneration vessel at about 10 to about 30 lbs/ft<sup>3</sup> and the amount of the oxygen content in the flue gas at about 0 to about 1 mole percent.

4,421,637

## CATALYTIC CRACKING PROCESS WITH SIMULTANEOUS PRODUCTION OF A LOW BTU FUEL GAS AND CATALYST REGENERATION

Dane C. Grenoble, Baton Rouge, La., and Walter Weissman, Berkeley Heights, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 203,139, Nov. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 927,830, Jul. 25, 1978, Pat. No. 4,244,811. This application Dec. 18, 1981, Ser. No. 332,161

The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C10G 11/04

U.S. Cl. 208—120

16 Claims

1. A process for catalytically cracking a hydrocarbon feed and simultaneously generating a low BTU gas or hydrogen rich gas, said process comprising the steps of:

- (1) contacting, in a cracking zone and at elevated temperature, a hydrocarbon feed with an acid catalyst comprising a catalytic metal oxide component wherein said metal is selected from the group consisting of (a) tungsten, niobium and mixtures thereof, and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof, said metal oxide component being supported on a silica-containing inorganic refractory metal oxide support having a silica content of less than 50 wt.% of the total support, for a time sufficient to effect the desired cracking of the feed and yield a coked catalyst,

said catalyst being steamed at a temperature of at least 600° C. prior to use;

- (2) regenerating the coked catalyst at regenerating conditions by contacting same with steam, an O<sub>2</sub>-containing gas or mixture thereof to produce a regenerated catalyst and a gas consisting of an H<sub>2</sub> rich gas, a low BTU gas rich in CO and a combination thereof; and
- (3) recirculating the regenerated catalyst of step (2) back to the cracking zone of step (1).

4,421,638

## DEMETALLIZATION OF HEAVY OILS

Simon G. Kukes; Marvin M. Johnson and Gerhard P. Nowack, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 31, 1983, Ser. No. 481,085

Int. Cl.<sup>3</sup> C10G 29/02

U.S. Cl. 208—251 R

10 Claims

1. A method for treating metal containing hydrocarbon feed streams comprising contacting said hydrocarbon feed stream with an amount of a phosphorus sulfide of at least about 0.5 weight percent based on the weight of the hydrocarbon containing feed stream at demetallizing temperatures and pressures sufficient to convert said metals to oil insoluble compounds.

4,421,639

## RECOVERY OF DEASPHALTING SOLVENT

John S. Lambert, New Providence, N.J., and Joseph W. Gletschmann, deceased, late of Springfield, N.J. (by Virginia E. Gletschmann, executrix), assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jul. 27, 1982, Ser. No. 402,447

Int. Cl.<sup>3</sup> C10G 21/00, 21/28

U.S. Cl. 208—309

21 Claims

1. An energy-efficient continuous process for solvent deasphalting a viscous hydrocarbon oil and recovering the solvent, which comprises:

- (a) contacting said viscous hydrocarbon oil with a deasphalting solvent under deasphalting conditions of temperature and pressure in a primary fractionator (12);
- (b) withdrawing the primary raffinate from the primary fractionator (12) and feeding said primary raffinate to a secondary fractionator (20);
- (c) contacting said primary raffinate of step (b) with a deasphalting solvent under deasphalting conditions of temperature and pressure in said secondary fractionator (20);
- (d) withdrawing the secondary extract from said secondary fractionator (20) and feeding said secondary extract to a secondary fractionator overhead exchanger (28) and then to a secondary high pressure flash tower (54);
- (e) withdrawing asphalt mix from said secondary fractionator (20) and feeding said asphalt mix to an asphalt recovery section;
- (f) withdrawing the primary extract from the primary fractionator (12) and feeding said primary extract to a primary fractionator overhead exchanger (24) and then to a primary steam heater (26) and then to a primary clarifier (16) operated at conditions above the critical temperature and pressure of the deasphalting solvent;
- (g) withdrawing the light phase from said primary clarifier (16) and using said light phase to heat the primary extract in the primary fractionator overhead exchanger (24) and then to heat and evaporate deasphalting solvent in said secondary extract of step (d) in the secondary fractionator overhead exchanger (28);
- (h) withdrawing the heavy phase from said primary clarifier (16) and heating said heavy phase to evaporate deasphalting solvent in a primary mix evaporator (32);
- (i) withdrawing the deasphalting solvent vapor from said primary mix evaporator (32) and feeding said deasphalting solvent vapor to a secondary pressure vapor heat exchanger (36) where said deasphalting solvent vapor is condensed;



- (j) withdrawing said deasphalting solvent from said secondary pressure vapor heat exchanger (36) and storing said deasphalting solvent in a high pressure solvent accumulator (18) and recycling said deasphalting solvent to the primary fractionator (12) and to the secondary fractionator (20);
- (k) withdrawing the deasphalting solvent vapor from the secondary high pressure flash tower (54) and feeding the deasphalting solvent vapor to a secondary pressure vapor heat exchanger (36) where the deasphalting solvent is condensed and storing said deasphalting solvent in the high pressure solvent accumulator (18) and recycling said deasphalting solvent to the primary fractionator (12) and to the secondary fractionator (20);
- (l) withdrawing the secondary mix from the secondary high pressure flash tower (54) and feeding said secondary mix to the secondary pressure vapor heat exchanger (36) and then to a secondary low pressure flash tower (56);
- withdrawing the secondary mix from the secondary low pressure flash tower (56) and feeding said secondary mix to a secondary reboiler (57); and,
- (n) withdrawing the deasphalting solvent vapor from said secondary low pressure flash tower (56) and condensing the deasphalting solvent vapor in a secondary solvent condenser (68) and storing said deasphalting solvent in a low pressure solvent accumulator (70) and recycling the deasphalting solvent to the secondary fractionator (20).

4,421,640

# METHODS FOR SEPARATING HYDROCARBONS BY LIQUID EXTRACTION

James M. Watson, Big Spring, Tex.; Jacques F. J. Grootjans, Leefdaal, and Luc F. L. N. Delorme, Brussels, both of Belgium, assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Feb. 16, 1982, Ser. No. 349,398

Int. Cl.<sup>3</sup> C10G 21/20

U.S. Cl. 208—326

5 Claims

1. A process for treating a hydrocarbon mixture to selectively separate the aromatic and paraffinic components thereof which comprises mixing said hydrocarbon mixture with a selective solvent consisting essentially of N-(2-hydroxyethyl)-2-pyrrolidone containing a minor amount of water at a temperature in the range of from about 107° C. to about 162° C. under pressure of from about 586 kilopascals to about 2137 kilopascals, separating the resultant mixture into two phases to obtain a raffinate phase and an extract phase, the latter being rich in the aromatic hydrocarbon components of said hydrocarbon mixture.

4,421,641

# ENRICHMENT PROCESS BY FLOTATION OF PHOSPHATE-CONTAINING ORES WITH CARBONATED AND/OR SILICEOUS GANGUES, BY AMPHOTERIC COLLECTING AGENTS

Pierre Blazy, Nancy; Robert Houot, Villers les Nancy; Robert Joussemet, Mazerulles; Philippe Haicour, Paris, and Jean Tracéz, Sceaux, all of France, assignors to Ceca S.A., Velizy Villacoublay, France

Filed Dec. 31, 1981, Ser. No. 336,451

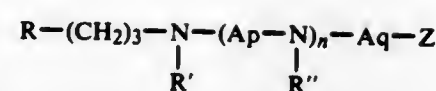
Claims priority, application France, Jan. 5, 1981, 81 00052

Int. Cl.<sup>3</sup> B03D 1/14

U.S. Cl. 209—166

1 Claim

1. Enrichment process by flotation of sedimentary ores containing phosphate and a gangue comprising both carbonated and siliceous materials, wherein two successive flotations are carried out choosing two different pH for the medium, and using the same collecting agent to float out the gangues, one flotation being carried out in a basic medium to float out carbonates and one flotation in an acid medium to float out silicates, the collecting agent used having the formula



in which formula:

R is of form R<sub>1</sub> or R<sub>1</sub>O—, R<sub>1</sub> being a saturated or unsaturated alkyl radical, either linear or branched, and comprising between 15 and 19 carbon atoms; —R' and R'' are H or —Aq—Z, bearing in mind that for R'', when n is greater than 1, there can be in the molecule simultaneously radicals H and radicals —Aq—Z;

Ap and Aq are polymethylene chains containing between 1 and 4 carbon atoms;

n is a number equal to 0 or an integer between 1 and 5;

Z is a radical selected from the carboxylic, the sulphonic and the phosphonic radicals.

4,421,642

# DEVICE FOR SEPARATING GRINDING MEDIUM AND MILLED SUSPENSION IN A WET COMMUNITING MACHINE

Ludwig Kreitner, Heppenheim; Juergen Klapper, Maxdorf, and Horst Schober, Otterberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

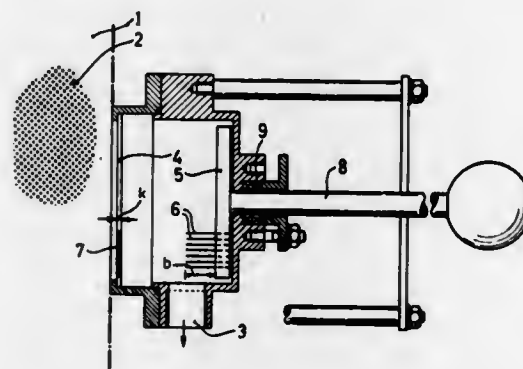
Filed Jan. 28, 1982, Ser. No. 343,761

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103662

Int. Cl.<sup>3</sup> B07B 1/52

U.S. Cl. 209—384

3 Claims



1. A device for separating grinding medium from milled suspension in a wet comminuting machine, having a sieve which is located at the mill base outlet of the machine and has orifices of such dimensions that they block the passage of grinding medium, wherein said outlet comprises a plate which carries, on the side facing the sieve, elements arranged in alignment with the orifices of the sieve, said plate and said elements being normally in a location opposite, but remote from, the exit face of said sieve, and means being provided for mounting said plate for reciprocating movement towards and away from said sieve to permit said elements to be pushed, intermittently, through the orifices of the sieve for cleaning said orifices.

4,421,643

# SWIMMING POOL FILTERING SYSTEM

Stanley H. Frederick, Ramsey, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y. Continuation of Ser. No. 742,387, Nov. 16, 1976, abandoned, which is a continuation of Ser. No. 627,179, Oct. 30, 1975, abandoned. This application Sep. 29, 1978, Ser. No. 946,979

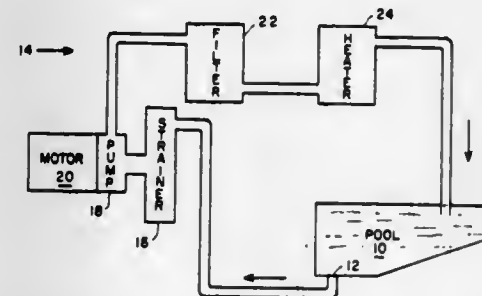
Int. Cl.<sup>3</sup> E04H 3/20

U.S. Cl. 210—138

6 Claims

1. A swimming pool filter system, comprising:  
a closed water circulating system having an inlet for receiving water from said pool and an outlet for discharging water into said pool at a point below the normal water level;

- a filter connected in said closed water circulating system for filtering pool water, said filter and closed water circulating system defining a variable system head curve dependent upon the particular condition of said filter when said water circulating system is primed with water;
- a centrifugal liquid pump connected in said closed water circulating system;
- a motor closely coupled to said pump, said motor being capable of operating at at least two speeds for driving said pump to produce at least two different pool water circulation rates through said water circulating system in accordance with the instantaneous system head curve for a water primed system, one of said motor speeds being sufficiently high to produce a head that will prime the



- water circulating system, the other of said motor speeds being lower than said one speed and sufficient to provide a low water circulation rate through said water circulating system but not to prime said system; and
- switch means for selecting a motor speed to thereby achieve a water circulation rate in accordance with the system head curve so that the most efficient circulation rate required to maintain a desired degree of pool water clarity may be selected thereby providing a more efficient filter system and for selecting said one speed when the water circulating system must be primed.
4. A swimming pool filter system as described in claim 1, wherein the switch means includes a timer means for automatically selecting preset motor speeds during selected periods of time.

4,421,644

# FILTER HOUSING

Laurence R. Gedye, Doncaster East, Australia, assignor to L.R. & N.R. Gedye Pty. Limited, Australia

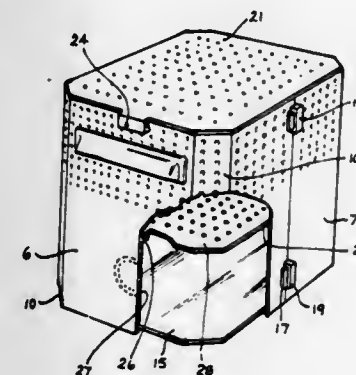
Filed Aug. 17, 1981, Ser. No. 293,086

Claims priority, application Australia, Aug. 15, 1980, PE5057

Int. Cl.<sup>3</sup> B01D 35/02

U.S. Cl. 210—233

6 Claims



1. A filter unit having a filter housing adapted to be erected from a flat blank and disassembled to said flat blank, comprising a plurality of side walls and two opposite end walls defining a housing, said end and side walls being moulded as a one-piece flat blank having fold lines dividing said one-piece moulded blank into said side and end walls, said blank comprising a generally rectangular main panel having at least three parallel fold lines formed in one face thereof and extending

transversely across said one face between opposite longitudinal edges thereof, said main panel being foldable along said fold lines to form the side walls of the filter housing, engageable latching elements adjacent each end of the main panel and adapted to be engaged to maintain the main panel folded to form said side walls of the filter housing, said latching elements being disengageable so that the filter housing may be knocked down into a flattened condition, two end panels each of a shape corresponding to the cross-section of the filter housing, said end panels being formed integral with the main panel on respective longitudinal edges thereof, a longitudinal fold line formed along the junction between the main panel and each of the respective end panels, the end panels being foldable along said respective fold lines forming the opposite end walls of the filter housing, said main panel and end panels being interlocked in the folded condition to constitute the filter housing, a division panel having perforations therein supported within the housing on lugs formed integral with the main panel and extending inwardly from respective side walls of the housing, said division panel being adapted to divide the interior of the housing into first and second chambers, perforations in at least one wall forming the first chamber to permit entry of liquid to the first chamber, and a filter element in the first chamber through which liquid entering the first chamber passes as it flows from the first chamber to the second chamber through the perforated division panel.

6. A filter unit as claimed in claim 1 including at least one annular shaped weakened area in one side wall, whereby upon fracturing said weakened area an aperture is formed in said side wall to communicate with the second chamber.

4,421,645

# COMPACT UNIVERSAL DRUM FILTER SETTLER

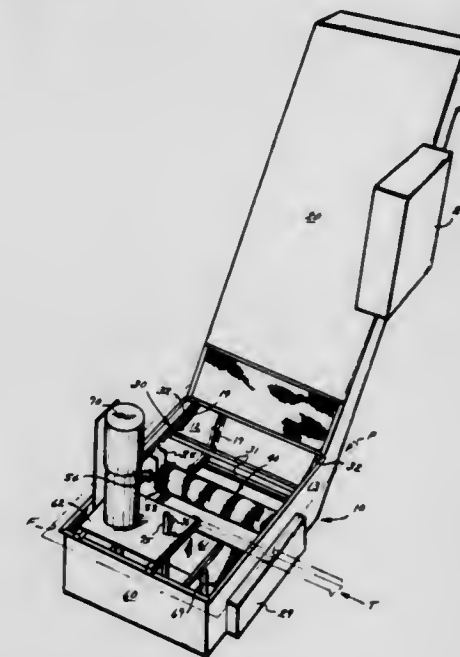
John L. Creps, Rudolph, Ohio; Robert J. Fox, Waukesha, Wis.; Ted W. Guelde, Deshler, Ohio; Eugene H. Harms, Perrysburg, Ohio, and Stephen N. McEwen, Bowling Green, Ohio, assignors to Henry Filters, Inc., Bowling Green, Ohio

Filed Sep. 27, 1982, Ser. No. 424,427

Int. Cl.<sup>3</sup> B01D 21/12, 33/06

U.S. Cl. 210—260

22 Claims



1. A combination settler filter for liquids comprising:

- (A) a receiving tank,  
(B) a removable cylindrical drum filter in said tank,  
(C) guide means for guiding and supporting opposite ends of said drum filter in said tank,  
(D) means for enabling removal of said drum filter by hand including:  
(a) a ball and socket-type duct joint between one end of said drum filter and an outlet duct aperture in said tank, and



- (b) resilient means acting on the other end of said drum filter to urge said joint together, and  
(E) means for applying a reduced pressure to said aperture for removing clean liquid therefrom.

4,421,646

## FILTERING DEVICE

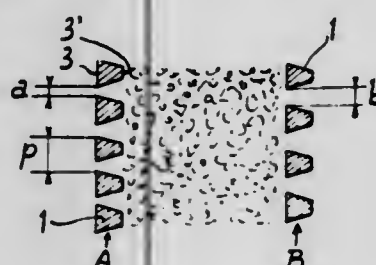
Philippe Corregge, Taverny, and Lucien Gay, Chavenay, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Continuation of Ser. No. 709,409, Jul. 28, 1976, abandoned, Ser. No. 832,479, Sep. 12, 1977, abandoned, and Ser. No. 925,325, Jul. 17, 1978, abandoned. This application May 29, 1979, Ser. No. 43,225

Int. Cl.<sup>3</sup> B01D 29/10

U.S. Cl. 210—291

4 Claims



1. A filtering device comprising a plurality of filtering walls arranged successively between a chamber containing the effluent to be filtered and a chamber containing the filtered effluent, each filtering wall constituted by spaced juxtaposed strips having a trapezoidal section with a large base located in the inlet face of the filtering wall, said strips being separated from each other, at said inlet face, by slots of equal widths which constitute the inlet areas for the effluent to be filtered, the sum of said areas representing the total inlet area of the filtering wall, said total inlet area of the filtering wall being 1 to 50% smaller than the total inlet area of an adjacent filtering wall located downstream of the first-mentioned filtering wall with reference to the direction of flow of the effluent, and the width of the slots of a filtering wall being less than the width of the slots of an adjacent downstream filtering wall, the interval separating any two adjacent filtering walls being filled with a packing material permeable to fluids and inert with respect to the various constituents of the effluent, said packing material being constituted by a material resistant to erosion and compressive stresses, said material being hard glass balls the minimum diameter of which are larger than the width of the inlet slots of the filtering wall encountered by the effluent, each filtering wall being constituted by a strip having a trapezoidal section and wound up around a cylindrical surface so as to form a spiral having a constant pitch which is equal to the sum of the width of the large base of said trapezoidal section and a constant distance defining the width of said slots.

4,421,647

## FILTER WITH INDEXABLE FILTER WEB

Mark R. Estabrook, and James I. Marchman, both of Rockford, Ill., assignors to Barnes Drill Co., Rockford, Ill.

Filed Jun. 28, 1982, Ser. No. 393,075

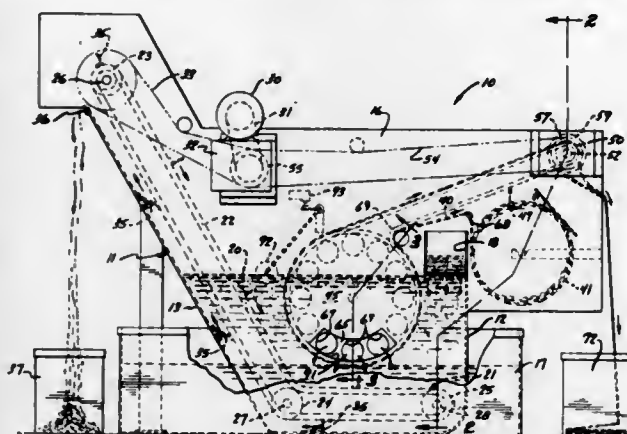
Int. Cl.<sup>3</sup> B01D 33/32

U.S. Cl. 210—387

10 Claims

1. A filter comprising a tank adapted to contain a pool of dirty liquid to be filtered, means for delivering dirty liquid to said pool, a supply roll of disposable filter web, a flexible and perforated endless conveyor for carrying the web along a curved path downwardly into and then upwardly out of the dirty pool, a pair of laterally spaced and stationary side members defining sides for a pool of clean liquid located within the dirty pool and above the bottom thereof, each of said side members having a laterally extending and stationary curved surface which conforms substantially to the curved path followed by said web as the latter moves through said dirty pool,

the side margins of one side of said conveyor being located alongside said curved surfaces, said web being carried on the other side of said conveyor and defining a curved bottom for said clean pool whereby liquid in said dirty pool is filtered upon passing through said web and into said clean pool, the side edges of said conveyor coating with said side members to define curved grooves between said conveyor and said side



members, the side margins of said web extending laterally beyond the side edges of said conveyor and spanning said grooves whereby the pressure of the liquid in the dirty pool forces the side margins of said web into said grooves to cause the web to seal the dirty pool from the clean pool adjacent said side members, and means for removing filtered liquid from said clean pool.

4,421,648

## APPARATUS AND A METHOD FOR BIOLOGICAL TREATMENT OF WASTE WATERS

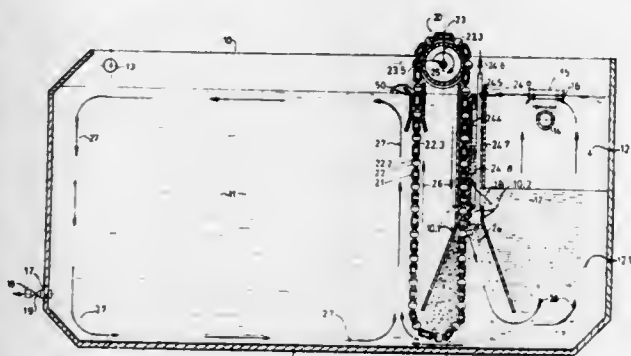
Ferdinand Besik, 3243 Chokecherry Crs., Mississauga, Ontario, Canada (L5L 1B1)

Filed Jun. 1, 1981, Ser. No. 268,725

Int. Cl.<sup>3</sup> C02F 3/08

U.S. Cl. 210—605

13 Claims



1. Apparatus for treatment of waste waters including means defining a reaction tank, waste water inlet means for introducing waste water into said reaction tank, endless vertical belt means for mixing, aerating and recirculating the liquid held in said reaction tank, said belt means comprising a pair of endless chain means arranged at opposite sides of said reaction tank, said chain means having a plurality of horizontal pipe means attached to and extending between said chain means, said pipe means being a chamber having openings located along their length thereof for flowing the reactor liquor out and for entering the air into said pipe means when said pipe means are located above the liquid level of the reactor mixed liquor and for release of the entrapped air from said pipe means through said openings in form of bubbles into said reactor mixed liquor when said pipe means are submerged in said reactor mixed liquor and are moving downwardly in said reaction tank, said belt means being positioned within said reaction tank with top portion of said belt means located above the top of said reaction tank and the bottom portion of said belt means extending

near the bottom of said reaction tank, said belt means being held in position by support means, said support means and said belt means being rotated by motor means, first solid wall partition means positioned inside said belt means, said first partition means being attached to two side walls of said reaction tank and forming with three side walls and the bottom of said reaction tank first reaction zone, second solid partition means positioned in parallel with said first partition means and along-side said belt means, said second partition means being attached to two side walls of said reaction tank and being submerged in the liquid held in said reaction tank and said second partition means extending diagonally into said reaction tank and forming an aeration zone between said first partition means and the two side walls of said reaction tank, and said second partition means forming with three side walls of said reaction tank second reaction zone, said first and second reaction zones being in communication with each other via openings formed by the bottoms of said first and second partition means, said two side walls and the bottom of said reaction tank, said reaction tank containing a fluidized bed of sludge solids located in said second reaction zone, said reaction tank also equipped with a vertical baffle means located in said second reaction zone and positioned in parallel with said second partition means, said vertical baffle means forming between said second partition means and said vertical baffle means a channel means for recirculating sludge from the top of said fluidized bed into said aeration zone and then back into said fluidized bed maintained in said second reaction zone, said vertical baffle means with three side walls of said reaction tank forming a clear well above and in communication with said fluidized bed in said second reaction zone and said vertical baffle means having openings for flowing the floating solids from said clear well back into said aeration zone, said vertical belt means being arranged to pump the sludge solids from the top of said fluidized bed into said aeration zone, to pump and disperse air into the reactor liquor in said aeration zone, to rotate the content in said first reaction zone and to circulate the reactor mixed liquor between said first reaction zone and said aeration zone, and said reaction tank equipped with the effluent discharge means and the excess sludge withdrawal means.

4. A method for treating waste waters comprising mixing the content of a single reaction tank by vertical belt means in three substantially different zones, the first reaction zone being substantially without dissolved oxygen, the second reaction zone being substantially saturated with dissolved oxygen and having a fluidized bed of sludge therein and the aeration zone for dispersing of the air into a downwardly recirculated mixed reactor liquor therein, said vertical belt means comprising a pair of endless chain means arranged at opposite sides of said reaction tank, said chain means having a plurality of horizontal pipe means attached to and extending between said chain means, said pipe means being a chamber having openings located along their length thereof for flowing the reactor liquor out and for entering the air into said pipe means when said pipe means are located above the liquid level of the reactor mixed liquor and for release of the entrapped air from said pipe means through said openings in form of bubbles into said reactor mixed liquor when said pipe means are submerged in said reaction tank, said belt means being positioned within said reaction tank with top portion of said belt means located above the top of said reaction tank and the bottom portion of said belt means extending near the bottom of said reaction tank, said reaction tank comprising first solid wall partition positioned inside said belt means and attached to two side walls of said reaction tank to form said first reaction zone, second solid wall partition positioned in parallel with said first partition and alongside said belt means and attached to two side walls of said reaction tank and extending diagonally into said reaction tank to form between said first partition and said side walls of said reaction tank said aeration zone, and said second partition forming with side walls of said reaction tank said second reaction zone, said first and second reaction zones being in communication with each other via openings formed by the bottoms of said first and second partitions, said side walls and the bot-

tom of said reaction tank, said reaction tank equipped in addition with a vertical baffle located in said second reaction zone and positioned in parallel with said second partition to form a channel for recirculating sludge from the top of said fluidized bed into said aeration zone and back into said fluidized bed and to form a clear well located above said fluidized bed in said second reaction zone and said reaction tank equipped with effluent discharge means and excess sludge discharge means, feeding the waste water into said first reaction zone, continuously rotating by said vertical belt means the content therein and contacting the waste water with sludge solids in the absence of dissolved oxygen therein, continuously circulating the reactor mixed liquor and sludge by said vertical belt means between said first reaction zone and said aeration zone, and mixing the reactor mixed liquor with sludge withdrawn from said fluidized bed in said aeration zone, continuously recirculating the sludge from the top of said fluidized bed from said second reaction zone into said aeration zone, then downwardly to the bottom of said reaction tank then upwardly through said fluidized bed and contacting the waste water with the sludge solids in said aeration zone and then in said fluidized bed in the presence of dissolved oxygen, continuously pumping air by said vertical belt means into said aeration zone and continuously dispersing the air into the downwardly recirculated mixed reactor liquor therein, withdrawing the excess sludge from said reaction tank, continuously flowing the purified waste water through the clear well located above said fluidized bed and out of said reaction tank and continuously flowing the floating solids from said clear well back into said aeration zone.

4,421,649

## METHOD AND APPARATUS FOR ENRICHING COMPOUNDS OF LOW WATER SOLUBILITY FROM AQUEOUS SUSPENSIONS OF SUBSTANTIALLY INORGANIC SOLID SUBSTANCES

Karl J. Giskehaug, Kjell O. Lötten, and Glør T. Mejdell, all of Porsgrunn, Norway, assignors to Norsk Hydro a.s., Oslo, Norway

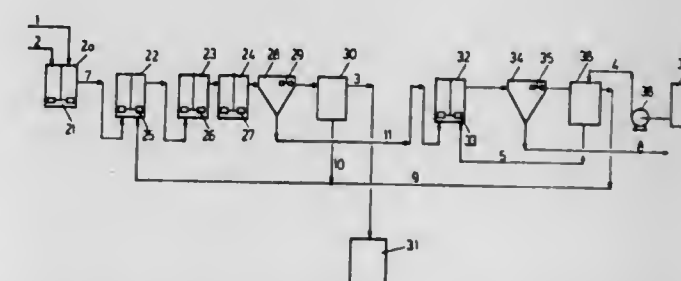
Filed Aug. 18, 1981, Ser. No. 293,983

Claims priority, application Norway, Aug. 20, 1980, 802471

Int. Cl.<sup>3</sup> B01D 11/00

U.S. Cl. 210—634

10 Claims



1. A process for enriching and extracting compounds of low water solubility from an aqueous suspension consisting essentially of substantially inorganic solid substances containing less than 10% by weight of said compounds of low water solubility, which comprises acidifying said aqueous suspension, contacting said acidified suspension with an organic solvent, extracting said acidified suspension with said organic solvent in at least two mixing stages with subsequent phase separation after each mixing stage, at least the first of said mixing stages comprising at least two mixing sequences arranged in series upstream of a phase separation where two liquid phases are separated from each other, a major proportion of said organic solvent resulting from said phase separation being recirculated



to the first mixing sequence in the corresponding upstream mixing stage.

4,421,650

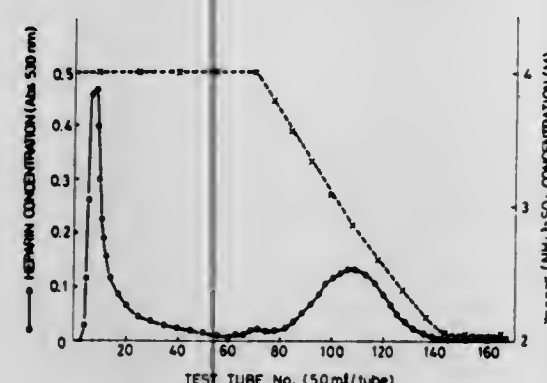
**PROCESS FOR SEPARATION OF CARBOHYDRATES**  
Kinzo Nagasawa, Tokyo, and Akira Ogamo, Yokohama, both of Japan; assignors to Seikagaku Kogyo Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 292,679, Aug. 13, 1981, abandoned.

This application Jan. 26, 1983, Ser. No. 461,059

Claims priority, application Japan, Aug. 22, 1980, 55-114688  
Int. Cl.<sup>3</sup> B01D 15/08

U.S. Cl. 210—635

12 Claims



1. A process for separation of mucopolysaccharides which comprises separating a mucopolysaccharide into its constituent components comprising

contacting said mucopolysaccharide with a chromatographic column comprising a support selected from the group consisting of crosslinked agarose, non-cross-linked agarose, and a polyvinyl alcohol, said support containing hydrophobic ligands selected from the group consisting of alkyl groups; alkyl groups substituted with at least one group selected from the group consisting of a hydroxyl group, a carboxyl group and an amino group; alkylene groups substituted with a hydroxyl group; aryl groups; and alalkyl groups, and thereby separating said mucopolysaccharide into its constituent components.

4,421,651

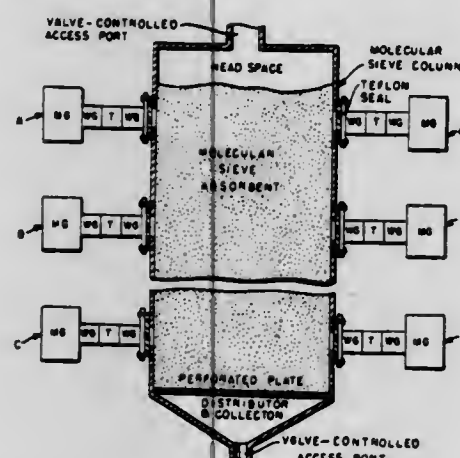
**METHOD OF RECOVERING ADSORBED LIQUID COMPOUNDS FROM MOLECULAR SIEVE COLUMNS**  
Harvey R. Burkholder, and Glenn E. Fanslow, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 28, 1982, Ser. No. 382,960

Int. Cl.<sup>3</sup> B01J 20/34

U.S. Cl. 210—672

12 Claims



4. The method of recovering a volatile liquid compound molecularly adsorbed within porous granules of a molecular sieve adsorbent from a dilute liquid solution thereof, said granules having a relatively low dielectric loss compared to that of

the adsorbed liquid and being arranged in a bed contained in a column providing head space above and collection space below the bed, upper access port means communicating with said head space, and lower access port means communicating with said collection space, said bed containing residual portions of said dilute liquid solution, comprising, with the upper port means closed and the lower port means open, directionally applying microwave energy to the bed upper portion and to successive portions thereof to selectively heat the adsorbed liquid compound within said granules for desorption thereof, the amount of applied microwave energy being sufficient to volatilize only part of the adsorbed compound within said granules to expell a liquid-gas effluent, said bed at the start of said microwave application being at a temperature at which the adsorbed compound is in a liquid state, the gas portion of the effluent creating a pressure in the bed upper portion pushing the effluent toward the bed lower portion, removing the liquid-gas effluent through a lower port, and separately collecting first and second portions of the removed liquid-gas effluent, said second portion having a substantially higher concentration of the desorbed compound than said first portion.

4,421,652

**FLUID TREATING METHOD**

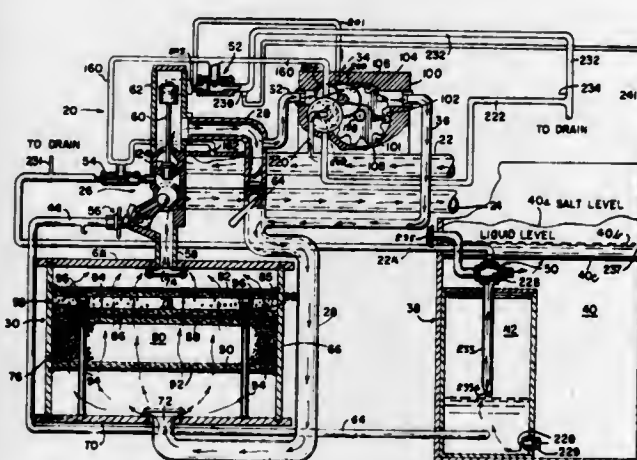
Don E. Heskett, Villa Park, Ill., assignor to Fluid Power Research, Inc., Windsor, Wis.

Filed Dec. 15, 1980, Ser. No. 216,558

Int. Cl.<sup>3</sup> B01D 15/04

U.S. Cl. 210—687

6 Claims



1. A method of treating hard water containing impurities selected from the group consisting of chlorine impurities, soluble iron, insoluble iron, and bacteria, said method comprising simultaneously softening said water and removing said impurities from said water by passing said water containing one or more of said impurities through a bed of cation exchange resin particles having a particle size below 50 mesh measured on a dry basis, said bed of cation exchange resin material being characterized by the ion exchange resin particles being in surface to surface contact with each other and in substantially tightly packed relationship to each other.

4,421,653

**PROCESS FOR THE DEPROTEINIZATION OF BIOLOGICAL FLUIDS**

Michel Le Dain, Neuwiller, France, and Werner Ritschard, Kaiseraugst, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 231,400, Feb. 4, 1981, abandoned. This application Aug. 16, 1982, Ser. No. 408,311

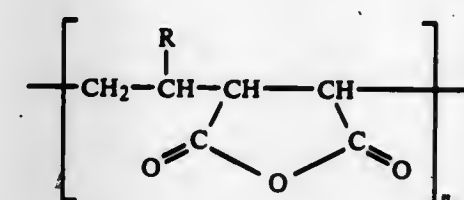
Claims priority, application Switzerland, Feb. 8, 1980, 1037/80

Int. Cl.<sup>3</sup> B01D 15/00

U.S. Cl. 210—692

8 Claims

1. A process for deproteinizing tumor extracts, comprising:  
(a) adding to the tumor extracts a deproteinizing agent comprising a water-insoluble crosslinked polycarbonic acid obtained by crosslinking the polymer of the formula



wherein R represents hydrogen or lower alkoxy and n represents a whole number of 100–10,000;  
with a diamine and hydrolyzing unreacted anhydride groups and

(b) removing the resulting water-insoluble phase from the tumor extracts.

4,421,654

**METAL EXTRACTION FROM SOLUTION AND NOVEL COMPOUNDS USED THEREFOR**

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 279,388, Jul. 1, 1981, Pat. No. 4,379,931.

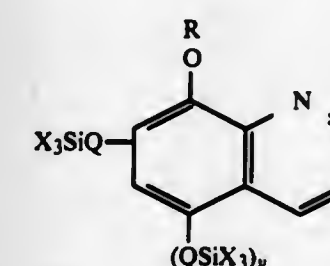
This application Jul. 15, 1982, Ser. No. 398,492

Int. Cl.<sup>3</sup> B01D 15/00, 15/04; B01J 39/04, 45/00

U.S. Cl. 210—698

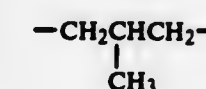
21 Claims

1. A method for preparing an immobilized chelating agent which comprises treating inorganic solid substrates with a silylating agent which is a compound of the formula



wherein

X is an alkoxy radical containing 1–4 carbon atoms;  
Q is a  $-\text{CH}_2-$  or



radical;

y has a value of 0 or 1;

R is hydrogen or an  $\text{R}'_3\text{Si}$ -radical wherein  $\text{R}'$  is  $\text{CH}_3-$  or  $\text{CH}_3\text{CH}_2-$ .

2. The product produced by the method of claim 1.

3. A method of removing heavy metal ions from solution which method comprises contacting a solution containing heavy metal ions with a silylated substrate of claim 2.

4,421,655

**ORGANOPHILIC POLYPHENOLIC ACID ADDITIVES FOR WELL-WORKING COMPOSITIONS**

Jack C. Cowan, Lafayette, La., assignor to Venture Chemicals, Inc., Lafayette, La.

Filed Jun. 11, 1981, Ser. No. 272,684

Int. Cl.<sup>3</sup> C09K 7/06

U.S. Cl. 252—8.5 M

14 Claims

1. An organophilic derivative of a polyphenolic compound comprising a complex salt of a polyphenolic acid, an amino compound, and a polyvalent metallic cation formed by reacting a salt of said polyphenolic acid and said amino compound with a polyvalent metal compound; wherein said polyphenolic acid is selected from the group consisting of humic acid, sulfonated humic acids, and mixtures thereof; wherein said amino compound has the structural formula:



where  $2 \leq x \leq 3$ ;  $z \geq 2$ ;  $\text{R}'$  is selected from the group consisting of H and  $\text{R}''-\text{CO}$ , and mixtures thereof;  $\text{R}''$  is an aliphatic group containing from 11 to 29 carbon atoms; wherein at least two of the  $\text{R}'$  groups are H; wherein said polyvalent metallic cation is selected from the group consisting of calcium, magnesium, iron, zinc, nickel, chromium, aluminum, and mixtures thereof; wherein the amount of said amino compound is from about 20% to about 50% by weight based on the weight of moisture free polyphenolic acid; and wherein the amount of said polyvalent metallic cation compound is such that the percentage by weight, based on the weight of the moisture-free polyphenolic acid salt, is in the range from about  $(\text{EW}) \div 18$  to about  $(\text{EW}) \div 4$  where (EW) is the equivalent weight of the anhydrous polyvalent metallic cation compound.

4,421,656

**SILICONE EMULSIFIER COMPOSITION, INVERT EMULSIONS THEREFROM AND METHOD THEREFOR**

Phillip A. Donatelli, and Joseph W. Keil, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

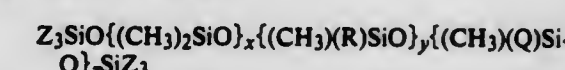
Filed Dec. 31, 1981, Ser. No. 336,153

Int. Cl.<sup>3</sup> C09K 7/06; E21B 43/00

U.S. Cl. 252—8.5 P

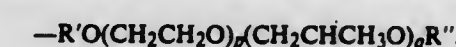
23 Claims

1. An emulsifier composition consisting essentially of  
(a) from 30 to 90 percent by weight of a polydiorganosiloxane having the formula



wherein

Q denotes a polyoxyalkylene radical having the formula



R denotes a monovalent hydrocarbon radical having from 6 to 18 carbon atoms, inclusive,

$\text{R}'$  denotes a divalent organic radical bonded to a silicon atom by a silicon-carbon bond,

$\text{R}''$  denotes a monovalent radical selected from the group consisting of hydrogen, alkyl, cycloaliphatic, aryl, arylalkyl and acyl radicals,

Z denotes a monovalent hydrocarbon radical having from 1 to 5 carbon atoms, inclusive, or a Q radical, or an R radical,

x has an average value of from 0 to 400,

y has an average value of from 0 to 400,

z has an average value of from 0 to 5,

$x+y+z$  has an average value of from 30 to 400,

p has an average value equal to or greater than the average value of q and

$p+q$  has an average value sufficient to provide a formula weight of from 600 to 3500 for the  $-(\text{CH}_2\text{C}(\text{H}_2\text{O})_p(\text{CH}_2\text{CH}(\text{CH}_3)\text{O})_q-$  portion of the Q radical,



there being an average of at least one Q radical and an average of at least one R radical per molecule of the polydiorganosiloxane, and

(b) from 10 to 70 percent by weight of a solid, benzene-soluble organopolysiloxane resin copolymer consisting essentially of  $(\text{CH}_3)_3\text{SiO}_2$  siloxane units and  $\text{SiO}_2$  siloxane units, there being from 0.6 to 0.9, inclusive, of said  $(\text{CH}_3)_3\text{SiO}_2$  siloxane units for every  $\text{SiO}_2$  siloxane unit.

8. An emulsion composition comprising

(A) 40 to 75 parts by volume of a brine as a discontinuous phase,

(B) 25 to 60 parts by volume of a liquid hydrocarbon selected from the group consisting of paraffins having a flash point of at least 100° F., kerosene, diesel oil, crude oil, turbine fuel, mineral oil and gas oil as a continuous phase, (A) and (B) totaling 100 parts by volume and 100 parts by weight,

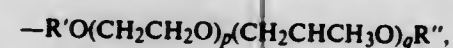
(C) 1.0 to 10 parts by weight, for every 100 parts by weight of brine plus liquid hydrocarbon, of an emulsifier composition consisting essentially of

(a) from 30 to 90 percent by weight of a polydiorganosiloxane having the formula



wherein

Q denotes a polyoxyalkylene radical having the formula



R denotes a monovalent hydrocarbon radical having from 6 to 18 carbon atoms, inclusive,

R' denotes a divalent organic radical bonded to a silicon atom by a silicon-carbon bond,

R'' denotes a monovalent radical selected from the group consisting of hydrogen, alkyl, cycloaliphatic, aryl, arylalkyl and acyl radicals,

Z denotes a monovalent hydrocarbon radical having from 1 to 5 carbon atoms, inclusive, or a Q radical, or an R radical,

x has an average value of from 0 to 400,

y has an average value of from 0 to 400,

z has an average value of from 0 to 5,

x+y+z has an average value of from 30 to 400,

p has an average value equal to or greater than the average value of q and

p+q has an average value sufficient to provide a formula weight of from 600 to 3500 for the  $-(\text{CH}_2\text{C}(\text{H}_2\text{O})_p(\text{CH}_2\text{CH}(\text{CH}_3)\text{O})_q-$  portion of the Q radical,

there being an average of at least one Q radical and an average of at least one R radical per molecule of the polydiorganosiloxane, and

(b) from 10 to 70 percent by weight of a solid, benzene-soluble organopolysiloxane resin copolymer consisting essentially of  $(\text{CH}_3)_3\text{SiO}_2$  siloxane units and  $\text{SiO}_2$  siloxane units, there being from 0.6 to 0.9, inclusive, of said  $(\text{CH}_3)_3\text{SiO}_2$  siloxane units for every  $\text{SiO}_2$  siloxane unit.

4,421,657

#### HEAVY DUTY LAUNDRY SOFTENING DETERGENT COMPOSITION AND METHOD FOR MANUFACTURE THEREOF

Edwin Allen, Oupeye; Alan Dillarstone, Rocourt, and Joseph A. Reul, Heusy, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,713

Int. Cl.<sup>3</sup> C09K 3/18; C11D 3/14, 11/00; D06M 11/06  
U.S. Cl. 252—8.6

1. A heavy duty laundering and textile softening particulate detergent composition, useful for automatic machine washing of laundry in water and dispensable from a charging compartment of such a machine by action of water being fed through such compartment, which comprises a built synthetic organic detergent selected from the group consisting of anionic and

nonionic detergents and mixtures thereof, a building proportion of a builder for the synthetic organic detergent selected from the group consisting of water soluble and water insoluble builders and mixtures thereof, and a softening proportion of bentonite, with the bentonite being in particles with which there is included a dispensing assisting proportion of a salt of a lower alkyl silicic acid and/or polymerization product(s) thereof formed therefrom on storage.

12. A process for manufacturing a heavy duty laundry and textile softening particulate detergent composition, useful for automatic machine washing of laundry in water and dispensable from a charging compartment of such a machine by action of water being fed through such compartment, which includes a built synthetic organic detergent selected from the group consisting of anionic and nonionic detergents and mixtures thereof, a building proportion of a builder for the synthetic organic detergent selected from the group consisting of water soluble and water insoluble builders and mixtures thereof, and a softening proportion of bentonite, with the bentonite being in particles with which there is included a dispensing assisting proportion of a salt of a lower alkyl silicic acid and/or polymerization product(s) thereof formed therefrom on storage, which comprises agglomerating particles of bentonite from finely divided form, passing through a No. 100 sieve and with over 50% thereof passing through a No. 200 sieve, into agglomerates of particle sizes within the range of No's. 10 to 100, U.S. Sieve Series, spray drying an aqueous crutcher mix of the synthetic organic detergent and the builder to detergent composition particles of sizes within the No. 10 to 100 range, blending the bentonite agglomerate particles and spray dried detergent composition particles and applying to the surfaces of such particles a dispensing assisting proportion of a salt of a lower alkyl silicic acid.

4,421,658

#### HALOCARBON-SOLUBLE MOLYBDENUM COMPOSITION

Franklin G. Reick, Westwood, N.J., assignor to Michael Ebert, New York, N.Y.

Continuation-in-part of Ser. No. 218,008, Dec. 18, 1980, Pat. No. 4,349,444, which is a continuation-in-part of Ser. No. 158,329, Jun. 10, 1980, Pat. No. 4,284,518. This application Mar. 29, 1982, Ser. No. 362,849

Int. Cl.<sup>3</sup> C10M 1/30

U.S. Cl. 252—32.7 E

7 Claims

1. A modified halocarbon oil composition capable of acting effectively as a hydraulic fluid and lubricant in those applications in which hydrocarbon oils create a fire hazard comprising a major amount of a chemically-inert halocarbon oil having lubricating characteristics inferior to hydrocarbon oils to which is added a minor amount of an oil soluble organic molybdenum compound in an amount lying within a relative volume range which results in a composition having exceptional low friction characteristics.

4,421,659

#### ZWITTERIONIC QUATERNARY AMMONIUM SULFATES AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,899

Int. Cl.<sup>3</sup> C10M 1/40

U.S. Cl. 252—33

28 Claims

1. A compound of the formula

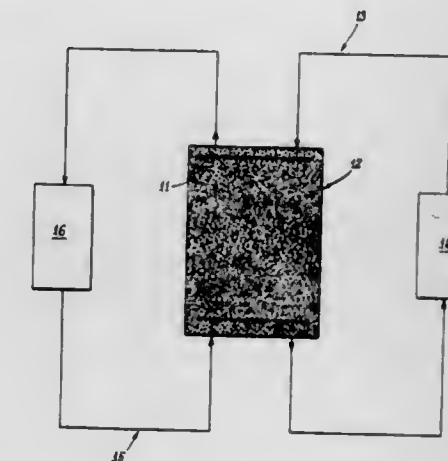
4,421,661

#### HIGH-TEMPERATURE DIRECT-CONTACT THERMAL ENERGY STORAGE USING PHASE-CHANGE MEDIA

Terry D. Claar, Lisle, and Randy J. Petri, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.  
Filed Jun. 19, 1981, Ser. No. 275,380

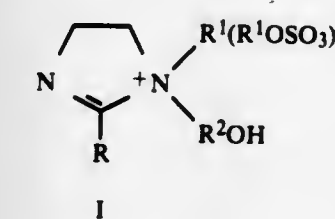
Int. Cl.<sup>3</sup> C09K 5/06; F24H 7/04; F28F 23/00  
U.S. Cl. 252—70

13 Claims



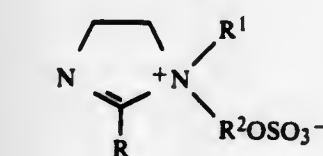
wherein R is a C<sub>7</sub> to C<sub>31</sub> hydrocarbyl group, R<sup>1</sup> is an alkyl or alkylene group containing 1 or 2 carbon atoms and R<sup>2</sup> is a hydrocarbylene group containing 2 to 6 carbon atoms.

9. A lubricant or liquid fuel composition comprising a major proportion of a lubricant or fuel and a friction reducing amount of a compound of the formula:



I

or



II

wherein R is a C<sub>7</sub> to C<sub>31</sub> hydrocarbyl group, R<sup>1</sup> is an alkyl or alkylene group containing 1 to 2 carbon atoms and R<sup>2</sup> is a hydrocarbylene group containing 2 to 6 carbon atoms.

4,421,660

#### COLLOIDAL SIZE HYDROPHOBIC POLYMERS PARTICULATE HAVING DISCRETE PARTICLES OF AN INORGANIC MATERIAL DISPERSED THEREIN

Jitka Solc nee Hajna, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1980, Ser. No. 216,695

Int. Cl.<sup>3</sup> C08K 3/10, 3/34; H01F 1/28, 1/00

U.S. Cl. 252—62.54

21 Claims

1. A method for preparing a colloidal size particulate comprising the steps of (1) emulsifying at least one hydrophobic, emulsion polymerizable monomer in an aqueous colloidal dispersion of discrete particles of an inorganic solid, said dispersion being maintained in a reasonably stable state with a chemical dispersant and/or surfactant, and (2) subjecting the resulting emulsion to emulsion polymerization conditions to form a stable, fluid aqueous colloidal dispersion of the particulate wherein essentially every particle of the inorganic solid is coated with the hydrophobic polymer resulting from said polymerization such that substantially all of the inorganic particles are maintained in a discrete spaced apart relationship to each other by the hydrophobic polymer; the dispersion further characterized in that when the inorganic solid is magnetic, the dispersion remains stable in any applied magnetic field.

4,421,662

#### NONAQUEOUS PURIFICATION OF MIXED NITRATE HEAT TRANSFER MEDIA

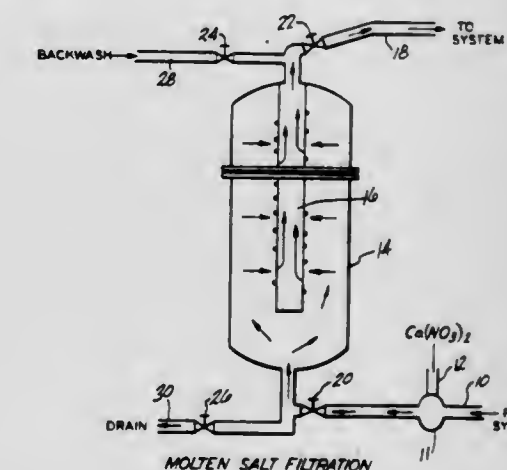
Louis C. Florucci, Hamden, and Michael J. Morgan, Guilford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 13, 1982, Ser. No. 414,725

Int. Cl.<sup>3</sup> C09K 5/06; C01D 9/16; C01F 11/36

U.S. Cl. 252—70

18 Claims



1. A method for removing carbonate and hydroxyl ion impu-



urities from a molten salt mixture of potassium nitrate and sodium nitrate which comprises:

dissolving a sufficient amount of an anhydrous nitrate salt of an alkali metal or alkaline earth metal in said molten salt capable of forming carbonate and hydroxide compounds which are essentially insoluble therein; and separating said insoluble compounds from said molten salt whereby said impurities are removed.

4,421,663

**ASPHALT-OIL HEAT TRANSFER COMPOSITION**  
Louie G. Embree, 3528 Bell Rd., Auburn, Calif. 95603, and Wayne W. Embree, Rte. 2, Box 1514, Lake Isabella, Calif. 93238

Filed May 18, 1981, Ser. No. 264,979  
Int. Cl.<sup>3</sup> C09K 5/00

U.S. Cl. 252-74

26 Claims

1. A heat transfer composition comprising a mixture of: between about 2.5% and 40% by weight soft light commercial asphalt in the range of gradings between AR-1000 and AR-4000;

up to about 30% by weight of an asphalt-miscible oil; and between about 50% and 90% by weight heat-conductive material of high specific gravity.

18. A heat transfer composition comprising a mixture of: between about 2.5% and 40% by weight soft light commercial asphalt;

up to about 30% by weight of an asphalt-miscible oil; between about 50% and 90% by weight heat-conductive material of high specific gravity; and up to about 40% by weight rock salt.

4,421,664

**COMPATIBLE ENZYME AND OXIDANT BLEACHES CONTAINING CLEANING COMPOSITION**  
Charles R. Anderson, Apple Valley, and Thomas R. Oakes, Stillwater, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Jun. 18, 1982, Ser. No. 389,617  
Int. Cl.<sup>3</sup> C11D 3/395, 7/42, 7/54

U.S. Cl. 252-94

18 Claims

1. A cleaning composition, having a combination of bleaching action and enzymatic degradation of biochemical soils, which comprises a slow release oxidant bleach composition which delays the appearance of the full concentration of the oxidant bleach, said composition having a tendency to release a small enzyme deactivating amount of the oxidant, prior to the full concentration of the bleach being released, a biological soil degrading enzyme and an amount of a chemical reducing agent effective to delay the appearance of an enzyme deactivating concentration of oxidant bleach composition until the full concentration of the oxidant bleach composition is released.

4,421,665

**CONTACT LENS CLEANING COMPOSITION CONTAINING LIPID SOLVENT AND METHOD OF USING**

Eugene A. Lloyd, 116 Broadway, Peter Madri, 33 S. Bay Ave., both of Amityville, N.Y. 11701, and William J. Closson, 179 Jayne Ave., Patchogue, N.Y. 11772

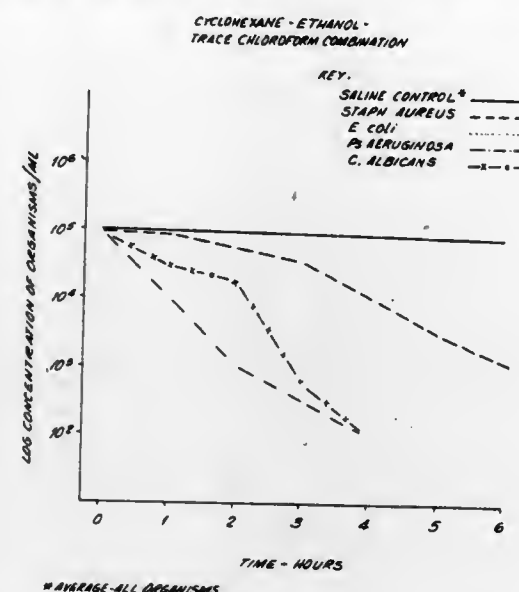
Continuation-in-part of Ser. No. 181,164, Aug. 25, 1980, abandoned. This application Jan. 19, 1981, Ser. No. 226,155  
Int. Cl.<sup>3</sup> C11D 3/43, 3/44, 3/48, 7/50

U.S. Cl. 252-106

43 Claims

1. A composition suitable for cleaning lenses and adapted to provide for enhanced solubility of lipids and lipoproteins which comprises in aqueous solution 0.001 to 1.0% by volume of a non-polar solvent which is cyclohexane or ethyl acetate.

23. A method for the cleaning of a contact lens comprising applying to the lens a composition which includes in aqueous



solution 0.001 to 1.0% by volume of a non-polar solvent which is cyclohexane or ethyl acetate.

4,421,666

**POWDERY ANTIFOAMING COMPOSITIONS FOR AQUEOUS SYSTEMS, THEIR PREPARATION AND USE**  
Hans-Ulrich Hempel, Overath, and Edmund Schmadel, Lechlingen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,574  
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115644

The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C11D 3/12

U.S. Cl. 252-140

16 Claims

1. A free-flowing, substantially silicone-free, powdery anti-foaming composition for use in aqueous systems consisting essentially of:

- a liquid homogeneous mixture of a branched-chain primary C<sub>16</sub>-C<sub>30</sub> alcohol and hydrophobic-reacting colloidal silicic acid with a ratio by weight of alcohol:silicic acid of 100:2 to 100:20, as obtained by heating to 100° to 240° C. with agitation for a time sufficient to obtain a homogeneous mixture;
- a water-insoluble wax in a ratio by weight of (a):(b) of from 3:1 to 1:3; and
- a water-soluble powdered carrier where the components (a) and (b) are present on the carrier in homogeneous distribution, the powdered carrier being present in such an amount that a free-flowing product results.

4,421,667

**SULFUR BASED METAL CLEANERS**

Merlin R. Lindstrom; Gary D. Macdonell, and Rector P. Louthan, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

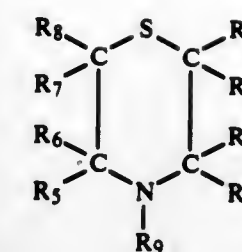
Filed Sep. 29, 1982, Ser. No. 427,222  
Int. Cl.<sup>3</sup> C11D 7/06, 7/32, 7/34

U.S. Cl. 252-156

8 Claims

1. An aqueous composition suitable as a metallic cleaning agent comprising a metal cleaning effective amount of at least one

- thiomorpholine compound represented by the formula:



where R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> can be hydrogen or any hydrocarbyl radical having from 1 to 3 carbon atoms and where the total number of carbon atoms in R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, and R<sub>8</sub> not to exceed about 10 carbon atoms; and where R<sub>9</sub> is hydrogen or any hydrocarbyl radical having from 1 to 8 carbon atoms;

- Group IA or IIA metal hydroxide; and
- water soluble surfactant.

4,421,668

**BLEACH COMPOSITION**

Roger B. Cox, Reading; David C. Steer, and John R. Woodward, both of Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,797

Claims priority, application United Kingdom, Jul. 7, 1981, 8120892

Int. Cl.<sup>3</sup> C11D 17/00; C01B 13/00, 15/037; C12N 9/02  
U.S. Cl. 252-174.12

20 Claims

1. An aqueous liquid bleach composition comprising a hydrogen peroxide precursor comprising

- from 50 to 1000 units per ml of the composition of a C<sub>1</sub> to C<sub>4</sub> alkanol oxidase enzyme; and
- from 5 to 25% by weight of the composition of a C<sub>1</sub> to C<sub>4</sub> alkanol substrate;

the enzyme and substrate being incapable of substantial interaction in the composition to form hydrogen peroxide until the composition is diluted with water; the composition containing less than 1 unit of catalase for every 2 units of alkanol oxidase; and the composition on dilution with 100 times its volume of water having a pH value of from 7.5 to 11.

19. An aqueous liquid detergent bleach composition which comprises

- from 1 to 90% by weight of detergent active compound;
- a hydrogen peroxide precursor comprising
  - from 50 to 1000 units of ethanol oxidase per ml of the composition; and
  - from 5 to 25% by weight of ethanol;
 the ethanol oxidase and ethanol being incapable of substantial interaction in the composition to form hydrogen peroxide until the composition is diluted with water; and
- from 0.1 to 10% by weight of organic bleach activator; the composition containing less than 1 unit of catalase for every 2 units of ethanol oxidase; and the composition on dilution with 100 times its volume of water having a pH value of from 7.5 to 11.

4,421,669

**PROCESS FOR THE STABILIZATION OF PARTICLES CONTAINING PEROXYGEN COMPOUNDS AND BLEACHING COMPOSITIONS CONTAINING PARTICLES STABILIZED ACCORDING TO THIS PROCESS**

Jean Brichard, Vilvoorde, Belgium, assignor to Interlox (Société Anonyme), Brussels, Belgium

Filed Dec. 12, 1980, Ser. No. 216,073

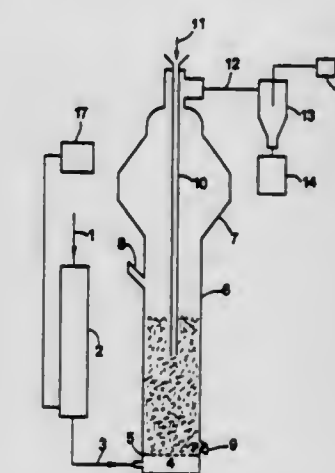
Claims priority, application France, Dec. 12, 1979, 79 30664  
Int. Cl.<sup>3</sup> C01B 15/10; C11D 3/39, 7/18, 7/54

U.S. Cl. 252-186.25

6 Claims

1. Process for the stabilisation of particles containing a peroxxygen compound by coating using a coating agent that is insoluble in water and melts at low temperature according to which the particles containing the peroxxygen compounds are

kept in a fluidised bed, comprising introducing the coating agent into a continuously operating fluidised bed in the form of solid particles at a flow rate of from 0.01 to 50 g per minute and per liter of bed and maintaining the fluidised bed at a temperature between the temperature at which the coating agent begins to melt and this same temperature plus 20° C., with the solid particles of the coating agent having a diameter between



0.05 and 10 mm, the amount of coating agent being between 0.01 and 10% by weight of the peroxxygen compound, the diameter of the particles containing the peroxxygen compound being between 0.01 and 2 mm, the coating agent being a wax having an initial melting point of between 50° and 90° C., and selected from high molecular weight hydrocarbons, fatty acids and their derivatives, fatty alcohols and mixtures of these.

4,421,670

**LIQUID CRYSTAL DIHYDROPHENANTHRENE SUBSTANCES**

Hans-Joachim Deutscher, Halle; Sabine Richter, Haldeleben; Horst Zschke, Halle; Dietrich Demus, Halle, and Ute Böttger, Halle, all of German Democratic Rep., assignors to VEB Werk für Fernsehelektronik Berlin im VEB Kombinat Mikroelektronik, Berlin-Oberschoneweide, German Democratic Rep.

Filed Sep. 14, 1981, Ser. No. 302,287

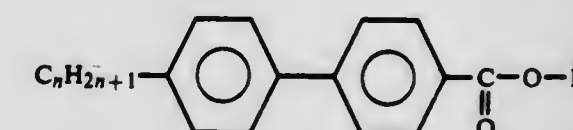
Claims priority, application German Democratic Rep., Sep. 16, 1980, 223829; Sep. 16, 1980, 223841

Int. Cl.<sup>3</sup> C09K 3/34; G02F 1/13; C07C 69/76, 121/64

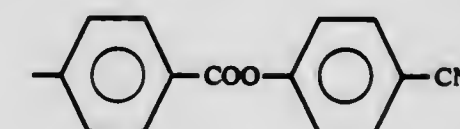
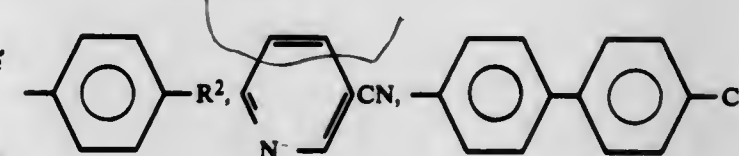
U.S. Cl. 252-299.62

19 Claims

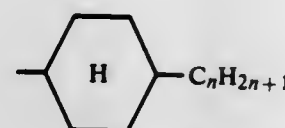
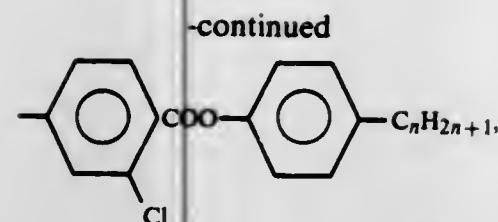
1. 7-n-alkyl-8,10-dihydrophenanthrene-2-carboxylic acid esters of the general formula



wherein R<sup>1</sup> = C<sub>n</sub>H<sub>2n+1</sub>,







$R^2 = -C_nH_{2n+1}, -C_nH_{2n+1}O, -CN, -Cl, -Br, -CF_3,$   
 $-CH_2-CH_2-CN, -CH=C(CN)_2$   
 with  $n$  equal to 1 to 10.

4,421,671

### RARE-EARTH-DOPED YTTRIA-GADOLINIA CERAMIC SCINTILLATORS

Dominic A. Cusano; Charles D. Greskovich, both of Schenectady, N.Y., and Frank A. DiBianca, Chapel Hill, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,815

Int. Cl.<sup>3</sup> C09K 11/477

U.S. Cl. 252-301.4 F

30 Claims

1. A polycrystalline ceramic scintillator comprising a composition consisting essentially of between about 5 and 50 mole percent  $Gd_2O_3$ , between about 0.02 and 12 mole percent of at least one rare earth activator oxide selected from the group consisting of  $Eu_2O_3$ ,  $Nd_2O_3$ ,  $Yb_2O_3$ ,  $Dy_2O_3$ ,  $Tb_2O_3$ , and  $Pr_2O_3$ , at least one transparency promoter selected from the group consisting of  $ThO_2$  in an amount up to 0.7 mole percent,  $ZrO_2$  in an amount up to 0.7 mole percent and  $Ta_2O_5$  in an amount up to 0.5 mole percent, said transparency promoter being present in amount sufficient to improve the transparency of the ceramic scintillator, and at least one light output restorer selected from the group consisting of  $CaO$  and  $SrO$ , in an amount sufficient to effect a higher light output than said ceramic scintillator absent said restorer the remainder being  $Y_2O_3$ .

22. A polycrystalline ceramic scintillator comprising a composition consisting essentially of between about 5 and 50 mole percent  $Gd_2O_3$ , between about 0.02 and 12 mole percent of at least one rare earth activator oxide selected from the group consisting of  $Eu_2O_3$ ,  $Nd_2O_3$ ,  $Yb_2O_3$ ,  $Dy_2O_3$ ,  $Tb_2O_3$ , and  $Pr_2O_3$ , and a transparency promoter selected from the group consisting of  $ThO_2$  in an amount up to 0.35 mole percent,  $ZrO_2$  in an amount up to 0.35 mole percent, and  $Ta_2O_5$  in an amount up to 0.3 mole percent, said transparency promoter being present in an amount sufficient to improve the transparency of the ceramic scintillator, the remainder being  $Y_2O_3$ .

4,421,672

### METHOD OF CYCLIC DESORPTION OF ADSORPTION MEDIA LOADED WITH ADSORBATES

Karl Rogge, Leihgestern, and Günther Gappa, Gelsenkirchen-Buer, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,301

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1980, 3038715

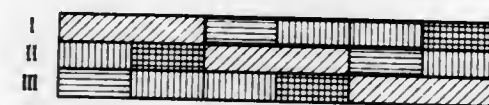
Int. Cl.<sup>3</sup> B01J 20/34; B01D 53/04

U.S. Cl. 502-55

8 Claims

1. A method of cyclic desorption of activated carbon cyclically loaded with adsorbates by a vapor, comprising the steps of performing a first desorption phase by guiding a mixture of a desorption vapor and an adsorption vapor over activated carbon; performing a second desorption phase by guiding a pure desorption vapor over said activated carbon; introducing the vapor mixture produced during the second desorption phase as said mixture into the first desorption phase; at least once interrupting the passage of the mixture of a desorption

vapor over said activated carbon so that a substantially increased concentration of the adsorbate vapor in said desorption vapor and removal of the desorbed adsorbate out of the pores of the activated carbon is effected; and resuming the flow of said desorption vapor over said activated carbon to continue said desorption.



6. A method as defined in claim 1, wherein said performing steps include utilizing a water vapor as the desorption vapor.

8. A method as defined in claim 1; and further comprising the step of performing at least one further desorption phase between said first and second desorption phases.

4,421,673

### CATALYST FOR MAKING POLYURETHANES

Francis W. Arbir, Itasca; Daniel S. Raden, Hawthorn Woods; Kenneth W. Narducy, Bloomington, and Francois M. Casati, Highland Park, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 9, 1981, Ser. No. 252,634

Int. Cl.<sup>3</sup> B01J 31/04

U.S. Cl. 502-167

6 Claims

1. A catalyst composition for preparing urethane foams using methylene chloride as auxiliary blowing agent, consisting essentially of 3-dimethylaminopropylamine and 10-50 equivalent-% thereof of a branched octanoic acid.

4,421,674

### SUPPORTED CATALYSTS FOR THE POLYMERIZATION OF ETHYLENE

Renzo Invernizzi, Milan; Ferdinando Ligorati, Usmate; Maurizio Fontanesi, Concorezzo, and Roberto Catenacci, Milan, all of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed May 10, 1982, Ser. No. 376,727

Claims priority, application Italy, May 21, 1981, 21881 A/81

Int. Cl.<sup>3</sup> C08F 4/02, 4/64

U.S. Cl. 502-154

7 Claims

1. Process for the preparation of a catalyst which is active in the polymerization of gaseous ethylene at low pressure characterized by the steps of:

(a) providing a solution consisting of  $MgCl_2$  dissolved in ethanol at a concentration of 100 to 300 g of  $MgCl_2$  per liter of solution, having a water content not exceeding 5% by weight;

(b) spray drying said solution by spraying the latter into a flow of substantially anhydrous gaseous nitrogen having a purity of at least 99.9% and having an inlet temperature below  $280^\circ C$ . while controlling the flows of said nitrogen and of said solution so that the outlet temperatures of the gaseous mixture is by at least  $40^\circ C$ . lower than the inlet temperature and that the ethanol is not completely evaporated, to obtain  $MgCl_2$  particles of spherical form and of a size in the range of from 3 to 100 microns with a residual alcoholic hydroxyl content of from 1.5% to 20% by wt., the solid  $MgCl_2$  in said particles having an X-ray spectrum in which the maximum peak at 2.56 angstrom characteristic of crystalline  $MgCl_2$  is practically absent and a new maximum peak at about 10.8 angstrom is present;

(c) reacting said  $MgCl_2$  particles with a titanium halide, said halide being in the vapour or liquid form, optionally di-

luted with an inert, vaporizable solvent, at a temperature of from  $20^\circ C$ . to  $100^\circ C$ ., the reaction time being in the range of from 2 to 60 minutes, while maintaining the weight ratio between the titanium halide and the  $MgCl_2$  particles in the reaction zone in the range of from 0.001:1 to 2:1;

(d) recovering by physical means the reaction product particles when the latter contains from 0.7% to 12% by wt. (expressed as titanium) and on dry basis of titanium chemically linked to the solid;

(e) mixing the said reaction product particles with an organometallic compound selected from the group consisting of alkylaluminum or halides of alkylaluminum, in the same solvent used for the polymerization of ethylene, at room temperature and controlling the respective amounts so as to have in the mixture an atomic ratio between Al and Ti of from 100:1 to 5,000:1.

4,421,675

### PROCESS

Robert A. Sawicki, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 8, 1982, Ser. No. 337,915

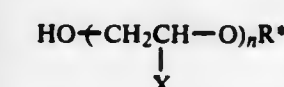
Int. Cl.<sup>3</sup> B01J 31/02

U.S. Cl. 502-150

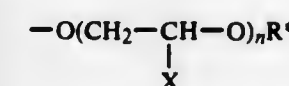
23 Claims

1. The process for preparing a functionalized refractory oxide which comprises

(i) reacting a porous refractory oxide bearing surface hydroxyl groups with a polyoxyalkylene glycol or monoalkyl ether

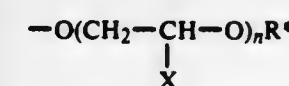


wherein  $R^*$  is hydrogen or lower alkyl hydrocarbon group containing 1-8 carbon atoms,  $X$  is hydrogen or methyl, and  $n$  is 1-300 thereby forming a functionalized oxide bearing at least one



residue on the surface of said oxide; and

(ii) recovering said functionalized oxide bearing at least one



residue on the surface thereof.

4,421,676

### PROCESS FOR PREPARATION OF PALLADIUM ON CARBON CATALYSTS USED IN THE PURIFICATION OF CRUDE TEREPHTHALIC ACID

Imre Puskas, Glen Ellyn, and David E. James, Batavia, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 29, 1981, Ser. No. 316,337

Int. Cl.<sup>3</sup> B01J 23/44; C07C 51/42

U.S. Cl. 502-185

5 Claims

1. A method of making a catalyst used for purification of terephthalic acid containing up to 10,000 ppm of 4-carboxybenzaldehyde in a standard laboratory test wherein 4-carboxybenzaldehyde content is decreased to less than 100 parts per million which comprises adsorbing catalytically active palladium crystallites on the surface of a porous carbonaceous support material comprising activated carbon granules having a surface area of at least 600  $m^2/g$  wherein said palladium

crystallites are predominantly less than 35 Å in longitudinal measurement, which method comprises contacting said support with an aqueous solution of a nitropalladate salt comprising  $Na_2Pd(NO_2)_4$ , prepared by reacting a nitrite salt and a palladium halide in a mole ratio of about 4:1, and wherein said nitropalladate salt is adsorbed upon the surface of said support material and reduction to metallic palladium occurs.

2. The method of claim 1 wherein said nitropalladate salt is prepared by reacting stoichiometric quantities of a nitrite salt with a palladium halide selected from the group consisting of palladium chloride, palladium bromide and palladium iodide.

3. The method of claim 2 wherein said nitrite salt is sodium nitrite.

4,421,677

### TRANSPARENT MATERIAL HAVING ELECTRICAL CONDUCTIVITY WHICH IS DEPENDENT ON THE DOSE OF OPTICAL RADIATION RECEIVED

Christian Bianchin, Saint Martin d'Heres; Alain F. Deneuille, Vif, and Philippe Gerard, Meylan, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, both of, France

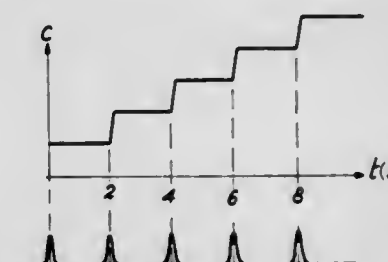
Filed Jun. 28, 1978, Ser. No. 919,976

Claims priority, application France, Jun. 29, 1977, 77 19922

Int. Cl.<sup>3</sup> H01C 13/00

U.S. Cl. 252-501.1

1 Claim



1. A transparent material whose electrical conductivity is dependent on the dose of optical radiation which it has received, said material comprising a thin layer of substoichiometric amorphous oxide of a metal selected from the group consisting of  $WO_x$  and  $MoO_x$ , wherein  $WO_x$  is in the range of  $2.2 < x < 2.6$  and  $MoO_x$  is in the range of  $2.4 < x < 2.7$ .

4,421,678

### ELECTRICALLY CONDUCTIVE COMPOSITIONS COMPRISING AN ETHYLENE POLYMER, A MINERAL FILLER AND AN OILED, ELECTRICALLY CONDUCTIVE CARBON BLACK

Aspy K. Mehta, Baton Rouge, La., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 29, 1980, Ser. No. 221,153

Int. Cl.<sup>3</sup> H01B 1/06

U.S. Cl. 252-511

12 Claims

1. An electrically conductive composition comprising an ethylene polymer, a mineral filler and conductive carbon black having a surface area greater than about 500  $m^2/gram$  and oiled with a paraffin mineral oil of lubricating viscosity wherein the mineral filler is present in an amount of about 5 to about 30 percent by weight and the oiled carbon black is present in an amount of about 5 to about 25 percent by weight.



4,421,679  
METHYL SUBSTITUTED-2-OXOHXANE  
DERIVATIVES AND PROCESSES FOR PREPARING AND  
USING SAME

Richard M. Boden, Monmouth Beach; Lambert Dekker, Wyck-off; Frederick L. Schmitt, Holmdel, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 195,630, Oct. 9, 1980, Pat. No. 4,335,009, which is a continuation-in-part of Ser. No. 160,788, Jun. 19, 1980, Pat. No. 4,287,084. This application Feb. 4, 1982, Ser. No. 345,665

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> A61K 7/46

U.S. Cl. 252-522 R

6 Claims

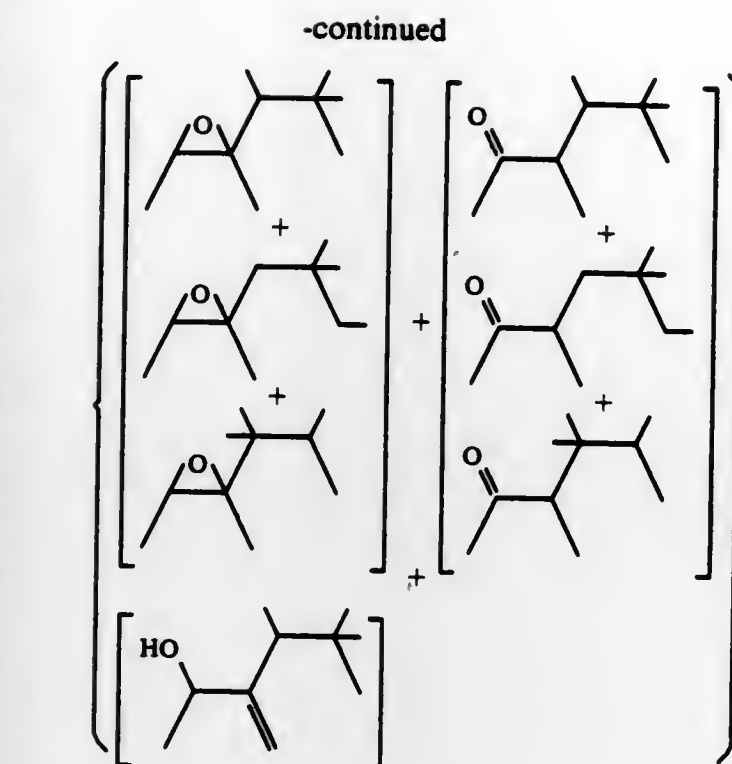
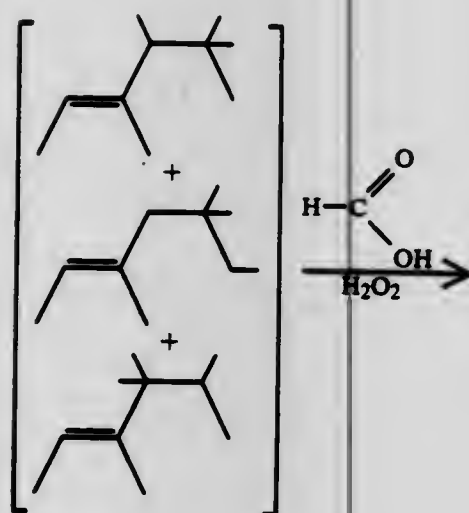
1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of intimately admixing with a perfume composition, a cologne or a perfumed article base, an aroma augmenting or enhancing quantity of a product produced according to a process comprising the steps of:

(i) dimerizing isoamylene to form diisoamylene in the presence of an acid catalyst, said diisoamylene being a mixture of compounds having the structures:



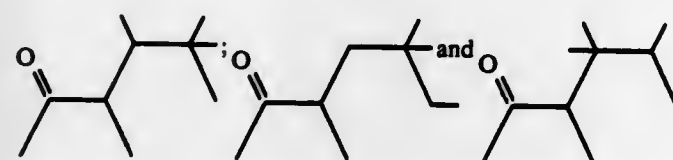
said diisoamylene having a distillation range of 36°-40° C. vapor temperature; 74°-94° C. liquid temperature and 4-5 mm/Hg pressure;

(ii) admixing the resulting diisoamylene mixture with a mixture of concentrated hydrogen peroxide and formic acid in order to effect the reaction:



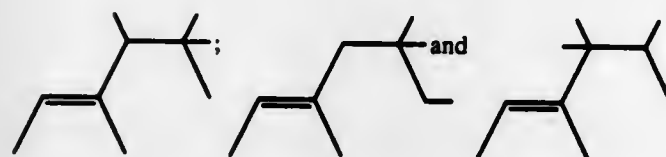
at a temperature in the range of from about 40° C. up to about 70° C.;

(iii) distilling the resulting reaction product at a vapor temperature in the range of from about 93° C. up to about 100° C. vapor temperature; 109° C. up to 120° C. liquid temperature at 50 mm/Hg pressure whereby a mixture of ketones is formed having the structures:



2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of intimately admixing with a perfume composition, a cologne or a perfumed article base, an aroma augmenting or enhancing quantity of a product produced according to a process comprising the steps of:

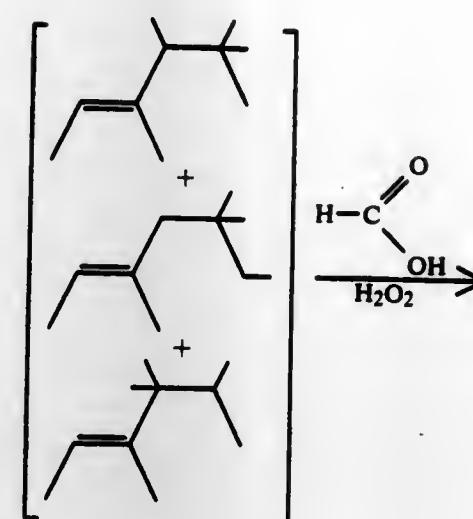
(i) dimerizing isoamylene to form diisoamylene in the presence of an acid catalyst, said diisoamylene being a mixture of compounds having the structures:



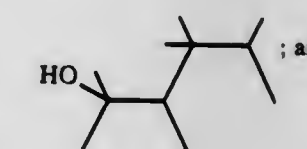
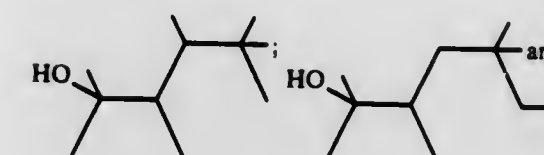
said diisoamylene having a distillation range of 36°-40° C. vapor temperature; 74°-94° C. liquid temperature and 4-5 mm/Hg pressure;

(ii) admixing the resulting diisoamylene mixture with a mixture of concentrated hydrogen peroxide and formic acid in order to effect the reaction:

-continued



wherein X is chloro or bromo;  
(v) reacting the resulting organometallic compound mixture with acid thereby forming a mixture of alcohols having the structures:



(vi) fractionally distilling the resulting acid; and mixture at a temperature in the range of 70°-74° C. vapor temperature; 95°-113° C. liquid temperature and 10 mm/Hg pressure.

4,421,680

CLEANING AND DEGREASING COMPOSITION

Irving Shivar, Rte. 2, Box 231, Camden, S.C. 29020

Filed Sep. 18, 1981, Ser. No. 303,467

Int. Cl.<sup>3</sup> C11D 1/84, 3/08

U.S. Cl. 252-526

1 Claim

1. A degreasing composition consisting essentially of 4.0-4.25% by weight of n-butoxyethanol, 4.0-4.25% by weight of a coconut diethanolamide, 0.75-1.0% by weight of sodium metasilicate pentahydrate, 0.2-0.3% by weight of potassium hydroxide, 1.75-2.0% by weight of cocamidopropyl betaine, 4.0-4.25% by weight of an isopropylamine salt of dodecylbenzenesulfonic acid and water.

4,421,681

LIQUID DETERGENT COMPOSITION COMPRISING AMMONIUM ALKYL SULFATE, POLYOXYALKYLENE ALKYL ETHER AND FATTY ACID DIALKANOLAMIDE

Hajime Hirota, Tokyo, and Hiroshi Watanabe, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

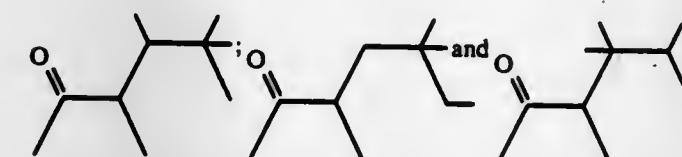
Filed Feb. 8, 1982, Ser. No. 346,713

Claims priority, application Japan, Feb. 23, 1981, 56-25258

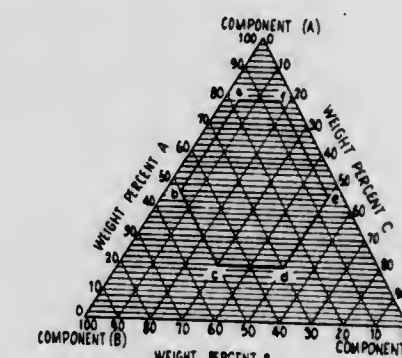
Int. Cl.<sup>3</sup> C11D 1/14

U.S. Cl. 252-541

4 Claims



(iv) reacting the resulting mixture of ketones with a methyl magnesium halide in the presence of an inert solvent whereby a mixture of organometallic compounds is formed having the structures:



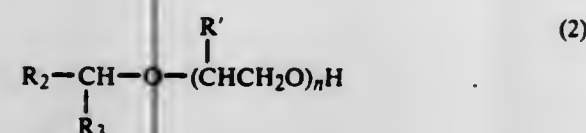
1. A liquid detergent composition having good stability at low and high temperatures and high foaming power, consisting essentially of:

(A) 5-25 wt. % of an ammonium alkyl sulfate of the formula:

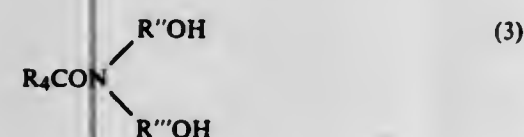




wherein  $R_1$  is straight-chain or branched-chain, saturated hydrocarbon group having 8-18 carbon atoms on the average;  
(B) 0.2-10 wt. % of a polyoxyalkylene alkyl ether of the formula:



wherein  $R_2$  is alkyl having 6-14 carbon atoms,  $R_3$  is alkyl having 1-7 carbon atoms,  $R'$  is hydrogen or methyl, and  $n$  is an integer in the range of 3-15;  
(C) 0.2-10 wt. % of a fatty acid dialkanolamide of the formula:



wherein  $R_4$  is a straight-chain or branched-chain, saturated or unsaturated hydrocarbon group having 7-17 carbon atoms,  $R''$  and  $R'''$  each is  $C_mH_{2m}$ , and  $m$  is 2 or 3, with the proviso that the relative proportions of components A, B and C lie on or within the polygon defined by the straight lines connecting points a, b, c, d, e and f in the attached drawing; and the balance is essentially water.

4,421,682

## HEATING OF PROTEINACEOUS LIQUIDS

Richard H. Edwards, and George O. Kohler, both of Albany, Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.  
Filed Apr. 6, 1981, Ser. No. 251,667  
Int. Cl.<sup>3</sup> C07G 7/00; A23J 1/14

U.S. Cl. 260-112 R 12 Claims

1. A method of raising the temperature of a first liquid containing uncoagulated heat coagulable proteins above the coagulation temperature of said proteins to coagulate said proteins, by means of a heat exchanger without contact between said first liquid and said heat exchanging surface, which comprises: mixing said first liquid with an amount of a second liquid which has been previously heated in a heat exchanger, the temperature of said second liquid being sufficient to raise the temperature of said first liquid above the coagulation temperature of said heat coagulable proteins therein; and holding said mixed liquids together for a time sufficient to coagulate said proteins in said first liquid.

4,421,683

## SUBSTANCE EFFECTIVE FOR PREVENTION OR THERAPY OF NEPHRITIS AND METHOD FOR PREPARATION THEREOF

Akira Fujimaki, Koganei, Japan, assignor to Zaidan Hojin Minsei Kagaku Kyokai, Tokyo, Japan  
Filed Dec. 8, 1981, Ser. No. 328,534

Claims priority, application Japan, Dec. 15, 1980, 55-176966; Dec. 15, 1980, 55-176967

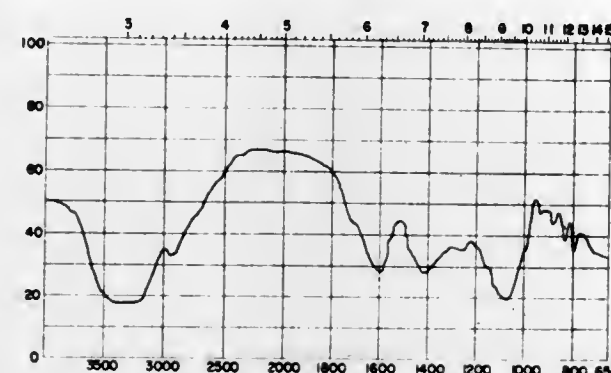
Int. Cl.<sup>3</sup> C07G 7/00

U.S. Cl. 260-112 R 9 Claims

1. A method of preparing a substance effective for prevention or therapy of nephritis, which comprises preparing a concentrated extract from watermelon pulp juice, adding to the extract a lower alcohol to provide an alcoholic solution with an alcohol concentration of about 80 to 95% by weight, adding acetone to the resulting solution in a volume of 1.5 to

2.5 times the volume of said solution to obtain a precipitate of glucopeptide, further repeating at least once the purification procedure for the precipitate which comprises dissolution with a similar alcohol and precipitation from the resulting solution with acetone, and finally removing the remaining solvent to dryness to obtain a white powder of glucopeptide.

9. A glucopeptide effective for nephritis, having unidentified sugar and peptide, exhibiting two different kinds of migration



fractions in each of fractionations by high-pressure paper electrophoresis and thin-layer chromatography, indicating maximum absorption at 325 mμ by micro biuret analysis, showing a specific infrared absorption spectrum as shown in FIG. 5, having a specific rotation  $[\alpha]_D^{25.5} = +374.91$  (water), and being in chemical reactions positive in each of Ninhydrin reaction, Glycyrhizin reaction, and reducing sugar reaction and negative in TCA (25%) reaction.

4,421,684

## COLUMN FOR ADSORPTION OF BLOOD PROTEINS

Toshihide Nakashima; Maso Tanihara, both of Kurashiki, and Koichi Takakura, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

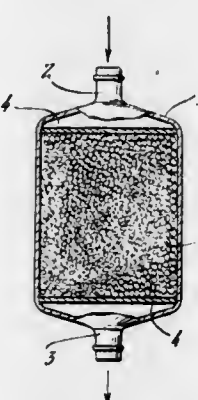
Division of Ser. No. 250,630, Apr. 3, 1981, Pat. No. 4,384,954. This application May 28, 1982, Ser. No. 383,137

Claims priority, application Japan, Apr. 16, 1980, 55-50733; Apr. 16, 1980, 55-50734; Sep. 22, 1980, 55-131804; Sep. 22, 1980, 55-131805; Oct. 29, 1980, 55-152457

Int. Cl.<sup>3</sup> A61K 37/02; C07G 7/00

U.S. Cl. 260-112 B

12 Claims



1. A method of removing blood proteins by adsorption which comprises bringing blood, plasma or serum into contact with porous glass having a mean pore diameter in the range of 30-3,000 angstroms with the ratio of the volume occupied by pores with diameters within the range of 0.8D-1.2D to the whole pore volume being at least 80%, D being the mean pore diameter, and with the mean pore diameter of the porous glass being selected to correspond to the molecular weights of the proteins to be adsorbed as follows:

- for adsorption of proteins having molecular weights of 500-20,000, porous glass with a mean pore diameter in the range of 30-150 angstroms is used;
- for adsorption of proteins having molecular weights of

20,000-200,000, porous glass with a mean pore diameter in the range of 150-1,000 angstroms is used; and  
(c) for adsorption of proteins having molecular weights of 200,000-1,000,000, porous glass with a mean pore diameter in the range of 1,000-3,000 angstroms is used.

4,421,685

## PROCESS FOR PRODUCING AN INSULIN

Ronald E. Chance, Westfield, and James A. Hoffmann, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 134,390, Mar. 27, 1980, abandoned. This application May 11, 1981, Ser. No. 262,141  
Int. Cl.<sup>3</sup> C07C 103/52; C07G 7/00

U.S. Cl. 260-112.7 18 Claims

1. A process for combining an A-chain of an insulin or an insulin analog and B-chain of an insulin or an insulin analog to produce an insulin or an insulin analog, which comprises bringing the S-sulfonated form of the A-chain, the S-sulfonated form of the B-chain, and a thiol reducing agent together in an aqueous medium under conditions which produce a mixture having (1) a pH of from about 8 to about 12, (2) a total protein concentration of from about 0.1 to about 50 milligrams per milliliter, and (3) an amount of thiol reducing agent which affords a total of from about 0.4 to about 2.5 -SH groups per each -SSO<sub>3</sub><sup>-</sup> group present in the total amount of A- and B-chain S-sulfonates, and allowing formation of insulin or an insulin analog to occur by maintaining the mixture at a temperature of from about 0° C. to about 25° C. and in an environment which provides a source of oxygen.

4,421,686

## 4-NORBORNYL-SULFONYL AZETIDINONE INTERMEDIATES AND PROCESS FOR PREPARING (S)-3-ACYLAMINO-4-SUBSTITUTED-2-AZETIDINONES

Richard H. Mueller, Lawrenceville; Christopher M. Cimarusti, Pennington, and Thomas P. Kissick, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 325,781, Nov. 30, 1981. This application Sep. 13, 1982, Ser. No. 416,837

Int. Cl.<sup>3</sup> C07D 205/08

U.S. Cl. 260-239 A

2 Claims

- (3R-cis)-3-Phenylacetamino-4-norbornylsulfonyl-2-azetidinone.
- (3R-cis)-3-Phenoxyacetamino-4-norbornylsulfonyl-2-azetidinone.

4,421,687

## MACBECIN DERIVATIVES

Toru Hasegawa, Kawanishi; Masayuki Muroi, Suita, and Seiichi Tanida, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Limited, Osaka, Japan

Filed Sep. 2, 1982, Ser. No. 414,031

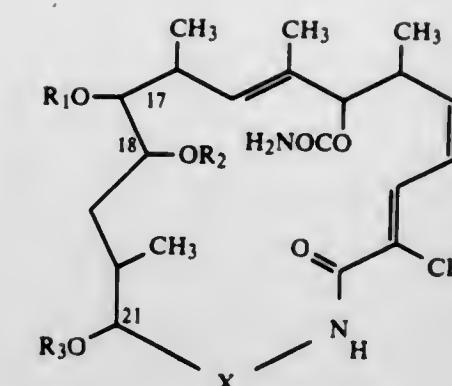
Claims priority, application Japan, Sep. 26, 1981, 56-152644; Jun. 4, 1982, 57-96711

Int. Cl.<sup>3</sup> C07D 225/06

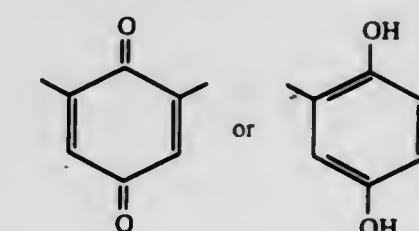
U.S. Cl. 260-239.3 B

5 Claims

1. Antibiotic C-33196 E-6, C-33196 E-6-R, C-33196 E-7 or C-33196 E-7-R, which has the following chemical structure:



wherein one of the groups of  $R_1$ ,  $R_2$  and  $R_3$  is methyl and the remaining ones are hydrogen, and X is a group of



and has the following properties:

- Antibiotic C-33196 E-6:  
(I) Specific rotation:  $[\alpha]_D^{24} + 258.8^\circ \pm 20^\circ$  ( $c=0.5$ ,  $CHCl_3$ );  
(II) Ultraviolet absorption spectrum:  $\lambda_{max}^{MeOH}$  273 nm  $\pm 2$  nm ( $E_{1cm}^{1\%}$  454  $\pm 45$ );  $\lambda_{max}^{MeOH}$  397 nm  $\pm 2$  nm ( $E_{1cm}^{1\%}$  50.3  $\pm 5$ );  
(III) Infrared absorption spectrum, principal peaks ( $cm^{-1}$ ): 1720, 1705, 1670, 1650, 1610, 1505, 1380, 1325, 1265, 1210, 1090, 1040;
- Antibiotic C-33196 E-6-R:  
(I) Specific rotation:  $[\alpha]_D^{24} + 37.8^\circ \pm 4^\circ$  ( $c=0.5$ ,  $MeOH$ );  
(II) Ultraviolet absorption spectrum:  $\lambda_{max}^{MeOH}$  255 nm  $\pm 2$  nm ( $E_{1cm}^{1\%}$  337  $\pm 30$ );  $\lambda_{max}^{MeOH}$  307 nm  $\pm 2$  nm ( $E_{1cm}^{1\%}$  91  $\pm 9$ );  
(III) Infrared absorption spectrum, principal peaks ( $cm^{-1}$ ): 1720, 1650, 1600, 1535, 1460, 1380, 1320, 1090, 1040, 1010;
- Antibiotic C-33196 E-7:  
(I) Specific rotation:  $[\alpha]_D^{24} + 37.4^\circ \pm 4^\circ$  ( $c=0.5$ ,  $CHCl_3$ );  
(II) Ultraviolet absorption spectrum:  $\lambda_{max}^{MeOH}$  274 nm  $\pm 2$  nm ( $E_{1cm}^{1\%}$  502  $\pm 50$ );  $\lambda_{max}^{MeOH}$  396 nm  $\pm 2$  nm ( $E_{1cm}^{1\%}$  59.8  $\pm 6$ );  
(III) Infrared absorption spectrum, principal peaks ( $cm^{-1}$ ): 1725, 1670, 1650, 1605, 1500, 1380, 1325, 1260, 1205, 1150, 1095, 1035;
- Antibiotic C-33196 E-7-R:  
(I) Specific rotation:  $[\alpha]_D^{24} + 18.6^\circ \pm 2^\circ$  ( $c=0.5$ ,  $MeOH$ );  
(II) Ultraviolet absorption spectrum:  $\lambda_{max}^{MeOH}$  250 nm  $\pm 2$  nm ( $E_{1cm}^{1\%}$  305  $\pm 30$ );  $\lambda_{max}^{MeOH}$  315 nm  $\pm 2$  nm ( $E_{1cm}^{1\%}$  68  $\pm 7$ );  
(III) Infrared absorption spectrum, principal peaks ( $cm^{-1}$ ): 1710, 1640, 1600, 1485, 1455, 1380, 1310, 1250, 1090, 1040.

4,421,688

## MACBECIN DERIVATIVES

Masayuki Muroi, Suita, and Makoto Kida, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 2, 1982, Ser. No. 414,032

Claims priority, application Japan, Sep. 17, 1981, 56-147175  
Int. Cl.<sup>3</sup> C07D 225/06

U.S. Cl. 260-239.3 B

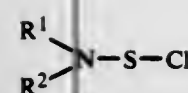
7 Claims

1. A compound represented by the formula:









wherein  $R^1$  and  $R^2$ , which may be the same or different, each represents (1)  $-X-COOR^3$ , in which X represents an alkylene group having 1 to 6 carbon atoms, and  $R^3$  represents an alkyl group having 1 to 8 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms; or (2)  $-Y-CN$ , in which Y represents an alkylene group having 1 to 6 carbon atoms; and  $R^2$  further represents an alkyl group having 1 to 8 carbon atoms; a cycloalkyl group having 3 to 6 carbon atoms; a benzyl group which may be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms; a phenyl group which may be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms; or  $-Z-R^4$ , in which Z represents a carbonyl group or a sulfonyl group, and  $R^4$  represents an alkyl group having 1 to 6 carbon atoms, a phenyl group which may be substituted with an alkyl group having 1 to 3 carbon atoms or a halogen atom, an alkoxy group having 1 to 3 carbon atoms or a phenoxy group.

4,421,694

## PROCESS FOR THE PREPARATION OF NITROANILINES

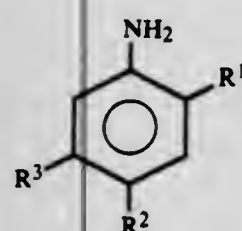
Bruno Kruger, Cologne; Adolf Winkler, Leverkusen, and Gunter Hentze, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Jan. 20, 1982, Ser. No. 340,901  
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104310

Int. Cl.<sup>3</sup> C07C 85/04, 120/00

U.S. Cl. 260-465 E

13 Claims

1. A process for the preparation of a nitroaniline of the formula



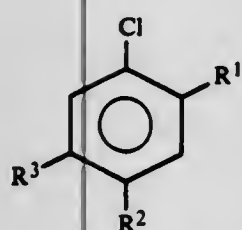
wherein

$R^1$  represents halogen, a cyano group, a nitro group, a carboxyl group, an acyl group or a sulphy group,

$R^2$  represents hydrogen, a nitro group or a carboxyl group and

$R^3$  denotes hydrogen or halogen, and wherein

at least one of the radicals  $R^1$  or  $R^2$  represents a nitro group, which comprises contacting a chloronitrobenzene of the formula



wherein  $R^1$ ,  $R^2$  and  $R^3$  have the meaning given above, with ammonia, at elevated temperature and under elevated pressure in the presence of a chlorinated aromatic hydrocarbon.

## (I) PRODUCTION OF ALKOXYALKYL PHOSPHATE ESTERS

Norman C. Parsons, Winfield, W. Va., and Joseph H. Finley, Metuchen, N.J., assignors to FMC Corporation, Philadelphia, Pa.

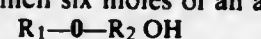
Filed Apr. 7, 1982, Ser. No. 366,265

Int. Cl.<sup>3</sup> C07F 9/09

U.S. Cl. 260-974

4 Claims

1. In the process for making trisubstituted phosphate esters in which six moles of an alkoxyalkanol of the formula



in which  $R_1$  contains 1 to 6 carbon atoms and  $R_2$  contains 1 to 4 carbon atoms, (a) is continuously reacted with 3 to 4 moles of an alkalimetal hydroxide in a non-oxidizing atmosphere to produce the corresponding alkali metal alkoxide while concurrently removing substantially all of the water formed in said reaction to produce a substantially anhydrous reaction mixture and (b) reacting this reaction mixture with phosphorus oxychloride in a non-oxidizing atmosphere at a temperature in the range of 0° to 100° C. to produce a product mixture containing the product ester of said alcohol and (c) separating the ester from the reaction mixture the improvement which comprises treating the alkoxyalkanol with 100 to 150 parts per million of sodium borohydride for at least 20 minutes before reacting the alkoxyethanol with the alkali metal hydroxide.

4,421,696

## GAS DIFFUSER

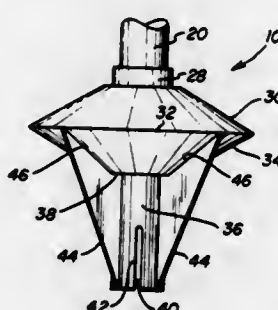
William D. Graue, 4228 N. Central Exp./208, Dallas, Tex. 75206, and Leo J. Oros, 440 N. Foster, Suite 303, Baton Rouge, La. 70806

Filed Apr. 10, 1981, Ser. No. 252,820

Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 261-123

2 Claims



1. A gas diffuser comprising:

(a) coupling means for rigidly and air-tightly connecting the gas diffuser to a source of gas supply;

(b) a frusto-conical directional distribution surface having a vertical central axis and diverging in an upward direction to terminate at a sharp circular shear edge, said directional distribution surface being attached to said coupling means;

(c) a distribution tube which is attached to said directional distribution surface which extends in a downward direction from said directional distribution surface;

(d) a plurality of port edges disposed in said distribution tube which define a plurality of slot-shaped distribution ports beneath said directional distribution surface such that gas streams escaping from said distribution ports rise under the influence of buoyancy, impinge upon said directional distribution surface, are evenly distributed to said shear edge, and are dispersed at the shear edge as bubbles; and

(e) a plurality of drift control vanes extending from said distribution tube to said shear edge to control the distribution of gas streams to said shear edge.

4,421,697

## METHOD AND APPARATUS FOR CASTING AN INNER LINING AMORPHOUS REFRACTORY INTO A MOLTEN METAL VESSEL

Kiyomi Taguchi; Osamu Terada; Noriaki Morishita; Hiroshi Mihashi, all of Fukuyama, and Seiji Nagai, Hiroshima, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

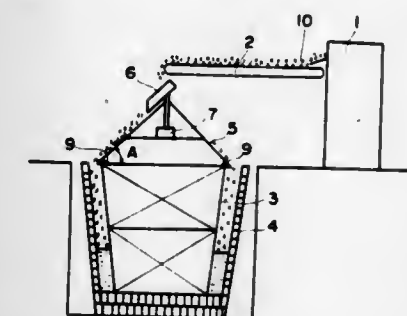
Filed May 7, 1982, Ser. No. 375,716

Claims priority, application Japan, May 15, 1981, 56-72136

Int. Cl.<sup>3</sup> F27D 1/16

U.S. Cl. 264-30

6 Claims



1. A lining method wherein when a lining frame is positioned within a molten metal vessel preliminarily lined with a permanent lining refractory and an amorphous refractory is casted into a space between said permanent lining refractory and said lining frame to thereby apply a lining to said vessel, while rotating a chute above a conical distributor, said amorphous refractory is caused to continuously fall down onto said distributor so as to describe a concentric path of moving falling points, and said amorphous refractory is dropped over a conical inclined surface of said distributor to fall into said space from an outer periphery of said distributor.

2. An apparatus of the type in which a lining frame is positioned within a molten metal vessel preliminarily lined with a permanent lining refractory and an amorphous refractory is casted into a space between said permanent lining refractory and said lining frame thereby applying a lining to said vessel, said apparatus comprising:

a conical distributor arranged above said lining frame for distributing a stream of said amorphous refractory to fall down from the outer periphery thereof into said space; and

a chute rotatable to cause said amorphous refractory to fall down onto a conical inclined surface of said distributor such that falling points of said amorphous refractory describe a circular path of movement concentric with said conical shape of said distributor.

4,421,698

## SEALING DEVICE FOR USE IN GROUTING PIPE JOINTS AND METHOD OF USING SAME

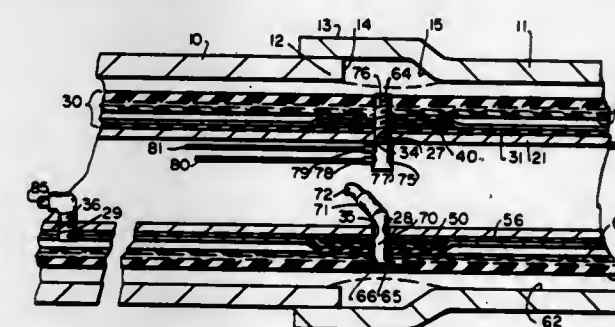
Gerald J. Vanderlans, 1310 W. Turner Rd., Lodi, Calif. 95240

Filed Aug. 16, 1982, Ser. No. 408,436

Int. Cl.<sup>3</sup> B28B 7/32, 21/20; B29C 1/12

U.S. Cl. 264-40.1

6 Claims



1. A method for the economic and controlled application of grout at each of a series of joints in a pipeline, including: positioning in said pipeline opposite one joint at a time a short cylindrical tube having an outer wall somewhat smaller in

diameter than the inner diameter of said pipeline, said tube having an inner rigid portion and an outer flexible portion bonded to said rigid portion only at each end, said tube having a through opening at about its axial center, said flexible portion having a cavity therein at about said axial center, spaced from said through opening, filled with liquid by a flexible conduit sealed to said flexible portion and extending from said cavity into the interior of said tube to a pressure gauge,

sending air into the space between said flexible and rigid portions to swell said flexible portion and urge said outer wall into contact with the inner wall of the pipeline on each side of a said joint, thereby sealing off that space, observing the pressure exerted on said liquid and therefore applied to the outer wall at said joint, and

sending grout into the space in said joint between said pipeline and said tube via a fitting member secured in said through opening, when the pressure of said liquid reaches a predetermined amount.

4,421,699

## METHOD FOR PRODUCING A CORDIERITE BODY

Kazuhiro Inoguchi, Okazaki; Tomohiko Nakanishi, Kariya, and Mitsuru Asano, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

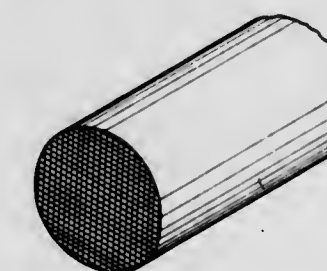
Filed Apr. 2, 1981, Ser. No. 250,151

Claims priority, application Japan, Apr. 4, 1980, 55-45018

Int. Cl.<sup>3</sup> C04B 35/18

U.S. Cl. 264-56

13 Claims



1. A method of producing a cordierite body having a coefficient of thermal expansion of less than  $10.5 \times 10^{-7}/^{\circ}\text{C.}$  comprising the steps of:

(1) mixing together and kneading a batch raw material containing tubular-shaped halloysite particles and plate-shaped talc particles delaminated along the (001) plane thereof,

said halloysite particles including at least one material selected from the group consisting of halloysite, meta-halloysite, endellite and allophane;

(2) anisotropically forming the mixed batch raw material into a formed body thereby imparting a planar orientation to said plate-shaped talc particles contained in said batch raw material; and

(3) drying and firing the thus formed body.



4,421,700

# METHOD AND TECHNIQUE FOR INSTALLING LIGHT-WEIGHT, FRAGILE, HIGH-TEMPERATURE FIBER INSULATION

Bhanu C. Patel, Northridge, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 185,868, Sep. 11, 1980, abandoned, and Ser. No. 969,757, Dec. 15, 1979, abandoned. This application Mar. 25, 1982, Ser. No. 361,711

Int. Cl.<sup>3</sup> C04B 33/32

U.S. Cl. 264—59

6 Claims



1. A method of installing light-weight, fragile, high-temperature fiber insulation, comprising:

- preforming a roughly dimensioned shape of said insulation oversized in at least one dimension in respect to a cavity into which said insulation is to be placed;
- saturating said shape with an aqueous solution of an acrylic polymer resin curable at a first temperature to form a relatively rigid mass and substantially completely fugitive at a second higher temperature;
- compressing said saturated mass to form a shape undersized with respect to said cavity;
- drying said undersized shape and curing it at said first temperature to form said rigid mass;
- emplacing said rigid mass in said cavity to form an assembly;
- and baking said assembly at said second temperature to drive off said resin thereby releasing said fiber insulation to expand and substantially fill said cavity.

4,421,701

# PROCESS FOR PREPARING IRON-CONTAINING REFRACTORY BALLS FOR RETORTING OIL SHALE

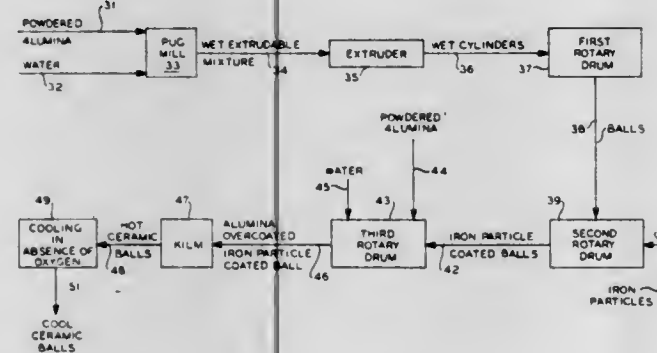
Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 209,926, Nov. 24, 1980, Pat. No. 4,371,481, which is a division of Ser. No. 9,627, Feb. 6, 1979, Pat. No. 4,360,565, which is a division of Ser. No. 837,130, Sep. 28, 1977, Pat. No. 4,160,719. This application Sep. 30, 1982, Ser. No. 430,634

Int. Cl.<sup>3</sup> B01J 2/00

U.S. Cl. 264—60

7 Claims



1. A process for preparing iron-containing ceramic balls, containing about 10 to 90 weight percent iron and the balance a high refractory alumina, which comprises:

- (a) pelletizing finely divided powdered refractory-grade alumina with sufficient water to form alumina pellets,
  - (b) inserting into each said alumina pellet an iron shot, thereby producing a pellet containing an iron shot,
  - (c) firing said iron shot-containing alumina pellet at a temperature in the range of about 2800° F. to 3400° F. for a time sufficient to produce said iron-containing ceramic balls, and
  - (d) cooling said fired ceramic balls in the substantial absence of molecular oxygen,
- wherein said iron-containing ceramic balls in cross-section contain a metallic iron core and an alumina-ceramic overcoating.

4,421,702

# CERAMIC RECUPERATIVE HEAT EXCHANGERS AND A METHOD FOR PRODUCING THE SAME

Isao Oda, and Tadaaki Matsuhisa, both of Nagoya, Japan, assignors to NGK Insulators Ltd., Nagoya, Japan

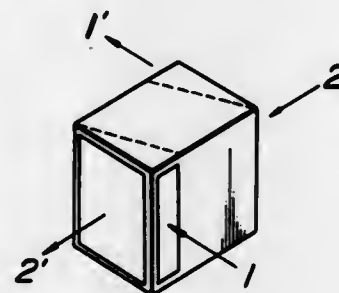
Filed Mar. 16, 1981, Ser. No. 243,698

Claims priority, application Japan, Mar. 24, 1980, 55-37333

Int. Cl.<sup>3</sup> B29D 23/04

U.S. Cl. 264—62

5 Claims



1. A method for producing ceramic recuperative heat exchangers having a large number of parallel channels formed of partition walls such that flowing fluids are capable of being heat-exchanged through respective channels, in which the sectional shape of the channels and thickness of the partition walls are substantially uniform, the open frontal area of the heat transmitting portion where the fluids are heat-exchanged being more than 60% and the porosity of the ceramic material forming the partition walls simultaneously being not more than 10%, which comprises: adding to ceramic material at least some water, an organic solvent, and a forming aid, kneading thoroughly the resulting mixture to prepare a raw batch material; extruding the raw batch material into a honeycomb structural body having a large number of axially extended channels in which the sectional shape of the channels and the thickness of the partition walls are substantially uniform, the channels being arranged generally into rows; drying the shaped honeycomb structural body; prior to or after firing, cutting off partition walls in particular rows of the honeycomb structural body in the axial direction of the channels to a given depth from the end surface of the honeycomb structural body; and sealing only the end surfaces of said rows with a suitable sealing means, such that the open frontal area of the heat transmitting portion is at least 60%, and the porosity of the ceramic is no more than 10% after the conclusion of said sealing step.

4,421,703

# HEAT TREATING OF MATERIAL IN FINELY DIVIDED FORM

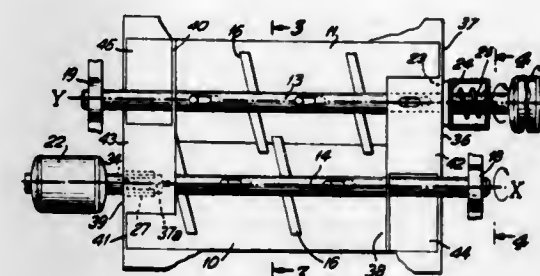
Friedhelm R. Feder, Collierville, Tenn., assignor to Wedco Inc., Bloomsbury, N.J.

Continuation of Ser. No. 139,630, Apr. 14, 1980, abandoned. This application Sep. 10, 1982, Ser. No. 416,747

Int. Cl.<sup>3</sup> B29C 19/02

U.S. Cl. 264—68

15 Claims



1. Process of heat treating a finely divided particulate polymer material which comprises:

- introducing the material into a material introduction location disposed in at least one of at least two intersecting, axially parallel disposed, generally cylindrical drums, filled with a fluid; heating and dispersing the material in the fluid at least in the vicinity of the wall of each drum throughout the circumference of each drum by agitating the material with an agitator comprising a rotor disposed over a length of each drum and having radially projecting, axially spaced blades for causing the simultaneous agitation and heating of the material to a desired temperature within the drums, wherein the intersection of the drums provides an open area between the two drums and the agitating causes particles from one drum to mix with particles of the other drum in the vicinities on either side of the open area; regulating the temperature within the drums to maintain the desired temperature and withdrawing heat treated material from a first material withdrawal location disposed at least in one of the drums at a location diagonally across the agitators from the material introduction location.

4,421,704

# METHOD OF TREATMENT FOR PLASTER ARTICLES TO IMPROVE WEAR AND WATER RESISTANCE AND ARTICLE OF MANUFACTURE

William S. Rely, Des Plaines, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 168,971, Jul. 14, 1980, Pat. No. 4,350,736.

This application Feb. 8, 1982, Ser. No. 346,964

Int. Cl.<sup>3</sup> B29C 13/00

U.S. Cl. 264—133

21 Claims

1. A method of surface treatment for plaster articles to improve wear and water resistance, said method comprising the steps of

- forming a plaster and water slurry,
- allowing said slurry to set into a dimensionally stable plaster article,
- drying said article to remove excess water,
- applying a coat of substantially molten Candelilla wax onto an exterior surface of said article in an amount no less than about 0.020 pounds per square foot (0.010 grams per square centimeter),
- maintaining said wax at a temperature of no less than about 155° F. (68° C.), for a sufficient period of time to allow said wax to substantially fill exterior pores and irregularities of said exterior surface while avoiding degradation of the set plaster, and
- cooling said article to solidify the wax.

4,421,705

# METHOD AND APPARATUS FOR ATTACHING SEALING PIECE ONTO POUR-OUT HOLE OF PLASTIC CLOSURE CAP OR CONTAINER

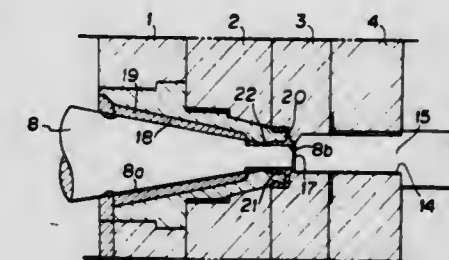
Yoshiharu Hatakeyama, Tokyo, and Susumu Kimura, Yachiyo, both of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 251,941, Apr. 7, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 422,432

Int. Cl.<sup>3</sup> B29C 6/04, 17/10; B29D 23/02

U.S. Cl. 264—153

7 Claims



1. A method for attaching a removable sealing piece onto an end of a plastic closure cap or container to seal a pour-out hole through such end, while forming said closure cap or container by injection molding, said method comprising:

- providing members defining an injection molding cavity for molding the closure cap or container, said cavity being open at an end portion to define a pour-out hole of said closure cap or container;
  - providing a continuous sealing strip having a thermoplastic layer;
  - intermittently advancing said strip in a direction transverse to the axis of said pour-out hole to position a portion of said strip at a location spaced from and confronting said open end portion of said cavity;
  - providing a molding member adjacent a side of said strip opposite said cavity, said molding member having a tip with a shaft edge;
  - advancing said molding member toward said strip in the direction of said axis, punching a sealing piece from said portion of said strip by said sharp edge of said tip, and conveying said sealing piece in said direction of said axis toward said cavity by means of said molding member only, while maintaining said cavity defining members immobile until said sealing piece reaches a position closing said open end portion of said cavity; and
  - injecting a thermoplastic resin having chemical affinity with said thermoplastic layer into said cavity, thereby forming said closure cap or container and simultaneously joining said thermoplastic layer of said sealing piece to an end of said closure cap or container.
4. An apparatus for forming a plastic closure cap or container by injection molding, while attaching a removable sealing piece onto an end of the closure cap or container to seal a pour-out hole through such end, said apparatus comprising:
- an injection molding device including members defining a cavity for molding the closure cap or container, said cavity being open at an end portion to define a pour-out hole of the closure cap or container;
  - means for intermittently advancing a sealing strip having a thermoplastic layer in a direction transverse to the axis of the pour-out hole to position a portion of said strip at a location spaced from and confronting said open end portion of said cavity;
  - a molding member positioned adjacent a side of said strip opposite said cavity, said molding member having a tip with a sharp edge;
  - means mounting said molding member for advancement in the direction of said axis toward said strip, for causing said sharp edge of said tip to punch a sealing piece from said portion of said strip, and for conveying said sealing piece in said direction of said axis toward said cavity by means



of said molding member only, with said cavity defining members of said injection molding device being maintained immobile, until said sealing piece reaches a position closing said end portion of said cavity; and means for injecting a thermoplastic resin having a chemical affinity with said thermoplastic layer into said cavity, thereby for forming the closure cap or container and simultaneously for joining said thermoplastic layer of said sealing piece to an end of said closure cap or container.

4,421,706

# METHOD OF MANUFACTURING PRINTING HEADS FOR INK JET PRINTERS

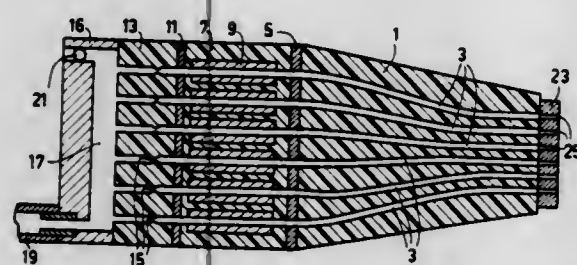
Johannes Feenstra; Hermanus N. Tuin, and Antonie Schrederhof, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1982, Ser. No. 359,644

Claims priority, application Netherlands, Apr. 24, 1981, 8102026

Int. Cl.<sup>3</sup> B29C 17/10

U.S. Cl. 264—157



1. A method of manufacturing printing heads for ink jet printers by forming moulded coupling pieces (1) for conveying a liquid from a reservoir (17) containing said liquid to jet nozzles (25) for ejecting said liquid, each of said coupling pieces containing jet nozzle ducts (3) extending from said reservoir to said jet nozzles which ducts in each coupling piece are closer to each other in the area adjacent to the jet nozzles than in the area adjacent to the reservoir and positioning around each jet nozzle duct a cylindrical pumping member (9) in an area closer to the reservoir than to the jet nozzles, characterized in that:

(1) a bundle of parallel glass tubes (27) are positioned so as to extend through corresponding openings (29) contained in two spaced parallel alignment plates (5), the openings in each of said plates corresponding to the desired arrangement of the jet nozzle ducts, said alignment plates dividing said bundle into a central portion (31) extending between said two alignment plates and two end portions (33), each of said end portions being situated outside of said central portion and each having a length at least equal to the length of said pumping members;

(2) heating said bundle sufficiently to soften said glass tubes; (3) constricting the thus softened glass tubes in said central portion in a manner such that the tubes are closest to each other along a separation plane (37) about halfway between, and extending parallel to, said two alignment plates to thereby form a pattern corresponding to the desired arrangement of the jet nozzles at the front of two coupling pieces, said coupling pieces being joined, one to the other, at the front of the jet nozzles;

(4) embedding at least said central portion of said bundle in a molding composition and setting said molding composition thereby forming two coupling pieces joined together at the front of said jet nozzles; and

(5) then separating said coupling pieces from each other along said separation plane (37) thereby forming two separate coupling pieces.

4,421,707

# ACRYLIC WET SPINNING PROCESS

Raymond E. Kourtz, and Shashikumar H. Daftary, both of Pensacola, Fla., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 29, 1982, Ser. No. 373,090

Int. Cl.<sup>3</sup> D01F 6/18

U.S. Cl. 264—182

5 Claims

1. A process for preparing an acrylonitrile polymer fiber which comprises preparing a spinning composition of a fiber-forming acrylonitrile polymer in an aqueous thiocyanate salt solution, said polymer having a composition of about 80 to about 95 weight percent acrylonitrile, from about 5 to about 12 weight percent of methyl methacrylate and any balance of a comonomer free of acid dyesites and said polymer having a number average molecular weight in the range of about 9,000 to about 14,750, said spinning composition having a polymer concentration in the range of about 12.5 to 16.0 weight percent in an aqueous thiocyanate salt solution in which the thiocyanate salt content is in the range of about 38 to 45 weight percent based on the total weight of water and polymer and said spinning solution having a viscosity in the range of 28–60 poise determined by the falling ball method at 40° C., extruding said spinning solution into a dilute aqueous thiocyanate salt solution to form a wet-gel fiber, washing and stretching the wet-gel fiber to remove thiocyanate salt and provide polymer orientation and thereafter collapsing the wet-gel structure.

4,421,708

# PROCESS FOR THE PRODUCTION OF HIGH-STRENGTH FILAMENTS FROM DRY-SPUN POLYACRYLONITRILE

Manfred Reichardt, Dormagen; Christian Pieper, Neuss; Alfred Nogaj, Dormagen; Surinder S. Sandhu, Dormagen, and Eckhard Gärtner, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

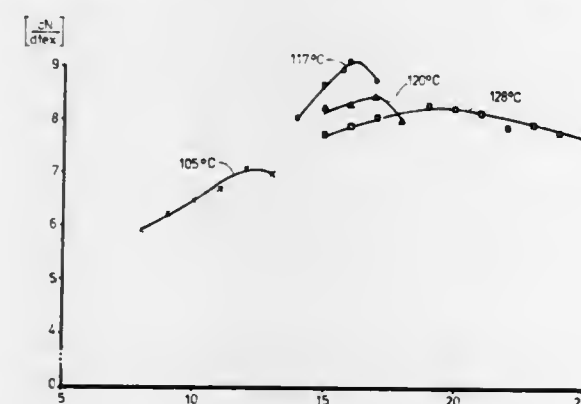
Filed Feb. 4, 1982, Ser. No. 345,845

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105360

Int. Cl.<sup>3</sup> D01F 7/00

U.S. Cl. 264—206

10 Claims



1. A process for the production of high-strength filaments of polyacrylonitrile by dry-spinning, comprising

(a) producing a spun material at take-up speeds of from 500 to 200 m/min. from acrylonitrile polymers having a molecular weight of more than 170,000 (weight average) and 50,000 (number average) using spinning solutions in which super-molecular structures in the solution characterized by reduced viscosity for the same polymer content, the same temperature and the same molecular weight are degraded by the following methods individually or collectively:

(i) tempering the spinning solution for at least 5 minutes at temperatures above 120° C., (ii) using polymer contents in the solution such that the solution has a dynamic viscosity at 120° C. of less than 40 Pas,

(iii) introducing additives having a viscosity-reducing effect, or to produce tension-reduced spun filaments producing a spun material from a tow produced at normal take-up speeds of from 200 to 400 m/min. and subsequently subjecting said material to a hydrothermal treatment at temperatures  $\theta = \theta_0$  with  $\theta_0 < \theta_n \leq \theta_n + 50^\circ \text{C.}$  and to produce tension-reduced spun filaments,

(b) stretching the tension-reduced spun filaments continuously hydrothermally in one or more stages such that where it involves several stages, stretching at a temperature of the stretching medium gradually increasing from stage to stage of up to  $\theta = \theta_n$  and, in the final (n-th) stage, to a degree of at least 50% of the maximum degree of stretching; where it involves a single stage, stretching at the optimal stretching temperature  $\theta_n$  and treating the material thereafter in a conventional way.

4,421,709

# HIGH CAPACITY POLYMER QUENCHING ON THIN SHELL WHEELS

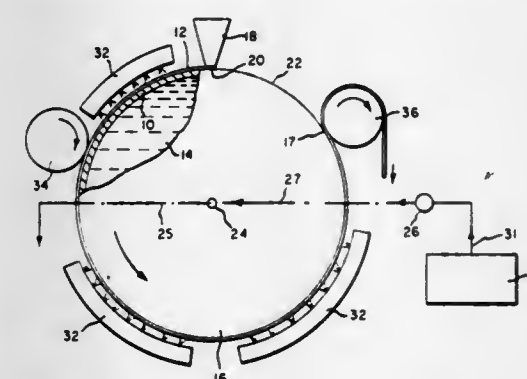
Neil I. Steinberg, Greer, S.C., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 10, 1983, Ser. No. 458,869

Int. Cl.<sup>3</sup> B29D 7/02

U.S. Cl. 264—216

6 Claims



1. In a method of forming a polymeric film by casting a molten web of a thermoplastic film-forming polymer on the surface of a rotating casting wheel, cooling the under surface of the molten web on the casting surface to a temperature and depth sufficient to permit stripping it from said casting surface, and subsequently stripping the web from the casting surface; the improvement wherein the production capacity is increased by reducing the shell thickness of the casting wheel to a thickness in inches of less than 0.1875 times the casting wheel diameter in feet but no greater than 0.9375 inches and not less than  $4.7 \times D^{0.5} \times E^{-0.25}$  where D is the wheel diameter in feet, and E = the modulus of elasticity of the wheel shell in psi.

4,421,710

# METHOD, DEVICES, MOLD BEARING STRUCTURES AND INSTALLATIONS FOR IMPROVING THE EFFICIENCY OF PROCESSES FOR THE MANUFACTURE OF PRESTRESSED CONCRETE PRODUCTS

Mircea Borcoman, 11, rue du Général Henriot Bertier, 92200 Neuilly sur Seine, France

Filed Jan. 25, 1982, Ser. No. 342,090

Claims priority, application France, Feb. 4, 1981, 81 02087

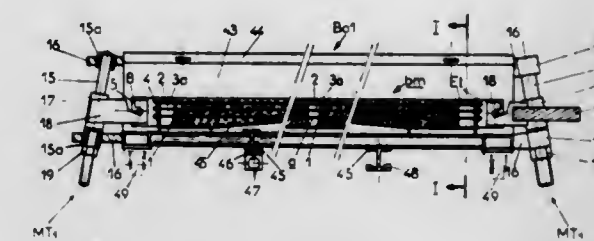
Int. Cl.<sup>3</sup> B28B 23/04; B23K 1/20

U.S. Cl. 264—228

22 Claims

1. A method of manufacturing concrete products prestressed by bonded reinforcements, comprising the steps of: using movable and self-supporting screens for closing molds at both ends and anchoring reinforcements such as wires and strands; after tensioning the reinforcements, and molding concrete in molds, and after hardening of concrete, particularly by passing filled molds through a heat treatment installation,

stripping the products with transfer of the prestressing forces to the end screens; then, passing the stripped products through a cooling installation;



and, after the passage of said products through the cooling installation, the concrete having acquired additional strength with respect to that which it had on stripping, effecting the transfer of the prestressing forces to the concrete by bonding, and then recovering the self-supporting screens.

4,421,711

# MOLDING OF ELONGATE, HOLLOW, BIAXIALLY ORIENTED THERMOPLASTIC SHAPED ARTICLES

Claude Bonnetat, Pontault Combault, and Louis Macabrey, Mitry-le-Neuf, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 8, 1981, Ser. No. 271,380

Claims priority, application France, Jun. 13, 1980, 80 13158

Int. Cl.<sup>3</sup> B29C 17/07

U.S. Cl. 264—529

8 Claims

1. A process for the manufacture of an elongate, rigid, tubular, biaxially oriented thermoplastic, hollow thin-walled shaped article which is open at both ends, has an internal diameter or inscribed diameter equal to at least 2 cm, and a length to diameter ratio of at least about 10/1 comprising (i) introducing into an elongate mold cavity, the internal configuration and dimensions thereof corresponding to the exterior surface area of the desired shaped article, and aligning along the longitudinal axis thereof, a long tubular thermoplastic blank which is open at both ends and which is heated to the biaxial orientation temperature of said thermoplastic; (ii) expanding under internal fluid pressure in the absence of mechanical stretching means said heated tubular blank to simultaneously, both longitudinally and transversely, uniformly stretch same, at least to the natural biaxial drawing ratio thereof, but to a value in the transverse direction of less than 100% of that ultimately desired so as to avoid any contact between the tubular blank and the internal walls of the mold cavity prior to the completion of said longitudinal stretching; (iii) next further expanding said heated tubular blank, under increased internal pressure, completely against the internal walls of the mold cavity to thus completely shape said ultimately desired shaped article; and (iv) thence cooling said desired shaped article and releasing all pressure therefrom.

4,421,712

# CONTINUOUSLY ROTARY THERMO-FORMING SYSTEMS AND APPARATUS OF THE PRESSURE ASSIST, PLUG ASSIST AND MATCH MOLD TYPE

Thomas W. Winstead, Cockeysville, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Aug. 13, 1980, Ser. No. 177,582

Int. Cl.<sup>3</sup> B29C 3/02; B29F 5/00

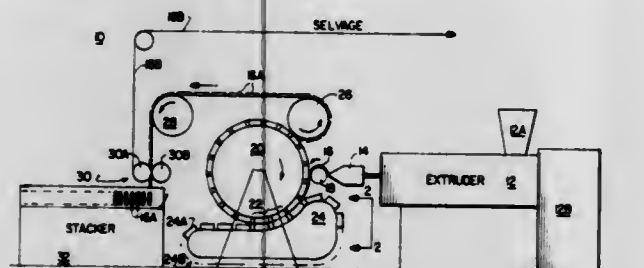
U.S. Cl. 264—551

12 Claims

1. The method of thermoforming an extruded thermoplastic web having heat of extrusion retained therein and being in a thermoformable state, comprising: receiving said web on the peripheral surface of a rotating mold wheel having mold cavities defined in the said peripheral surface;



applying a vacuum to said web from within said mold cavities to impart a drawing force to said web tending to ingest discrete areas thereof into said mold cavities; providing draw assisting devices moving continuously along a conformally arcuate path with and adjacent to the periphery of said mold wheel in registry with said mold cavities over a predetermined arc of registration, said assisting devices also being reciprocated axially into and from said mold cavities to impart said draw assisting force;



constraining said draw assisting devices to impart a draw assisting external force to said discrete areas of said web over said predetermined arc of registration in conjunction with and in enhancement of said drawing force imparted by the said application of vacuum internally thereof; removing said draw assisting external force from said web; subsequently removing said drawing force from said web; and thereafter removing said web and said thermoformed products from said mold wheel and said die cavities, respectively.

4,421,713

### TOKAMAK PLASMA HEATING WITH INTENSE, PULSED ION BEAMS

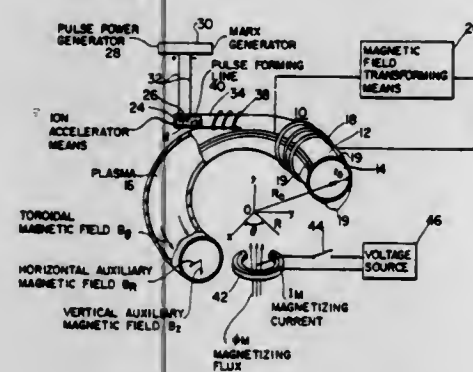
Wallace M. Manheimer, Silver Spring, Md., and Niels K. Winsor, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1981, Ser. No. 247,420

Int. Cl.<sup>3</sup> G21B 1/02

U.S. Cl. 376—127

5 Claims



1. Apparatus for heating a plasma, the plasma being confined in an apparatus of the type wherein the plasma is confined in a vacuum chamber by a magnetic field, and no plasma current is initially carried by the plasma, comprising:  
means for producing a space-charge-neutralized, pulsed, ion beam;  
means for directing the ion beam into the plasma-confining chamber;  
means for transforming the magnetic field to one which can trap the ion beam at the center of the plasma; and  
means for cancelling a plasma return current inductively generated in the plasma by the ion beam current so that a net current is produced which is carried by the ion beam alone, and which is dissipated by the ion beam's transferring its energy to the plasma by classical collisions with the electrons and ions of the plasma.

### 4,421,714 NOZZLE PENETRATION FOR A NUCLEAR REACTOR PRESSURE VESSEL CLOSURE

Peter Dronkers, Mannheim, Fed. Rep. of Germany, assignor to The Babcock & Wilcox Company, New Orleans, La.

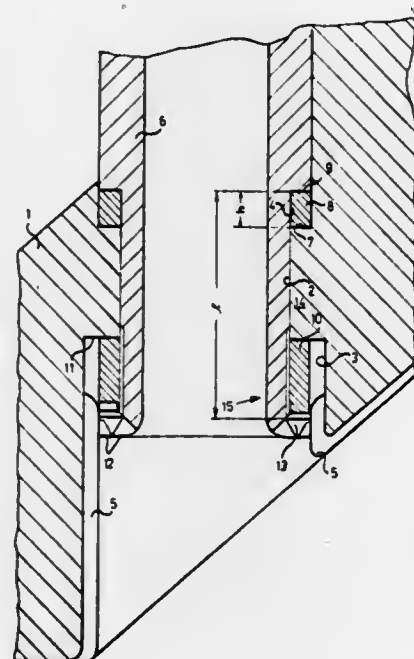
Filed Nov. 28, 1980, Ser. No. 211,141

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952025

Int. Cl.<sup>3</sup> G21C 13/00

U.S. Cl. 376—204

2 Claims



1. A nozzle penetration for a nuclear pressure vessel closure head comprising:

- a closure head made of ferritic material having an inside cladding of austenitic material;
- a nozzle composed of an alloy of the Ni Cr 15 Fe type having a shoulder portion intermediate its two ends penetrating said closure head and connected thereto by frictional engagement;
- a compensating ring of austenitic material seated between said shoulder and a support surface of said closure head.

4,421,715

### BAFFLE MAINTENANCE APPARATUS

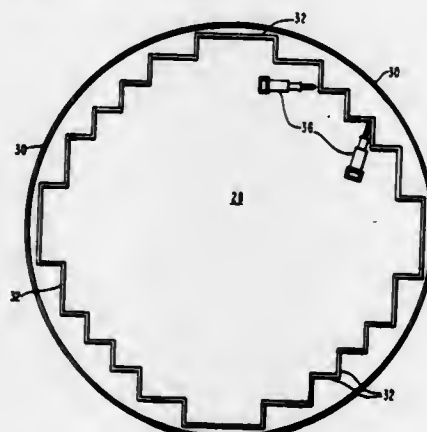
John B. Gunter, Pittsburgh, Pa.; George J. Quinn, Spartanburg, S.C.; Edward P. Shields, N. Huntingdon Township, Huntingdon County, Pa.; Burton S. Thomas, Bethel Park, Pa., and Clifford J. Winkler, Plum Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 4, 1981, Ser. No. 270,458

Int. Cl.<sup>3</sup> G21C 17/00, 19/00

U.S. Cl. 376—245

19 Claims



1. Baffle maintenance apparatus for reducing the size of gaps between baffle plates in a nuclear reactor comprising:

a support member capable of being positioned in a nuclear reactor;  
a carriage slidably disposed on said support member; and  
reducing means disposed on said carriage and arranged to contact said baffle plates for deforming at least one of said baffle plates thereby reducing the gap between said baffle plates.

4,421,716

### SAFETY MONITORING AND REACTOR TRANSIENT INTERPRETER

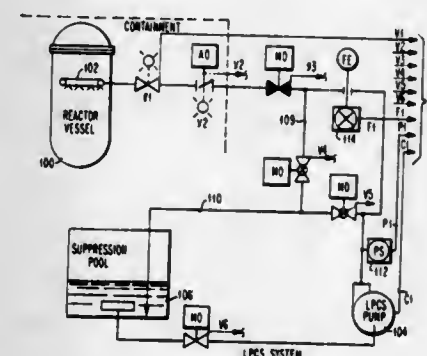
John E. Hench, and Tom Y. Fukushima, both of San Jose, Calif., assignors to S. Levy, Inc., Campbell, Calif.

Filed Dec. 29, 1980, Ser. No. 221,327

Int. Cl.<sup>3</sup> G21C 7/36

U.S. Cl. 376—216

6 Claims



1. For use in a nuclear reactor power plant, including a reactor vessel having a reactor core, said power plant having a number of first subsystems utilized for operating said plant during normal operating conditions, a number of second subsystems utilized for operating said plant during abnormal and accident operating conditions, and a control panel for displaying plant parameters relating to plant operation, said first and second subsystems including subsystems that add water to said reactor vessel, and subsystems that take water away from said reactor vessel, a transient interpreter comprising:

- A. means (36) connected to said first and second subsystems for receiving signals representing the values of various ones of said plant parameters;
- B. interpreter logic means (22) responsive to said receiving means (36) for analyzing said ones of said plant parameters, said interpreter logic means including:  
means for determining the instantaneous water inventory of said reactor vessel by monitoring the parameters of those of said first and second subsystems that add water to said reactor vessel, and those of said first and second subsystems that take water away, to provide first data corresponding to the net inflow or outflow of water to said reactor vessel as indicated by directly measured process instrumentation level meters;

means for converting said first data to measured water level data relative to the top of said reactor core;  
back-up system means for calculating reactor vessel water level based upon an analytical model of said reactor vessel and said core, said analytical model being based upon the integration of the inflow and outflow of water to said reactor vessel, reactor power, reactor pressure, and reactor water mass, to thereby provide calculated water level data as an alternate to said measured water level data;  
means for setting said calculated water level data to be equal to said measured water level data, so that said calculated water level is consistent with said measured water level data as indicated by said directly measured process instrumentation level meters, said means for setting being operative periodically only during normal operation of said plant;  
C. first means (14) responsive to said interpreter logic means (22) for generating for display, a primary display, said primary display comprised of information corresponding to primary parameters, said primary parameters compris-

ing a first subset of said plant parameters, said first subset of said plant parameters relating to said first subsystems utilized for operating said plant during normal operating conditions;

D. second means (18, 20) responsive to said interpreter logic means (22) for generating for display, a plurality of secondary displays, each of said secondary displays comprised of information corresponding to secondary parameters, said secondary parameters comprising a second subset of said plant parameters relating to said second subsystems utilized for operating said plant during abnormal and accident operating conditions,

said second means including third means (310) responsive to said determining means within said interpreter logic means (22) for generating a first one of said plurality of secondary displays, said first one secondary display comprised of said calculated water level data; and,

E. fourth means (16, 32, 34) connected to said first means (14) and to said second means (18, 20), said fourth means being selectively operable by an operator, for selecting for display any one of said secondary displays, including said first one of said secondary displays, from said plurality of secondary displays.

4,421,717

### METHOD OF MAKING WEAR RESISTANT FERROUS BASED PARTS

Vemulapalli D. N. Rao, Bloomfield Township, Oakland County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/00789, § 371 Date Jun. 10, 1982, § 102(e)

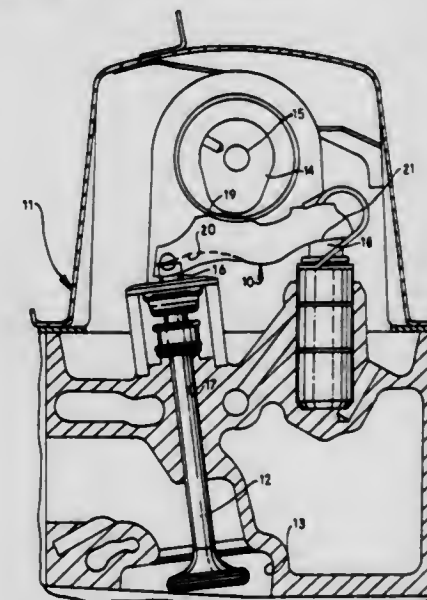
Date Jun. 10, 1982

PCT Filed Jun. 10, 1982, Ser. No. 405,136

Int. Cl.<sup>3</sup> B22F 3/12

U.S. Cl. 419—27

19 Claims



1. A method of making a wear resistant, ferrous based part, comprising the steps of:

- (a) molding a uniform mixture of ferrous based powder and binder material into a compacted shape;
- (b) heating said compacted shape to remove said binder material and to partially sinter said mixture to a strength of about 1000-8000 psi, while maintaining a porosity of 20-40% at least along the outer region of said part;
- (c) depositing a fluid suspension of refractory wear resistant powder particles onto at least a selected surface zone of said partially sintered shape, said particles coating said zone and permeating the surface region of said zone by absorption as permitted by said porosity; and
- (d) heating said coated shape to remove said fluid, to bond said particles to said shape, and to fuse said powder and particles together to define said part.



4,421,718

**ALLOY FOR OCCLUSION OF HYDROGEN**

Yasuaki Osumi, Minou; Hiroshi Suzuki, Ikeda; Akihiko Kato, Matsubara, and Keisuke Oguro, Ikeda, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

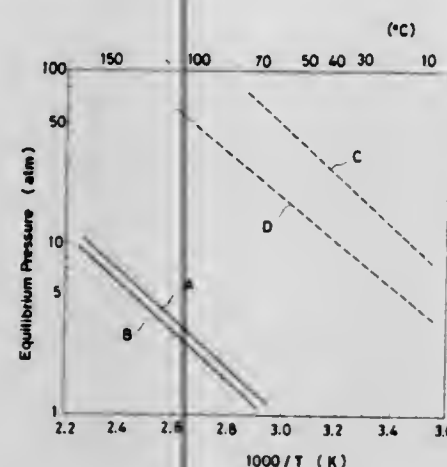
Filed Sep. 24, 1982, Ser. No. 423,421

Claims priority, application Japan, May 27, 1982, 57-91031

Int. Cl.<sup>3</sup> C22C 19/05

U.S. Cl. 420—443

6 Claims



1. A quaternary hydrogen-occluding alloy with slight hysteresis represented by the general formula:



wherein, R denotes one member selected from the group consisting of rare earth metal atoms and Misch metal, A denotes one metal atom selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, and tantalum, x denotes a number falling in the range of 0.01 to 2.0, y denotes a number falling in the range of 0.01 to 2.0, and z denotes a number greater than 0 but not exceeding 0.2, providing that x, y, and z have the relation,  $5.0 \leq 5-x+y+z \leq 5.2$ .

4,421,719

**COLORIMETRIC INDICATORS**

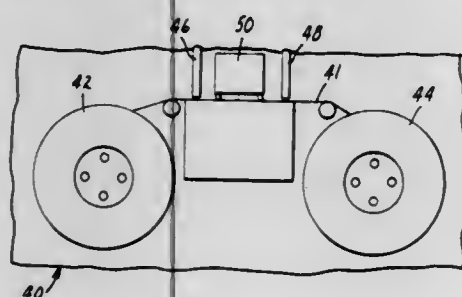
Malcolm B. Burleigh, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 161,442, Jun. 20, 1980, abandoned. This application Oct. 8, 1981, Ser. No. 309,717

Int. Cl.<sup>3</sup> G01N 31/08, 31/22

U.S. Cl. 422—57

10 Claims



1. A colorimetric indicator in sheet form for the monitoring of a hazardous substance in ambient air comprising a flexible, non-adhesive bearing, organic film backing on which is coated a colorimetric indicator consisting essentially of

- a. an indicator substance selected from permanganate salts,
- b. a high surface area carrier for said indicator substance selected from the group consisting of alumina and silica, and
- c. a self-adhering bentonite clay mineral binder, said colorimetric indicator upon exposure to said hazardous substance undergoing an irreversible chemical reaction which progresses, as a function of diffusion, through the depth of the

colorimetric indicator resulting in a visually resolvable color change, the rate of said reaction being proportional to the amount of said indicator substance present and the concentration of said hazardous substance to be monitored, said color change indicating that exposure to said hazardous substance has reached a selected time-weighted-average value.

4,421,720

**DETECTOR FOR CARBON MONOXIDE CONCENTRATION OF A GAS**

Hideo Kamiya, Ekakushinmachi; Hiroshi Shinohara, Okazaki; Yasuhiro Otuka, Toyota, and Mari Okazaki, Chiryu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

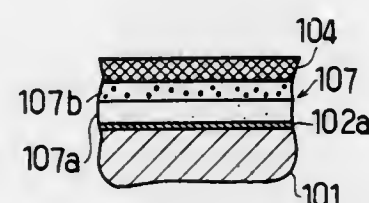
Filed May 28, 1981, Ser. No. 268,055

Claims priority, application Japan, May 29, 1980, 55-072611

Int. Cl.<sup>3</sup> G01N 27/16

U.S. Cl. 422—97

4 Claims



1. A resistance gas sensor comprising:

- (a) a forked base from which a pair of arms extend;
- (b) a resistance layer forming a resistive element in a bridge circuit disposed of each of said pair of arms, said resistance layers serving both to measure the difference in temperature between said arms and to heat a catalyst layer;
- (c) a protective layer means to prevent electrical shorts which might otherwise be caused by deposit of conductive particles contained in a gas to be detected on said resistance layers, said protective layer means comprising an inner protective layer formed from fine ceramic particles disposed over said resistance layers, and an outer protective layer formed from coarse ceramic particles disposed over said inner protective layer; and
- (d) a catalyst layer formed on one and only one of said pair of arms in direct contact with said outer protective layer, whereby:
- (e) when electricity is passed through said resistance layers, said resistance layers and said catalyst layer are heated
- (f) the change in the resistance value of said resistance layer on said one and only one of said pair of arms due to a reaction in a gas promoted by said catalyst layer can be used to calculate the concentration of the gas.

4,421,721

**APPARATUS FOR GROWING CRYSTAL FIBERS**

Robert L. Byer, Stanford, and Martin M. Fejer, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 2, 1981, Ser. No. 308,161

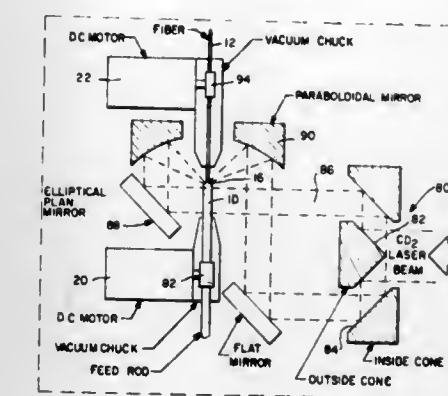
Int. Cl.<sup>3</sup> C30B 15/14, 15/32

U.S. Cl. 422—109

6 Claims

1. Apparatus for growing crystal fibers comprising
- a housing,
  - first drive means within said housing for supporting and driving a feed rod,
  - second drive means within said housing for supporting and driving a fiber,
  - first laser means for generating a laser beam,
  - transmission means for transmitting said laser beam to said housing, and
  - optical means within said housing for receiving and expanding said laser beam into a generally annular configuration

and focusing said laser beam on an end of said feed rod, said optical means including a refraxicon portion having inner and outer conical reflecting surfaces for receiving a round laser beam and forming an annular laser beam, an



elliptical mirror and a parabolic mirror, said elliptical mirror receiving said annular laser beam from said refraxicon portion and directing said annular laser beam to said parabolic mirror, said parabolic mirror focusing said annular laser beam on said end of said feed rod.

4,421,722

**ADIABATIC EXPANSION ORIFICE ASSEMBLY FOR PASSING A SLURRY FROM A HIGH PRESSURE REGION TO A LOW PRESSURE REGION**

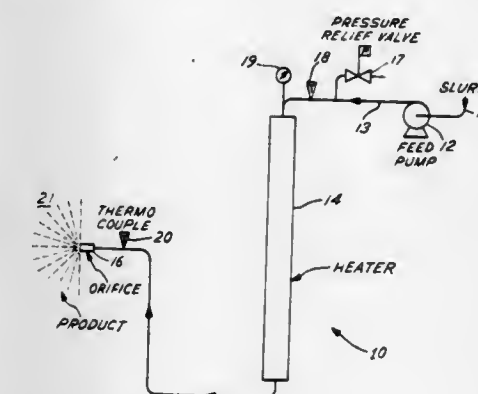
Lester G. Massey, Moreland Hills; David A. George, Park Forest; Robert I. Brabets, Lombard, and William A. Abel, Joliet, all of Ill., assignors to CNG Research Company, Cleveland, Ohio

Continuation of Ser. No. 127,739, Mar. 6, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 321,750

Int. Cl.<sup>3</sup> B01J 8/00; B05B 1/00

U.S. Cl. 422—129

21 Claims



1. An orifice assembly for passing a slurry from high temperature and pressure conditions to relatively low temperature and pressure conditions, comprising, in combination:

- (a) a housing made of material capable of withstanding the flow of an abrasive slurry at high temperature and pressure conditions and having an end wall, an internal chamber and a flange partially closing said internal chamber near said end wall and thereby defining an inner frusto conical surface that opens toward said internal chamber; and
- (b) an insert having an outer frusto conical surface that fits within said internal chamber in abutment and at least partially contacts with said inner frusto conical surface of said flange, and includes a substantially cylindrical passage extending through said insert and communicating with said internal chamber of said housing;
- (c) said flange, said insert, and said abutment of said outer frusto conical tapered surface of said insert against said inner frusto conical surface of said flange defining means

for retaining and sealing said insert within said chamber against the flow of slurry under high pressure conditions.

4,421,723

**METHOD AND APPARATUS FOR SUPPORTING RADIAL REACTOR CENTERPIPES TO ACCOMMODATE THERMAL CYCLING**

Robert A. Farnham, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 20, 1982, Ser. No. 400,119

Int. Cl.<sup>3</sup> B01J 8/02, 35/02

U.S. Cl. 422—218

12 Claims



1. Method of assembling a hydroprocessing reactor wherein an axially elongated reactor vessel includes an internal structure permitting radial flow between the central portion of said vessel, said internal structure being formed by a plurality of elements, each of which is insertable or removable through an access opening in the upper wall of said vessel and each of said internal structure elements being supported by gravity on the lower end wall of said vessel, which comprises positioning a centralizing socket member to communicate with a flow passageway through said lower end wall of said vessel,

seating the lower end of a centerpipe member in said socket member to centralize said centerpipe in said vessel and to extend it axially parallel to a substantial portion of the length of a sidewall of the vessel,

said centerpipe member including a vertically elongated, constant diameter cylindrical screen member, said screen member having a portion of the surface uniformly permeable for fluid flow therethrough, the lower end of the screen member having an unperforated collar with a length coextensive with said socket member, enclosing within said screen member a perforated pipe having a length which is at least coextensive with said screen member,

enclosing said centerpipe screen member within a body of catalyst particles extending outwardly from said screen member, externally confining said particles adjacent said vessel sidewall to form an annular vertical passageway between said vessel sidewall and the so formed cylindrical body of said catalyst particles to permit radial flow of reacting fluids from the cylindrical surface of said body to said centerpipe screen member, and

accommodating axial lifting of said gravity supported centerpipe member from said socket member due to thermal cycling of said catalyst particles and/or said vessel internal elements by extending the length of said socket to exceed the expected maximum lift of said centerpipe member in said socket member.

10. In a radial flow reactor for flowing a hydrocarbon fluid



to be reacted with a solid contact material wherein said reactor comprises:

a vertically elongated vessel having fluid inlet and outlet passageways formed therein;  
a vertically elongated centerpipe member, having flow paths formed therethrough, said centerpipe member being vertically movable relative to said vessel;  
means for retaining said solid contact material in a generally cylindrical body around said centerpipe member, said means for retaining being arranged around the periphery of said vessel and axially generally coextensive with said centerpipe member;

socket means for independently seating said centerpipe member therein by gravity for vertical insertion or removal of said centerpipe member relative to said vessel; and  
low heat conductive means for supporting said socket means on a lower wall of said vertically elongated vessel;  
the improvement comprising

a centerpipe member having an elongated, uniformly permeable screen means formed by axially extending rods equally spaced circumferentially to permit substantially unimpeded flow between said rods, a lower end of the screen means including an imperforate collar member axially coextensive with said socket means and secured to a lower end of said rods, and

said socket means having a length sufficient only to accommodate axial lifting of said gravity seated centerpipe member from said socket means within a predetermined distance due to process thermal cycling of said catalyst and/or said vessel internals, including said centerpipe member.

4,421,724

# EXTRACTION METHOD FOR REFRACTORY PRECIOUS METAL ORE

Larry B. Hunnel, Rathdrum, Id., assignor to Anglo Mineral Resources, Inc., Beverly Hills, Calif.

Filed Sep. 8, 1981, Ser. No. 299,652

Int. Cl.<sup>3</sup> C01G 55/00, 3/00; B01D 11/00; B01F 1/00

U.S. Cl. 423-22 12 Claims

1. A method for effecting cyanic extraction of precious metal from comminuted, refractory precious metal ore, which comprises:

agitationally treating said ore with an aerated, alkaline solution containing (a) water soluble cyanide in an amount from about 112 to about 336 grams of cyanide ion per gallon of solution and (b) chemical oxidizer in an amount from about 0.5 to about 10 grams per gallon of solution, wherein the weight per gallon ratio of ore to solution is from about 500 to about 10,000 grams of ore per gallon of solution.

4,421,725

# PROCESS FOR PURIFYING A GAS CONTAINING HYDROGEN SULFIDE AND CARBON DIOXIDE AND APPARATUS THEREFOR

Claude Dezael, Maisons Laiffite, and Sigismond Franckowiak, Rueil Malmaison, both of France, assignors to Institut Français du Pétrole, Rueil-Malmaison, France

Filed Jul. 9, 1981, Ser. No. 281,798

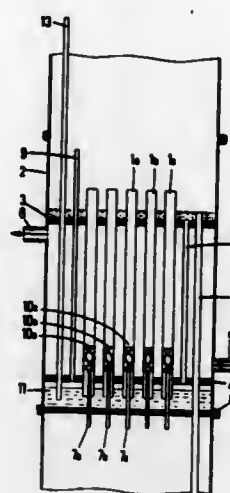
Claims priority, application France, Jul. 9, 1980, 80 15337

Int. Cl.<sup>3</sup> B01D 53/34

U.S. Cl. 423-228 7 Claims

1. In a process for the selective separation of hydrogen sulfide from a gas mixture containing hydrogen sulfide and carbon dioxide, wherein, in an absorption zone, the gas to be treated is contacted with an aqueous solution of an absorbing agent selective for hydrogen sulfide, said absorbing agent being a tertiary alkanolamine in a concentration of 0.5 to 6 moles per liter, so as to separate a gas substantially free of hydrogen sulfide and containing the most part of the carbon dioxide and a solution of high hydrogen sulfide content which is fed to a regeneration zone where a gas of high H<sub>2</sub>S content and low CO<sub>2</sub> content is separated to form a regenerated solu-

tion which is recycled to the first stage, the improvement comprising conducting the absorption stage in a contact apparatus comprising from 1 to 10 stages, each stage being formed of parallel tubes wherein the gas and the liquid flow co-cur-



rently with a swirling motion generated by injection means of the cyclonic type, with a gas velocity from 3 to 30 meters per second, said parallel tubes having a diameter from 8 to 100 mm and a length from 5 to 100 times their diameter.

4,421,726

# METHOD OF POLLUTION CONTROL INVOLVING THE ABSORPTION OF SULFUR DIOXIDE FROM STACK GASES

William L. Nikolai, Box 12, Rte. 4, Platteville, Wis. 53818

Filed Jun. 21, 1982, Ser. No. 390,383

Int. Cl.<sup>3</sup> C01B 17/00; C01F 1/00, 3/00

U.S. Cl. 423-242 6 Claims

1. A process for removing sulfur dioxide from effluent oxidation product gas and for recovering amphoteric components from solid inorganic combustion byproducts of coal combustion of a coal burning power generating facility comprising the steps of

leaching said solid inorganic combustion byproducts with an aqueous caustic leachant solution having a pH of at least about 12 to provide an alkali solubilized salt solution comprising alkali-solubilized amphoteric combustion by-product components selected from the group consisting of alkali aluminates as an absorber solution,

contacting said effluent gas with said absorber solution at a solution temperature in the range of from about 60° to about 90° centigrade while maintaining the pH of said absorber solution in the range of from about 12 to about 6 to remove sulfur dioxide from the effluent gas and to produce a precipitate of said amphoteric inorganic combustion byproduct components and an alkali sulfite salt solution.

recovering said precipitate by separating said precipitate from said alkali sulfite salt solution,

acidifying the alkali sulfite salt solution after separation of said amphoteric inorganic combustion byproduct precipitate to recover sulfur dioxide from said solution, and to produce an alkali salt solution,

electrolytically recovering an aqueous caustic leachant solution from said alkali salt solution, and

recycling said caustic leachant to leach solid inorganic amphoteric combustion byproducts from said power generation facility to provide an alkali solubilized amphoteric salt absorber solution.

# 4,421,727 NF<sub>4</sub>+WF<sub>7</sub>- AND NF<sub>4</sub>+UF<sub>7</sub>- AND METHODS OF PREPARATION

William W. Wilson, Simi Valley, and Karl O. Christe, Calabasas, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 25, 1982, Ser. No. 392,100

Int. Cl.<sup>3</sup> C01G 43/00, 41/00; C01B 21/083

U.S. Cl. 423-253 8 Claims

1. NF<sub>4</sub>UF<sub>7</sub>.

4,421,728

# STABILIZATION OF RED PHOSPHORUS

Helena Twardowska, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Jul. 7, 1982, Ser. No. 396,125

Int. Cl.<sup>3</sup> C01B 25/01, 25/02, 25/04

U.S. Cl. 423-265 17 Claims

4. A process for producing red phosphorus stabilized against oxidation, which comprises:  
forming a slurry of red phosphorus particles of particle size of at most about 2 mm,  
heating said slurry to a temperature of about 60° to about 95° C.,

adding to the heated slurry a titanium compound in an amount to provide an oxidation stabilizing amount of titanium on the red phosphorus particles, said titanium compound being one whereby titanium dioxide or titanium phosphate precipitates in said slurry,  
adjusting the pH of said slurry to a value of about 2 to 6 to effect precipitation of titanium dioxide or titanium phosphate on the red phosphorus particles,  
separating the red phosphorus particles so treated from the slurry, and

drying the separated treated particles to form a homogenous blend of red phosphorus particles and titanium dioxide or titanium phosphate.

4,421,729

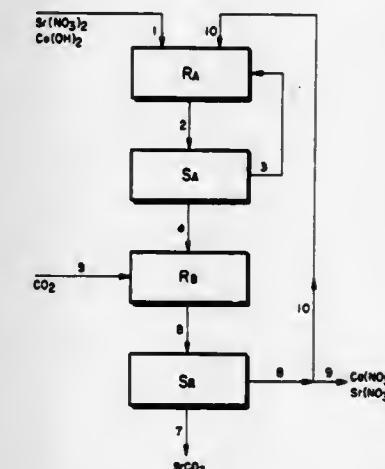
# PREPARATION OF STRONTIUM CARBONATE

John S. Chiang, Mercerville, and David Goldstein, East Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jan. 11, 1982, Ser. No. 338,829

Int. Cl.<sup>3</sup> C01F 11/40, 5/24

U.S. Cl. 423-430 14 Claims



1. The process of preparing strontium carbonate which comprises

(a) reacting strontium nitrate in an aqueous reaction medium, that is concentrated with respect to strontium nitrate, with carbon dioxide to selectively precipitate strontium carbonate product;

(b) neutralizing nitric acid byproduct which forms during the reaction by introducing sufficient lime into the aqueous reaction medium to obtain a molar ratio of dissolved

calcium to dissolved strontium therein at from 0.1:1 to about 7:1 Ca:Sr; and

(c) recovering the solid strontium carbonate product substantially free of lime and calcium carbonate from the reaction medium.

4,421,730

# PROCESS FOR MANUFACTURING HIGHLY PURE CHLORINE DIOXIDE

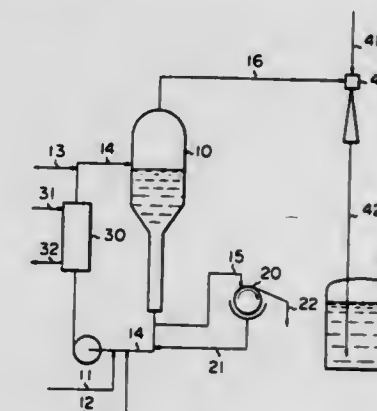
Isao Isa, Misatomachi; Hideo Yamamoto, Shibukawa; Syuki Shindo, Shibukawa, and Morioki Shibuya, Shibukawa, all of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1982, Ser. No. 347,257

Claims priority, application Japan, May 19, 1981, 56-75553

Int. Cl.<sup>3</sup> C01B 11/02, 15/02

U.S. Cl. 423-478 6 Claims



1. A process for manufacturing highly pure chlorine dioxide by reducing an alkali metal chlorate selected from the group consisting of sodium chlorate and potassium chlorate with chloride ion, in a strong acidic reaction medium selected from the group consisting of sulfuric acid, hydrochloric acid and mixtures thereof in the presence of hydrogen peroxide and a complex catalyst palladium(II) with chloride ion, in a single generator-crystallizer at a temperature of 25° to 90° C. under a reduced pressure of 20 to 400 mmHg.

4,421,731

# PROCESS FOR PURIFYING PHOSPHOGYPSUM

Jay W. Palmer, Tampa, Fla., and John C. Gaynor, Des Plaines, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,377

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> C01F 11/46; C01G 56/00; C01B 25/16

U.S. Cl. 423-555 15 Claims

1. A process for reducing radioactivity of phosphogypsum containing radioactive contamination comprising the steps of  
(A) thermally calcining phosphogypsum containing radioactivity in about 10-60 minutes at a temperature between about atmospheric and 60 psig to yield phosphohemihydrate containing radioactivity;

(B) slurrying the phosphohemihydrate with sufficient water and purified gypsum seed crystals that are substantially free of radioactivity to form an aqueous slurry of about 10-60 weight % calcium sulfate solids and about 1:9 to 9:1 weight proportion of phosphohemihydrate to purified gypsum seed crystal;

(C) hydrating at a temperature between about 55° and 90° C., in about 10-60 minutes, a substantial proportion but less than all, of the phosphohemihydrate to gypsum substantially free of radioactivity; and

(D) separating relatively larger gypsum particles substantially free of radioactivity from relatively smaller hemihydrate particles containing radioactive contamination.











4,421,748

## ARTIFICIAL TEAR AID

Seymour F. Trager, 14 Sherwood Dr., Plainview, N.Y. 11803, and Victoria S. Chylinski, 11 Peghouse Rise, Slad Road, Stroud, Glos., England

Filed Jul. 13, 1982, Ser. No. 397,914

Int. Cl.<sup>3</sup> A61K 31/685, 31/74

U.S. Cl. 424—199

7 Claims

1. An artificial tear composition comprising a sterile hypotonic aqueous solution containing from about 1.0 to 20 percent weight/volume lecithin and from about 0.1 to about 20 percent by weight of a viscosity-adjusting agent selected from the group consisting of methyl cellulose, hydroxypropyl cellulose, polyvinyl alcohol and hydroxyethyl cellulose.

4,421,749

## ALUMINUM PYRIDINETHIOLS AS ANTIMICROBIALS

Horst Pauling, Bottmingen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 26, 1981, Ser. No. 277,781

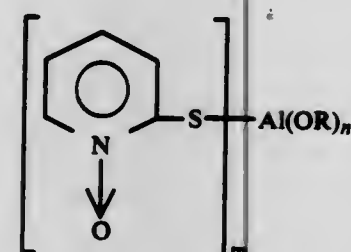
Claims priority, application Switzerland, Jul. 2, 1980, 5112/80

Int. Cl.<sup>3</sup> A61K 31/555; C07D 213/89

U.S. Cl. 424—200

18 Claims

1. A compound of the formula



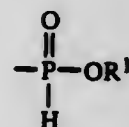
wherein

m is 1 or 2,

n is 1 or 2,

whereby the sum m + n is 3, and

R is ethyl or n-hexadecyl; straight-chain or branched C<sub>1-4</sub>-alkyl monosubstituted with phenoxy; 2,4-hexadienyl; unsubstituted phenyl or phenyl substituted with 1 to 5 chlorine atoms or a phenyl group; or a group of the formula

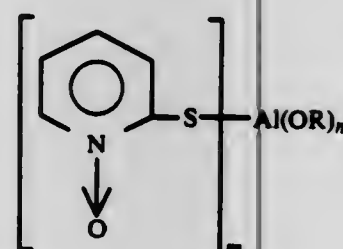


wherein

R<sup>1</sup> is C<sub>1-6</sub>-alkyl, or,

where m is 1 and n is 2, the two R-symbols together form a 2,2'-methylene-bis-(3,4,6-trichloro-o-phenylene) group, or, where m is 2 and n is 1, R is a 2,4,5-trichloro-6-[2,3,5-trichloro-6-[di(2-pyridinethiolato)aluminum]oxy-benzyl]-phenyl N,N'-dioxide group.

9. An antimicrobial cosmetic composition, comprising a cosmetic base and an antimicrobially-effective amount of at least one compound of the formula



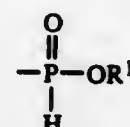
wherein

m is 1 or 2,

n is 1 or 2,

whereby the sum m + n is 3, and

R is ethyl or n-hexadecyl; straight-chain or branched C<sub>1-4</sub>-alkyl monosubstituted with phenoxy; 2,4-hexadienyl; unsubstituted phenyl or phenyl substituted with 1 to 5 chlorine atoms or a phenyl group; or a group of the formula



(a)

wherein

R<sup>1</sup> is C<sub>1-6</sub>-alkyl, or,

where m is 1 and n is 2, the two R-symbols together form a 2,2'-methylene-bis-(3,4,6-trichloro-o-phenylene) group, or, where m is 2 and n is 1, R is a 2,4,5-trichloro-6-[2,3,5-trichloro-6-[di(2-pyridinethiolato)aluminum]oxy-benzyl]-phenyl N,N'-dioxide group.

4,421,750

## ORGANOPHOSPHORIC ACID ESTER ANHYDRIDES AS PESTICIDES

Hiromichi Ishikawa; Kazuhiko Kitaori, both of Atsugi; Kimiyoshi Kaneko, Isehara; Satoru Moriyama, Ebina; Takashi Kobayashi, and Tsugio Uchiyama, both of Atsugi, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Nihonbashi, Japan

Filed Mar. 2, 1982, Ser. No. 353,927

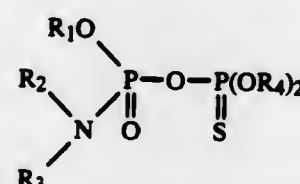
Claims priority, application Japan, Mar. 9, 1981, 56-33295

Int. Cl.<sup>3</sup> A01N 57/12; C07F 9/24

U.S. Cl. 424—207

7 Claims

1. The compound of the formula



(I)

wherein R<sub>1</sub> is a lower alkyl group containing 3 or more carbon atoms and R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> may be the same or different from each other and each are a lower alkyl group.

2. A method of combating insect pests, acarine pests and/or nematode pests at a locus of infestation, which comprises treating the pests or the locus of infestation with an insecticidally, miticidally and/or nematocidally effective amount of the compound as claimed in claim 1.

4,421,751

## BIPYRIDINE SUBSTITUTED IMIDAZOYLIDENE, COPPER COMPLEX, AND ITS USE IN FOOD-PRODUCING ANIMALS

Kurt G. R. Sundelin, Modesto, Calif., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

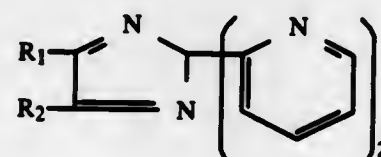
Filed Apr. 1, 1982, Ser. No. 364,369

Int. Cl.<sup>3</sup> A61K 31/555, 31/44; C07D 401/00; C07F 15/00

U.S. Cl. 424—245

11 Claims

1. A compound of the formula



wherein R<sub>1</sub> and R<sub>2</sub> are hydrogen, alkyl or phenyl, and including the cuprous, ferrous and nickelous salts thereof.

4,421,753

## 1-(5-AMINO-4H-1,2,4-TRIAZOL-3-YL)-4-SUBSTITUTED-PIPERAZINES

Andrew S. Tomcufcik, Old Tappan, N.J.; Walter E. Meyer, Suffern, and John P. Duzza, Nanuet, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

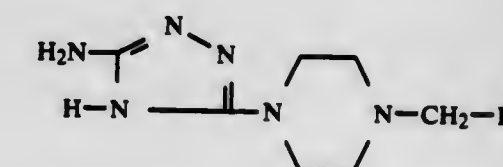
Continuation-in-part of Ser. No. 339,361, Jan. 15, 1982, abandoned. This application Mar. 22, 1982, Ser. No. 360,864

Int. Cl.<sup>3</sup> C07D 417/14; A61K 31/50

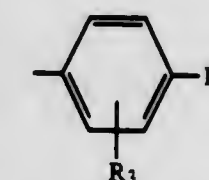
U.S. Cl. 424—250

30 Claims

1. A compound selected from the group consisting of those of the formula:



wherein R<sub>1</sub> is selected from the group consisting of alkyl having up to 3 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, allyl, benzyl, β-phenethyl, β-phenoxyethyl, 3,4,5-trimethoxyphenyl, 2-furyl, 2-quinolyl, 2-phenyl-2H-1,2,3-triazol-4-yl and a moiety of the formula:



wherein R<sub>2</sub> is hydrogen, alkyl having up to 4 carbon atoms, fluoro, chloro, bromo, cyano, amino or dimethylamino and R<sub>3</sub> is hydrogen, methyl, fluoro, chloro, bromo or nitro; and the pharmacologically acceptable acid-addition salts thereof.

4,421,752

## ISOXAZOLYL INDOLAMINES AS HYPOGLYCEMICS

Leonard J. Brand, Randolph, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 251,068, Apr. 6, 1981, Pat. No. 4,336,391.

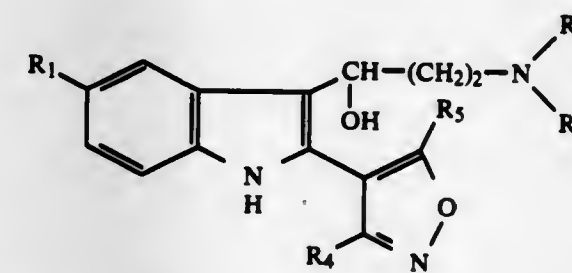
This application Mar. 19, 1982, Ser. No. 359,752

Int. Cl.<sup>3</sup> C07D 413/04, 413/14; A61K 31/42

U.S. Cl. 424—248.4

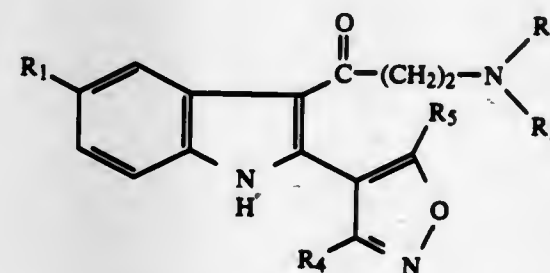
19 Claims

1. A pharmaceutical composition useful in treating diabetes as a hypoglycemic agent comprising a compound of the formula:



(I)

or of the formula



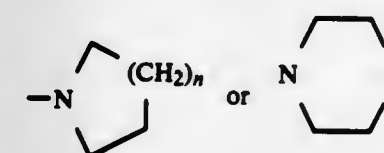
(II)

wherein

R<sub>1</sub> represents hydrogen, fluoro, chloro, lower alkyl having 1 to 4 carbon atoms, or lower alkoxy having 1 to 4 carbon atoms,

R<sub>2</sub> and R<sub>3</sub> each independently represent lower alkyl having 1 to 4 carbon atoms, or

R<sub>2</sub> and R<sub>3</sub> together with N represent



wherein

n is 1, 2 or 3, and

R<sub>4</sub> and R<sub>5</sub> each independently represent hydrogen or lower alkyl having 1 to 4 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutical carrier or diluent, said compound being present in an amount sufficient to provide a daily dose of 70 to 1000 milligrams of compound.

4,421,754

## SYNDONIMINE DERIVATIVES, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF

Hiroyoshi Hidaka, 766-38, Kannonji-cho, Tsu-shi, Mie-ken, Japan; Ikuro Matsumoto, Tokyo, Japan; Junji Yoshizawa, Machida, Japan, and Shigenori Kotani, Kodaira, Japan, assignors to Hiroyoshi Hidaka, Mie, Japan

Filed Jul. 29, 1982, Ser. No. 402,974

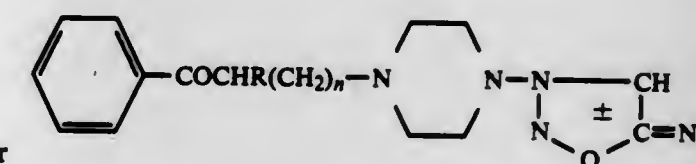
Claims priority, application Japan, Aug. 24, 1981, 56-131564

Int. Cl.<sup>3</sup> C07D 413/04; A61K 31/495

U.S. Cl. 424—250

8 Claims

1. A 3-[4-(benzoylalkyl)piperazine-1-yl]syndonimine compound represented by the following formula (I)



(I)

wherein R represents a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, and n represents zero or an integer of 1 to 10, and its acid addition salt.



**4,421,755**  
**METHOD OF TREATING CORONARY HEART DISEASE WITH IMIDAZO(4,5-B)PYRIDINES**

Lothar Benedikter, and Eberhard Kutter, both of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,838

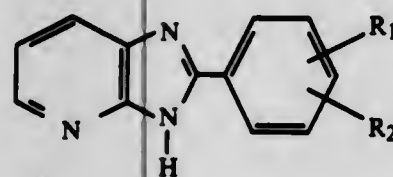
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3108027

Int. Cl.<sup>3</sup> A61K 31/435, 31/44

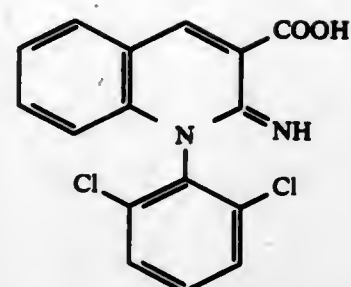
U.S. Cl. 424—256

3 Claims

1. The method of treating angina pectoris, coronary insufficiency or cardiac infarct in a warm-blooded animal in need thereof which comprises perorally, parenterally or rectally administering to said animal an effective coronary dilating and peripheral vasodilating amount of a compound of the formula



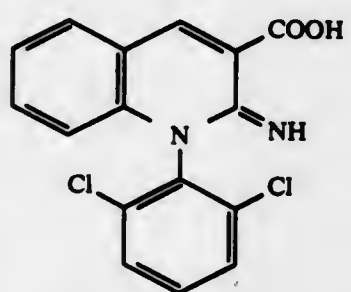
wherein R<sub>1</sub> is alkoxy of 1 to 4 carbon atoms, and R<sub>2</sub> is (alkyl of 1 to 4 carbon atoms) sulfinyl, or non-toxic, pharmacologically acceptable acid addition salt thereof.



(I)

and pharmacologically acceptable salts thereof.

2. An anti-inflammatory and analgesic composition wherein a pharmaceutically effective amount of 1-(2,6-dichlorophenyl)-2-quinolinoneimine-3-carboxylic acid represented by the formula (I):



(I)

or a pharmaceutically acceptable salt thereof is contained as an effective ingredient.

**4,421,756**  
**QUINOLINONEIMINE CARBOXYLIC ACID ANTI-INFLAMMATORY AND ANALGESIC COMPOSITION CONTAINING THE COMPOUND**

Tatsuo Shinohara; Yukihiko Oguri; Yukio Fujimori, and Hiroyuki Kondo, all of Toyama, Japan, assignors to Daito Koeiki Kabushiki Kaisha, Toyama, Japan

PCT No. PCT/JP80/00243, § 371 Date Aug. 18, 1981, § 102(e) Date Aug. 18, 1981, PCT Pub. No. WO81/01001, PCT Pub. Date Apr. 16, 1981

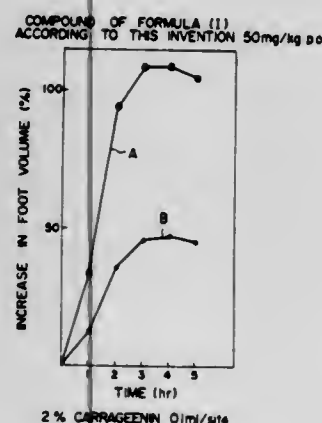
PCT Filed Oct. 9, 1980, Ser. No. 296,262

Claims priority, application Japan, Oct. 12, 1979, 54-132105

Int. Cl.<sup>3</sup> A61K 31/47; C07D 215/54

U.S. Cl. 424—258

2 Claims



1. 1-(2,6-dichlorophenyl)-2-quinolinoneimine-3-carboxylic acid represented by the formula (I):

**4,421,757**  
**THIAZOLINE DERIVATIVES, PROCESSES FOR THEIR PREPARATION, THEIR USE AND PHARMACEUTICAL PREPARATIONS BASED ON THESE COMPOUNDS**

Hans-Jochen Lang, Hofheim an Taunus; Bernhard Seuring, Frankfurt am Main, and Erno Granzner, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 28, 1981, Ser. No. 335,149

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049460

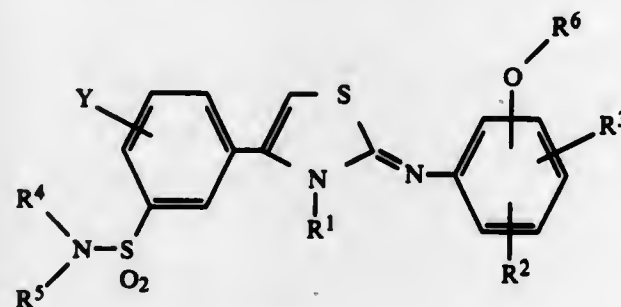
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C07D 277/38; A61K 31/425

U.S. Cl. 424—270

9 Claims

1. A thiazoline derivative of the formula



or a physiologically tolerated salt thereof, in which R<sup>1</sup> is alkyl with 1 to 3 C atoms, R<sup>2</sup> and R<sup>3</sup> are hydrogen, halogen, alkyl or alkoxy with 1 to 4 C atoms, and are identical or different, R<sup>4</sup> and R<sup>5</sup> are hydrogen or alkyl with 1 to 4 C atoms, and are identical or different or together with the N atom form a saturated ring with up to 6 ring members, R<sup>6</sup> is hydrogen or an aliphatic acyl group with 1 to 4 C atoms and Y is hydrogen, halogen, or methyl.

**4,421,758**  
**ANTI-MICROBIAL DIAZOLE DERIVATIVES**  
 Isao Kawamoto, and Masaki Nakahara, both of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,995

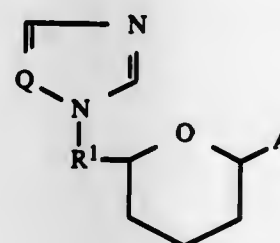
Claims priority, application Japan, Dec. 12, 1980, 55-175525; Feb. 3, 1981, 56-14771

Int. Cl.<sup>3</sup> A01N 43/50; A61K 31/415; C07D 405/06

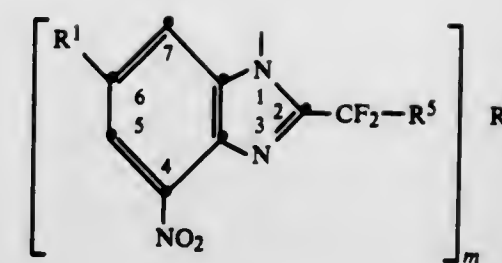
U.S. Cl. 424—273 R

24 Claims

17. An antimicrobial composition comprising an antimicrobial effective amount of an antimicrobial agent and a carrier or diluent, wherein the antimicrobial agent is selected from a compound of formula (I):

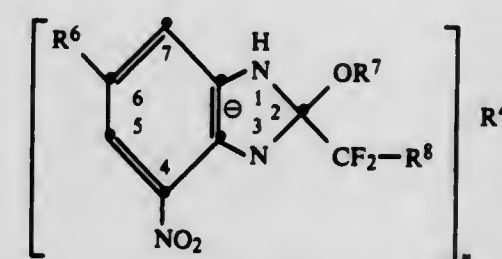


(I)



I

and



II

wherein R<sup>1</sup>-R<sup>8</sup> and m and n have the following meanings:

R<sup>1</sup>=halo, CF<sub>3</sub>, CF<sub>2</sub>H, or CF<sub>2</sub>Cl;

R<sup>2</sup>=H, COOR<sup>3</sup>, or R<sup>4</sup>;

R<sup>3</sup>=alkyl of C<sub>1</sub>-C<sub>8</sub>, alkenyl of C<sub>3</sub>-C<sub>4</sub>, or benzyl;

R<sup>4</sup>=sodium, potassium, lithium, silver, magnesium, calcium, barium, strontium, ammonium, or substituted ammonium derived from an organic amine which is as basic as, or more basic than, ammonia;

R<sup>5</sup>=H, Cl, F, CF<sub>2</sub>H, or CF<sub>3</sub>;

R<sup>6</sup>=Br, Cl, or CF<sub>3</sub>;

R<sup>7</sup>=H or lower alkyl of C<sub>1</sub>-C<sub>4</sub>;

R<sup>8</sup>=H, F, CF<sub>2</sub>H, or CF<sub>3</sub>;

m=when R<sup>2</sup>=H or COOR<sup>3</sup>, 1, and when R<sup>2</sup>=R<sup>4</sup>, the valence of R<sup>4</sup>; and n=the valence of R<sup>4</sup>.

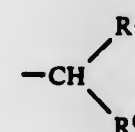
wherein:

Q represents a =CH— group;

R<sup>1</sup> is methylene; and

A is —OR<sup>2</sup>

wherein R<sup>2</sup> represents a C<sub>1</sub>-C<sub>6</sub> alkyl group; a C<sub>2</sub>-C<sub>6</sub> alkenyl group; a C<sub>2</sub>-C<sub>6</sub> alkynyl group; a phenyl group; a phenyl group substituted with up to three halogen atoms, a C<sub>1</sub>-C<sub>6</sub> alkyl group or a C<sub>1</sub>-C<sub>6</sub> alkoxy group; or a group of formula



in which R<sup>5</sup> represents a hydrogen atom; a C<sub>1</sub>-C<sub>6</sub> alkyl group; a phenyl group; a phenyl group substituted with up to two halogen atoms, a C<sub>1</sub>-C<sub>6</sub> alkyl group or a C<sub>1</sub>-C<sub>6</sub> alkoxy group; a thienyl group; a thienyl group substituted with a halogen atom; a furyl group; or a furyl group substituted with a halogen atom; R<sup>6</sup> represents a phenyl group; a phenyl group substituted with up to three halogen atoms, a C<sub>1</sub>-C<sub>6</sub> alkyl group, a C<sub>1</sub>-C<sub>6</sub> alkoxy group, a nitro group, a phenoxy group, or a phenyl group; a benzyl group; a benzyl group substituted on the benzene ring with up to two halogen atoms, a C<sub>1</sub>-C<sub>6</sub> alkyl group, or a C<sub>1</sub>-C<sub>6</sub> alkoxy group; a thienyl group; a thienyl group substituted with a halogen atom; a furyl group; or a furyl group substituted with a halogen atom; or an acid addition salt or the cupric chloride, zinc chloride or stannous chloride complex thereof.

**4,421,760**  
**β-LACTAM ANTIBIOTIC, ITS PREPARATION AND USE**  
 Stephen J. Box, Horsham, England, assignor to Beecham Group Limited, England

Filed Jun. 17, 1981, Ser. No. 274,464

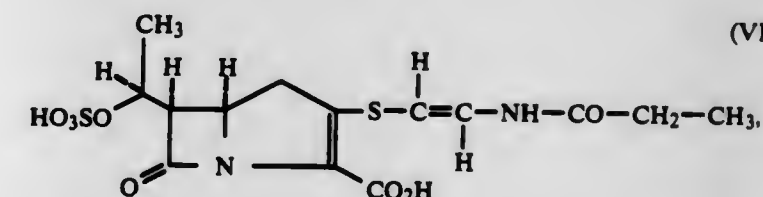
Claims priority, application United Kingdom, Jul. 2, 1980, 8021730

Int. Cl.<sup>3</sup> C07D 487/04; A61K 31/40

U.S. Cl. 424—274

74 Claims

1. A compound of the formula (VI):



(VI)

**4,421,759**  
**METHODS FOR CONTROLLING FIRE ANTS**  
 Rudolph J. Boisvenue, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 27, 1981, Ser. No. 286,728

Int. Cl.<sup>3</sup> A01N 43/50, 43/56

U.S. Cl. 424—273 R

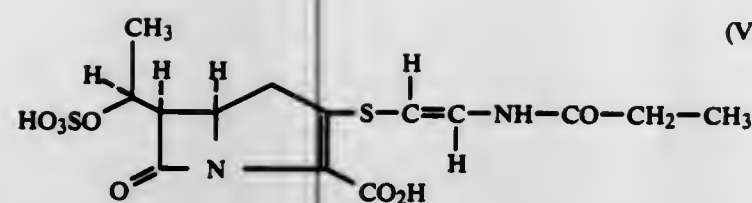
15 Claims

1. Method for eradicating a red imported fire ant colony, which comprises supplying to the colony an effective amount of an active agent which is selected from the class consisting of compounds of the formulae

a pharmaceutically acceptable salt, the lithium salt or a pharmaceutically acceptable ester thereof, said ester being one which is convertible to the free acid or salt thereof by biological methods or chemical methods.

23. A pharmaceutical composition useful for treating bacterial infections in humans and animals and for effecting β-lactamase inhibition in humans and animals which comprises an antibacterially effective amount or a β-lactamase inhibitory amount of a compound of the formula (VI):





or a pharmaceutically acceptable salt or pharmaceutically acceptable ester thereof, in combination with a pharmaceutically acceptable carrier.

4,421,761

## THIOPHENE DERIVATIVES

Shigeki Nagai, Hirota; Yojiro; Takashi Yorie; Hisao Sugiura; Toru Hibi, all of Ube; Katsumi Sato, Hiratsuka; Takuo Wada, Hatano, and Masahiko Miyahara, Atsugi, all of Japan, assignors to Hokko Chemical Industry Co. Ltd. and Ube Industries, Ltd., both of Japan

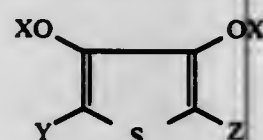
Filed Jan. 27, 1981, Ser. No. 228,696

Int. Cl.<sup>3</sup> A01N 43/02; C07D 333/24

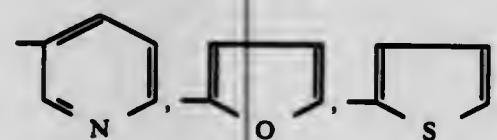
U.S. Cl. 424—275

12 Claims

1. A thiophene derivative of the general formula



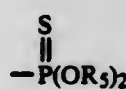
wherein X represents hydrogen atom, alkali metal, —NH<sub>4</sub>, —COR<sub>1</sub> (in which R<sub>1</sub> represents phenyl, halophenyl, lower alkyl, lower alkenyl, lower alkoxy lower alkyl, lower alkylthio lower alkyl, lower haloalkyl,



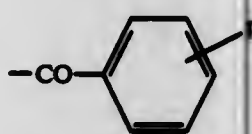
cycloalkyl, or lower alkylthio), —CO-lower alkyl-R<sub>2</sub> (in which R<sub>2</sub> represents lower alkylcarbonyloxy or lower alkoxy-carbonyl),



(in which n represents an integer of 4 to 6 inclusive), di-lower alkylcarbonyl, mono-lower alkylcarbonyl, cycloalkylcarbonyl, —COOR<sub>3</sub> (in which R<sub>3</sub> represents lower alkyl, lower alkenyl, lower alkynyl, lower haloalkyl, lower alkoxy lower alkyl, lower alkoxy lower alkyl lower alkyl, phenyl, substituted phenyl or benzyl), —SC<sub>2</sub>H<sub>4</sub> (in which R<sub>4</sub> represents lower alkyl, lower alkyl-substituted phenyl or di-lower alkylamino) or

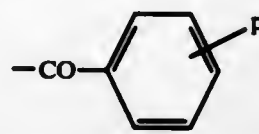


(in which R<sub>5</sub> represents lower alkyl); Y represents COOR<sub>6</sub> (in which R<sub>6</sub> represents alkyl, lower alkenyl, lower alkynyl, lower alkoxy lower alkyl or benzyl), hydrogen atom or



(in which p represents hydrogen atom, halogen atom or lower

alkyl); and Z represents —COOR<sub>6</sub> (in which R<sub>6</sub> is as defined above), cyano or



(in which p is as defined above), provided that both Y and Z are not —COOR<sub>6</sub> (in which R<sub>6</sub> represents alkyl, lower alkenyl or lower alkynyl) when X represents hydrogen atom, alkali metal or —NH<sub>4</sub>.

4,421,762

## METHOD OF TREATMENT OF AN ALLERGY TO AN INGESTED ALLERGEN

George Wardell, Loughborough, England, assignor to Fisons Limited, London, England

Continuation-in-part of Ser. No. 941,632, Sep. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 755,606, Dec. 29, 1976, Pat. No. 4,152,448, which is a continuation of Ser. No. 471,139, May 17, 1974, abandoned, which is a

continuation-in-part of Ser. No. 329,417, Feb. 5, 1973, abandoned. This application Sep. 8, 1981, Ser. No. 300,281 Claims priority, application United Kingdom, Feb. 15, 1972, 6911/72; Feb. 2, 1974, 4912/74

Int. Cl.<sup>3</sup> A61K 31/35

U.S. Cl. 424—283

8 Claims

1. A method of treatment of an allergy to an ingested allergen, which comprises per os administration of a daily dosage of from 20 to 4,000 mg of 1,3-bis(2-carboxychromon-5-yloxy)-2-hydroxypropane or a therapeutically acceptable salt thereof, as active ingredient to a patient having such an allergy.

4,421,763

## CYCLOHEXANE DERIVATIVES, PROCESS FOR PREPARATION THEREOF AND MEDICINES CONTAINING THESE CYCLOHEXANE DERIVATIVES

Sachiyuki Hamano; Shinichi Kitamura, both of Tokyo; Toshiiji Igarashi, Tokorozawa, and Yoshikage Nakajima, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

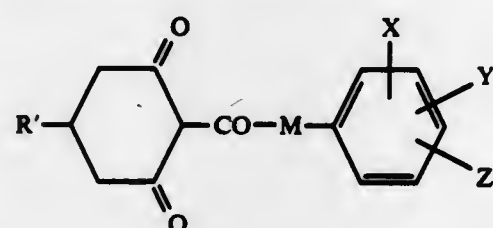
Division of Ser. No. 133,694, Mar. 25, 1980, Pat. No. 4,350,705. This application Mar. 26, 1982, Ser. No. 362,358

Claims priority, application Japan, Mar. 31, 1979, 54-37696; Sep. 10, 1979, 54-115240

Int. Cl.<sup>3</sup> A61K 31/34, 31/12, 31/165; C07C 49/30; C07D 307/34 U.S. Cl. 424—285

11 Claims

1. A compound having the formula



in which

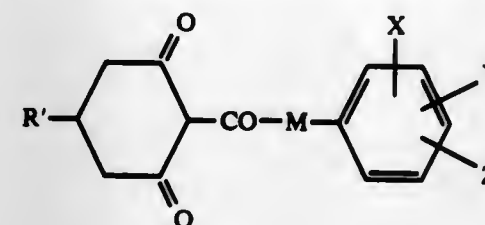
(1) R' is phenyl, furyl or substituted phenyl, in which said substituted phenyl is substituted with from 1 to 5 substituents which are the same or different and are selected from the group consisting of alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, hydroxy, halogen, halogenated alkyl having 1 to 6 carbon atoms, amino, mono- or di-alkyl amino in which the alkyl has 1 to 6 carbon atoms and —O—(CH<sub>2</sub>)<sub>a</sub>—O— bonded to any two adjacent carbon atoms of the phenyl nucleus and in which "a" is 1 or 2;

(2) M is —CH<sub>2</sub>—<sub>m</sub>, wherein "m" is zero or an integer from 1 to 4;

(3) X, Y and Z, which can be the same or different, are

hydrogen, lower alkyl, lower alkoxy, lower alkyl carbonyloxy, hydroxy, lower alkyl sulfonyl, nitro, cyano or halogen; and pharmacologically acceptable salts thereof.

11. A method treating a subject suffering from hypertension which comprises administering to that subject an effective antihypertensive amount of a compound having the formula



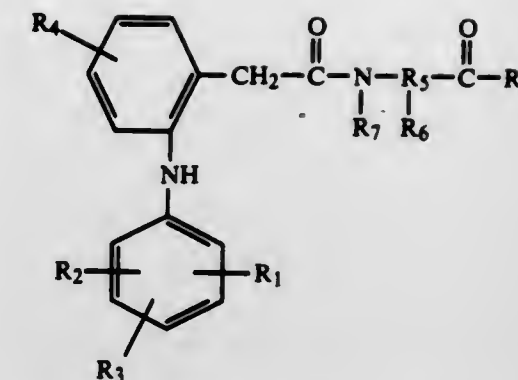
in which

(1) R' is phenyl, furyl or substituted phenyl, in which said substituted phenyl is substituted with from 1 to 5 substituents which are the same or different and are selected from the group consisting of alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, hydroxy, halogen, halogenated alkyl having 1 to 6 carbon atoms, amino, mono- or di-alkyl amino in which the alkyl has 1 to 6 carbon atoms and —O—(CH<sub>2</sub>)<sub>a</sub>—O— bonded to any two adjacent carbon atoms of the phenyl nucleus and in which "a" is 1 or 2;

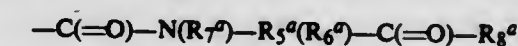
(2) M is —CH<sub>2</sub>—<sub>m</sub> or —NH—, wherein "m" is zero or an integer from 1 to 4;

(3) X, Y and Z, which can be the same or different, are hydrogen, lower alkyl, lower alkoxy, lower alkyl carbonyloxy, hydroxy, lower alkyl sulfonyl, nitro, cyano or halogen;

and pharmacologically acceptable salts thereof.



in which each of R<sub>1</sub> and R<sub>2</sub> is hydrogen, lower alkyl, lower alkoxy, halogen having an atomic number of not more than 35 or trifluoromethyl, each of R<sub>3</sub> and R<sub>4</sub> is hydrogen, lower alkyl, lower alkoxy or halogen having an atomic number of not more than 35, R<sub>5</sub> is lower alkylene or lower alkylidene, R<sub>6</sub> is carboxy, lower alkoxy, lower alkoxy carbonyl, phenyl-lower alkoxy carbonyl or aminocarbonyl, R<sub>7</sub> is hydrogen, and the group of the formula —C(=O)—R<sub>8</sub> is carboxyl, lower alkoxy carbonyl, or substituted carbamoyl of the formula



in which R<sub>5</sub><sup>a</sup> is lower alkylene or lower alkylidene, R<sub>6</sub><sup>a</sup> is phenyl or phenyl substituted by hydroxy, R<sub>7</sub><sup>a</sup> is hydrogen and R<sub>8</sub><sup>a</sup> is carboxy or lower alkoxy carbonyl, wherein the radical of the formula —NR<sub>7</sub>—R<sub>5</sub>(R<sub>6</sub>)—CO—R<sub>8</sub> has the L-configuration, or a therapeutically acceptable salt thereof.

10. A pharmaceutical preparation containing an antiinflammatory effective amount of a compound as claimed in claim 1 together with conventional pharmaceutical excipients.

4,421,766

## METHOD OF PRESERVING ORGANIC MATERIALS FROM FUNGAL ATTACK AND A COMPOSITION FOR USE IN SUCH A METHOD

Yasuhiro Morisawa; Kiyoshi Konishi, and Mitsuru Kataoka, all of Hiromachi, Japan, assignors to Sankyo Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1982, Ser. No. 338,141

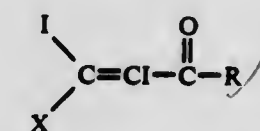
Claims priority, application Japan, Jan. 13, 1981, 56-3364

Int. Cl.<sup>3</sup> A01N 37/02, 37/06

U.S. Cl. 424—311

12 Claims

1. A method of protecting degradable organic material from fungal attack by applying to or admixing with said material an anti-fungal effective amount of a compound of formula (I):



(I)

wherein: X represents a chlorine, bromine or iodine atom; and R represents a hydroxy group or a C<sub>1</sub>—C<sub>6</sub> alkoxy group.

4,421,767

## COMPOUNDS AND METHODS FOR TREATING DEPRESSION

Michael G. Palfreyman, Fegersheim, and Ian A. McDonald, Truchtersheim, both of France, assignors to Merrell Torrance et Compagnie, Strasbourg, France

Continuation-in-part of Ser. No. 268,553, Jan. 1, 1981,

abandoned. This application Sep. 13, 1982, Ser. No. 417,751

Int. Cl.<sup>3</sup> C07C 101/77, 101/72; A61K 30/95, 31/24

U.S. Cl. 424—319

36 Claims

1. A compound of the formula:

4,421,764

## USE OF 9-ANTHROYLCHOLINE IN THE UTERUS TO PREVENT PREGNANCY

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Division of Ser. No. 253,567, Jul. 6, 1981, Pat. No. 4,377,577, which is a continuation-in-part of Ser. No. 155,800, May 30, 1980. This application Jul. 14, 1982, Ser. No. 398,298

Int. Cl.<sup>3</sup> A61K 31/235

U.S. Cl. 424—308

8 Claims

1. A method of preventing pregnancy in a female which comprises introducing an effective amount of the drug 9-anthroylcholine directly into the uterus of the female after sexual intercourse.

4,421,765

## SUBSTITUTED PHENYLACETIC ACID AMIDE COMPOUNDS

Alfred Sallmann, Bottmingen, and Gerhard Baschang, Bettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 33,295, Apr. 25, 1979, Pat. No. 4,250,192, which is a continuation of Ser. No. 905,087, May 11, 1978, abandoned, and Ser. No. 906,292, May 15, 1978, abandoned.

This application Oct. 3, 1980, Ser. No. 193,776 Claims priority, application Luxembourg, May 11, 1977, 77316; Sep. 9, 1977, 78106

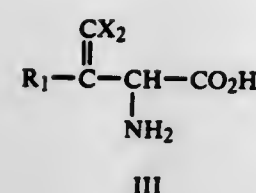
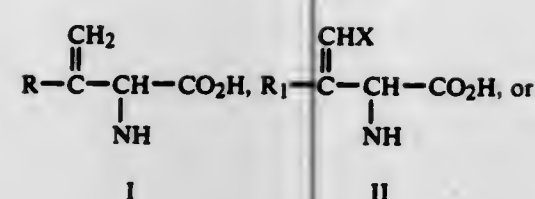
Int. Cl.<sup>3</sup> A61K 31/24; C07C 101/44

U.S. Cl. 424—309

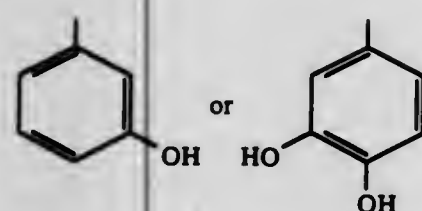
10 Claims

1. A phenylacetic acid amide compound of the formula

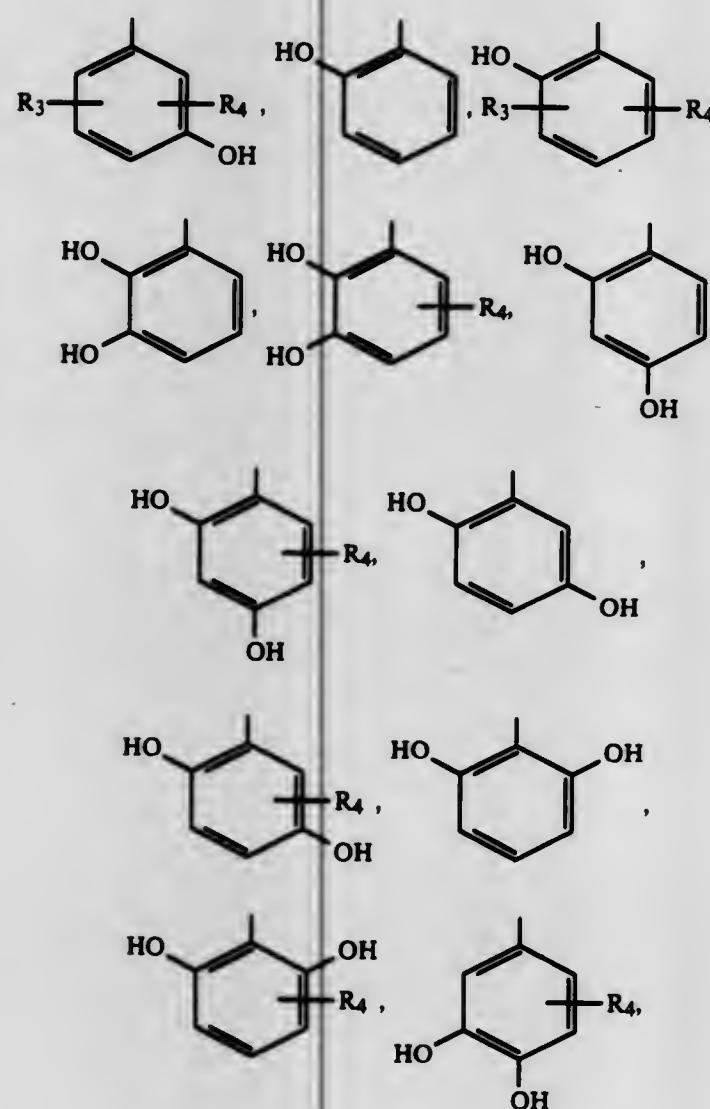




wherein:  
X is fluorine, chlorine, or bromine;  
R is the group R<sub>2</sub> as defined below;  
R<sub>1</sub> is a group of the formula:



or the group R<sub>2</sub> as defined below; wherein R<sub>2</sub> is:



wherein R<sub>3</sub> is hydrogen, (C<sub>1</sub>-C<sub>4</sub>)alkyl, or (C<sub>1</sub>-C<sub>4</sub>)alkoxy, and

R<sub>4</sub> is (C<sub>1</sub>-C<sub>4</sub>)alkyl or (C<sub>1</sub>-C<sub>4</sub>)alkoxy; or a (C<sub>1</sub>-C<sub>8</sub>)alkyl ester thereof; or a non-toxic pharmaceutically acceptable salt thereof.

27. A method for treating depression which comprises administering to a depressed patient an effective amount of a compound as defined in claim 1.

4,421,768

### FLUORINATED DIAMINO-HEPTENE AND-HEPTYNE DERIVATIVES

Patrick Casara, Truchtersheim, and Charles Danzin, Strasbourg, both of France, assignors to Merrell Toroude et Compagnie, Strasbourg, France

Filed Aug. 11, 1982, Ser. No. 407,225

Int. Cl.<sup>3</sup> A61K 31/13; C07C 87/26

U.S. Cl. 424—325

11 Claims

1. A fluorinated diamino-heptene or -heptyne derivative of the following Formula I:



Formula I

wherein:

Y represents CH<sub>2</sub>=CH— or CH≡C—; and  
p represents 1 or 2

or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical composition for inhibiting ornithine decarboxylase comprising a compound as defined in claim 1 as an active ingredient and a pharmaceutically acceptable carrier or diluent.

4,421,769

### SKIN CONDITIONING COMPOSITION

Thomas J. Dixon, and Gary R. Kelm, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 29, 1981, Ser. No. 306,807

Int. Cl.<sup>3</sup> A61K 7/40, 7/48

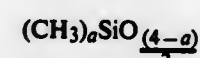
U.S. Cl. 424—358

9 Claims

1. A skin conditioning composition comprising:

(A) from about 5% to about 30% glycerin;

(B) from about 0.5% to about 10% of a volatile silicone or mixtures thereof selected from the group consisting of methylsiloxane fluids having the average unit formula



wherein a has an average of from 2 to 3, inclusive;

(C) from about 0.05% to about 1% of a polydiorganosiloxane-polyalkylene copolymer containing at least one polydiorganosiloxane segment and at least one polyoxyalkylene segment, said polydiorganosiloxane segment consisting essentially of



siloxane units wherein b has a value of from 0 to 3, inclusive, there being an average value of approximately 2 R radicals per silicon for all siloxane units in the copolymer, and R denotes a radical selected from the group consisting of methyl, ethyl, vinyl, phenyl and a divalent radical bonding said polyoxyalkylene segment to the polydiorganosiloxane segment, at least 95% of all R radicals selected from the group consisting of carbon, hydrogen, nitrogen, and oxygen being methyl; and said polyoxyalkylene segment having an average molecular weight of at least 1000 and consisting of from 0 to 50 mol percent polyoxypropylene units and from 50 to 100 mol percent polyoxyethylene units, at least one terminal portion of said polyoxyalkylene

segment being bonded to said polydiorganosiloxane segment, any terminal portion of said polyoxyalkylene segment not bonded to said polydiorganosiloxane segment being satisfied by a terminating radical; the weight ratio of polydiorganosiloxane segments to polyoxyalkylene segments in said copolymer having a value of from 2 to 8;

(D) from about 0.25% to about 5% of a surfactant or mixture of surfactants having an HLB of from about 8 to about 14; and

(E) the remainder water.

4,421,770

### METHOD OF PREPARING HIGH PROTEIN SNACK FOOD FROM EGG PROTEIN

Jan M. Wilker, Rowland Heights, Calif., and Franklin E. Cunningham, Leonardville, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Mar. 24, 1982, Ser. No. 361,411

Int. Cl.<sup>3</sup> A23J 3/00; A23L 1/32

U.S. Cl. 426—89

13 Claims

1. The method of preparing a high protein snack food from egg whites for frozen storage, comprising:

(a) preparing a liquid heat-coagulable egg protein composition from raw egg whites or from a mixture of raw egg whites and raw whole eggs, said composition containing from 6 to 14% of heat-coagulable egg protein solids dispersed in water, said percentages being by weight based on the total composition;

(b) introducing said composition into a heated mold and coagulating said composition therein to form a shaped body;

(c) cutting said body after cooling to form a plurality of coagulum pieces;

(d) coating the exterior surfaces of said pieces with a liquid batter mix containing at least 35% by weight solids in a water suspension, said solids including starch-containing ingredients providing at least 10% by weight of gelatinizable starch based on said batter mix; and

(e) deep fat frying said battered coagulum pieces to seal the outer surfaces of said coagulum, whereby water weeping of said pieces during frozen storage, thawing, and reheating is substantially prevented.

4,421,771

### CHOCOLATE COVERED NUTRIENT BARS

Karl-Wilhelm Stock, Buettelborn, Fed. Rep. of Germany; Norman Brudney, Paris, France, and Horst G. P. Wienecke, Gross-Gerau, Fed. Rep. of Germany, assignors to Richardson GmbH, Gross-Gerau, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,011

Claims priority, application Fed. Rep. of Germany,

Int. Cl.<sup>3</sup> A21D 13/00

U.S. Cl. 426—94

6 Claims

1. A chocolate covered bar having waffles, wafers or biscuits covering sheets portions and containing a filling, said filling comprising a water-containing raw material containing about 5 to 50% vegetable fibrous materials by weight of the filling and having a moisture content between 5 to 20 percent.

4,421,772

### METHOD FOR IDENTIFYING BOTANICAL COMPONENT PARTS OF GROUND SEEDS

Lars Munck, Helsingør; Gregory C. Gibbons, Virum, and Carol Fell, Greve Strand, all of Denmark, assignors to De Forenede Bryggerier A/S, Copenhagen, Denmark

Continuation of Ser. No. 88,231, Oct. 25, 1979, abandoned. This application Aug. 26, 1981, Ser. No. 296,612

Claims priority, application Sweden, Nov. 1, 1978, 7811307

Int. Cl.<sup>3</sup> G01N 21/64, 33/02; G01J 3/30

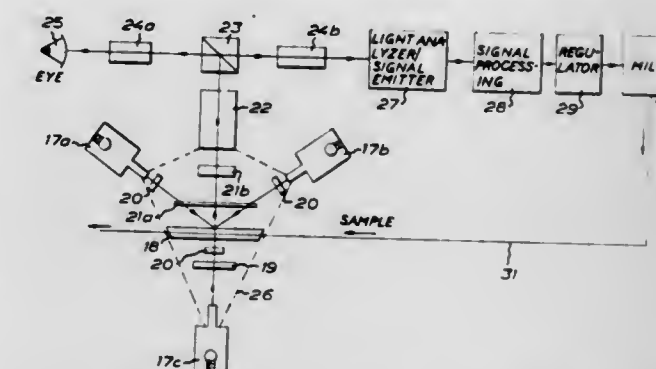
U.S. Cl. 426—231

23 Claims

1. A method of identifying the proportions of starchy endosperm parts, aleurone layer parts and hull layer parts in a

product produced by the disintegration of seeds having such parts comprising the steps of

irradiating the product with electromagnetic radiation in a wavelength band of about 250 to about 300 nm to excite said starchy endosperm part of said product to fluoresce, electromagnetic radiation in a wavelength band of about



300 to about 370 nm to excite said aleurone layer parts of said product to fluoresce, and electromagnetic radiation in a wavelength band of about 410 to about 490 nm to excite said hull layer parts of said product to fluoresce, and analyzing the resulting fluorescence emitted by said product to identify relative starchy endosperm, aleurone layer, and hull layer proportions in said product.

4,421,773

### PROCESS FOR MOLDING CHOCOLATE TO MAKE CHOCOLATE BLOCK HAVING ORNAMENTAL PATTERN AND INTERNAL HOLLOW CAVITY

Tokuji Akutagawa, Tokyo, Japan, assignor to Akutagawa Chocolate Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 260,250, May 5, 1981, Pat. No. 4,382,968. This application Mar. 10, 1983, Ser. No. 474,077

Int. Cl.<sup>3</sup> A23G 1/00, 1/21

U.S. Cl. 426—249

13 Claims

1. A process for molding chocolate to make a molded product including a thin ornamental relief pattern made of a first chocolate material of one color and a body portion carrying said thin ornamental relief pattern and made of a second chocolate material of different color, said body portion having a hollow cavity internally thereof, said first and second chocolate materials containing 30 to 40%, by weight, of the same kind of base oils and fats, and the difference between the content of base oils and fats in said first chocolate material and the content of base oils and fats in said second chocolate material being 10%, by weight, or less, said process comprising the steps of:

- fluidizing said first chocolate material by heating;
- casting said fluidized first chocolate material into an engraved pattern formed on the face of a first mold;
- scraping said face of said first mold to press said first chocolate material into said engraved pattern and to scrape off the excess material;
- rapidly cooling the surface of said first chocolate material to a temperature of from 18° C. to 22° C. thereby to crystallize the base oils and fats contained in said first chocolate material to form microcrystallites;
- fluidizing said second chocolate material by heating;
- pouring into a second mold said fluidized second chocolate material in an amount of at least 30% by volume of the total apparent volume of the molded product including the volume of the hollow cavity;
- placing the first mold on at least said second mold so that at least said second mold is closed by said first mold;
- rotating and vibrating said closed mold formed by said first mold and at least said second mold at such a speed as not to allow said first chocolate material to be effected by centrifugal force while said micro-crystallites are growing in said first chocolate material so that said fluidized second chocolate material is allowed to adhere substantially uni-



formely onto the inner faces of said closed mold, thereby forming an empty or hollow center cavity;  
 (i) cooling the whole body to be solidified by crystallization of the base oils and fats contained in said second chocolate material in all the regions including the interface region at which said second chocolate material penetrates into and adjoins to said first chocolate material; and  
 (j) opening said closed mold to remove the solidified product therefrom.

#### 4,421,774 GASEOUS ANTIMICROBIAL TREATMENTS OF STORAGE GRAIN WITH SULFUR DIOXIDE AND AMMONIA

Frederick D. Vidal, Englewood Cliffs, and Anantharaman Jayaraman, Nutley, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 163,410, Jun. 26, 1980, Pat. No. 4,350,709, which is a continuation-in-part of Ser. No. 156,501, Jun. 4, 1980, Pat. No. 4,309,451, which is a division of Ser. No. 50,162, Jun. 20, 1979, abandoned, said Ser. No. 163,410, is a

continuation-in-part of Ser. No. 38,739, May 14, 1979, abandoned. This application May 3, 1982, Ser. No. 374,458

Int. Cl.<sup>3</sup> A23B 9/00; A23L 3/34

U.S. Cl. 426—319

4 Claims

1. A method of treating moist grain to produce a preserved grain product which resists spoilage, comprising the steps of:

- perusing an effective amount of SO<sub>2</sub> gas through said grain for a period of time sufficient to assure adequate contact between the SO<sub>2</sub> and the grain;
- permitting said grain to react with said SO<sub>2</sub> for a preselected period of time and under conditions suitable to produce an intermediate grain product by the SO<sub>2</sub> penetrating the grain thereby effecting antimicrobial actions in the grain;
- perusing said intermediate grain product with an effective amount of ammonia gas to produce a preserved grain product which resists spoilage.

#### 4,421,775 METHOD FOR REMOVING THE OUTER WAXY CUTIN-CONTAINING LAYER FROM PAPAYA

Harvey T. Chan, Jr., Hilo, HI., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 4, 1982, Ser. No. 385,172

Int. Cl.<sup>3</sup> A23L 1/212; A23P 1/00

U.S. Cl. 426—482

2 Claims

1. A method for removing the outer waxy, cutin-containing layer from papaya, comprising:

- freezing the papaya at a predetermined temperature to form a frozen papaya;
- freeze-drying the frozen papaya for a time sufficient to cause the outer waxy, cutin-containing layer to form a film around the papaya and to cause the underlying papaya to shrink so that the outer layer becomes separated from the underlying papaya; and
- mechanically removing the so-separated layer.

#### 4,421,776 METHOD AND DEVICE FOR ROLLING A DOUGH MASS INTO A CONTINUOUS SHEET

Bernardus H. C. Brinkers, Wassenaar, and Willem B. A. N. Veenman, Rijnsaterwoude, both of Netherlands, assignors to Koninklijke Brinkers Margarinefabrieken B.V., Zoetermeer, Netherlands

Filed Nov. 9, 1981, Ser. No. 319,142

Claims priority, application Netherlands, Jan. 20, 1981, 8100256

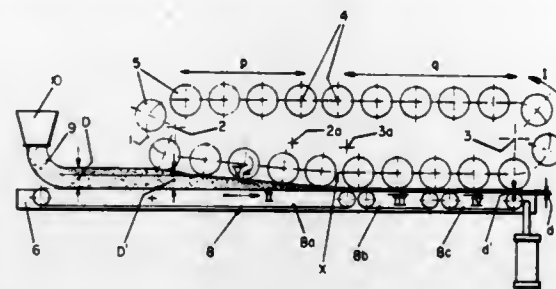
Int. Cl.<sup>3</sup> A21C 3/02, 13/00

U.S. Cl. 426—502

3 Claims

1. A method of rolling to compress a layer of dough into a continuous sheet, comprising the step of transporting the

dough layer on a conveying surface while compressing the dough layer by means of a series of rotatable rolls which travel in the same direction but at a greater linear speed than said conveying surface, wherein the improvement comprises the



step of intermittently relaxing the dough layer by eliminating the contact between said rolls and the dough layer, to release completely and then restore the pressure of said rolls against the dough layer at least once during the travel of said rolls along each portion of the dough layer.

#### 4,421,777 METHOD FOR IMPROVING THE YIELD OF CHOCOLATE CAKE

Frank H. Y. Chung, Norwalk, Conn., assignor to NutriSearch Company, Cincinnati, Ohio

Filed Mar. 27, 1981, Ser. No. 248,592

Int. Cl.<sup>3</sup> A21D 10/04

U.S. Cl. 426—553

7 Claims

1. In a process for preparing a chocolate flavored cake comprising mixing together and baking the ingredients comprising flour, water, egg, sugar, chocolate or cocoa, milk or non-fat dry milk, oil or shortening, salt, baking powder and emulsifier,

the improvement comprising adding to said ingredients (1) a whey-protein-containing composition in an amount of about 3% to about 15% on a flour basis, in combination with (2) an amount of sodium bicarbonate sufficient to elevate the pH of the cake crumb to a pH within the range of from 7.5 to about 9, wherein

said whey protein-containing composition comprises: (a) at least about 40% of a whey protein concentrate having at least 35% whey protein, (b) from 0 to about 50% of a second whey protein-containing composition different from said whey protein concentrate (a), and (c) from 0 to about 35% of another dairy protein-containing product, the total protein in said whey protein-containing composition being at least 50% whey protein whereby the resulting chocolate flavored cake is characterized by good volume, good color and good flavor.

#### 4,421,778 FREEZER STABLE WHIPPED ICE CREAM AND MILK SHAKE FOOD PRODUCTS

Marvin L. Kahn, Williamsville, and Robert J. Lynch, Buffalo, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,129

Int. Cl.<sup>3</sup> A23G 9/02, 9/04

U.S. Cl. 426—564

37 Claims

1. A whipped food product comprised of an oil-in-water emulsion of nonfat milk solids, and about 40% to about 70% water, and sugar in a ratio to water of about 1:1.75 to about 3.0, said sugar being comprised of at least about 30% fructose and/or dextrose; and about 3% to about 10% fat, wherein at least about 50% of said fat is a solid beta phase-tending crystalline fat, and minor effective amounts of flavoring, emulsifier, and stabilizers comprised of microcrystalline cellulose and sodium carboxymethylcellulose, wherein the product is substantially noncrystalline and spoonable at about 0° F., and the

volume of the product remains substantially constant during storage at about 0° F. for at least about six months.

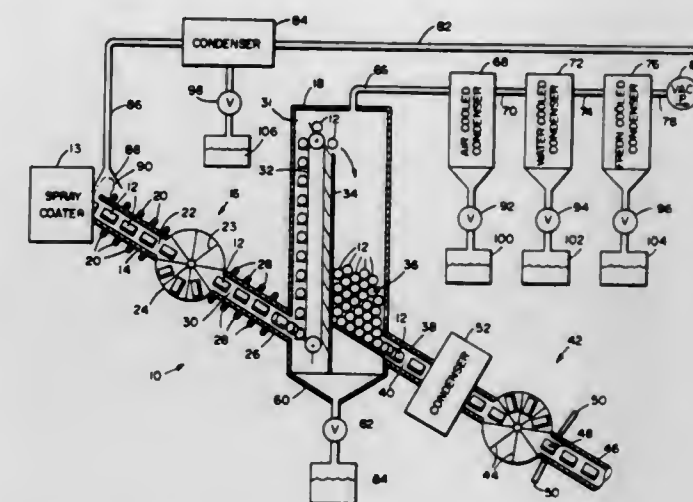
#### 4,421,779 PROCESS FOR TREATING CONFECTIONERY

John E. Baker; Michael G. Topor, both of Farmers Branch; John T. Ivers, Lewisville, and H. Kent Stutz, Hurst, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.  
 Filed May 10, 1982, Ser. No. 376,728  
 Int. Cl.<sup>3</sup> A23G 3/00

U.S. Cl. 426—660

4 Claims

1. A process for treating a confectionery to enhance the forming properties thereof, said confectionery comprised of sugar, water and fat containing at least about 50% unsaturated fatty acid and less than about 10% lauric acid moieties, based on the total fatty acid moiety content, which comprises melting said confectionery and cooling the melted confectionery through the temperature range of about 120° F. to about 78°–85° F. slowly at an average rate no greater than about 1.25° F. per hour to provide the confectionery with a dough-like consistency wherein the forming properties are enhanced and said confectionery may be formed without destroying its structure.



5. The process of claim 4 in which the metal substrate is heated by induction.

#### 4,421,780 HEAT-SEALABLE POLYOLEFIN FILMS AND PROCESSES FOR THEIR PREPARATION

Pierpaolo Buzio, Rho; Lucio Edefonti, Busto Arsizio, and Gianluigi Argela', Arese, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy  
 Filed Dec. 16, 1981, Ser. No. 331,361  
 Claims priority, application Italy, Dec. 24, 1980, 26966 A/80  
 Int. Cl.<sup>3</sup> B05D 3/00

U.S. Cl. 427—40

22 Claims

1. A process for preparing heat-sealable polyolefin films comprising:

- treating the surfaces of a polyolefin film with an aqueous or an aqueous-alcoholic solution containing from about 0.5 to 2% by weight of a primer;
- washing a first surface of said film with water at room temperature;
- drying the washed film in the presence of a gaseous flow at a temperature of from about 50° to 100° C.;
- treating the unwashed second surface of said film with an organic solvent solution containing from about 20 to 40% by weight of a lacquer; and
- drying the film in the presence of a gaseous flow at a temperature of from about 60° to 120° C.

#### 4,421,781 CONTINUOUS VACUUM CURING AND SOLVENT RECOVERY COATING PROCESS

David Reznik, Haifa, Israel, assignor to Tri/Valley Growers, San Francisco, Calif.

Filed Mar. 29, 1982, Ser. No. 362,628

Int. Cl.<sup>3</sup> B05D 3/02, 1/40, 3/12; C23C 13/08

U.S. Cl. 427—46

24 Claims

1. A process for coating a substrate which comprises: establishing a vacuum in a vacuum chamber, applying a polymerizable coating material in a vacuum liquifiable solvent to the substrate, heating the substrate in a confined space around an entrance to the vacuum chamber to evaporate a sufficient amount of the solvent for the substantial exclusion of air around the entrance to the vacuum chamber, admitting the coated substrate and evaporated vacuum condensable solvent to the vacuum chamber to the substantial exclusion of air, condensing the solvent while subject to the chamber vacuum, and heating the substrate a second time to cure said polymerizable material.

#### 4,421,782 PROCESS FOR PROVIDING IMPROVED RADIATION-CURABLE SURFACE COVERINGS AND PRODUCTS PRODUCED THEREBY

Nicholas C. Bolgiano, East Hempfield Township, Lancaster County, and William T. Sigman, Eden Township, Lancaster County, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 314,988, Oct. 26, 1981, abandoned. This application Jun. 17, 1982, Ser. No. 389,164  
 Int. Cl.<sup>3</sup> B05D 3/06

U.S. Cl. 427—53.1

80 Claims

1. A process for preparing a composite layer material comprising the steps of:

depositing a first layer of a composition which is curable by exposure to actinic radiation on a support, preparing a solution comprising water, from about 0.1 to about 75% by weight of acrylic acid and from about 0.01 to about 5% by weight of a suitable surfactant which is compatible with said acrylic acid and which enables said solution to wet said first layer, depositing a layer of said solution on said first layer, and exposing the pair of layers to actinic radiation.

41. A composite layer material having improved durability, abrasion resistance, and stain resistance, said material being obtained by irradiating with actinic radiation a first uncured layer which is curable by exposure to said radiation, said layer being coated prior to irradiation with a layer of an aqueous solution comprising from about 0.1 to about 75% by weight of acrylic acid and from about 0.01 to about 5% by weight of a suitable surfactant which is compatible with said acrylic acid and which enables said solution to wet said first uncured layer.

#### 4,421,783 PROCESS FOR COATING SUBSTRATES

Heinrich Marwitz; Kurt Ullrich, and Karl Huhn, all of Burg-hausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany  
 Filed Feb. 4, 1982, Ser. No. 345,853  
 Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108595

Int. Cl.<sup>3</sup> B05D 3/06, 3/02

U.S. Cl. 427—54.1

11 Claims

1. A process for coating a substrate, which comprises coating the substrate with a composition containing

- a diorganopolysiloxane having terminal SiC-bonded vinyl groups,
- an organopolysiloxane having at least 3 Si-bonded hydrogen atoms per molecule,



- (3) a catalyst which promotes the addition of Si-bonded hydrogen to an aliphatic multiple bond,
  - (5) a diorganopolysiloxane having a viscosity of at least 10<sup>6</sup> mPa.s at 25° C., in which a vinyl group is bonded to the silicon atom in 0.033 to 3.33 percent of the diorganopolysiloxane units, while the remaining organic radicals in the diorganopolysiloxane units of the diorganopolysiloxane are free of aliphatic multiple bonds,
  - (6) an organosilicon adhesive compound which promotes adhesion and an organic solvent and thereafter cross-linking the coated substrate.
11. The process of claim 1, wherein the coated substrate is cross-linked with ultraviolet light.

4,421,784

# PROCESS FOR PRODUCING TEXTURED COATINGS

Harden H. Troue, Plainfield, Ind., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 12, 1982, Ser. No. 348,345  
Int. Cl.<sup>3</sup> B05D 3/02, 3/06

U.S. Cl. 427—54.1

3 Claims

1. In a process for providing a textured or woven coating on a substrate, which coating has a thickness of about 0.1 mil to about 10 mils, comprising the following steps:

- (a) applying a coating, which is curable with ultraviolet light, to the substrate, said coating having a viscosity, as applied, of at least about 50 centipoises;
  - (b) exposing the coated substrate to ultraviolet light having wavelengths in the range of about 1800 Angstroms to about 2750 Angstroms in an inert atmosphere for a period of time sufficient to initiate texturing at the surface of the coating;
  - (c) maintaining the coated substrate from step (b) in a space essentially devoid of ultraviolet light for a period of time sufficient for the surface of the coating to texture; and
  - (d) exposing the coated substrate from step (c) to ultraviolet light having wavelengths in the range of about 1800 Angstroms to about 4000 Angstroms in an inert atmosphere or air until the coating is essentially cured,
- the improvement comprising, after step (a) and prior to step (b), increasing the viscosity of the coating by exposing the coating to ultraviolet light, said viscosity being increased to a viscosity no higher than that at which the coating is capable of being textured in steps (b) and (c), above.

4,421,785

# SUPERCONDUCTIVE TUNNEL JUNCTION DEVICE AND METHOD OF MANUFACTURE

Harry Kroger, Sudbury, Mass., assignor to Sperry Corporation, New York, N.Y.

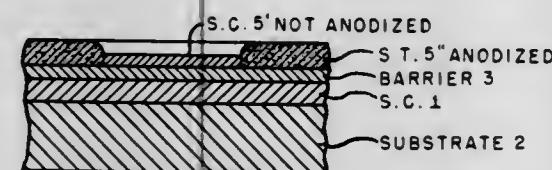
Filed Aug. 18, 1980, Ser. No. 179,311

The portion of the term of this patent subsequent to Nov. 27, 1996, has been disclaimed.

Int. Cl.<sup>3</sup> B05D 5/12

U.S. Cl. 427—63

15 Claims



1. A method of manufacturing a superconductive tunnel junction device including at least one superconductive tunnel junction defined as a predetermined active region comprising the steps of
- forming a first layer of superconductive material on said substrate,
  - forming a barrier layer of barrier material on said first layer,
  - forming a second layer of superconductive material on said barrier layer, and
  - rendering insulating at least the entire thickness of said sec-

ond layer of superconductive material except at said predetermined active region for defining said tunnel junction, and with the exception of said first layer of superconductive material which remains substantially unconverted to insulating material,

the unconverted second layer at said predetermined active region providing an upper electrode for said tunnel junction, the barrier layer underlying said upper electrode providing a tunnelling barrier for said tunnel junction and the unconverted first layer underlying said tunnelling barrier providing a lower electrode for said tunnel junction,

electrical contact to said lower electrode being effected through the unconverted first layer laterally adjacent said predetermined active region.

4,421,786

# CHEMICAL VAPOR DEPOSITION REACTOR FOR SILICON EPITAXIAL PROCESSES

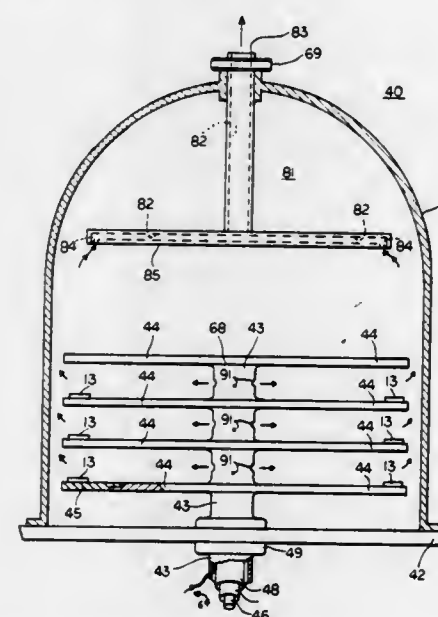
Roop L. Mahajan, Lawrenceville, and Joseph R. Ristorelli, Jr., Belle Mead, both of N.J., assignors to Western Electric Co., New York, N.Y.

Division of Ser. No. 227,873, Jan. 23, 1981, abandoned. This application Jun. 1, 1982, Ser. No. 383,881

Int. Cl.<sup>3</sup> H01L 21/02

U.S. Cl. 427—82

2 Claims



1. A method of depositing a thin film of a material on a plurality of semiconductor wafers, comprising the steps of:
- placing the wafers on resistance heated portions on each of a plurality of vertically spaced, parallel, planar wafer holders, said heated portions being vertically aligned and the holders having a centrally disposed, perforated, tube passing therethrough;
  - directing a gaseous reactant material through the perforated tube, radially outward, between the wafer holders;
  - maintaining an individually controlled, forced convective flow of the gaseous reactants across each holder and the wafers thereon; and
  - activating the resistance heated portions to conductively and radiatively heat the wafers on each holder to deposit a thin film of reactant material thereon.

4,421,787

# PROCESS FOR FORMING A THIN DENSE SINTERED LAYER

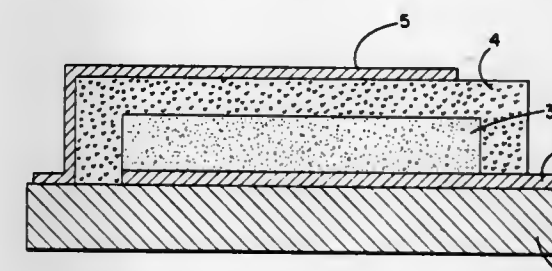
Kenji Ikezawa, Yokohama; Hiroshi Takao, Kamakura; Hiroyuki Aoki, Noba, and Shinji Kimura, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 58,428, Jul. 19, 1979, abandoned. This application May 14, 1981, Ser. No. 263,558

Claims priority, application Japan, Jul. 24, 1978, 53-089322  
Int. Cl.<sup>3</sup> B05D 5/12

U.S. Cl. 427—126.2

8 Claims



1. A process for forming a thin dense oxygen ion conductive solid electrolyte layer from a solid electrolyte paste of oxygen ion conductive solid electrolyte powder in an organic vehicle, said process comprising the steps, in the following order, of:
- applying a solid electrolyte paste of Y<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub> onto a substrate by a screen printing technique, and sintering said applied paste under sintering conditions; and
  - repeating at least one more time the above procedure of applying a paste of the same material as the initially applied paste onto said substrate provided with the sintered paste, and sintering the repeated application of paste under sintering conditions;
- the sintering of the final application of paste being effected at a temperature of about 1420 degrees C., and the sintering of each application of paste prior to the final application of paste being effected at a temperature of 0.4 to 0.8 times the temperature used to sinter the final application of paste.

4,421,788

# METHOD AND APPARATUS FOR COATING A SUBSTRATE WITH FOAMED PLASTIC

Fritz Kramer, Newport Beach, Calif., assignor to Sanifom, Inc., Costa Mesa, Calif.

Filed Feb. 22, 1982, Ser. No. 351,027

Int. Cl.<sup>3</sup> B05D 1/02

U.S. Cl. 427—136

4 Claims



1. A method of sealing a surface of a landfill with a layer of hardened plastic foam comprising the steps of:
- forming a hardenable plastic foam under a gas pressure;
  - expelling said hardenable plastic foam through a slit toward said surface;
  - forming said slit and producing a value of said gas pressure effective to break up said hardenable plastic foam expelled through said slit into a high-speed spray of discrete particles of foam which impact on and adhere to said surface; and
  - permitting said hardenable plastic foam to harden on said surface.

4,421,789

# PROCESS FOR TREATING THE SURFACES OF ALUMINUM HEAT EXCHANGERS

Hideaki Kaneko, Tokyo, and Kazuhisa Naito, Chiba, both of Japan, assignors to Occidental Chemical Corporation, Warren, Mich.

Filed Jun. 28, 1982, Ser. No. 393,000  
Claims priority, application Japan, Jun. 30, 1981, 56-101703

Int. Cl.<sup>3</sup> B05D 5/04

U.S. Cl. 427—204

8 Claims

1. A method for the treatment of aluminum surfaces to provide thereon a corrosion resistant, hydrophilic coating which comprises forming on said aluminum surface a corrosion-resistant film having a thickness which is not in excess of about 10 microns and, thereafter, applying to said corrosion resistant film a top coating of fine silica particles, having a size within the range of about 1-100 millimicrons, the amount of said silica particles applied being at least sufficient to impart the desired degree of water wettability to the surface.

4,421,790

# METHOD FOR COATING THE INNER SURFACE OF LONG TUBES OF SMALL DIAMETER

Koji Nagata; Mamoru Nishikawa, and Shiro Sato, all of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

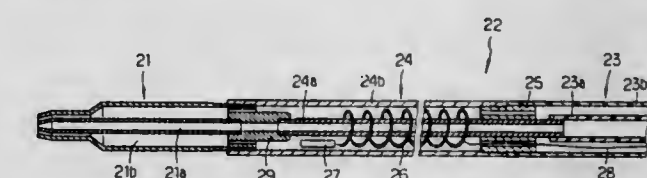
Division of Ser. No. 228,682, Jan. 26, 1981, Pat. No. 4,370,944.  
This application Sep. 22, 1982, Ser. No. 421,343

Claims priority, application Japan, May 14, 1980, 55-63681

Int. Cl.<sup>3</sup> B05D 7/22, 1/02

U.S. Cl. 427—236

3 Claims



1. A method for coating the inner surface of a long tube of small diameter by a spray coating, wherein a spray nozzle for spraying a paint is shifted from one end opening of the long tube to the other end opening thereof comprising:
- inserting a supplying hose, longer than said long tube, provided with said spray nozzle attached to the tip of said supplying hose and respective passages for flowing the paint and flowing compressed air to said nozzle, into said long tube; and
  - heating said paint and said compressed air up to a predetermined temperature within said respective passage for spraying the heated paint from said nozzle by the action of the similarly heated compressed air.

4,421,791

# SIDE RELEASE AGENT FOR COAL CARS

George T. Kekish, Naperville, and Carol B. Batton, Bartlett, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

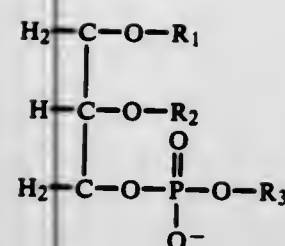
Filed Nov. 25, 1981, Ser. No. 324,767  
Int. Cl.<sup>3</sup> B05D 7/22; C09K 3/18, 5/00; C08L 91/00

U.S. Cl. 427—239

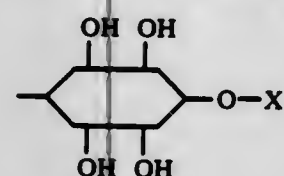
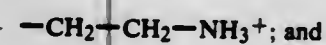
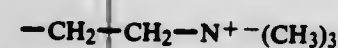
6 Claims

1. The method of reducing the freeze-adherence of coarse mineral particles to the metal surfaces of shipping containers, which method comprises the steps of applying to said surfaces a coating mixture of a naturally occurring phospholipid substance dispersed in a hydrocarbon liquid, in which the principal phospholipids have the structural formula:





wherein  $\text{R}_1$  and  $\text{R}_2$  are fatty acyl radicals containing from 8 to 18 carbon atoms and wherein  $\text{R}_3$  is selected from:



wherein X is one or more phosphate groups linked to one or more sugar molecules and subsequently adding coarse mineral particles to the container.

4,421,792

## ADDITIVES FOR CLOTHES DRYERS

Jerome Rudy, Livingston, N.J., and Anthony A. Rapisarda, Elmhurst, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 161,639, Jun. 20, 1980, Pat. No. 4,327,133, which is a division of Ser. No. 853,663, Nov. 21, 1977, Pat. No. 4,238,531, which is a continuation of Ser. No. 589,993, Jun. 24, 1975, abandoned, which is a continuation of Ser. No. 376,586, Jul. 5, 1973, abandoned, which is a division of Ser. No. 158,090, Jun. 29, 1971, abandoned, which is a continuation of Ser. No. 821,476, May 2, 1969, abandoned. This application Mar. 10, 1982, Ser. No. 356,706

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> B05D 3/12

U.S. Cl. 427-242

12 Claims

1. An article of manufacture for softening fabric by contacting damp fabric in a hot air tumbler fabric dryer in the drying cycle with said article, said article comprising:

(a) a composition which comprises:

- (i) a fabric softening agent; and
- (ii) at least 5 percent by weight of a distributing agent for said fabric softening agent wherein said distributing agent is meltable, sublimeable, soluble, softenable, or otherwise spreadable at the temperatures encountered in said fabric dryer; and

(b) a backing strip or sheet carrying said composition.

7. A method for applying a fabric softening agent to damp fabric in a hot air tumbler fabric dryer comprising adding to said fabric in the drying cycle an article of manufacture comprising:

(a) a composition which comprises:

- (i) a fabric softening agent; and
- (ii) at least 5 percent by weight of a distributing agent for said fabric softening agent wherein said distributing agent is meltable, sublimeable, soluble, softenable, or otherwise spreadable at the temperatures encountered in said fabric dryer; and

(b) a backing strip or sheet carrying said composition.

4,421,793  
SELECTIVE GALVANIZING PROCESS USING A  
CALCIUM CARBONATE MASKING COMPOSITION  
Ernest Moroni, Bresso, Italy, assignor to Hodigal s.a.s. di  
Luciano Moroni, Milan, Italy

Division of Ser. No. 169,602, Jul. 17, 1980, abandoned. This application May 6, 1982, Ser. No. 375,464

Claims priority, application Italy, Jul. 24, 1979, 24600 A/79; Dec. 21, 1979, 28352 A/79

Int. Cl.<sup>3</sup> B05D 1/32

U.S. Cl. 427-272

13 Claims

1. A process for selectively galvanizing a material adapted to be galvanized by immersion in a hot zinc melt, said process comprising:

- (A) applying to said material, prior to said galvanizing, in the areas which are to be masked from said galvanizing action a composition consisting essentially of:
- (B) about 60% to 99.9% by weight calcium carbonate and about 40% to 0.1% by weight of a chlorine containing compound.

4,421,794

SOLVENT REMOVAL VIA CONTINUOUSLY  
SUPERHEATED HEAT TRANSFER MEDIUM

Homan B. Kinsley, Jr., Powhatan, Va., assignor to James River Corporation, Richmond, Va.

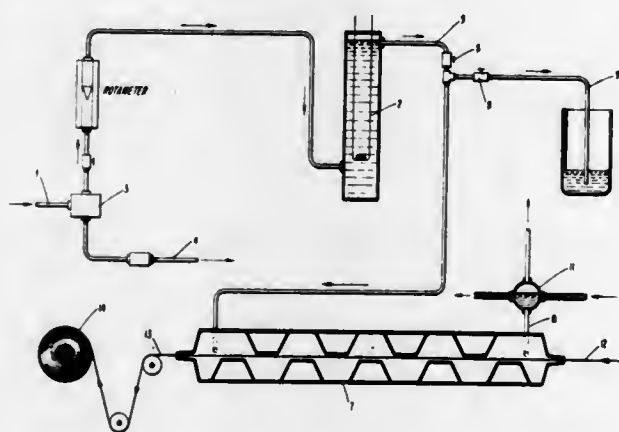
Continuation of Ser. No. 155,118, May 30, 1980, abandoned.

This application Dec. 18, 1981, Ser. No. 332,212

Int. Cl.<sup>3</sup> B05D 3/04

U.S. Cl. 427-377

22 Claims



1. A process for the removal of a non-aqueous liquid from a high bulk, low density, porous cellulosic substrate having a void volume of from about 60 to 90 percent which is essentially completely impregnated with said non-aqueous liquid, comprising contacting such substrate with an effective amount of a condensable, vaporous heat transfer medium which is in a superheated state, and maintaining said substrate in contact with said superheated transfer medium, while also maintaining said heat transfer medium in superheated state, for a period of time sufficient to effect removal of substantially all said non-aqueous liquid from said substrate without concomitant condensation of said superheated heat transfer medium thereon.

4,421,795

METHOD OF APPLYING A COATING OF  
POLYARYLENE SULPHIDE TO A COOKING UTENSIL  
Glyndwr J. Davies, Southall, England, assignor to The Glacier  
Metal Company Limited, Wembley, England

PCT No. PCT/GB81/00126, § 371 Date Mar. 3, 1982, § 102(e)

Date Mar. 3, 1982, PCT Pub. No. WO82/00087, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 2, 1981, Ser. No. 359,660

Claims priority, application United Kingdom, Jul. 4, 1980, 8022068

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427-385.5

8 Claims

1. A method of applying a coating of polyarylene sulphide to a cooking utensil which comprises:

- applying a mixture of polyarylene sulphide and an aryl ester of an aryl alcohol to the surface of a backing for forming a cooking utensil; and
- subsequently heating said mixture to evaporate said ester and to cure said coating.

4,421,796

## TREATING TEXTILE FIBRES

Peter M. Burril, Cowbridge, and Stephen Westall, Barry, both of Wales, assignors to Dow Corning Limited, Barry, Wales

Filed Sep. 24, 1982, Ser. No. 422,763

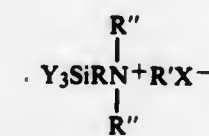
Claims priority, application United Kingdom, Oct. 3, 1981, 8129913

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427-387

6 Claims

1. A process for the treatment of fibres which comprises contacting the said fibres with both (A) an organosilane of the general formula



wherein each Y represents a monovalent group having less than 6 carbon atoms selected from hydrocarbon groups, alkoxy groups and alkoxyalkoxy groups, at least one Y being alkoxy or alkoxyalkoxy, R represents a divalent group having from 3 to 10 carbon atoms, the said group being composed of carbon, hydrogen and, optionally, oxygen present in the form of ether linkages, hydroxyl groups or both, R' represents a group selected from monovalent hydrocarbon groups having from 1 to 15 carbon atoms and groups of the general formula  $(-\text{OQ})_n\text{OZ}$ , wherein Q represents an alkylene group having 2 or 3 carbon atoms, a has a value from 1 to 20 and Z represents a hydrogen atom, an alkyl group or an acyl group, each R'' represents a methyl group or an ethyl group and X represents a halogen atom, and (B) one or more organosiloxanes.

5. A process as claimed in claim 1 wherein (A) and (B) are applied to the fibres as a mixture.

6. A process as claimed in claim 5 wherein the treated fibres are heated to a temperature of from 100° C. to 200° C.

4,421,797

METHOD AND DEVICE FOR THE DRY-SPRAY  
APPLICATION OF CONCRETE TO A SUBSTRATE

Rainer Koehne, Mülheim-Speldorf, Fed. Rep. of Germany, assignor to Pressbau GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 15, 1981, Ser. No. 302,449

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034851

Int. Cl.<sup>3</sup> B05D 1/02

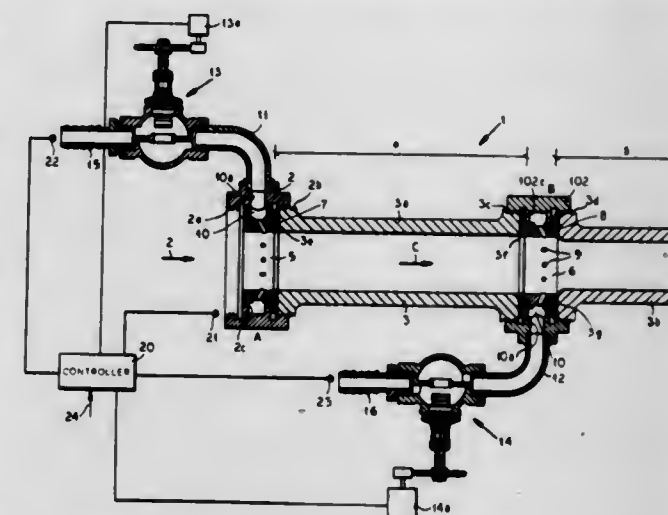
U.S. Cl. 427-403

8 Claims

1. A method of placing a synthetic-resin-containing dry spray concrete having a synthetic resin and cement as binders, said method comprising the steps of:

- (a) feeding, by compressed air through a first inlet into a

- mixing body having a discharge nozzle at an end thereof, a dry mix of hydraulic cement and aggregate;
- (b) feeding through a second nozzle and separately from said dry mix into said body a mixture of an epoxy resin and water;
- (c) introducing a hardener for said epoxy resin into said body whereby said dry mix, said mixture of epoxy resin and



water and said hardener are mixed intimately in said body to form a concrete mix;

- (d) discharging said concrete mix through said nozzle upon a substrate to deposit a concrete layer thereon; and
- (e) varying the proportions of resin and hydraulic cement in said mix reciprocally while maintaining substantially constant the total volume formed by the resin and the hydraulic cement.

4,421,798

APPARATUS FOR COATING RECORDED DISCS WITH A  
LUBRICANT

Peter T. Lin, E. Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

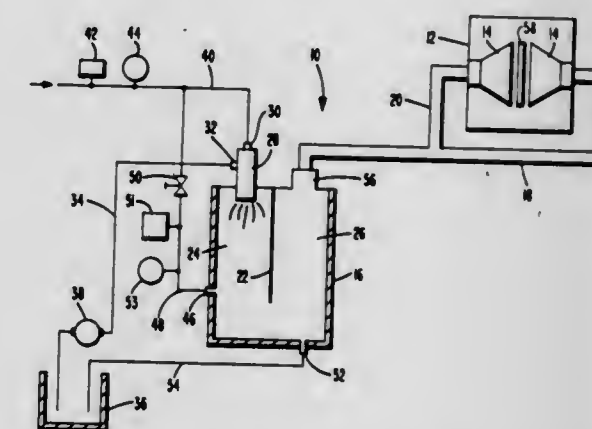
Continuation of Ser. No. 319,920, Nov. 10, 1981, abandoned.

This application Dec. 6, 1982, Ser. No. 447,139

Int. Cl.<sup>3</sup> B05D 1/02

U.S. Cl. 427-421

5 Claims



1. A method for coating a disc with a thin film of a lubricant comprising the steps of:

- generating droplets of the lubricant at the top of one section of a chamber which is divided into two sections, which sections are connected together along the bottom of the chamber,
- admitting air under pressure into said one section of the chamber above the connection between the two sections of the chamber to carry said lubricant droplets into the other section of the chamber and to carry at least some of the droplets upwardly through the other section to an outlet at the top of the other section, controlling the flow of the air into the one section so as to control the size of



the lubricant droplets carried upwardly through the other section, and directing the air-carried lubricant droplets flowing from the outlet onto the surface of a disc to be coated.

**4,421,799**  
**ALUMINUM CLAD REFRACTORY OXIDE FLAME SPRAYING POWDER**

Edward R. Novinski, Mineola, N.Y., assignor to Metco, Inc., Westbury, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,290  
Int. Cl.<sup>3</sup> B05D 1/08

U.S. Cl. 427—423

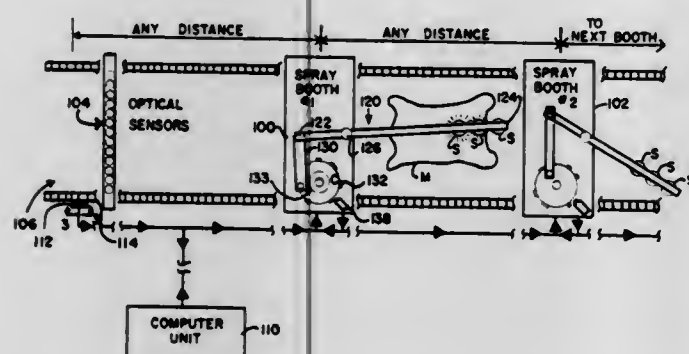
9 Claims  
8. A process for producing an abradable coating comprising: flame spraying flame spray powder particles comprising a core comprising a member selected from the group consisting of zirconium oxide, magnesium oxide, hafnium oxide, cerium oxide, yttrium oxide and combinations thereof, wherein a coating of aluminum is bonded to the surface of said core.

**4,421,800**  
**SPRAYING APPARATUS**

Steve Schoenberg, Clifton Park, and David G. Ellis, Ballston Lake, both of N.Y., assignors to Digitronics Inventioning Corp., Clifton Park, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,106  
Int. Cl.<sup>3</sup> B05D 1/02; B05B 1/16, 12/00

U.S. Cl. 427—424



27. A method for spraying at least one finishing substance onto a material carried on a conveyor along which at least one spray booth is positioned, each spray booth having at least one sprayer device associated therewith, each sprayer device being movable in cyclical fashion relative to the conveyor and having a valve for selectively permitting or inhibiting the dispensing of a substance therefrom, the method comprising:

- positioning sensors across the conveyor and before the first spray booth along the conveyor;
- detecting when material passes before each such sensor;
- detecting the respective position of each sprayer device;
- measuring the movement of the conveyor; and
- executing a spray control operation comprising the steps of:
  - (a) determining the speed of the conveyor based on the conveyor movement measurements;
  - (b) determining the location and size of material on the conveyor based on the detection of material by the sensors;
  - (c) updating the position of each sprayer device; and
  - (d) determining which, if any, sprayer device is not properly positioned for spraying a substance onto material on the conveyor; and
- maintaining each valve in a normally open state; and wherein the operation executing step further comprises the step of:
- (e) generating a valve close signal to a valve when the corresponding sprayer device is determined to be not properly positioned for spraying.

**4,421,801**  
**DECORATION STAND IN THE FORM OF A CHRISTMAS TREE**

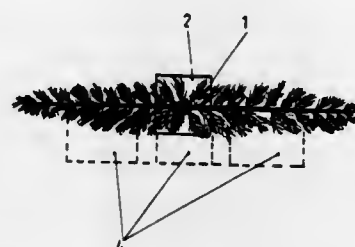
Harald Wahlfahrt, Herrngasse 2, 8803 Rothenburg ob der Tauber, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,119  
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 8209353[U]

U.S. Cl. 428—19

Int. Cl.<sup>3</sup> A47G 33/06

4 Claims



1. A decoration stand in the approximate form of a Christmas tree comprising a base, an upright middle support mounted at its lower end portion to said base, a plurality of branches with needles extending therefrom, each of said branches mounted at one of its end portions to said middle support and extending laterally from said middle support, with some branches extending on one side of said middle support and with other branches extending on the other side of said middle support, said branches and said middle support all positioned in a common upright plane to form an outline of a Christmas tree, a plurality of article display members extending out of a common plane of the branches and middle support for exhibiting articles adjacent the outline of the Christmas tree.

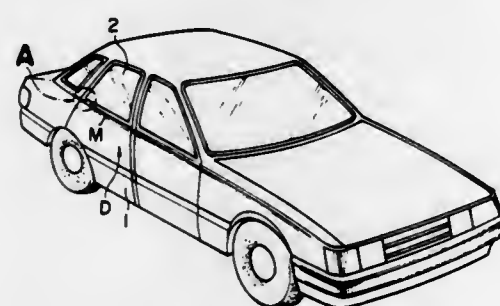
**4,421,802**  
**AUTOMOTIVE DOOR SIDE MOLDING STRUCTURE**  
Toshihiro Mitsuoka, and Shojiro Seki, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 20, 1982, Ser. No. 380,450  
Claims priority, application Japan, May 22, 1981, 56-73237[U]

U.S. Cl. 428—31

Int. Cl.<sup>3</sup> B60R 13/04

9 Claims



1. An automotive door side molding structure, comprising: a molding body including a metallic molding base member provided along the waistline of a door panel, and a molding lip member of a resilient material secured along the length of said molding base member and adapted to be disposed in resilient contact with a door windowpane in a door sash; said molding body being formed with a recessed portion at each of the front and rear end portions of said metallic molding base member thereof, each said recessed portion having a horizontal edge and vertical edge; and end caps adapted to be fitted over said front and rear portions of said molding base member for covering said re-

cessed portions respectively, each of said end caps being provided with a protuberance protruding therefrom toward said door windowpane to cover at least partially the vertical edge of each said recessed portion, thereby keeping the vertical edge of each said recessed portion from direct contact with said door sash.

**4,421,803**  
**GLASS ENVELOPE FOR ELECTRIC LIGHT SOURCES**

Andras Czeiler, Istvan Kallai, and Laszlo Simenfalvi, all of Budapest, Hungary, assignors to Egyesült Izzolampa és Világoságy Rt., Budapest, Hungary

Filed Dec. 11, 1979, Ser. No. 102,360  
Claims priority, application Hungary, Dec. 12, 1978, EE 2610

U.S. Cl. 428—35

7 Claims

1. A glass envelope for electric light sources comprising: an outer glass body; a glass matrix adhering to the inner surface of the glass body and comprising pigment grains fully embedded into the glass matrix, said glass matrix being a cured glass forming precursor.

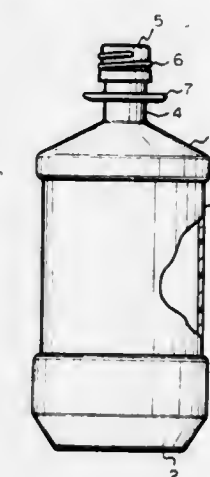
**4,421,804**  
**BOTTLE FOR CARBONATED DRINK**

Fumio Mori, Yokohama; Junichi Itsubo; Hiroyuki Oda, both of Hiratsuka, and Gunji Matsuda, Isehara, all of Japan, assignors to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,412  
Int. Cl.<sup>3</sup> B65D 23/00

U.S. Cl. 428—35

12 Claims



1. A bottle for a carbonated drink, which is formed by biaxial draw-blow molding of a polyester containing a surface active agent and being composed mainly of ethylene terephthalate units, wherein at least the barrel wall portion of the bottle is molecularly oriented biaxially so that the density is from 1.34 to 1.40 g/cm<sup>3</sup> as measured at 20° C., and the surface active agent is distributed in the surface of the barrel wall portion so that the contact angle of the surface of the barrel wall portion to water is not larger than 76°, the surface active agent being incorporated in an amount of at least 10 ppm based on the polyester.

**4,421,805**  
**SLIP-RESISTANT SHIPPING SACKS**

Randolph D. Prader, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1982, Ser. No. 372,873  
Int. Cl.<sup>3</sup> B32B 5/12; B65D 33/02

U.S. Cl. 428—35

10 Claims

1. A product sack comprising an envelope of plastic film having at least one surface thereof at least partially coated with a thin layer of a slip-resistant thermoplastic polyamide resin.

**4,421,806**  
**LOW DENSITY RESIN SYSTEMS FOR IMPROVED FILAMENT-WOUND COMPOSITES USEFUL AS ROCKET MOTOR CASES**

Burton S. Marks, Palo Alto; Richard E. Mauri, Mt. View, and Gazel W. Watsey, Livermore, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Aug. 13, 1981, Ser. No. 292,648  
Int. Cl.<sup>3</sup> B32B 1/08; B64G 1/20; F02K 9/00

U.S. Cl. 428—36

49 Claims

1. A cured filament-wound composite comprising fibers and resin, said resin characterized when cured by a density of less than 1.05 g/cc, and by a saturation water pick-up of less than 1% by weight, and when uncured by comprising an aromatic vinyl hydrocarbon monomer and as its major component poly(1,2-butadiene), carboxy-terminated poly(1,2-butadiene) or mixtures thereof and by having a viscosity at 45° C. of less than 2000 cps.

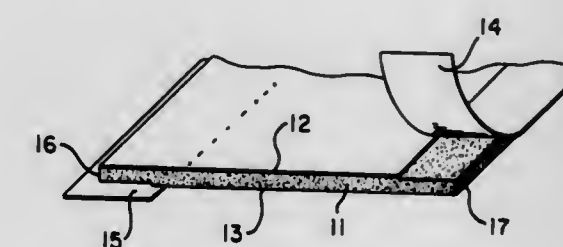
**4,421,807**  
**SHEET-LIKE SEALING WEB**

Rüdiger Clausing, Neckargemünd, and Werner Schunter, Lobfeld, both of Fed. Rep. of Germany, assignors to Teroson GmbH, Heidelberg, Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 351,791  
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 8105299[U]; Jul. 14, 1981, 8120644[U]  
Int. Cl.<sup>3</sup> B32B 3/06

U.S. Cl. 428—41

9 Claims



1. A sheet-like sealing web for use in construction above and under ground comprising a layer of resilient elastic pressure sensitive adhesive and sealing composition having upper and lower surfaces disposed between respective upper and lower flexible layers covering a major portion of the area of said upper and lower surfaces with the longitudinal edges of said upper and lower surfaces being exposed, thereby forming first and second exposed sealing strips at opposite longitudinal edges of said upper and lower surfaces for overlap bonding of said web to adjacent identical webs and first and second fixation strips at the longitudinal edges of said upper and lower surfaces opposite said sealing strips for securing the web to a substrate or for bonding a cover material to the sealing web, said fixation strips being narrower than either of said sealing strips.

**4,421,808**  
**WOOD PLANK WALLCOVERING SYSTEM**

Daniel A. Winkowski, Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Continuation-in-part of Ser. No. 327,242, Dec. 3, 1981. This application Apr. 6, 1982, Ser. No. 365,991  
Int. Cl.<sup>3</sup> B32B 3/14, 3/16

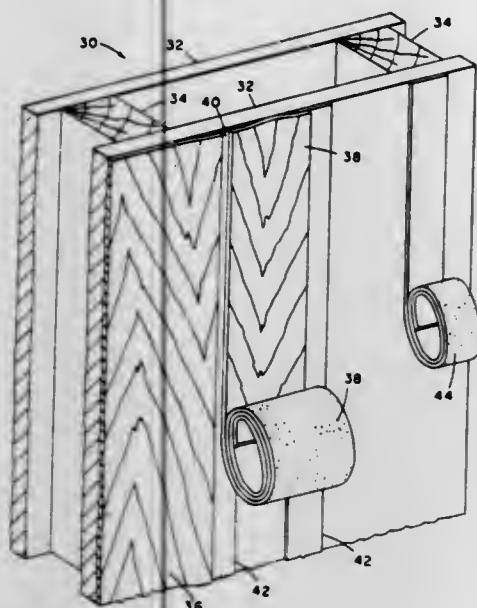
U.S. Cl. 428—55

8 Claims

1. A wallcovering combination for covering a single wall comprising a plurality of strips of wallcovering all having widths in the range of from about 3 inches to about 8 inches and all having a common decorative pattern, a pressure-sensitive adhesive on the back surface of said strips for adhering the strips to a wall in parallel spaced relationship one to another



and, as separate elements, a plurality of narrow tapes of from about  $\frac{1}{4}$  inch to about 1 inch and of contrasting appearance,



having a pressure-sensitive adhesive on the back surface of said tapes for adhering said tapes in the spaces between said wall-covering strips.

4,421,809

#### FLOOR MAT WITH FLOCK FIBERS ADHESIVELY BONDED ONTO A THIN POLYMERIC FILM

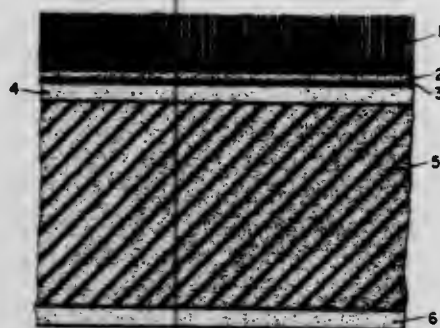
Steven S. Bish, Reading; Paul J. Sagel, Cincinnati, and Toan Trinh, Maineville, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 20, 1982, Ser. No. 420,426

Int. Cl.<sup>3</sup> B05D 1/14

U.S. Cl. 428—90

11 Claims



1. A floor mat comprising a thin, flexible polymeric film primary backing, a flocking adhesive, and assembled flock fibers, the fibers being bonded to the primary backing with the flocking adhesive; wherein the film is a water-impermeable, polymeric film, said film being dimensionally stable under flocking adhesive curing conditions; wherein the flexible polymeric film is selected from the group consisting of polycarbonate, nylon, polyester, polypropylene, and other suitable flexible films, said film having a thickness of at least 0.005 mm, and wherein said adhesive is coated on said film at a thickness of at least 0.1 mm prior to flocking, and wherein the fibers are flocked onto the film at a level of from about 1,000 to about 40,000 fibers/cm<sup>2</sup>; the fibers having lengths of from 0.4 mm to about 10 mm and a denier of from 1.5 to about 80, and wherein the flocking adhesive is cured, and the cured adhesive has a water contact angle of from 0° to 70°.

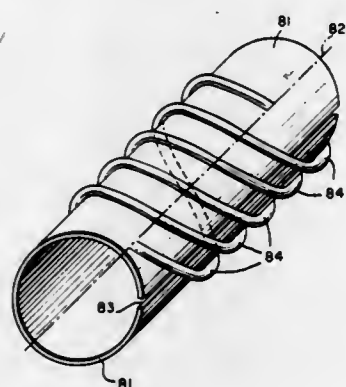
#### 4,421,810 PERFORATED DRAINPIPE AND METHOD OF MAKING SAME

Ole-Bendt Rasmussen, 7, Topstykke, 3460 Birkerød, Denmark Division of Ser. No. 102,561, Dec. 11, 1979, Pat. No. 4,294,638, which is a continuation of Ser. No. 841,481, Oct. 12, 1977, abandoned, which is a continuation of Ser. No. 657,649, Feb. 12, 1976, abandoned. This application Aug. 13, 1980, Ser. No. 177,807

Claims priority, application United Kingdom, Feb. 12, 1975, 5971/75

Int. Cl.<sup>3</sup> E02B 11/00; B32B 29/02; B65H 81/00; B29C 19/00 U.S. Cl. 428—109

4 Claims



1. A drainpipe comprising at least one sheet comprised of polymeric material, such sheet being in generally tubular configuration with at least one gap extending generally lengthwise therealong and defined by adjacent sheet edges slightly spaced apart from one another, and wound helically around the exterior periphery of said tubular sheet configuration and bridging said gap at least one ribbon comprised of polymeric material, such ribbon being bonded to the sheet configuration and serving to reinforce and shape the same.

3. A method of making a drainpipe which comprises forming an elongated sheet comprised of polymeric material into a tubular configuration with a gap extending generally lengthwise therealong defined by slightly spaced apart adjacent sheet edges, and applying helically around the exterior periphery of the thus-formed sheet and bridging said gap at least one ribbon comprised of polymeric material and bonded to the sheet surface to reinforce and shape the same.

4,421,811

#### METHOD OF MANUFACTURING DOUBLE LAYER ATTENUATION PANEL WITH TWO LAYERS OF LINEAR TYPE MATERIAL

Philip M. Rose, Chula Vista, and Frank J. Riel, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Dec. 21, 1979, Ser. No. 106,146

The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B32B 3/12; E04B 1/82

U.S. Cl. 428—116

6 Claims

1. A method of manufacturing adhesively bonded acoustic attenuation structure, the structural components comprising first and second honeycomb cores with a multiplicity of endwise directed cells, an impermeate facing sheet, a first, second and third perforated sheets, the third perforated sheet having perforations of a larger cross-section than the first and second perforated sheets, a first and second thin sheet of porous fibrous material, said method comprising the steps of:

- (a) cleaning the components to be assembled into said acoustical attenuation structure;
- (b) applying a solvent base first adhesive covering to one surface of each of said first and second perforated sheets for bonding thereto one of said first and second thin sheets of porous fibrous material;

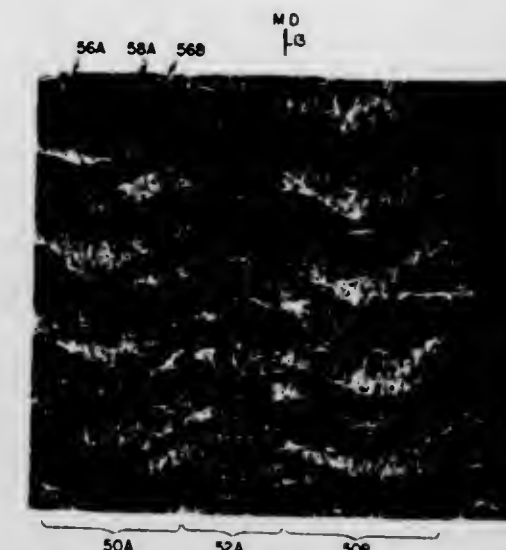
- (c) removing the solvent from said solvent base first adhesive;
- (d) stacking said first perforated sheet with said first thin sheet of porous fibrous material and said second perforated sheet with said second thin sheet of porous fibrous material, applying a positive pressure between the components of each stack and curing said first adhesive;
- (e) applying a covering of a maskant material to the perforation exposed surface of the now combined perforate sheets and thin sheets of porous fibrous material;
- (f) applying an anti-wetting solution to the fibers of the thin sheets of porous fibrous material and the adjacent attached surface of maskant material covered perforated sheets;
- (g) removing the covering of maskant of step (e);
- (h) applying a layer of a second adhesive on one surface of the impermeate sheet, the perforated surfaces of the com-



bined first and second perforated sheets and porous fibrous material and both surfaces of the third perforated sheet; and

- (i) stacking the first honeycomb core adjacent the adhesive applied surface of the impermeate sheet, the perforated sheet and first porous fibrous material adjacent the remaining open surface of the first honeycomb core, the third perforated sheet adjacent the porous fibrous surface of the combined first perforated sheet and first porous fibrous material, the second honeycomb core adjacent the third perforated sheet and the perforated surface of the combined second perforated sheet and second porous fibrous material adjacent the remaining open surface of the second honeycomb core, applying a positive pressure between the outer components toward the center and curing the second adhesive.

the creped web having bonds extending through portions of the web, creping folds in the cross machine direction, and



having ridges consisting predominately of unbonded fibers and extending in the machine direction of the web.

4,421,813

#### COVERSTOCK FABRICS

Graham Athey, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

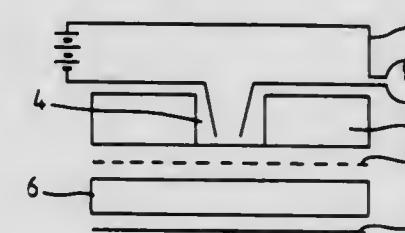
Filed Jun. 15, 1981, Ser. No. 273,687

Claims priority, application United Kingdom, Jul. 10, 1980, 8022562

Int. Cl.<sup>3</sup> B32B 3/00

U.S. Cl. 428—195

6 Claims



1. A coverstock fabric comprising an area-bonded non-woven fabric containing a plurality of homofilament staple fibres comprising polyethylene terephthalate and a plurality of heterofilament staple fibres comprising a core of polyethylene terephthalate and a sheath of polyethylene isophthalate/polyethylene terephthalate copolymer, the fabric having a soakthrough less than 3.5 seconds, a re-wet moisture less than 0.2 grams and a K factor less than 0.6.

4,421,814

#### STRIPPABLE RESISTS

John R. Piazza, Hopewell, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Continuation of Ser. No. 178,321, Aug. 15, 1980, abandoned, which is a division of Ser. No. 29,951, Apr. 13, 1979, Pat. No. 4,254,163. This application Mar. 29, 1982, Ser. No. 362,949

Int. Cl.<sup>3</sup> C23F 1/02

U.S. Cl. 428—195

2 Claims

1. A thermographic printed strippable resist comprises a hydrophobic combination of a solvent-free, tacky, non-dryable low molecular weight liquid resin ink fused with a compatible powdered resin wherein said ink is a primary plasticizer for said powdered resin and both said ink and said powdered resin are polyester polymers, and wherein said resist forms a raised pattern on a substrate and is resistant to attack by metal etching and plating solutions and to scratching.

4,421,812

#### METHOD OF MAKING A BONDED CORRUGATED NONWOVEN FABRIC AND PRODUCT MADE THEREBY

Derek Plant, Runnemede, N.J., assignor to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 260,507, May 4, 1981. This application Jul. 6, 1982, Ser. No. 395,741

Int. Cl.<sup>3</sup> B32B 3/26, 33/00

U.S. Cl. 428—152

18 Claims

1. A corrugated, nonwoven, creped web consisting primarily of thermoplastic fibers, said creped web having been compacted in a machine direction of the web by at least about 30%,



4,421,815

**FIBROUS COMPOSITE MATERIALS AND THE PRODUCTION AND USE THEREOF**

Peter J. Briggs, Cheadle Hume, and Kevin McAloon, Appleton Thorn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 7, 1981, Ser. No. 281,106

Claims priority, application United Kingdom, Jul. 11, 1980, 8022713

Int. Cl.<sup>3</sup> B32B 27/14, 7/02; D21D 3/00

U.S. Cl. 428—198

17 Claims

1. A fibrous composite material in the form of a three-dimensional block comprising a nonwoven mass of combustible fibers and vermiculite lamellae obtained by chemical delamination of vermiculite and having a thickness of less than 0.5 micron, the fibers comprising at least 15% by weight of the block and being bonded together by the vermiculite at their points of contact.

4,421,818

**ARTICULATED FABRIC FORMED BY SELF-ASSEMBLING FIBERS**

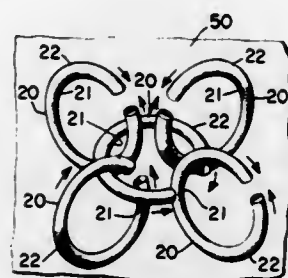
Edward F. Leonard, Bronxville, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 12, 1982, Ser. No. 367,203

Int. Cl.<sup>3</sup> B32B 17/04; D04H 1/58

U.S. Cl. 428—222

7 Claims



1. A patterned, nonwoven, articulated fabric exhibiting a substantially uniform texture and comprised of a multiplicity of synthetic fiber elements cut to predetermined lengths, the opposing free ends of each of said synthetic fiber elements being permanently joined to one another in a direct abutting relationship to form substantially continuous loops of predetermined diameter, said loops being interlocked with one another in a predetermined pattern, yet remaining free to articulate with respect to one another.

4,421,816

**DRY TRANSFER DECAL AND METHOD OF MANUFACTURE**

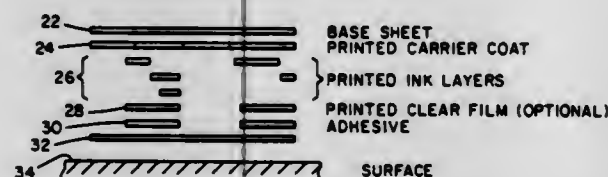
Raymond M. Arnold, Chicago, Ill., assignor to Advanced Graphic Technology, Chicago, Ill.

Filed Nov. 18, 1981, Ser. No. 322,596

Int. Cl.<sup>3</sup> B32B 3/18; B41M 3/12

U.S. Cl. 428—202

12 Claims



1. A pressure sensitive, dry transfer decal comprising, in combination:  
a base sheet;  
a printed carrier coat of cross linked polymeric material on the base sheet having an extent of coverage on the base sheet of a complete image on the base sheet, said carrier coat being releasable from the base sheet;  
at least one layer of printed ink on the carrier coat defining at least a portion of the image;  
a second coat of cross linked polymeric material over the printed ink layer; and  
a pressure sensitive adhesive layer over said second coat and carrier coat and substantially coextensive with the carrier coat for pressure application of the decal to a surface.

4,421,817

**METHOD FOR MAKING PRINTABLE SELF-ADHESIVE TAPES AND THE SELF-ADHESIVE TAPES OBTAINED THEREBY**

Felice Pina, Via Poliziano, 12, Milano, and Graziano Galli, Via Vitruvio, 31, Formia (Latina), both of Italy

Filed Jan. 25, 1982, Ser. No. 342,598

Int. Cl.<sup>3</sup> B32B 3/00; B05D 1/00; C09J 7/02

U.S. Cl. 428—207

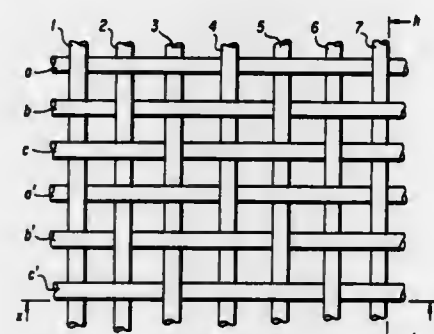
7 Claims

1. A self-adhesive printed tape consisting of a film of polypropylene, an adhesive layer applied to one surface of said film and an antiadhesive lacquer applied on the other surface of said film, said antiadhesive layer being in the amount of 0.5–1.5 g/m<sup>2</sup> of said tape and being one member selected from the group consisting of acrylic and methacrylic resins, polyurethane resins, polyamide copolymers, and being printed on.

1. A heat set paper making fabric woven of machine direction and cross-machine direction thermoplastic polymer yarns, wherein at least a portion of its wear resisting surface is composed of cross-linked high density high molecular weight polyethylene.

4. A monofilament for use in a paper making fabric said monofilament being composed of cross-linked high density high molecular weight polyethylene.

5. A monofilament for use in a paper making fabric, said monofilament being composed of a core material having desirable mechanical properties, said core being coated with cross-linked high density high molecular weight polyethylene.



4,421,819

**WEAR RESISTANT PAPER MACHINE FABRIC**

Samuel M. Baker, Carleton Pl., Canada, assignor to JWI Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 351,492, Feb. 23, 1982, abandoned. This application Sep. 30, 1982, Ser. No. 430,698

Int. Cl.<sup>3</sup> B01D 39/08; D03D 15/00, 15/12; D21F 7/08

U.S. Cl. 428—229

5 Claims

4,421,820

**ELASTOMER-MODIFIED PHOSPHORUS-CONTAINING IMIDE RESINS**

Indra K. Varma, New Delhi, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 15, 1982, Ser. No. 441,899

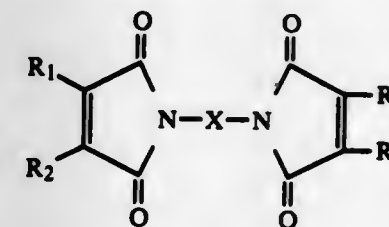
Int. Cl.<sup>3</sup> C08K 3/04, 3/40; B32B 7/00; D03D 3/00

U.S. Cl. 428—246

9 Claims

1. A thermosetting phosphorus-containing imide resin comprising the reaction product of

(1) a phosphine oxide moiety containing N,N'-bisimide of an unsaturated dicarboxylic acid of the formula (I)



(I)

wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, which may be the same or different, each represents a hydrogen atom, a lower alkyl group or a halogen atom, and X is a divalent aromatic group containing a phosphine oxide moiety;

with  
(2) a low molecular weight di(amino group-terminated) elastomer wherein the amount of said elastomer to the weight of said N,N'-bisimide of the formula (I) ranges from about 3% to about 10% by weight.

4,421,821

**CORROSION RESISTANT TIRE RIM**

Hideyuki Matsubara, Takarazuka; Ikutaka Kosugi, Kyoto, and Chiaki Tsukamoto, Ibaragi, all of Japan, assignors to The Toyo Rubber Industry Company, Limited, Osaka, Japan

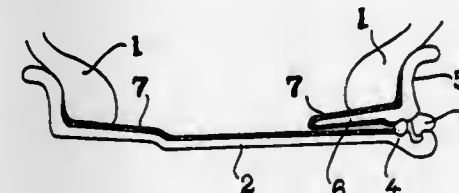
Filed Dec. 21, 1981, Ser. No. 333,183

Claims priority, application Japan, Dec. 25, 1980, 55-186755

Int. Cl.<sup>3</sup> B32B 5/16; B60B 21/00

U.S. Cl. 428—323

8 Claims



1. A tire rim having a 100–1000μ thick coating thereon of a composition containing a resin selected from the group consisting of an unsaturated thermosetting polyester resin and an epoxy resin and 10–100 weight parts of a chemically resistant flake filler having a Tyler mesh size of 30–325 per 100 weight parts of the resin.

4,421,822

**ULTRAVIOLET POLYMERIZATION OF ACRYLATE MONOMERS USING OXIDIZABLE TIN COMPOUNDS**

Dennis L. Levens, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Division of Ser. No. 68,109, Aug. 20, 1979, Pat. No. 4,303,485.

This application Nov. 27, 1981, Ser. No. 325,503

Int. Cl.<sup>3</sup> C09U 7/02

U.S. Cl. 428—343

7 Claims

1. Pressure-sensitive adhesive tape comprising a backing member and a photopolymerized pressure-sensitive adhesive coating of a mixture comprising by weight

(a) 100 parts of a composition which is polymerizable to a

pressure-sensitive adhesive state and consists of 50–100 parts of one or both of acrylate and alkyl methacrylate and 0–50 parts of copolymerizable monoethylenically unsaturated monomer,

(b) oxidizable tin salt dissolved in composition (a) in an amount providing at least 0.01 part of tin, and

(c) addition-polymerization photoinitiator which is activatable by ultraviolet radiation and is dissolved in composition (a) in an amount providing about 0.01–5 parts of the photoinitiator.

4,421,823

**FLEXIBLE WRAPPING MATERIAL AND METHOD OF MANUFACTURE**

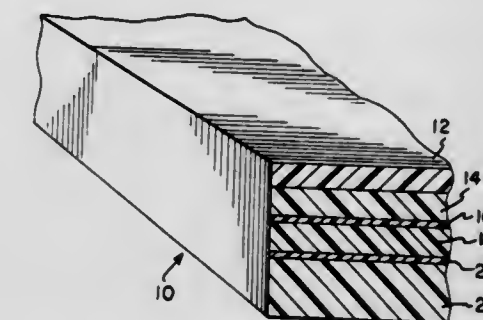
Henry J. Theisen, New London, and Willard H. Gehrke, Appleton, both of Wis., assignors to Curwood, Inc., New London, Wis.

Filed Jun. 1, 1982, Ser. No. 383,754

Int. Cl.<sup>3</sup> B32B 27/06; B29C 19/00; B33B 27/08

U.S. Cl. 428—349

12 Claims



1. A film laminate of flexible, heat-sealable wrapping material, particularly suitable for use in the packaging of products which are to be maintained in hermetically sealed relationship to the atmosphere, comprising a first outer layer of heat-set, biaxially oriented polymeric material bonded on its inner side to a layer of polymeric material which is sandwiched between said outer layer and a layer of oxygen barrier polymer, adapted to provide a barrier against the migration of oxygen through the laminate, a layer of biaxially oriented polypropylene disposed between said layer of oxygen barrier polymer and a layer of special grease-resistant polymer bonding, without the use of a solvent, said layer of biaxially oriented polypropylene to an inner layer of heat-sealable polymeric material having a lower melting point than said outer layer whereby said layer of special grease-resistant polymer is resistant to food oils and greases and is selected from the group consisting of polyethylene, copolymers of vinyl acetate having a vinyl acetate content of approximately 12 percent or less, copolymers of ethylene acrylic acid, ethylene-vinyl acetate terpolymers, and ionomers.

4,421,824

**PROCESS FOR RECONDITIONING OF CURRENCY AND CURRENCY**

Desh B. Gupta, Dayton, and Robert H. Granzow, Miamisburg, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 30, 1981, Ser. No. 325,702

Int. Cl.<sup>3</sup> B32B 3/00

U.S. Cl. 428—211

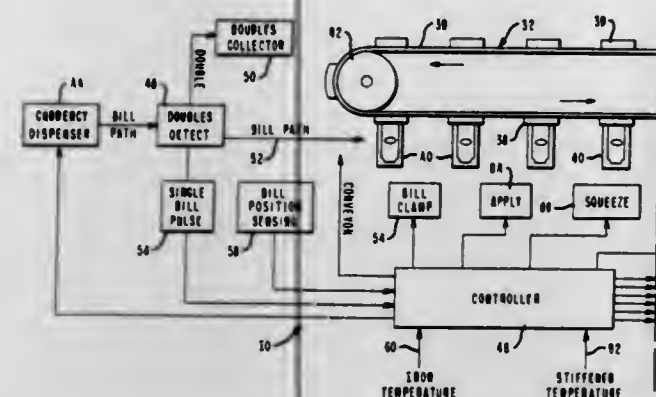
13 Claims

1. A process for reconditioning used paper currency which



has become worn and unsuitable for further use in circulation as a medium of exchange comprising the following steps:

- a. applying a stiffening composition to said currency;



- b. pressing said currency to remove excess stiffening composition therefrom; and  
c. drying said currency.

4,421,825

**PAPERBOARD COATED TO MINIMIZE BROWNING**  
George M. Seiter, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 334,586, Dec. 28, 1981, abandoned.

This application May 2, 1983, Ser. No. 487,711

Int. Cl.<sup>3</sup> B32B 23/00, 23/08

U.S. Cl. 428—332

10 Claims

1. A paperboard product resistant to browning at temperatures of up to about 205° C., said product comprising a paperboard substrate coated on at least one surface thereof with a plurality of distinct coatings including a first coating comprising titanium dioxide and a solution having from about 5 to 15 weight percent acrylic copolymer, said titanium dioxide being present in said first coating in amounts ranging from about 15 to about 35 weight percent of the acrylic copolymer in the first coating, and one or more overcoatings of a clear acrylic copolymer which is substantially free of titanium dioxide wherein the first coating and the one or more overcoatings have a combined thickness totaling about 0.20 mils.

4,421,826

**POLYURETHANE POLYMER AMINE SALT AS A DYEING AID, PARTICULARLY FOR POLYOLEFIN FIBERS**

John L. Ohlson, Bedford, and Irving E. Isgur, Framingham, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 147,781, May 8, 1980, abandoned. This application Apr. 15, 1982, Ser. No. 361,317

Int. Cl.<sup>3</sup> B05D 5/04; C09B 65/00; D06M 15/12; D06F 3/79

U.S. Cl. 428—394

18 Claims

1. A process of treating a synthetic fiber comprising a polyolefin to impart improved dyeing properties thereto which comprises treating said synthetic fiber with a waterborne hydrophilic polyurethane polymer amine salt, said amine salt being prepared by a process comprising the steps of:

- (a) reacting an isocyanate capped hydrophilic polyol prepolymer comprising a mixture of from about 2.9 to about 50% by weight of said mixture of an isocyanate capped polyol having a hydroxyl functionality in the range of 3 to 8 prior to capping and from about 97.1 to about 50% by weight of said mixture of an isocyanate capped hydrophilic polyoxyethylene diol having an ethylene oxide content of at least 40 mole percent with from about 0.7 to about 1.2 equivalents of an oxime to block substantially all of the isocyanate groups of said prepolymer and provide an oxime blocked prepolymer;  
(b) reacting said oxime blocked prepolymer with a polyfunctional amine containing at least 2 primary amine functional groups to form an amine reaction product; and  
(c) supplying an acid and water to the reaction mixture of (b)

after an increase in viscosity has occurred and prior to the completion of the reaction of said polyfunctional amine and oxime blocked prepolymer to form said waterborne polyurethane polymer amine salt, said water and said acid being added to said reaction mixture separately or as an aqueous acid.

18. A treated fiber produced by the process of claim 1.

4,421,827

**COMPOSITES AND METHODS FOR PROVIDING METAL CLAD ARTICLES AND ARTICLES PRODUCED**  
Cecil L. Phillips, Boughton, England, assignor to Scott Bader Company Limited, Great Britain

Filed Jan. 18, 1982, Ser. No. 340,405

Int. Cl.<sup>3</sup> B29D 9/08; B29H 9/00; B32B 15/08

U.S. Cl. 428—418

16 Claims

1. A composite for providing a rigid metal clad article of thermosetting resin which composite includes a metal facing, a layer of adhesive material on the metal facing, and laid on the layer of adhesive material, an uncured curable thermosetting resin, the layer of adhesive material consisting essentially of a fully precured thermosetting or a thermoplastics material and being capable of adhesion to the metal facing and to the thermosetting resin at least upon curing of said uncured resin to form an adhesive bond with both the metal facing and the cured curable thermosetting resin.

11. A method of forming a rigid metal clad article which includes the steps of applying to a metal facing a layer consisting essentially of thermosetting or thermoplastics adhesive material capable of adhesion to the metal facing, bonding the said layer of adhesive material to the metal facing, which bonding is effected, when the adhesive material is a thermoplastics material, by heating the thermoplastics material and, when the adhesive material is a thermosetting material, by fully curing the thermosetting material, laying up on said layer of adhesive material an uncured curable thermosetting resin and curing the said curable thermosetting resin thereby bonding the adhesive material to the resin to provide the said metal clad article, which step of curing the said curable thermosetting resin is, when the adhesive material is a thermosetting material, carried out after the said curing of the thermosetting material.

4,421,828

**STEEL SHEET CARRYING A PROTECTIVE LAYER AND PROCESS FOR PRODUCING SUCH A SHEET**

Raymond Alloué, and Claude Mergey, both of Ville d'Array, France, assignors to Carnaud S.A., Boulogne, France

Filed Sep. 8, 1980, Ser. No. 184,863

Claims priority, application France, Sep. 6, 1979, 79 22322

Int. Cl.<sup>3</sup> B32B 15/18; C25D 5/10

U.S. Cl. 428—629

9 Claims

1. A process for the production from mild steel sheets of a steel sheet carrying a protective layer suitable for the manufacture of metal containers, in particular food cans, the protected steel sheet possessing an electrical contact resistance which is lower than  $100 \times 10^{-5}$  ohms, so as to permit roller spot welding during the manufacture of said containers, which process includes the steps of:

- (a) depositing on the surface of the metal sheet a layer of tin in an amount of from 0.1 to 1.05 g/m<sup>2</sup> of the surface area of the metal sheet to form a layer of tin which is unalloyed to the steel, and then  
(b) electrolytically depositing a layer of chromium metal and chromium oxide on said unalloyed tin layer the said layer being deposited so that the said layer contains at least 5 micrograms per square centimeter of the surface area of the metal sheet (5  $\mu\text{g}/\text{cm}^2$ ) of metallic chromium and from 0.6 to 2.5  $\mu\text{g}/\text{cm}^2$  of chromium in oxidized form.

8. A steel sheet carrying a protective layer and being suitable for the manufacture of metal containers, in particular food cans, the protected steel sheet having an electrical contact resistance which is lower than  $100 \times 10^{-5}$  ohms, so as to permit

roller spot welding during the manufacture of the containers, the steel sheet comprising a sheet of mild steel having a layer of tin deposited on the surface of the sheet, in an amount of from 1.0 to 1.05 g/m<sup>2</sup>, the tin layer not being alloyed with the steel, and a layer of metallic chromium and chromium oxide deposited on the resultant tin-coated metal sheet, the said layer containing at least 5 micrograms per square centimeter of metallic chromium (5  $\mu\text{g}/\text{cm}^2$ ) and from 0.6 to 2.5  $\mu\text{g}/\text{cm}^2$  of chromium in oxidized form.

4,421,829

**HYDROGEN AZIDE-OXYGEN FUEL CELL**

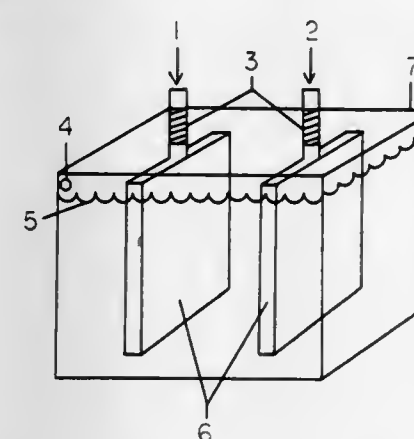
Robert C. Bohannon, 3392 W. Aksarben Ave., Littleton, Colo. 80123

Filed Aug. 2, 1982, Ser. No. 404,141

Int. Cl.<sup>3</sup> H01M 8/22

U.S. Cl. 429—15

1 Claim



1. A method of operation of a fuel cell comprising a cell housing, a catalytic fuel electrode, a catalytic oxidant electrode and an electrolyte, said method comprising supplying an electrolyte solution containing hydrogen azide to said fuel electrode and an oxygen containing gas to said oxidant electrode.

4,421,830

**BATTERY HAVING REPLACEABLE ELECTRODES**

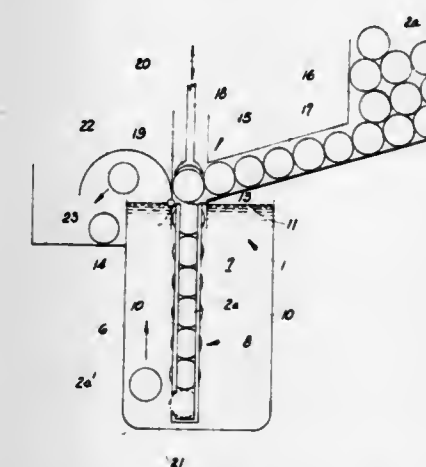
Richard T. Schneider, 3550 NW. 33rd Pl., Gainesville, Fla. 32605, and Frederick A. Hauck, 2501 Carew Tower, Cincinnati, Ohio 45202

Filed Jun. 4, 1982, Ser. No. 384,914

Int. Cl.<sup>3</sup> H01M 10/28

U.S. Cl. 429—49

19 Claims



1. A battery having replaceable electrodes including an anode and a cathode, a tank holding a quantity of liquid electrolyte solution, a plurality of solid shaped anodic electrodes each having an outer surface comprising an anodic material, a plurality of solid shaped cathodic electrodes each having an outer surface comprising a cathodic material, said electrodes being configured to be bouyant in said electrolyte solution, means for immersing at least some of said electrodes in the

electrolyte solution comprising anode guide means making electrical contact with the outer surfaces of the immersed anodic electrodes and electrically connected to the battery anode, and cathode guide means making electrical contact with the outer surfaces of the immersed cathodic electrodes and electrically connected to the battery cathode, and means for replacing individual ones of said electrodes.

4,421,831

**BATTERY FLOW RESTRICTOR**

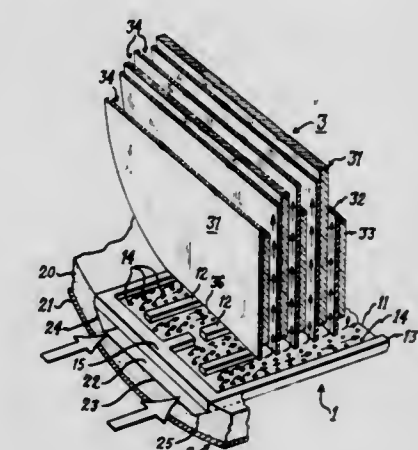
Roger Garcia, Jr., Pittsfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,087

Int. Cl.<sup>3</sup> H01M 2/40

U.S. Cl. 429—70

10 Claims



1. In a bipolar primary battery having a multiplicity of closely spaced parallel battery plates defining a plurality of electrolytic cells, a casing surrounding the cells and channels in said casing for circulation of electrolyte to and from the cells and to and from other components of an electrolyte management system, the improvement wherein:

one said channel formed in said casing constitutes an intake raceway for conducting electrolyte past the edges of said plates in a direction relatively normal to said plates for delivery of electrolyte to all said cells; and  
a flow restrictor interposed between said raceway and said cells for controlling the flow of electrolyte from said raceway to said cells to provide for an equalized flow of electrolyte through all cells, said flow restrictor being primarily a barrier but having passages therethrough to permit a limited distributed flow of electrolyte and to cause a pressure drop, both as predetermined to equalize flow among said cells.

4,421,832

**ELECTROCHEMICAL CELL**

Toshio Uba, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Aug. 24, 1981, Ser. No. 295,479

Int. Cl.<sup>3</sup> H01M 2/36, 6/32

U.S. Cl. 429—72

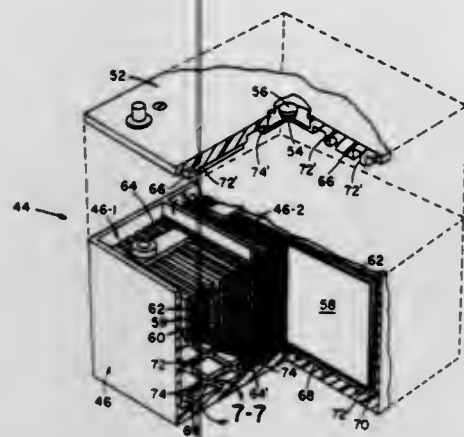
16 Claims

1. In an electrochemical cell of the limited electrolyte type having a cell pack comprised of absorbent separator interleaved and compressed between positive and negative plates, an electrolyte substantially fully absorbed within the separator and plates, and a container comprised of a jar having an opening and a lid closing said opening, the container enclosing the cell pack and having a substantially planar end wall portion in substantial abutting contact with an edge of the cell pack, the improvement comprising:

channel means formed at the interface between said edge of the cell pack and the abutting end wall portion of the container, providing at least one passageway promoting along the extent of said channel means, the substantially



uniform distribution of electrolyte within the cell pack at least during filling of the cell with the electrolyte; and



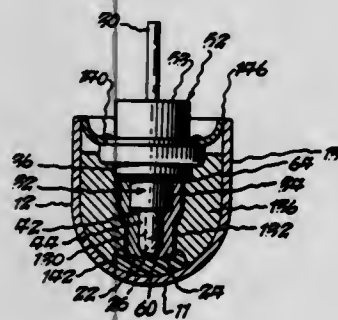
a substantially unrestricted path interconnecting the jar opening with the channel means insuring effective distribution of electrolyte to said interface.

#### 4,421,833 LITHIUM-HALOGEN CELL

Robert A. Zayatz, North Tonawanda, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.  
Division of Ser. No. 222,498, Jan. 5, 1981. This application Apr. 15, 1982, Ser. No. 368,865  
Int. Cl.<sup>3</sup> H01M 4/36

U.S. Cl. 429—101

10 Claims



1. A lithium-halogen cell comprising:
  - (a) a casing of electrically conducting material;
  - (b) anode means positioned within said casing and comprising an anode electrical conductor sandwiched between a pair of lithium plates defining substantially oppositely directed lithium outer surfaces terminating in a peripheral lithium edge, a major portion of the length of said peripheral edge being uncovered and exposed;
  - (c) said anode electrical conductor extending through said casing;
  - (d) means for sealing said conductor from the remainder of said cell;
  - (e) cathode means comprising halogen-containing cathode material within said casing and in operative contact with said outer surfaces of said lithium plates and with said peripheral lithium edge and with a major portion of the surface of said casing in a manner such that said casing serves as a cathode current collector; and
  - (f) said sealing means shielding said anode conductor from said halogen-containing material and electrically insulating said conductor from said casing;
  - (g) whereby an electrical potential difference exists between said conductor and said casing during operation of said cell.

#### 4,421,834 LIQUID CATHODE CELLS WITH A GLASS FIBER SEPARATOR

Ronald L. Zupancic, Parma Heights, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.  
Filed Jul. 1, 1982, Ser. No. 394,298  
Int. Cl.<sup>3</sup> H01M 4/36

U.S. Cl. 429—105

11 Claims

1. A nonaqueous cell employing a liquid cathode containing a solute, an active anode, a cathode collector, and a separator disposed between said anode and said cathode collector; the improvement wherein the separator comprises a uniform mixture of 85 to 95 weight percent glass fibers and 15 to 5 weight percent binder, said glass fibers being  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in length and 2 to 8 microns in diameter, and wherein at least 90 percent of the glass fibers are within 20 percent of the average length of the glass fibers and within 20 percent of the average diameter of the glass fibers.

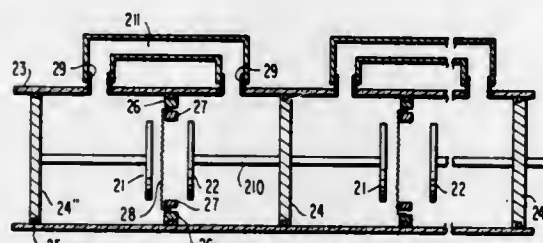
#### 4,421,835 STORAGE OF ELECTRICAL ENERGY WITH TIN ELECTRODE SYSTEM, STORAGE APPARATUS, AND METHOD OF FORMING SUCH APPARATUS

Joost Manassen; Gary Hodes, and David Cahen, all of Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Apr. 22, 1981, Ser. No. 256,547  
Claims priority, application Israel, Apr. 25, 1980, 59925  
Int. Cl.<sup>3</sup> H01M 6/36

U.S. Cl. 429—111

28 Claims



1. A system for storing electrical energy comprising a plurality of individual cells positioned in a container, each cell comprising a storage compartment containing a storage electrode comprising tin, and further containing an alkaline sulfide solution containing tin in a soluble form, said storage compartment being at least partially enclosed by a membrane, each of said cells further comprising a second compartment, said second compartment containing a second electrode and a polysulfide solution, said membrane separating said storage and said second compartments, wherein the membrane of each of said cells is free to move within said container while maintaining the separation between the compartments of each cell, thereby compensating for volume changes in said container.

3. The system as defined by claim 1 wherein said second electrode in said second compartment is a counterelectrode, and wherein said second compartment further comprises a semiconductor photoconversion electrode, said semiconductor photoconversion electrode being adapted to be electrically connected to said storage electrode.

#### 4,421,836 METHOD FOR REPAIRING SILVER IMAGE GLASS PHOTOMASKS WITH NI

Dennis S. Postupack, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.  
Division of Ser. No. 305,430, Sep. 25, 1981, Pat. No. 4,383,016.  
This application Nov. 3, 1982, Ser. No. 438,562  
Int. Cl.<sup>3</sup> G03F 5/00; G02B 5/22

U.S. Cl. 430—5

1 Claim

1. A patterned photomask article comprising a glass sub-

strate and a silver stained pattern wherein defects in said pattern are coated with a nickel coating of sufficient density to mask actinic radiation.

ting or thermoplastic resins having a glass transition point of 70°–150° C.



**4,421,841**  
**PHOTOSENSITIVE LITHOGRAPHIC PLATE WITH SULFONATE CONTAINING PHOTOSENSITIVE POLYESTER**

Shigeki Shimizu, Atsugi, and Akinobu Oshima, Tokyo, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

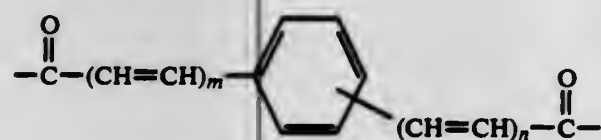
Filed Jul. 14, 1982, Ser. No. 398,442  
 Claims priority, application Japan, Jul. 28, 1981, 56-118345; Apr. 5, 1982, 57-56183

Int. Cl.<sup>3</sup> G03C 1/68; C08G 18/00, 63/00, 69/00  
 U.S. Cl. 430—285

5 Claims

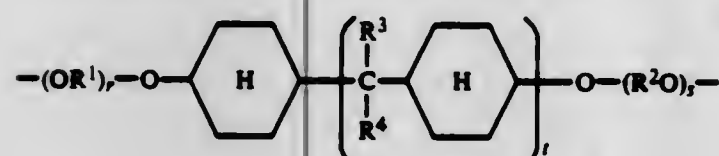
1. A photosensitive lithographic plate having, on a substrate, a photosensitive layer comprising a photosensitive polyester containing at least (A):

(a) an aromatic dicarboxylic acid unit represented by the general formula:



where m and n each represents an integer of 0 or 1, with at least one of them being 1,

(b) a dicarboxylic acid unit having a sulfonate group, and  
 (c) a diol unit represented by the general formula:



wherein H represents a hydrogenated benzene ring, R<sup>1</sup> and R<sup>2</sup> each represents an alkylene group of 2-4 carbon atoms, R<sup>3</sup> and R<sup>4</sup> each represents a hydrogen atom or an alkyl group of 1-6 carbon atoms, r and s each represents an integer of from 0 to 3 and t represents an integer of 0 or 1.

**4,421,842**  
**PROCESS FOR FORMING FILM OF FLUOROALKYL ACRYLATE POLYMER ON SUBSTRATE AND PROCESS FOR PREPARING PATTERNED RESIST FROM THE FILM**

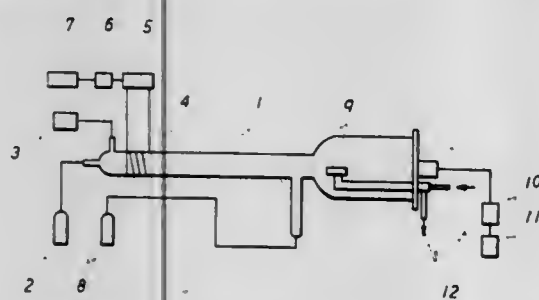
Shuzo Hattori; Shinzo Morita, both of Nagoya, and Tsuneo Fujii, Suita, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 310,407, Oct. 9, 1983, Pat. No. 4,382,985. This application Jan. 6, 1983, Ser. No. 455,909

Claims priority, application Japan, Oct. 11, 1980, 55-142198; Jun. 1, 1981, 56-84092; Jun. 1, 1981, 56-84093

Int. Cl.<sup>3</sup> B05D 3/04, 7/24, 3/14  
 U.S. Cl. 430—296

1 Claim



1. A process for forming a patterned resist film on a substrate which comprises (a) forming a film of a polymer on a substrate

by polymerizing a fluoroalkyl acrylate having the following general formula:



wherein R<sup>1</sup> is a C<sub>1</sub> to C<sub>15</sub> straight or branched perfluoroalkyl group or a C<sub>1</sub> to C<sub>15</sub> straight or branched perfluoroalkyl group in which at least one of the fluorine atoms is substituted by hydrogen atom and which has at least one fluorine atom, R<sup>2</sup> is hydrogen atom, methyl group, ethyl group or a halogen atom, and R<sup>3</sup> is a bivalent hydrocarbon group, by the action of an inert gas excited by glow discharge in the presence of a substrate, and (b) radiating electron beams to the film to form a pattern.

**4,421,843**  
**PROCESS FOR FORMING FILM OF FLUOROALKYL ACRYLATE POLYMER ON SUBSTRATE AND PROCESS FOR PREPARING PATTERNED RESIST FROM THE FILM**

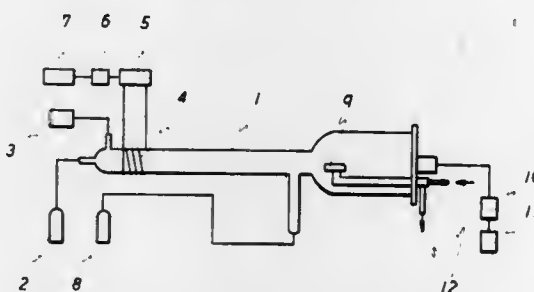
Shuzo Hattori; Shinzo Morita, both of Nagoya, and Tsuneo Fujii, Suita, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 310,407, Oct. 9, 1981, Pat. No. 4,382,985. This application Jan. 6, 1983, Ser. No. 455,910

Claims priority, application Japan, Oct. 11, 1980, 55-142198; Jun. 1, 1981, 56-84092; Jun. 1, 1981, 56-84093

Int. Cl.<sup>3</sup> B05D 3/04, 7/24, 3/14  
 U.S. Cl. 430—322

4 Claims



1. A process for forming a patterned resist film on a substrate which comprises (a) forming a film of a polymer on a substrate by polymerizing a fluoroalkyl acrylate having the following general formula:



wherein R<sup>1</sup> is a C<sub>1</sub> to C<sub>15</sub> straight or branched perfluoroalkyl group or a C<sub>1</sub> to C<sub>15</sub> straight or branched perfluoroalkyl group in which at least one of the fluorine atoms is substituted by hydrogen atom and which has at least one fluorine atom, R<sup>2</sup> is hydrogen atom, methyl group, ethyl group or a halogen atom, and R<sup>3</sup> is a bivalent hydrocarbon group, by the action of an inert gas excited by flow discharge in the presence of a substrate, (b) radiating high energy rays to the film to form a latent pattern, and (c) developing the latent pattern.

**4,421,844**  
**PROCESS FOR THE PREPARATION OF RELIEF COPIES**

Gerhard Buhr, Koenigstein, and Marie-Luise Geus, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,276  
 Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038605

Int. Cl.<sup>3</sup> G03C 5/24; G03F 7/00  
 U.S. Cl. 430—326

9 Claims

1. A process for the preparation of relief copies, comprising the steps of:

imagewise irradiating a radiation-sensitive copying material comprising a layer support and a radiation-sensitive layer comprising

(a) a compound which upon irradiation splits off acid, and  
 (b) a compound possessing at least one acid-cleavable

C—O—C group comprising an orthocarboxylic acid ester grouping or a carboxylic amide acetal grouping, or an organic polymeric compound containing recurring acetal or ketal groupings in the main chain and whose solubility in a developer liquid is increased by the action of an acid, wherein said polymeric compound is produced by reaction of an aldehyde and/or ketone with a bivalent alcohol and wherein each alpha-carbon atom of the alcohol constituent of the acetal or ketal groupings is aliphatic; after said irradiating step and before developing, heating the imagewise irradiated copying material to a temperature in the range of between 65° and 90° C. for a period of time sufficient to produce an increase in radiation sensitivity of the radiation-sensitive layer; and washing out the irradiated layer areas with a developer, after said heating step.

**4,421,845**  
**SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL**

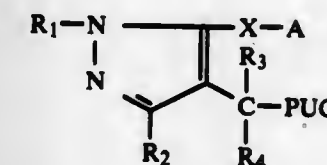
Morito Uemura, Hino; Kenichi Kishi, Sagami; Satoshi Nakagawa, Hino; Shuji Kida, and Hiroshi Sugita, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Mar. 11, 1982, Ser. No. 357,149  
 Claims priority, application Japan, Mar. 19, 1981, 56-39766

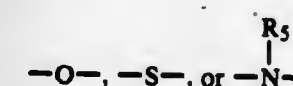
Int. Cl.<sup>3</sup> G03C 1/40  
 U.S. Cl. 430—544

6 Claims

1. A silver halide photographic light-sensitive material which comprises at least one of those pyrazole compounds represented by the following general formula:



wherein A is a group which can be eliminated in a photographic process condition; X is



wherein R<sub>5</sub> is a hydrogen atom or an alkyl, an aryl, an acyl or a sulfone group, which R<sub>5</sub> group may combine together with R<sub>1</sub> to form a condensed ring; R<sub>1</sub> is a hydrogen atom or an alkyl, an aryl, an acyl, a sulfone, an alkoxy, or a heterocyclic residue; R<sub>2</sub> is a hydrogen atom or an alkyl, an aryl, an alkoxy, an amino, an acid amide, a sulfonamide, a carboxyl, an alkoxy-carbonyl, a carbamoyl, a cyano, or a halogenated alkyl group; R<sub>3</sub> and R<sub>4</sub> each is a hydrogen atom or an alkyl or an aryl group; and PUG is a photographically useful group which is released after elimination of the A group in a photographic processing condition and which has a hetero atom directly combined with the carbon substituted in the fourth position of the pyrazole nucleus.

**4,421,846**  
**PHOTOGRAPHIC ELEMENT WITH REDUCIBLE METAL COMPLEX THAT RELEASES PHOTOGRAPHICALLY USEFUL COMPOUND**

Satoru Ikenuchi, Hino; Masaru Kanbe, Hachioji; Jiro Takahashi, Hachioji; Ryuichi Kobayashi, Hachioji; Shunji Suganaka, Tokyo, and Noboru Mizukura, Tsukuba, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,901  
 Claims priority, application Japan, Dec. 23, 1980, 55-183573

Int. Cl.<sup>3</sup> G03C 5/54, 1/10, 1/40, 1/06  
 U.S. Cl. 430—559

17 Claims

1. A photographic element comprising, a silver halide photo-

sensitive emulsion layer on a support, said emulsion layer containing a metal complex having a plurality of ligands, said complex being non-diffusible, inert with respect to ligand exchange until reduced under alkaline conditions (hereinafter referred to as ligand exchange inert complex) and wherein said complex has at least one polydentate group having a photographically useful group which itself is diffusible when released from said complex, said photographically useful group being selected from the group consisting of a dye, a development inhibitor, an anti-foggant, a development accelerator, a silver halide solvent, a developing agent, a toning agent, a fixing agent, a hardening agent and a precursor thereof; said complex being capable of being activated, when reduced under alkaline conditions, to become labile with respect to ligand exchange (hereinafter referred to as ligand exchange labile complex) to release said dissolvable photographically useful group.

**4,421,847**  
**PROCESS FOR THE CHAIN-LENGTHENING OF GELATINE BY PARTIAL HARDENING**

Heinrich Jung, Leverkusen, and Ulrich Biskup, Cologne, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktien-Gesellschaft, Leverkusen, Fed. Rep. of Germany  
 Continuation of Ser. No. 157,464, Jun. 9, 1980, abandoned. This application Dec. 11, 1981, Ser. No. 329,731

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2924035

Int. Cl.<sup>3</sup> G03C 1/30  
 U.S. Cl. 430—621

13 Claims

1. In a process for chain-lengthening gelatin for a photographic material by an agent or agents to provide increased molecular weight, the steps comprising preparing a gelatin solution containing from 5 to 35% by weight of gelatin, contacting said gelatin solution for a period of 0.01 seconds to 10 minutes at 30° to 90° C. with 0.001 to 0.01 mole of an agent per 100 g of dry gelatin, said agent being capable of activating the carboxyl groups of the gelatin with the formation of reactive products causing cross-linking, and thereby providing chain-lengthening of the molecules of the gelatin resulting in a change of the distribution of the molecular weight within said gelatin solution by producing intercatenary bonds and linear chain-lengthening to increase the molecular weight of the gelatin derivative and in the absence of decreasing triple helix formation, said chain-lengthened gelatin solution being coatable into a layer on a support, said chain-lengthening agent being capable of converting a photographic gelatin layer resistant to boiling after treatment of a 20μ thick dry gelatin layer with an aqueous solution of the agent at a concentration of 0.01 to 0.03 mole chain-lengthening agent per 100 g dry gelatin at a pH value of the moist gelatin layer of 5 to 7 at a temperature of 20° C.

**4,421,848**  
**METHOD OF DETECTING THE PRESENCE OF LIVE ORGANISMS IN SUBSTANCES**

Gerald D. Whitlock, Wilton Rd., Malvern, Worcestershire WR14 3RG, England

Filed Mar. 30, 1981, Ser. No. 248,847  
 Claims priority, application United Kingdom, Apr. 15, 1980, 8012364

Int. Cl.<sup>3</sup> C12M 1/34; C12Q 1/04, 1/06, 1/66, 1/70  
 U.S. Cl. 435—8

11 Claims

2. In a method of detecting the presence of live organisms in a substance employing the steps of disrupting said organisms by treatment of the substance so that certain constituents of said organisms are released, bringing said constituents into close relationship with a light-photon-producing reagent so



that photons of light are produced and detecting said photons of light, the improvement comprising the steps of: gently and completely mixing said organisms with said reagent prior to said organisms becoming suddenly disrupted by violent agitation so that each disruption of a live organism causes production of a burst of light photons and detecting the bursts of light photons.

4,421,849

## METHOD FOR BIOLOGICAL SCREENING

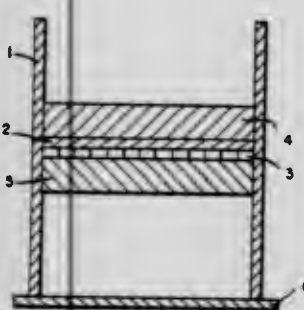
Eberhard Breuker, Rekenstrasse 10, Detmold, Fed. Rep. of Germany (D-4930)

Continuation-in-part of Ser. No. 176,006, Aug. 7, 1980, abandoned. This application Jun. 4, 1982, Ser. No. 385,116  
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932694

Int. Cl.<sup>3</sup> C12Q 1/18

U.S. Cl. 435—32

8 Claims



1. A method for screening or identifying a microorganism comprising providing two microorganism nutrient medium layers in communication with and separated by a sterilizable membrane filter; implanting in one of said layers:

- a first unknown microorganism suspected of producing a substance effective by its reaction with a second known microorganism or enzyme detecting agent to identify said first microorganism; or
- a first known microorganism which produces a substance effective by its reaction with a second unknown microorganism to identify said second unknown microorganism; implanting in the other layer said second microorganism or enzyme detecting agent, said membrane filter being impermeable to each of said microorganisms and enzyme detecting agent but permeable to said effective substance; causing said effective substance to be produced and diffused through said membrane filter, and observing the effect of said effective substance on said second microorganism or enzyme detecting agent.

4,421,850

## IMMOBILIZATION OF ENZYMES

Michael J. Daniels, and Digby M. Farmer, both of Reading, England, assignors to Tate & Lyle Limited, England

Filed Feb. 24, 1981, Ser. No. 237,637  
Claims priority, application United Kingdom, Feb. 26, 1980, 8006448

Int. Cl.<sup>3</sup> C12P 1/00, 19/20; C12N 11/00, 11/02

U.S. Cl. 435—41

18 Claims

1. An immobilized enzyme product consisting essentially of particulate inert bone char carrying an immobilized cross-linked enzyme in the form of a gel, said gel consisting essentially of active immobilized enzyme and 50–90% water, at least a portion of said gel being external to said bone char and said portion forming at least 3% by volume of said product, the bulk volume of said product being from 5 to 300% greater than the bulk volume of said bone char.

4,421,851

## ANTITUMOR ANTIBIOTICS

Giuseppe Cassinelli, Pavia; Arpad Grein, Milan; Sergio Merli, Milan, and Giovanni Rivola, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Division of Ser. No. 94,671, Nov. 15, 1979, Pat. No. 4,370,474.  
This application Nov. 16, 1981, Ser. No. 321,558  
Claims priority, application United Kingdom, Nov. 21, 1978, 45434/78

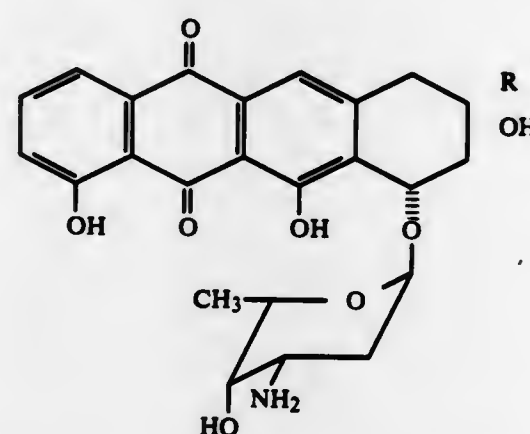
Int. Cl.<sup>3</sup> C12P 19/56; C12N 1/14; C12R 1/465

U.S. Cl. 435—78

6 Claims

1. A biologically pure culture of the microorganism *Streptomyces peucetius* var. *aureus* ATCC 31428, said culture being capable of producing 11-deoxy-14-hydroxy-carminomycin, 11-deoxy-carminomycin and 11-deoxy-13-deoxy-carminomycin in recoverable quantities upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances.

2. A process for producing an antibiotic complex including a mixture of the compounds having the formula:



wherein R is CO—CH<sub>2</sub>—OH, COCH<sub>3</sub>, or CH<sub>2</sub>—CH<sub>3</sub> and a salt thereof, said process comprising cultivating the microorganism *Streptomyces peucetius* var. *aureus* ATCC 31428, under aerobic conditions in an aqueous culture medium containing an assimilable source of carbon, an assimilable source of nitrogen and mineral salts and recovering said antibiotic complex from the culture medium.

4,421,852

## PRODUCTION OF HIGH FRUCTOSE SYRUP FROM INULIN INVOLVING ULTRAFILTRATION

Ernst Hoehn, 128 Traverse Ave., Winnipeg, Manitoba, Canada (R2H 2G9); Curtis J. McKay, Apt. 424, 99 Dalhousie Dr., Winnipeg, Manitoba, Canada (R2G 2G5), and E. Donald Murray, 833 Kilkeny Dr., Winnipeg, Manitoba, Canada (R3T 4Y4)

Filed Aug. 9, 1982, Ser. No. 406,178

Claims priority, application Canada, Sep. 15, 1981, 385954

Int. Cl.<sup>3</sup> C13D 3/16; C13K 11/00; C12P 19/14

U.S. Cl. 435—99

17 Claims

1. A process for producing a syrup containing reducing sugars wherein fructose constitutes at least 60 wt% of the reducing sugars, which comprises:

extracting soluble substances from an inulin-containing naturally-occurring material with water to form an aqueous inulin solution containing low molecular weight nitrogen-containing organic species and minerals, simultaneously concentrating said aqueous inulin solution and removing at least a substantial proportion of said low molecular weight nitrogen-containing organic species and minerals therefrom to form a concentrated inulin solution by a membrane technique which permits said lower molecular weight nitrogen-containing organic species and minerals to pass through the membrane while retaining said inulin in solution, subjecting said concentrated inulin solution to enzymatic hydrolysis to form fructose and glucose from inulin and

any related fructans present in said concentrated inulin solution to produce a fructose solution containing unhydrolyzed and partially hydrolyzed higher molecular weight species, removing at least a substantial proportion of said higher molecular weight species from said fructose solution to form a purified fructose solution containing reducing sugars of at least about 90 wt% of the dissolved material therein and wherein fructose constitutes at least about 60 wt% of said reducing sugars, said removal being effected by a membrane technique which permits fructose and glucose to pass therethrough to form said fructose solution while retaining said higher molecular weight species, and evaporatively concentrating said purified fructose solution to a syrup of desired concentration.

4,421,853

## FERMENTATIVE PREPARATION OF L-LEUCINE

Mark H. Updike, Baltimore, and Gary J. Calton, Elkridge, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,760

Int. Cl.<sup>3</sup> C12P 13/06; C12N 15/00; C12R 1/13

U.S. Cl. 435—116

6 Claims

1. A process for preparing L-leucine which comprises cultivating under aerobic conditions a mutant strain of *Brevibacterium thioaerophilum* resistant to an analogue of L-leucine selected from the group consisting of α-amino-β-hydroxyvaleric acid; methallylglycine; and β-hydroxyisoleucine, to yield a fermentation broth, accumulating from about 0.1 to about 6 grams/liter L-leucine in said fermentation broth, and recovering the accumulated L-leucine from said fermentation broth.

4,421,854

## FERMENTATIVE PREPARATION OF L-LEUCINE

Mark H. Updike, Baltimore, and Gary J. Calton, Elkridge, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,901

Int. Cl.<sup>3</sup> C12P 13/06; C12N 15/00; C12R 1/06

U.S. Cl. 435—116

10 Claims

1. A process for preparing L-leucine which comprises cultivating under aerobic conditions a mutant strain of *Arthrobacter citreus* resistant to an analogue of L-leucine selected from the group consisting of α-amino-β-hydroxyvaleric acid; D-leucine; α-aminoisovaleryl-sulfonic acid; norvaline; norleucine; methallylglycine; α-amino-β-chlorobutyric acid; valine; α-chloroleucine; isoleucine; β-hydroxynorleucine; β-hydroxyisoleucine; cyclopentene alanine; 3-cyclopentene-1-alanine; 2-amino-4-methylhexenoic acid; 5,5,5-trifluoroleucine, and 4-azaleucine, to yield a fermentation broth, accumulating from about 0.1 to about 8 grams/liter L-leucine in said fermentation broth, and recovering the accumulated L-leucine from said fermentation broth.

4,421,855

## PRODUCTION OF ACRYLAMIDE USING IMMOBILIZED CELLS

Ichiro Watanabe; Keiichi Sakashita, both of Yokohama, and Yasuo Ogawa, Kawasaki, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1981, Ser. No. 292,848

Claims priority, application Japan, Aug. 19, 1980, 55-113039

Int. Cl.<sup>3</sup> C12P 13/02; C12N 11/08, 11/04

U.S. Cl. 435—129

9 Claims

1. A process for producing acrylamide from acrylonitrile in an aqueous medium by the action of a microorganism having nitrilase activity immobilized with a polyacrylamide gel wherein the improvements comprise immobilizing the microorganism by the use of cationic acrylamide-based polymer gel comprising from 50 to 95% by weight acrylamide, from 1 to 50% by weight of at least one cationic ethylenically unsaturated monomer copolymerizable with acrylamide selected from the group consisting of dimethylaminoethyl methacry-

late, diethylaminoethyl methacrylate, dimethylaminopropylmethacrylamide, diethylaminopropylmethacrylamide, and quaternary salts thereof, and from 0.1 to 20% by weight of a cross-linking monomer, based on the total weight of the three monomers and using as said medium, an aqueous medium having a salt concentration of 0.1 weight percent or less.

4,421,856

## FERMENTABLE SUGAR FROM THE HYDROLYSIS OF CARBOHYDRATE POLYMER

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

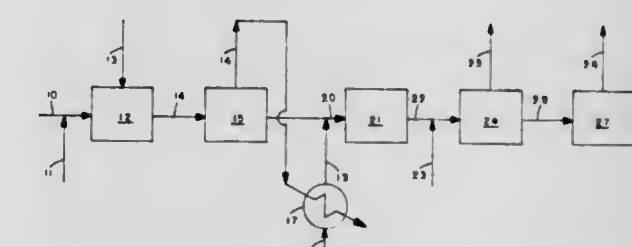
Filed Nov. 12, 1981, Ser. No. 320,277

The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C13K 1/06

U.S. Cl. 435—161

9 Claims



1. In the acid hydrolysis of carbohydrate polymer in which an aqueous slurry of carbohydrate polymer selected from the group consisting of starch and cellulose is hydrolyzed at elevated pressure and temperature in the presence of an acid catalyst to provide a hydrolysate comprising a sterile aqueous solution of fermentable sugar, the improvement which comprises carrying out hydrolysis in the presence of added aqueous water soluble non-fermentable carbohydrate.

6. The process of claim 1 wherein the hydrolysate is fermented to provide dilute aqueous ethanol, the dilute aqueous ethanol is concentrated by distillation and the stillage resulting from said distillation is used as the source of added water soluble non-fermentable carbohydrate in the hydrolysis of a further quantity of hydrolysate.

4,421,857

## NOISE CHECKING METHOD

Lilla S. Sun, Seal Beach, and John C. Anderson, Burbank, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 15, 1981, Ser. No. 330,973

Int. Cl.<sup>3</sup> G01J 3/02

U.S. Cl. 436—2

10 Claims

1. In a method for checking noise of an optical instrument, said instrument being capable of measuring an absorption property of a material as a function of wavelength, of the type comprising measuring an absorption property of a solution over a period of time, the improvement comprising employing as said solution one comprising from about 0.040 to 0.090 molar nitrite, wherein said nitrite is present as a nitrite ionized constituent.

4,421,858

## METHOD FOR DETERMINING THE CONCENTRATION OF SELECTED INGREDIENTS IN ANIMAL FEEDS

Dennis E. Jackson, Springfield, Mo., assignor to Cambridge Products, Ltd., Springfield, Mo.

Filed Jul. 10, 1981, Ser. No. 281,979

Int. Cl.<sup>3</sup> G01N 33/02, 31/02

U.S. Cl. 436—20

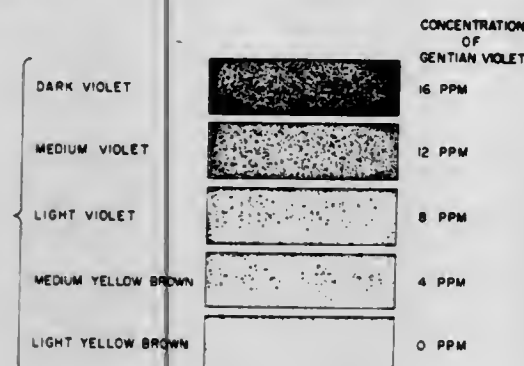
14 Claims

1. A method for measuring the concentration of a selected



finely-divided, dry component of an animal feedstuff comprising the steps performed in the following order;

- dispersing gentian violet on a finely-divided carrier, the carrier particles being of approximately the same size as those of the selected components;
- admixing thoroughly an amount of gentian violet bearing carrier to the selected animal feedstuff component to label the component;
- admixing the labeled component into the animal feedstuff to form a complete animal feedstuff, the quantity of gentian violet being sufficient to provide, upon complete mixture, a known concentration in the resultant animal feedstuff in the range from about 3 to about 16 parts per million;



- selecting a sample of the resultant animal feedstuff and placing it in a container;
- adding a sufficient amount of a solvent for gentian violet to cover the sample;
- agitating the immersed sample sufficiently to extract the gentian violet from the sample;
- separating the gentian violet and solvent from the solid portion of the sample; and
- comparing visually the color of the gentian violet solution of step (g) to a suitable standard for the known concentration to ascertain the concentration of gentian violet in the sample whereby the concentration of the selected component in the resultant feedstuff may be measured concomitantly at the situs of the resultant animal feedstuff.

4,421,859

#### ASSESSMENT OF THE STATE OF CHANGE OF KERATIN FIBERS

Pierre Bore, Monfermeil, and Arnaud de Labbey, Aulnay-sous-Bois, both of France, assignors to L'Oreal, Paris, France  
Continuation of Ser. No. 55,213, Jul. 6, 1979, Pat. No. 4,353,708.  
This application Jun. 18, 1981, Ser. No. 274,936  
Claims priority, application France, Jul. 13, 1978, 78 20975; Jun. 8, 1979, 79 14791

The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> G01N 31/00

U.S. Cl. 436—86 25 Claims  
1. Process for evaluating the ionic state of keratin fibers with particular respect to the surface thereof, which process comprises:

- taking at least one sample having a weight of between about 10 mg and about 50 mg of fibers from the fibers to be evaluated; then
- contacting for a period of time of between about one and about two minutes at a temperature of about normal room or other ambient temperature the said fiber sample(s) with at least one acidic solution at a pH value of between about 0.5 and up to but exclusive of 7 of at least one acidic or basic dyestuff,
- said solution being in volume in a quantity that is between about 0.25 cm<sup>3</sup> and about 1 cm<sup>3</sup> with the dyestuff(s) concentration in said solution being on an order of between about 0.005% by weight and about 0.02% by weight; and thereafter

observing what, if any, change in the color of the solution has occurred; and, finally  
deducing by color comparison the ionic state of at least the surface of said fibers according to the detectable change in coloration of said involved dyestuff solution(s).

4,421,860

#### HOMOGENEOUS FLUOROIMMUNOASSAY INVOLVING AUTOCORRELATION PROCESSING OF OPTICALLY SENSED SIGNALS

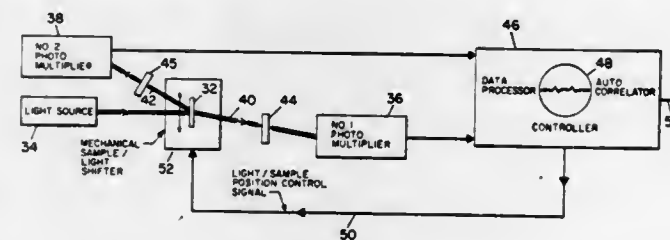
Virgil B. Elings, Santa Barbara, and David F. Nicoli, Goleta, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 194,856, Oct. 7, 1980. This application Oct. 13, 1981, Ser. No. 310,746

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> G01N 33/54, 33/58, 33/52, 21/64

U.S. Cl. 436—518 20 Claims



- A homogeneous fluorescent immunoassay method comprising the steps of:

- providing relatively large carrier particles in solution with antibodies residing at a plurality of sites on each of said carrier particles;
- providing at least first and second active components; with the first being an unknown antigen to be tested, the second being tagged with a fluorescent substance;
- exposing said carrier particles to the first and second components, to cause a reaction between said first and second components and the antibodies on said particles; whereby the number of fluorescently tagged components bonded to said carrier particles changes;
- illuminating the solution containing both the free and bound fluorescently tagged substances with optical radiation at a first wavelength to cause fluorescent output radiation at a second longer wavelength;
- optically sensing output signals at said second wavelength resulting from said fluorescent output radiation; and
- electronically processing the optically sensed signals to determine the amount of the fluorescently tagged component which is free and/or that which is bound to the carrier particles without physically separating the free and bound fluorescent material, said electronic processing including autocorrelation processing to discriminate between fluorescent radiation arising from the bound fluorescent material and from the free fluorescent material.

4,421,861

#### HIGH-STRENGTH AND TEMPERATURE-CHANGE RESISTANT CERAMIC FORMED BODY, ESPECIALLY OF MULLITE, ITS PRODUCTION AND USE

Nils Claussen, Leonberg; Günter Petzow, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, and Richard J. Brook, Leeds, England, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.v., Göttingen, Fed. Rep. of Germany

Filed May 19, 1980, Ser. No. 150,850

Claims priority, application Fed. Rep. of Germany, May 22, 1979, 2920795

Int. Cl.<sup>3</sup> C04B 35/48, 35/50

U.S. Cl. 501—103 15 Claims  
1. A ceramic formed body having high temperature change

#### 4,421,864 IMPROVED ION EXCHANGE PARTICLE REGENERATION METHOD

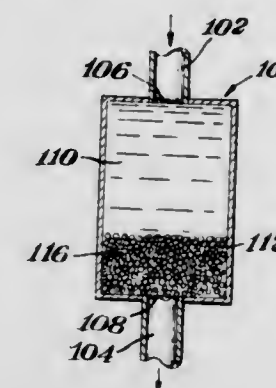
John D. Watson, Sr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 9, 1981, Ser. No. 328,964

Int. Cl.<sup>3</sup> B01J 49/00

U.S. Cl. 521—26

10 Claims



resistance and strength and being composed of a ceramic matrix with dispersed particles of ZrO<sub>2</sub>, HfO<sub>2</sub> or a mixture thereof, said ceramic formed body being produced by the process of:

- forming a mixture of a powdered ceramic material which is a precursor to the matrix material of the ceramic matrix; with a compound which can form ZrO<sub>2</sub>, HfO<sub>2</sub> or a mixture thereof upon reaction with the ceramic material above a reaction temperature, the reaction temperature being that temperature at which the ceramic material is converted into the matrix material; thereafter
- densely sintering said mixture below said reaction temperature; and thereafter
- heat treating said densely sintered mixture by raising its temperature above said reaction temperature, to convert the precursor ceramic material into the matrix material and form the ceramic body with in situ formation of the dispersed particles.

4,421,862

#### CO HYDROGENATION AND ALCOHOL HOMOLOGATION BY MEANS OF SOLUBLE GROUP VIII HOMOGENEOUS CATALYSTS

John S. Bradley, Scotch Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 76,967, Sep. 20, 1979, abandoned, which is a continuation of Ser. No. 917,209, Jun. 20, 1978, abandoned. This application Mar. 11, 1981, Ser. No. 242,639

Int. Cl.<sup>3</sup> C07C 27/06

U.S. Cl. 518—700

2 Claims

- A process for the homogeneous catalytic synthesis of methanol and methyl formate from CO and hydrogen consisting essentially of contacting CO and H<sub>2</sub> with a catalytic system comprising essentially of a soluble ruthenium carbonyl containing complex plus a phosphine in a solvent selected from the group consisting of saturated and aromatic hydrocarbons, ethers, carboxylic acids, alkanols, ketones, esters and lactones at a temperature of from about 250° to 300° C., a pressure of from about 54 to 200 MPa and a CO to H<sub>2</sub> ratio of from 3:1 to 1:10.

4,421,863

#### PROCESS FOR PREPARING LOW MOLECULAR WEIGHT OXYGENATED COMPOUNDS FROM SYNGAS USING A NOVEL CATALYST SYSTEM

Roger G. Duranleau, Georgetown, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,276

Int. Cl.<sup>3</sup> C07C 27/06

U.S. Cl. 518—701

19 Claims

- A process for preparing low molecular weight oxygenated products, especially ethylene glycol and methanol, from syngas which comprises contacting a mixture of carbon monoxide and hydrogen with a catalytic amount of a catalyst comprising a soluble rhodium-containing compound, an organic ligand and a cationic fused ring polynuclear aromatic compound possessing a nitrogen atom at a ring fusion position from the group consisting of salts of phenanthradiaziniums, naphthaziniums, acridaziniums and derivatives thereof dissolved in a suitable solvent and heating the resulting mixture at a temperature of 150° C. to 350° C. and pressure of 1000 psig to 15,000 psig for sufficient time to produce the desired low molecular weight oxygenated products.

4,421,866

#### METHOD FOR THE PREPARATION OF SYRENE POLYMER FOAM

Kyung W. Suh, Granville; David C. Krueger, Reynoldsburg, and Burch E. Zehner, Pataskala, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 29, 1982, Ser. No. 426,414

Int. Cl.<sup>3</sup> C08J 9/14

U.S. Cl. 521—79

5 Claims

- In a process for the preparation of an alkenyl aromatic thermoplastic resinous elongate foam body having a machine direction and a transverse direction, the body defining a plurality of closed noninterconnecting gas-containing cells therein, the steps of the method comprising heat plastifying an alkenyl aromatic synthetic resinous material, adding to the heat plasti-

- In a method for regenerating gel ion exchange particles of the type wherein a regenerating fluid is flowed through a bed of unregenerated gel ion exchange particles and ions are exchanged between the fluid and the particles, thereby forming regenerated ion exchange particles; the improvement comprising:

- flowing a regenerating fluid which has a density different from about 0.01 to about 100 lbs. per cu. ft. that of the regenerated particles to cause said regenerated particles to be displaced from the unregenerated bed at a first position in a column;
- displacing said particles from the unregenerated bed;
- flowing substantially all of said regenerated particles in a direction substantially countercurrent to that of the regenerating fluid; and
- reforming the regenerated particles into a bed of regenerated particles at a second position in the column.

4,421,865

#### SELECTIVE HYDROGEN-DEUTERIUM INTERCHANGE USING ION EXCHANGE RESINS

Jacob Shen, c/o Aramco Service Company, P.O. Box 8745, Dhahran, Saudi Arabia, assignor to Standard Oil Company (Sohio), Cleveland, Ohio

Filed Jun. 8, 1981, Ser. No. 271,467

Int. Cl.<sup>3</sup> B01J 39/20

U.S. Cl. 521—31

10 Claims

- A process for exchanging at least one labile proton of a first compound with at least one labile deuteron of a second compound, in the absence of a catalyst, the process comprising contacting the first compound with the second compound, with the proviso that one of the compounds is a porous ion exchange resin and the other compound is a non-solid.



lying synthetic resinous material a volatile fluid foaming agent to provide a foaming agent resinous polymer mixture under a pressure sufficiently high that foaming is prevented, mixing the fluid foaming agent with the plastified resin to form a blowable resinous mixture, reducing the temperature of the mixture to a temperature such that when pressure is removed therefrom, a foam of desirable quality is obtained, reducing the pressure on the mixture to thereby cause the mixture to form a foam of desired quality, the foam having a minimal cross section of 8 square inches and a minimal thickness of 0.25 inch and water vapor permeability of not greater than 1.8 perm inches, the improvement which comprises employing a blowing agent selected from the group consisting of

- (1) a mixture of from about 5 to 20 weight percent isopropyl alcohol, from about 5 to 50 percent chlorodifluoromethane, and from about 30 to 70 percent dichlorodifluoromethane;
  - (2) a mixture of from about 5 to 50 percent of an ethanol, methanol or mixtures thereof, from about 5 to 50 percent of chlorodifluoromethane, and about 30 to 70 percent dichlorodifluoromethane;
- and mixtures thereof, all percentages being by weight.

4,421,867

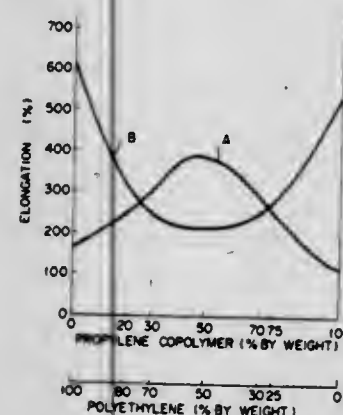
## COMPOSITION FOR A CROSSLINKED POLYOLEFIN FOAM

Akio Nojiri, Kawasaki; Takashi Sawasaki; Isamu Noguchi, both of Tokyo; Shinji Onohori, Hatano, and Junnosuke Sasazima, Hiratsuka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 179,477, Aug. 18, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 358,684 Claims priority, application Japan, Aug. 29, 1979, 54-110063 Int. Cl.<sup>3</sup> C08J 9/12

U.S. Cl. 521—82

12 Claims



1. A foamable composition for making a closed cell polyolefin foam which comprises 20 to 75% by weight of crystalline propylene copolymer having a melt index of 1 to 20 and containing 1 to 15% by weight of ethylene and having a crystallinity higher than 50%, 80 to 25% by weight of polyethylene having a density of from 0.920 to 0.945 g/cm<sup>3</sup> and a melt index of 1 to 10, a polyfunctional organic monomeric cross-linking agent and a blowing agent.

4,421,868

## POLYESTER-MELAMINE THERMOSETTING FOAM AND METHOD OF PREPARATION

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development, Ltd., Knoxville, Tenn.

Continuation-in-part of Ser. No. 379,118, May 17, 1982, abandoned. This application Sep. 28, 1982, Ser. No. 425,396 Int. Cl.<sup>3</sup> C08J 9/14

U.S. Cl. 521—112

18 Claims

1. A polyester thermosetting foam composition having improved flame, smoke and burning high-temperature properties with high compressive strength, which foam composition is prepared by:

- (a) the mixing of a saturated polyester resin, which resin is

prepared by the reaction of a saturated dicarboxylic acid with an aliphatic dihydroxy alcohol, to provide a saturated polyester resin having reactive hydroxyl groups, with from about 100 or more parts of melamine per 100 parts of the saturated resin; and,

- (b) reacting the melamine-polyester admixture in the presence of a blowing agent, surfactant and trimerization catalyst and in the absence of a urethane catalyst, with a methylene diisocyanate, to produce the thermosetting foam composition.

4,421,869

## CATALYST FOR MAKING POLYURETHANES

Francis W. Arblir, Itasca; Daniel S. Raden, Hawthorn Woods, and Kenneth W. Narducy, Bloomington, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 267,150, May 26, 1981, Pat. No. 4,366,084. This application Oct. 21, 1982, Ser. No. 435,841

Int. Cl.<sup>3</sup> C08G 18/14

U.S. Cl. 521—126

4 Claims

1. The process of preparing a polyurethane foam from a polyisocyanate and a polyol in the presence of a blowing agent, consisting essentially in carrying out the reaction in the presence of a catalytically effective amount of a partially blocked DMAPA, said partial blocking being caused by the inclusion of phenol in the molar amount of 10–50% of said DMAPA.

4,421,870

## PROCESS FOR THE PREPARATION OF CELLULAR POLYURETHANE ELASTOMERS BASED ON 4,4'-DIISOCYANATO-1,2-DIPHENYLETHANE

Herbert Stutz, Karlsruhe; Karl H. Illers, Otterstadt; Herbert Haberkorn, Gruenstadt, and Walter Heckmann, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 419,755

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138422

Int. Cl.<sup>3</sup> C12P 7/16

U.S. Cl. 521—160

9 Claims

1. In a process for the manufacture of molded cellular polyurethane elastomers by reacting (a) an organic polyisocyanate with (b) higher molecular weight polyhydroxyl compounds and (c) water as well as possibly (d) chain extenders in the presence of (e) auxiliaries and/or additives wherein the improvement comprises using 4,4'-diisocyanato-1,2-diphenylethane or diisocyanato-1,2-diphenylethane isomer mixtures containing more than 95 percent by weight of 4,4'-diisocyanato-1,2-diphenylethane as the organic polyisocyanate.

4,421,871

## PROPYLENE OXIDE ADDUCTS OF TOLUENEDIAMINE

Alexander Korczak, Grosse Ile, and William W. Lewis, Jr., Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 326,298, Dec. 1, 1981, Pat. No. 4,391,728. This application Feb. 22, 1983, Ser. No. 468,202

Int. Cl.<sup>3</sup> C08G 18/14

U.S. Cl. 521—167

15 Claims

1. A process for preparing a polyurethane foam comprising reacting, in the presence of a blowing agent and catalyst, an organic polyisocyanate with a polyol composition comprising the reaction product prepared by reacting from 4 to 9 moles of propylene oxide per mole of toluenediamine at temperatures greater than 140° C. in the presence of at least 0.6 part of alkali metal hydroxide per 100 parts of toluenediamine with the proviso that at least 0.8 part of alkali metal hydroxide is used if the toluenediamine is 2,4-toluenediamine or 2,6-toluenediamine, or mixtures thereof.

4,421,872

## PROCESS FOR THE PREPARATION OF ELASTIC FLEXIBLE POLYURETHANE FOAMS

Ingolf Büethe, Boehr-Iggelheim; Wolfgang Straehle, Heidelberg; Matthias Marx, Bad Dürkheim, and Reinhard Peters, Munich, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 2, 1982, Ser. No. 414,572

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137132

Int. Cl.<sup>3</sup> C08G 18/00, 18/14

U.S. Cl. 521—174

8 Claims

1. In the process for the manufacture of elastic flexible polyurethane foams by reacting organic polyisocyanates with polyoxyalkylene polyols in the presence of catalysts, blowing agents, and, optionally, compounds serving as chain extenders or cross-linkers, fillers, plasticizers, flame retardant, cell openers, mold release agents, colorants, and the like, the improvement wherein the polyoxyalkylene polyol used has terminal oxyethylene blocks equivalent to an oxyethylene degree of 1 to 13 and at least a minimum primary hydroxyl group content expressed as a percentage of total hydroxyl groups, which increases with the degree of oxyethylation as shown in curve A of the FIGURE.

4,421,873

## OXIDATIVELY COUPLED COLD-SET BINDERS

Charles E. Seene, Brazil; John F. Kraemer, Terre Haute, both of Ind., and Nancy C. Varnum, Kingsville, Mo., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 283,718, Jul. 16, 1981, Pat. No. 4,393,152. This application Aug. 25, 1982, Ser. No. 411,202

Int. Cl.<sup>3</sup> C08K 3/34

U.S. Cl. 523—145

16 Claims

1. A process for preparing foundry cores and molds comprising the steps of (a) mixing a foundry aggregate with an ortho-substituted phenol-formaldehyde polymerizable binder capable of being oxidatively coupled, a metal salt catalyst therefor selected from the group consisting of a salt of lead, manganese, cobalt II or copper I and an amine, (b) placing the mixture in a mold or core box and (c) passing an oxygen source through the mixture to effect oxidative polymerization of the binder and (d) removing the core or mold from the core box or mold.

4,421,874

## POLYMER SLURRY WASHING

Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 2, 1981, Ser. No. 269,206

Int. Cl.<sup>3</sup> C08F 6/08

U.S. Cl. 523—315

8 Claims

1. Process for purification of a polymer slurry comprising solid polymer particles and a fluid phase containing a liquid wherein said fluid phase contains at least one ingredient to be at least partially removed from said slurry, said process comprising

- (a) moving said slurry in a first direction continuously or discontinuously through a housing confined by a wall, said wall comprising at least one filter portion, wherein said portion is made of a filter material permitting said fluid phase to pass through but preventing a substantial amount of said solid polymer particles from passing through,
- (b) injecting a wash fluid into said housing at a location and under pressure conditions such as to cause a flow of said wash fluid in a second direction through said slurry thereby replacing at least a portion of said fluid phase by said wash fluid and causing said portion of said fluid phase to leave the housing through said filter, said first and second direction forming a substantial angle with each other,
- (c) recovering a purified polymer slurry as the product of

the process, said purified polymer slurry comprising solid polymer particles and a purified fluid phase containing substantially less of said at least one ingredient as compared to the fluid phase of the starting polymer slurry.

4,421,875

## PROCESS FOR THE MANUFACTURE OF IMPACT RESISTANT THERMOPLASTIC MOLDING MATERIALS

Graham E. McKee, Weinheim; Franz Brandstetter, Neustadt; Adolf Echte, Ludwigshafen; Juergen Hambrecht, Heidelberg; Heinz-Juergen Overhoff; Edmund Priebe, both of Frankfurt; Josef Schwaab, Maikammer, and Peter Siebel, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,697

Int. Cl.<sup>3</sup> C08J 3/02

U.S. Cl. 523—335

5 Claims

1. In a process for the preparation of an impact resistant thermoplastic material comprising:

(Step I) the aqueous emulsion polymerization at a temperature of between 30° C. and 90° C. of at least one monomer selected from the group consisting of

- (a) conjugated diolefins having 4 to 5 carbon atoms and
- (b) acrylate esters of alcohols having 1 to 8 carbon atoms, and, optionally,
- (c) 0 to 30 weight percent of monomers which copolymerize with (a) or (b), and
- (d) 0 to 10 weight percent of monomers having a cross-linking action, in the presence of
- (e) 0.3 to 5 weight percent based on monomers of an emulsifier, and

(f) a vinyl polymerization initiator, to produce a rubber latex having a solids content of 33 to 50 weight percent and an average particle size (d<sub>50</sub>-value of the integral mass distribution) in the range of 0.02 to 0.15 micron;

(Step II) agglomeration of the latex of Step I by the addition of a dilute aqueous dispersion of a chemically acting agglomerating agent selected from the group consisting of (g) copolymers of C<sub>1</sub>–C<sub>4</sub> alkyl acrylates with 0.1 to 10 weight percent of acrylic or methacrylic acid or amide, and

(h) polyvinylether, wherein the agglomerating agent is used in an amount between 0.2 and 20 weight percent (solids basis) of the rubber polymer at a temperature of 20° C. to 90° C. for a period of time required to increase the average particle size (d<sub>50</sub>-value) to 0.20 to 0.65 micron; and

(Step III) graft polymerization of the agglomerated rubber latex of Step II with a monomer selected from the group consisting of styrene, acrylonitrile, methyl methacrylate, and mixtures thereof optionally with a non-conjugated diolefinic monomer having a cross-linking action wherein 20 to 90 weight percent of the grafted polymer is derived from the grafting monomer and 80 to 10 weight percent from the agglomerated rubber latex polymer,

the improvement comprising using as the emulsifier (e), a potassium salt of a saturated or unsaturated carboxylic acid having 10 to 30 carbon atoms.



**4,421,876**  
**RESINOUS COMPOSITIONS CONTAINING MODIFIED ALUMINA HYDRATE CRYSTALS**

Jorg F. Greber, Bonn, and Gunter Winkhaus, Königswinger, both of Fed. Rep. of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany

Division of Ser. No. 98,846, Nov. 30, 1979, Pat. No. 4,340,579. This application Apr. 5, 1982, Ser. No. 365,626

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852273

Int. Cl.<sup>3</sup> C08K 3/10

U.S. Cl. 523—402

6 Claims

1. A composition comprising a thermosetting or thermoplastic material admixed with a flame retardant effective amount of modified alumina hydrate particles, said alumina hydrate particles having a mean particle diameter of less than about 35 microns and less than about 0.1 percent by volume of said particles having a diameter of less than about 2 microns, said particles further having substantially rounded edges and smooth surfaces, said particles obtained by isolating gibbsite trihydrate crystals from the Bayer process, selecting from said crystals a portion having a mean crystal diameter having a predetermined range of between about 40 and about 100 microns, partially dissolving said selected crystals in caustic solution having a concentration of between 100 and 200 grams per liter caustic, and isolating the modified particles from said caustic solution.

**4,421,877**  
**FLAME-RESISTANT AQUEOUS EPOXY IMPREGNATING COMPOSITIONS CONTAINING NONIONIC SURFACE ACTIVE AGENTS**

William M. Alvino, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 7, 1982, Ser. No. 415,096

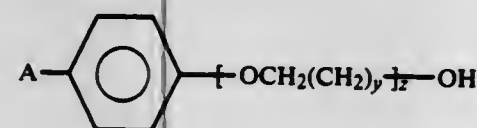
Int. Cl.<sup>3</sup> B05D 3/02; C08L 63/02; C09J 5/02

U.S. Cl. 523—414

17 Claims

1. An aqueous impregnating emulsion, said emulsion consisting essentially of the admixture of:

- (a) an epoxy resin;
- (b) a flame retardant phenol;
- (c) a nonionic alkylaryl polyether alcohol surface active agent having the general structural formula:



where A is an alkyl group having from 5 to 10 carbons, y=1 to 2, and z=15 to 70;

- (d) a latent curing agent selected from the group consisting of monomethylol dicyandiamide and dicyandiamide; and
- (e) water; where the weight ratio of (epoxy resin):(flame retardant phenol):(nonionic surface active agent solids):(latent curing agent solids) is about (100):(1 to 100):(13 to 25):(2 to 10).

**4,421,878**  
**FLUOROELASTOMER FILM COMPOSITIONS AND SOLUTIONS CONTAINING EPOXY RESIN ADDUCTS**

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Division of Ser. No. 187,721, Sep. 16, 1980, abandoned, which is a continuation of Ser. No. 178,895, Sep. 18, 1980, abandoned.

This application Nov. 25, 1981, Ser. No. 324,840

Int. Cl.<sup>3</sup> C08L 27/20, 27/12

U.S. Cl. 523—454

10 Claims

1. An improved cured fluoroelastomer film composition consisting essentially of:

- a fluoroelastomer gum; and
- a curative selected from the group consisting of polyamine and polyamide adducts of epoxy resins and blends of fatty amidoamine resins and polyamide adducts of epoxy resins, the improvement wherein said film composition is devoid of metal oxides.

4. An improved fluoroelastomer solution consisting essentially:

- a fluoroelastomer gum;
- a curative selected from the group consisting of polyamine and polyamide adducts of epoxy resins and blends of fatty amidoamine resins and polyamide adducts of epoxy resins; and
- a solvent for said gum and said curative the improvement wherein said fluoroelastomer is cured in the absence of metal oxides.

**4,421,879**  
**USE OF 3,4-DISUBSTITUTED ANILINES AS ACCELERATORS FOR UNSATURATED POLYESTER RESINS**

Erich Eimers; Klaus Kraft, and Dieter Margotte, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 412,513

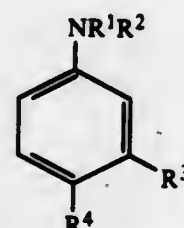
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136292

Int. Cl.<sup>3</sup> C08L 67/02

U.S. Cl. 523—500

8 Claims

1. A composition comprising (a) an unsaturated polyester resin which is a mixture of from 30 to 75 parts by weight of  $\alpha,\beta$ -ethylenically unsaturated polyester and 70 to 25 parts by weight of an unsaturated monomer copolymerizable therewith; (b) 1 to 10% by weight of an accelerator, based on said unsaturated polyester resin, said accelerator being of the formula



wherein R<sup>1</sup> and R<sup>2</sup> which may be the same or different are saturated or unsaturated, optionally OH-substituted hydrocarbon radicals containing from 1 to 18 carbon atoms, one of the two radicals R<sup>3</sup> and R<sup>4</sup> is an optionally phenyl-substituted C<sub>1</sub>-C<sub>4</sub>-alkyl radical or a C<sub>5</sub>-C<sub>6</sub>-cycloalkyl radical and the other of said radicals R<sup>3</sup> and R<sup>4</sup> is a halogen atom; (c) 0.01 to 0.1% by weight, based on unsaturated polyester resin, of at least one inhibitor and (d) 50 to 350 parts by weight of a filler based on each 100 parts by weight of polyester resin.

**4,421,880**  
**AMINOPLAST RESIN CROSSLINKING AGENTS AND NITROALKANOL USED TO TREAT CELLULOSE**

Jerry H. Hunsucker, and Milton E. Woods, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Continuation-in-part of Ser. No. 63,221, Aug. 3, 1979, abandoned. This application Jul. 21, 1980, Ser. No. 170,437. The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.

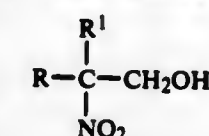
Int. Cl.<sup>3</sup> C08G 6/00, 12/12; C08L 61/02

U.S. Cl. 524—14

22 Claims

20. Improved particle board comprising cellulose particles and fibers and a crosslinking agent selected from the group consisting of ethylene urea, carbamate, triazone, and curable urea-formaldehyde resin, wherein the cellulose particles and

fibers are impregnated with a composition comprising the crosslinking agent and from 0.18 to 1.42 parts per part of the agent of a nitroalkanol of the formula



where R and R<sup>1</sup> are hydrogen, methyl, ethyl or hydroxymethyl and can be the same or different.

**4,421,881**  
**NITROCELLULOSE LACQUER COMPOSITION CONTAINING GELATIN AND ACRYLIC COPOLYMERS**

Sol Benkendorf, 2403 Mountainbrook Dr., Richmond, Va. 23233; Frank A. Calamito, 1 Babbling Brook Rd., Sufferin, N.Y. 10901, and Carmine M. Zaccaria, 574 Chestnut St., Westwood, N.J. 07675

Continuation-in-part of Ser. No. 246,836, Mar. 23, 1981, abandoned. This application Apr. 19, 1982, Ser. No. 369,379

Int. Cl.<sup>3</sup> C08L 1/18, 89/06; C08J 3/20

U.S. Cl. 524—24

13 Claims

- 1. A lacquer composition, comprising:
- A. a nitrocellulose primary film former,
- B. at least two resinous secondary film-formers, one of said at least two secondary film formers being acrylic copolymer present in an amount between about 10% and about 70% by weight based on the total of secondary film formers, and in an amount less than about 4% based on the weight of said lacquer composition,
- C. a Type B water-soluble animal gelatin prepared by alkaline hydrolysis of animal bone and hide, wherein said gelatin has a molecular weight range of 15,000 to 250,000 and an average molecular weight of 50,000 to 70,000, and wherein said gelatin comprises:
  - (i) 50-80 weight % animal bone-derived gelatin,
  - (ii) 20-50 weight % animal hide-derived gelatin,
- D. plasticizer, and
- E. liquid carrier.

**4,421,882**  
**BLEND COMPOUNDS OF SULFONATED POLYMERS AND COMPOSITIONS THEREOF**

Robert D. Lundberg, Bridgewater; Warren A. Thaler, Aberdeen, and Pawan K. Agarwal, Westfield, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

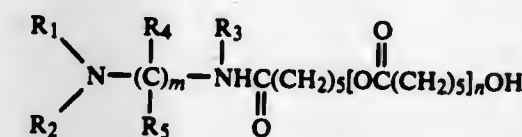
Filed Dec. 21, 1981, Ser. No. 332,860

Int. Cl.<sup>3</sup> C08L 1/18, 51/04, 51/08, 81/00

U.S. Cl. 524—31

10 Claims

- 1. A polymer blend which comprises a blend of:
- (a) a sulfonated polymer which has about 10 to about 200 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonate groups being neutralized with a polycaprolactone polymer having the formula:



wherein n=1 to 500, m=1 to 20, R<sub>1</sub> or R<sub>2</sub> is selected from the group consisting of alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms and aryl groups, and R<sub>3</sub> is selected from the group consisting of hydrogen, alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms and aryl groups, and R<sub>4</sub> and R<sub>5</sub> are selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl groups and said polycaprolactone polymer has an M<sub>n</sub> as measured by GPC of about 200 to about 50,000 and a melting point from below room temperature to about 55°C., wherein said neutralized sulfonated polymer is formed from an elastomeric polymer selected from the group

- consisting of Butyl rubber and an EPDM terpolymer, said component having about 5 to about 50 percent of said sulfonated polymer neutralized with said polycaprolactone polymer; and
- (b) an unsulfonated thermoplastic or elastomeric polymer.

**4,421,883**  
**POLYPHENYLENE ETHER MOLDING COMPOSITIONS THAT INCLUDE AN ALKENYL AROMATIC RESIN AND AN EPDM RUBBER**

Glenn D. Cooper, Delmar; Glim F. Lee, Jr., Albany, and Rainey A. Shufelt, Coeymans, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 111,983, Jan. 14, 1980, Pat. No. 4,315,084. This application Aug. 14, 1981, Ser. No. 292,747

Int. Cl.<sup>3</sup> C08K 5/52

U.S. Cl. 524—127

8 Claims

- 1. A thermoplastic molding composition which consists essentially of:
- (a) from 35-95 parts by weight of a polyphenylene ether resin;
- (b) from 65-5 parts by weight of a phosphate compound; and
- (c) from 1-15 parts by weight of a rubbery interpolymer of a mixture of monoolefins and a polyene.

**4,421,884**  
**OIL-RESISTANT RUBBER COMPOSITION**

Motofumi Oyama, Yokosuka, and Kinro Hashimoto, Yokohama, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo; Toyota Jidosha Kabushiki Kaisha and Toyoda Gosei Co. Ltd., both of Aichi, all of Japan

Filed Aug. 4, 1982, Ser. No. 405,025

Claims priority, application Japan, Aug. 11, 1981, 56-125681

Int. Cl.<sup>3</sup> C08L 9/02

U.S. Cl. 524—209

4 Claims

- 1. An oil-resistant rubber composition comprising 98 to 50 parts by weight of (1) a partially hydrogenated unsaturated nitrile/conjugated diene copolymer rubber in which at least 50% of units derived from the conjugated diene are hydrogenated, and 2 to 50 parts by weight of (2) a liquid copolymer having a number average molecular weight of 500 to 10,000 obtained by copolymerizing 10 to 80% by weight of a conjugated diene, 10 to 70% by weight of an unsaturated nitrile and 0 to 20% by weight of a vinyl monomer copolymerizable with these monomers, the total amount of the components (1) and (2) being 100 parts by weight.

**4,421,885**  
**HALOGEN-CONTAINING RESIN COMPOSITION CONTAINING ESTER PLASTICIZER**

Katsuhiko Tsuda, Sakai; Hisao Tanaka, Sennan; Michio Nagae, Izumiotsu, and Yasuhiko Imanaga, Kaizuka, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 175,764, Aug. 6, 1980, Pat. No. 4,317,760.

This application Sep. 17, 1981, Ser. No. 303,123

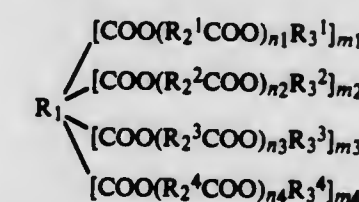
Claims priority, application Japan, Jul. 31, 1979, 54-97560

Int. Cl.<sup>3</sup> C08K 5/10, 5/11, 5/15

U.S. Cl. 524—295

16 Claims

- 1. A halogen-containing resin composition comprising (1) a halogen-containing resin and (2) as a plasticizer, at least one compound of the general formula



wherein R<sub>1</sub> represents an aromatic hydrocarbon group containing 1 or 2 aromatic rings or an alicyclic hydrocarbon group



having 4 to 37 carbon atoms,  $R_1^1$ ,  $R_2^2$ ,  $R_3^3$  and  $R_4^4$  are identical or different and each represents an aliphatic hydrocarbon group having 2 to 17 carbon atoms,  $R_3^1$ ,  $R_3^2$ ,  $R_3^3$  and  $R_3^4$  are identical or different and each represents an aliphatic hydrocarbon group having 5 to 22 carbon atoms, an aromatic hydrocarbon group or a heterocyclic group, each of  $n_1$ ,  $n_2$ ,  $n_3$  and  $n_4$  is 0 or an integer of 1 to 20 and the sum of these is 1 to 20, and each of  $m_1$ ,  $m_2$ ,  $m_3$  and  $m_4$  is 0 or 1 and the sum of these is 1 or 2.

4,421,886

# STABILIZER-LUBRICANT COMBINATION OF LEAD COMPOUNDS AND PARTIAL ESTERS OF PENTAERYTHRITOL AND/OR TRIMETHYLOLPROPANE WITH FATTY ACIDS FOR MOLDING COMPOSITIONS BASED ON POLYVINYL CHLORIDE

Kurt Worschech, and Peter Wedl, both of Loxstedt, Fed. Rep. of Germany, assignors to Neynaber Chemie GmbH, Loxstedt, Fed. Rep. of Germany

Continuation of Ser. No. 188,577, Sep. 18, 1980, abandoned, which is a continuation of Ser. No. 30,845, Apr. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 834,458, Sep. 19, 1977, abandoned. This application Jun. 3, 1981, Ser. No. 269,895

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652328

Int. Cl.<sup>3</sup> C08K 5/10

U.S. Cl. 524—310

5 Claims

1. A moldable composition consisting essentially of from 90 to 99.5% by weight of a thermoplastic resin selected from the group consisting of polyvinyl chloride, a mixed polymer containing mainly vinyl chloride, and any mixture thereof, and from 0.5 to 10% by weight of a stabilizer-lubricant composition consisting essentially of:

- a stearic acid ester of pentaerythritol which has an OH number between 120 and 600 and an acid number below 15, and
- a tribasic lead compound, wherein 15 to 1500 parts by weight of tribasic lead compound are present for each 100 parts by weight of said stearic acid ester of pentaerythritol.

4,421,887

# BIAXIALLY ORIENTED POLYESTER FILMS

Shigeru Horie; Takamasa Asano; Tetsuo Ichihashi, all of Matsuyama, and Hideo Kato, Kanagawa, all of Japan, assignors to Teijin, Limited, Osaka, Japan

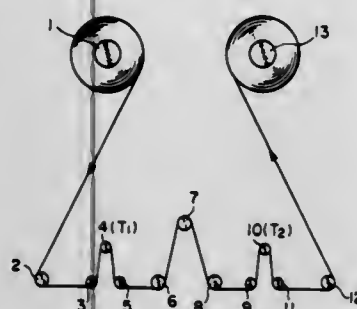
Filed May 20, 1982, Ser. No. 380,433

Claims priority, application Japan, May 27, 1981, 56-79121

Int. Cl.<sup>3</sup> C08K 5/10

U.S. Cl. 524—317

7 Claims



1. A biaxially oriented polyester film composed of a polyester composition comprising

- 100 parts by weight of a substantially linear polyalkylene terephthalate having ethylene terephthalate as a main structural component,
- 0.01 to 5 parts by weight of a partial ester of an aliphatic polyol having 4 to 6 hydroxyl groups and 5 or 6 carbon atoms in the molecule with an aliphatic monocarboxylic acid having 8 to 30 carbon atoms, and
- not more than 0.8 part by weight of fine inorganic particles having an average particle diameter of not more than about 1 micron and being substantially insoluble in the polyalkylene terephthalate.

cles having an average particle diameter of not more than about 1 micron and being substantially insoluble in the polyalkylene terephthalate.

4,421,888

# SUSTAINED HIGH ARC RESISTANT POLYESTER COMPOSITION

Tsuneyoshi Okada, Fuji, Japan, assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,676

Int. Cl.<sup>3</sup> C08L 67/02

U.S. Cl. 524—371

13 Claims

1. A non-burning, non-dripping polyester molding composition with a sustained high level of arc resistance and tracking resistance, comprising:

- approximately 30 to 60 percent by weight of the composition a mixture of polybutylene terephthalate and polyethylene terephthalate wherein polyethylene terephthalate comprises approximately 3 to 20 percent by weight of the composition;
- approximately 30 to 60 percent by weight of the composition of a mixture of talc and fiber glass wherein said talc comprises about 15 to 35 percent by weight of the composition; and
- an effective amount, up to 20 percent by weight of the composition of a flame retardant or flame retardant mixture to render the composition non-burning.

4,421,889

# AQUEOUS DISPERSION PAINTS AND PROCESS FOR MAKING THE SAME

Helmut Braun, Hofheim; Helmut Rinno, Lorsbach, and Werner Stelzel, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 233,823, Feb. 12, 1981, abandoned, which is a continuation of Ser. No. 819,272, Jul. 27, 1979, abandoned, which is a continuation of Ser. No. 712,363, Aug. 6, 1976, abandoned, Ser. No. 712,364, Aug. 6, 1976, abandoned, Ser. No. 712,365, Aug. 6, 1976, abandoned. This application May 13, 1983, Ser. No. 493,803

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535372; Aug. 8, 1975, 2535373; Aug. 8, 1975, 2535374

Int. Cl.<sup>3</sup> C08L 35/02; C09D 3/74

U.S. Cl. 524—381

16 Claims

1. A paint composition having improved wet adhesion consisting essentially of an aqueous dispersion of at least one polymer, from 3% to 20% by weight of said composition of a gloss-improving organic solvent selected from the group consisting of glycols, glycol ethers and glycol esters and a pigment in an amount of 7% to 30% by volume, the polymer of said aqueous dispersion being a copolymer of at least one olefinically unsaturated monomer and from 1 to 5% by weight, based on the weight of the copolymer, of an ethylenically unsaturated acetoacetic acid ester copolymerizable therewith.

4,421,890

# FIRE RETARDING SYSTEM FOR POLYMERIC COMPOSITIONS, AND A METHOD AND PRODUCTS COMPRISING THE SAME

Burton T. MacKenzie, Jr., Monroe, and Sidney Rothenberg, Fairfield, both of Conn., assignors to General Electric Company, Schenectady, N.Y.

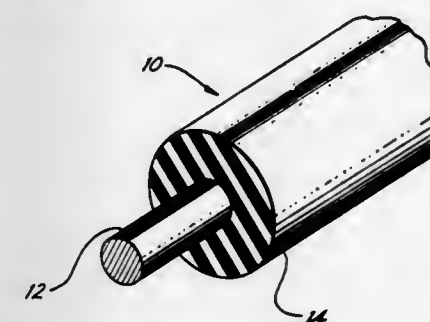
Continuation of Ser. No. 869,256, Jan. 13, 1978, abandoned, which is a continuation of Ser. No. 725,324, Sep. 21, 1976, abandoned, which is a division of Ser. No. 585,069, Jun. 9, 1975, Pat. No. 4,022,945, which is a continuation-in-part of Ser. No. 400,830, Sep. 26, 1973, Pat. No. 3,908,068. This application Dec. 31, 1981, Ser. No. 336,241

The portion of the term of this patent subsequent to Sep. 23, 1992, has been disclaimed.

Int. Cl.<sup>3</sup> C08K 3/22, 5/02

U.S. Cl. 524—431

7 Claims



1. A flame resistant polymeric composition comprising an ethylene-containing polymer containing a flame retarding system consisting essentially of the combination of:

- at least one bromine-containing hydrocarbon selected from the group consisting of hexabromobiphenyl, and decabromobiphenyl in an amount sufficient to provide about 8 to about 50 percent by weight of bromine based upon the organic content of the composition; and
- an oxide of iron in an amount of about 3 to about 15 percent by weight of the organic content of the composition.

4,421,891

# BEAD FILLER RUBBER COMPOSITION

Itsuo Miyake, Kodaira; Keizo Okamoto, Higashikurume; Motonori Bundo, Higashimurayama, and Akihiro Noda, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

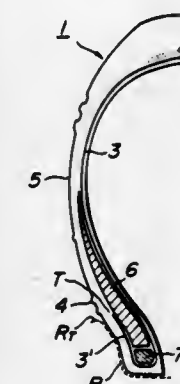
Continuation of Ser. No. 85,346, Oct. 16, 1979, abandoned. This application Feb. 27, 1981, Ser. No. 238,875

Claims priority, application Japan, Oct. 18, 1978, 53-127256

Int. Cl.<sup>3</sup> C08L 61/14, 7/00

U.S. Cl. 524—495

8 Claims



1. A bead filler rubber composition, consisting essentially of:

- 100 parts by weight of a rubber selected from the group consisting of natural rubber, polyisoprene rubber, polybutadiene rubber, styrene-butadiene copolymer rubber and blends thereof;
- 40-130 parts by weight of carbon black having an iodine

adsorbability of 40-130 mg/g and a dibutyl phthalate adsorbability of not higher than 130 ml/100 g;

- 15-45 parts by weight per 100 parts by weight of carbon black of a mixture of a novolak phenolic resin selected from the group consisting of novolak phenol resin, novolak cresol resin, novolak resorcinol resin; and a novolak modified phenolic resin obtained by modifying with a compound selected from the group consisting of oils, aromatic hydrocarbons, or rubbers, wherein the mixing ratio of the novolak phenolic resin to the novolak modified phenolic resin is from 80/20 to 20/80 by weight, an effective amount of a hardener for the resin.

4,421,892

# THERMOPLASTIC POLYMERIC MATERIAL AND METHOD FOR THE PREPARATION THEREOF

Hideo Kasahara; Kichiya Tazaki, both of Yokohama; Kunio Fukuda, Chigasaki, and Hiroshi Suzuki, Tokyo, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Continuation of Ser. No. 190,737, Sep. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 355,384, Mar. 8, 1982, abandoned. This application May 6, 1982, Ser. No. 375,685

Claims priority, application Japan, Oct. 4, 1979, 54/127298; Oct. 9, 1979, 54/129467; Nov. 14, 1979, 54/146506; Feb. 8, 1980, 55/13560

Int. Cl.<sup>3</sup> C08G 81/02

U.S. Cl. 524—514

21 Claims

1. A thermoplastic polymeric material predominantly comprising a novel copolymer, said novel copolymer being composed of polymer chain moieties A having a molecular weight of 30,000 to 300,000 derived from a hard styrene copolymer and polymer chain moieties B having a molecular weight of 10,000 to 50,000 derived from a polyamide, said polymer chain moieties A and B being chemically bonded to each other, said styrene copolymer including 2 to 30 mol% of  $\alpha,\beta$ -unsaturated dicarboxylic acid anhydride and a styrene compound, said styrene copolymer being contained in a range of 10 to 65% by weight based on the weight of the said novel copolymer, said polyamide being contained in a range of 90 to 35% by weight based on the weight of the said novel copolymer and said polymeric material having a fine dispersion microstructure of not greater than 5  $\mu$  in average particle diameter of the disperse phase.

4,421,893

# TINTABLE, DYEABLE, CURABLE COATINGS AND COATED ARTICLES

Loren A. Haluska, and Marcelle G. Molzahn, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

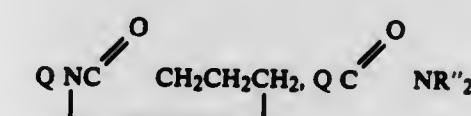
Filed Jan. 18, 1982, Ser. No. 340,160

Int. Cl.<sup>3</sup> C08L 83/00

U.S. Cl. 524—588

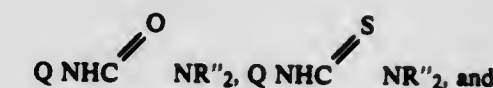
6 Claims

1. A composition of matter which comprises (A) 1 to 50 weight percent, based on the weight of (A) and (B), of a silane having the general formula  $(XO)_3SiR^1SR^2$  wherein X is an alkyl radical of 1 to 4 carbon atoms, R is a divalent aliphatic hydrocarbon radical containing less than five carbon atoms and R' is selected from a group consisting of



(i)

(ii)

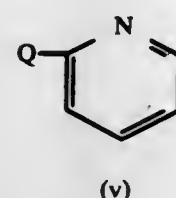


(iii)

(iv)



-continued



wherein Q is a radical selected from a group consisting of  $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}_2\text{CH}_2-$ ,



wherein in groups (iii) and (iv), R' is hydrogen or the methyl group and in group (ii), R' is hydrogen, the methyl group or the isobutoxymethyl group, and (B) 99 to 50 weight percent, based on the weight of (A) and (B), of a curable resin compatible with component (A).

2. A composition of matter as claimed in claim 1 wherein (A) is present at 15 to 35 weight percent and (B) is present at 85 to 65 weight percent.

3. A composition of matter as claimed in claim 2 wherein component (B) is a pigment-free aqueous coating composition comprising a dispersion of colloidal silica in lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula  $\text{R}''\text{Si}(\text{OH})_3$  in which R'' is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the phenyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidopropyl radical, the gamma-methacryloxypropyl radical, and the gamma-mercaptopropyl radical, at least 70 weight percent of the silanol being  $\text{CH}_3\text{Si}(\text{OH})_3$ , said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0.

4,421,894

#### POLYURETHANE OLIGOMER IMPACT AND SHRINKAGE MODIFIERS FOR THERMOSET POLYESTERS

James M. O'Connor, Clinton; Donald L. Lickel, Wallingford, and Willie J. Sessions, New Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 16,857, Mar. 2, 1979, abandoned. This application Nov. 24, 1980, Ser. No. 210,076  
Int. Cl.<sup>3</sup> C08L 67/06, 67/02

U.S. Cl. 525—28

18 Claims

1. In a thermosetting polyester resin composition comprising a polyester resin, a catalyst, and at least one of a reinforcing agent or a filler; the improvement comprising the addition of an effective proportion of a polyurethane oligomer modifier, said oligomer prepared by reacting:

- (a) an isocyanate-terminated prepolymer which is the reaction product of an organic diisocyanate with a polyol having an average equivalent weight of about 1,000 to about 3,000, in an equivalent ratio of NCO to OH ranging from about 1.02/1 to about 1.6/1 with
- (b) an isocyanate reactive group-containing unsaturated monomer to result in an oligomer product having terminal reactive unsaturation and a final free NCO content of from 0 to about 1 percent.

4,421,895

#### PROCESS FOR THE MANUFACTURE OF ABS POLYMERS AND USE THEREOF IN PREPARATION OF MOLDED PARTS

Adolf Echte, Ludwigshafen; Hermann Gausepohl, Neustadt, and Karl Gerberding, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 329,596  
Int. Cl.<sup>3</sup> C08F 279/04

U.S. Cl. 525—53

3 Claims

1. A process for the manufacture of acrylonitrile butadiene styrene polymer particles which comprises continually polymerizing a mixture of

- (a) styrene and
- (b) acrylonitrile, in a ratio of (a):(b) between 90:10 and 10:90

in the presence of

- (c) 3 to 35 percent by weight, relative to the weight of (a) and (b), of a styrene-butadiene block copolymer of solution viscosity, measured in a 5 percent by weight solution in styrene at 25° C., of equal to or less than 80 mPa.s,
- (d) a solvent selected from the group consisting of methyl-ethyl ketone, toluene and ethylbenzene, wherein the ratio of the percent of solvent, expressed by  $100[d/(a+b+c+d)]$  to the solution viscosity of (c) is greater than 0.4,
- (e) from 0.02 to 0.5 percent by weight, relative to the weight of (a) and (b), of a radical initiator selected from the group consisting of t-butyl peroxybenzoate, t-butyl peroctoate and dibenzoyl peroxide,

at a temperature from 80° C. to 180° C. in two or more reaction zones; with stirring and removal of monomers and solvent in a degassing zone.

4,421,896

#### METHOD OF COUPLING A PROTEIN TO A POLYMER PARTICLE CONTAINING HYDRAZIDE GROUPS IN A POLYMER LATEX AND THE PRODUCTS FORMED THEREFROM

Linneaus C. Dorman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 93,409, Nov. 13, 1979, abandoned. This application Feb. 17, 1982, Ser. No. 349,557  
Int. Cl.<sup>3</sup> C08L 89/00

U.S. Cl. 525—54.1

12 Claims

1. A method for coupling in a polymer latex a protein having at least one reactive nucleophilic group to polymer particles containing reactive surface hydrazide groups, said polymer particles having reactive surface hydrazide groups derived from styrenic polymer particles containing surface carbox-amido groups, by using a difunctional compound having first and second functional groups, so that a polymer particle-protein conjugate is obtained, which method comprises:

- (1) forming a first chemical bond between said first functional group and a reactive surface hydrazide group of the polymer particle in the latex; and
  - (2) forming a second chemical bond between said second functional group and a reactive nucleophilic group of the protein at a pH of about 7 to about 8.5 for a time sufficient to form the second chemical bond; and
  - (3) recovering the polymer particle-protein conjugate.
5. The polymer particle-protein conjugate formed by the method of claim 1.

4,421,897

#### ONE COMPONENT SYSTEMS BASED ON CRYSTALLINE EPOXIDE RESINS

Ferdinand Gutekunst, Riehen; Hans Lehmann, Aesch, and Rolf Schmid, Gelterkinden, all of Switzerland, assignors to Ciba-Gelby Corporation, Ardsley, N.Y.

Division of Ser. No. 145,407, May 1, 1980, Pat. No. 4,339,571.

This application Dec. 7, 1981, Ser. No. 328,180

Claims priority, application Switzerland, May 8, 1979, 4308/79

Int. Cl.<sup>3</sup> C08L 63/10, 63/00

U.S. Cl. 525—119

7 Claims

1. A curable, solid, one-component epoxy resin composition, which is stable on storage at room temperature, consisting essentially of

- (a) one or more crystalline, solid epoxy resin, said resin having on average more than one epoxide group in the molecule and a melting point between 40° and 150° C.;
- (b) 1 to 12% by weight, based on component (a), of a curing catalyst; and
- (c) 5 to 30% by weight, based on the total of components (a) and (b), of a thermoplastic polymer in powder form.

4,421,898

#### SULFONATED POLYMER AND COMPOSITIONS THEREOF

Robert D. Lundberg, Bridgewater, and Warren A. Thaler, Aberdeen, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

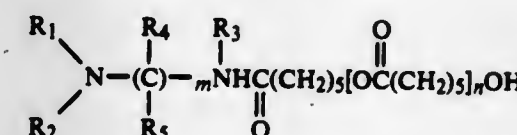
Filed Dec. 21, 1981, Ser. No. 332,850

Int. Cl.<sup>3</sup> C08L 51/04, 51/08, 51/00

U.S. Cl. 525—186

8 Claims

1. A sulfonated polymer which has about 10 to about 200 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonate groups being neutralized with a polycaprolactone polymer having the formula:



wherein  $n = 1$  to 500,  $m = 1$  to 20,  $\text{R}_1$  or  $\text{R}_2$  is selected from the group consisting of alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms,  $\text{R}_1$  is selected from the group consisting of hydrogen, alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms and aryl groups, and  $\text{R}_4$  and  $\text{R}_5$  are selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl groups, wherein said sulfonated polymer is formed from an elastomeric polymer selected from the group consisting of Butyl rubber and an EPDM terpolymer or from a polymer selected from the group consisting of polystyrene, poly-t-butylstyrene, polychlorostyrene and poly-2-methylstyrene, said polycaprolactone polymer having an  $M_n$  as measured by GPC of about 200 to about 50,000 and a melting point from below room temperature to about 55° C.

4,421,899

#### PNEUMATIC TIRES HAVING IMPROVED DURABILITY

Noboru Yamazaki, Tokyo; Michio Okuyama, Kodaira, and Seisuke Tomita, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 28, 1982, Ser. No. 372,602

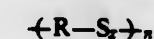
Claims priority, application Japan, May 11, 1981, 56-69281

Int. Cl.<sup>3</sup> C08L 81/00

U.S. Cl. 525—189

2 Claims

1. A steel cord belted radial pneumatic tire having improved durability, comprising steel cords and a rubber composition comprising a polysulfide polymer, having a polyether bond therein, of the general formula I:



wherein

x is 3 to 6, R is  $-\text{CH}_2-\text{CH}_2-\text{O}-$ , m is 3 to 5 and n is 10 to 300,

in an amount, a sulfur equivalent, of 2.0 to 10 parts by weight per 100 parts by weight of a rubber hydrocarbon consisting of at least 30% by weight of rubber selected from the group consisting of natural rubber, synthetic polyisoprene rubber and blends thereof, used as a coating rubber for the belt and/or carcass ply.

4,421,900

#### BLENDS OF NATURAL AND SYNTHETIC RUBBERS

Gary R. Hamed, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 16, 1982, Ser. No. 369,283

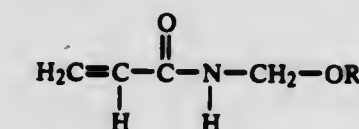
Int. Cl.<sup>3</sup> C08L 7/00, 9/00, 9/06, 15/02

U.S. Cl. 525—218

3 Claims

1. A blend of natural and synthetic rubbers having processability and improved green strength and tack, said blend comprising:

from about 5 to 55 parts by weight of natural rubber; from about 30 to 50 parts by weight of a conjugated diene-containing synthetic rubber having an average molecular weight of from about  $50 \times 10^3$  to about  $800 \times 10^3$ ; and from about 5 to 50 parts by weight of a substituted acrylamide-containing synthetic rubber having an average molecular weight of from about  $50 \times 10^3$  to about  $500 \times 10^3$ ; wherein said conjugated diene-containing synthetic rubber is selected from the group consisting of conjugated diene homopolymers and copolymers, prepared from conjugated diene monomers having from four to about 12 carbon atoms, with monomers containing a vinyl group selected from the group consisting of monovinyl aromatic compounds having from eight to about 20 carbon atoms and acrylic compounds having from three to about five carbon atoms including halogen-substituted compounds; said substituted acrylamide-containing synthetic rubber comprises from about 60 to 99.7 percent by weight of said conjugated diene monomer; from about 0 to 39.7 percent by weight of said monomer containing a vinyl group and copolymerizable with said conjugated diene monomer; and from about 0.3 to 10 percent by weight of an N-(alkoxymethyl)acrylamide monomer having the formula



wherein R is a straight or branched alkyl chain having from 1 to about 20 carbon atoms, the weight of each said monomer component being based upon the total weight of said substituted acrylamide-containing synthetic rubber; and

wherein said blend is based upon the following relationship:

$$A+B \geq C$$

$$C+A \geq B$$

wherein A is equal to the parts by weight of said natural rubber, B is equal to the parts by weight of said conjugated diene-containing synthetic rubber, and C is equal to the parts by weight of said substituted acrylamide-containing synthetic rubber.



4,421,901

## RUBBER POWDERS

Christian Lindner, Cologne, and Karl-Heinz Ott, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
 Filed Jan. 4, 1982, Ser. No. 337,010  
 Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100714

Int. Cl.<sup>3</sup> C08F 265/04

U.S. Cl. 525—309

3 Claims

1. A process for the production of a pourable rubber powder comprising particles having an average diameter of from 0.01 to 10 mm, said process comprising completely breaking a latex of a rubber composed of a core polymer and a sheath polymer, the core and sheath differing from each other in their chemical composition and at least the sheath polymer being a diene or acrylate rubber having a glass transition temperature of below 0° C. so as to form an aqueous suspension of said rubber, then introducing into said aqueous suspension from 2 to 20% by weight, based on the rubber, of at least one vinyl monomer which forms a polymer having a glass transition temperature of above 25° C., and then polymerizing said vinyl monomer in the optional presence of a radical-forming catalyst.

4,421,902

ALKYL, POLY(OXYETHYLENE)  
 POLY(CARBONYLOXYETHYLENE) ACRYLATE  
 EMULSION COPOLYMERS FOR THICKENING  
 PURPOSES

Ching-Jen Chang, Chalfont, and Travis E. Stevens, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

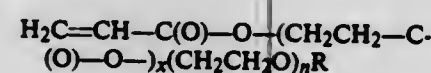
Filed Sep. 30, 1982, Ser. No. 429,597

Int. Cl.<sup>3</sup> C08L 31/06; C08F 18/14

U.S. Cl. 526—317

22 Claims

1. A copolymer polymerized from a monomer system comprising  
 (1) at least about 10 weight percent of a monomer or a monomer mixture selected from the group consisting of methacrylic acid, acrylic acid, itaconic acid, acryloxypionic acid, maleic acid, fumaric acid, citraconic acid and crotonic acid;  
 (2) about 0.5 to 25 weight percent of at least one monomer of the formula:



wherein:

R is selected from the group consisting of alkyl, alkylaryl and polycyclic alkyl groups having 8 to 30 carbon atoms; x is a number from about 0.1 to about 10; n is a number of at least 2 and has an average value of up to 60 or more, from zero up to 50% of the  $(\text{CH}_2\text{CH}_2\text{O})_n$  units being substituted for by  $(\text{CH}_2\text{CR}^1\text{HO})_m$  units wherein  $\text{R}^1$  is  $\text{C}_1$ - $\text{C}_2$  alkyl and m is a number of at least 2 and has an average value of up to 60 or more.  
 (3) optionally at least one copolymerizable ethylenically unsaturated monomer selected from the group consisting of compounds of the formula:



wherein

- (a) Y is H and Z is  $\text{COOR}''$ ,  $\text{C}_6\text{H}_4\text{R}'''$ , CN, Cl,  $\text{CONH}_2$ ,  $\text{OC}(\text{O})\text{R}''''$  or  $\text{CH}=\text{CH}_2$ ;  
 (b) Y is  $\text{C}_1$ - $\text{C}_4$  alkyl and Z is  $\text{COOR}''$ ,  $\text{C}_6\text{H}_4\text{R}'''$ , CN,  $\text{CONH}_2$ , or  $\text{CH}=\text{CH}_2$ ; or  
 (c) Y and Z are Cl; and  $\text{R}''$  is  $\text{C}_1$ - $\text{C}_8$  alkyl or  $\text{C}_2$ - $\text{C}_8$  hydroxyalkyl or lower alkoxy( $\text{C}_2$ - $\text{C}_8$ )alkyl;  $\text{R}'''$  is H, Cl, Br, or  $\text{C}_1$ - $\text{C}_4$  alkyl; and  $\text{R}''''$  is  $\text{C}_1$ - $\text{C}_8$  alkyl; and  
 (4) zero to 1.0 weight percent of a polyethylenically unsaturated monomer;

4,421,903

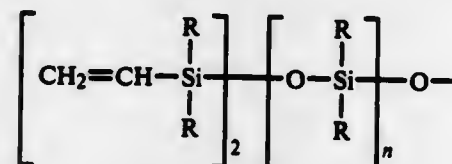
## PLATINUM COMPLEX CATALYSTS

Bruce A. Ashby, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.  
 Filed Feb. 26, 1982, Ser. No. 352,522  
 Int. Cl.<sup>3</sup> B01J 31/02

U.S. Cl. 528—15

10 Claims

4. A composition comprising  
 (a) an organosilicon compound containing at least one  $\text{SiH}$  bond;  
 (b) an organic compound containing an aliphatic unsaturated group, a hydroxyl group, or a mixture of such groups; and  
 (c) a catalytic amount of a storage-stable platinum-siloxane complex catalyst, substantially free of inhibitory impurities, and consisting essentially of platinum and an organosiloxane of the formula



wherein R is free of aliphatic unsaturation and is selected from alkyl radicals, cycloalkyl radicals and phenyl radicals and n is 0 or an integer of from 1 to 1000, said platinum and said organosiloxane having been chemically combined by heating, in the substantial absence of an acid binding agent,

- (i) a platinum halide with  
 (ii) an amount of said organosiloxane sufficient to provide not less than about 0.01 gram atom of platinum per mole of vinyl content in said organosiloxane compound, and an amount of platinum in said catalyst of not substantially less than about 2.0 percent by weight, said heating being carried out for a time sufficient to insure substantially complete reaction therebetween.

4,421,904

## ULTRAVIOLET CURABLE SILICONE COATING COMPOSITIONS

Richard P. Eckberg, Round Lake, and Ronald W. LaRochelle, Clifton Park, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 63,648, Aug. 3, 1979, Pat. No. 4,279,717.

This application Jun. 12, 1981, Ser. No. 272,827

Int. Cl.<sup>3</sup> C08G 77/20

U.S. Cl. 528—27

8 Claims

1. An ultraviolet-curable epoxy functional silicone intermediate fluid composition comprising a pre-crosslinked epoxy functional dialkyl epoxy chainstopped polydialkyl-alkyl epoxy siloxane copolymer silicone fluid which comprises the reaction product of:

- (a) a vinyl- or allylic- functional epoxide;  
 (b) a vinyl functional siloxane cross-linking fluid having a viscosity of approximately 1 to 100,000 centipoise at 25° C.;  
 (c) a hydrogen functional siloxane precursor fluid having a viscosity of approximately 1 to 10,000 centipoise at 25° C.; and  
 (d) an effective amount of precious metal catalyst for facilitating an addition cure hydrosilation reaction between said vinyl functional cross-linking fluid, said vinyl functional epoxide, and said hydrogen functional siloxane precursor fluid.

4,421,905

PROCESS FOR PREPARING POLYIMIDES  
 END-CAPPED WITH ANHYDRIDE OR ISOCYANATE  
 GROUPS

Chung J. Lee, Sheboygan, Wis., assignor to Plastics Engineering Company, Sheboygan, Wis.

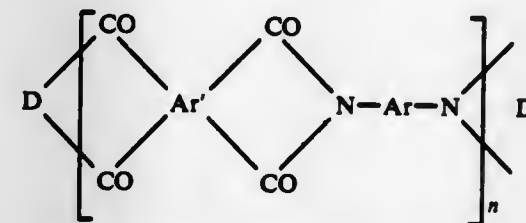
Filed Sep. 20, 1982, Ser. No. 420,567

Int. Cl.<sup>3</sup> C08G 73/10

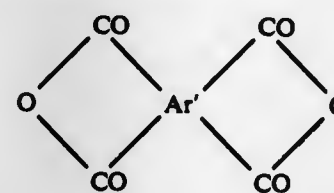
U.S. Cl. 528—56

13 Claims

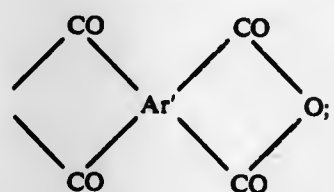
1. In the process of preparing a polyimide of the formula:



by the reaction of an aromatic dianhydride of the formula:



with an aromatic diisocyanate of the formula  $\text{OC}-\text{N}-\text{Ar}-\text{NCO}$ ; wherein  $\text{Ar}'$  is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the  $\text{Ar}'$  radical except that in the case of the  $\text{Ar}'$  being a naphthalene radical one or both pairs of the carbonyl groups may be attached to peri carbon atoms; Ar is a divalent aromatic radical; n is an integer of at least one; D is a radical selected from the group consisting of  $\text{O} <$  and  $> \text{N}-\text{AR}-\text{NCO}$ ; and  $\text{D}'$  is a radical selected from the group consisting of  $\text{OC} <$  and



the improvement comprising the reaction of said aromatic dianhydride and said aromatic diisocyanate while in intimate contact with each other and with a metal acetylacetonate in which said metal is selected from the class consisting of Al, Co, Fe, Ni and Zr, the temperature of said reaction being in the range of 70°-150° C. and the amount of said metal acetylacetonate being in the range of 0.005-1 gram per equivalent weight of aromatic dianhydride.

4,421,906

## WATER-BASED EPOXY RESIN COATING COMPOSITION

Harold G. Waddill, and Kathy B. Sellstrom, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,685

Int. Cl.<sup>3</sup> C08G 59/60, 59/54

U.S. Cl. 528—111

15 Claims

1. An epoxy resin composition comprising:  
 (A) a diglycidyl ether comprising a condensation product of  
 (a) epichlorohydrin with  
 (b) a bisphenol A type resin or derivative thereof which diglycidyl ether has been partially reacted with a polyoxyalkyleneamine of molecular weight of 900 to 5000; and  
 (B) a reactive polyamidopolyamine prepared from reaction of multi-functional carboxylic acids, esters, anhydrides

and mixtures thereof with a polyfunctional amine selected from the group consisting of aliphatic, cycloaliphatic and aromatic polyfunctional amines and mixtures thereof.

4,421,907

## METHOD FOR MAKING POLYETHERIMIDE

Lawrence R. Schmidt, Schenectady, and Eric M. Lovgren, Westerlo, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,849

Int. Cl.<sup>3</sup> C08G 73/10

U.S. Cl. 528—128

25 Claims

1. A process for the continuous polymerization of polyetherimide which comprises  
 (1) dry-blending aromatic bis(ether anhydride) and organic diamine,  
 (2) feeding the resulting solids into an extruder,  
 (3) conveying the solids to a melting stage in the extruder, where they are kneaded and melted via viscous heating at a temperature in the range of from about 50° C. to about 300° C. resulting in the production of a liquid pool,  
 (4) conveying the liquid of (3) to a mass transfer stage where water of reaction is vented to the atmosphere at temperatures of from 200° C. to 350° C.,  
 (5) conveying the resulting melt from the mass transfer stage of (4) to an advanced polymerization stage where the melt is further subjected to higher shear and intensive mixing at a temperature in the range of from 300° C. to 400° C. while being subjected to pressures of 1 atmospheres to 25 atmospheres, and  
 (6) and thereafter separating from the extruder polyetherimide and additional water of reaction.

4,421,908

PREPARATION OF POLYESTERS BY DIRECT  
 CONDENSATION OF HYDROXYNAPHTHOIC ACIDS,  
 AROMATIC DIACIDS AND AROMATIC DIOLS

Anthony J. East, Madison, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,991

Int. Cl.<sup>3</sup> C08G 63/18, 63/60

U.S. Cl. 528—181

15 Claims

1. A process for preparing a wholly aromatic polyester comprising reacting from 10 to 90 mole percent of at least one hydroxynaphthoic acid, from 5 to 45 mole percent of at least one aromatic dicarboxylic acid and from 5 to 45 mole percent of at least one aromatic diol in the presence of a catalytic amount of a metallic compound selected from the group consisting of the salt, oxide or organo-metallic derivative of antimony, titanium, tin and germanium under polymerization reaction conditions.

4,421,909

CYANACRYLIC ACID ESTER BASED GLUES WITH A  
 CONTENT OF A DIESTER OF A POLYOXYALKYLENE  
 GLYCOL

Werner Gruber, Korschbroich, and Hans-Athanas Bruhn, Garbsen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Division of Ser. No. 328,993, Dec. 9, 1981, Pat. No. 4,378,457.

This application Dec. 27, 1982, Ser. No. 452,881

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121119

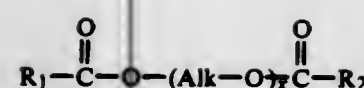
Int. Cl.<sup>3</sup> C08G 83/00

U.S. Cl. 528—362

4 Claims

1. Cyanacrylic acid ester based glues with a reduced setting time comprising an  $\alpha$ -cyanacrylic acid ester having from 1 to 12 carbon atoms in the alcohol moiety and from 0.005% to 3% by weight, based on the cyanacrylic acid ester of a polyoxyalkylene glycol diester having the formula:





wherein x is an integer from 5 to 80, Alk is an alkylene having from 2 to 4 carbon atoms, and R<sub>1</sub> and R<sub>2</sub> represent members selected from the group consisting of hydroxyl, halogen, lower alkoxy, alkoxyalkyl having from 3 to 12 carbon atoms, alkyl having from 1 to 12 carbon atoms, cyanoalkyl having from 1 to 12 carbon atoms, haloalkyl having from 1 to 12 carbon atoms, nitroalkyl having from 1 to 12 carbon atoms, cycloalkyl having from 3 to 12 carbon atoms, phenyl, nitrophenyl, halophenyl, phenylalkyl having from 1 to 6 carbon atoms in the alkyl and alkylphenyl having from 1 to 6 carbon atoms in the alkyl.

4,421,910

## POLYMER STABILIZATION

Jerry O. Reed and Ronald D. Mathis, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 24, 1982, Ser. No. 423,386

Int. Cl.<sup>3</sup> C08G 75/14

U.S. Cl. 528—388

14 Claims

1. A polymer composition exhibiting increase melt viscosity when subjected to heat comprising a poly(arylene sulfide) polymer containing a finite, but small effective amount, sufficient to promote polymer curing and cross-linking of at least one metal salt of dihydrocarbyl dithiophosphinic acid.

4,421,911

## DEOXYDESMYCOSIN

Tatsuro Fujiwara, Shizuoka; Eichi Honda, Mishima; Hideo Sakakibara, Mishima, and Takao Hirano, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Mar. 16, 1982, Ser. No. 358,805

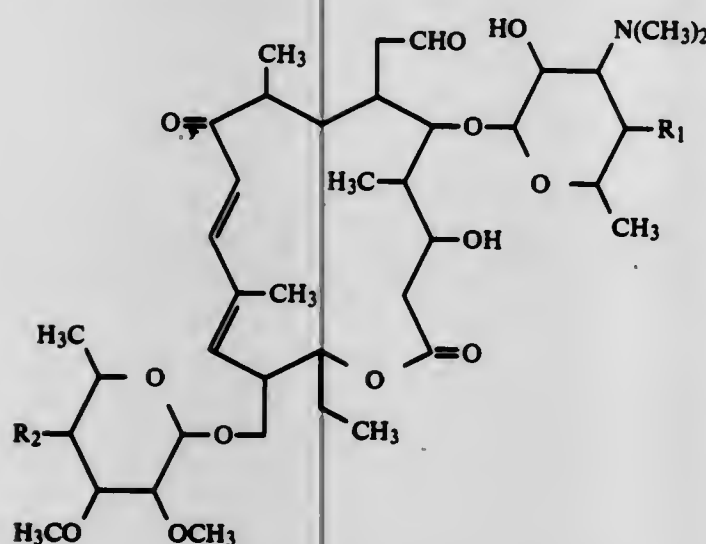
Claims priority, application Japan, Mar. 16, 1981, 56-38375

Int. Cl.<sup>3</sup> C07H 17/08; A61K 31/71

U.S. Cl. 536—7.1

4 Claims

1. A compound of the formula



wherein R<sub>1</sub> and R<sub>2</sub> are hydrogen or hydroxy and at least one of R<sub>1</sub> and R<sub>2</sub> is hydrogen, or a pharmaceutically acceptable salt thereof.

4,421,912

## CEPHALOSPORIN DERIVATIVES

Mitsuo Numata, Osaka; Isao Mimamida, Kyoto; Masayoshi Yamaoka; Mitsuru Shiraishi, both of Osaka, and Toshio Miyawaki, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 863,719, Dec. 23, 1977, Pat. No. 4,379,924, which is a division of Ser. No. 534,782, Dec. 20, 1974, Pat. No. 4,080,498. This application Feb. 18, 1981, Ser. No. 235,609

Claims priority, application Japan, Dec. 25, 1973, 48-1521; Feb. 20, 1974, 49-20752; Apr. 15, 1974, 49-42574; Jul. 17, 1974, 49-82623; Nov. 13, 1974, 49-131381

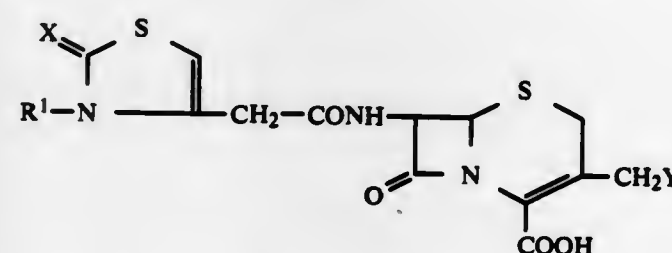
The portion of the term of this patent subsequent to Mar. 21, 1995, has been disclaimed.

Int. Cl.<sup>3</sup> C07D 501/34

U.S. Cl. 544—27

29 Claims

1. A compound of the formula:



Wherein R<sup>1</sup> represents hydrogen or an alkyl group, X represents oxygen or sulfur or a group of formula NR<sup>2</sup> where R<sup>2</sup> is hydrogen or an alkyl group and in the case of alkyl, R<sup>2</sup> may form a ring jointed with R<sup>1</sup>, and Y represents acetoxy group or a group of formula —SR<sup>3</sup> where R<sup>3</sup> is a nitrogen-containing heterocyclic group, or a pharmaceutically acceptable salt thereof.

4,421,913

## SEPARATION OF TRIPHENYLPHOSPHINE OXIDE FROM METHOTREXATE ESTER AND PURIFICATION OF SAID ESTER

James A. Ellard, and James A. Webster, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 143,129, Apr. 23, 1980, abandoned.

This application Dec. 11, 1981, Ser. No. 329,869

Int. Cl.<sup>3</sup> C07D 475/08

U.S. Cl. 544—260

2 Claims

1. In the preparation of methotrexate by the Ellard process, which involves the coupling of dimethyl-N-[4-(methylamino)-benzoyl]-L-glutamate with a 6-(bromomethyl)-2,4-diaminopteridine derivative to form the methotrexate ester, and further in a step involving the quenching and separation of the methotrexate ester, utilizing a biphasic solution and the use of an organic solvent selected from the group consisting of benzene, toluene, and xylene to form a two-phase system wherein the methotrexate ester is recovered in the aqueous phase and a byproduct triphenylphosphine oxide is separated and recovered in the organic solvent.

4,421,914

## THIAZOLO[3,2-a]PYRIMIDINES, DERIVATIVES THEREOF, PROCESSES FOR PRODUCTION THEREOF, AND PHARMACEUTICAL USE THEREOF

Noriaki Okamura, Chofu; Takeshi Toru, Hachioji; Takeo Oba, Hino; Toshio Tanaka, Hino; Kiyoshi Bannai, Hino; Kenzo Watanabe, Hino; Seiji Kurozumi, Kokubunji; Tatsuyuki Naruchi, Hino, and Keiji Komoriya, Hachioji, all of Japan, assignors to Teijin Limited, Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,329

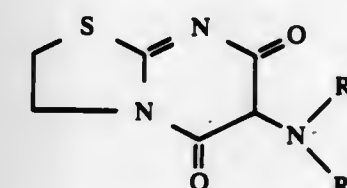
Claims priority, application Japan, Oct. 15, 1980, 55-142869; Aug. 10, 1981, 56-124173

Int. Cl.<sup>3</sup> C07D 513/14; A61K 31/505

U.S. Cl. 544—278

2 Claims

1. A compound selected from thiazolo[3,2-a]pyrimidines represented by the following general formula:



wherein R<sup>1</sup> and R<sup>2</sup> are identical or different, and each represents a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 3 to 10 carbon atoms, a substituted or unsubstituted phenyl group, a substituted or unsubstituted cycloaliphatic group having 3 to 8 carbon atoms, a substituted or unsubstituted phenylalkyl group or a substituted or unsubstituted acyl group having 2 to 7 carbon atoms, each of the above-mentioned substituted groups being substituted by a substituent selected from the group consisting of a halogen atom, a hydroxy group, a C<sub>1-4</sub> alkyl group which may be substituted by one or more halogen atoms, a C<sub>1-4</sub> alkoxy group which may be substituted by one or more halogen atoms, a nitrile group, a carboxyl group, and an alkoxy carbonyl group having 2 to 7 carbon atoms, provided that R<sup>1</sup> and R<sup>2</sup> are not simultaneously hydrogen atoms or substituted or unsubstituted acyl groups having 2 to 7 carbon atoms, or their enolate derivatives, or acid addition salts of these compounds.

4,421,915

## POLYMERIZABLE ETHYLENICALLY UNSATURATED AMIDE COMPOUNDS

Ignazio S. Ponticello; Kenneth R. Hollister, and Richard C. Tuites, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

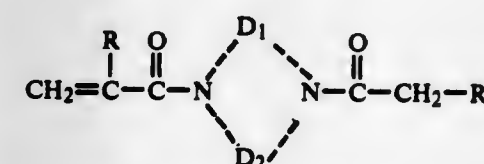
Division of Ser. No. 157,600, Jun. 9, 1980, Pat. No. 4,346,231, which is a division of Ser. No. 85,138, Oct. 15, 1979, Pat. No. 4,247,673, which is a division of Ser. No. 971,463, Dec. 20, 1978, Pat. No. 4,215,195. This application Apr. 19, 1982, Ser. No. 370,002

Int. Cl.<sup>3</sup> C07D 241/04

U.S. Cl. 544—387

5 Claims

1. A compound of the formula:



wherein R is hydrogen or methyl; R<sup>1</sup> is cyano or



wherein R<sup>2</sup> is alkyl of 1 to 6 carbon atoms; and D<sub>1</sub> and D<sub>2</sub> are groups of the formula:

together are the carbon atoms necessary to complete a six-membered saturated ring.

4,421,916

## INTERMEDIATES FOR OCTAHYDROBENZOFURO[3,2-E]ISOQUINOLINES

Ashokkumar B. Shenvi, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

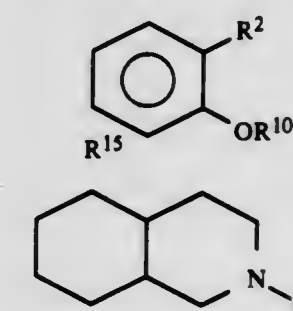
Filed Dec. 28, 1981, Ser. No. 334,839

Int. Cl.<sup>3</sup> C07D 217/04

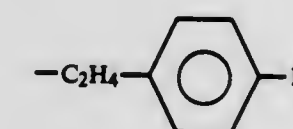
U.S. Cl. 546—14

2 Claims

1. The compound, Compound X, having the formula:



wherein R<sup>1</sup> is C<sub>1-10</sub> alkyl, —CH<sub>2</sub>R<sup>6</sup> or



R<sub>2</sub> is —H or C<sub>1-12</sub> alkoxy; R<sup>6</sup> is C<sub>3-6</sub> cycloalkyl, phenyl or 2-tetrahydrofuryl optionally substituted with a methyl group; R<sup>7</sup> is —H or C<sub>1-3</sub> alkyl; R<sup>10</sup> is C<sub>1-10</sub> alkyl; and R<sup>15</sup> is C<sub>1-3</sub> alkyl carbonyloxy, —OH, or —OCH(R<sup>12</sup>)OR<sup>13</sup> wherein R<sup>12</sup> and R<sup>13</sup> are —H or C<sub>1-3</sub> alkyl and taken together may form a C<sub>2-5</sub> alkylene group, optionally substituted with a methyl group, except that R<sup>12</sup> and R<sup>13</sup> may not both be —H, or R<sup>15</sup> may be R<sup>11</sup> or R<sup>14</sup> wherein R<sup>11</sup> is —Cl, —Br, —I, p—MeC<sub>6</sub>H<sub>4</sub>SO<sub>3</sub>—MeSO<sub>3</sub> and R<sup>14</sup> is Me<sub>3</sub>SiO— or t—BuMe<sub>2</sub>SiO—.

4,421,917

## DERIVATIVES OF 2-UREIDO-7-PHENYLHEXAHYDROBENZO[a]-QUINOLIZINES

Bruce E. Maryanoff, New Hope, and David F. McComsey, Warminster, both of Pa., assignors to McNeilab, Inc., Fort Washington, Pa.

Filed Jul. 16, 1982, Ser. No. 399,029

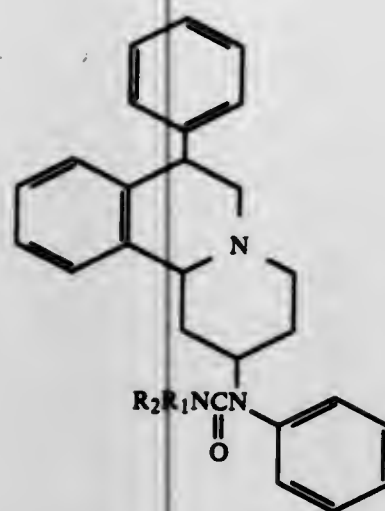
Int. Cl.<sup>3</sup> C07D 455/06

U.S. Cl. 546—95

5 Claims

1. A compound selected from the group consisting of compounds of the formula:





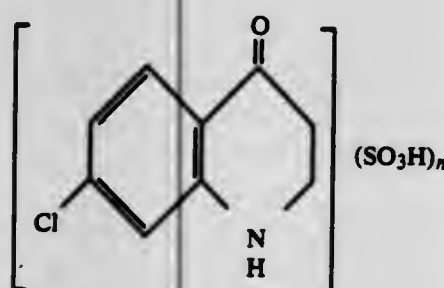
and non-toxic, pharmaceutically-acceptable acid addition salts thereof, wherein  $R_1$  is H or a  $C_{1-3}$  lower alkyl and  $R_2$  is a  $C_{1-6}$  lower alkyl.

4,421,918

**PROCESS FOR THE PREPARATION OF 7-CHLORO-1,2,3,4-TETRAHYDROQUINOLIN-4-ONE**  
Michel Baudouin, St. Fons, and Hubert Linares, Caluire, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jan. 15, 1982, Ser. No. 339,704  
Claims priority, application France, Jan. 16, 1981, 81 00763  
Int. Cl.<sup>3</sup> C07D 215/22

U.S. Cl. 546—153 4 Claims  
1. A process for the preparation of 7-chloro-1,2,3,4-tetrahydroquinolin-4-one which comprises cyclizing 3-m-chloroanilinopropionic acid by means of an oleum, then desulphonating the intermediate aromatic sulphonic acids of the formula:



(wherein  $n$  is 1 or 2) by means of dilute sulphuric acid, and then isolating the 7-chloro-1,2,3,4-tetrahydroquinolin-4-one obtained.

4,421,919

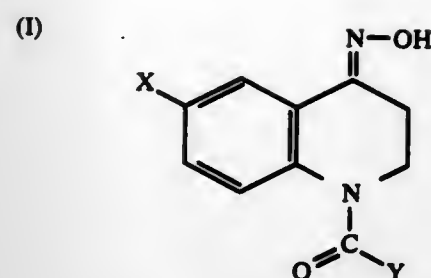
**4-OXIMINO-1,2,3,4-TETRAHYDROQUINOLINE DERIVATIVES**

Susumu Jinbo; Shoichi Kohno, and Kotchi Kashima, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd. and Mochida Selyaku Kabushiki Kaisha, both of Tokyo, Japan  
Filed Jul. 7, 1981, Ser. No. 281,243

Claims priority, application Japan, Jul. 28, 1980, 55-103272; Jul. 28, 1980, 55-103273; Mar. 19, 1981, 56-39909; Mar. 19, 1981, 56-39910; Mar. 19, 1981, 56-39911

Int. Cl.<sup>3</sup> C07D 215/48, 215/42; A61K 31/47

U.S. Cl. 546—159 5 Claims  
1. A 4-oximino-1,2,3,4-tetrahydroquinoline derivative of the formula (I):



wherein  $X$  represents a halogen, and  $Y$  represents hydrogen, a straight-chain or branched-chain alkyl group of 1 to 9 carbon atoms, a trifluoromethyl group, a phenylmethyl group, a phenylethylene group, a pyridyl group, a straight-chain or branched-chain alkoxy group of 1 to 3 carbon atoms, an amino group substituted by an alkyl group of 1 to 2 carbon atoms, or a phenylamino group.

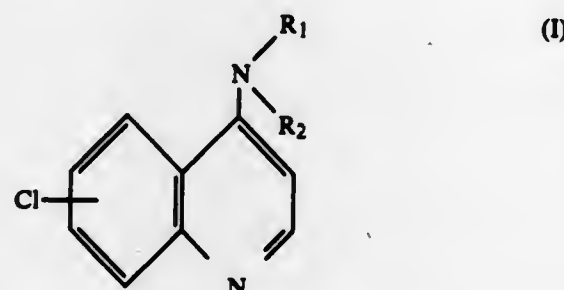
4,421,920

**PROCESS FOR THE PREPARATION OF 4-AMINO-CHLOROQUINOLINES**

Michel Baudouin, St. Fons, and Daniel Michelet, Tassin, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jan. 15, 1982, Ser. No. 339,722  
Claims priority, application France, Jan. 16, 1981, 8100765  
Int. Cl.<sup>3</sup> C07D 215/42, 215/44, 215/46

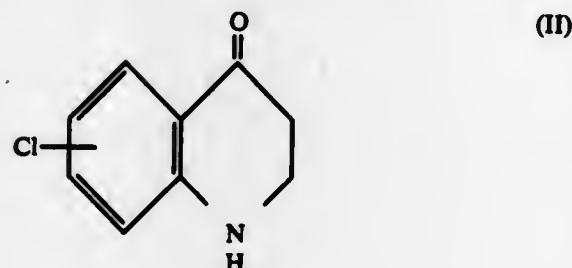
U.S. Cl. 546—163 11 Claims  
1. A process for the preparation of a 4-amino-chloroquinoline of the formula:



in which  $R_1$  represents hydrogen or alkyl of 1 through 5 carbon atoms, and  $R_2$  represents alkyl of 1 through 5 carbon atoms, alkyl of 1 through 5 carbon atoms substituted by a dialkylamino group of which each alkyl radical contains 1 through 4 carbon atoms, phenyl, or phenyl substituted by one or more radicals selected from carboxy and hydroxy and alkyl radicals of 1 through 4 carbon atoms optionally substituted by a dialkylamino group of which each alkyl radical contains 1 through 4 carbon atoms, which comprises carrying out the condensation of an amine of the general formula:



in which  $R_1$  and  $R_2$  are as hereinbefore defined, with a chloro-1,2,3,4-tetrahydroquinolin-4-one of the formula:



with aromatisation of the tetrahydroquinoline, the reaction being carried out in the presence of a ruthenium based catalyst on a support.

4,421,921

**PROCESS FOR THE PRODUCTION OF 3-PICOLINE**  
James I. Grayson, Visp, and Rolf Dinkel, Münchenstein, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Filed Sep. 8, 1982, Ser. No. 415,835  
Claims priority, application Switzerland, Sep. 29, 1981, 6250/81

Int. Cl.<sup>3</sup> C07D 213/09, 213/12, 213/10

U.S. Cl. 546—251 13 Claims

1. Process for the production of 3-picoline comprising reacting acrolein or a mixture of acrolein and formaldehyde in the liquid aqueous phase at a temperature of 180° to 280° C. in a closed vessel in the presence of ammonia and/or ammonium ions and in the presence of anions of an inorganic and/or organic acid, which has an acid dissociation constant of  $10^6$  to  $10^{-12}$  at 20° C.

4,421,922

**PROCESS FOR THE PRODUCTION OF TETRONIC ACID**  
Raimund Miller, Hackensack, N.J., and Leander Tenud, Visp, Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Filed Jun. 14, 1982, Ser. No. 388,431  
Claims priority, application Switzerland, Jun. 17, 1981, 3983/81

Int. Cl.<sup>3</sup> C07D 307/60

U.S. Cl. 549—313 22 Claims

1. Process for the production of tetronic acid from 4-haloacetoacetic ester comprising converting a 4-haloacetoacetic ester into the corresponding 4-benzyloxyacetoacetic ester, forming the 4-benzyloxyacetoacetic ester by hydrogenolysis into the corresponding 4-hydroxyacetoacetic ester, and converting the 4-hydroxyacetoacetic ester by treatment with acid into tetronic acid.

4,421,923

**RING SUBSTITUTED CROWN ETHERS AND METHOD OF PRODUCING SAME**

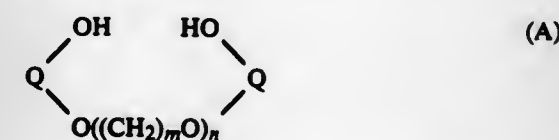
Richard A. Bartsch, Lubbock, Tex., assignor to PCR Research Chemicals, Inc., Gainesville, Fla.

Filed Dec. 12, 1980, Ser. No. 215,680

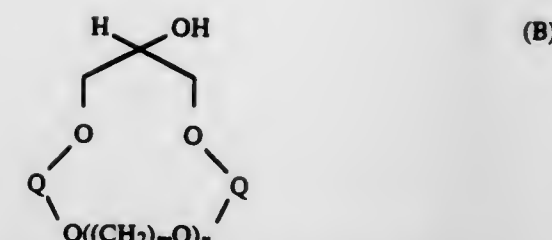
Int. Cl.<sup>3</sup> C07D 323/00

U.S. Cl. 549—349 6 Claims

1. A process for making a macrocyclic polyether which comprises reacting in an aqueous medium a dihydroxy ether having the general formula:



wherein  $Q$  is a bivalent organic cyclic radical containing at least 6 carbon atoms and selected from phenylene, naphthylene, phenyl phenylene and mono or poly-substituted phenylene, naphthylene, and phenyl phenylene where the substituent group is selected from hydrocarbyl groups containing from 1 to 12 carbon atoms, halogen, alkoxy groups containing from 1-6 carbon atoms, acetyl, acetonyl, and nitro, vicinal carbon atoms of which are directly attached to oxygen atoms in the dihydroxy ether; and  $m$  and  $n$  are integers selected from 1, 2 and 3, with an epihalohydrin in the presence of an alkali metal hydroxide and recovering a product having the general formula:



wherein  $Q$ ,  $m$ , and  $n$  have the meanings ascribed above.

4,421,924

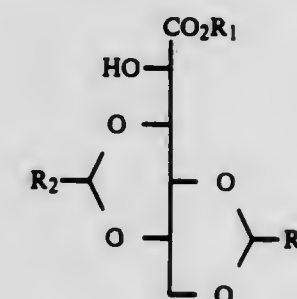
**ASCORBIC ACID INTERMEDIATES AND THEIR PREPARATION**

Thomas C. Crawford, County of New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 146,239, May 5, 1980, Pat. No. 4,283,340, which is a division of Ser. No. 805,880, Jun. 13, 1977, Pat. No. 4,232,168. This application Apr. 24, 1981, Ser. No. 257,208  
Int. Cl.<sup>3</sup> C07D 407/00

U.S. Cl. 549—370 1 Claim

1. A process for preparing a 3,5:4,6 protected derivative of gulonic acid which comprises contacting D- or L-gulono-1,4-lactone with either at least two equivalents of an aldehyde dialkyl acetal of the formula  $R_2CH(OR_1)_2$  or at least two equivalents of an aldehyde of the formula  $R_2CHO$  and at least one equivalent of an alcohol of the formula  $R_1OH$  in the presence of an acid having a  $pK_a$  less than 3 at a temperature of from about 0° to about 70° C. to obtain a compound of the formula



wherein  $R_1$  is alkyl having 1 to 6 carbon atoms and  $R_2$  is alkyl having 1 to 6 carbon atoms, phenyl or monosubstituted or disubstituted phenyl wherein said substituents are alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, chloro, bromo, fluoro or nitro.

4,421,925

**4-ALKOXY-1,3-DIOXANE-5-CARBONITRILES AND PROCESS FOR PREPARING THE SAME**

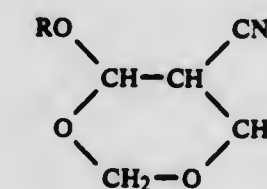
Sumio Umemura; Kozo Fujii; Kelgo Nishihira; Hiroyuki Sawada; Shuji Tanaka; Mamoru Nakai; Hiroshi Yoshida, and Yoshiaki Kuroki, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed May 5, 1982, Ser. No. 375,203  
Claims priority, application Japan, May 19, 1981, 56-74194; Sep. 30, 1981, 56-153814; Oct. 12, 1981, 56-160986

Int. Cl.<sup>3</sup> C07D 319/06

U.S. Cl. 549—372 11 Claims

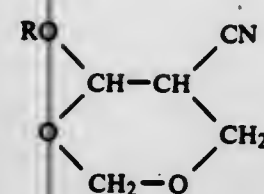
1. A 4-alkoxy-1,3-dioxane-5-carbonitrile represented by the formula



wherein  $R$  represents a lower-alkyl group.



3. A process for preparing a 4-alkoxy-1,3-dioxane-5-carbonitrile of the formula



wherein R is a lower-alkyl group, which comprises reacting at a temperature between  $-20^{\circ}\text{C}$ . and  $300^{\circ}\text{C}$ . a 3-alkoxy-2-propenenitrile of the formula  $\text{RO}-\text{CH}=\text{CH}-\text{CN}$  with formaldehyde in the presence of an acid catalyst, said formaldehyde being in an amount of 1 to 20 moles in terms of the aldehyde based on one mole of the 3-alkoxy-2-propenenitrile.

**4,421,926**  
**PROCESS FOR CO-ALKOXYLATION OF HALOSILANES AND SEPARATION OF THE RESULTING PRODUCTS**  
Luisito A. Tolentino, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 28, 1982, Ser. No. 393,011

Int. Cl.<sup>3</sup> C07F 7/08, 7/18, 7/04

U.S. Cl. 556-471

44 Claims

1. A process for converting a mixture of at least two different halosilanes having the general formula,  $\text{R}_n\text{SiX}_{4-n}$  to at least two different alkoxyhalanes having the formula,  $\text{R}_n\text{Si}(\text{OR}')_{4-n}$ , where R and R' are selected from the group consisting of saturated or unsaturated alkyl radicals of 1 to about 8 carbon atoms, substituted saturated or unsaturated alkyl radicals of 1 to about 8 carbon atoms, cyclic carbon groups of about 4 to about 10 carbon atoms, substituted cyclic carbon groups of about 4 to about 10 carbon atoms, and except for R', hydrogen; X is halogen; and n is 0 to 3; and separating the alkoxyhalanes, comprising:

- charging a reboiler equipped with a column with at least one compound selected from the group consisting of an alcohol having the formula,  $\text{R}'\text{OH}$ , and, optionally, at least one halosilane having the formula,  $\text{R}_n\text{SiX}_{4-n}$ , or the corresponding alkoxyhalane having the formula  $\text{R}_n\text{Si}(\text{OR}')_{4-n}$ ; where R and R' are selected from the group consisting of saturated or unsaturated alkyl radicals of 1 to about 8 carbon atoms, substituted saturated or unsaturated alkyl radicals of 1 to about 8 carbon atoms, cyclic carbon groups of about 4 to about 10 carbon atoms, substituted cyclic carbon groups of about 4 to about 10 carbon atoms, and except for R', hydrogen; X is halogen; and n is 1 to 3; the lower end of the column being connected to the reboiler;
- heating the reboiler at a temperature to cause the contents of the reboiler to reflux in the column;
- feeding at least two halosilanes having the formula,  $\text{R}_n\text{SiX}_{4-n}$ , where R, X and n are defined above, into the column;
- introducing an alcohol having the formula,  $\text{R}'\text{OH}$ , where R' is defined above, into the column at a point wherein the alcohol passes into a reaction zone in the column, and the alcohol and the halosilanes react in the reaction zone to form the corresponding alkoxyhalanes and hydrogen chloride;
- removing the hydrogen chloride;
- collecting at least two alkoxyhalanes; and
- separating the alkoxyhalanes.

**4,421,927**  
**NEW CINNAMOYL-CINNAMIC ACID DERIVATIVE, AND ITS USE AS PHARMACEUTICAL**  
Francois Picart, Dijon, France, assignor to Societe de Recherches Industrielles (S.O.R.I.), Paris, France

Filed Oct. 22, 1981, Ser. No. 314,041

Claims priority, application France, Oct. 23, 1980, 80 22693

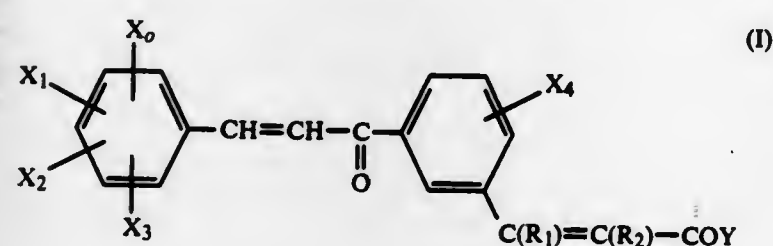
Int. Cl.<sup>3</sup> C07C 69/76

U.S. Cl. 424-248.55

6 Claims

1. A new cinnamoyl-cinnamic acid derivative, characterised in that it is selected from the group consisting of:

(i) the m-cinnamoyl-cinnamic acid derivatives of formula:



wherein:

$\text{X}_0, \text{X}_1, \text{X}_2, \text{X}_3, \text{X}_4$ , are identical or different, and are selected from the group consisting of hydrogen, a halogen, a lower alkyl group, a lower alkoxy group, the group  $\text{NRR}'$  (where R and R', identical or different, are selected from the group consisting of hydrogen or a lower alkyl group), the group  $\text{NO}_2$ ,  $\text{CF}_3$  or  $\text{OH}$ ;

$\text{R}_1$  represents hydrogen or a lower alkyl group;

$\text{R}_2$  represents hydrogen or the methyl group;

Y represents a group  $\text{OH}$ ,  $\text{OR}_3$  (where  $\text{R}_3$  is a lower alkyl group),  $\text{NRR}'$  (where R and R' are defined as hereinabove) or the group  $\text{O}(\text{CH}_2)_n\text{NR}_4\text{R}_5$  (where n is an integer of value 1 to 5- and preferably 2 or 3-; and  $\text{NR}_4\text{R}_5$  is selected from the group consisting of the pyrrolyl, imidazolyl, pyrazolyl, imidazolidinyl, pyrrolidinyl, pyrazolidinyl, piperidyl, piperazinyl-morpholinyl, homopiperidinyl, 4-methylpiperidyl, 4-methyl-piperazinyl, 4-phenyl-piperazinyl, 4-p-chlorophenylpiperazinyl and 4- $\beta$ -hydroxyethyl-piperazinyl groups);

(ii) their geometrical isomers; and

(iii) their salts.

**4,421,928**  
**4-METHYL-3-FORMYL-PENTANOIC ACID ESTERS**  
Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 25, 1982, Ser. No. 352,259

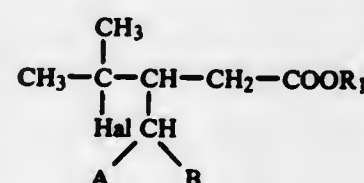
Claims priority, application France, Feb. 26, 1981, 81 03832

Int. Cl.<sup>3</sup> C07C 69/708, 69/716

U.S. Cl. 560-177

5 Claims

1. A compound of the formula



wherein Hal is a halogen,  $\text{R}_1$  is 1 to 12 carbon atoms and A and B are  $=\text{O}$  or A is halogen and B is  $\text{OR}_2$  and  $\text{R}_2$  is alkyl of 1 to 12 carbon atoms.

**4,421,929**  
**TETRACARBOXYLIC ACIDS**  
Edmund P. Woo, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

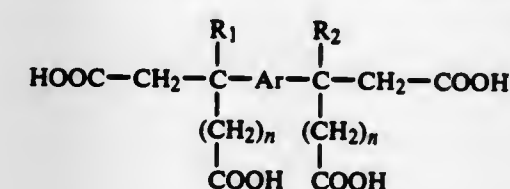
Continuation-in-part of Ser. No. 113,896, Jan. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 53,672, Jul. 2, 1979, abandoned. This application Dec. 2, 1981, Ser. No. 326,717

Int. Cl.<sup>3</sup> C07C 59/00, 65/00

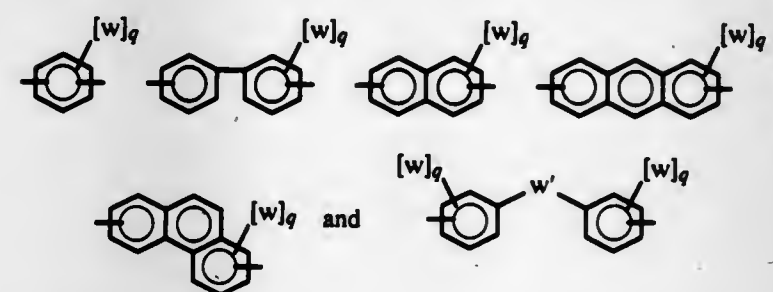
U.S. Cl. 562-465

8 Claims

1. A tetracarboxylic acid compound of the formula



wherein Ar is a  $\text{C}_{6-20}$  arylene radical selected from the group consisting of:



wherein w in each occurrence is halo, nitro, or a  $\text{C}_{1-10}$  radical selected from alkyl, aryl alkaryl, aralkyl, haloalkyl, haloaryl, aryloxy and alkoxy; q is an integer from zero to 4; and w' is oxygen, sulfur, alkylene, oxyalkylene, alkylenedioxy, or polyoxyalkylene;  $\text{R}_1, \text{R}_2$  individually are hydrogen or alkyl, aryl, aralkyl, or alkaryl radicals containing up to 10 carbon atoms; and both n's are zeros or ones.

**4,421,930**  
**PROCESS FOR PREPARING A PUMPABLE SURFACE-ACTIVE PRODUCT BASED ON POLYESTER ACETIC ACID**  
Nicolaas A. I. van Paassen, Bodegraven, and Hermanus C. H. van Riel, Waddinxveen, both of Netherlands, assignors to Chem-Y Fabriek van Chemische Produkten B.V., Bodegraven, Netherlands

Filed Aug. 18, 1981, Ser. No. 294,041

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1980, 3032061

Int. Cl.<sup>3</sup> C07C 59/66, 59/10

U.S. Cl. 562-470

8 Claims

1. A process for preparing a pumpable liquid surface-active product, based on polyether acetic acid, which comprises to a crude reaction mixture, obtained in extremely viscous, pasty or almost solid form by reacting, in a non-aqueous alkaline medium, an adduct of the formula  $\text{RO}-(\text{C}_2\text{H}_4\text{O})_x\text{H}$  with a compound  $\text{Hal}-\text{CH}_2\text{COOM}$ , wherein R is a hydrophobic, aliphatic or aliphatic-aromatic residue, x is a number having an average value of 0.5-10, Hal is a halogen atom and M represents an alkali metal, adding an amount in the range of 1-10% of water effective to obtain a substantial decrease in viscosity without the occurrence of gelling and such an amount of acid that a 10 percent aqueous solution of the product shows a pH in the range of 4-7, said amount of acid being insufficient to cause phase separation, to provide said pumpable liquid surface-active product.

**4,421,931**  
**PREPARATION OF ANTHRANILIC ACID AMIDES**  
Peter Tonne, Neustadt; Winfried Ludwig, Gruenstadt; Gerhard Kilpper, Carlsberg, and Johannes Grimmer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,243

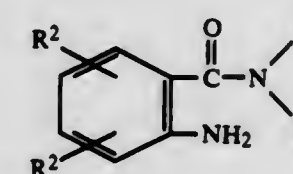
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103563

Int. Cl.<sup>3</sup> C07C 102/04, 103/28, 103/76

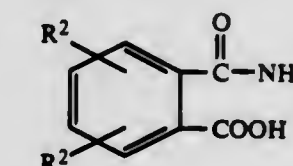
U.S. Cl. 564-139

13 Claims

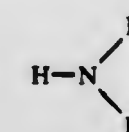
1. A process for the preparation of an anthranilic acid amide of the formula



where the individual radicals  $\text{R}^1$  and  $\text{R}^2$  can be identical or different and each is hydrogen or an aliphatic radical,  $\text{R}^1$  can also be cycloaliphatic, araliphatic or aromatic radical and  $\text{R}^2$  can also be halogen or alkoxy, wherein a phthalamic acid of the formula



where  $\text{R}^2$  has the above meaning, is reacted with a hypohalite and ammonia or an amine of the formula



where  $\text{R}^1$  has the above meaning, by dissolving the starting material II in aqueous alkali, mixing the solution with amido-sulfonic acid, sulfamide and/or potassium iodide as a catalyst and a hypohalite, leaving the mixture to stand for from 1 to 1,000 seconds, then introducing the amine and thereafter adding acid until the pH of the mixture is from 6 to 8.

**4,421,932**  
**MANUFACTURE OF QUATERNARY AMMONIUM COMPOUNDS**  
Horst Rutzen, Langenfeld, and Manfred Petzold, Duesseldorf-Holthausen, both of Fed. Rep. of Germany, assignors to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,810

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136564

Int. Cl.<sup>3</sup> C07C 89/00

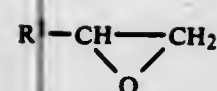
U.S. Cl. 564-292

10 Claims

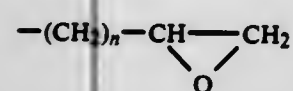
1. A process for the manufacture of a quaternary ammonium compound comprising the steps of:

- reacting in the presence of water a tertiary amine which is from about 50 to about 90 mole percent in the form of a salt of an inorganic or organic acid with a compound containing a terminal epoxy group to form a quaternary ammonium compound, wherein the compound containing a terminal epoxy group is selected from the group consisting of
- (i) a compound of the formula

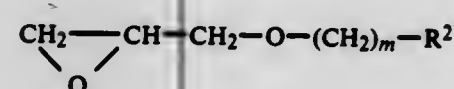




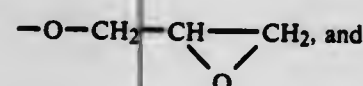
wherein R<sup>1</sup> is a straight or branched chain aliphatic hydrocarbon group having 1 to 21 carbon atoms or a group of the formula



wherein n is an integer of from 4 to 16, and (ii) a compound of the formula



wherein m is an integer of from 1 to 10, and R<sup>2</sup> is hydrogen, or a straight or branched chain aliphatic hydrocarbon group having from 1 to 24 carbon atoms, or a group of the formula



wherein the tertiary amine contains at least one straight or branched chain alkyl, hydroxyalkyl or aralkyl group or an N-heterocyclic group containing the nitrogen atom of the tertiary amine in the ring structure, in which such group contains less than 10 carbon atoms; and

(b) adding to the reaction mixture at the end of the reaction an inorganic acid, an acid salt, or an organic acid in an amount required for complete salt formation of the quaternary ammonium compound.

4,421,933

# PROCESS FOR THE CO-PRODUCTION OF KETONES AND MONO-OLEFINS

Johannes A. M. Van Broekhoven, and Christopher S. John, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 2, 1982, Ser. No. 394,598

Int. Cl.<sup>3</sup> C07C 45/00

U.S. Cl. 568-403

10 Claims

1. Process for the co-production of ketones and mono-olefins from secondary lower alcohols and cycloalkanols and conjugated di-olefins containing from 4 to 6 carbon atoms which comprises contacting in a reaction zone a feed mixture of said conjugated di-olefin and said secondary alcohol in a volume ratio of di-olefin to alcohol in the range from 1:30 to 2:1 at a temperature in the range from 70° to 130° C. with a supported heterogeneous copper-containing catalytic system containing between 1 and 35%w copper on carrier and withdrawing a ketone and mono-olefin-containing reaction product from said zone.

# PROCESS FOR THE PREPARATION OF δ-ETHYLENIC CARBONYL COMPOUNDS

Norbert Bluthé, Jacques Gore, both of Calluire, and Max MacLaria, Villeurbanne, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Mar. 5, 1982, Ser. No. 354,145

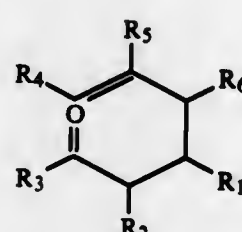
Claims priority, application France, Mar. 9, 1981, 81 04600; Jun. 23, 1981, 01 12300

Int. Cl.<sup>3</sup> C07C 45/51

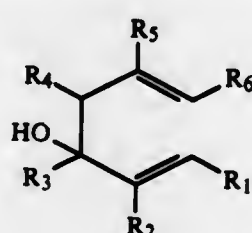
U.S. Cl. 568-341

8 Claims

1. A process for the preparation of δ-ethylenic carbonyl compounds of the general formula



in which R<sub>1</sub>, R<sub>2</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub>, which are identical or different, represent hydrogen or an acyclic hydrocarbon radical containing 1 to 20 carbon atoms, the chain of which may contain one or more double or triple bonds, and R<sub>3</sub> represents an acyclic hydrocarbon radical containing 1 to 20 carbon atoms, the chain of which may contain one or more double or triple bonds, it being understood that R<sub>1</sub> and R<sub>3</sub> can together form a trimethylene radical, or alternatively that R<sub>3</sub> and R<sub>4</sub> can together represent an alkylene radical  $-(CH_2)_n-$ , in which one or more carbon atoms may be substituted by one or more alkyl radicals containing 1 to 4 carbon atoms, and in which n represents an integer from 3 through 20 inclusive, by the rearrangement of a diethylenic alcohol of the general formula:



in which R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> are defined as above, which comprises carrying out the rearrangement at a temperature from -40° C. to 80° C., in the presence of a substantially stoichiometric amount of a mercuric salt, selected from the chloride, the acetate and the trifluoroacetate, or in the presence of a catalytic amount of a mercuric salt and a substantially stoichiometric amount of a lithium salt, and isolating the product obtained, if necessary after the reaction mixture has been treated with, as reducing agent, an alkali metal borohydride in a basic medium.

4,421,935

# PROCESS FOR THE PREPARATION OF BICYCLO [2.2.] HEPTENE DERIVATIVES

Pieter A. Verbrugge, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

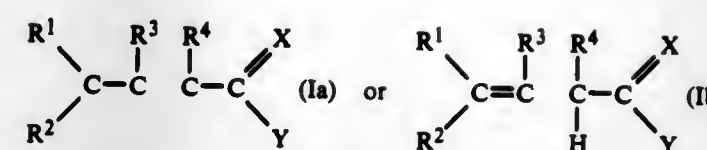
Filed May 3, 1982, Ser. No. 373,832

Int. Cl.<sup>3</sup> C07C 45/69

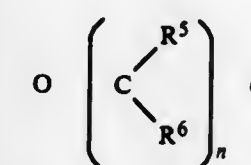
U.S. Cl. 568-343

10 Claims

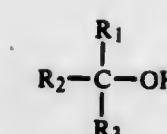
1. Process for the preparation of Diels-Alder type adducts which comprises reacting at a temperature less than about 25° C. a compound according to the general formula



or the corresponding hydrated derivative, wherein R<sup>1</sup>, R<sup>2</sup>, and R<sup>4</sup>, which may be the same or different, each represents a hydrogen atom or a lower alkyl group; R<sup>3</sup> represents a lower alkyl group; X represents an oxygen or sulphur atom or a group  $(O-CR^5R^6R^7)_2$  or



wherein R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup>, which may be the same or different, each represents a hydrogen atom or a lower alkyl group; n is an integer of from 2 up to 5 and Y represents a hydrogen atom, an alkyl or alkenyl group or Y and R<sup>2</sup> together form an alkylene group which may contain one or more hydrocarbyl substituents, with a cyclopentadiene and/or an oligomer thereof in the presence of an aqueous solution of a strong proton donor having a conjugate base with a low nucleophilicity, wherein the concentration of said donor is at least 25% of the reaction mixture, and wherein said donor is selected from sulphuric acid, phosphoric acid, perchloric acid, methane sulphonic acid, trihalomethane sulphonic acid and an aromatic sulphonic acid.



in which R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are selected from hydrogen, alkyl or alkoxyalkyl radicals, said aliphatic alcohol having 4 to 18 carbon atoms, and feeding the vaporized alcohol into a lower section of the column reactor at a rate of 2 to 4 moles of alcohol per mole of alkali metal hydroxide introduced into the column reactor;

(c) Reacting the aliphatic alcohol with the alkali metal hydroxide in the column reactor;

(d) Concurrently removing water from the alkali metal hydroxide solution and the alkoxide formation from an upper section of the column reactor in the form of an azeotrope;

(e) Continuously condensing and separating the azeotrope into an alcohol phase and a water phase, the water phase being removed from the process and the alcohol phase being returned to the column reactor;

(f) Recovering a substantially anhydrous reaction product comprising alkoxide product and aliphatic alcohol from a lower section of the column reactor while simultaneously maintaining a non-oxidizing atmosphere throughout the conduct of steps a through f.

4,421,937

# CRYSTAL PURIFICATION

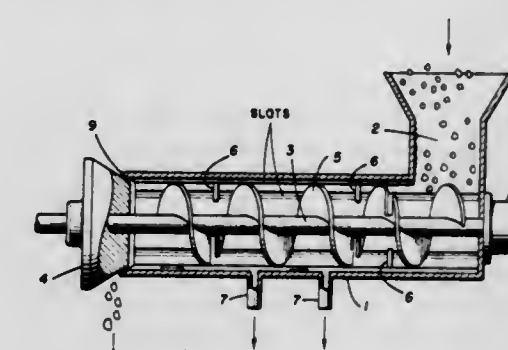
Dan K. Lynch, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 4, 1982, Ser. No. 336,549

Int. Cl.<sup>3</sup> C07C 37/84

U.S. Cl. 568-708

5 Claims



1. A process for the continuous separation of a feed mixture of 50-99 weight percent crystals of aromatic organic compounds selected from the group consisting of para-dichlorobenzene, para-nitrochlorobenzene, para-chlorophenol, 2,4-dichlorophenol, ortho-nitrophenol, para-nitrophenol, and trans-stilbene and 1-50 weight percent liquid comprising continuously feeding the mixture into a screw type press having a feed orifice, a substantially closed compression channel having drainage means and an ejection orifice, thereby subjecting the mixture to a pressure sufficient to substantially reduce interstitial space between crystals while maintaining the crystals at a temperature below their melting point, causing drainage and removal of a substantial portion of the liquid and leaving in the compression channel purified crystals with compressed interstitial space; and continuously ejecting the purified crystals.

# CONTINUOUS ALKOXIDATION PROCESS

Harry M. Smith, St. Albans, and Raymond D. Williams, Eleanor, both of W. Va., assignors to FMC Corporation, Philadelphia, Pa.

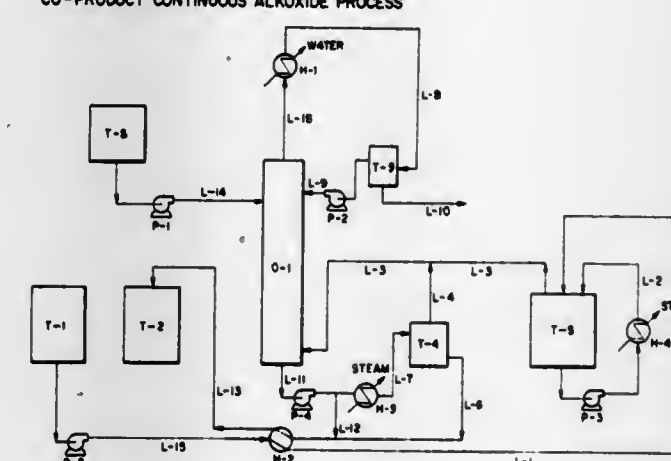
Continuation-in-part of Ser. No. 366,262, Apr. 7, 1982, abandoned. This application Mar. 31, 1983, Ser. No. 480,977

Int. Cl.<sup>3</sup> C07C 29/70, 43/13

U.S. Cl. 568-678

6 Claims

CO-PRODUCT CONTINUOUS ALKOXIDE PROCESS





4,421,938

## PREPARATION OF ALDEHYDES

Hassan Windawi, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 5, 1982, Ser. No. 365,718

Int. Cl.<sup>3</sup> C07C 45/29

U.S. Cl. 568—474

12 Claims

1. In a process for the conversion of an aliphatic alcohol containing from 1 to about 10 carbon atoms in the aliphatic chain to the corresponding aldehyde by reaction of the alcohol with an oxygen-containing gas at a temperature in the range of from about 200° C. to about 400° C., a pressure in the range of from about atmospheric to about 50 atmospheres and a liquid hourly space velocity in the range of from about 1 to about 10, the improvement which comprises reacting said alcohol and gas in the presence of a catalyst comprising at least two oxides of metals selected from the group consisting of molybdenum, tungsten, cobalt, nickel, manganese, iron and chromium, one of said oxides being molybdenum oxide or tungsten oxide, composited on a high surface area support selected from the group consisting of gamma-alumina, eta-alumina, theta-alumina, silica, zeolites, alumina-silica, alumina-zirconia, alumina-magnesia and alumina-zirconium-silica.

4,421,939

## PRODUCTION OF ETHANOL FROM ACETIC ACID

Ben W. Kiff, Lehigh Acres, Fla., and David J. Schreck, Cross Lanes, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 15, 1982, Ser. No. 434,562

Int. Cl.<sup>3</sup> C07C 31/08, 29/136

U.S. Cl. 568—885

6 Claims

1. Method of producing ethanol from acetic acid which comprises the steps:

- (1) contacting acetic acid with an olefinically unsaturated hydrocarbon having about 4 to about 10 carbon atoms, in the presence of a catalytic amount of an acidic esterification catalyst whereby an ester is obtained;
- (2) hydrogenating the ester from step (1) whereby a mixture of ethanol and a higher alcohol containing the same number of carbons as the olefinically unsaturated hydrocarbon from step (1) is obtained;
- (3) separating the mixture of step (2) by fractional distillation into ethanol and the higher boiling alcohol;
- (4) recovering the ethanol;
- (5) dehydrating the higher boiling alcohol into the original olefinically unsaturated hydrocarbon used in step (1); and
- (6) recycling the olefinically unsaturated hydrocarbon from step (5) with fresh acetic acid back to step (1) to repeat the process of esterification.

4,421,940

## PREPARATION OF NITROALKANES

William V. Hayes, Clute, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 25, 1982, Ser. No. 352,506

Int. Cl.<sup>3</sup> C07C 76/02

U.S. Cl. 568—948

10 Claims

1. In a process for making nitroalkanes by reacting an alkane with nitric acid in the vapor phase in the presence of an inert diluent gas, the improvement which comprises employing a catalyst of a salt or oxide of a metal of Group II in the periodic chart of the elements.

4,421,941

## CATALYST AND PROCESS FOR SELECTIVE PRODUCTION OF PARA-DIALKYSUBSTITUTED BENZENES

David H. Olson, Pennington, and Paul G. Rodewald, Rocky Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 223,878, Jan. 8, 1981, Pat. No. 4,379,761.

This application Sep. 10, 1982, Ser. No. 416,740

Int. Cl.<sup>3</sup> C07C 2/68

U.S. Cl. 585—467

11 Claims

1. A process for the selective production of para dialkyl substituted benzenes wherein the alkyl group contains from 1 to 4 carbon atoms which comprises contacting, under conversion conditions, a hydrocarbon precursor selected from the group consisting of mono alkyl-substituted benzenes having 1-4 carbon atoms in the alkyl substituent and a mixture of said precursor or benzene with an alkylation agent containing from 1 to 4 carbon atoms with a catalyst composition comprising

a porous crystalline zeolite, having silica deposited thereon as a result of contact with a silicone compound of a molecular size incapable of entering the pores of the zeolite and subsequent heating in an oxygen-containing atmosphere to a temperature in excess of 300° C. but below a temperature at which crystallinity of the zeolite is adversely affected at a rate such that the silicone compound does not volatilize being characterized by an activity, in terms of alpha value, of between about 2 and about 5000, a xylene sorption capacity greater than 1 gram/100 grams of zeolite and an ortho xylene sorption time for 30 percent of said capacity greater than 10 minutes, said sorption capacity and sorption time being measured at 120° C. and a pressure of 4.5±0.8 mm. of mercury and modified by the addition thereto of phosphorus, and

recovering from the resulting product mixture, a para-dialkyl-substituted benzene in an amount greater than the thermodynamic equilibrium concentration thereof in the total dialkyl substituted benzenes produced.

4,421,942

## THERMOCOUPLE MOUNTING SYSTEM

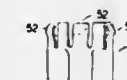
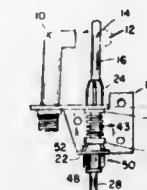
John F. Crichton, Oakville, Canada, assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 7, 1981, Ser. No. 328,176

Int. Cl.<sup>3</sup> H01L 35/28

U.S. Cl. 136—217

3 Claims



1. A thermocouple assembly for use with a burner in a mounting bracket with spaced openings for receiving the thermocouple, said assembly comprising an elongated thermocouple tube having a cylindrical outside surface which is mostly of uniform diameter but which includes a locating groove indented in and extending around the outside of the tube, said tube terminating in a closed tip at one end and an outwardly extending flange at the other end, and an elongated sheath having outer flanges for mounting it in a burner bracket, and having a cylindrical opening therethrough for receiving the thermocouple tube, the tube being long enough for its tip end to project out of one end of the sheath when the flange on the opposite end of the tube engages the sheath, said sheath having its said one end divided into integral fingers projecting parallel to the axis of said cylindrical opening and resiliently biased to press their tips toward the tube, the tips of said fingers having projections extending radially inward therefrom to enter into the locating groove, and the locating groove being positioned to receive the finger projections when the flange on the tube engages the sheath, whereby the tube is securely but removably held in a desired predetermined position.

4,421,943

## COLLAPSIBLE MOBILE SOLAR ENERGY POWER SOURCE

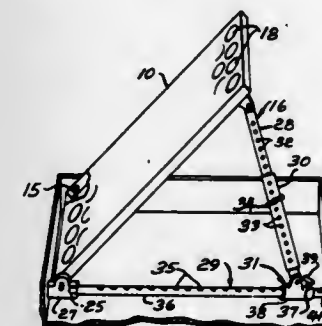
Eric M. Withjack, Broken Arrow, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Feb. 19, 1982, Ser. No. 350,507

Int. Cl.<sup>3</sup> H01L 31/04; F24J 3/02

U.S. Cl. 136—246

6 Claims



1. An apparatus for providing electrical energy from a mobile solar energy power source having collapsible solar energy collecting means, comprising:

- (a) at least one inner solar energy collecting means for collecting solar energy and converting the solar energy into electrical energy, said inner collecting means having an upper end and a lower end;
- (b) a main base including a front and a back thereof, said

## ELECTRICAL

main base pivotally mounted to the lower end of said inner collecting means such that said inner collecting means is free to pivot about the mounting axis between 0° and about 90° above the horizontal;

- (c) at least one inner support member for each inner collecting means, said inner support member having a first end and a second end, the first end of said inner support member pivotally connected in proximity to the upper end of said inner collecting means, said inner support member comprising an inner leg and an outer leg including respective longitudinal axes thereof, the inner leg slidably mated within the outer leg such that the longitudinal axis of the inner leg is longitudinally aligned with the longitudinal axis of the outer leg, the length of said inner support member changeable by sliding the inner leg within the outer leg along their respective longitudinal axes;
- (d) an inner guide member having a longitudinal axis, said inner guide member attached to said main base such that said inner guide member longitudinally traverses said main base between the front and the back thereof;
- (e) an inner sliding shoe pivotally connected to the second end of said inner support member, said inner sliding shoe mounted to said inner guide member for movement along said inner guide member between the front and the back of said main base such that movement of said sliding shoe along said inner guide member in combination with the sliding of the inner leg within the outer leg allows positioning of said inner collecting means at an angle between about 0° and about 90° above the horizontal; and
- (f) means for storing the electrical energy received from the inner solar energy collecting means and supplying the energy to an external receptable.

4,421,944

## PRINTED CIRCUITS

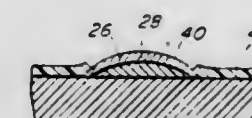
Raymond C. DesMarais, Jr., 1 Mansur St., North Chelmsford, Mass. 01863

Division of Ser. No. 103,157, Dec. 13, 1979, Pat. No. 4,327,124, which is a continuation of Ser. No. 928,876, Jul. 28, 1978, abandoned, which is a continuation of Ser. No. 707,355, Jul. 21, 1976, abandoned. This application Apr. 26, 1982, Ser. No. 372,094

Int. Cl.<sup>3</sup> H05K 1/09

U.S. Cl. 174—68.5

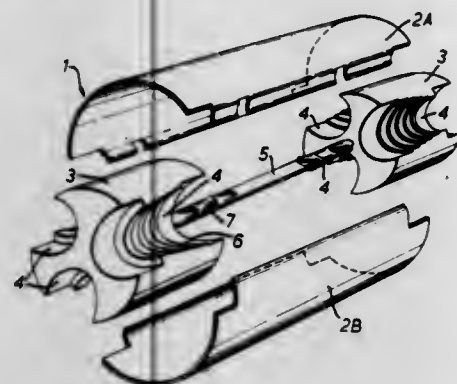
2 Claims



1. A printed circuit, comprising:
  - (a) a support stratum providing a dielectric surface;
  - (b) at least one circuit segment bonded to a selected area of said surface;
  - (c) said segment including a stratum of metal loaded resinous ink, a stratum of electrically conductive metal powder bonded to the surface of said ink and a stratum of electrically conductive solder alloyed to said stratum of metal powder;
  - (d) said stratum of metal loaded resinous ink including a phenolic based thermosetting resin of about 24% by weight, untreated copper powder of about 70% by weight, and a mixture of a catalyst of about 6% by weight comprised of anhydrous isopropanol and phosphoric acid;
  - (e) said stratum of electrically conductive metal powder bonded to the surface of said ink and being formed of copper; and
  - (f) said stratum of electrically conductive solder alloyed to said stratum of metal powder being a composition of a lead-tin alloy with antimony of about 80% by weight, an inorganic acid flux of about 5% by weight, and a binder of about 15% by weight, said solder stratum materially enhancing the conductivity of said circuit segment.

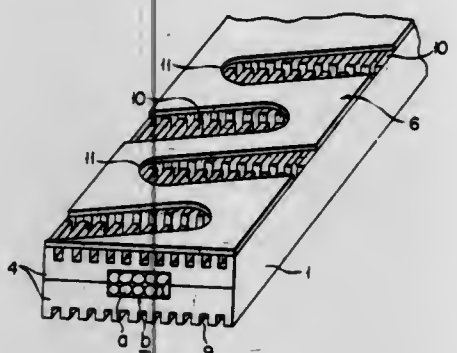


**4,421,945**  
**JUNCTION ASSEMBLY**  
 Marc F. Moisson, Strombeek-Bever, Belgium, assignor to N.V. Raychem S.A., Kessel, Belgium  
 Filed Feb. 16, 1978, Ser. No. 878,424  
 Claims priority, application United Kingdom, Apr. 21, 1977, 16699/77; Oct. 12, 1977, 42545/77  
 Int. Cl.<sup>3</sup> H02G 15/113, 15/18  
 U.S. Cl. 174-92



1. An assembly for protecting a junction between conduits, the assembly being openable to allow access to repair the junction and comprising (a) a tubular sleeve comprising a longitudinal split tube of internal diameter such that it can accommodate the junction, (b) support means for the split tube for positioning on each side of the junction, at least one support means being contoured to provide a plurality of laterally-enterable channels, each of at least some of the channels being capable in cooperation with the tubular sleeve of forming an outlet closed in cross-section for accommodating a conduit, (c) sealing means for independently sealing a conduit to a channel so that each conduit can be sealed into the assembly independently of any other conduit present therein, and (d) mechanical means for maintaining the outlet closed in cross-section.

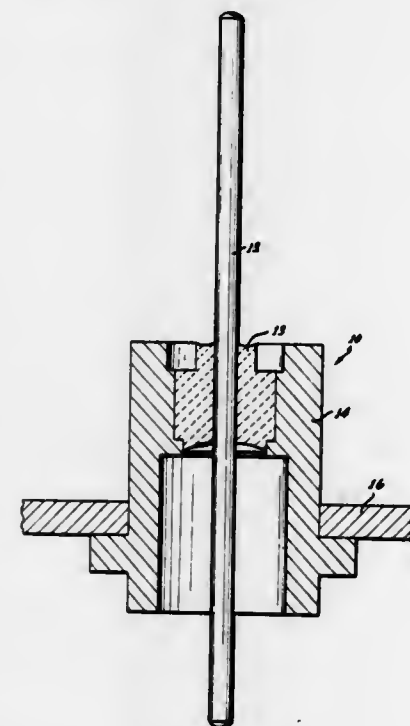
**4,421,946**  
**HIGH CURRENT CAPACITY SUPERCONDUCTOR**  
 Yoshio Furuto; Shinichiro Meguro, both of Shinagawa; Takuya Suzuki; Ikuo Ito, both of Nikko; Toshinari Ando, Ibaragi; Masataka Nishi, Ibaragi, and Susumu Shimamoto, Ibaragi, all of Japan, assignors to The Furukawa Electric Co., Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan  
 PCT No. PCT/JP80/00105, § 371 Date Jan. 8, 1981, § 102(e) Date Jan. 8, 1981, PCT Pub. No. WO80/02619, PCT Pub. Date Nov. 27, 1980  
 PCT Filed May 16, 1980, Ser. No. 230,952  
 Claims priority, application Japan, May 18, 1979, 54-61169  
 Int. Cl.<sup>3</sup> H01B 12/00  
 U.S. Cl. 174-128 S



1. In a composite superconductor having superconductive wires and electrically and thermally high conductive stabilizing metal electrically coupled in the longitudinal direction of the superconductive wires, a high current capacity superconductor to be used in direct contact with a liquid coolant

wherein the improvement comprises an inorganic compound film formed on the surface of the stabilizing metal.

**4,421,947**  
**POLYCRYSTALLINE INSULATING MATERIAL SEALS BETWEEN SPACED MEMBERS SUCH AS A TERMINAL PIN AND A FERRULE**  
 James C. Kyle, 24372 Via San Clemente, Mission Viejo, Calif. 92675, assignor to James C. Kyle, Roseburg, Oreg.  
 Continuation of Ser. No. 840,740, Oct. 11, 1977, abandoned.  
 This application Jan. 28, 1981, Ser. No. 229,151  
 Int. Cl.<sup>3</sup> H01B 17/26; C03C 27/02, 3/22  
 U.S. Cl. 174-152 GM

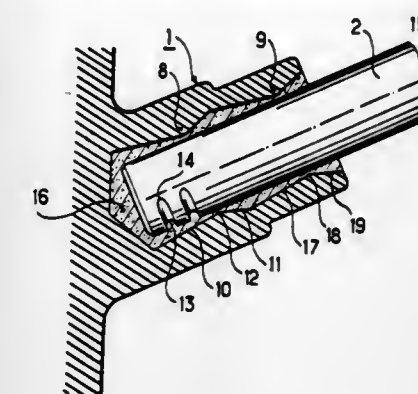


1. In combination, a first member made from a noble metal, a second member made from a material selected from the group consisting of titanium and an alloy of titanium and disposed in spaced relationship to the first member and having at least one of alpha ( $\alpha$ ) and beta ( $\beta$ ) phases, and an electrically insulating material preformed to provide partially amorphous and partially crystalline characteristics and hermetically sealing the first and second members and including at least one flux formed from the oxides of lead, silicon and boron, the insulating material being sealed to the first and second members, in at least one of the alpha ( $\alpha$ ) and beta ( $\beta$ ) phases of the second member, by the application of heat to the first and second members and to the insulating material at a particular temperature for a limited period of time, the insulating material having partially amorphous and partially crystalline characteristics in the sealed relationship with the first and second members.

**4,421,948**  
**LINE POST TYPE ELECTRIC INSULATOR**  
 Michel Willem, Abrest, France, assignor to Societe Anonyme dite: Ceraver, Paris, France  
 Filed Feb. 9, 1982, Ser. No. 347,200  
 Claims priority, application France, Feb. 13, 1981, 81 02890  
 Int. Cl.<sup>3</sup> H01B 17/16  
 U.S. Cl. 174-158 R

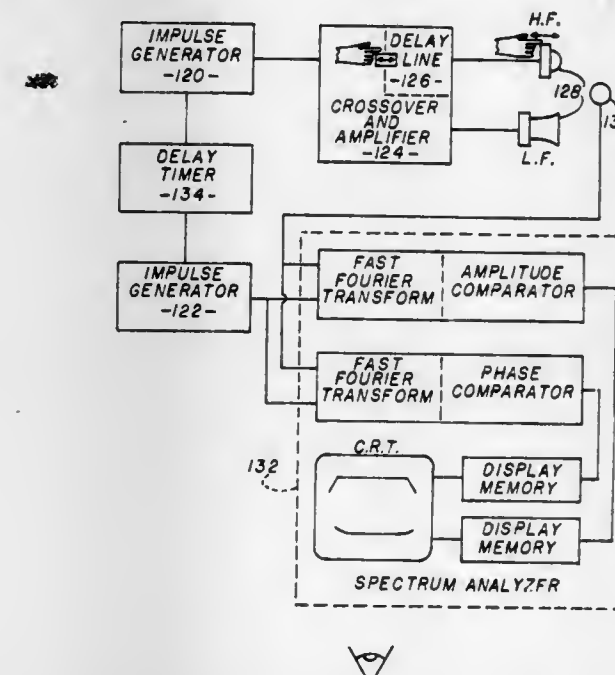
1. An electric line post type insulator which comprises a rod made of glass fibres and resin covered with an insulating coating, one end of said rod being held fast in a fitting designed to be fixed on a post, wherein said fitting has a recess substantially in the shape of a double cone for receiving said end of the rod

and embedding it in an organic substance, said end having at least one groove to provide positive anchoring, said groove



being formed only through the lower portion of the rod where the fibres are subjected to compression forces.

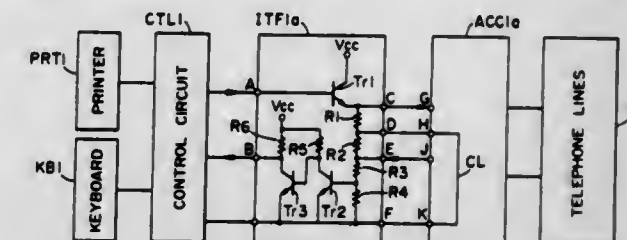
**4,421,949**  
**ELECTROACOUSTIC NETWORK**  
 Steven J. Eberbach, 950 Fountain St., Ann Arbor, Mich. 48103  
 Filed May 5, 1980, Ser. No. 146,254  
 Int. Cl.<sup>3</sup> H04R 1/22, 3/04, 3/14, 29/00  
 U.S. Cl. 381-98



1. A co-axial pair of high and low frequency electroacoustic drivers wherein the high frequency driver is mounted in front of the low frequency driver, a cross-over filter network connected in the electrical signal path to both drivers, and a delay network connected in the electrical signal path to the high frequency driver, the improvement comprising components of the filter and delay network being selected and adjusted for a substantially flat amplitude versus frequency response within the pass bands and through the cross-over frequency of the drivers and a substantially flat phase versus frequency response both within and beyond the pass bands of the low frequency filter driver network and the high frequency filter, delay and driver network, and, means to substantially prevent direct sound radiation between the high frequency driver and the low frequency driver without inhibiting direct sound radiation from the low frequency driver to the environment comprising a sound absorbent material surrounding the side and back of the high frequency driver and an annular open space between the low frequency driver and the sound absorbent material.

2. The method of adjusting the elements of an electroacoustic network including a delay network comprising the steps of: applying an electrical impulse signal to the signal path of the electroacoustic network and to a timer to trigger a delayed second identical impulse signal, applying the second impulse signal to one channel of a spectrum analyzer, sensing the acoustic output of the electroacoustic network and applying the sensed output signal electrically to another channel of the spectrum analyzer, generating a frequency by frequency comparison of the amplitudes of the two signals input to the channels of the spectrum analyzer and a frequency by frequency comparison of the relative phase angles of the two signals input to the channels of the spectrum analyzer, generating a Fourier analysis of the frequency by frequency comparisons of the signals in the spectrum analyzer, displaying and viewing the acoustic phase and amplitude versus frequency response curves resulting from the analysis, and in response thereto, adjusting the electroacoustic network to thereby flatten the acoustic phase and amplitude versus frequency response of the network.

**4,421,950**  
**COMMUNICATION DEVICE HAVING COUPLING MEANS**  
 Sakae Horyu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
 Filed Dec. 5, 1980, Ser. No. 213,592  
 Claims priority, application Japan, Dec. 18, 1979, 54-163474  
 Int. Cl.<sup>3</sup> H04M 11/00  
 U.S. Cl. 179-2 DP



1. A communication device comprising: input means for introducing input information; output means for recording or displaying the information to produce an output of the information; control means connected to said input means and said output means for controlling the input and the output, respectively, of the information; and coupling means including a first input portion for introducing the information from said control means, a first output portion for providing the information from said first input portion to an external unit, a second input portion for introducing the information from the external unit, a second output portion for providing the information introduced from said second input portion to said control means, a connection portion connected to the external unit, and coupling elements for coupling said first output portion to said second input portion through said connection portion, said coupling means providing the information introduced from said first input portion to said second output portion through said coupling elements.

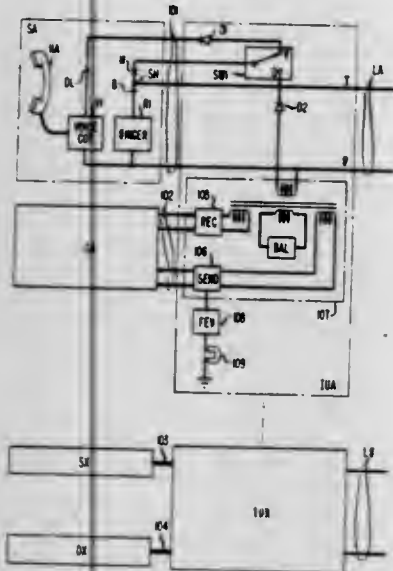


4,421,951

# METHOD AND ARRANGEMENT FOR SIGNALING THE TRANSMISSION MODE OF A COMMUNICATION SYSTEM

John G. Van Bosse, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Sep. 24, 1981, Ser. No. 305,124  
Int. Cl.<sup>3</sup> H04M 11/00

U.S. Cl. 179-2 DP



8. Apparatus for controlling the analog or digital communication mode of a transmission facility characterized in that said apparatus includes

means responsive to a control signal for providing either a first polarity dc signal over said facility to represent a first communication mode or a second polarity dc signal over said facility to represent a second communication mode and

control means for generating said control signal to interchange the existing coupling of said providing means in response to a predetermined interruption in the dc signal on said facility.

23. A method for controlling the analog or digital communication mode of a transmission facility characterized by the steps of

providing either a first polarity dc signal over said facility to represent a first communication mode or a second polarity dc signal over said facility to represent a second communication mode and

interchanging the dc signal coupled to said facility during the providing step in response to a predetermined interruption in the dc signal on said facility.

4,421,952

# MULTI-FREQUENCY BUSY SIGNAL SYNTHESIZING CIRCUITRY

Michael F. Barnes, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 16, 1981, Ser. No. 311,832

Int. Cl.<sup>3</sup> H03B 19/00

U.S. Cl. 179-2 EA



1. Circuitry for synthesizing a tone output signal that approximates a multi-frequency signal comprised of a first tone having a first predetermined frequency and a second tone having a second predetermined frequency, said synthesizing circuitry comprising:  
a signal source for generating a clock signal having a predeter-

mined frequency that is greater than said first predetermined frequency and said second predetermined frequency;  
means for generating a control signal alternately having first and second states at a frequency that is substantially one-half of a frequency selected from a predetermined range of frequencies substantially midway between said first predetermined frequency and said second predetermined frequency; and

24 Claims means coupled to the clock signal source and generating means for dividing the clock signal by a first number in response to the first state of the control signal to produce the tone output signal having a first frequency greater than said first predetermined frequency and by a second number in response to the second state of the control signal to produce the tone output signal having a second frequency that is greater than said second predetermined frequency.

4,421,953

# TELEPHONE TACTILE ALERT SYSTEM

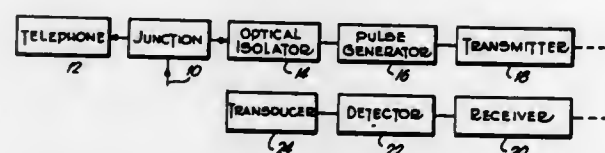
Lech S. Zielinski, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 7, 1981, Ser. No. 327,799

Int. Cl.<sup>3</sup> H04M 11/00

U.S. Cl. 179-2 EC

11 Claims



1. A system for non-audibly alerting a telephone user when the telephone is being energized by ringing voltage, the system comprising (i) a telephone unit for coupling to the telephone line, the telephone unit including a sensing means for sensing successive ringing voltage bursts and a transmitter adapted to emit a signal burst in response to each successive ringing voltage burst, and (ii) a user unit including a receiver for receiving the signal bursts from the transmitter and a transducer under the control of the receiver for converting the received signal into a non-audibly sensible signal.

4,421,954

# AUTOMATIC TELEPHONE ANSWERING AND MESSAGE RECORDING DEVICE

Satoshi Mita; Kouichi Tanaka, both of Kanagawa; Yoshitomo Nakano, Tokyo; Harumi Saita, Kanagawa, and Akira Nakayama, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 7, 1981, Ser. No. 261,512

Claims priority, application Japan, May 12, 1980, 55-62509

Int. Cl.<sup>3</sup> H04M 1/64

U.S. Cl. 179-6.13

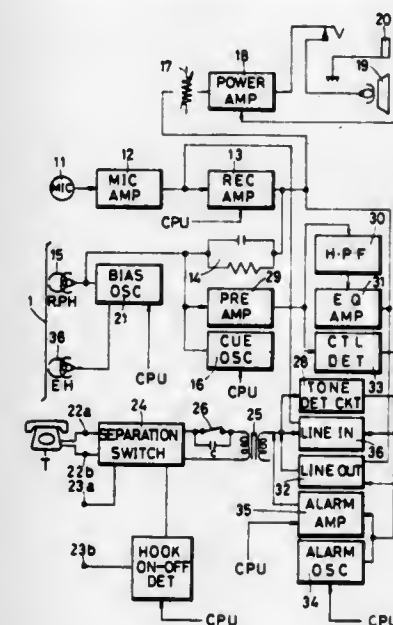
8 Claims

1. A method of automatically answering phone calls on a phone line and recording messages from calling parties in sequence on a single magnetic tape with a magnetic tape device having a stop mode, a rewind mode, a forward mode, and a fast-forward mode comprising the steps of:

automatically coupling the device to the phone line upon detection of a ringing signal on the phone line;  
setting the device into its forward mode and playing a pre-recorded outgoing message recorded in a track on the magnetic tape;

after the playing of the outgoing message and if no previous incoming messages have been recorded, recording in said track any incoming message from the calling party simultaneously with a control signal followed by a silent portion that is free of said control signal, said control signal being separable from said incoming message on playback;  
storing a quantity representing the number of incoming messages that have been previously recorded in said track;  
after the playing of the outgoing message and if incoming

messages have been previously recorded, setting said device into its fast-forward mode to drive said tape beyond the last such previously-recorded incoming message by detecting the presence of said recorded control signal and counting the number of spaces therein representing the silent portions between the recorded incoming messages, and then setting said device into its forward mode upon coincidence of the counted number of spaces and said stored quantity and recording the incoming message from the calling party simultaneously with said control



signal followed by said silent portion that is free of said control signal, said control signal being separable from said incoming message on playback;  
upon termination of the incoming message, setting the device into its rewind mode; and  
when said tape has been rewound to a point corresponding to the beginning of said recorded outgoing message, setting said device into its stop mode, thereby conditioning the device to greet any subsequent calling parties by playing back said recorded outgoing message.

4,421,955

# DISTRIBUTED SWITCHING SYSTEM

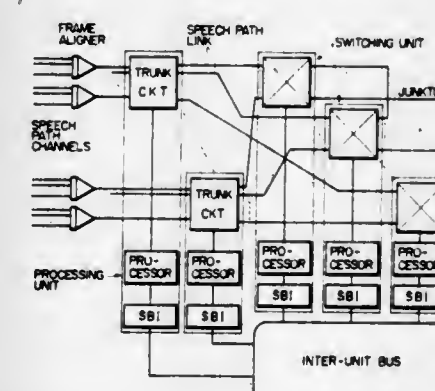
Hiroichi Mori, Kawasaki; Jun Matsumoto, Tama, and Masanobu Fujioke, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 147,899, May 8, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,616  
Claims priority, application Japan, Jul. 20, 1979, 54-91637

Int. Cl.<sup>3</sup> H04Q 3/42

U.S. Cl. 179-18 EA

4 Claims



1. A distributed switching system operating as a single large switching system as a whole comprising:  
a plurality of switching units including speech-path switches and processors which control the said speech-path

switches, and speech-path links inter-connecting said switching units for alternative routing between the units;  
a plurality of processing units connected to speech paths for signal and call processing, each of said processing units including a trunk circuit connected with a group of said speech-paths for processing signals in accordance with signaling systems of the said speech-path group and also including a processor for controlling said trunk circuit, said processing units being operative to process signals and calls coming in from and going out to the said speech-paths; and

an inter-unit bus for transferring information between said switching units and said processing units,  
each said switching unit being operative as a small size simple function switching system which is highly independent of the other switching units, and each said processing unit being operative to process independently of the other processing units only incoming calls which come in to the processing unit to which the speech-paths carrying said incoming calls is connected or to process only outgoing calls which go out of the processing unit to which the speech-paths carrying said outgoing calls is connected.

4,421,956

# LOUD SPEAKER WITH MINIMIZED MAGNETIC LEAKAGE

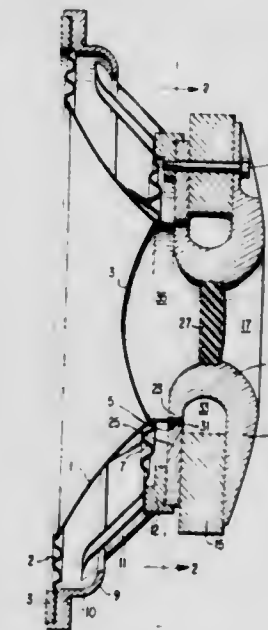
Robert M. O'Neill, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.

Filed Sep. 29, 1981, Ser. No. 306,926

Int. Cl.<sup>3</sup> H04R 9/00, 9/06

U.S. Cl. 179-120

4 Claims



1. In a loudspeaker, which includes a diaphragm, a voice coil attached to the diaphragm, a basket for supporting the diaphragm, an annular permanent magnet, an annular front plate between the magnet and the basket, a back plate on the side of the magnet opposite the front plate, and a pole-piece extending through the annular magnet and forming a magnetic gap with the front plate, the improvement wherein:

said back plate and pole piece are integral, said back plate being annular and having a thickness which smoothly tapers radially from a first inner thickness to a smaller circumferential thickness, said pole piece having a toroidal portion with a first surface convex to a central opening and a second surface concave to the exterior of said pole piece, an upper surface of said back plate merging smoothly with said second surface and a lower surface of said back plate merging smoothly with said first surface, said pole piece including a flat annular portion merging smoothly with the toroidal portion and extending parallel to said upper surface and terminating in a cylindrical surface forming one side of said gap,



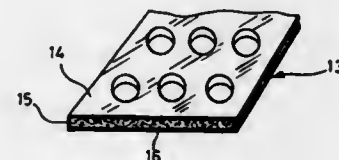
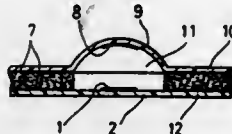
whereby the magnetic field of said magnet is concentrated into said gap and leakage of the magnetic field is minimized.

**4,421,958**  
**PANEL KEYBOARD WITH AIR PERMEABLE SPACER**  
Eiichi Kameda, Kukizaki, Japan, assignor to Nippon Mektron Co., Ltd., Japan

Filed Jun. 5, 1981, Ser. No. 271,041  
Claims priority, application Japan, Jun. 10, 1980, 55-078674  
Int. Cl.<sup>3</sup> H01H 13/70

U.S. Cl. 200—5 A

10 Claims



**4,421,957**  
**END-FIRE MICROPHONE AND LOUDSPEAKER STRUCTURES**

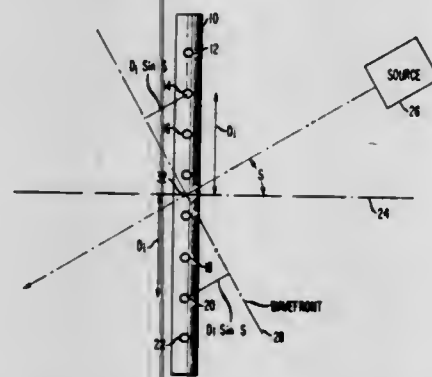
Robert L. Wallace, Jr., Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 15, 1981, Ser. No. 273,734

Int. Cl.<sup>3</sup> H01R 1/10

U.S. Cl. 179—121 D

9 Claims



1. Acoustic end-fire apparatus for producing a directional response comprising a sound transducer; and a plurality of acoustical paths coupling the sound transducer to the atmosphere, each path having a transducer end and an atmosphere end; and a centerline corresponding to a line equidistant from the atmosphere end of the shortest path and the atmosphere end of the longest path; the acoustical paths being arranged in an array of pairs, the atmosphere ends of the *i*th pair being equal distances  $D_i$  on opposite sides of said centerline; the distance between any path atmospheric end and the centerline being given by the application of the recursive formulae:

$$D'_i = D_i - \Delta D_i$$

$$\Delta D_i = \frac{KR}{4\pi (\sin\theta - 1)} \sin[4\pi D_i (\sin\theta - 1)]$$

where  $R$  is the response of the apparatus given by the formula

$$R = \frac{2 \sum_{i=1}^N \cos[4\pi D_i (\sin\theta - 1)]}{2N}$$

$K = \Delta R/R$ , the desired fractional change in response,  
 $\Delta R$  = desired change in response,  
 $2N$  = number of paths,  
 $D_i$  = initial distance of the *i*th path atmospheric end from the centerline of the array,  
 $D'_i$  = final distance of the *i*th path atmospheric end from the centerline array,  
 $\theta$  = angle of incidence which a sound wavefront makes with the centerline.

**4,421,959**  
**BRIDGING CONTACTOR WITH MAIN AND ARCING CONTACTS**

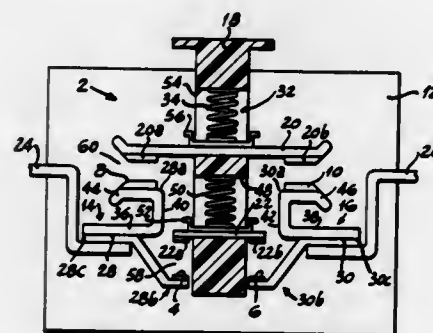
C. Gregory Chen, Brown Deer, and Daniel A. Wycklendt, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 19, 1982, Ser. No. 369,762

Int. Cl.<sup>3</sup> H01H 9/38, 15/00

U.S. Cl. 200—16 A

6 Claims

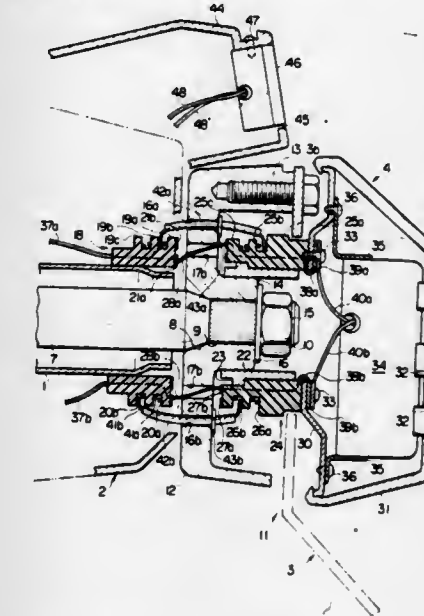


1. A bridging contact structure with double-break main contacts and double-break arcing contacts, comprising:

a housing;  
contact support means in said housing and having a pair of spaced stationary main contacts in parallel with a pair of spaced stationary arcing contacts;  
actuator means movable in said housing and carrying a main conductor and an arcing contactor, said actuator means being movable to an ON position with said arcing contactor engaging said arcing contacts followed by said main contactor engaging said main contacts, said actuator means being movable to an OFF position with said main contactor disengaging said main contacts followed by said arcing contactor disengaging said arcing contacts; said actuator means includes lost motion means operative with said arcing contactor upon engagement of said arcing contacts to maintain such engagement during continued movement of said actuator means to said ON position, and further maintaining such engagement during return movement of said actuator means towards said OFF position until said main contactor disengages said main contacts; said contact support means comprises a pair of spaced opposed terminals extending laterally towards each other, each terminal having an upper and lower branch facing the upper and lower branch of the other terminal, the facing upper branches mounting a respective pair of said contacts, and the facing lower branches mounting the other pair of said contacts;  
said actuator means comprises a plunger slideable up and down between said facing terminal branches, said contactors extending laterally across said plunger for butting engagement with respective said contacts;  
said lost motion means comprises resilient biasing means bearing between said plunger and said arcing contactor and biased to a given loaded condition upon movement of said plunger to said ON condition.

**4,421,960**  
**STEERING WHEEL WITH SWITCH ASSEMBLY**  
Sumitsugu Arima, Yokosuka; Hiroshi Tsuda, and Yukio Fukunaga, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan  
Filed Jul. 29, 1981, Ser. No. 287,944  
Claims priority, application Japan, Sep. 5, 1980, 55-126288[U]  
Int. Cl.<sup>3</sup> H01H 9/00; H01R 39/00  
U.S. Cl. 200—61.54

13 Claims

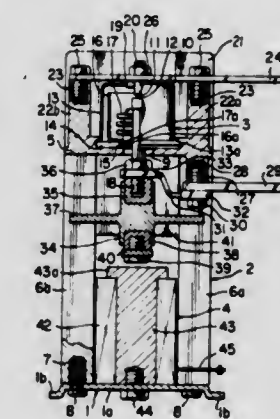


1. A steering mechanism for a steerable vehicle including a body structure having a fore-and-aft direction, comprising:  
a hollow steering column tube held stationary with respect to said body structure,  
a steering shaft axially extending in and through said steering column tube, the steering shaft having a center axis there-through and being rotatable about the center axis with respect to the column tube,

a steering wheel rotatable with the steering shaft about said center axis and having a circular rim portion,  
a switch support structure positioned internally of the rim portion of said steering wheel,  
a switch assembly mounted within said switch support structure and including an electric switch unit to be manually actuated,  
a column-tube covering member held stationary with respect to said body structure and having at least a rear end portion of said steering column tube enclosed therein,  
retaining means for retaining said switch support structure in position independently of the turning movement of said steering wheel and holding the switch support structure against rotation with respect to said steering column tube and said column-tube covering member, and  
an optical display unit supported by said column tube covering member and positioned in front of said steering wheel, said steering shaft having a rear end portion axially projecting rearwardly from said steering column tube and said steering wheel forming part of a steering wheel structure which further comprises a hub member secured to the rear end portion of the steering shaft, said switch support structure being rotatable about an extension of the center axis of the steering shaft with respect to said hub member, wherein said retaining means comprises a first spool member fixed with respect to said steering column tube and formed with at least two circumferential grooves about the center axis of said steering shaft, a second spool member having said switch support structure secured thereto and formed with at least two circumferential grooves about the center axis of the steering shaft, said second spool member being rotatable on said hub member about the center axis of the steering shaft, and at least two flexible lines each anchored at one end thereof to said first spool member and at the other end thereof to said second spool member, one of the flexible lines being wound in one direction about the center axis of the steering shaft partially in one of the two circumferential grooves in said first spool member and partially in one of the two circumferential grooves in said second spool member, the other of the flexible lines being wound in the other direction about the center axis of the steering shaft partially in the other of the two circumferential grooves in said first spool member and partially in the other of the two circumferential grooves in said second spool member.

**4,421,961**  
**VACUUM CIRCUIT BREAKER**  
Shinzo Sakuma, Yokohama; Hifumi Yanagisawa, Sagami-hara; Kazuo Tokuhata, Kanagawa, and Hiroshi Miyagawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan  
Filed Feb. 13, 1981, Ser. No. 235,023  
Claims priority, application Japan, Feb. 14, 1980, 55-17148  
Int. Cl.<sup>3</sup> H01H 33/66  
U.S. Cl. 200—144 B

8 Claims



1. A vacuum circuit breaker having at least one vacuum power interrupter unit comprising:



- (a) a bell-shaped metallic casing having a radially extending portion provided in the vicinity of an open end thereof;
- (b) an insulating circular end plate made of a ceramic material fitted to the opening end of said bell-shaped metallic casing so as to form a vacuum vessel together with said bell-shaped metallic casing;
- (c) a stationary electrical contact rod extending into said bell-shaped metallic casing and having a stationary electrical contact provided at the extending end thereof;
- (d) a movable electrical contact rod extending into said bell-shaped metallic casing so as to move relative to said stationary electrical contact rod and having a movable electrical contact at the extending end thereof; and
- (e) an actuating mechanism disposed below said movable electrical contact rod for opening said movable electrical contact with respect to said stationary electrical contact, the improvement wherein a peripheral surface of said insulating circular end plate outside said vacuum vessel and a radially extending surface portion of said bell-shaped metallic casing are embedded into an insulating molded block made of a resin, the remaining surface portion of said bell-shaped metallic casing being exposed to air.

4,421,962

## COMPRESSED GAS CIRCUIT-BREAKER

Edmond Thurles, Pusignan; Pierre-Paul Sigward, Villeurbanne; Marcel Besson, Eyzin-Pinet; Doan P. Van, Meyzieu, and Dante Nicoloso, Jonage, all of France, assignors to Alsthom-Atlantique, Paris, France

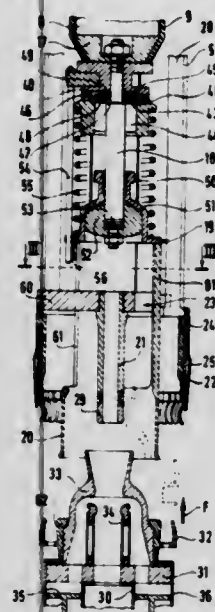
Filed Jul. 23, 1981, Ser. No. 286,220

Claims priority, application France, Jul. 23, 1980, 80 16222; Mar. 31, 1981, 81 06444

Int. Cl.<sup>3</sup> H01H 33/16

U.S. Cl. 200—144 AP

11 Claims



1. A compressed gas circuit-breaker comprising:
- a resistance,
  - a tubular stationary contact,
  - a tubular moving contact,
  - an insertion device for inserting said resistance in a circuit including said circuit-breaker when the circuit-breaker closes, the insertion device and the resistance being disposed in a coaxial casing,
  - means responsive to movement of said moving contact for controlling the device,
  - said insertion device being of the semi-mobile type and having a first means for damping its movement during circuit-breaker closing and a second means for delaying its movement when the circuit-breaker opens,
  - and wherein the first means and the second means comprise gas pressure damping means which operate by gas pressure reduction.

4,421,963

## MAGNETIC EXTINCTION OF ARCS IN SWITCHES

Martin Mailander, Leinfelden, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft und Raumfahrt e.V., Fed. Rep. of Germany

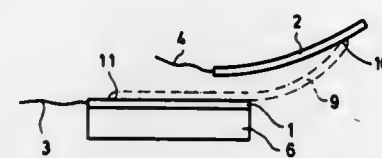
Filed Jun. 22, 1981, Ser. No. 276,174

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023673

Int. Cl.<sup>3</sup> H01H 9/44, 33/18

U.S. Cl. 200—147 R

16 Claims



1. A method of extinguishing the arc formed between an anodic spot and a cathodic spot on the respective contacts of a circuit-breaking switch, comprising causing the cathodic spot to be displaced along the surface of said contact with said cathodic spot under the influence of a magnetic field in a direction contrary to the direction of the Lorentz force so that the arc is lengthened until it is extinguished.

7. A switch for circuit-breaking, comprising two contacts which constitute an anode and a cathode during circuit-breaking when an arc is formed between an anodic spot and a cathodic spot on the respective contacts, and means for generating a magnetic field in the region of the cathode such that the cathodic spot is displaced under the influence of said magnetic field along the surface of said cathodic contact contrary to the direction of the Lorentz force, whereby the arc is lengthened until it is extinguished.

4,421,964

## REMOTE SWITCH ACTUATION

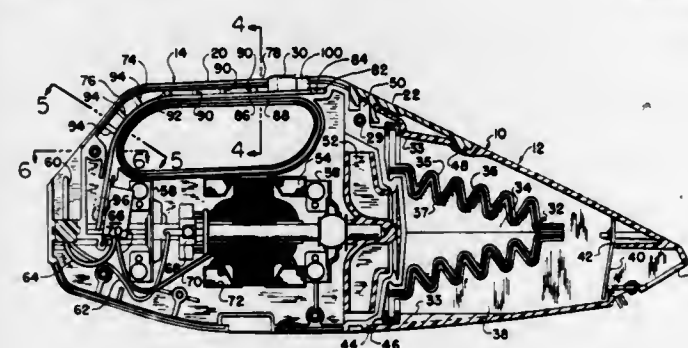
Dean H. Buchtel, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Apr. 2, 1982, Ser. No. 364,780

Int. Cl.<sup>3</sup> H01H 9/06

U.S. Cl. 200—157

6 Claims



1. A hand held appliance including:
- (a) a handle having a straight section and a relatively steeply curved section,
  - (b) a switch actuating button disposed adjacent to said handle,
  - (c) a guideway formed by said handle and extending longitudinally therealong,
  - (d) a switch for said hand held appliance disposed adjacent said guideway and remote from said switch actuating button,

- (e) a flexible lamella-like link, extending in said guideway, attached to said switch and said switch actuating button adjacent its terminations,
- (f) whereby said flexible link moves, upon movement of said switch actuating button, to actuate said switch.

4,421,965

## COMMUTATOR WITH SEVERAL LAYERS OF CROSS-POINTS

Alain Gentric, 27 Lotissement Keranroux, Ploubezre 22300 Lannion, and Andre Frances, 3, allée des Ajuncs, 22300 Lannion, both of France

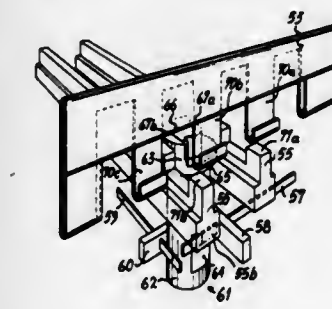
Continuation of Ser. No. 174,790, Aug. 4, 1980, abandoned. This application May 17, 1982, Ser. No. 379,058

Claims priority, application France, Aug. 16, 1979, 79 21202

Int. Cl.<sup>3</sup> H01H 63/00

U.S. Cl. 200—175

18 Claims



1. A switch with several layers of cross points, composed of several first layers of spaced parallel conductors oriented in a first direction and of several second layers of spaced parallel conductors oriented in a direction perpendicular to the first direction, the first and the second layers being interposed between each other, each layer of conductors being carried by a grid of insulating material, said grid of insulating material defining an orthogonal array of windows having perpendicular conductors exposed therein, plug means in at least some of said windows, a cross point comprising at least two superimposed adjacent layers and a conductor surface formed on an associated one of said plugs, the height of the conductor surface on said plug being sufficient to electrically connect a conductor segment of an upper conductor with a conductor segment of a lower conductor, each of said plug conductor surfaces occupying an angular sector in the order of 180°, and means for causing said plugs to rotate by one quarter of a rotation in one direction or in the other direction in order to open or close the cross point.

4,421,966

## KEYBOARD ELASTOMERIC COVER WITH BUTTONS HAVING CHANGEABLE LEGENDS

Walter R. Pounds, Lafayette, Colo., assignor to KB Denver, Inc., Frederick, Colo.

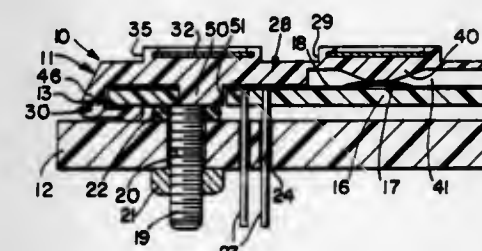
Filed Jul. 26, 1982, Ser. No. 401,657

The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> H01H 9/04

U.S. Cl. 200—309

12 Claims



1. In a keyboard assembly having a printed circuit board with conductive paths and dome switches coacting with said

paths, and a cover member for said board, wherein said board includes fastening means for mounting the assembly on a support panel, the improvement being in the cover member which comprises an elastomeric boot overlying the board and sealing said board to said support panel against the entry of contaminants, said boot having coacting button and dome actuating portions aligned with said dome switches, sealing means disposed peripherally of the board and between the board and panel, and alignment bosses matingly received in sockets formed in the board to maintain the dome actuating portions in alignment with said dome switches.

4,421,967

## WINDMILL DRIVEN EDDY CURRENT HEATER

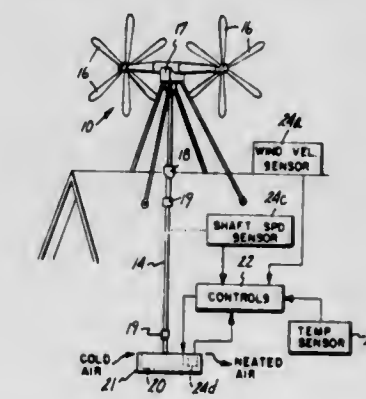
Warren J. Birgel, Golden Valley, and Chester S. Hajec, Roseville, both of Minn., assignors to VS Systems, Inc., St. Paul, Minn.

Continuation of Ser. No. 170,736, Jul. 21, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,602

Int. Cl.<sup>3</sup> H05B 6/06; F03D 9/00

U.S. Cl. 219—10.51

4 Claims



1. An apparatus for converting wind energy to heat, comprising:

windmill means for rotating a shaft in response to wind movement;

eddy current heater means having an inner stator fixedly mounted and an electrically conductive metal outer rotor which at least partially surrounds the inner stator and has an inner surface which is spaced from an outer circumference of the stator by a narrow air gap which is connected to and driven by the shaft and which is rotatably mounted in relation to the inner stator, a plurality of north and south ferromagnetic pole pieces alternately spaced and supported about the circumference of the stator, and magnetic field coil means mounted on the inner stator between the pole pieces for generating, as a function of a variable electrical excitation current, magnetic flux lines which pass from the north pole pieces across the air gap through the outer member and across the air gap to adjacent south pole pieces to induce eddy currents in the outer rotor which create a torque opposing rotation of the outer rotor and which thereby generate heat in the outer rotor as the outer rotor rotates relative to the inner stator due to rotation of the shaft, the heat generated in the outer rotor being a function of the torque opposing rotation and relative speed of the outer rotor with respect to the inner stator, and wherein the torque opposing rotation is a function of magnetic coupling between the outer rotor and the inner stator across the air gap produced by the magnetic flux lines;

first sensing means for sensing wind velocity and providing a first electrical signal indicative thereof;

second sensing means for sensing ambient room temperature of an area heated by heat derived from the outer rotor and providing a second electrical signal which is a function of the sensed ambient room temperature;

control means for providing the variable electrical excitation



current to the magnetic field coil means to control the magnetic coupling between the outer rotor and the inner stator as a function of (a) the first electrical signal, (b) the second electrical signal and (c) a predetermined torque speed curve as a function of wind velocity for the wind-mill means so that the eddy current heater means generates a desired heat output; and means for drawing air past an outer surface of the outer rotor to derive heat from the eddy current heater means.

4,421,968

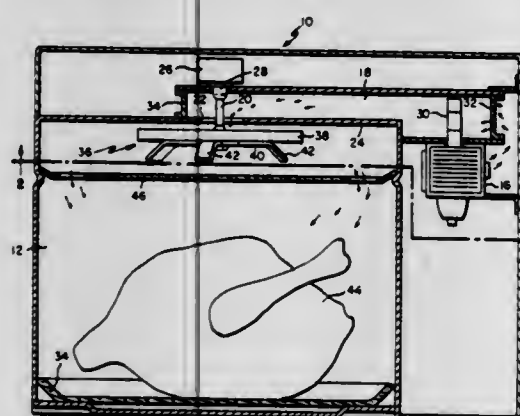
# MICROWAVE OVEN HAVING ROTATING CONDUCTIVE RADIATORS

John M. Osepchuk, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 965,636, Dec. 1, 1978, abandoned. This application Jan. 5, 1981, Ser. No. 222,811  
Int. Cl.<sup>3</sup> H05B 6/72

U.S. Cl. 219—10.55 F

3 Claims



1. A microwave oven comprising:  
a conductive enclosure;  
a waveguide positioned outside said enclosure adjacent to a horizontal wall of said enclosure;  
a magnetron for energizing said waveguide with microwave energy;  
an aperture in said wall communicating from said waveguide into said enclosure;  
an antenna probe extending vertically through said aperture for coupling said microwave energy from said waveguide into said enclosure;  
a plurality of microwave radiating elements positioned in said enclosure;  
transmission lines for coupling said microwave energy from said antenna probe to said microwave radiating elements, said transmission lines comprising conductive strips connected to said antenna probe at a common junction, each of said conductive strips extending radially from said antenna probe and supporting one of said radiating elements, each of said conductive strips being parallel to said wall and spaced less than a quarter wavelength of said microwave energy from said wall wherein said wall functions as a ground plane substantially limiting microwave radiation from said conductive strips; and  
means for rotating said antenna probe about its axis wherein said conductive strips move with respect to adjacent portions of said wall to move said radiating elements in circular paths around said antenna probe.

4,421,969

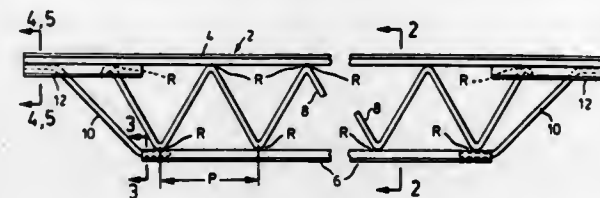
# METHOD FOR FABRICATING OPEN WEB STEEL JOISTS

Joseph M. Tanenbaum, 4 Dewbourne Ave., Toronto, Ontario, Canada (M5P 1Z2)

Division of Ser. No. 179,634, Aug. 20, 1980. This application Jul. 21, 1981, Ser. No. 285,498  
Int. Cl.<sup>3</sup> B23K 11/32

U.S. Cl. 219—107

3 Claims



1. In a method for fabricating open web steel joists having at least two substantially uniformly spaced apart chord members joined together by generally planar web member, with said chord member having a smaller cross sectional area than said web member at the common regions of contact, including the steps of:

- forming said chord members by drawing chord forming material through a chord forming station for straightening, shaping and cutting said chord forming material;
- forming said web member by uniformly bending equal sections of web forming material into an undulating configuration of generally uniform pattern having a series of apices presented by said bent web forming material;
- then feeding said formed chord and web members to a surface cleaning station to provide said members with surfaces substantially free of scale and coating;
- then moving said cleaned members to a stacking station and stacking said chord members along one side of a welding path extending longitudinally to said chord members and stacking said web members along the other side of said path;
- then moving said chord and web members from said stacking station onto said path and there assembling said chord members in substantially parallel relation with said web member between said chord members so that alternate opposite apices presented by said web member contact said spaced chord members respectively;
- then feeding said assembled members along said path to a resistance welding station;
- then simultaneously clamping at least four of said juxtaposed apices of said web member to each of said chord members respectively between first and second electrodes so as to exert an external force at said common regions of contact for urging said members together, with the first electrode means in clamped contact with said chord member of lesser cross sectional area in said region of contact and the second electrode means in clamped contact with said web member of larger cross sectional area at said region of contact respectively;
- then applying to said regions of contact through said first and second electrodes a series of time controlled intermittent impulses of electric current adapted to incrementally raise the temperature of said chord and web members in said region of contact to substantially the same level and in stages so as to minimize the escape of generated heat energy from said region of contact and effectively weld said members along said region of contact and substantially reduce formation of weld defects in said region of contact;
- then unclamping said members so as to remove said external force from said region of contact;
- then feeding said members along said path a further predetermined distance in a direction towards said welding station so as to present said next four following apices for welding to said chord members;
- then repeating said clamping step, said application step,

said unclamping step, and said feeding step successively so as to progressively simultaneously weld each of said next following four juxtaposed apices presented by said chord and web members respectively;  
(l) and finally removing said welded members from said path.

4,421,970

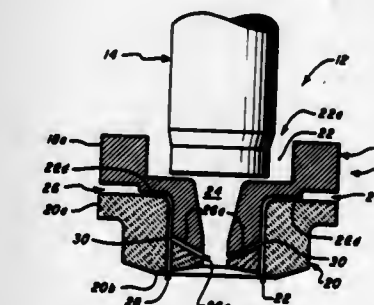
# COOLING AND HEIGHT SENSING SYSTEM FOR A PLASMA ARC CUTTING TOOL

Richard W. Couch, Jr., Hanover, N.H., assignor to Hypertherm, Incorporated, Hanover, N.H.

Division of Ser. No. 230,025, Jan. 30, 1981, Pat. No. 4,361,748. This application Apr. 5, 1982, Ser. No. 365,466  
Int. Cl.<sup>3</sup> B23K 9/00

U.S. Cl. 219—121 PV

1 Claim



1. In the method of initially positioning a plasma arc cutting torch relative to a workpiece, the torch being of the type in which a swirling motion is imparted to an ionizable gas through which the arc takes place, the flow of ionizable gas being initiated while the torch is in a retracted position and said swirling motion producing a vortex in said gas flow, the torch being advanced toward the workpiece, the advance being terminated in response to a sensed, abrupt change in the pressure of said vortex within the torch, and the torch having an internal passage system in its nozzle that conducts a cooling liquid through said nozzle, the improvement comprising providing a set of auxiliary ports each in fluid communication with said cooling passage system, said auxiliary ports diverting a portion of said cooling liquid and said gas from said nozzle, stopping the flow of said cooling liquid through said nozzle, and directing a stream of gas through said auxiliary ports while said torch is retracted from the workpiece at a sufficient flow rate and pressure to drive residual cooling liquid from said nozzle prior to cutting.

4,421,971

# ARC WELDING PROCESS

Jun Ukai; Toyozo Tetsu, and Kunio Shamoto, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP80/00037, § 371 Date Sep. 16, 1980, § 102(e) Date Sep. 16, 1980, PCT Pub. No. WO80/01771, PCT Pub. Date Sep. 4, 1980

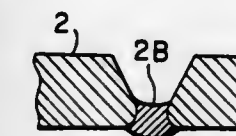
PCT Filed Feb. 29, 1980, Ser. No. 197,102

Claims priority, application Japan, Mar. 1, 1979, 54-23861

Int. Cl.<sup>3</sup> B23K 9/00

U.S. Cl. 219—128

7 Claims



1. An arc welding process for welding along a weld line by arcing between an electrode of a welding torch and a workpiece having an outer and inner side comprising:  
placing a pair of gas nozzles on opposite sides of said electrode

along a line perpendicular to said weld line adjacent said outer side;  
ejecting a functional gas from said nozzles toward said workpiece and toward said arc;  
compressing said arc between said nozzles with said functional gas such that said arc is flattened along said weld line; and forming a convex penetration weld bead on an inner side of said workpiece irrespective of the orientation of said arc with respect to said workpiece by directing said functional gas against said bead.

4,421,972

# PULSED DIRECT CURRENT ARC WELDING

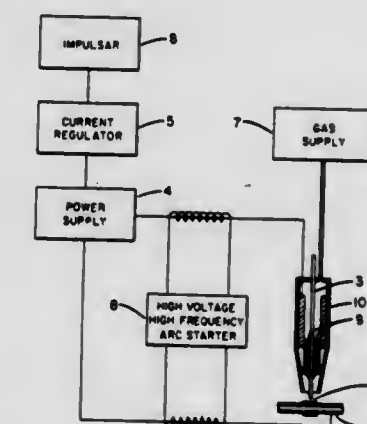
John R. Duncan, Tarzana; Roderick G. Rohrberg, Torrance; Ross A. Moyer, Lafayette, and William E. Wright, Sr., E. Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 9, 1981, Ser. No. 252,567

Int. Cl.<sup>3</sup> B23K 9/09

U.S. Cl. 219—137 PS

6 Claims



1. A method of arc welding of work pieces having surface oxides which comprises:  
positioning an electrode and the work pieces relative to each other to form an arc gap;  
providing inert gas continuously at the arc gap;  
applying across the arc gap an arc starter voltage having a magnitude sufficient to ionize the inert gas and initiate current flow across the arc gap;  
discontinuing the arc starter voltage;  
providing a maintenance current flow across the arc gap which is sufficient to sustain a minimum current flow across the arc gap throughout the arc welding process, said maintenance current providing a power flow which is insufficient to increase the temperature of the work pieces to the melting temperature of the work pieces;  
increasing the magnitude of the current flowing across the arc gap to a peak value which can provide sufficient power flow to melt the work pieces and which is of sufficient magnitude that a power flow is provided which dissipates oxides on the surfaces of the work pieces during the time interval in which the increase in current flow occurs;  
holding the current flow across the arc gap at substantially the increased value for a duration of time sufficient to provide enough energy to heat the work pieces to their melting temperature;  
decreasing the magnitude of the current flowing across the arc gap to substantially the maintenance current value to allow the temperature of the work pieces to decrease to a temperature below their melting temperature whereby the work pieces are welded together;  
cycling the current flow across the arc gap by repeating the steps of increasing, holding, and decreasing the current flow to vary the magnitude of the current flowing across the arc gap between the maintenance current value and the peak current value to form a series of current pulses which are applied to the work pieces; and



changing the relative position of the electrode and the work pieces to direct each current pulse to a selected portion of the work pieces.

4,421,973

**ELECTRIC TOOTH PASTE TUBE WARMER**

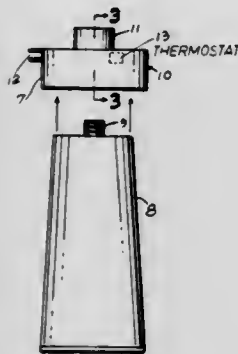
Kwong-Li Lou, 2400 W. Alhambra Rd., Alhambra, Calif. 91801

Filed May 18, 1981, Ser. No. 264,675

Int. Cl.<sup>3</sup> B67D 5/62; B05B 1/24; H05B 3/00

U.S. Cl. 219—301

4 Claims



1. An apparatus for prewarming the tooth paste in a tooth paste tube before it is extruded from the tube through an opening in the end of the tube, said apparatus comprising:

a cap-shaped member closing said opening and enveloping the outlet end of said tooth tube, the cap-shaped member having an outer skirt portion extending along and surrounding a portion of the tubular side wall of the tube; an electrical heating element insulated and molded in said cap-shaped member including said outer skirt portion surrounding the side wall of the tube with exterior electrical terminals to the heating element extending on the outside; and

connecting means on said cap-shaped member for detachably holding the cap-shaped member on and enclosing the outlet end of said tooth paste tube,

whereby the tooth paste in the outlet section of said tooth paste tube is warmed up when the exterior electrical terminals of said electrical heating element are connected to an electrical power source while the tube is closed by the cap-shaped member.

4,421,974

**ELECTRIC RICE COOKER**

Hiroaki Oota, Iwakura; Terutaka Aoshima, Toyohashi; Kenji Yamamori, and Ryuho Narita, both of Nagoya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 18, 1983, Ser. No. 458,873

Claims priority, application Japan, Jan. 29, 1982, 57-14111

Int. Cl.<sup>3</sup> F27D 11/02

U.S. Cl. 219—441

9 Claims

1. An electric rice cooking apparatus comprising:

(a) a cooking kettle for containing rice and a proper amount of water therefor;

(b) thermal insulating frame means for detachably placing said cooking kettle therein;

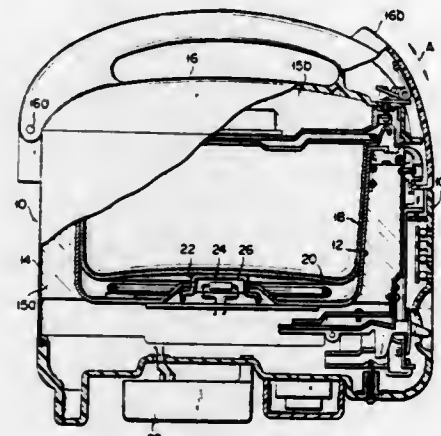
(c) heater means disposed in said frame means, for electrically heating the kettle contents to perform main cooking and subsequent auxiliary cooking for effectively converting beta-starch to alpha-starch;

(d) temperature detecting means disposed in said frame means, for measuring the actual temperature of said cooking kettle and for producing a detection signal corresponding to the actual kettle temperature;

(e) first control means, connected to said temperature detecting means and said heater means, for deenergizing said heater means to complete the main cooking at a proper time in accordance with the actual kettle temperature indicated by the detection signal, and for energizing said

heater means again to initiate the auxiliary cooking at another proper time;

(f) auxiliary cooking operating time determining means connected to said temperature detecting means, for electrically detecting a change in the actual kettle temperature represented by the detection signal after the main cooking is completed in every cooking operation, for determining the actual amount to be cooked in accordance with a change in the actual kettle temperature, and for producing a data signal indicating a reference timer operating inter-



val corresponding to the auxiliary cooking operating time in accordance with the amount to be cooked; and

(g) second control means, connected to said auxiliary cooking operating time determining means and said heater means, for receiving the data signal to measure the actual time interval of the auxiliary cooking operation, and for finally deenergizing said heater means when said actual time interval is equal to the reference timer operating interval, thereby completing the auxiliary cooking operation.

4,421,975

**HEATING ELEMENT ASSEMBLY**

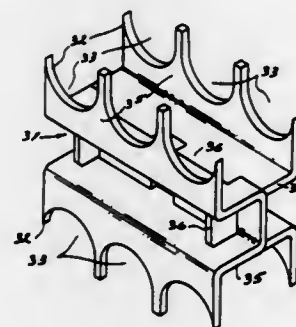
John Stein, Fruitland, Wash., assignor to Kim Hotstart Mfg. Co., Inc., Spokane, Wash.

Filed Jan. 18, 1982, Ser. No. 340,182

Int. Cl.<sup>3</sup> H05B 3/06; F16L 3/22

U.S. Cl. 249—335

10 Claims



1. A brace for interlocking a group of elongated heating elements each having two legs arranged substantially parallel to one another and joined by a U-shaped bend at one end of the element, said legs being fixed to a supporting wall at the remaining end of the element, the brace comprising:

a partition having oppositely facing outer edges each having a plurality of recesses formed across them complementary to the spacing of the element legs for loosely engaging an equal number of element legs along each of its outer edges while perpendicular to the heating element legs, said partition being free to move parallel to the element legs in response to their vibration to an average vibrational node for the plurality of elements.

4,421,976

**SYSTEM FOR MONITORING HEATER ELEMENTS OF ELECTRIC FURNACES**

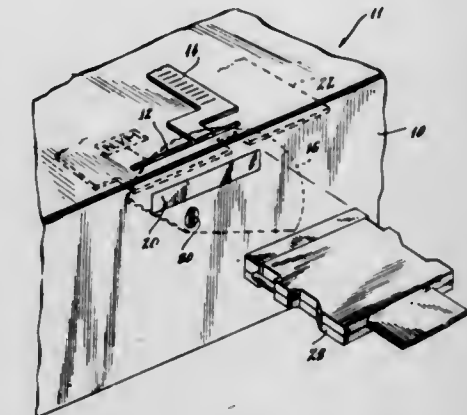
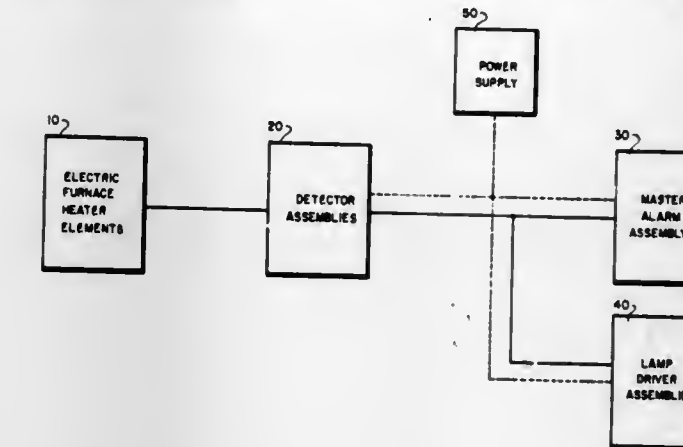
John J. Jurek, Watertown, Wis., assignor to General Signal Corporation, Stamford, Conn.

Filed Aug. 26, 1981, Ser. No. 296,666

Int. Cl.<sup>3</sup> H05B 1/02

U.S. Cl. 219—506

3 Claims



1. A system for monitoring heater elements of electric furnaces and the like to identify individual failures, comprising: a plurality of individual detector circuits, including first means for simultaneously detecting the electrical open state of each of a respective plurality of heater elements, and second means for simultaneously measuring the voltage of each of said heater elements;

said means for simultaneously detecting the open state including a current transformer continuously connected to a respective heater element;

said means for simultaneously monitoring the voltage of each of said heater elements including a voltage detecting pair of terminals continuously connected directly across each heater element;

said first and second means further comprising an opto-coupler integrated circuit device in each of said individual detector circuits;

a first comparison means in each of said detector circuits for comparing, with reference voltage, the resultant signal derived from said current transformer for each heater element and from said voltage detecting pair of terminals for monitoring the voltage of each heater element;

a second comparison means, and a timing means connected between said first and second comparison means to insure that a failure condition must exist for a minimum time for a failure to be indicated;

means for simultaneously providing a master alarm indication of a defined failure in any one or more of said heater elements;

means for simultaneously providing an individual alarm indication for all of said plurality of heater elements so as to identify particular failed elements, said means including a light-emitting diode in an individual indicator circuit for each of said heater elements.

housing permitting access to the memory means to read out accounting information registered thereon, wherein movement of the switch from the first position to the second position to disconnect the control circuit from the power supply disables the calculating device from further normal operation but permits readout of the accounting information through the aperture.

4,421,978

**DECODING METHOD FOR MULTICHARACTER LABELS**

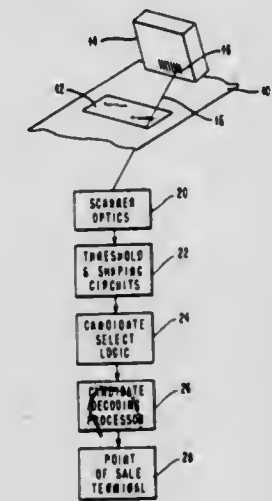
George J. Laurer, Raleigh, and Olen L. Stokes, Jr., Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,594

Int. Cl.<sup>3</sup> G06K 7/10

U.S. Cl. 235—462

14 Claims



1. A method of decoding a multicharacter label having one or more ambiguous positions, each of which is occupied by a character included in a set of characters which is ambiguously decoded during each of multiple scans of the label, said method including the steps of:

(a) deriving and storing a preliminary label value following each scan, said preliminary label value having a common set-identifying character assigned to any ambiguous position;

(b) deriving and storing a tentative specific character value for each ambiguous position;

(c) comparing preliminary label values derived from the multiple scans of the same label to determine whether a

4,421,977

**SECURITY SYSTEM FOR ELECTRONIC DEVICE**

Lloyd G. Kittredge, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 19, 1982, Ser. No. 399,595

Int. Cl.<sup>3</sup> G07G 1/00

U.S. Cl. 235—101

10 Claims

1. An electronic calculating device comprising a memory means having accounting information registered thereon, a control means for calculating the accounting information and entering the information into the memory means, a power supply providing power to the control means, a switch means having a first position in which an electrical connection is











subject to tidal flows and arranged between said sea body and said single storage reservoir;  
 a connection channel arranged above said turbine between said sea body and said single storage reservoir;  
 a common shutoff device located at one end of said at least one turbine and operable under pressure to selectively control the flow of water through the main channel and the turbine located therein and the connection channel alternatively and in opposite directions;  
 said common shutoff device comprising a slidable shutoff element;  
 substantially vertical slit means in which there is slidable said common shutoff device; and  
 said shutoff element comprising a slidable panel flood gate.

4,421,991

## WAVE POWERED ELECTRICAL GENERATOR

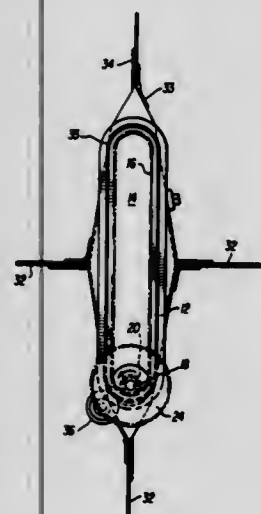
Owen L. McLaughlin, 193 Seneca Cir., Winfield, W. Va. 25213

Filed Sep. 27, 1982, Ser. No. 423,862

Int. Cl.<sup>3</sup> F03B 13/12

U.S. Cl. 290-53

6 Claims



1. Apparatus for generating electrical energy from fluid waves comprising at least one hollow, buoyant vane movable by the waves, each vane having an elongated slot, a shaft connected to said vane and rotated by movement of said vane, gear means disposed in said slot and connected to said shaft to enable relative longitudinal movement of said shaft and vane during rotation of said vane, an electrical generator, coupling means connecting said shaft to said electrical generator, and weighting means inside said vane and movable to vary the center of gravity of said vane during rotation of said vane.

4,421,992

## SMART SWITCH

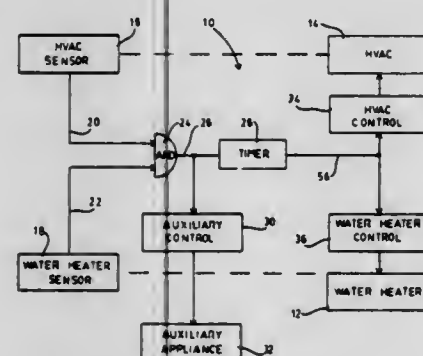
Ray W. Hibbard, and Randal C. Hines, both of Morristown, Tenn., assignors to Nuclear Systems, Inc., Morristown, Tenn.

Filed Dec. 4, 1981, Ser. No. 327,406

Int. Cl.<sup>3</sup> H02J 3/00

U.S. Cl. 307-41

12 Claims



12. Apparatus for preventing the simultaneous application of

electrical power to first and second electrical loads comprising:

a first and second sensing means, one each connected to said first and second electrical loads respectively, for determining when said first and second electrical loads demand electrical power, and for providing first and second sensing signals respectively indicative of such demand;  
 combining means for receiving first and second representative signals which are representations of said first and second sensing signals respectively and for providing a timer start signal when both said first and second representative signals are equally present at said combining means;  
 first and second load control means connected to said first and second electrical loads for alternately applying and interrupting electrical power to said first and second electrical loads respectively in response to a control signal;  
 timing means suitable for providing said control signal to said first and second load control means, upon receiving said timer start signal, such that said electrical loads are prevented from simultaneously receiving electrical power; and  
 first and second latching means for providing said first and second representative signals respectively whenever said timing means is operating regardless of whether or not said sensing means are providing corresponding sensing signals, wherein said first representative signal provided by said first latching means corresponds to the actual state of said first sensing signal only when one of said timing start signals and a high level of said control signal is present, and always provides a high signal when both said timing start signals and said high level of said control signal are present.

4,421,993

## LOAD RESISTANCE CONTROL CIRCUITRY

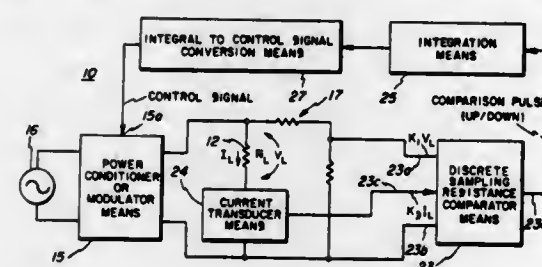
Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 28, 1982, Ser. No. 382,875

Int. Cl.<sup>3</sup> H01H 47/00

U.S. Cl. 307-126

28 Claims



1. A circuit for controlling the resistance of a load having a non-zero resistance temperature coefficient and receiving energy from an electrical source, comprising:  
 means connected between said source and said load for varying the temperature of said load by adjustment of the magnitude of periodic current pulses flowing through said load responsive to a control signal;  
 means for monitoring the resulting voltage pulse across said load to provide a first pulse signal;  
 means for monitoring the current pulse flowing through said load to provide a second pulse signal;  
 comparison means, receiving said first and second pulse signals and first and second substantially-constant reference signals, for providing an output signal having a characteristic indicative of the time at which the magnitude of said first pulse signal exceeds the magnitude of the first reference signal with respect to the time at which the magnitude of said second pulse signal exceeds the magnitude of the second reference signal; and  
 means for providing said control signal responsive to said comparison means output signal to cause the load current pulse magnitude and said load temperature to vary in a

manner to cause said resistance to be maintained at a substantially constant, predetermined value.

4,421,994

## HIGH SPEED LINE DRIVER WITH GROUND OUTPUT CAPABILITY

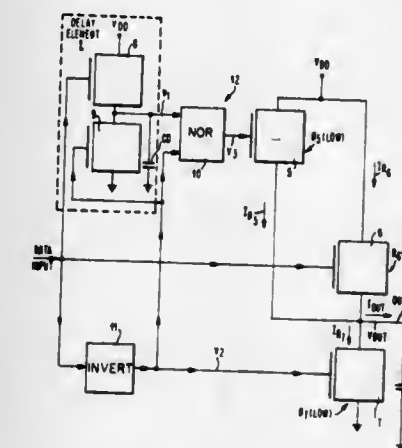
Yogi K. Puri, Vienna, and Keith M. A. Selbo, Manassas, both of Va., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,659

Int. Cl.<sup>3</sup> H03K 3/01, 3/26

U.S. Cl. 307-200 B

10 Claims



1. An FET driver circuit with an output shorting protection feature, comprising:  
 an active FET device having its source/drain path connected between ground potential and an output node and its gate connected to an input node, for switching off its source/drain path when a first polarity input signal is applied to said input node;  
 a first, relatively low resistance FET load device having its source/drain path connected between a drain potential and said output node, for selectively providing a relatively fast charging current path to said output node in response to a signal on its gate;  
 a second, relatively high resistance FET load device having its source/drain path connected between said drain potential and said output node and having a gate connected to said input node, for selectively providing a relatively slow charging current path to said output node when said first polarity signal is applied to said input node;  
 switching means having an input connected to said input node and an output connected to said gate of said first FET load device, for turning on said fast charging current path when said input signal transitions from ground potential to said first polarity and for turning off said fast charging current path after a predetermined delay;  
 whereby said output node is provided with a fast charging current when said input signal begins said first polarity state and then said output node is thereafter protected from ground shorts by having a high resistance as its sole connection to said drain potential.

4,421,995

## TIMING DISCRIMINATOR USING LEADING-EDGE EXTRAPOLATION

Bernard Gottschalk, Palo Alto, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 30, 1981, Ser. No. 288,562

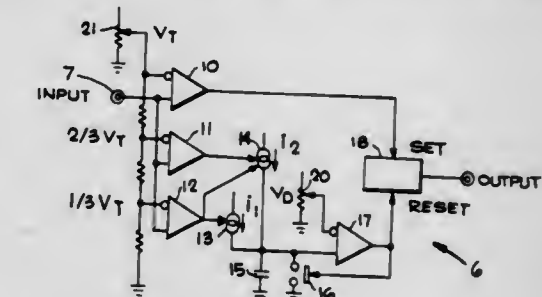
Int. Cl.<sup>3</sup> H03K 5/153

U.S. Cl. 307-361

10 Claims

1. A timing discriminator for recovering timing information from slow-rising input pulses, which comprises:  
 a voltage divider for setting a threshold voltage at a predetermined voltage;  
 a first means for comparing said input pulses with said threshold voltage;  
 a flip-flop circuit means connected to said first comparing

means and set by said first comparing means when said input pulses reach said threshold voltage;  
 a second means for comparing said input pulses with two-thirds said threshold voltage;  
 a third means for comparing said input pulses with one-third said threshold voltage;  
 a first means for generating current connected to said third comparing means and switched on by said third comparing means when said input pulses reach one-third of said threshold voltage;  
 a second means for generating current connected to said second comparing means switched on by said third comparing means when said input pulses reach one-third of said threshold voltage and switched off by said second



comparing means when said input pulses reach two-thirds of said threshold voltage;  
 a capacitor connected to said first and second generating means and charged by said first and second generating means;  
 a bias divider for setting a bias voltage at a predetermined level;  
 a fourth means for comparing said capacitor voltage with said bias voltage and for resetting said flip-flop circuit means when said capacitor voltage reach said bias voltage; and  
 a clamping circuit means connected to said fourth comparing means and said capacitor for discharging said capacitor when said capacitor voltage reaches said bias voltage.

4,421,996

## SENSE AMPLIFICATION SCHEME FOR RANDOM ACCESS MEMORY

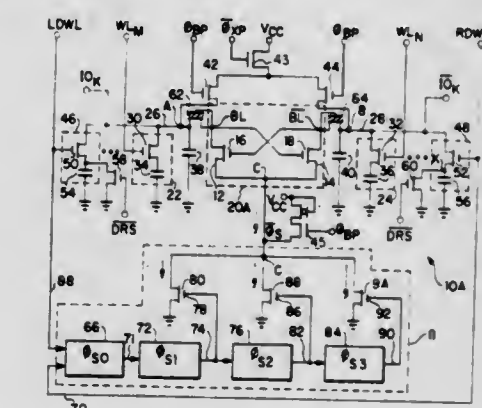
Patrick T. Chuang, Cupertino, and Paul D. Keswick, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 9, 1981, Ser. No. 310,180

Int. Cl.<sup>3</sup> H03K 5/24; G01R 19/163; G11C 7/06

U.S. Cl. 307-530

11 Claims



1. For use in a capacitive storage integrated circuit memory device having at least one sense amplifier of a type employing a latch including cross-coupled field effect transistors with common source electrodes, said sense amplifier for sensing and comparing charge on a bit line coupled to each drain electrode of each one of said transistors of said latch, each said bit line being selectively coupled to a storage cell through a transistor



switch transfer gate in response to signals applied to a word line, an apparatus for controlling sense rate of said bit lines comprising:

means operative to sense said word line signals for initiating a clock sequence, said clock sequence initiating means producing a first output signal having a first dynamic characteristic which is delayed relative to said word line signals;

first clock means responsive to said first output signal for generating a second output signal having a second dynamic characteristic which is delayed relative to said first output signal;

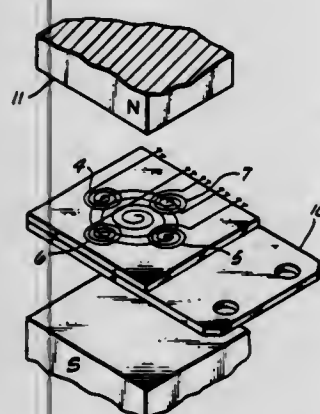
second clock means responsive to said second output signal for generating a third output signal having a third dynamic characteristic which is delayed relative to said second output signal and which overlaps in time said second output signal; and

means operative to amplify current in proportion to at least said second output signal and to said third output signal and to sum said amplified current for applying current in a controlled manner to said common source electrodes to strobe said source electrodes at a controlled sense rate.

**4,421,997**  
**MULTIPLE AXIS ACTUATOR**  
Edward L. Forsy, Covina, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.  
Continuation of Ser. No. 943,063, Sep. 18, 1978, abandoned. This application Nov. 13, 1981, Ser. No. 321,083  
Int. Cl.<sup>3</sup> H02K 41/02

U.S. Cl. 310—12

20 Claims



1. A force producing apparatus comprising:
  - a. a single pair of opposed magnetic poles for establishing a monogeneous magnetic field having flux lines aligned in the same direction from pole to pole; and
  - b. means for producing force in a direction substantially parallel to the flux lines of said magnetic field comprising at least a pair of electrically conductive spiral windings positioned within said magnetic field for interacting therewith, the windings of said pair being wound in like directions in adjacent parallel planes generally orthogonal to said flux lines and connected together at the inner ends of the spirals, said windings being displaced from each other in a direction aligned with the magnetic field by a predetermined distance sufficient to develop, when the windings are energized, like magnetic poles on opposite sides of said winding pair for interacting with said magnetic field to develop a force in the direction of said field.

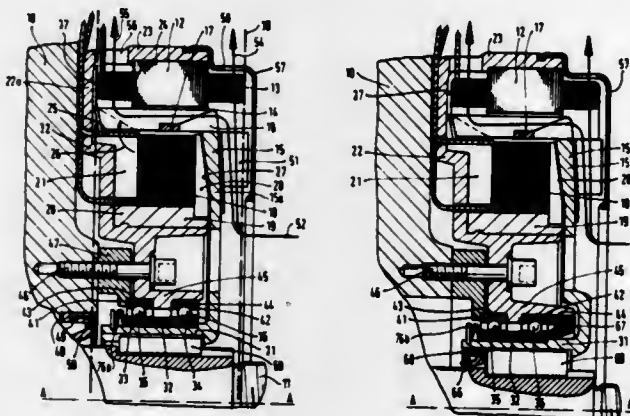
**4,421,998**  
**COMPACT ALTERNATOR FOR A SELF-CONTAINED ON-BOARD ELECTRIC NETWORK, PARTICULARLY FOR AN AUTOMOTIVE VEHICLE**

Peter Ahner, Ludwigsburg; Helmut Harer, Remseck, and Siegfried Schustek, Immenstaad, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,413  
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144063; Mar. 2, 1982, 3207385  
Int. Cl.<sup>3</sup> H02K 11/00

U.S. Cl. 310—68 R

26 Claims

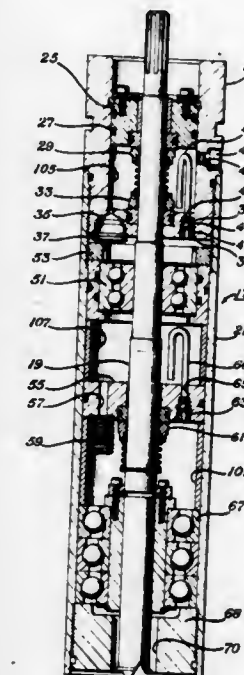


1. Alternator for a self-contained electrical network, and adapted for coupling to a drive shaft (11) of a variable speed drive engine having
  - a carrier structure (22, 122) defining a cylindrical cavity therein;
  - an armature structure including an armature core (12) and an armature winding (13) located in said cavity;
  - an essentially cylindrical exciter or field structure (20, 120) having a diameter less than the inner diameter of said armature core (12) to define a flux path gap therewith, concentrically located in said cavity and secured to said carrier structure, and including a field winding (18);
  - a claw pole rotor (15) having claw poles (16; 90, 116) located within said flux path gap and spaced from the outer circumference of the cylindrical field structure by an inner air gap, and from the inner circumference of the armature by a second air gap;
 wherein, in accordance with the invention
  - the carrier structure (22, 122) includes a radially extending portion (22a, 122a) adapted for attachment to a fixed support,
  - an outer axially extending portion (23) surrounding said cylindrical cavity,
  - and an inner axially extending cylindrical portion (45, 145) projecting concentrically to the shaft (11);
  - the rotor (15, 115) includes a radially extending portion (15a, 115a) and a re-entrant portion (31, 131) located beneath the exciter or field structure (20, 120) and forming a hub; means (60, 70) are provided rotatably coupling the hub to the engine drive shaft (11);
  - and roller-type bearings (35, 36; 76a; 135, 136) are provided located between the outer circumference of the hub and the inner cylindrically extending portion (45, 145) of said carrier structure (22);
  - wherein the armature windings (13) has outer end portions which are located between two planes (37, 38) extending essentially at right angles to axis of rotation (A—A) of the rotor;
  - and wherein the bearings are located between said planes whereby the axial thickness of the alternator is essentially defined by said planes and limited, essentially, to the axial extent of said armature windings (13).

**4,421,999**  
**SUBMERSIBLE PUMP SEAL SECTION WITH MULTIPLE BELLOWS**  
John A. Beavers, and Raymond L. Witten, both of Tulsa, Okla., assignors to Hughes Tool Company, Houston, Tex.  
Filed Mar. 2, 1981, Ser. No. 239,767  
Int. Cl.<sup>3</sup> H02K 5/12

U.S. Cl. 310—87

10 Claims

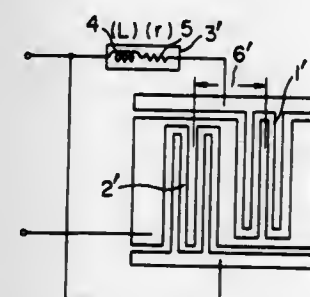


1. In a submersible pump assembly of the type having a motor section with a shaft extending through a seal section to a pump, an improved means for reducing pressure differential between lubricant fluid in the motor and seal sections and well fluid, comprising in combination:
  - a partition in the seal section, dividing the motor and seal sections into a primary chamber and a secondary chamber, with the shaft sealingly passing through the partition;
  - a primary pressure compensator means separating well fluid from lubricant fluid in the primary chamber, for reducing pressure differential between the lubricant in the primary chamber and well fluid;
  - a secondary pressure compensator means mounted to a port in the partition, separating lubricant fluid contained in the secondary chamber from lubricant fluid contained in the primary chamber, for reducing pressure differential between lubricant in the secondary chamber and lubricant in the primary chamber.

**4,422,000**  
**UNIDIRECTIONAL SURFACE ACOUSTIC WAVE DEVICE WITH MEANDERING ELECTRODE**  
Jun Yamada, Yokohama, and Katashi Hazama, Zushi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed May 4, 1982, Ser. No. 374,758  
Claims priority, application Japan, May 8, 1981, 56-68340  
Int. Cl.<sup>3</sup> H03H 9/145

U.S. Cl. 310—313 D

6 Claims



1. A surface acoustic wave device comprising an interdigital

input transducer and an interdigital output transducer formed on a piezoelectric substrate, at least one of said input and output transducers being unidirectional and having an interdigital sending electrode part disposed nearer to the other transducer and an interdigital reflecting electrode part disposed apart from the other transducer, a common electrode disposed between said sending and reflecting electrode parts, an electrical phase difference being provided between said sending and reflecting electrode parts, in which the electrical phase difference is established to be  $\phi$  in the unit of radians, which is not equal to  $\pi/2$  radians and a distance between said sending and reflecting electrode parts providing a geometrical phase difference therebetween is established to be

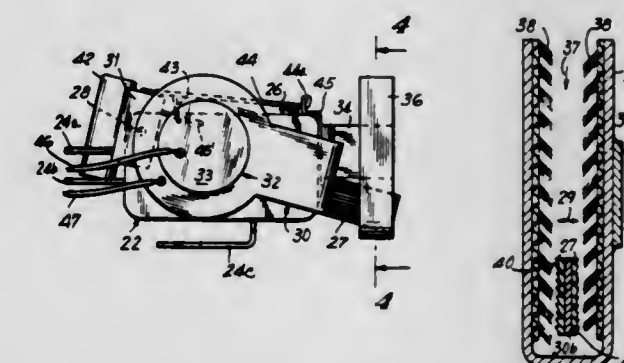
$$\left\{ n + \left( \frac{1}{2} - \frac{\phi}{2\pi} \right) \right\} \lambda_0$$

where  $n$  is a positive integer and  $\lambda_0$  is the wavelength of a surface acoustic wave.

**4,422,001**  
**CRYSTAL VIBRATOR ACTUATED RELAY**  
Gerhart Weiss, 76-70 172nd St., Flushing, N.Y. 11366  
Filed Jun. 5, 1981, Ser. No. 270,940  
Int. Cl.<sup>3</sup> H01H 45/00; H04R 17/00

U.S. Cl. 310—328

24 Claims



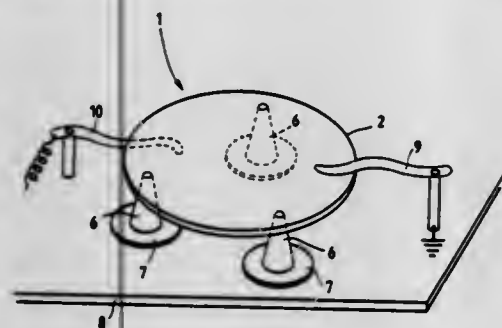
1. A relay device comprising switch means; first lever means coupled to said switch means for actuation thereof and displaceable between first and second positions, said switch means being "open" at one of said first and second positions of said lever means and being "closed" at the other of said first and second positions of said lever means; and vibrator means coupled through a coupling means to said lever means, said coupling means effecting displacement of said lever means between said lever means first and second positions in response to the vibration of said vibrator means, said coupling means including first and second interactive coupling members, said first coupling member being joined to said vibrator means for vibration thereby, one of said vibrator means and said second coupling member being fixed relative to said switch means, the other of said vibrator means and said second coupling member being displaceably mounted relative to said switch means and joined to said lever means for displacement by the interaction of the vibration of said first coupling member relative to said second coupling member to effect displacement of said lever means between said first and second positions, one of said first and second coupling members including a plurality of projections distributed in the direction of relative displacement of said first and second coupling members, the other of said first and second coupling members including a plurality of resilient fingers facing said projections and adapted to displace the moveable one of said first and second coupling members in said direction in response to the periodic interengagement of said resilient fingers and said projections caused by the vibration of said vibrator means.



**4,422,002**  
**PIEZO-ELECTRIC TRAVELLING SUPPORT**  
 Gerd Binnig, Richterswil; Hermann Nievergelt, Adliswil; Heinrich Rohrer, Richterswil, and Edmund Weibel, Adliswil, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,653  
 Claims priority, application European Pat. Off., Aug. 10, 1981, 81106229.8

Int. Cl.<sup>3</sup> H01L 41/08  
 U.S. Cl. 310—328 7 Claims



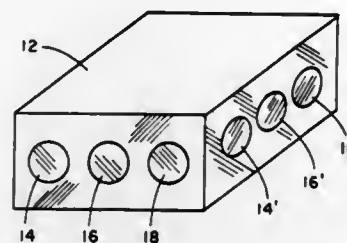
1. Apparatus for producing precise minute controlled linear and rotary displacements of an assembly with respect to a base member, comprising:
  - a piezo-electric crystal assembly having electrodes on opposed parallel surfaces thereof;
  - individual electrical connections to the said electrodes, which connections do not restrict movement of the crystal assembly;
  - a plurality of electrically conductive support legs electrically insulated from said crystal assembly and yieldingly affixed thereto;
  - an electrically conductive base member with respect to which said crystal assembly with affixed legs is operative to move;
  - a dielectric member interposed between said legs and said base member;
  - electrical connections to each of said legs and to said base member; and
  - means for selectively applying timed electrical potentials respectively between said electrodes, and between each of said legs and said base member whereby the potential applied between a leg and the base member produces a clamping force to restrict the movement of that leg with respect to the base, and the potential applied between said electrodes produces a change in the dimension of the crystal resulting in movement of the non-clamped legs with respect to said base member.

**4,422,003**  
**PERFORATED PZT POLYMER COMPOSITES**  
 Ahmad Safari; Robert E. Newham; Leslie E. Cross, and Walter A. Schulze, all of State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1982, Ser. No. 408,320  
 Int. Cl.<sup>3</sup> H01L 41/08

- U.S. Cl. 310—358 10 Claims
1. A PZT-polymer composite material of 3-1 connectivity which comprises:
    - a matrix of PZT;
    - means for electrically poling said matrix of PZT; and
    - a plurality of generally parallel voids partially filled with an

inactive polymer in said matrix of PZT, said voids partially filled of the inactive polymer having axes thereof

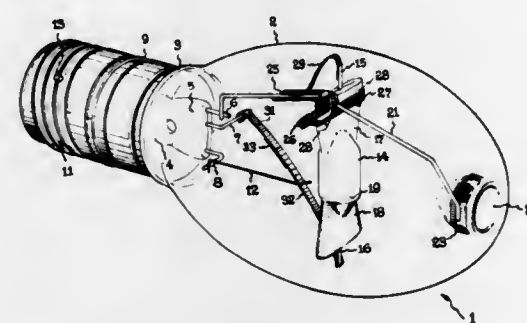


perpendicular to the direction of polarization of said matrix of PZT.

**4,422,004**  
**TRANSVERSE ARC TUBE MOUNTING**  
 David C. Knecht, Columbus, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 24, 1981, Ser. No. 276,878  
 Int. Cl.<sup>3</sup> H01J 61/30

U.S. Cl. 313—25 5 Claims



1. An electric lamp comprising:
  - an outer envelope having a bulb portion with a reduced diameter neck portion having lead-in wires sealed there-through;
  - a base fastened to the neck portion;
  - an arc tube within the bulb portion of greater overall length than the internal diameter of the neck portion, said arc tube having electrodes attached to inleads sealed into opposite ends;
  - and a mount structure comprising a support rod extending from one of said lead-in wires into the bulb portion and a hinged attachment of one end of said arc tube to said rod allowing the arc tube to be swung out of the way for passage through the neck and thereafter to be swung transversely within the bulb;
  - and means for locking said arc tube in transverse orientation comprising a two-piece connector having a bendable knee joint extending from a lead-in wire in said stem to the inlead in said arc tube opposite its hinged end.

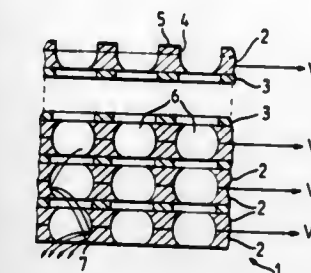
**4,422,005**  
**CHANNEL PLATE ELECTRON MULTIPLIER**  
 Derek Washington, Wallington, and Alan G. Knapp, Crawley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,128  
 Claims priority, application United Kingdom, Jul. 9, 1980, 8022539

Int. Cl.<sup>3</sup> H01J 43/22  
 U.S. Cl. 313—105 CM 10 Claims

1. A channel plate electron multiplier comprising, a stack of conducting sheet dynodes insulated from one another, channels passing transversely through the stack, each channel comprising aligned holes in the dynodes and the walls of the holes having a secondary electron emissive surface, and a layer of material having a secondary electron emission coefficient less

than 2.0 deposited on a carrier sheet placed in contact with the outermost surface of the input dynode, said carrier sheet hav-

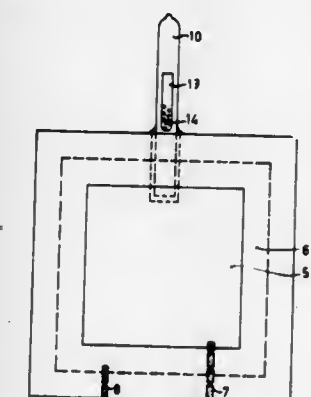


ing holes registering with the input dynode holes, and said material lying between the holes in said carrier sheet.

**4,422,006**  
**ELECTROCHEMICAL LUMINESCENT CELL**  
 Hartwig Schaper, Roetgen, and Karl H. Wilhelm, Aachen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,301  
 Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3021587

Int. Cl.<sup>3</sup> H01K 1/52  
 U.S. Cl. 313—483 6 Claims



1. An electrochemical luminescent cell having a fill which contains an electrochemical luminescent material and a solvent as the filling components, characterized in that the cell contains a getter material which does not react with the filling components, and which chemically or physically binds contaminations present in the cell or converts them into compounds which do not cause disturbances.

**4,422,007**  
**LUMINESCENT SUBSTANCES HAVING A BASE OF DOUBLE BORATE OF MAGNESIUM AND RARE EARTHS AND LOW PRESSURE MERCURY VAPOR LAMP CONTAINING THE SAME**  
 Claude Fouassier, Gradignan, and Bernadette Saubert, Seyssinet, both of France, assignors to Rhone Poulenc Industries, Paris, France

Filed Jun. 17, 1981, Ser. No. 274,362  
 Claims priority, application France, Jun. 27, 1980, 80 14307  
 Int. Cl.<sup>3</sup> C09K 11/475; H01J 1/63

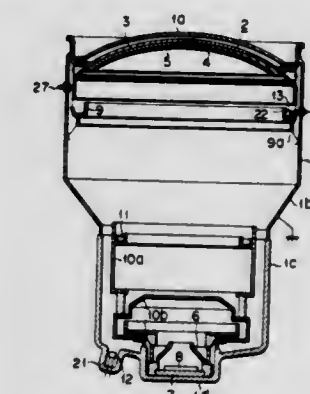
- U.S. Cl. 313—486 4 Claims
1. A luminescent substance characterized by the fact that it has a monoclinic crystalline structure and by the fact that it consists of a double borate of magnesium and rare earths and has the general formula  $Ln_{1-x}Tb_xMgB_2O_{10}$  in which  $Ln$  represents at least one element selected from the group consisting of La, Gd, Lu, and Y and in which  $0 \leq x \leq 1$ ; Tb being present in an amount sufficient to effect an intense narrow emission peak at about 538 nm.

**4,422,008**  
**ELECTRON TUBE HAVING A PHOTOELECTRIC SCREEN**

Yoshimitsu Aramaki, Kawasaki, and Norio Harao, Ayase, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 20, 1981, Ser. No. 312,981  
 Claims priority, application Japan, Oct. 22, 1980, 55-150615[U]

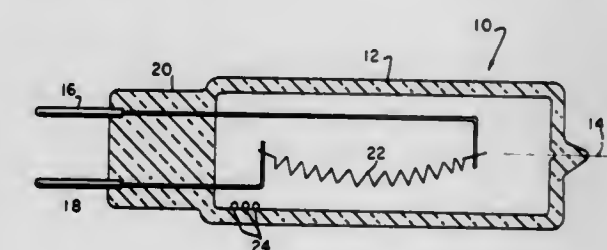
Int. Cl.<sup>3</sup> H01J 40/00  
 U.S. Cl. 313—524 6 Claims



1. An electron tube which comprises:
  - a metal vacuum envelope;
  - a metal high energy ray input window fitted to the envelope; and
  - a photoelectric screen held in the metal vacuum envelope in the proximity of the high energy ray input window, and is characterized in that a semiconductor photosensor is set at that position within the metal vacuum envelope which lies near the peripheral edge of the photoelectric screen and to which a material constituting the photoelectric screen can be deposited, said semiconductor photosensor being formed of a sealed container provided with a light input window and a semiconductor element received in the container.

**4,422,009**  
**TUNGSTEN-HALOGEN INCANDESCENT LAMP CONTAINING ADDITIVE TO REDUCE FILAMENT SAG**  
 John W. Shaffer, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 28, 1982, Ser. No. 372,513  
 Int. Cl.<sup>3</sup> H01K 1/62  
 U.S. Cl. 313—579 2 Claims



1. A tungsten-halogen incandescent lamp comprising: a light transmitting, hermetically sealed glass envelope; two lead-in wires hermetically sealed in a press of said envelope and extending internally and externally thereof; a tungsten filament attached between the internal ends of said lead-in wires; a fill gas in said envelope, said fill gas comprising an inert gas and a halogen at relatively high pressure; and an effective amount of a component to reduce filament sag included within said envelope, said component being selected from the group consisting of bismuth, antimony and tellurium or combinations thereof.



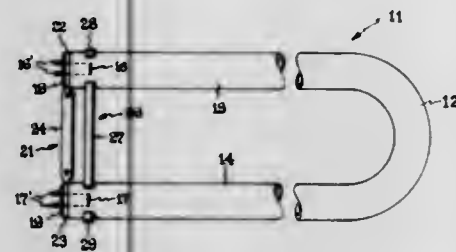
4,422,010

**SHAPED DISCHARGE LAMP WITH STARTING AID**  
Edward E. Hammer, Mayfield Village, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 253,089, Apr. 13, 1981, abandoned. This application Apr. 23, 1982, Ser. No. 371,143  
Int. Cl.<sup>3</sup> H01J 61/30, 61/54

U.S. Cl. 313—594

8 Claims



1. A mercury vapor discharge lamp comprising an elongated bulb shaped so that its ends are substantially closer together than if the bulb were straight and containing electrodes respectively near said ends thereof, and a starting aid comprising conductive means respectively adjacent to said bulb in the vicinity extending from the base to about the position of said electrodes of said ends, and spatially extending means electrically interconnecting said conductive means, said starting aid being devoid of means for connection to a starting voltage source.

4,422,011

**HIGH-PRESSURE MERCURY VAPOR DISCHARGE LAMP**

Leonce M. J. Bruninx-Poesen; Peter C. Drop; Lambert C. I. Kaldenhoven; Roland Lorenz, and Willy J. C. Endevoets, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

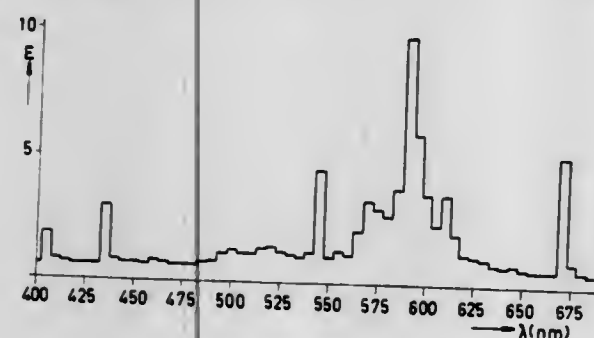
Filed Sep. 30, 1981, Ser. No. 307,129

Claims priority, application Netherlands, Oct. 2, 1980, 8005456

Int. Cl.<sup>3</sup> H01J 61/20

U.S. Cl. 313—642

3 Claims



1. A high-pressure mercury vapour discharge lamp, the emitted radiation of which has a white color aspect, comprising a gas-tight, radiation-permeable discharge vessel, means for maintaining a discharge and in addition an ionizable filling within said discharge vessel consisting of a rare gas, mercury, a sodium halide and at least one halide of at least one of the rare earth metals selected from the group consisting of cerium, praseodymium, neodymium and lutetium, the lamp being suitable for a nominal consumed power in the range of from 10 to 2000 W, characterized in that the molar ratio of the rare earth metal Ln to sodium, Ln:Na, has a value in the range from 1:20 to 1:1, and that the quantity of mercury per cm<sup>3</sup> volume of the discharge vessel, A, has a value in the range from 2 to 100 mg/cm<sup>3</sup>, wherein Ln:Na and A values are in inverse relationship to the value of said nominal consumed power.

4,422,012

**LADDER SUPPORTED RING BAR CIRCUIT**

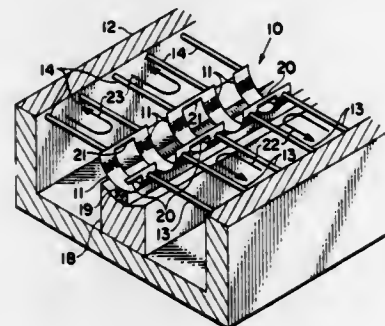
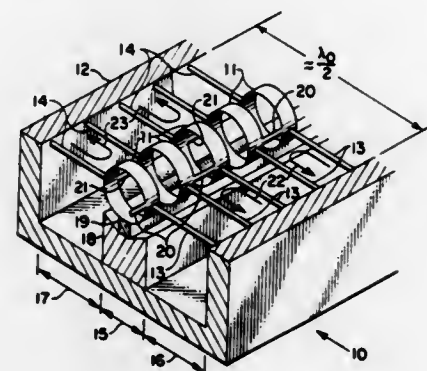
Henry G. Kosmahl, Olmsted Falls, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 3, 1981, Ser. No. 251,009

Int. Cl.<sup>3</sup> H01J 25/34

U.S. Cl. 315—3.5

12 Claims



1. A slow wave structure for a backward wave oscillator tube, said slow wave structure being disposed in a wave guide and comprising:

- a plurality of rings disposed in axial alignment in said waveguide, said rings being coaxial with the longitudinal center of said waveguide;
- a first plurality of electrically conducting stubs extending inwardly from one wall of said waveguide, each stub being attached to a respective ring;
- a second plurality of electrically conducting stubs extending inwardly from a wall of said waveguide opposite said one wall, each stub being attached to a respective ring;
- a first plurality of electrically conductive connecting bars extending axially in alternate spaces between said rings at the points of attachment of said plurality of stubs to respective ones of said rings; and
- a second plurality of electrically conductive connecting bars extending axially between said rings in the spaces not including said first connecting bars and at the points of attachment of each of said second plurality of stubs to a respective ring, whereby currents in said first connecting bars and in said second connecting bars are in opposite directions to establish magnetic fields resulting in a high impedance characteristic for said slow wave structure; and
- a longitudinal ridge member of electrically conducting, non-magnetic material having high thermal conductivity attached to the inside of each of third and fourth walls of said waveguide and a longitudinal spacer of an electrically nonconductive material having high thermal conductivity disposed between and contacting each ridge member and all of said rings to conduct heat away from said rings, stubs and bars.

7. A slow wave structure (SWS) for a backward wave oscillator said SWS being disposed in a rectangular waveguide having first, second, third and fourth walls, said SWS comprising:

a plurality of generally half-circle, bowed members disposed in said waveguide in alignment with each other as viewed from either end of said waveguide;

a first plurality of stubs extending from said first wall of said waveguide, each of said stubs being attached to one end of a respective one of said half-circle members; and

a second plurality of stubs extending from said second wall of said waveguide, each of said stubs being attached to the other end of a respective one of said half circle members; and

a first plurality of electrically conductive connecting bars extending axially in alternate spaces between points on said half rings intersected by said stubs;

a second plurality of electrically conductive bars extending axially between said rings in the spaces not including said first connecting bars and at the points of attachment of each of said second plurality of stubs to a respective ring, whereby currents in said first connecting bars and in said second connecting bars are in opposite directions to establish magnetic fields resulting in a high impedance characteristic for said SWS.

4,422,013

**MPD INTENSE BEAM PULSER**

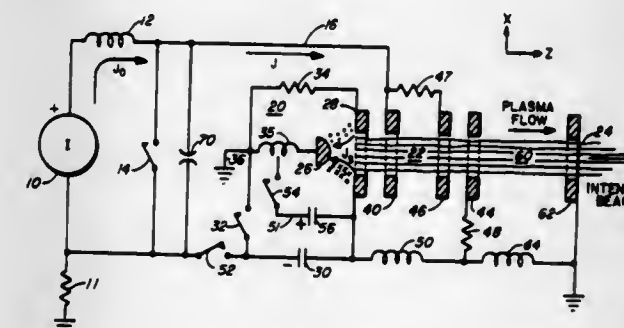
Peter J. Turchi, Alexandria, Va., and Ihor M. Vitkovitsky, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 21, 1981, Ser. No. 285,690

Int. Cl.<sup>3</sup> H01J 27/02

U.S. Cl. 315—111.81

15 Claims



1. An MPD intense beam pulser for generating high voltage, intense charged particle beams comprising:

- a plasma channel device including
  - a high speed source of directed plasma;
  - a diode with an aperture therein disposed to accelerate the particles of the plasma emitted from said plasma source and including a volume therearound for inductive energy storage; and
  - a high energy particle window disposed to pass there-through accelerated particle beams emerging from the diode aperture;
- means for directing a current through said diode in order to inductively store energy in the magnetic field generated around said diode; and
- means for truncating the plasma flow from said plasma source in order to cause a rapid decrease in plasma density resulting in the production of an intense beam of charged particles directed through said high energy particle window of said plasma channel device.

4,422,014

**METHOD AND APPARATUS FOR OBTAINING A FOCUSABLE BEAM OF ELECTRONS FROM A GASEOUS HOLLOW-CATHODE DISCHARGE**

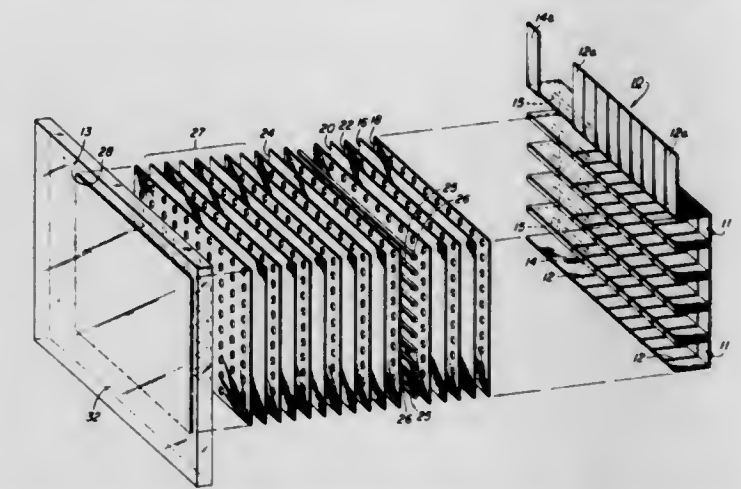
David Glaser, 1918 Raymond Dr., Northbrook, Ill. 60062

Filed Nov. 12, 1981, Ser. No. 320,325

Int. Cl.<sup>3</sup> H05B 37/00

U.S. Cl. 315—169.4

20 Claims



14. For use in a cathodoluminescent display device of a type wherein a luminescent target is scanned by an electron beam, the combination comprising means including a cathode for generating a gas discharge for use as a source of electrons, an electron-transmissive extraction electrode spaced from said cathode and biased at a positive potential relative to said cathode for extracting electrons from said discharge, an electron-transmissive repeller electrode positioned in proximity to said extractor electrode for intercepting electrons from said source which pass through said extractor electrode, said repeller electrode being biased at a potential which is positive relative to said cathode and negative relative to said extractor electrode, and said extractor and repeller electrodes being spaced from said cathode by a distance substantially less than the mean free path of the electrons from said source, whereby only electrons having at least a predetermined energy level are transmitted by said repeller electrode.

4,422,015

**ELECTRIC INSECT TRAP POWER SUPPLY**

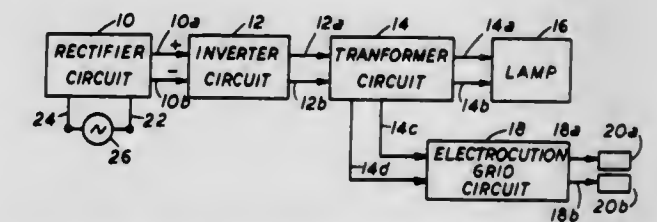
Ole K. Nilssen, 1984 Caesar Dr. - Rte. 5, Barrington, Ill. 60010

Filed Mar. 20, 1981, Ser. No. 246,006

Int. Cl.<sup>3</sup> H04B 37/02, 41/36; H05C 1/02; A01M 1/22

U.S. Cl. 315—209 R

32 Claims



1. A power supply for an electric insect trap having an electrocution grid for killing insects and a fluorescent lamp for attracting insects to the grid, comprising: means including an inverter for generating an alternating voltage; means responsive to said alternating voltage for providing a limited current to operate the fluorescent lamp; and means responsive to said alternating voltage for producing a current-limited high voltage for application to the electrocution grid, said current-limited high voltage being sup-



plied by way of a manifest current-limiting-means that is operative to limit the current supplied to the grid to a distinct pre-established maximum level.

#### 4,422,016 CONSTANT ENERGY TRANSFER RATE STROBE SOURCE

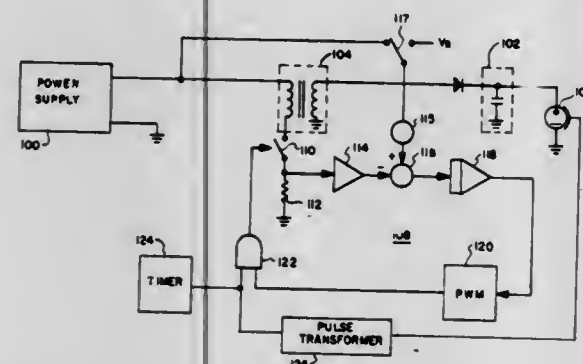
William M. Kurple, Urbana, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 22, 1981, Ser. No. 313,744

Int. Cl.<sup>3</sup> H05B 37/00

U.S. Cl. 315—241 S

14 Claims



1. In a strobe light wherein capacitance means is successively charged by a power source and discharged through a strobe lamp, the charge control system comprising: charging means for coupling said power source to said capacitance means; energy transfer means connected to said charging means including switch means connected into the input side of said charging means to control the duty cycle of the input current to said charging means and switch control means monitoring the input to said charging means including pulse width modulator means connected to drive said switch means, thereby regulating the rate of energy transfer between said power source and said capacitance means generally to a preselected energy transfer rate; and, timer means operatively connected to said energy transfer means for setting a preselected duration in which energy is transferred from said power source to said capacitance means, whereby charging the capacitance means at the preselected energy transfer rate for the preselected energy transfer duration sets the amount of energy with which the capacitance means is charged.

#### 4,422,017 ELECTRODELESS GAS DISCHARGE LAMP

Jan W. Denneman; Hendrik B. B. van Dam, and Petrus F. J. A. Wouters, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 120,968, Feb. 13, 1980. This application Aug. 11, 1982, Ser. No. 407,185

Claims priority, application Netherlands, Mar. 9, 1979, 7901897

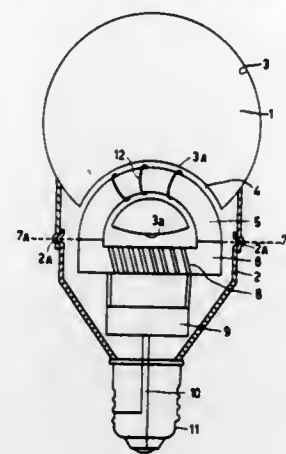
Int. Cl.<sup>3</sup> H05B 41/16, 41/24

U.S. Cl. 315—248

16 Claims

1. An electrodeless gas discharge lamp having a lamp base and a lamp vessel having an elongated tubular channel extending completely through said lamp vessel and having a fluid tight wall with no fluid communication between the interior of said channel and the interior of said vessel, said vessel being filled with a metal vapor and one or more rare gases, the lamp comprising a closed loop core of a magnetic material, part of said core extending through the lamp vessel, a high frequency magnetic field being inducible in the core by means of an h.f. generator in the lamp base characterized in that the magnetic core is assembled from at least two separable core portions, at least a major part of one portion lying within said channel, said channel being dimensioned and configured for passage of said major part thereof, said major portion being semi-circular

shaped, and the other of the two portions being located in the lamp base, the lamp base being detachably secured to the lamp vessel, said part of said one core portion which lies mainly within the lamp vessel being disposed in said elongated channel formed as part of the lamp vessel.



vessel, said part of said one core portion which lies mainly within the lamp vessel being disposed in said elongated channel formed as part of the lamp vessel.

#### 4,422,018 AUTOMATIC LIGHTING DISCONNECT TIMER INCORPORATING AN ACOUSTIC ABORT SWITCH

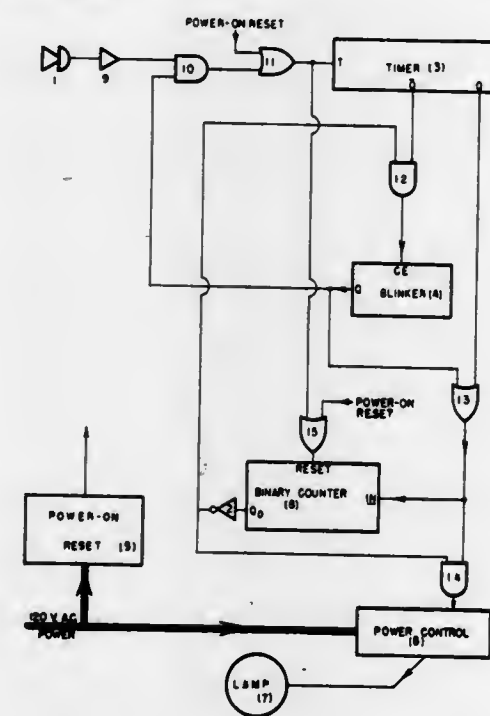
Alan S. Bailey, 50 Keegans La., Great Kills, Staten Island, N.Y. 10308

Continuation of Ser. No. 241,108, Mar. 6, 1981, abandoned. This application Sep. 9, 1982, Ser. No. 416,257

Int. Cl.<sup>3</sup> H05B 37/02

U.S. Cl. 315—360

10 Claims



1. Apparatus for controlling an electrical circuit that will automatically disconnect or open the circuit after a predetermined time interval and to interrupt the disconnecting or opening of the circuit and reset the predetermined time interval in response to an acoustic signal comprising in combination timing means capable of being set for a predetermined time interval to maintain the circuit in an operating mode for said predetermined time interval and including means to interrupt the circuit and open the same at the termination of said predetermined time interval, and means for generating a signal near the termination of said predetermined time interval indicating the approaching termination thereof; acoustic means connected to the timing means for generating a signal in response to acoustic stimulation and aborting the completion of said predetermined

time interval and means for resetting said predetermined time interval in response to the signal from said acoustic means.

compensating means and to the first and second output signals from said storing means.

#### 4,422,019 APPARATUS FOR PROVIDING VERTICAL AS WELL AS HORIZONTAL SMOOTHING OF CONVERGENCE CORRECTION SIGNALS IN A DIGITAL CONVERGENCE SYSTEM

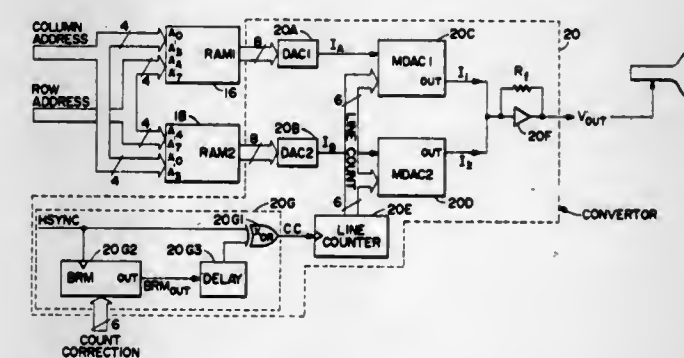
William W. Meyer, Oregon City, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 12, 1982, Ser. No. 397,615

Int. Cl.<sup>3</sup> H01J 29/70, 29/76

U.S. Cl. 315—368

4 Claims



1. An interpolator for use in a convergence system, said convergence system developing convergence correction signals for deflecting an electron beam while scanning across the inner surface of a cathode ray tube, the surface of said cathode ray tube being subdivided into a matrix including a plurality of intersecting rows and columns, each row and each column having an address associated therewith, said electron beam tracing within one of the rows and across said columns of said matrix while scanning across the inner surface of said tube, a row address signal and a column address signal being developed corresponding to the address of the row and the column in which said electron beam is scanning, a certain number of scans of said electron beam are actually traced within each of said rows of said matrix, a horizontal sync signal being produced for each of said scans, comprising:

storing means for storing a plurality of values therein corresponding, respectively, to a plurality of intersections associated with the plurality of intersecting rows and columns of said matrix, said storing means generating a first output signal indicative of one of said values associated with one of said intersections and generating a second output signal indicative of another of said values associated with the next, adjacent, vertically oriented intersection relative to the one intersection in response to said row address signal and said column address signal;

converter means responsive to said first and said second output signal from said storing means for developing said convergence correction signal, said convergence correction signal having a signal parameter which changes linearly ranging from a first signal parameter corresponding to said first output signal from said storing means to a second signal parameter corresponding to said second output signal from said storing means, the degree of deflection of said electron beam being proportional to the linear change of said signal parameter associated with said convergence correction signal; and compensating means responsive to the certain number of said horizontal sync signals for each of said rows of said matrix for developing an output signal indicative of a particular number when the last of said certain number of scans is traced within each of the rows of said matrix, said particular number representing a desired number of scans to be traced by said electron beam within each of said rows of said matrix; said converter means developing said convergence correction signal in response to said output signal from said

#### 4,422,020 VERTICAL IMAGE CORRECTION FOR PROJECTION TV

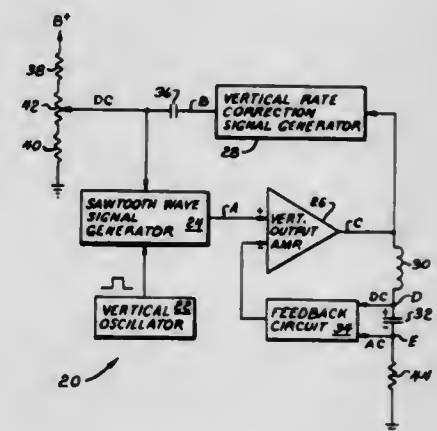
Stanley E. Lehnert, Addison, and Donald Ankeny, Schaumburg, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 21, 1982, Ser. No. 400,329

Int. Cl.<sup>3</sup> H01J 29/56

U.S. Cl. 315—371

5 Claims



1. In a projection television having a projecting screen and at least one cathode ray tube for producing and projecting onto said projecting screen a video image representing a received video signal, wherein said projecting screen is obliquely disposed in the vertical direction relative to the image projection axis of at least said one cathode ray tube, a vertical deflection system for correcting for projected video image vertical distortion comprising:

an oscillator responsive to said received video signal and synchronized therewith for producing a pulsed output signal in timed relation with said received video signal; circuit means coupled to said oscillator and responsive to said pulsed output signal for generating a substantially linear, sawtooth-shaped output voltage;

a vertical output circuit coupled to said circuit means and responsive to the sawtooth-shaped output voltage therefrom for generating an amplified sawtooth-shaped output current and a pulsed output voltage in timed relation with said received video signal;

a deflection coil coupled to said vertical output circuit and responsive to the output current therefrom for vertically deflecting an electron beam in at least said one cathode ray tube; and vertical rate correction means coupled to said circuit means and said vertical output circuit and responsive to the pulsed output voltage therefrom for decreasing the vertical deflection rate over that portion of said projecting screen where said video image is vertically stretched and increasing the vertical deflection rate over that portion of said projecting screen where said video image is vertically compressed in correcting for the vertical distortion of said video image on said projecting screen.

#### 4,422,021 ELECTRIC MOTOR DYNAMIC BRAKING ENERGY RECUPERATING SYSTEM

Albrecht Schwarz, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,458

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048999

Int. Cl.<sup>3</sup> H02P 3/14

U.S. Cl. 318—376

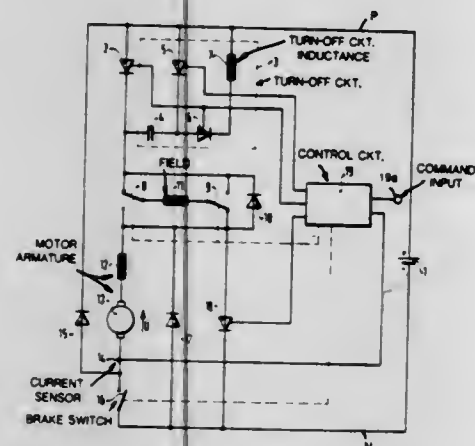
8 Claims

1. Energy recuperating system to return energy from a series



dynamo electric machine (11, 12, 13) to an energy storage battery (1) upon dynamic braking operation of the dynamo electric machine,

- said dynamo electric machine having a series circuit including a field winding (11) and an armature (12, 13);
- said system further including a chopper switch (2) connected in series between the storage battery (1) and said dynamo electric machine;
- a control circuit (3, 19) connected to and controlling the duty cycle of the chopper switch (2) to control the average current flow to the dynamo electric machine;
- a field polarity reversal switch (8, 9) connecting, selectively, the field winding in, respectively, reverse directions, with respect to current flow through the armature;



and a reverse current diode (15) connected across the series circuit formed by the field winding (11) and the armature (12, 13), and comprising, in accordance with the invention, a field diode (10) connected across the field winding (11); and a controlled switch (18) connected to the junction between the field winding (11) and the armature, and to a return line (N) to the storage battery, closing of said controlled switch (18) being controlled by said control circuit (19) when the motor is operating under dynamic braking conditions and to return energy to the storage battery.

4,422,022

## SPEED CONTROL FOR TRUCK

Walter A. Hill, Andrew C. Stevenson, and Peter G. McKenna, all of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

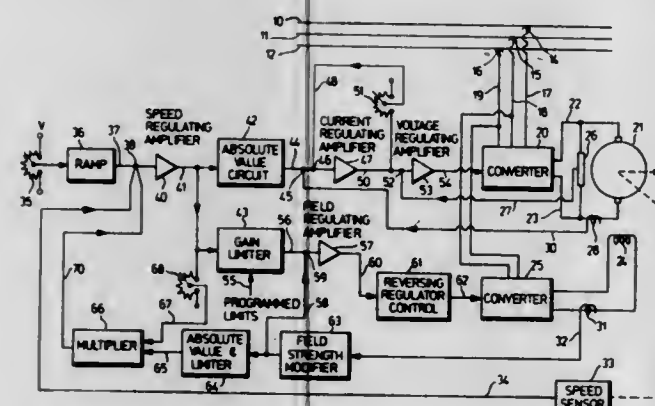
Filed May 10, 1982, Ser. No. 376,288

Claims priority, application Canada, May 29, 1981, 378638

Int. Cl.<sup>3</sup> H02P 3/14

U.S. Cl. 318—376

8 Claims



1. A motor control for a direct current motor having an armature and a field winding, and having a power source for providing armature current and for providing field current, said motor being operable in a motoring and in a regenerative

braking state with field reversal in the braking state, comprising

- means for providing a first control signal representing the difference between an input speed reference signal and an actual motor speed signal,
- means for deriving a signal representing actual field current,
- means for converting said signal representing field current into a signal representing field strength,
- means for modifying said first control signal by summing it with a compensating signal derived from a product of a limited value of said signal representing field strength and a predetermined fraction of said first signal to provide torque compensation, and
- means responsive to said modified first signal for controlling armature current and field strength.

4,422,023

## STARTING CIRCUIT FOR ELECTRONICALLY CONTROLLED MOTOR APPARATUS

Teruo Iwasawa, Mitaka, and Hitomi Tojiki, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

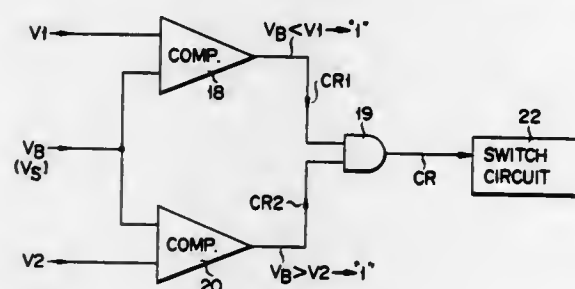
Filed Jul. 10, 1981, Ser. No. 281,949

Claims priority, application Japan, Jul. 17, 1980, 55-100975[U]

Int. Cl.<sup>3</sup> H02P 5/16

U.S. Cl. 318—384

14 Claims



1. A starting circuit for a motor apparatus including an integration capacitor which stores electrical charge corresponding to the operational state of said motor apparatus, said starting circuit comprising:

- a source of power supply for supplying said motor apparatus with a power supply voltage;
- comparison means having first and second given voltages and coupled to said source of power supply, for comparing a specific voltage corresponding to said power supply voltage with said first and second given voltages; and
- discharge means coupled to said comparison means and to said integration capacitor of said motor apparatus, for discharging the electrical charge stored in said integration capacitor when said specific voltage has a level between said first and second given voltages.

4,422,024

## WIPER CONTROL DEVICE FOR VEHICLE

Hajime Itoh, Aichi, and Yoshiyuki Igarashi, Nagoya, both of Japan, assignors to Toyota Jidoshia Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 7, 1982, Ser. No. 337,715

Claims priority, application Japan, Sep. 3, 1981, 56-139198

Int. Cl.<sup>3</sup> H02P 3/10

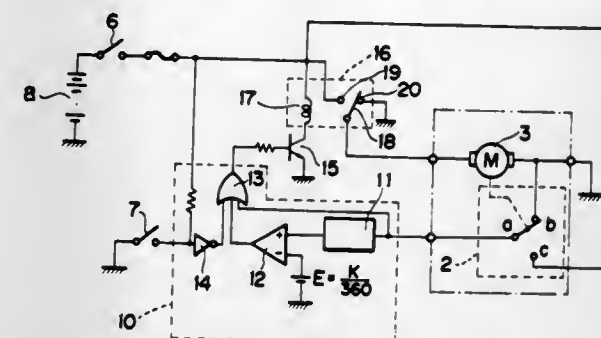
U.S. Cl. 318—443

3 Claims

1. A wiper control device for use with a vehicle for automatically stopping a wiper motor at a lowermost position of its wiping range when a wiper switch is turned OFF at an arbitrary time, wherein said motor synchronously rotates a cam plate formed with an annular electrode of a predetermined pattern on the surface thereof and has a plurality of cam contacts selectively isolated from or contacted with said annular electrode at predetermined angular positions in accordance

with the revolution of said wiper motor, said device comprising:

- control circuit means for obtaining from the rotating speed of said wiper motor a sliding angle corresponding to the rotating speed of said wiper motor and causing an electric



current to flow continuously in said wiper motor before and even after said wiper motor is interrupted by selectively isolating a said cam contact from said annular electrode, wherein the sliding angle of said wiper motor is obtained by

$$T_2 = \frac{\theta_2}{360 - \theta_0} \cdot T_1 - \frac{k}{360}$$

wherein  $T_1$  represents the time in which said cam contacts are shortcircuited with said annular electrode,  $T_2$  represents the time required that said wiper motor passes the sliding angle,  $k$  is a constant of proportion,  $\theta_0$  represents the rotating angle of said cam plate during the time  $T_1$ , and  $\theta_2$  represents the arbitrary sliding angle of said wiper motor stopped from a predetermined rotating speed as required during the time  $T_2$ .

4,422,025

## CONTROL CIRCUIT

Manfred Steller, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

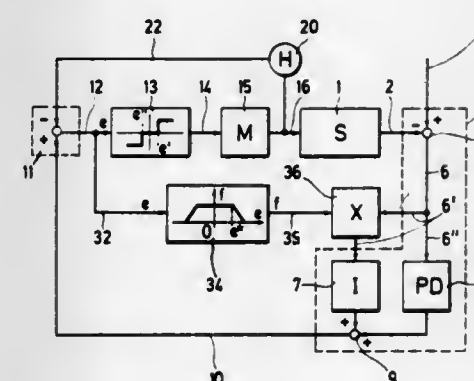
Filed Oct. 2, 1981, Ser. No. 308,106

Claims priority, application Switzerland, Oct. 7, 1980, 7467/80

Int. Cl.<sup>3</sup> G05B 11/36

U.S. Cl. 318—609

4 Claims



1. A control circuit for a plant comprising a controller having an input for receiving a first signal from the plant representative of a controlled magnitude in the plant, an I-member for generating a second signal corresponding to an integrated value of the first signal and an output for emitting a third signal corresponding to said second signal;
- a comparator having a first input connected to said output of said controller to receive said third signal, a second input to receive a fourth signal and an output for emitting a fifth signal representative of a difference between said third and fourth signals;
- a servo-motor having a limited rate of adjustment, an

input connected to said comparator output to receive said fifth signal and an output for delivering a control signal for controlling the controlled magnitude in the plant;

- a pick-off connected to and between said output of said servo-motor and said second input of said comparator to generate a follow-up signal indicative of said control signal and to deliver said follow-up signal as said fourth signal to said second input of said comparator; and
- an attenuating means connected to and between said comparator output and said I-member to attenuate said first signal being delivered to said I-member.

4,422,026

## SERVO CONTROL ARRANGEMENT UTILIZING ALTERNATELY ENERGIZED LIGHT SOURCES AND A SINGLE PHOTODETECTOR

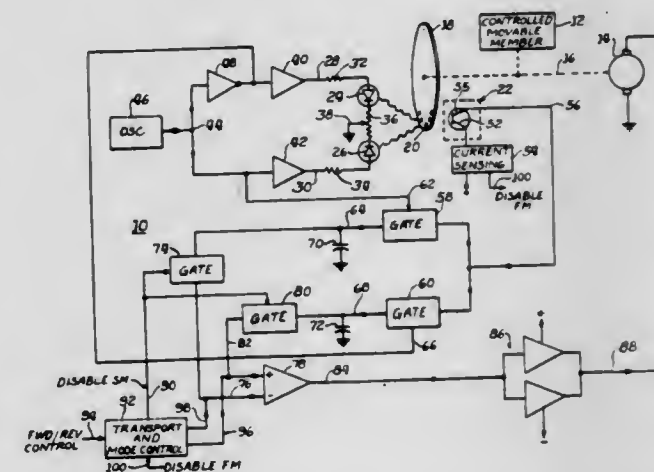
Rudolph Starai, Arlington Heights, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 31, 1981, Ser. No. 336,469

Int. Cl.<sup>3</sup> G05B 1/06

U.S. Cl. 318—640

16 Claims



1. A servo control arrangement for controlling the accurate positioning of a movable controlled member to each of a predetermined plurality of controlled positions, the servo control arrangement comprising:

- means responsive to a drive input signal for moving the controlled member to said plurality of controlled positions;
- coded array means arranged for movement in a manner directly correlated to movement of the controlled member, said coded array means comprising an array of energy transmissive members arranged in a predetermined pattern, one of said energy transmissive members being disposed in said predetermined pattern corresponding to each of the predetermined plurality of controlled positions, movement of said coded array means resulting in said coded array describing a predetermined path, movement of said coded array means sequentially presenting each of said energy transmissive members in said predetermined pattern to a predetermined detection station;

energy generating means comprising two energy generation sources and means for alternately energizing each of said two energy generation sources at a predetermined rate, said two energy generation sources being disposed at said detection station on one side of said coded array means, said two energy generation sources being arranged side by side along said predetermined path and substantially centered about said detection station;

- energy detection means responsive to said energy generation sources for generating an output signal representative of the relative level of energy received, said energy detection means being disposed at said detection station on the side of said coded array means opposite said energy generation sources and generally aligned with a line substantially per-



pendicular to said planar array and passing through the midpoint of said two energy generation sources such that energy generated by said energy generation sources is received by said energy detection means through one of said energy transmissive members when said energy transmissive member is within a predetermined positional range of said aligned detection position, the relative amount of energy received by said energy detection means from each of said energy generative sources being dependent on the position of said energy transmission member within said predetermined positional range;

control means responsive to said output signal of said energy detection means for controlling operation of said moving means and generating said drive input signal in accordance with the relative difference in the output of said energy detection means occurring between the respective energization times of said alternately energized sources and corresponding to the relative difference in energy received from each of said energy generative sources.

4,422,027

## LINEAR MOTOR CONTROLLER

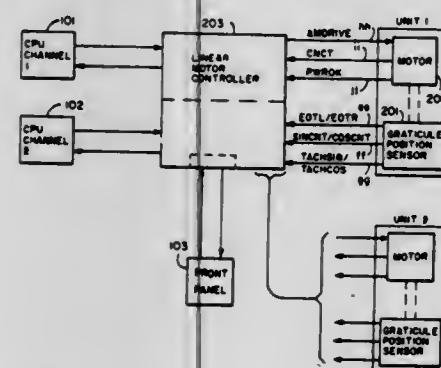
Richard D. Mohlere, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 16, 1981, Ser. No. 244,438

Int. Cl.<sup>3</sup> G05B 11/00

U.S. Cl. 318-687

1 Claim



1. A motor controller device comprising a motor to be controlled; a position sensor associated with said motor such that the sensor will generate at its outputs, signals indicating the position and travel of said motor; a linear motor controller connected to drive said motor and connected to receive the signals from said position sensor; said linear motor controller having a plurality of registers which may be loaded with predetermined values so as to control various motions and rates of said motor; a panel control device having a plurality of data input switches which are connected to said registers for selectively inputting said predetermined value into selective ones of said registers for controlling movement of said motor; a second motor, a second position sensor associated with said second motor for indicating position and movement of said second motor; said second motor and said second position sensor being connected to said linear motor controller; further switching means on said panel control device for selecting which motor is to be controlled; first and second computer inputting devices; and additional switching means on said panel control device for selectively connecting the plurality of registers to one of said computer inputting devices or to said panel control device.

# 4,422,028 BRUSHLESS EXCITATION SYSTEM WITH A HOLDING CURRENT RESISTOR

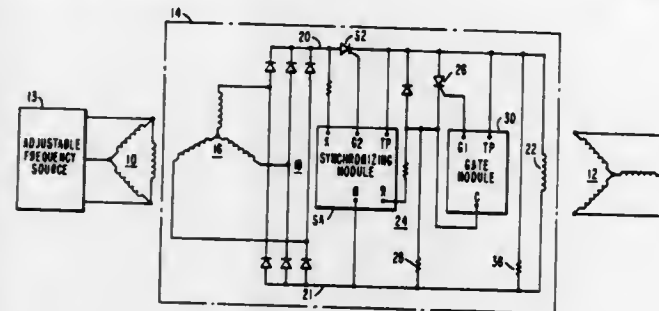
Gurney L. Godwin, and Alvin M. Vance, both of Georgetown, Tex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1981, Ser. No. 262,737

Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318-718

8 Claims



1. A brushless excitation system for a synchronous dynamoelectric machine comprising:  
a stationary exciter field winding;  
a rotor assembly including:  
an exciter armature winding inductively coupled to the exciter field winding,  
a rectifier connected to the exciter armature winding,  
a synchronous dynamoelectric machine field winding connected in circuit with said rectifier, and  
an excitation control system for controlling the application of excitation current from said rectifier to said field winding, said control system including in part a semiconductor switch requiring a minimum holding current for reliable turn-on in response to a predetermined gating signal, and  
a holding current resistor connected across said field winding for insuring conduction of sufficient holding current to reliably turn on said semiconductor switch.

4,422,029

## INSTANT REVERSE CONTROL CIRCUIT FOR A SINGLE PHASE MOTOR

J. T. Maurice Demers, and Peter G. Stefanatos, both of Quebec, Canada, assignors to Doorlec Corporation/Corporation Doorlec, Montreal, Canada

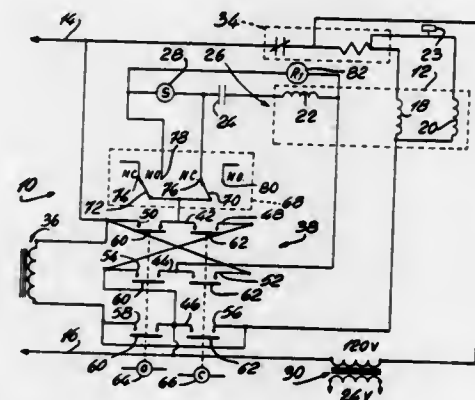
Filed May 19, 1982, Ser. No. 379,921

Claims priority, application Canada, May 28, 1981, 378548

Int. Cl.<sup>3</sup> H02P 1/44

U.S. Cl. 318-753

7 Claims



1. In a control circuit for a single phase AC motor having a running winding, a starting circuit comprising a start winding and a phase shift device connected in series, and a switch means for deenergizing the starting circuit when the motor is running, the motor being capable of operating in either direction, the improvement comprising:  
reversing switch means for reversing the current direction

through the start windings, said reversing switch means comprising a remotely operable double-pole, double-throw reversing switch having a set of first contacts, a set of second contacts, a set of common contacts, and two movable contact members for selectively, electrically connecting each of said common contacts with corresponding ones of said first and second contacts, a first one of said common contacts being connected at all times to one end of the starting circuit, corresponding ends of the starting circuit; and

switch means for bypassing the deenergizing switch means comprising a first contact connected to one end of the starting circuit and a second contact connected at all times to a second one of said reversing switch common contacts such that the starting circuit can be energized while the motor is running in the opposite direction thereby rapidly decelerating the motor.

4,422,030

## A.C. MOTOR CONTROL

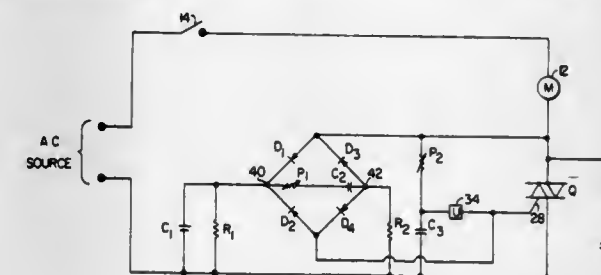
Raymond J. McAllise, 1812 Bruce St., Canal Fulton, Ohio 44614

Continuation-in-part of Ser. No. 178,499, Aug. 15, 1980, abandoned. This application Sep. 11, 1981, Ser. No. 301,423

Int. Cl.<sup>3</sup> H02P 1/18

U.S. Cl. 318-779

43 Claims



1. A motor control in combination with a motor and a source of substantially constant frequency and substantially constant voltage A.C. power, said motor control comprising terminals connecting it in circuit with said motor and with said source of A.C. power, a main switching means switchable between ON and OFF conditions, and control means responsive to the switching of said main switching means from its OFF to its ON condition and operable while said A.C. source remains at its substantially constant frequency and its substantially constant voltage for first feeding power from said source to said motor at a high average voltage during a starting period of some duration and for automatically thereafter feeding power from said source to said motor at a lower average voltage of fixed value which is maintained for so long as said main switching means remains in its ON condition, said high average voltage at least at the very beginning of said starting period being equal to the average value of the voltage of said source.

4,422,031

## METHOD AND DEVICE FOR CHARGING AN ELECTRICAL ACCUMULATOR BATTERY BY MEANS OF SOLAR-CELLS

Ole K. Vigerstol, Turramurra, Australia, assignor to SAB Nife AB, Landskrona, Sweden

PCT No. PCT/SE81/00376, § 371 Date Aug. 12, 1982, § 102(e) Date Aug. 12, 1982, PCT Pub. No. WO82/02121, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 16, 1981, Ser. No. 413,344

Claims priority, application Sweden, Dec. 17, 1980, 80088990

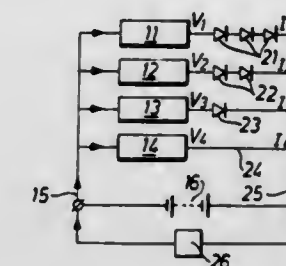
Int. Cl.<sup>3</sup> H02J 7/00

U.S. Cl. 320-2

3 Claims

1. A device for charging an electrical accumulator battery by means of solar panels containing solar-cells characterised by a plurality of charging branches connected in parallel, each comprising at least one solar-cell panel, which charging branches contain solar-cell panels of substantially the same

power, and in which branches at least one diode is respectively connected in series between at least some of the solar panels and the battery to constitute the sole switching means for disconnecting the solar panels in the respective branches auto-



matically in response to variations in battery voltage, the charging branches being adapted to deliver charging current at different voltages with at least one voltage from one of the panels by means of the diodes being higher than the others.

4,422,032

## BATTERY CHARGING CIRCUIT FOR MAINTAINING A SUBSTANTIALLY CONSTANT AVERAGE VALUE OF CHARGING CURRENT DESPITE VARIATIONS IN CHARGING VOLTAGE

Hiroshi Kakumoto, and Kaoru Furukawa, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

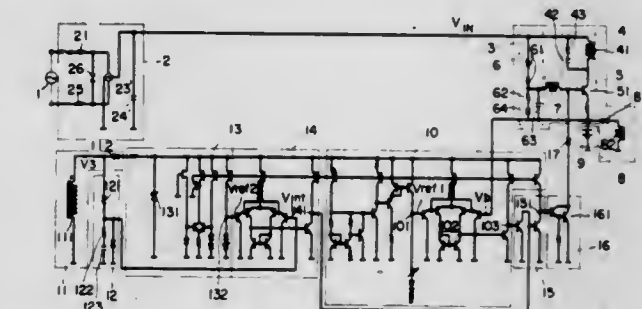
Filed Feb. 3, 1981, Ser. No. 231,006

Claims priority, application Japan, Feb. 14, 1980, 55-16842

Int. Cl.<sup>3</sup> H02J 7/10

U.S. Cl. 320-39

6 Claims



1. A charging apparatus for a rechargeable battery, comprising:  
an alternating current voltage source for supplying an A.C. input voltage;  
a rectifying means for converting said A.C. input voltage to a D.C. input voltage;  
inverter means receiving the D.C. input voltage from said rectifying means, said inverter means including,  
an oscillating transformer having a primary winding, a secondary winding and a feedback winding,  
a semiconductor switch means inserted in a current path of said primary winding, and  
means receiving the D.C. input voltage from said rectifying means for providing an on signal to said semiconductor switch means through said feedback winding,  
said primary winding receiving the output from said rectifying means, said secondary winding being connected to a rechargeable battery through a rectifying element,  
a fourth winding coupled to said oscillating transformer, means for rectifying the voltage obtained from said fourth winding in synchronism with an oscillating period of said inverter means for generating a source voltage; and  
control means responsive to said source voltage, said control means including,



voltage comparing means receiving at one input thereof a predetermined reference voltage,  
means for supplying a comparison voltage associated with said source voltage to the other input of said voltage comparing means,  
said voltage comparing means providing an output if and when said comparison exceeds said reference voltage,  
means responsive to the output from said voltage comparing means for forcing said semiconductor switch means off,  
the on time period of said semiconductor switch means being approximately reversely proportional to the magnitude of said D.C. input voltage, whereby the charging current of the rechargeable battery coupled to said secondary winding is maintained approximately constant.

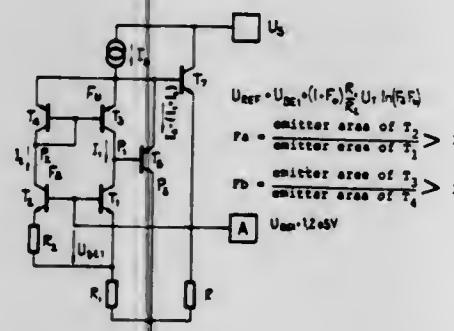
4,422,033

**TEMPERATURE-STABILIZED VOLTAGE SOURCE**  
Willy Minner, Schwaigern; Rolf Böhme, Bad Friedrichshall; Martin Siegle, Weinstadt, and Heinz Rinderle, Heilbronn, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany  
Filed Dec. 15, 1981, Ser. No. 330,811  
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047685

Int. Cl.<sup>3</sup> G05F 3/08, 1/58

U.S. Cl. 323—314

10 Claims



1. A temperature-stabilized voltage supply circuit comprising first and second parallel-connected circuit branches, first and second pairs of interconnected transistors, one transistor from each pair lying in each circuit branch, electrical supply means connected to said current branches, a third circuit branch connected in parallel to said first and second circuit branches, and circuit output means for the temperature-stabilized voltage wherein the active transistor areas of the transistors within each of said pairs are different.

4,422,034

# METHOD FOR MEASURING INSULATION RESISTANCE AND DEVICE THEREFOR

Tatsuji Matsuno, Kawasaki, and Yosio Nomura, Fujisawa, both of Japan, assignors to Toyo Sushinki Kabushiki Kaisha, Kanagawa, Japan

Filed Jan. 19, 1981, Ser. No. 226,620

Claims priority, application Japan, Jan. 22, 1980, 55-6207; Mar. 27, 1980, 55-39926; Apr. 9, 1980, 55-47324

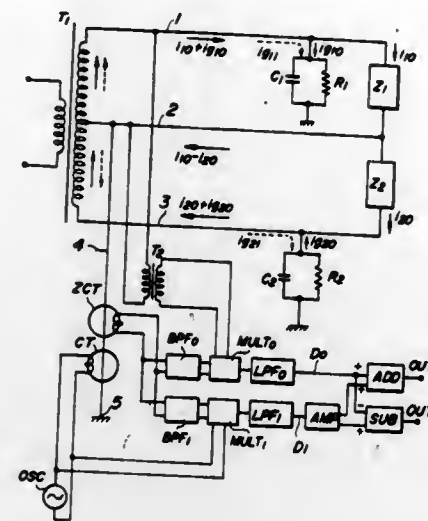
Int. Cl.<sup>3</sup> G01R 31/02

U.S. Cl. 324—51

9 Claims

1. A method for the measuring insulation resistance of a grounded supply line, in which one end of a secondary circuit, to which a main frequency  $f_0$  is fed, is grounded via a ground wire, comprising the steps of applying a low voltage of a frequency  $f_1$ , different from the main frequency  $f_0$ , into the ground wire through a transformer coupled thereto, detecting separately the leakage current of the frequency  $f_0$  and the leakage current of the frequency  $f_1$ , both said current leakages being included in the output of a zero phase transformer coupled with said ground wire, obtaining a component of the leakage current of the frequency  $f_0$  and a component of the

leakage current of the frequency  $f_1$ , and deriving an amount in inverse proportion to the insulation resistance of each non-



grounded line by using an arithmetic operation of said components while the line is in active condition.

4,422,035

# CAPACITANCE MEASUREMENT PROBE

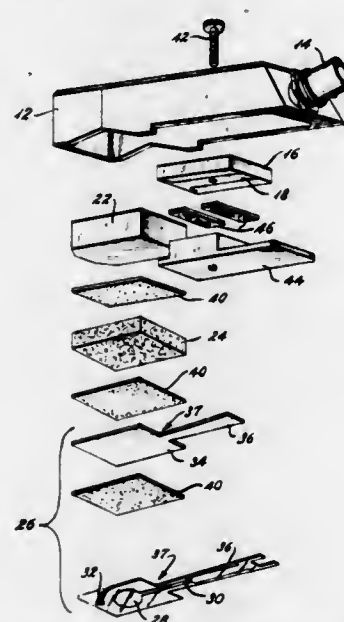
Donald G. Risko, Monroeville, Pa., assignor to Extrude Hone Corporation, Irwin, Pa.

Filed Dec. 11, 1981, Ser. No. 329,943

Int. Cl.<sup>3</sup> G01R 27/26

U.S. Cl. 324—61 P

29 Claims



1. In a probe for use in capacitive gauging of the texture of a conductive surface, said probe having a casing and attached elastomer pad backing for a capacitive type sensor, an active sensor area electrically insulated from said casing, and a dielectric attached to said sensor to space said active sensor area from said surface, the improvement comprising:

a flexible coating of conductive material on said dielectric, said coating having a configuration to form said active sensor area and an integral conductive lead for connection of said sensor area to an electronic instrumentation package.

4,422,036

# APPARATUS FOR CONTINUOUSLY MEASURING CELLS OR PARTICLES IN SUSPENSION IN A LIQUID MEDIUM

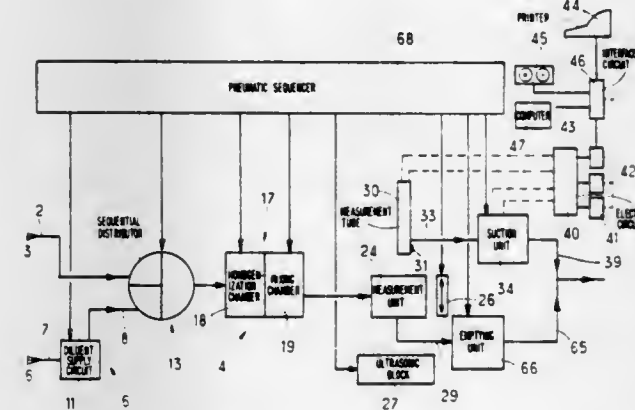
Manfred Moll, Allee Chaptal, Richardmenil, 54630 Flavigny S/Moselle; Jean J. Delorme, 47 bld Albert ler, 54000 Nancy, and Jean C. Weber, 16 rue du Portugal, 54500 Vandoeuvre, all of France

Continuation of Ser. No. 835,788, Sep. 22, 1977, abandoned. This application Dec. 31, 1979, Ser. No. 108,571

Claims priority, application France, Aug. 31, 1977, 77 27155 Int. Cl.<sup>3</sup> G01N 27/00

U.S. Cl. 324—71.4

4 Claims



1. An automatic apparatus for sampling and preparing a sample of a liquid medium during the course of fermentation of the liquid medium and for determining the number of cells or particles in suspension in the liquid medium, said apparatus comprising:

sampling means for sampling a liquid medium;  
dilution means for diluting the sample of liquid medium;  
measuring means for measuring the number of cells or particles in the diluted sample of liquid medium;  
said measuring means comprising a measurement receptacle for containing the diluted sample of liquid medium and being positionable at a raised measurement position and a lowered treatment position, ultrasonic applicator means for applying ultrasonic energy to the diluted sample of liquid medium within said measurement receptacle when said measurement receptacle is in the lowered treatment position, a measurement electrode positioned for measuring the number of cells or particles in suspension in the diluted sample of liquid medium within said measurement receptacle when said measurement receptacle is in the raised measurement position; and  
sequential actuating means for automatically sequentially actuating said sampling means, said dilution means and said measuring means to sequentially sample, dilute, treat with ultrasonic energy and measure the liquid medium.

4,422,037

# STORM WARNING METHOD AND APPARATUS

Ernest W. Coleman, 1465 Sinkler Rd., Warminster, Pa. 18974

Filed Feb. 17, 1981, Ser. No. 235,168

Int. Cl.<sup>3</sup> G01N 31/02

U.S. Cl. 324—72

25 Claims

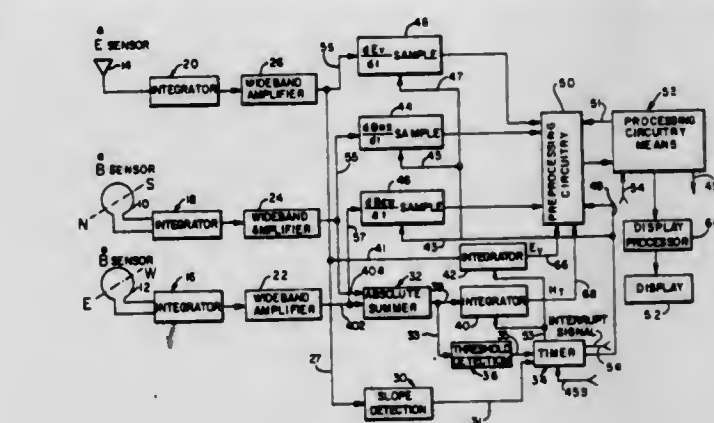
1. An apparatus for determining the location of lightning strokes, each lightning stroke generating electric (E) and magnetic (H) field components, said apparatus comprising:

receiving means for receiving separately the electric (E) and magnetic (H) field components of a lightning stroke and for generating electrical signals associated with said E and H field components;

recognition circuitry means connected to said receiving means for indicating when said E and H field components of a lightning stroke have been received by said receiving means;

control circuitry means connected to said recognition circuitry means for providing control signals to said apparatus when said recognition circuitry means indicates that

said E and H field components of a lightning stroke have been received by said receiving means;  
integration circuitry means connected to said receiving means and said control circuitry means for integrating separately over a predetermined time interval said electrical signals associated with said E field and said electrical signals associated with said H field, said integration occurring in response to at least a selected one of said control signals;  
sampling circuitry means connected to said receiving means



and said control circuitry means for sampling said electrical signals in response to a plurality of second ones of said control signals; and  
processing circuitry means disposed to receive said integrated and sampled electrical signals in response to a third one of said control signals, said processing circuitry means for determining the direction to said lightning stroke relative to said apparatus from said sampled electrical signals, and for determining the distance to said lightning stroke from said apparatus from said integrated or sampled electrical signals.

4,422,038

# INTEGRATED CIRCUIT WITH FREQUENCY-DIVIDING CIRCUITS CAPABLE OF BEING TESTED AT A HIGH SPEED

Hideo Monma, Kawasaki; Masayuki Takahashi, Utsunomiya, and Masato Ishiguro, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP80/00138, § 371 Date Feb. 18, 1981, § 102(e) Date Feb. 18, 1981, PCT Pub. No. WO80/02880, PCT Pub. Date Dec. 24, 1980

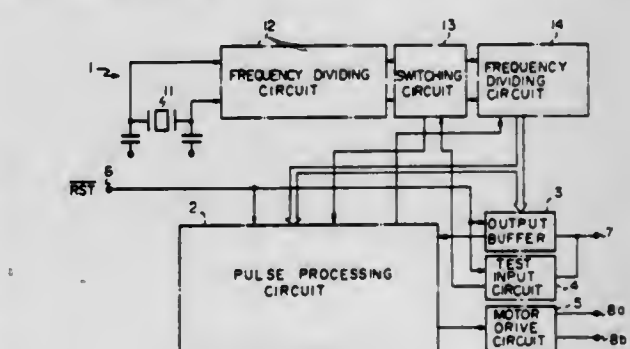
PCT Filed Jun. 19, 1980, Ser. No. 237,152

Claims priority, application Japan, Jun. 19, 1979, 54-77169

Int. Cl.<sup>3</sup> G01R 31/28, 23/00; G04C 3/00

U.S. Cl. 324—73 R

7 Claims



1. An improved integrated circuit of the type which has a plurality of pins and which includes a frequency-dividing circuit for dividing an input signal, a pulse processing circuit for processing the signal that is divided by said frequency-dividing circuit to produce processed pulses, an output circuit



for feeding the processed pulses through at least one first pin to a load, said pulse processing circuit including a reset signal receiving circuit, for discontinuing the transfer of processed pulses to the load following receipt of a reset signal applied to a second pin, and an output buffer circuit connected between said frequency-dividing circuit and a third pin, wherein the improvement comprises:

testing means responsive to a test signal applied to said third pin while said reset signal is applied to said second pin for introducing said test signal at an intermediate point in said frequency-dividing circuit, said intermediate point dividing said frequency-dividing circuit into first stage and second stage frequency-dividing circuits, and for permitting transfer of processed pulses to said at least one first pin despite the presence of said reset signal at said second pin, in order to permit testing of said second stage frequency-dividing circuit, said pulse processing circuit, and said output circuit, said testing means including a switching circuit inserted between the first stage and second stage frequency-dividing circuits; test input circuit means having an input connected to said third pin for supplying said test signals through said switching circuit to the second stage frequency-dividing circuit; and means included within said output buffer circuit for isolating said output buffer circuit from said third pin when a reset signal is fed through said second pin to said reset signal receiving circuit.

4,422,039

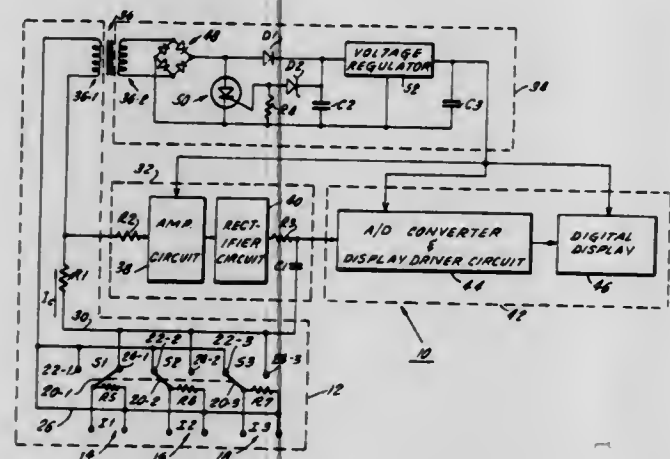
**SELF-POWERED AMMETER**

Lee A. Davis, Audubon, N.J., assignor to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed Apr. 24, 1981, Ser. No. 256,998

Int. Cl.<sup>3</sup> G01R 19/22, 1/20

U.S. Cl. 324—119



1. A self-powered ammeter for providing a visual indication of the magnitude of an a-c current; said ammeter comprising: a metering circuit for generating a first d-c voltage signal indicative of the magnitude of said a-c current; a display circuit connected to said metering circuit and responsive to said first d-c voltage signal for providing a visual indication of the magnitude of said a-c current; and a power supply circuit including a current transformer having a primary winding which conducts said a-c current, and a secondary winding connected to burden circuit means; said burden circuit means having a d-c power supply output having a regulated magnitude and means for applying said power supply output to power supply inputs of both said metering circuit and said display circuit for powering the same; said burden circuit means comprising rectifier means connected to said secondary winding and voltage regulator means connected to the output of said rectifier means; said burden circuit means further including a capacitor and means for charging said capacitor to a predetermined level and for maintaining the

charge on said capacitor substantially at said predetermined level; said charging means comprising a first diode for permitting charging current to flow into said capacitor but preventing discharge current to flow and thyristor means for permitting charging current to flow into said capacitor only when the charge across said capacitor is below a predetermined value.

4,422,040

**METHOD OF TESTING STEPPING MOTORS**

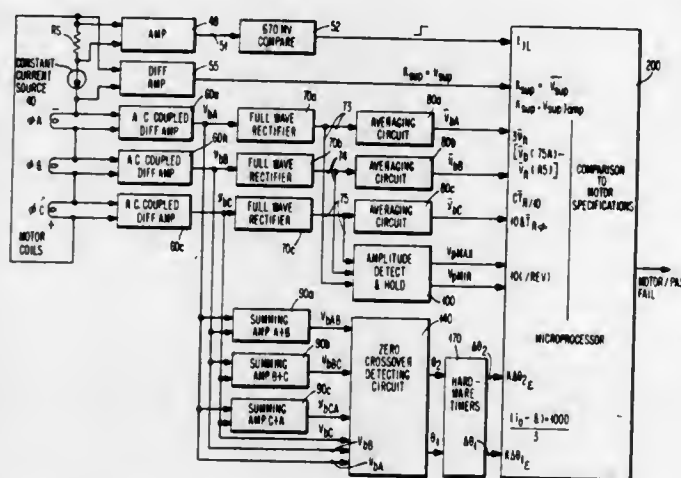
Jerry W. Raider, and Earl D. Ward, II, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,492

Int. Cl.<sup>3</sup> G05B 19/40

U.S. Cl. 324—158 MG

29 Claims



1. A method of testing a stepping motor having a stator with a plurality of phases and a rotor, comprising the steps of: connecting the phases of the motor under test in series; applying a constant current to said phases; rotating said rotor of said motor at a constant speed; detecting a voltage drop across at least one phase and converting said detected voltage drop into back EMF for said at least one phase; analyzing the back EMF of at least said one phase to determine a parameter of said motor.

4,422,041

**MAGNET POSITION SENSING SYSTEM**

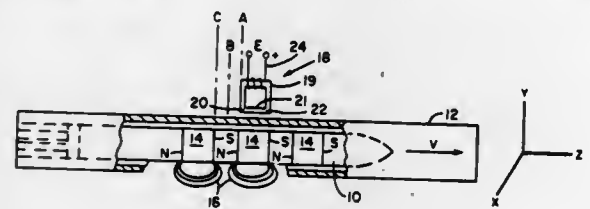
Jeffrey A. Lienau, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 30, 1981, Ser. No. 288,595

Int. Cl.<sup>3</sup> G01B 7/14

U.S. Cl. 324—207

4 Claims



1. A magnetic position sensing circuit comprising: an object having a longitudinal axis and adapted for displacement substantially along said axis; magnetic means disposed selectively on said object for producing a plurality of magnetic fields, said magnetic means being a plurality of spaced apart magnetic field producing members disposed around the circumference of the object for radiating individual magnetic fields circumferentially outward from the object; sensing means disposed adjacent to said object for sensing magnetic field strength indicative of lateral and longitudinal position changes of said

magnetic means relative to said sensing means, said sensing means being a plurality of sensor elements disposed in a plurality of parallel planes passing through the object and each element being disposed for sensing positional changes in the object; signal processing means for indicating the changes in lateral and longitudinal position between said sensing means and said magnetic means; and a centerline axis normal to said planes, said sensor elements being equidistant from said centerline.

4,422,042

**NUCLEAR RESONANCE APPARATUS INCLUDING MEANS FOR ROTATING A MAGNETIC FIELD**

Hiroshi Sugimoto, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

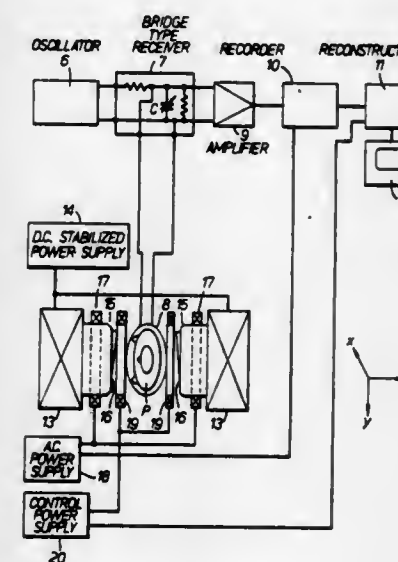
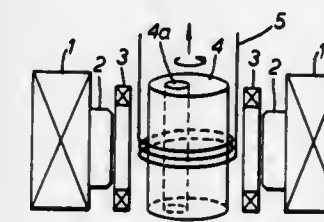
Filed May 19, 1981, Ser. No. 265,240

Claims priority, application Japan, Jun. 13, 1980, 55-79391

Int. Cl.<sup>3</sup> G01R 33/08

U.S. Cl. 324—313

5 Claims



1. A nuclear magnetic resonance apparatus for measuring the nuclear magnetic resonance of a specified atomic nucleus in a body, the apparatus comprising:

a magnet apparatus for generating a homogeneous static magnetic field between its magnetic poles; shim means composes of a magnetic substance mounted on said magnetic poles for applying a first gradient magnetic field intensity distribution in a direction orthogonal to the direction of the line of magnetic force of the static magnetic field; gradient magnetic field generating electromagnetic apparatus for generating a second gradient magnetic field having a gradient magnetic field intensity distribution as to the direction along said line of magnetic force in superimposition with the static magnetic field for varying the magnetic field gradient of said first gradient magnetic field; an oscillator for generating an oscillating output having a frequency corresponding to the nuclear magnetic resonance condition of the atomic nucleus to be measured; a coil wound around the body to be examined for applying the output of said oscillator as electromagnetic waves upon the body;

a receiver for detecting the nuclear magnetic resonance signal received by the coil; a gradient magnetic field controller making a magnetic field line equivalent to the gradient magnetic field defined as the combination of the first gradient magnetic field generated by said magnet apparatus, as acted on by said shims, and the second gradient magnetic field generated by said electromagnetic apparatus, and for rotating the line along the section of the body to be examined by controlling said electromagnetic apparatus; a recorder for recording the nuclear magnetic resonance signal intensity detected by the receiver as to a plurality of directions of equivalent magnetic fields due to said gradient magnetic field controller in a manner to correspond to the position as to the direction perpendicular to said equivalent magnetic field line; a reconstructor for reconstructing the concentration distribution of the specific atomic nuclei in the section of the body on the basis of the nuclear magnetic resonance signal intensity as to a plurality of directions recorded in the recorder;

and

a display unit for depicting the result of the reconstruction by said reconstructor.

4,422,043

**ELECTROMAGNETIC WAVE LOGGING DIPMETER**

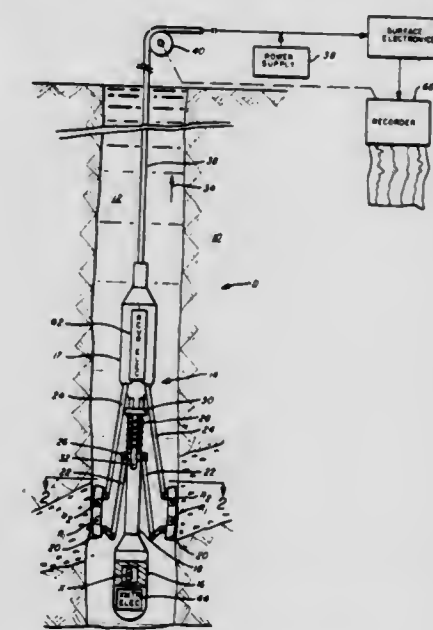
Richard A. Meador, Spring, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,391

Int. Cl.<sup>3</sup> G01V 3/30

U.S. Cl. 324—338

12 Claims



1. A radio frequency well logging dipmeter for determining dip of subsurface formations adjacent a well borehole, comprising:

(a) a sonde for movement in the well borehole; (b) transmitter means in said sonde for emitting radio frequency electromagnetic waves at a frequency in a preferred range of two megahertz to one hundred megahertz; (c) at least three pads mounted with said sonde for contacting subsurface formation walls at selected depths in the well borehole; (d) a plurality of radio frequency sensor coils mounted in a manner so that a common axis of the sensor coils is substantially parallel to the longitudinal axis of the well borehole when in use on each of said pads for sensing the water emitted from said transmitter means; (e) electronic circuit means for forming a measure of the phase difference between the waves sensed by said sensor coils for each one of said pads to form an indication of the dip of the well borehole.



# 4,422,044 HIGH PRECISION TRIANGULAR WAVEFORM GENERATOR

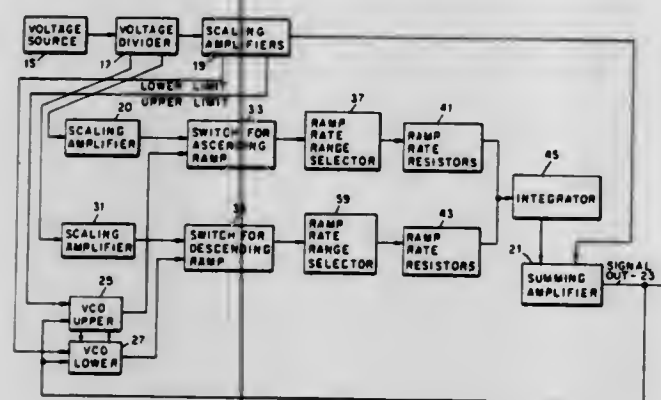
Theodore R. Mueller, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 17, 1981, Ser. No. 322,145

Int. Cl.<sup>3</sup> H03K 4/10, 4/84

U.S. Cl. 328—181

4 Claims



1. A triangular waveform generator, comprising:  
a current integrator having an input and an output;  
a first constant-current-generating means connected to the input of said integrator for generating and applying a first constant current to said input of said integrator corresponding to a selectable positive-going ramp rate for the triangular waveform at the output of said integrator in response to a first selectable scaled voltage applied to an input thereof;

a second constant-current-generating means connected to the input of said integrator for generating and applying a second constant current following said first constant current to said input of said integrator corresponding to a selectable negative-going ramp rate for said triangular waveform at the output of said integrator in response to a second scaled voltage applied to said input;  
means for generating said first and second selectable scaled voltages;

means for generating first and second selectable reference voltages corresponding to the desired upper and lower voltage limits, respectively, of said triangular waveform; and

switching means for alternately applying said first and second scaled voltages to said first and second constant-current-generating means, respectively, including first and second gated rectifier circuits each having an input connected to receive said first and second scaled voltages, respectively, and generating and continuously applying either a zero volt signal or the corresponding scaled voltage signal to said first and second current generating means, respectively, when gated "off" or "on" in response to first and second gate control signals applied to respective gate control inputs thereof; and first and second voltage crossing detector means each having inputs coupled to receive the output signal of said integrator and said first and second reference voltages, respectively, for generating said first and second gate control signals so that said first gated rectifier circuit is gated on and said second gated rectifier circuit is gated off until the amplitude of the positive going portion of the output signal of said integrator crosses said first reference signal level and alternately said first gated rectifier circuit is gated off and said second gated rectifier circuit is gated on until the amplitude of the negative-going portion of the output signal of said integrator crosses said second reference signal level.

# 4,422,045 BARNETRON MICROWAVE AMPLIFIERS AND OSCILLATORS

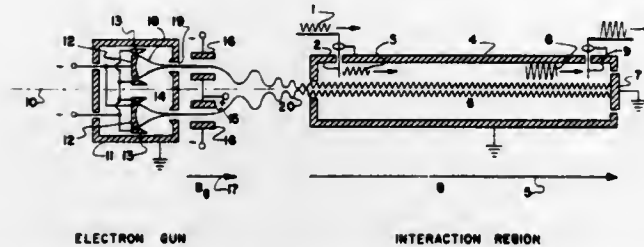
Larry R. Barnett, 8221 Erika Dr., Manassas, Va. 22111

Filed Mar. 20, 1981, Ser. No. 245,759

Int. Cl.<sup>3</sup> H01S 1/00; H01J 23/16

U.S. Cl. 330—4

6 Claims



1. An amplifying maser device utilizing a spatially nonlinear electrostatic field to induce stimulated cyclotron emission of radiation by electrons which comprises: a fast-wave propagating electromagnetic waveguide to support the wave, an input and output coupling means, a means of producing a magnetic field in the said waveguide, a means of injecting electrons with components of velocity parallel and perpendicular to the said magnetic field wherein the spatial distribution of the electrons produces the spatially nonlinear electrostatic field where the said spatially nonlinear electrostatic field is defined to be an electric field which is described as: the magnitude of the said electric field having a nonlinear variation as a function of position in one or more directions and serves to cause an electron moving in cyclotron orbits, in said magnetic field and said electric field, to have its cyclotron orbit to be modified and the cyclotron resonance frequency to be modified where the said resonance frequency is a function of the magnitude of the said orbit.

# 4,422,046

## AXISYMMETRIC SPATIAL/TEMPORAL ENCODER

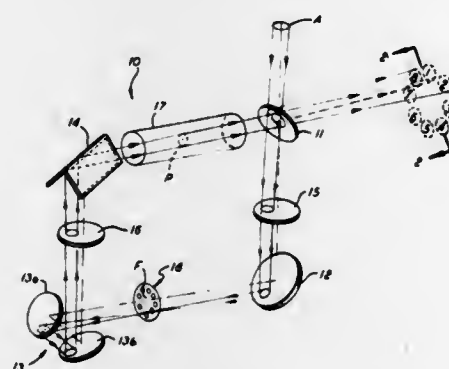
Peter B. Mumola, Huntington; Paul R. Yoder, Jr., Wilton; Raul E. Casas, Danbury, and William M. Grossman, Ridgefield, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 23, 1980, Ser. No. 162,213

Int. Cl.<sup>3</sup> H01S 3/05

U.S. Cl. 330—4.3

19 Claims



1. An optical ring for continuously circulating a beam around its periphery, comprising in combination;  
first means for receiving a collimated beam into said ring at a predetermined angle relative to the optical axis of the ring;  
second means comprising an out-of-plane mirror assembly for causing said beam to turn in azimuth about the optical axis.

# 4,422,047 SOLID STATE AUTOTUNE POWER AMPLIFIER

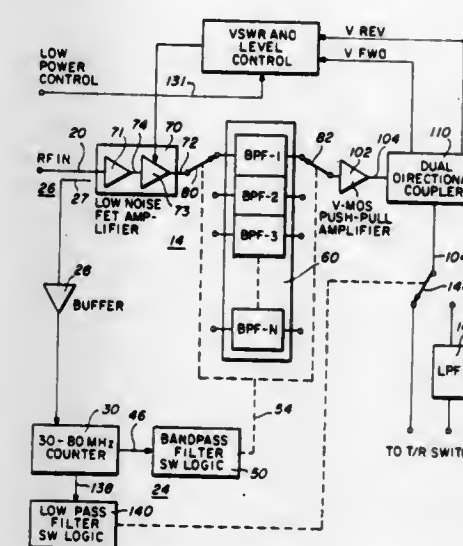
William A. Wright, Fairfax Station, Va., assignor to E-Systems, Inc., Dallas, Tex.

Filed Nov. 23, 1981, Ser. No. 324,223

Int. Cl.<sup>3</sup> H03F 3/191; H03G 3/30; H04B 1/04

U.S. Cl. 330—51

10 Claims



1. A method of automatically tuning an R.F. power amplifier to the R.F. signal generated in a multichannel radio transmitter and applied to the input of the R.F. power amplifier so as to provide equal response across all transmission channels of the radio transmitter, comprising the steps of:

- determining the frequency of the R.F. signal;
- automatically selecting one of a plurality of band pass filters (BPF) having separate band-pass characteristics which collectively cover the bandwidth of all channels of the radio transmitter, basing said selection on said frequency determination;
- passing the RF signal through said selected BPF for reducing broadband noise;
- amplifying said filtered RF signal to a preselected level;
- sampling said amplified and filtered RF signal; and
- controlling the magnitude of said amplified and filtered RF signal with said sample and in functional relation to said preselected level and a Voltage Standing Wave Ratio (VSWR) load of the RF power amplifier.

# 4,422,048

## MULTIPLE BAND FREQUENCY RESPONSE CONTROLLER

Richard K. Edwards, 784 Austin Ave., Oradell, N.J. 07649  
Continuation-in-part of Ser. No. 121,596, Feb. 14, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,108

Int. Cl.<sup>3</sup> H03F 1/34, 3/181

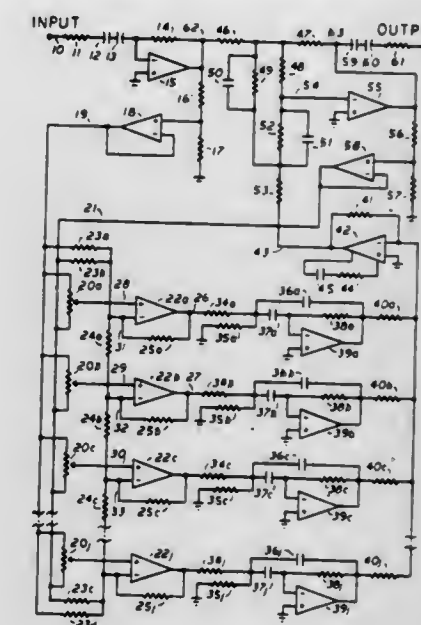
U.S. Cl. 330—109

22 Claims

20. A multiple band frequency response controller having a plurality of frequency control bands, each of which includes frequency band selective means in combination with a band response control, said band response controls being operatively controlled by control means, said control means comprising computing means characterized in that:

the control signals applied to said plurality of band response controls by said control means are determined by said computing means by the process comprising the step of multiplying the matrix representing the desired system response levels at the band center frequencies of said plurality of frequency control bands by a multiplier matrix which is substantially proportional to the matrix which is the inverse of the matrix representing the real response components of said frequency band selective means of each of said frequency control bands at the various center

frequencies of said plurality of frequency band selective means, whereby system response at each of said band



center frequencies is caused to substantially conform to said desired system response levels.

# 4,422,049

## GAIN CONTROL CIRCUIT

Kenzo Akagiri, and Masayuki Katakura, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

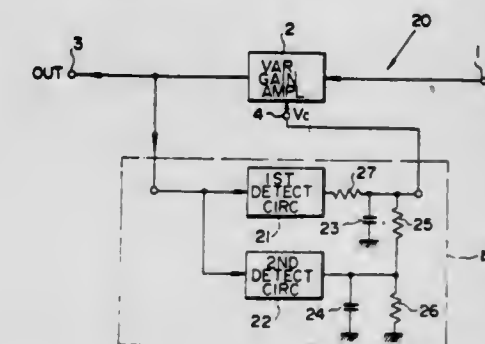
Filed Mar. 23, 1981, Ser. No. 246,392

Claims priority, application Japan, Mar. 24, 1980, 55-37112

Int. Cl.<sup>3</sup> H03G 7/00

U.S. Cl. 330—134

19 Claims



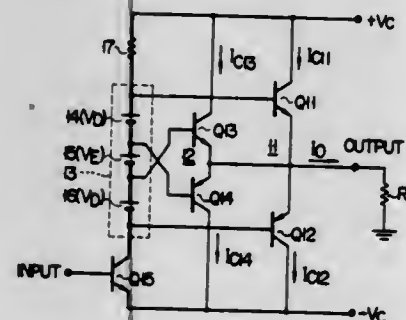
1. A gain control circuit including variable gain amplifier means having input, output and control terminals, and control means for generating a control signal applied to said control terminal for controlling the gain with which said variable gain amplifier means amplifies an input signal applied to said input terminal for providing an output signal to said output terminal, said control means comprising:

first and second detector means for detecting a signal passed through the amplifier means and providing respective first and second detector outputs representative of the level of said signal passed through the amplifier means;  
first and second capacitors connected at one side to said first and second detector means so as to be chargeable by said first and second detector outputs, respectively;  
said one side of said first capacitor being connected with said control terminal of the variable gain amplifier means so that the charge on said first capacitor constitutes said control signal;  
a first resistor connected between said one sides of said first and second capacitors; and  
a second resistor connected with said one side of said second capacitor for the discharge of said second capacitor through said second resistor and for the discharge of said first capacitor through said first and second resistors only



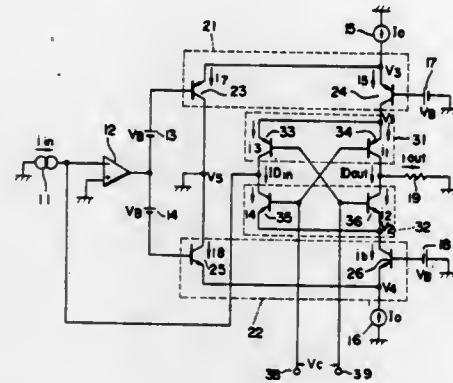
after substantial discharge of said second capacitor through said second resistor so that the discharge time constant of said first capacitor is varied in accordance with said second detector output.

**4,422,050**  
**SINGLE-ENDED PUSH-PULL AMPLIFIER WITH TWO COMPLEMENTARY PUSH-PULL CIRCUITS**  
 Kenji Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan  
 Filed Jul. 1, 1981, Ser. No. 279,253  
 Claims priority, application Japan, Jul. 9, 1980, 55-93420  
 Int. Cl.<sup>3</sup> H03F 3/26  
 U.S. Cl. 330-263 15 Claims



1. An audio amplifier comprising:  
 first and second complementary single-ended push-pull circuits connected in parallel across a power source and having their outputs connected together, said first push-pull circuit including first and second complementary transistors and said second push-pull circuit including third and fourth complementary transistors, said first and third transistors being in a positive side, and said second and fourth transistors being in a negative side, said output of said push-pull circuits being adapted to be coupled to a load;  
 an input coupled to said push-pull circuits for receiving an input signal; and  
 a bias circuit coupled to said first and second push-pull circuits for biasing said first to fourth transistors, such that:  
 idling currents are allowed to flow through said first and second transistors under a zero signal input condition;  
 said third and fourth transistors are both in a cut-off state when an input signal applied to said first and second push-pull circuits is small;  
 as said input signal increases in one direction, a current flowing through said first transistor continuously increases, and when said input signal reaches a predetermined magnitude in said one direction, said second transistor is rendered cut-off and said third transistor is rendered conductive, whereby a sum of currents flowing through said first and third transistors is derived as an output current of the amplifier; and  
 as said input signal increases in the other direction, a current flowing through said second transistor continuously increases; and when said input signal reaches a predetermined magnitude in said other direction, said first transistor is rendered cut-off and fourth transistor is rendered conductive, whereby a sum of currents flowing through said second and fourth transistors is derived as the output current of the amplifier.

**4,422,051**  
**GAIN CONTROL CIRCUIT**  
 Masayuki Katakura, and Kenzo Akagiri, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan  
 Filed Jul. 23, 1981, Ser. No. 286,243  
 Claims priority, application Japan, Jul. 28, 1980, 55-103322;  
 Jul. 28, 1980, 55-103323  
 Int. Cl.<sup>3</sup> H03G 3/30; H03F 3/45  
 U.S. Cl. 330-278 17 Claims



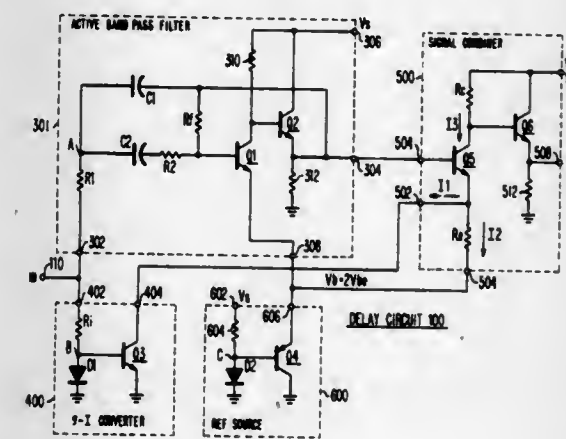
1. A gain control circuit comprising  
 input means receiving an input signal;  
 first differential amplifier means having an input coupled to said input means and first and second differential output terminals;  
 second differential amplifier means having an input coupled to said input means and first and second differential output terminals;  
 a first pair of transistors of one conductivity type having emitters coupled together to the first differential output terminal of said first differential amplifier and also having respective bases and collectors;  
 a second pair of transistors having an opposite conductivity type in respect to said first pair, having emitters coupled together to the first differential output terminal of said second differential amplifier means, having respective collectors coupled so that the collector of one transistor of the first pair is coupled to the collector of one transistor of the second pair and the collector of the other transistor of the first pair is coupled to the collector of the other transistor of the second pair, and having respective bases coupled so that the base of the one transistor of each pair is coupled to the other transistor of the remaining pair;  
 feedback means coupling the collectors of said one transistors to said input means;  
 means coupling the second differential amplifier means to a common reference point;  
 output means coupled to the collectors of the other transistors of said first and second pairs; and  
 control input means coupled to apply a control voltage between the bases of the transistors of each of the first and second pairs thereof.

**4,422,052**  
**DELAY CIRCUIT EMPLOYING ACTIVE BANDPASS FILTER**  
 Bernard J. Yorkanis, South Plainfield, and Walter E. Sepp, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.  
 Filed May 29, 1981, Ser. No. 268,374  
 Int. Cl.<sup>3</sup> H23F 3/68  
 U.S. Cl. 330-295 7 Claims

1. In a delay circuit of the type comprising an input node for receiving an input signal to be delayed, active bandpass filter means having an input coupled to said node and an output for providing a bandpass filtered output signal voltage, voltage-to-current converter means having an input coupled to said node and an output for providing an output signal current proportional to the amplitude of said input signal and independent of

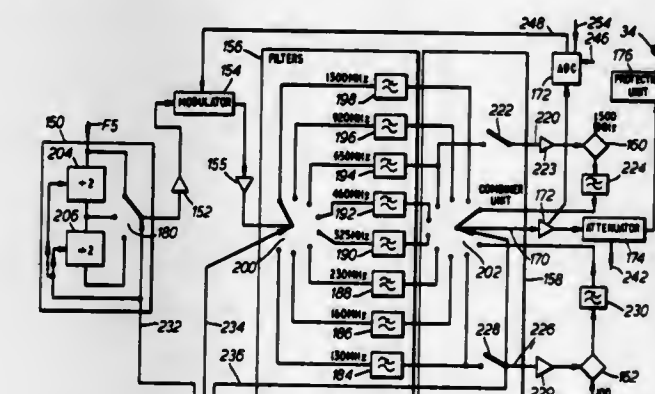
the frequency thereof, and active signal combining means responsive to said signal voltage and to said signal current for providing a delayed output signal, the improvement for minimizing quiescent power dissipation of said delay circuit, characterized in that:

said filter means includes first transistor means biased to regulate a DC component of said output signal voltage at a predetermined value equal to the sum of a DC reference voltage supplied to said first transistor means and a threshold voltage characteristic of said first transistor means;  
 said combiner means includes second transistor means having a threshold voltage substantially equal to that of said first transistor means, having a control electrode coupled



- to receive said signal voltage, having a conduction path coupled at a first end thereof to a source of supply voltage via a load resistor for developing said delayed signal and coupled at a second end thereof to receive said signal current, said signal current including a DC component providing the sole source of quiescent operating current for said second transistor means; and  
 a resistor in said combiner means coupled between said second end of said conduction path of said second transistor means and a source of said DC reference voltage for maintaining a substantially zero quiescent power dissipation in said resistor means, said resistor means controlling the ratio of components of said delayed signal attributable to said signal current and to said signal voltage.

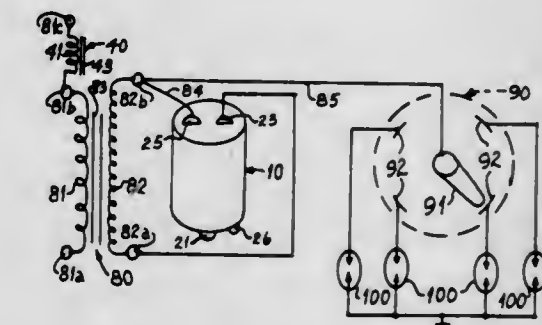
**4,422,053**  
**FREQUENCY MODULATOR INCLUDING FREQUENCY SYNTHESIZER**  
 David Brewerton, Bracknell, and Peter P. R. Connell, Marlow, both of England, assignors to Racal-Dans Instruments Limited, Bracknell, England  
 Division of Ser. No. 123,267, Feb. 21, 1980, Pat. No. 4,322,692.  
 This application Sep. 8, 1981, Ser. No. 300,280  
 Claims priority, application United Kingdom, Mar. 6, 1979, 7907795  
 Int. Cl.<sup>3</sup> H03C 3/00 2 Claims



1. An electrical circuit arrangement for producing a fre-

quency modulated output frequency having a predetermined step-wise-variable carrier frequency, comprising  
 adjustable frequency generating means producing a first frequency signal having a predetermined nominal value,  
 frequency modulating means for adjusting the first frequency signal over a predetermined range which is a small fraction of the nominal value,  
 means producing a fixed frequency signal such that the sum of its value and of the said nominal value divided by a fixed division factor is the same as the nominal value,  
 a frequency divider connected to divide the frequency modulated first frequency signal by the said fixed division factor,  
 means producing an intermediate frequency comprising adding means for adding the fixed frequency signal to the divided frequency-modulated first frequency signal,  
 means producing a stepped frequency signal whose frequency is variable over a predetermined range in steps each of predetermined size,  
 combining means connected to combine the stepped frequency signal and the said intermediate frequency, and  
 subtracting means connected to subtract a frequency having the said nominal value from the output of the combining means to produce the said output frequency.

**4,422,054**  
**DISTRIBUTED INDUCTIVE-CAPACITIVE HIGH VOLTAGE IGNITION CABLE**  
 Martin E. Gerry, 13452 Winthrop St., Santa Ana, Calif. 92705  
 Continuation-in-part of Ser. No. 282,755, Jul. 13, 1981, and a continuation-in-part of Ser. No. 282,756, Jul. 13, 1981. This application Feb. 3, 1982, Ser. No. 345,462  
 Int. Cl.<sup>3</sup> H03H 7/01; H05K 9/00; H01B 7/34  
 U.S. Cl. 333-12 10 Claims



1. A high voltage distributed inductance-capacitance cable for an electrical ignition system of a fuel burning engine, said system having an ignition transformer with primary and secondary windings, said cable being coupled to the secondary winding, wherein said cable comprises the combination of:  
 an electrically conductive electrode elongated along the length of said cable; and  
 a distributed inductor coaxial with and electrically insulated from said electrode, said electrode and inductor being coupled to each other by distributed capacity therebetween along the length of said cable, said cable having a first end and a second end, said electrode being open-circuited at the first end and said inductor being open-circuited at the second end, said inductor at the first end and said electrode at the second end being connective portions of the cable.



4,422,055

**STRAIN RELIEF TECHNIQUE FOR SURFACE ACOUSTIC WAVE DEVICES**

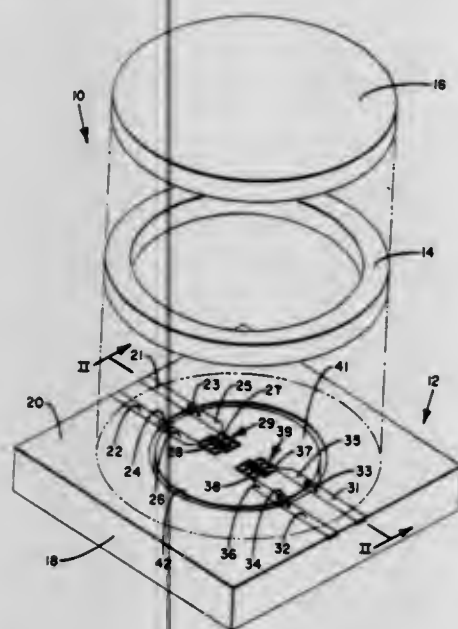
Donald E. Cullen, Manchester; Gary K. Montress, Glastonbury; Meyer Gilden, West Hartford, and Robert A. Wagner, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 30, 1981, Ser. No. 316,699

Int. Cl.<sup>3</sup> H03H 9/10, 9/64, 9/42

U.S. Cl. 333—151

4 Claims



1. A surface acoustic wave (SAW) device, comprising: an elastic SAW substrate having a surface with at least one strain sensitive surface area; a cover bonded to the elastic SAW substrate to form a chamber above at least a portion of one of the strain sensitive surface areas of the elastic SAW substrate; a cut extending into the elastic SAW substrate and surrounding a selected surface region of the portion of the strain sensitive surface area which is within the chamber formed by the cover, said cut having a width and a depth sufficient to isolate the selected surface region from surface strains originating outside the selected surface region; at least one acousto-electric coupling means disposed on the isolated surface region; and connector means for electrically connecting each acousto-electric coupling means to electronic circuitry.

4,422,056

**INTEGRATED MULTI-STAGE ELECTRICAL FILTER**

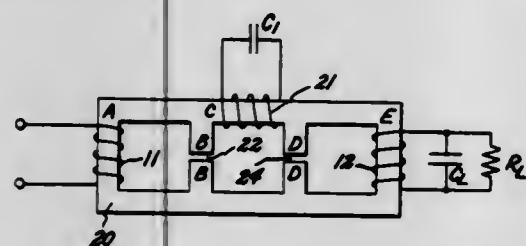
Victor D. Roberts, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,819

Int. Cl.<sup>3</sup> H03H 7/09

U.S. Cl. 333—177

3 Claims



1. An integrated electrical filter employing magnetic components comprising: a closed magnetic loop multi-legged core having a first pair of legs comprising one gapped leg and one ungapped leg and a second pair of legs comprising one gapped leg and one ungapped leg, said first pair of legs positioned adjacent to the second pair of legs.

- cent said second pair of legs on said core and connected to one another by series connected portions of the core;
- a first winding disposed on the ungapped leg in said first pair of legs;
- a second winding disposed on the ungapped leg in said second pair of legs;
- a third winding disposed on one of said series connected core portion joining said first pair of legs to said second pair of legs; and
- a capacitor connected across said third winding.

4,422,057

**SURFACE WAVE FILTER WITH REDUCED SUBSTRATE SIZE**

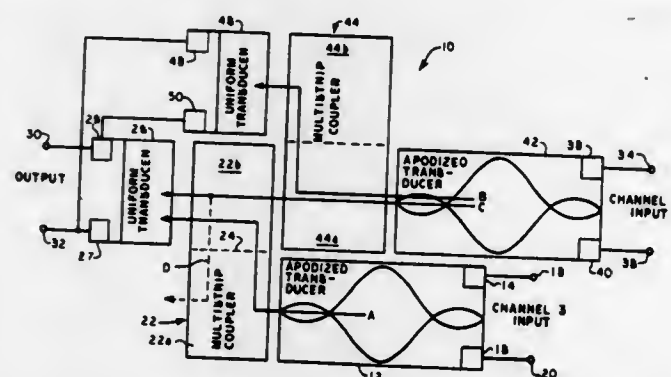
Michael Garbacz, Norridge, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 22, 1982, Ser. No. 370,705

Int. Cl.<sup>3</sup> H03H 9/25, 9/64, 9/72

U.S. Cl. 333—194

12 Claims



1. In an acoustic surface wave multiplexing filter having a substrate, first and second input transducers, first and second output transducers, and first and second multistrip couplers for coupling acoustic surface waves from the input transducers to the output transducers, an improved architecture for the filter characterized in that the first and second multistrip couplers are formed on the substrate in a position of side-by-side overlap with each other, with each multistrip coupler being disposed between one of the input transducers and one of the output transducers.

4,422,058

**FOLDED-OVER HELICAL RESONATOR**

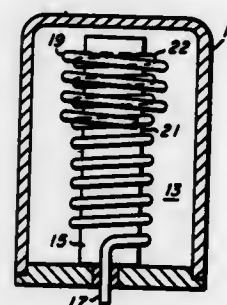
Peter Viztmuller, Thornhill, Canada, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 10, 1981, Ser. No. 319,849

Int. Cl.<sup>3</sup> H01P 1/201, 1/208, 7/00

U.S. Cl. 333—202

6 Claims



1. In a helical resonator which includes a housing to form a conductive shield and a helical conductive coil disposed within the housing, the improvement characterized by the conductive coil having a first portion being wound to form a cylindrical helix having a given pitch with one end of the first portion being connected to the housing, and a second portion extending from the first portion and being wound to create a winding

of opposite pitch so as to eliminate third harmonic re-resonance.

4,422,059

**BAND-PASS FILTER HAVING MULTILAYERED COIL STRUCTURES**

Tsuneharu Fuji, Neyagawa; Masakatsu Tsumura, Shijonawate, and Takayoshi Ishikawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

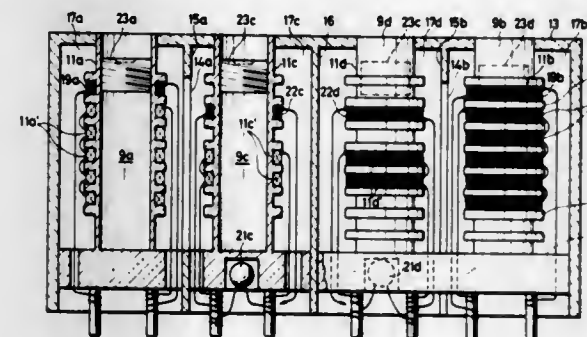
Filed Mar. 31, 1982, Ser. No. 363,998

Claims priority, application Japan, Apr. 8, 1981, 56-53415; Dec. 8, 1981, 56-198089

Int. Cl.<sup>3</sup> H01P 1/201, 7/00, 1/205

U.S. Cl. 333—202

8 Claims



1. A band-pass filter comprising within a shielded housing having first and second chambers separated by a shielding plate: first and second quarter-wavelength resonators mounted respectively in said first and second chambers and each comprising a bobbin formed with a plurality of axially spaced apart fins and a multilayered coil structure having a plurality of coil portions each mounted between adjacent ones of said fins, said coil structure being open-circuited at one end thereof and short-circuited at the other end; first and second parallel-circuit resonators mounted respectively in said first and second chambers to provide interstage coupling with said first and second quarter-wavelength resonators and each comprising a capacitor and a bobbin having a plurality of fins and a multilayered coil structure having a plurality of coil portions each mounted between adjacent ones of the fins of said bobbins, one end of each of said parallel-circuit resonators being coupled to one end of the other parallel-circuit resonator at a circuit point outside of said shielded housing; first and second auxiliary coils inductively coupled with said first and second parallel-circuit resonators respectively, one end of each of said auxiliary coils being short-circuited and the other ends of said auxiliary coils being coupled together to said circuit point; and an input and an output coupling coil respectively coupled inductively with said quarter-wavelength resonators.

4,422,060

**D.C. ELECTROMAGNETIC ACTUATOR**

Norio Matsumoto, Kumagaya, and Tetsuo Umehara, Hanyu, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,653

Claims priority, application Japan, Aug. 21, 1981, 56-123955[U]

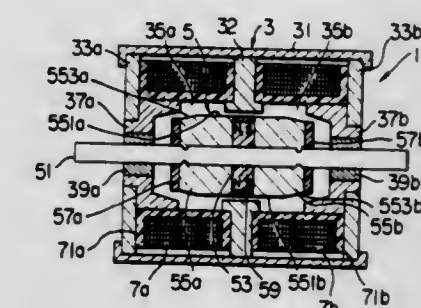
Int. Cl.<sup>3</sup> H01F 7/08

U.S. Cl. 335—256

17 Claims

1. A direct current actuator for use in a vehicle door locking device, adapted to be operated by means of an electric switch, said actuator comprising: a yoke apparatus having a hollow cylindrical yoke member, an annular center yoke member projecting inwardly from the middle inner peripheral surface of said cylindrical yoke member, a pair of end yoke means disposed in opposite end portions of said cylindrical yoke member to axi-

ally separate from said center yoke member to form a magnetic gap therebetween; two annular solenoid coil means supported by said yoke apparatus therein and disposed axially separately in such a manner that the poles of the same polarity are generated in the adjacent end portions of said solenoid coils when they are energized; and a moving means disposed in a space defined by said yoke apparatus and having a predetermined annular gap between the periphery of said moving means and said yoke



apparatus so as to reciprocate in said space, said moving means having an axially magnetized permanent magnet, a pair of magnetic members attached to the axially opposite ends of said permanent magnet, and a shaft engaging with said permanent magnet, each of said magnetic members including an annular portion attached to said permanent magnet and a tapered portion tapered toward the adjacent end of said actuator, and said end yoke means being so shaped as to be able to receive said tapered portion of said magnetic member.

4,422,061

**LAMINATED CORE OF TRANSFORMER**

Takaaki Yamamoto, and Yoshihiro Ohya, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

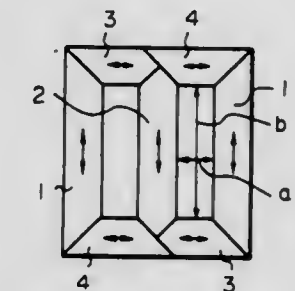
Filed Sep. 2, 1981, Ser. No. 298,800

Claims priority, application Japan, Jan. 29, 1981, 56-10870

Int. Cl.<sup>3</sup> H01F 27/24

U.S. Cl. 336—218

5 Claims



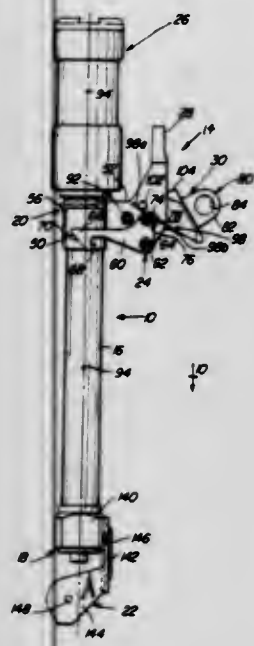
1. A three-phase transformer having a laminated core of the type having at least three legs and at least two yokes joining said at least three legs, the three-phase transformer further having at least three coils wound on respective ones of the legs, the three-phase transformer further comprising: a plurality of leg portion laminate layers formed of a first grain-oriented silicon steel sheet having a first degree of grain orientation; and a plurality of yoke portion laminate layers formed of a second grain-oriented silicon steel sheet having a second degree of grain orientation, in each of the at least two yokes, said first degree of grain orientation being higher than said second degree of grain orientation.



**4,422,062**  
**APPARATUS FOR ASSOCIATING AN ELECTRICAL DEVICE WITH A MOUNTING THEREFOR**  
 Bruce A. Biller, Chicago; Henry W. Scherer, Mt. Prospect, and Roy Swanson, North Riverside, all of Ill., assignors to S&C Electric Company, Chicago, Ill.  
 Filed Oct. 6, 1982, Ser. No. 433,077  
 Int. Cl.<sup>3</sup> H01H 71/10

U.S. Cl. 337-171

33 Claims



1. Improved apparatus for associating an electrical device with a mounting, the mounting including first and second insulatively spaced brackets; each end of the device being adjacent a respective bracket when the device is closed in the mounting; a first end of the device carrying a trunnion which is insertable into and removable from a hinge on the first bracket; the device being rotatable when the trunnion is in the hinge to move a second end of the device toward the second bracket during closing movement of the device and to move the second end of the device away from the second bracket during opening movement of the device; the second end of the device carrying an assembly which is manipulable (a) to insert the trunnion into the hinge, (b) to rotate the device after such insertion for closing the device upon application to the assembly of a pushing force generally transverse to the device, (c) to rotate the device when the trunnion is in the hinge for opening the device upon application to the assembly of a pulling force generally transverse to the device, and (d) to remove the trunnion from the hinge after such opening; the second bracket including a latch member; the second end of the device also carrying latch means movable between a normal first position, whereat the latch member and the latch means are engageable, and a second position, whereat the latch member and the latch means are disengageable, engagement of the latch member and the latch means when the trunnion is in the hinge maintaining the device closed, and disengagement of the latch member and the latch means when the trunnion is in the hinge permitting opening of the device; wherein the improvement comprises:

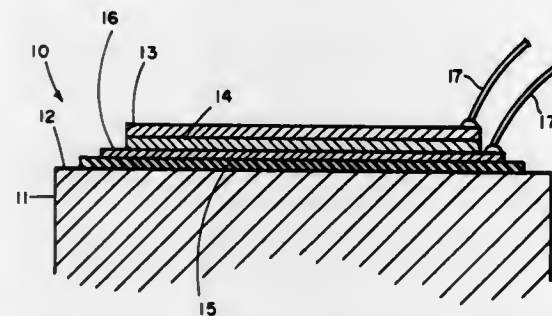
first means for mounting the assembly to the second end of the device for limited reciprocating movement of the assembly from a first normal location to a second location upon application of the pulling force to the assembly, the first and second locations residing at different distances from the device on a line of reciprocating movement which is generally transverse to the device; means for moving the latch means out of its first position and toward its second position in response to reciprocating movement of the assembly out of its first location and toward its second location; and second means for mounting the assembly to the second end of the device for limited pivoting thereon relative to the device, which pivoting is independent of the reciprocating movement of the assembly and affects neither the location of the assembly nor the position of the latch means, the

line of reciprocating movement of the assembly assuming different generally transverse positions relative to the device in various pivotal orientations of the assembly, so that the pivotal orientation of the assembly is continuously changeable or adjustable force, during, and after the application of the pushing force or the pulling force thereto without affecting the position of the latch means, and so that the assembly may be reciprocated regardless of the pivotal orientation thereof.

**4,422,063**  
**SEMICONDUCTOR STRAIN GAUGE**  
 Roger W. Pryor, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.  
 Filed Apr. 1, 1982, Ser. No. 364,557  
 Int. Cl.<sup>3</sup> G01L 1/22

U.S. Cl. 338-2

7 Claims



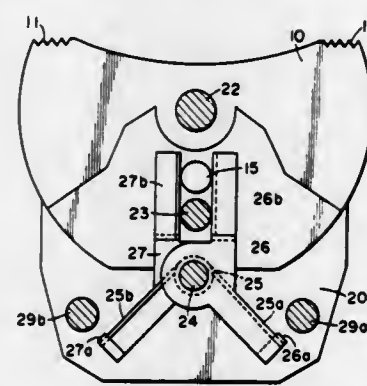
1. A semiconductor strain gauge comprising: an elastic member having a surface subject to stress; a semiconductor substrate secured to said surface, the substrate including at least one PN junction wherein both the P type and N type material is composed of amorphous semiconducting material; and electrical connection means for conducting a signal indicative of strain.

**4,422,064**  
**ELECTRICAL RESISTANCE REGULATOR**  
 Toshio Araki, Yokohama, and Kenji Fujikawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
 Filed Sep. 3, 1981, Ser. No. 299,090  
 Claims priority, application Japan, Sep. 10, 1980, 55-128689[U]

Int. Cl.<sup>3</sup> H01C 10/32

U.S. Cl. 338-162

16 Claims



1. A regulator comprising:  
 a housing;  
 an operating member having a central portion which is rotatably supported on said housing;  
 a projection provided on said operating member;  
 two movable members rotatably supported on said housing to push back said projection in a predetermined direction;  
 a spring secured to said movable members to bias them in opposite directions;

a limit member provided on said housing to limit the approach limit amount of said movable members;  
 an electrical resistor provided on said housing; and  
 a sliding member provided on said operating member and slidable on said electrical resistor.

**4,422,065**  
**METHOD FOR READOUT FROM MULTISCALE ENCODERS AND A MULTITURN ABSOLUTE ANGLE-CODE CONVERTER**  
 Radomir V. Radomirov; Kolyo R. Kolev, both of Stara Zagora; Encho M. Enchev, Nova Zagora, and Ivan N. Ivanov, Gabrovo, all of Bulgaria, assignors to Nauchno Proizvodstven Kombinat Po Robotika "Beroe", Stara Zagora, Bulgaria  
 Filed Jan. 18, 1980, Ser. No. 113,292  
 Claims priority, application Bulgaria, Jan. 18, 1979, 42122  
 Int. Cl.<sup>3</sup> H03K 13/18

U.S. Cl. 340-347 P

2 Claims



1. In a method for readout from multiscale encoders having coarse and fine readout masks, wherein the fine readout digits information signals are formed in Gray code immediately by the read elements of the fine readout mask, and for every digit of the coarse readout mask there is formed by analogy in Gray code an auxiliary pair of signals, and comprising anticipating and delaying electrical signals dephased with respect to the theoretical information signal of the corresponding coarse readout digit of an angle equal to half of the angle discretion of the coarse readout mask, the improvement comprising forming the actual coarse readout information signals in Gray code without the immediate participation of the read elements of the coarse readout mask, dividing the period of the theoretical information signal of every coarse readout digit into four intervals which are coded with the aid of four binary patterns 00, 10, 01, and 11 which are formed from logical levels "0" and "1" of the corresponding auxiliary pair of signals, in the intervals of the period that are coded by binary patterns 00 and 11 forming the logical levels "0" and "1" of the actual information signals of all coarse readout digits in accordance with the Gray code, switching on a common source of logical level "0" and a common source of logical level "1" in the remaining intervals coded by binary patterns 10 and 01; the front and rear edges of all actual coarse readout information signals being formed where, according to the Gray code, the inverted and the non-inverted imitating signal is used, which is equal in form and periodicity with the information signal of the highest-ranking fine readout digit and is dephased in accordance to in a quarter of its period and is formed by an additional read element of the fine readout mask.

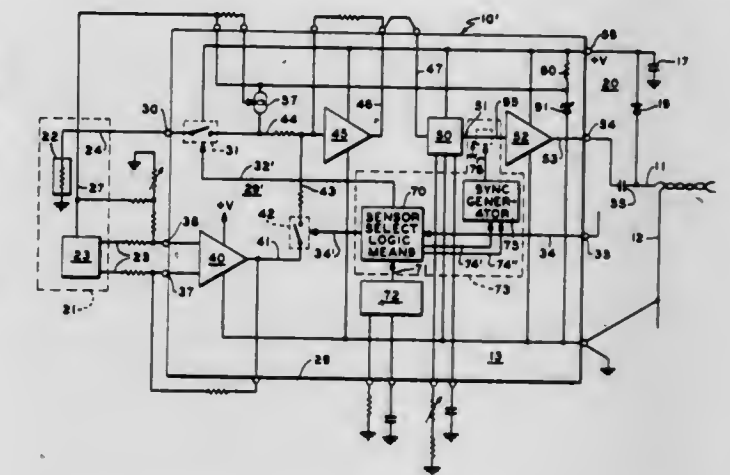
1037 O.G.—45

**4,422,066**  
**CONDITION SENSOR INTERFACE MEANS**  
 Francis J. Belcourt, Shakopee, and Martin J. van Dyke, Brooklyn Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 8, 1981, Ser. No. 309,739  
 Int. Cl.<sup>3</sup> G08B 23/00; H01N 35/00

U.S. Cl. 340-500

13 Claims



1. A condition sensor interface means responsive to sensor means with said interface means utilizing a pair of input conductors to both power said interface means and to output information from said sensor means, including: condition sensor means responsive to at least one condition to be sensed; sensor interface means including sensor input means connected to said sensor means with said sensor interface means having two modes of operations; said sensor interface means having mode selection means whereby two sensing modes are selectable within said sensor interface means by the application of two different mode selection voltages to said mode selection means; said sensor interface means further including digital signal output means which has input means responsive to said sensor means through said mode selection means; power terminal means for said sensor interface means with said terminal means adapted to be connected by said pair of conductors to a direct current source to energize said sensor interface means; and said digital signal output means having output circuit means connected to said pair of input conductors to load said direct current source to in turn provide a digital output signal on said pair of conductors in response to a condition sensed by said sensor means.

**4,422,067**  
**DYNAMIC SELF-CHECKING SAFETY CIRCUIT MEANS**  
 Rodney L. Clark, Dakota; William R. Landis, Hennepin; Paul B. Patton, Anoka, and Charles B. Yancey, Hennepin, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.  
 Filed Oct. 5, 1981, Ser. No. 308,703  
 Int. Cl.<sup>3</sup> G08B 29/00

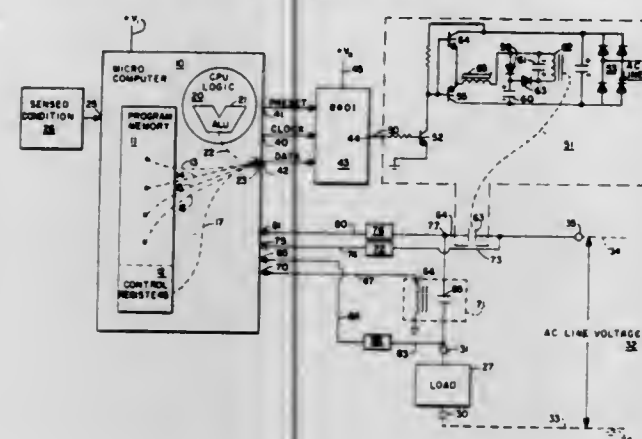
U.S. Cl. 340-508

12 Claims

1. A dynamic self-checking safety circuit means adapted for control of electric power to a load, including: condition responsive circuit means including repetitively operated signal generating means for generating a series of logic bits conditioned upon the normal operation of said condition responsive circuit means; clock means having clock output means providing timed output signals; preset signal generating means providing a preset signal; cyclic redundancy checker means connected to said condition responsive circuit means, to said clock means, and to said preset signal generating means to receive said logic bits, said timed output signals, and said preset signals; said cyclic redundancy checker means having circuit means capable of properly identifying said series of logic bits conditioned upon the normal operation of said condition responsive circuit means; said cyclic redundancy checker means having output means providing output signals that cycle each time



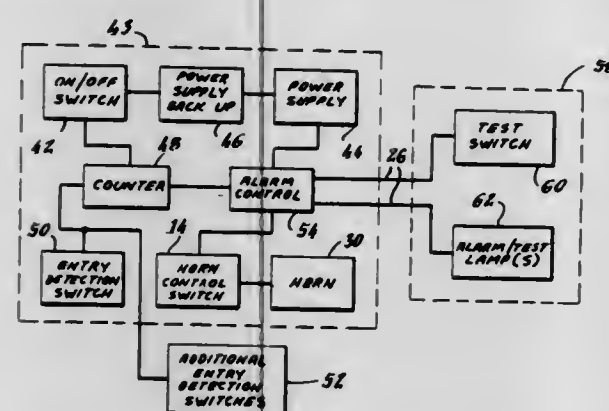
said cyclic redundancy checker means receives said series of logic bits and then said preset signal; cyclic signal detecting circuit having an input connected to said cyclic redundancy checker output means, and having safety switch means as an output; load control switch means connected to said condition responsive circuit means and controlled thereby; and said two



switch means being connected in series circuit and adapted to connect said load to said electric power upon said condition responsive circuit means causing said load control switch means to operate with said cyclic redundancy checker means operating the said cyclic signal detecting circuit to in turn operate said safety switch means.

**4,422,068**  
**INTRUSION ALARM SYSTEM FOR PREVENTING**  
**ACTUAL CONFRONTATION WITH AN INTRUDER**  
**John M. Helft, Center Rd., Eagle Bridge, N.Y. 12057, and**  
**Walter O. Noyes, 308 Elm St., Bennington, Vt. 05201**

U.S. Cl. 340—514



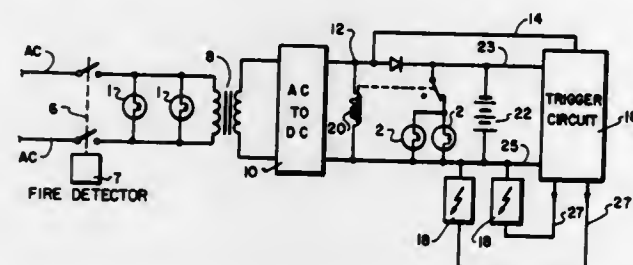
1. An intrusion detection system adapted to provide an intrusion detection signal observable from outside of a protected premises to warn a returning occupant of a possible intrusion and thereby avoid a potential confrontation between the returning occupant and an intruder within the protected premises, said detection system comprising:

an alarm lamp mountable on an entrance to the protected premises and observable from without said protected premises, means for actuating said alarm lamp in response to an intrusion through the entrance of said protected premises, and a test circuit coupled to said means for actuating said alarm lamp for providing a test signal, said test circuit being mountable on said entrance to the protected premises such that it is operable from without the protected premises for determining if said means for actuating said alarm lamp is operational, said test circuit being positionable such that said test signal is discernable from without the protected premises, whereby said alarm lamp is observable from without said

protected premises and said test circuit is operable from without the protected premises.

**4,422,069**  
**SYSTEM FOR INDICATING AN EMERGENCY EXIT**  
**Karl L. Edström, Batterivägen 60, 951 00 Luleå, Sweden, and**  
**Per A. W. Höglström, 71 Duke St., London W1, England**  
**Filed Oct. 15, 1981, Ser. No. 311,760**

Claims priority, application Sweden, Oct. 17, 1980, 8007308  
Int. Cl.<sup>3</sup> G08B 5/38, 17/00, 21/00  
U.S. Cl. 340—691



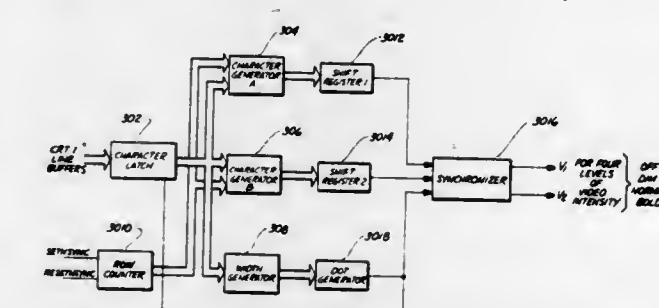
1. A system for indicating an emergency exit in case of fire in a building, comprising at least one flashable light located near floor level adjacent to the emergency exit and having an associated drive unit including a trigger circuit and accumulator batteries, said drive unit being arranged for connection to a mains supply voltage power source, and means for sensing interruption of the supply voltage to the drive unit and operable to actuate the trigger circuit upon such interruption to thereby initiate the energization and flashing of said flashable light from said accumulator batteries.

4,422,070  
CIRCUIT FOR CONTROLLING CHARACTER  
ATTRIBUTES IN A WORD PROCESSING SYSTEM  
HAVING A DISPLAY

**Robert A. Couper, Sunnyvale; John K. Frediani, Santa Cruz, and Terrance L. Lillie, Palo Alto, all of Calif., assignors to Pitney Bowes Inc., Stamford, Conn.**

Filed Aug. 12, 1980, Ser. No. 177,651  
Int. Cl.<sup>3</sup> G09G 1/06

U.S. Cl. 340-723 15 Claims



1. A system for character attribute control comprising:

- (a) a display for displaying a plurality of lines of such characters;
- (b) a display control circuit means for controlling the information exhibited on said display, said display control circuit means being responsive to an input of digital words, a first portion of said input words defining particular characters and a second portion of said input words defining the attributes associated with said defined characters, whereby a sequence of said input words will define a line of characters and associated attributes to be displayed;
- (c) a refresh memory for storing sequences of data words, said data words comprising data words defining characters and control words defining information about the display of said characters, said control words further comprising attribute control words for controlling the attributes associated with characters defined by character

data words stored between said attribute control words and the next control word belonging to a preselected subgroup of said control words; and

(d) line buffer means operatively connected between said refresh memory and said display control circuit means for transferring lines of characters from said memory to said display control circuit means, said line buffer means further comprising:

(1) memory access means for controlling access to a selected subsequence of said data words in said refresh memory, said subsequences defining at least a line of characters to be displayed;

(2) buffer storage wherein data words from said memory may be stored under control of said memory access means, said buffer storage being operatively associated with said display control circuit means so that the output of said storage provides said input word to said display control circuit means;

(3) character attribute control circuit means for recognizing said control data words as they are read from said memory and preventing said attribute control words from being stored in said buffer storage and for storing the attribute information in additional bits provided in each word of said buffer storage so that the attribute information is stored in the same buffer storage word as each of the associated character data words, whereby said input words are formed and stored in said buffer storage; and

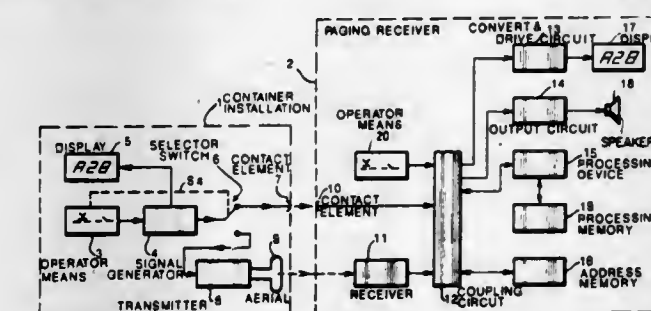
(4) buffer control means operatively associated with said display control means for controlling said buffer means so that said sequence is stored in said buffer storage and at least a portion of said subsequence is then output to said display control circuit means whereby a line of characters with associated attributes is displayed.

**4,422,071**  
**PAGING RECEIVER**

**Nicolaas R. de Graaf, Emmen, Netherlands, assignor to Nira International B.V., Emen, Netherlands**

Filed Jan. 26, 1981, Ser. No. 228,473  
Claims priority, application Netherlands, Jan. 30, 1980,  
8000578

Int. Cl.<sup>3</sup> G08B 5/22  
U.S. Cl. 340—825.44 6 Claims

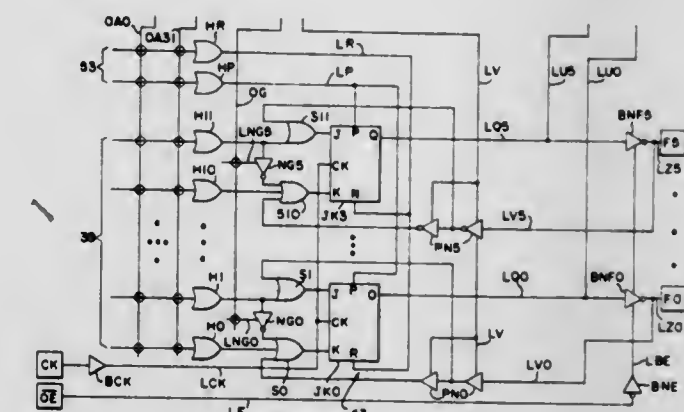
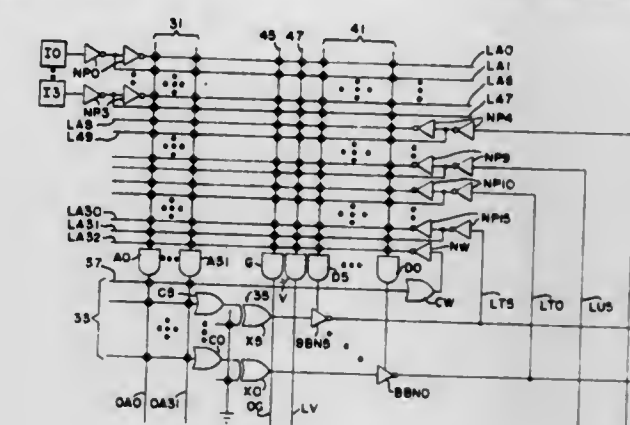


1. A programmable paging receiver comprising: address memory means that are freely programmable from exterior of said receiver, for storing therein at least one desired programmable address code used to select that particular receiver; comparator means for comparing the programmed address code and a received address code, to determine whether that particular receiver is to be selected in response to the received address code; means for receiving and processing programming signals for changing the stored address code; a display device; and message coding means cooperating with the display device to represent on the display device a received message code and an address code, whereby the address code used to select that particular receiver may be variably programmed, and the programmed address code verified on the display device.

4,422,072  
FIELD PROGRAMMABLE LOGIC ARRAY CIRCUIT  
Napoleone Cavan, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jul. 30, 1981, Ser. No. 288,576  
Int. Cl.<sup>3</sup> H04Q 9/00

U.S. Cl. 340—825.87 46 Claims



1. A programmable logic circuit characterized as comprising:

a plurality of first lines, one part of which comprises input lines for receiving input data to the circuit and another part of which comprises feedback lines:

a plurality of logic AND/NAND gates, each having an output section and having a plurality of input sections each connected to a different one of the first lines;

feedback means for supplying output data from the second lines to the feedback lines.

a plurality of buffers corresponding on a one-to-one basis to at least part of the logic gates and respectively coupled between their output sections and the second lines, each buffer having a buffer control line for receiving control data to control activation of that buffer;

at least one control AND/NAND gate, each having an output section coupled to at least two of the buffer control lines and having a plurality of input sections each connected to a different one of the first lines; and programmable means for selectively connecting each input section of each AND/NAND gate to its output section.

**4,422,073**  
**COMBUSTIBLE GAS DETECTION SYSTEM**  
Joe K. Winner, Pinellas, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 27, 1981, Ser. No. 315,684  
Int. Cl.<sup>3</sup> G08C 19/16, 19/36

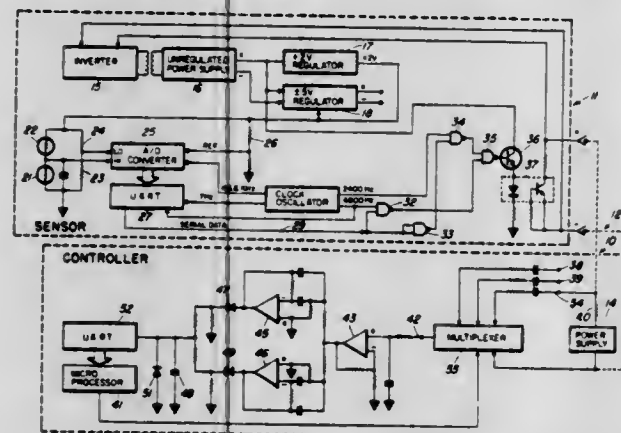
U.S. Cl. 340-870.21 1 Claim  
1. In a combustible gas detection system having a central

1. In a combustible gas detection system having a central



control station and a remotely located combustible gas sensor of the catalytically activated resistance bridge type providing an analog signal indicative of the concentration of combustible gas at the sensor location, a noise immune transmission system for transmitting signals from said sensor to said control station, comprising

a two-wire transmission line connecting said control station with said sensor location;  
means supplying d.c. power to said transmission line;  
means at said sensor location for converting d.c. power received from said transmission line to a.c. power;  
means for converting said a.c. power to regulated d.c. operating power for said sensor;  
an analog to digital converter at said sensor location for converting said analog signal from said sensor into a parallel format binary digital signal;  
means for converting said parallel format digital signal into a serial format digital signal;



a clock oscillator at said sensor providing at least a pair of harmonically related, phase coherent clock signals of different frequency;  
keying means controlled by said serial format digital signal for selecting one of said clock signals upon the appearance of a logic "1" in said serial digital signal and for selecting the other of said clock signals upon the appearance of a logic "0" in said serial digital signal; and  
an optically coupled isolator for applying said clock signal selected by said keying means to said transmission line, said isolator including  
a light emitting diode to which said clock signal selected by said keying means is applied,  
a load resistor, and  
a phototransistor connected through said load resistor to said transmission line, said phototransistor responding to light emitted by said light emitting diode to vary current through said load resistor.

4,422,074

## SIGNAL SKIMMING SYSTEM

Barry E. Williams, Downey; Norol T. Evans, San Pedro, and John A. Propster, La Mirada, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 24, 1965, Ser. No. 458,971

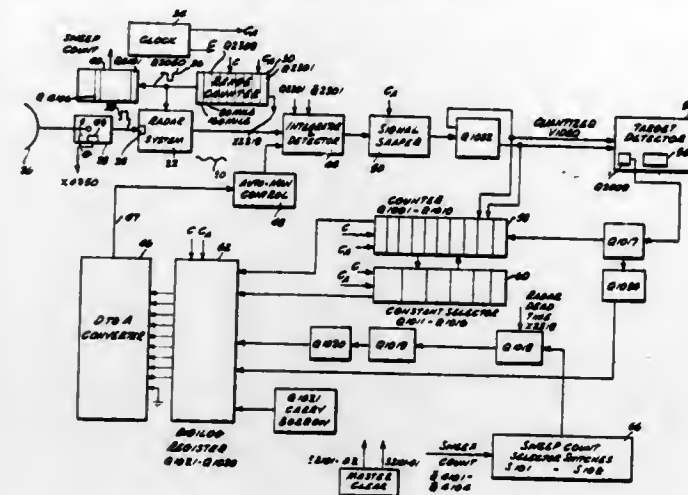
Int. Cl.<sup>3</sup> G01S 13/16

U.S. Cl. 343—5 CF

12 Claims

1. A system responsive to a composite signal including first signals in the presence of second signals and detecting the presence of said first signals with a selected threshold level ratio of signal voltage to noise voltage comprising  
means for integrating the composite signal over selected intervals of time,  
means for comparing a selectable threshold level with the integrated signals,  
means for storing data to provide said threshold level,  
counting means responsive to the integrated signals exceeding the threshold level to accumulate a count thereof,  
constant selector means responsive to the count of said counting means to establish a proportion of the value of

said stored data for changing said threshold level to maintain the selected threshold level ratio,



and means responsive to said constant selector means for correcting the stored data after a selected number of said intervals of time.

4,422,075

## PROXIMITY MONITOR

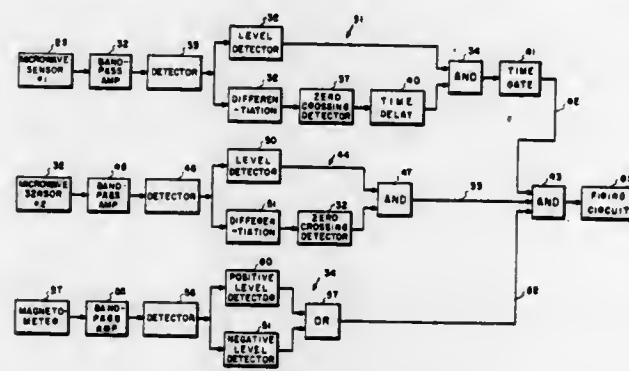
Eldon Nerheim, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 21, 1981, Ser. No. 265,880

Int. Cl.<sup>3</sup> G01S 13/86; F42C 13/04

U.S. Cl. 343—6 R

2 Claims



1. In a proximity monitor for movement at a selected distance from a surface, in combination:

a first microwave sensor having an antenna pattern directed toward said surface, the principal component of said pattern parallel to said surface being in the direction of said movement;

a second microwave sensor having a second antenna pattern directed toward said surface, the principal component of said second pattern parallel to said surface being in a direction opposite to that of said movement, said patterns being mutually spaced, at said surface, in said direction of movement;

a magnetic anomaly sensor giving an output representative of the presence at said surface of a magnetic anomaly located between said patterns; and

means connected to said sensors, including time delay means connected to said first sensor, for performing a control function when the signals from said sensors are above predetermined levels in a predetermined time relationship.

# 4,422,076 PASSIVE SYNTHETIC APERTURE SYSTEM FOR LOCATING A SOURCE OF ELECTROMAGNETIC RADIATION

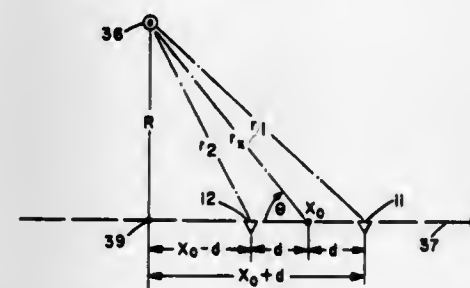
Gus P. Tricoles, San Diego, and Eugene L. Rope, El Cajon, both of Calif., assignors to General Dynamics Corporation, Electronics Division, San Diego, Calif.

Filed Jul. 24, 1980, Ser. No. 171,979

Int. Cl.<sup>3</sup> G01S 3/02, 5/02

U.S. Cl. 343—458

2 Claims



1. A vehicle-mounted system for locating a source of electromagnetic radiation having a given wavelength, comprising first and second receiving antennas mounted to a vehicle and spaced apart from each other by a predetermined distance in the principle direction of motion associated with said vehicle for respectively providing first and second received signals in response to electromagnetic radiation having said given wavelength received by the first and second antennas;

a first phase sensitive receiver coupled to the first and second antennas for responding to the first and second received signals by providing a first phase difference signal that indicates a phase difference  $\phi_{21}$  that is proportional to the difference between the respective ranges from the first and second antennas to the source of said received radiation when said received radiation is radiated spherically from said source, whereby the value of the first phase difference signal varies as the vehicle moves in a straight line;

means operable when said vehicle is moving for determining the speed of said vehicle; and

a signal processor coupled to the receiver for processing the values of the first phase difference signal provided as the vehicle moves in a straight line past its point of closest approach to said radiation source in combination with said determination of vehicle speed to determine the range and direction from said vehicle to said source.

4,422,077

# ELECTRICAL SIGNAL SEPARATING DEVICE FOR COMBINED WINDSHIELD ANTENNA AND HEATER GRID

Jerzy J. Kroplewnicki, Knutsford, England, assignor to B.S.H. Electronics (Manchester) Limited, Manchester, England

Continuation of Ser. No. 105,232, Dec. 19, 1979, abandoned, which is a continuation of Ser. No. 933,289, Aug. 14, 1978, abandoned. This application Mar. 18, 1982, Ser. No. 359,304

Claims priority, application United Kingdom, Aug. 17, 1977, 34443/77

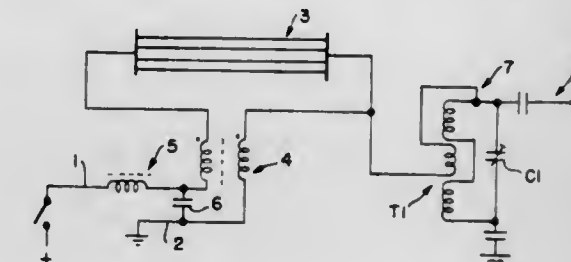
Int. Cl.<sup>3</sup> H01Q 1/02, 1/32

U.S. Cl. 343—704

7 Claims

1. An isolating and matching device to enable a motor vehicle electrically heated window, not designed specifically to be an antenna or aerial and essentially aperiodic and non-resonant at VHF frequencies, to be used as a transmitting aerial, comprising: an electrical circuit having input leads for connection to a motor vehicle D.C. power supply, power output leads for connection to a window heating element of said motor vehicle electrically heated window, and an aerial input terminal for connection of said electrical circuit to an aerial feeder circuit of a transmitter, the said electrical circuit further including isolating circuitry interconnecting said input leads and said power

output leads, and matching and tuning circuitry interconnecting the said power output leads and said aerial input terminal, said isolating circuitry including a bifilar coil formed by two wires wound on a common core and defining two concentric coils and being operative to permit passage of current from said motor vehicle D.C. power supply to heat said window while isolating or blocking passage of radio signals from said



4,422,078

## FULL WAVE COMMUNICATION ANTENNA

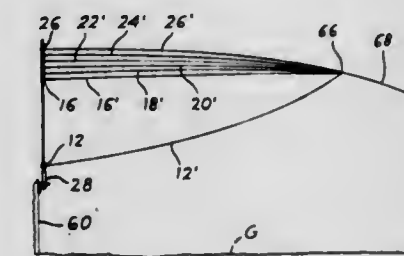
Melvin L. Cremeen, 643 Edgewater NW., Space F-1, Salem, Oreg. 97304

Continuation of Ser. No. 210,127, Nov. 24, 1980. This application Aug. 27, 1982, Ser. No. 412,177

Int. Cl.<sup>3</sup> H01Q 1/36

U.S. Cl. 343—895

4 Claims



1. A full wave communication antenna for use with communication equipment, comprising:

(a) an elongated antenna rod of dielectric material of substantially uniform diameter and defining the top and bottom ends of a vertical antenna, and

(b) an antenna wire of length corresponding to a selected radiation frequency, wrapped about the rod to provide

(1) a radiating base coil adjacent the bottom end of the rod, the bottom end of the base coil wire being arranged for connection to communication equipment,

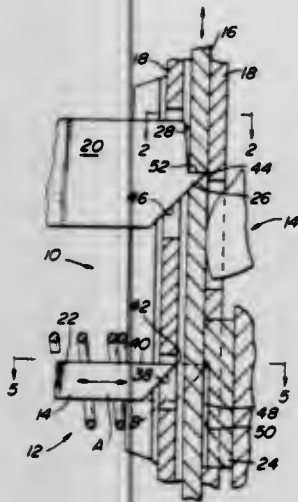
(2) a substantially non-radiating antenna wire section extending along the rod from the top end of the base coil toward the top end of the rod a length greater than one-half the length of the rod, and

(3) a plurality of longitudinally closely spaced radiating loading coils of substantially equal numbers of a plurality of coil turns extending along the rod from the non-radiating wire section toward the top end of the rod,

(4) the base and loading coils being configured to produce vertical radiation field patterns at substantially the selected radiation frequency and which field patterns merge together a distance radially outward of the rod and there change to a horizontal field pattern which proceeds downward to the ground.



**4,422,079**  
**TIME RECORDER REGISTRATION APPARATUS**  
 George Franke, Amherst, N.H., assignor to Simplex Time Recorder Co., Gardner, Mass.  
 Filed Feb. 20, 1981, Ser. No. 236,392  
 Int. Cl.<sup>3</sup> G01D 15/04  
 U.S. Cl. 346—1.1

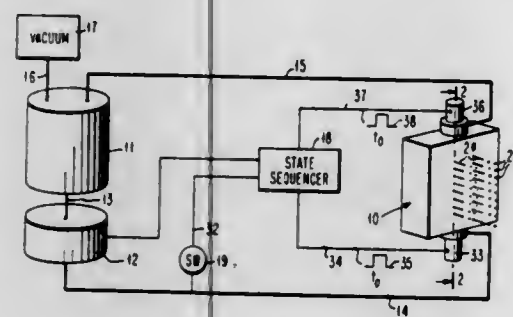


9. Method of aligning a time card in registry with a printing means comprising:

moving a punch in a direction substantially perpendicular to said card such that said punch cuts the card fibers and spreads the card fibers as they are cut without removing material from the card to form a deformation having an upper surface and a lower surface inclined with respect to said upper surface, said upper and lower surfaces terminating at a slit, and

supporting said card at a deformation by contacting substantially the entire deformation upper and lower surfaces by moving a sensing surface into said deformation in a direction substantially perpendicular to the card face such that said sensing surface contacts substantially the entire deformation upper and lower surfaces.

**4,422,080**  
**INK JET PRINTING METHOD AND APPARATUS**  
 Stanley C. Titcomb, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.  
 Filed Dec. 17, 1981, Ser. No. 331,695  
 Int. Cl.<sup>3</sup> G01D 15/18  
 U.S. Cl. 346—1.1



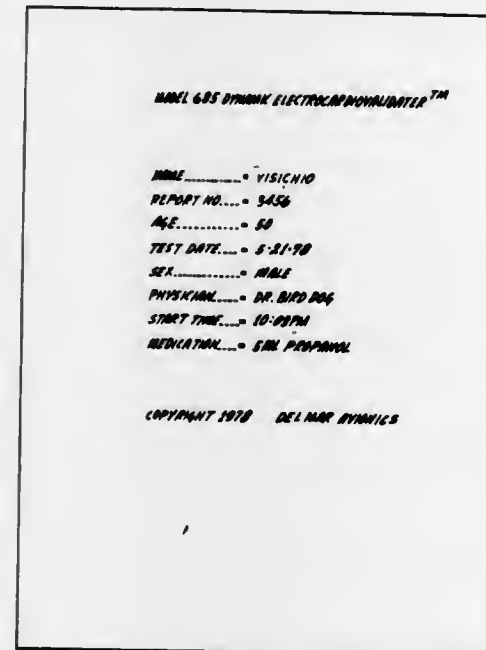
1. The method for control of ink from a pressurized fluid reservoir to an ink jet print head comprising an ink cavity having at least one orifice in fluid communication with the ink cavity, wherein the improvement comprises the steps of:

establishing an operative mode in which the entire ink cavity is full of fluid at a pressure such that fluid issues as a stream from said orifice; and

thereafter establishing an idle mode in which no printing occurs by sealing off the ink cavity full of pressurized fluid thereby to maintain a positive pressure in the fluid in the ink cavity during the ensuing idle mode to prevent fluid from either flowing from said orifice or into said orifice to

prevent contaminants from entering said ink jet print head.

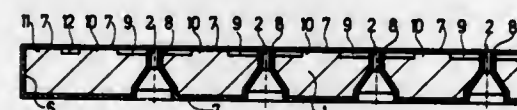
**4,422,081**  
**VALIDATOR FOR ELECTROCARDIAL DATA PROCESSING SYSTEM**  
 Donald C. Woods, Lompoc, Calif., assignor to Del Mar Avionics, Irvine, Calif.  
 Division of Ser. No. 88,105, Oct. 24, 1979, which is a continuation-in-part of Ser. No. 957,527, Nov. 3, 1978. This application Apr. 27, 1982, Ser. No. 372,115  
 Int. Cl.<sup>3</sup> G01D 9/00, 9/28; A61B 5/04  
 U.S. Cl. 346—33 ME



1. Apparatus for controlling the operation of a printer-plotter to produce marks at a high speed on a medium that are representative of electrocardiographic signals generated at a slower real time speed by a patient, then stored in a storage device and later retrieved from the storage device, said apparatus comprising:

formatting means receiving the retrieved electrocardiographic signals and connected to the printer-plotter for controlling it to plot at the high speed successive segments of the retrieved electrocardiographic signals in successive rows juxtaposed along the medium to facilitate visual analysis of the retrieved electrocardiographic signals, said formatting means responsive to applied timing signals to control the printer-plotter to print alpha-numeric symbols adjacent predetermined rows of the plotted electrocardiographic signals to indicate the time of day corresponding to the respective said predetermined rows.

**4,422,082**  
**JET NOZZLE PLATE FOR AN INK JET PRINTING HEAD AND METHOD OF MANUFACTURING SUCH A JET NOZZLE PLATE**  
 Friedrich Louzil, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.  
 Filed Oct. 26, 1981, Ser. No. 314,931  
 Claims priority, application Austria, Nov. 7, 1980, 5493/80  
 Int. Cl.<sup>3</sup> G01D 15/18  
 U.S. Cl. 346—75



1. A method of manufacturing a jet nozzle plate for an ink jet

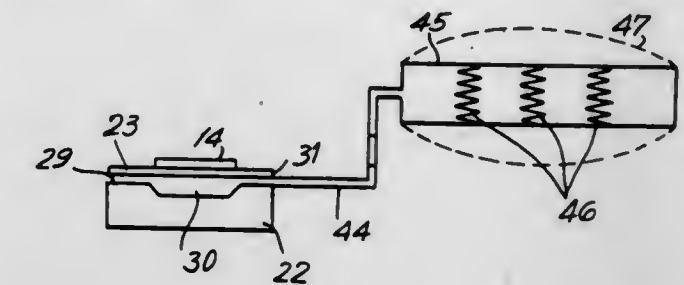
printing head, utilizing a base plate in which there is provided a bore in order to form a jet nozzle, said bore having a diameter which is larger than the inner diameter of the ultimate jet nozzle, the base plate being subsequently covered as a whole unit, as far as into the bore, with a layer of a chemically depositable material characterized in that the base plate and said layer consist of different, selectively chemically etchable materials, the method further comprising the steps of:

milling on the front of the base plate a recess which surrounds the bore mainly concentrically at a distance; depositing the layer with a thickness which defines the inner diameter of the bore to the inner diameter of the ultimate jet nozzle;

grinding down the front of the base plate by an amount which at least equals the thickness of the layer but which is smaller than the sum of the thickness of the layer and the depth of the recess;

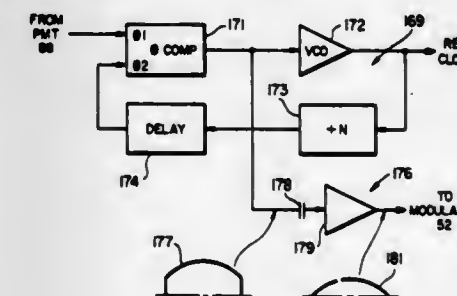
etching the base plate from the front to remove the material of the base plate exposed by the grinding operation until the layer projecting from the bore forms a freely projecting cylindrical tube which is surrounded by a trough.

formed of an organic material and including biasing means for generating and maintaining a negative pressure with respect to atmospheric pressure in said vessel said vessel and biasing



means being adapted so that the negative pressure is less than the surface tension of fluid within the nozzle and further within a range so that fluid does not escape from the nozzle when the vessel is disposed at a height above or below the nozzle.

**4,422,083**  
**SYSTEM AND METHOD FOR PRODUCING ARTWORK FOR PRINTED CIRCUIT BOARDS**  
 Don B. Neumann, Laguna Beach; Lyle K. Norton, Santa Ana, and Eric V. Olson, Long Beach, all of Calif., assignors to American Hoechst Corporation, Somerville, N.J.  
 Division of Ser. No. 42,133, May 24, 1979. This application Mar. 19, 1981, Ser. No. 245,674  
 Int. Cl.<sup>3</sup> G01D 9/42; H04N 1/22; G03B 41/00  
 U.S. Cl. 346—108



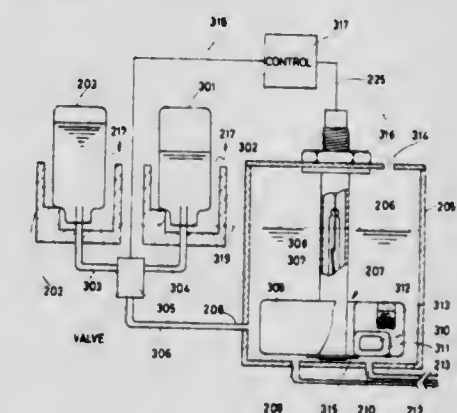
1. In a system for forming an image on an output medium in accordance with an input signal: means for providing a beam of coherent radiation, means for modulating the beam in accordance with the input signal, means including a rotating reflector for deflecting the modulated beam to scan the same along a substantially straight line across the output medium, and means for applying a correction signal to the means for modulating the beam to adjust the intensity of the beam to reduce the intensity of the beam toward the ends of the scan line and maintain a substantially uniform exposure across the output medium notwithstanding variations in the velocity of the beam.

**4,422,084**  
**FLUID TANK AND DEVICE FOR DETECTING REMAINING FLUID**  
 Shizuo Saito, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikousha, Tokyo, both of Japan  
 Filed Nov. 5, 1980, Ser. No. 204,115  
 Claims priority, application Japan, Nov. 6, 1979, 54-143708; Nov. 22, 1979, 54-151824  
 Int. Cl.<sup>3</sup> G01D 18/00  
 U.S. Cl. 346—140 R

1. A negative pressure tank for storing and selectively dispensing a printing fluid for use in an ink jet printer including a nozzle coupled to the tank, the printing fluid being selectively discharged through the nozzle connected to the tank, comprising a vessel for storing said fluid, the walls of said vessel

**4,422,085**  
**INK LIQUID VISCOSITY CONTROL IN AN INK LIQUID SUPPLY SYSTEM FOR AN INK JET SYSTEM PRINTER**  
 Yuji Sumitomo, Yamatokoriyama, and Yoshio Kanayama, Nabari, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan  
 Filed Mar. 24, 1981, Ser. No. 247,052  
 Claims priority, application Japan, Mar. 28, 1980, 55-41762  
 Int. Cl.<sup>3</sup> G01D 15/16; G01N 9/18  
 U.S. Cl. 346—140 R

8 Claims



1. An ink liquid viscosity control system in an ink liquid supply system for an ink jet system printer, said ink liquid supply system comprising an ink liquid reservoir for containing a new ink liquid therein, and a sub tank for containing a predetermined ink liquid supply having an ink liquid level and for introducing the new ink liquid from said ink liquid reservoir and developing the ink liquid to be supplied to an ink droplet issuance unit included in the ink jet system printer, said ink liquid viscosity control system comprising:

a float member being entirely submerged within the ink liquid contained in said sub tank, said float member having a specific gravity slightly greater than a specific gravity of a preferred ink liquid suited for the ink jet system printer; detection means disposed below the ink liquid level for detecting a movement of said float member while said float member is entirely submerged within said sub tank and producing an output signal indicative thereof, said movement of said float member being caused by a variation in the specific gravity of the ink liquid contained in said sub tank; and

viscosity adjusting means for maintaining the viscosity of the ink liquid contained in said sub tank within a preselected range in response to said output signal produced by said detection means; said float member normally being entirely submerged, disposed in a lower portion of said sub tank and being unaf-



ected by surface tension of the ink liquid level and being periodically, automatically moved upwardly, while still remaining entirely submerged within said ink liquid, in response to an increase in the specific gravity of said ink liquid above the specific gravity of said preferred ink liquid thereby actuating said detection means and producing said output signal for actuating said viscosity adjusting means for effecting a reduction in the viscosity of said ink liquid contained within said sub tank.

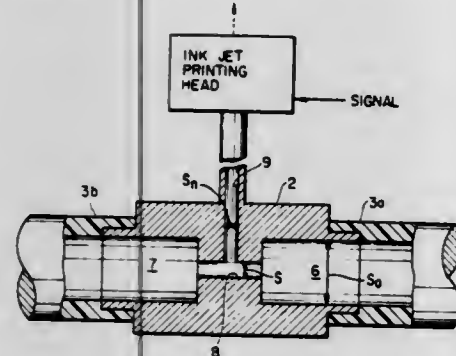
4,422,086

**DEVICE FOR FEEDING CONSTANT PRESSURE FLUID**  
Masayoshi Miura, Kawasaki; Gen Oda, Sagami; Kenji Akami, Kawasaki, and Hiroshi Naito, Machida, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jan. 19, 1982, Ser. No. 340,811  
Claims priority, application Japan, Jan. 20, 1981, 56-7724  
Int. Cl.<sup>3</sup> G01D 15/16

U.S. Cl. 346—140 R

22 Claims



1. A device for feeding a fluid under substantially constant pressure to a utilization element having a tendency to be exposed to abrupt variations in fluid pressure, said fluid being supplied to said device through a conduit from a fluid single supply source, comprising:

- first means forming a pair of first and second substantially identical chambers respectively connected to the single supply source in a closed loop circuit through first and second sections of said conduit;
- second means forming a connecting channel connecting said first and second chambers, the cross section of said connecting channel being smaller than the cross section of each of said first and second chambers; and
- third means forming a passageway connected at one end to a point intermediate opposite ends of said connecting channel and at the other end to said utilization element, said device being operable to absorb transitory pressure variations in said conduit sections to enable said second and third means to deliver fluid under substantially constant pressure to said utilization element.

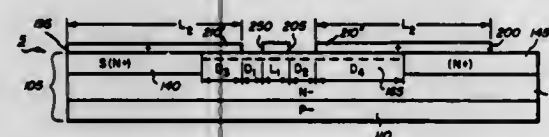
4,422,087

**SELF-ALIGNED SHORT CHANNEL MESFET**  
Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 3, 1980, Ser. No. 155,995  
Int. Cl.<sup>3</sup> H01L 29/48

U.S. Cl. 357—15

2 Claims



1. A solid state MESFET device including:  
a substrate layer;  
a source region, of a given doping concentration, formed in

said substrate and having an outer surface extending along a surface of said substrate layer;  
a drain region, of a given doping concentration, formed in said substrate and having an outer surface extending along said surface of said substrate layer;  
the portion of said substrate layer extending from said source region to said drain region along said surface providing a channel region having an outer surface, said channel region having a doping concentration less than the doping concentrations of said source region and said drain region;  
the outer surfaces of said source region, said drain region and said channel region lying in a common plane;  
a Schottky gate contact to said channel region;  
a metallic drain contact contacting at least a portion of said outer surface of said drain region and a portion of said outer surface of said channel;  
a metallic source contact contacting at least a portion of the outer surface of said source region and a portion of said outer surface of said channel;  
said portions of the outer surface of said channel region in contact with said metallic contacts being short-circuited by such metallic contacts whereby the effective length of said channel region is determined by the distance between said metallic contacts.

4,422,088

**BUS ARRANGEMENT FOR INTERCONNECTING CIRCUIT CHIPS**

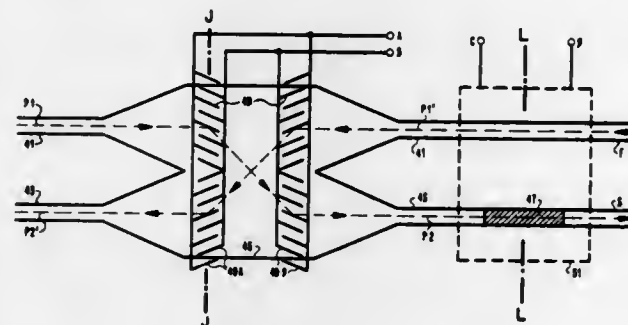
Fritz R. Gfeller, Adliswil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Dec. 7, 1981, Ser. No. 328,306

Claims priority, application European Pat. Off., Apr. 28, 1981, 81103161.3

Int. Cl.<sup>3</sup> H01L 31/12; G02B 5/14

U.S. Cl. 357—19

6 Claims



1. A semiconductor module for interconnecting circuit chips comprising:

- a substrate including an optical waveguide bus structure at the surface of said substrate, said structure including at least one optical waveguide bus comprising a feeder waveguide and a signal waveguide;
- a plurality of separately controllable coupling junctions between each feeder waveguide and its associated signal waveguide; said waveguide each extending longitudinally in a straight line and parallel to each other, the lateral extension of each waveguide gradually increasing symmetrically with respect to the straight axis of the respective waveguides towards the junction on both sides said waveguide propagating light only along the straight axis of each wave guide and a plurality of optical output means on each signal waveguide;
- light source means coupled to said substrate for illuminating each said feeder waveguide; and
- a plurality of circuit chips mounted on said substrate, each including control elements and photodetector elements; each of said control elements comprising a pair of said electrode gratings the upper half and lower half of each grating being inclined at inverse angles with respect to each other and to the axis of the associated optical waveguide bus so that when said pair of gratings is electrically excited

light propagating in the respective feeder waveguide is deflected first toward the center of the associated coupling junction and then into the respective signal waveguide;  
each of said control elements being located adjacent to a respective coupling junction, and each said photodetector element being located adjacent to a respective optical output means.

4,422,089

**SEMICONDUCTOR DEVICE HAVING A REDUCED SURFACE FIELD STRENGTH**

Henricus M. J. Vae; Johannes A. Appels, and Adrianus W. Ludikhuijze, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

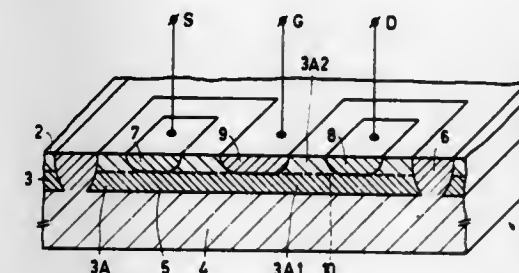
Filed Dec. 22, 1980, Ser. No. 219,160

Claims priority, application Netherlands, Sep. 8, 1980, 8005053

Int. Cl.<sup>3</sup> H01L 29/76, 29/78, 29/72

U.S. Cl. 357—22

21 Claims



1. A semiconductor device having a semiconductor body comprising a substrate region of a first conductivity type, a surface-adjointing layer-shaped semiconductor region provided at the surface of said substrate region, at least a substrate region-adjointing part of said layer-shaped semiconductor region being of a second conductivity type opposite to that of said first type and forming a p-n junction with said substrate region, an island-shaped part of said layer-shaped semiconductor region being bounded laterally by a separation region which extends from the surface over substantially the whole thickness of the semiconductor region, at least a first zone of a semiconductor circuit element being provided within said island-shaped part, the overall net doping of the second conductivity type of said layer-shaped semiconductor region in atoms per unit of surface area being sufficiently small such that when a voltage in the reverse direction is applied across said p-n junction the depletion zone within the island-shaped part will extend at least locally from said p-n junction up to the surface at a voltage which is lower than the breakdown voltage of the p-n junction, at least a part of said island-shaped part of the layer-shaped semiconductor region having a doping profile comprising at least two overlying layer portions of different average net doping concentrations between said substrate and said surface.

4,422,090

**THIN FILM TRANSISTORS**

Frank R. Shepherd, Kanata, and William D. Westwood, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 60,275, Jul. 25, 1979, abandoned. This application May 26, 1981, Ser. No. 266,630

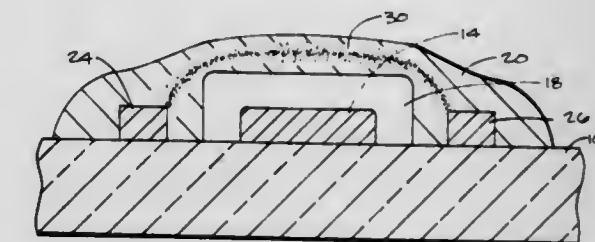
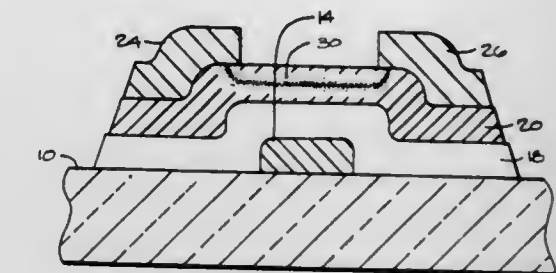
Int. Cl.<sup>3</sup> H01L 29/78

U.S. Cl. 357—23

8 Claims

1. A thin film insulated gate field effect transistor comprising a dielectric substrate and deposited on the substrate a thin film layered structure comprising a dielectric layer, a conducting gate layer, and a semiconductor layer, the dielectric layer sandwiched between the gate and the semiconductor layers, the thin film source and drain terminals contacting the semiconductor layer, the source and drain terminals spaced from one another and further being spaced from the gate layer by

the dielectric layer, wherein the thin film semiconductor layer has a non-uniform conductivity across the width thereof being



more conductive over an internal elemental layer than at elemental layers adjacent opposed surfaces of the semiconductor layer.

4,422,091

**BACKSIDE ILLUMINATED IMAGING CHARGE COUPLED DEVICE**

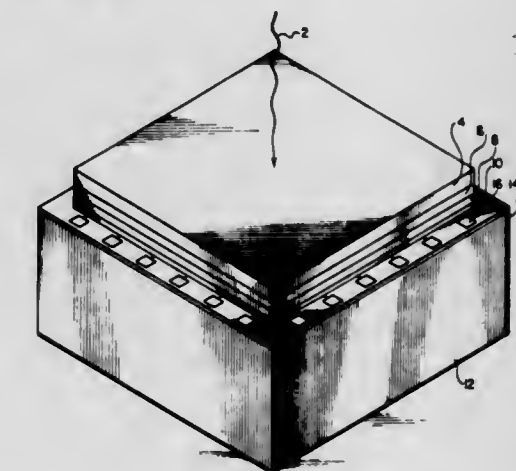
Yet-Zen Liu, Westlake Village, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 19, 1981, Ser. No. 225,899

Int. Cl.<sup>3</sup> H01L 29/78

U.S. Cl. 357—24

8 Claims



1. An imaging charge coupled device (CCD) comprising:  
a first layer of supporting material;  
a second layer of semiconductive material of a first conductivity type having a CCD circuit on one side, said one side being bonded to said first layer;  
a third layer of semiconductive material of a second conductivity type epitaxially joined to the other side of said second layer; and  
a fourth thin layer of semiconductive material of said second conductivity type epitaxially joined to said third layer, said semiconductive material forming said fourth layer having a wider bandgap than said semiconductive material forming said third layer so that said fourth layer is a window for said third layer;  
said imaging CCD not having a substrate, whereby the support for said device is provided by said first layer.

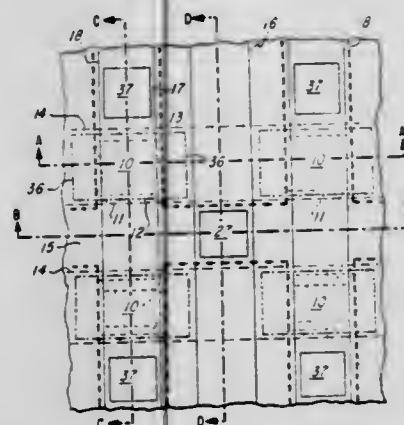


# 4,422,092 HIGH COUPLING RATIO ELECTRICALLY PROGRAMMABLE ROM

Daniel C. Guterman, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Division of Ser. No. 75,854, Sep. 17, 1979, Pat. No. 4,326,331.  
This application Feb. 1, 1982, Ser. No. 344,289  
Int. Cl.<sup>3</sup> H01L 27/02

U.S. Cl. 357-41

3 Claims



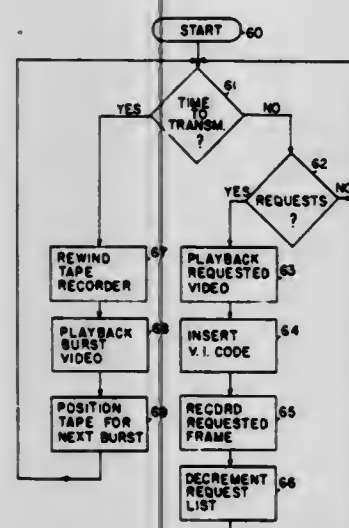
1. A semiconductor device comprising: a first field oxide on a face of a semiconductor body surrounding an active area of the face, a plurality of heavily doped regions in said face in said active area, such regions being covered by a second field oxide at said face, such regions being spaced from one another, a first layer of conductive material overlying said face at said active area forming an electrode located above the space between the heavily doped regions and also overlapping the heavily doped regions by a significant amount, the first layer also extending over the first field oxide by a substantial amount, a second layer of conductive material on said face overlying the first layer and defining an elongated strip overlying the heavily doped regions, the second layer having opposite edges coinciding with edges of the first layer, a thin insulator separating the first layer from said face, the first and second field oxides being much thicker than said thin insulator.

# 4,422,093 TELEVISION BURST SERVICE

Robert W. Pargue, Jr., San Clemente, Calif., assignor to Eco Incorporated, Santa Ana, Calif.  
Continuation of Ser. No. 249,792, Apr. 1, 1981, abandoned. This application Jan. 27, 1983, Ser. No. 461,316  
Int. Cl.<sup>3</sup> H04N 9/32

U.S. Cl. 358-12

8 Claims



1. The method of distributing for storage and subsequent elective viewing plural dissimilar individually specified com-

plete color images simultaneously to an unlimited number of remote receivers, which includes the method steps of:

- (a) forming plural frames of video signal, each of dissimilar specified subject matter,
- (b) contiguously storing in a manner allowing reproduction of each successive frame at video speed said frames prior to transmission,
- (c) transmitting only once all said contiguously stored frames of video signal in a continuous burst over a wide band communication channel at video speed,
- (d) contiguously storing at video speed all said frames of video signal at all remote receivers simultaneously during transmission, and
- (e) at any later time upon demand, locating and repeatedly reproducing at the original video speed a selected said frame of specified subject matter from the contiguous storage, after transmission, for viewing.

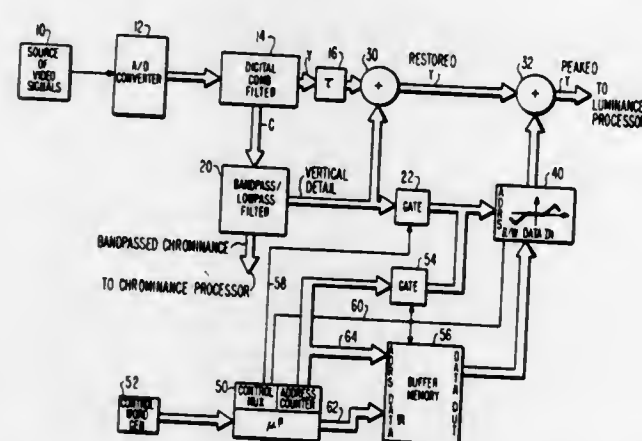
# 4,422,094 DIGITAL SIGNAL PROCESSOR WITH SYMMETRICAL TRANSFER CHARACTERISTIC

Henry G. Lewis, Jr., Hamilton Square, N.J., and Alfonso Acampora, Staten Island, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 6, 1981, Ser. No. 319,090  
Int. Cl.<sup>3</sup> H04N 19/535

U.S. Cl. 358-37

12 Claims



1. In a television receiver, including a source of digital video signals of N-bit words, including an Nth most significant bit, and occupying a dynamic range of M signal levels, a digital signal translation circuit comprising: a digital memory having an address input coupled to receive said digital video signals and an output at which translated video signal components of less than N bits are produced; said digital memory storing a table of digital signals of less than N times M bits; and means for combining said Nth bit of said digital video signals with said translated video signal components to produce translated digital video output signals occupying a given dynamic range.

# 4,422,095 VIDEO TONE CONTROL CIRCUIT

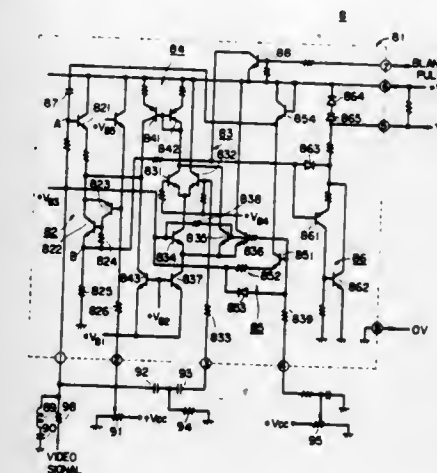
Nobukazu Hosoya, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan  
Filed Sep. 3, 1981, Ser. No. 299,118  
Claims priority, application Japan, Sep. 8, 1980, 55-124938  
Int. Cl.<sup>3</sup> H04N 5/14

U.S. Cl. 358-166

13 Claims

1. A video tone control circuit for emphasizing or attenuating a high frequency component in a video signal, comprising: means for providing a video signal, direct current bias voltage setting means for variably setting a direct current bias voltage, first circuit means for receiving said video signal for empha-

sizing a high frequency component in said video signal as a function of said direct current bias voltage, filter means for receiving said video signal for attenuating a high frequency component in said video signal as a function of said direct current bias voltage, second circuit means responsive to said direct current bias

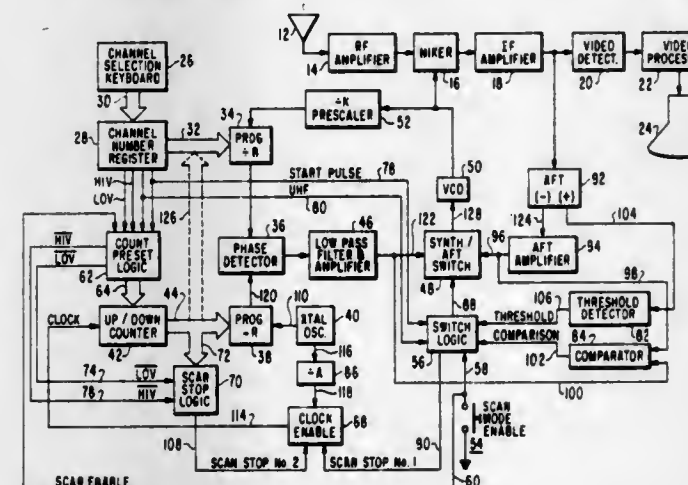


voltage for enabling one of said first circuit means and said filter means and for disabling the other, and output means for outputting any one of said video signal the high frequency component of which has been emphasized by said first circuit means and said video signal the high frequency component of which has been attenuated by said filter means.

# 4,422,096 TELEVISION FREQUENCY SYNTHESIZER FOR NONSTANDARD FREQUENCY CARRIERS

John G. N. Henderson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.  
Continuation of Ser. No. 632,060, Nov. 14, 1975, abandoned.  
This application Dec. 16, 1976, Ser. No. 751,924  
Int. Cl.<sup>3</sup> H04N 5/44, 5/50; H04B 1/26  
U.S. Cl. 358-191.1

29 Claims



29. A tuning system for receiving composite RF television signals associated with respective channels, each of said composite RF signals having either a standard frequency carrier or a nonstandard frequency carrier, each of said nonstandard frequency carriers being arbitrarily near a respective one of said standard frequency carriers within a first predetermined range less than the frequency separation between adjacent ones of said channels, comprising:

local oscillator means for generating a local oscillator signal having a frequency controlled in response to a control signal; first programmable divider means for dividing the frequency of said local oscillator signal by a first programmable factor to generate a first frequency-divided signal; a source of a relatively stable frequency signal having a

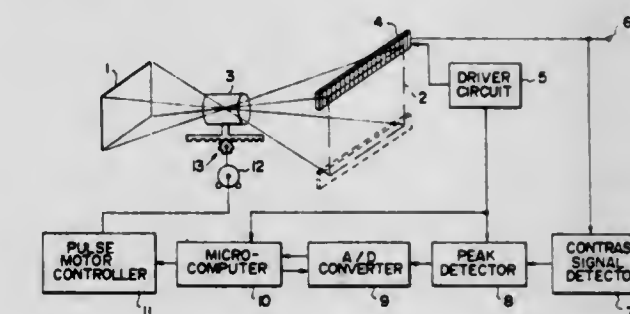
substantially lower frequency than said local oscillator signal; a second programmable divider for dividing the frequency of said stable frequency signal by a second programmable factor to generate a second frequency-divided signal; phase comparator means for generating said control signal for said local oscillator means in response to at least one of the phase and frequency deviation between said first frequency-divided signal and said second frequency-divided signal; mixer means for combining said RF signals and said local oscillator signal to generate an IF signal including at least one information bearing carrier; first control means for controlling said first programmable factor to select one of said channels; and second control means for controlling the second programmable factor to control the frequency of said information bearing carrier within a second predetermined range determined by said first predetermined range.

# 4,422,097 AUTOMATIC FOCUS CONTROLLING METHOD

Masafumi Inuiya, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Mar. 18, 1981, Ser. No. 244,918  
Claims priority, application Japan, Mar. 19, 1980, 55-35202  
Int. Cl.<sup>3</sup> H04N 5/38

U.S. Cl. 358-227

2 Claims



1. An automatic focus controlling method for a system including a lens comprising the steps of moving the lens axially in a first direction, generating a contrast signal from an image pick-up device scanning an image focused by the lens, comparing the maximum/peak contrast signal generated with a previously generated and stored maximum/peak contrast signal, moving said lens in said first direction by a predetermined distance beyond a position at which a maximum/peak contrast signal is generated while continuing to generate the contrast signal to search for another peak, said predetermined distance being established as a distance long enough to encompass lens movement corresponding to a lower contrast signal following an immediately preceding peak-signal, and moving said lens in a second opposite direction if a greater peak signal is not generated in said predetermined distance to a position corresponding to the last maximum/peak signal.

# 4,422,098 INTERNAL TEST METHOD AND APPARATUS FOR FACSIMILE TRANSCIVER

James A. Logie, Orlando, and Arthur G. Wilson, Maitland, both of Fla., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 120,488, Feb. 11, 1980. This application Oct. 30, 1981, Ser. No. 316,949  
Int. Cl.<sup>3</sup> H04N 1/42, 1/02

U.S. Cl. 358-256

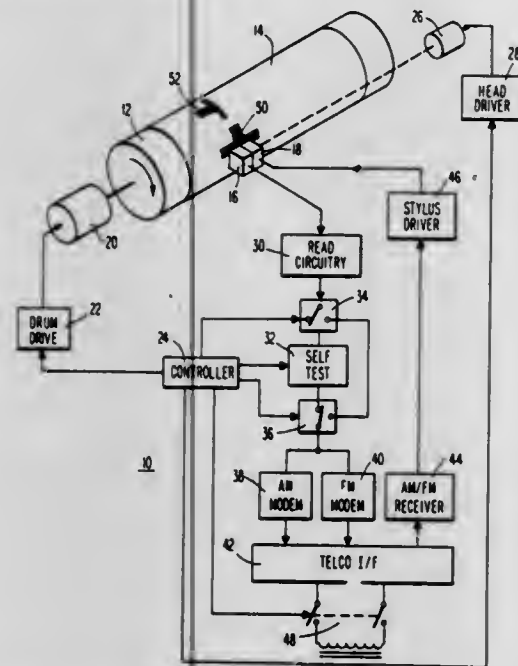
8 Claims

1. A method of self-diagnostic testing a facsimile transceiver with a transmitter means and a receiver means and including a reading means and a writing means closely situated with re-



spect to said reading means, said method comprising the steps of:

- positioning a document having a test pattern on a first portion thereof adjacent said reading means;
- scanning a part of a single scan line of said document with said reading means said writing means being inactive during said scanning;
- selectively switching a memory to the output of said reading means during the period in which said part of said scan line is being scanned;



storing the output of said reading means in said memory; selectively switching the contents of said memory to said transmitter means the output of which is directed to said receiver means; and displaying the output of said receiver means on a second portion of said document with said writing means during another part of said single scan line said reading means being inactive during said displaying.

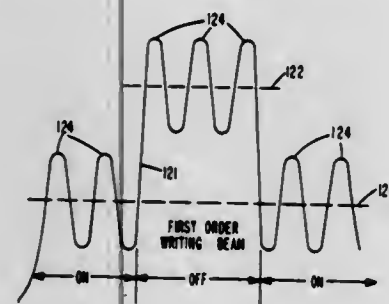
4,422,099

#### OPTICAL COMMUNICATION ON VARIABLE POWER BEAM

Larry L. Wolfe, Broomfield, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Feb. 3, 1982, Ser. No. 345,492  
Int. Cl.<sup>3</sup> H04N 1/24, 1/30

U.S. Cl. 358—293

29 Claims



1. In a deflection system for selectively deflecting a major portion of a light beam from a zero-order path, feedback apparatus comprising:

light responsive means for providing a signal representative of a characteristic of an applied light beam;  
feedback means for applying a feedback representation to an undeflected portion of said light beam of said zero-order path, said feedback representation modulating said characteristic of light beam substantially different from said selective deflection;  
means for directing said undeflected portion of said light

beam of said zero-order beam to said light responsive means; and  
detector means responsive to said representative signal for detecting said feedback representation modulation without detecting said selective deflection.

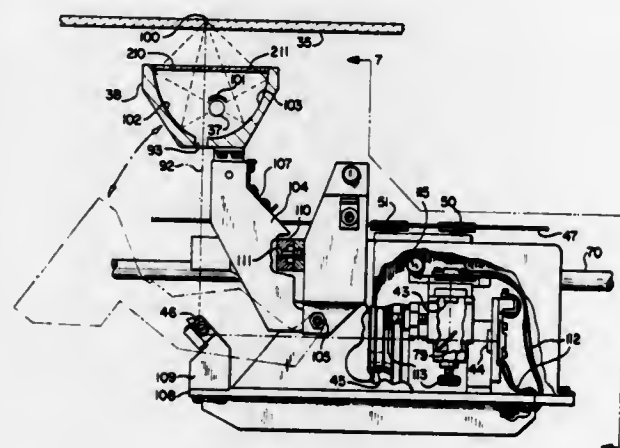
4,422,100

#### DOCUMENT SCANNING APPARATUS

Dale R. DuVall, Keller, and Barry C. Kockler, Lewisburg, both of Tex., assignors to The Mead Corporation, Dayton, Ohio  
Filed Mar. 8, 1982, Ser. No. 355,411  
Int. Cl.<sup>3</sup> H04N 1/24

U.S. Cl. 358—293

8 Claims



1. Document scanning apparatus comprising:

- a. reflector means including a reflecting surface defining a section of an elliptic cylinder having an enclosed first focal line and a non-enclosed second focal line; said reflecting surface being provided with an elongated slot which extends parallel to said focal lines and which is positioned such that a plane extending along an optical path from said second focal line to said slot makes an acute angle with another plane extending along the major axis of said elliptic cylinder between said focal lines,
- b. a line source of illumination mounted in said reflector means along said first focal line to illuminate said reflecting surface and produce an intense line of illumination at said second focal line,
- c. document support means for supporting a document along said second focal line so as to be illuminated and reflect rays of image light along said optical path,
- d. an arcuate circular cylindrical baffle positioned along said major axis concentric with said first focal line for preventing illumination of said document by direct rays from said line source of illumination and redirecting said direct rays backwardly through said first focal line and toward said reflecting surface; said baffle being positioned in such a manner as to avoid blocking said optical path,
- e. lens means for receiving said rays of image light and focussing said rays into an image of said document,
- f. a plurality of photodetecting elements arranged along a line for sensing said image and producing electrical representations thereof,
- g. carriage means for supporting said reflector means, said baffle, said lens means, and said photodetecting elements, and
- h. means for causing relative movement between said carriage means and said document.

4,422,101

#### ELECTRONIC CYLINDER MAKING METHOD

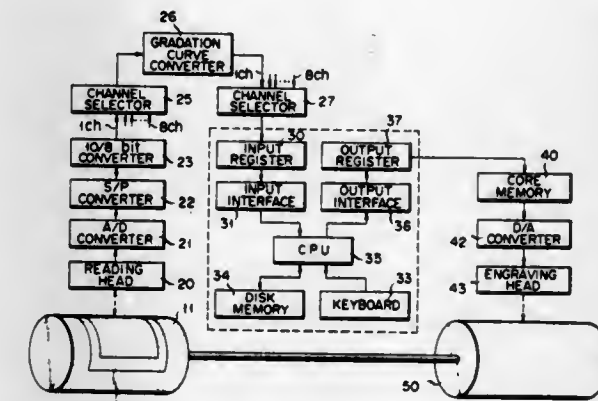
Masayuki Takel, Ikeda, Japan, assignor to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 285,916  
Claims priority, application Japan, Jul. 30, 1980, 55-104485; Mar. 9, 1981, 56-33649

Int. Cl.<sup>3</sup> H04M 1/22

U.S. Cl. 358—299

12 Claims



1. An electronic cylinder making method for an endless pattern and/or a multiple pattern which comprises the steps of: scanning an original on which a main pattern extended at a portion to be continued in a required degree is impressed, thereby producing a density signal;  
carrying out an analog-digital conversion of the density signal, thereby providing digital data on the density of the original;  
correcting the digital density data obtained by gradually converting data on the density of the extended pattern section into data on the density of the opposite pattern section to the extended pattern section; and  
engraving a screened pattern on the surface of a printing cylinder in accordance with the contents of a signal denoting the corrected density.

4,422,102

#### LASER RECORDING METHOD AND APPARATUS SIMULTANEOUSLY SCANNING AND READING OUT ADJACENT DATA

Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 151,685, May 20, 1980, abandoned.

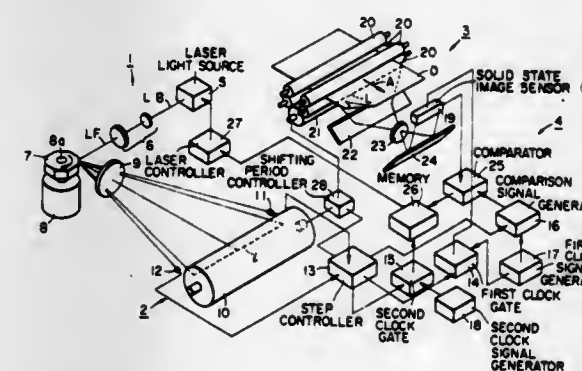
This application Sep. 1, 1982, Ser. No. 413,776

Claims priority, application Japan, May 25, 1979, 54-64801; May 25, 1979, 54-64802

Int. Cl.<sup>3</sup> H04N 1/06, 1/40

U.S. Cl. 358—302

6 Claims



1. A laser recording method in which recording is made on a recording medium with a laser beam modulated in accordance with a signal corresponding to an original to be recorded, comprising the steps of:  
reading an original to be recorded line by line in its main scanning direction at a first clock frequency, with original

reading means having a photoelectric means, and for each line so read generating a read signal therefrom;  
transferring the read signal generated by the reading means to memory means for storage therein;  
while said reading means is reading one line on the original, reading out of said memory means as an output signal at a second clock frequency higher than the first clock frequency, the read signal corresponding to the line on the original immediately preceding the one line;  
controlling a laserbeam at the second clock frequency in accordance with the output signal thus read out;  
scanning with the laser beam by moving a movable reflecting surface wherein the time required for one effective scan is shorter than that required for said original reading means to read one line of the original, said second clock frequency being related to the time required for one effective scan; and  
recording the image of the original on the recording medium with the laser beam thus scanned and controlled in a one-to-one magnification relationship.

4,422,103

#### DEVICE FOR REDUCING THE EFFECT OF TIME BASE VARIATIONS IN VIDEO DISC PLAYER

Hitoshi Kanamaru, Saitama, Japan, assignor to Universal Pioneer Corporation, Tokorozawa, Japan

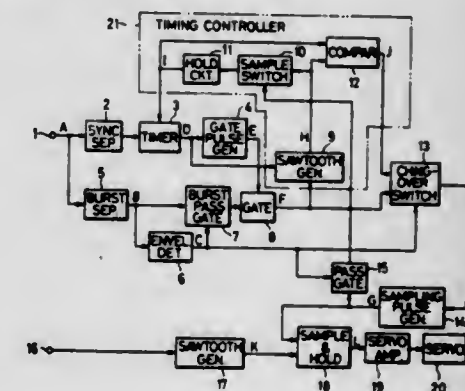
Filed May 21, 1981, Ser. No. 265,929

Claims priority application Japan, May 28, 1980, 55-71172

Int. Cl.<sup>3</sup> H04N 9/44, 1/28, 5/78

U.S. Cl. 358—320

7 Claims



2. A device for eliminating time base variations in a video disc player comprising:  
means for reproducing color video signals recorded on a video disc;  
means for separating horizontal synchronizing signals from reproduced color video signals;  
means for separating color burst signals from said color video signals and means for generating a color burst pulse signal in response to said color burst signals;  
means for generating color burst presence signals indicative of periods when said color burst signals are present;  
means for generating a gate pulse after a predetermined time from each of said horizontal synchronizing signals;  
means responsive to said gate pulse, said color burst presence signal and said color burst pulse signal for generating a time base information pulse which has a width extending from the leading edge of said gate pulse to a predetermined edge of said color burst signals appearing after the leading edge of said gate pulse when said color burst presence signals are present and which has the same width as said gate pulse when said color burst presence signals are absent;  
timing control means for generating a timing pulse in response to a sampling pulse and said time base information pulse when said color burst presence signals are present and in response to said sampling pulse alone when said color burst presence signals are absent;  
means responsive to said color burst presence signals for generating said sampling pulse in response to said time



base information pulse when said color burst presence signals are present and in response to said timing pulse when said color burst presence signals are absent; means for generating a reference horizontal synchronizing pulse; means for generating an error signal in response to said reference horizontal synchronizing pulse and said sampling pulse; and servo means for compensating for time base variations in response to said error signal.

#### 4,422,104 TIME BASE ERROR CORRECTING APPARATUS FOR VIDEO PLAYER

Tooru Fujishima, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

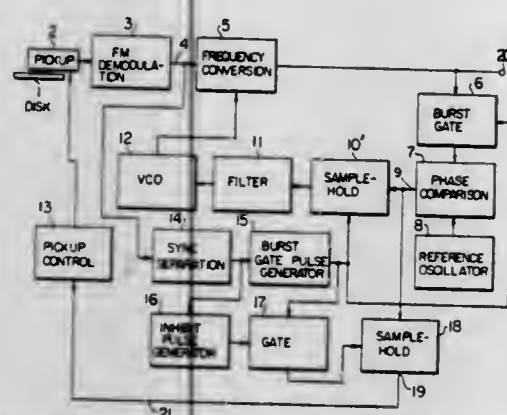
Filed Apr. 23, 1981, Ser. No. 256,683

Claims priority, application Japan, Apr. 23, 1980, 55-52958

Int. Cl.<sup>3</sup> H04N 5/76

U.S. Cl. 358—322

20 Claims



6. A time base error correcting apparatus for a video player comprising pickup means for detecting a color video signal including a color burst signal from a recording medium, first gate means for extracting the color burst signal from the detected color video signal, phase comparison means for comparing a phase of the extracted color burst signal with that of a reference signal and providing a comparison output signal indicative of the comparison, pickup control means for supplying the comparison output signal from the phase comparison means to the pickup means for correcting a relative position of the pickup means and the recording medium, and second gate means for inhibiting the supplying of the comparison output signal from the comparison means occurring at least for a predetermined period of time immediately after a period of time in which the color burst signal disappears in each vertical blanking period to the pickup control means.

#### 4,422,105 INTERACTIVE SYSTEM AND METHOD FOR THE CONTROL OF VIDEO PLAYBACK DEVICES

Dale F. Rodesch, Reno, and Nicholas Cerracchio, Las Vegas, both of Nev., assignors to Video Education, Inc., Reno, Nev.

Continuation-in-part of Ser. No. 83,821, Oct. 11, 1979, abandoned. This application Sep. 30, 1980, Ser. No. 192,227

Int. Cl.<sup>3</sup> G09B 9/00; G11B 15/52, 17/24

U.S. Cl. 358—903

14 Claims

1. An interactive video display system comprising, in combination:

a video playback device adapted to respond to respective ones of a set of input control function commands either to play a prerecorded program medium to recover signal information recorded on a video signal track thereon or to fast reverse or fast forward scan said program medium while recovering medium position information from a control track thereon to produce control track pulse output signals;

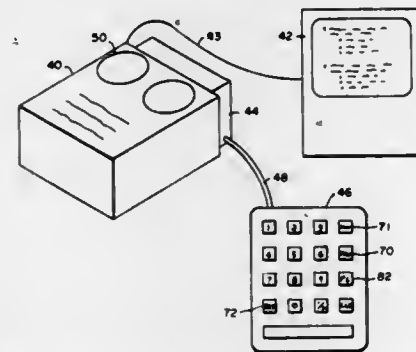
a video monitor coupled to said video playback device for

receiving video output signals therefrom and producing video displays corresponding thereto;

an input control signal means responsive to system user selected input commands to produce corresponding control signals; and

a microcomputer system including a central processing unit, an operating program memory, a scratch pad memory, and a plurality of programmable input/output devices communicating with said central processor unit (CPU) by way of a system address bus, a system data bus, and a system control signal bus, a control track circuit coupled to said video playback device to receive said control track pulse output signals and being operative to produce a sequence of interrupt signals to said CPU in response thereto, and a data recovery circuit coupled to said video playback device to receive said video output signals therefrom for recovering data words contained therein, a first of said programmable input/output devices being coupled to said video playback device for supplying said input control function commands thereto under CPU-program control, a second of said programmable input/output devices being coupled to said input control signal means to communicate said control signals to said CPU under CPU-program control, and a third of said programmable I/O devices being coupled to said data recovery circuit to communicate data therefrom to said system data bus;

said video display system being adapted to be controlled by program information provided on said prerecorded program medium and comprising a plurality of groups of live video segments and a plurality of data dump segments



with a data identifying signal preceding each data dump segment adapted to be sensed by said data recovery circuit in conjunction with said CPU to enable operation of said data recovery circuit, each of said live video segments being preceded by a data dump segment which includes at least one control word identifying the medium location thereof, and at least one of said data dump segments consisting of a software routine in the form of a prearranged sequence of control words providing a set of branching instructions for said CPU to data dump locations associated with selected live video segments and instructions for interpreting a predetermined set of user input commands to operatively select one of said branching instructions, said CPU thereby being responsive to one of said predetermined set of user input commands to produce either a fast reverse or forward scan function command to said video playback device until an approximate medium location corresponding to a new data dump location is reached, using said interrupt signals received from said control track circuit as a guide, followed by a play function command to said video playback device until the data dump associated with the selected branching instruction is encountered on said medium and said live video segment associated therewith is displayed on said monitor.

13. A method of providing random access playback of program segments recorded on one or both of the video and audio tracks of a video tape which also includes a control track having control track signals recorded thereon at regular intervals throughout the length of the tape, using a video tape playback device which is responsive to input function control

signals either to play a video tape or to fast scan said tape in either forward or reverse directions and which includes means for recovering video and audio signals from respective video and audio tracks during said play mode and means for recovering said control track signals from said control track during play and fast scan modes, said method comprising:

recording said program segments at precisely defined predetermined tape locations on said video tape;

recording on said tape as part of each program segment a precise tape location address corresponding to said defined tape location of said program segment;

tracking approximate tape location in a tape location address memory during play and fast scan of said playback device by using control track signals received from said control track to continuously update said tape location address memory to an approximate current tape location address;

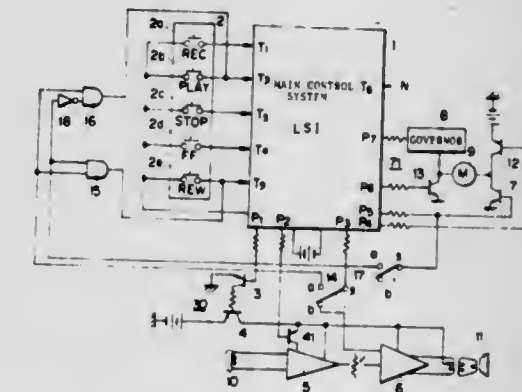
supplying a target tape location address corresponding to the target tape location of a different program segment;

supplying function control signals to said playback device to drive said video tape to said target tape location based on the displacement between said target tape location address and said approximate current tape location address;

recovering said precise tape location address as said different program segment is played; and

updating said tape location address memory with the recovered precise tape location address.

4,422,107  
TAPE RECORDER CONTROL SYSTEM FOR AUTOMATICALLY REVERSING TAPE  
Kazuyasu Motoyama, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan  
Continuation of Ser. No. 129,236, Mar. 11, 1980, abandoned.  
This application May 14, 1982, Ser. No. 378,269  
Claims priority, application Japan, Mar. 12, 1979, 54-31483  
Int. Cl.<sup>3</sup> G11B 15/00  
U.S. Cl. 360—62  
4 Claims



1. For a tape recorder capable of producing a tape-stop signal indicating that tape feed has stopped, a control system, comprising:

a motor for driving reels;

a plurality of switches including a recording switch to actuate a recording function for producing recording input signals, a reproducing switch to actuate a reproducing function for producing reproducing input signals, a stop switch to actuate a function for producing stopping input signals, a forward switch to actuate a fast forward tape feed for producing fast forward input signals, and a rewind switch to actuate a rewind function for producing rewind input signals;

an LSI circuit having a plurality of input terminals each connected to one of said switches for receiving the respective input signals and having an input terminal for receiving tape-stop signals;

said LSI circuit being responsive to the signals at the input terminals for producing recording and reproducing output signals, motor forward and reverse output signals, and tape-stop output signals in response to the tape-stop signals, said LSI circuit having a plurality of output terminals at which respective ones of said output signals appear;

recording and reproducing means responsive to the recording and reproducing output signals for recording and reproducing data;

power switch means coupled to the output terminals and responsive to said motor forward and reverse output signals for supplying power to the motor in response to the motor forward and reverse output signals; and

feedback means outside the LSI circuit and external to the terminals thereof and responsive to the stop-tape output signals and coupled to the input terminal connected to the rewind switch.

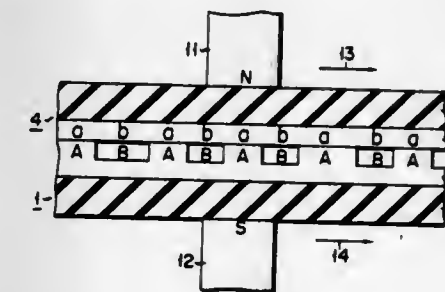
4,422,106  
MAGNETIC TRANSCRIPTION-RECORDING METHOD  
Norikazu Sawazaki, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan  
PCT No. PCT/JP80/00153, § 371 Date Jul. 27, 1981, § 102(e)  
Date Feb. 26, 1981, PCT Pub. No. WO81/00165, PCT Pub. Date Jan. 22, 1981

PCT Filed Jul. 1, 1980, Ser. No. 243,909  
Claims priority, application Japan, Jul. 2, 1979, 54-82609; Sep. 13, 1979, 54-116767

Int. Cl.<sup>3</sup> G11B 5/86

U.S. Cl. 360—17

9 Claims



1. A magnetic transcription-recording method, in which a magnetic material layer of a magnetic recording medium is brought into contact with the magnetic material layer of a master recording medium having information signals recorded therein in a pattern of projections, and a magnetic field is applied to the master recording medium and the magnetic recording medium so as to transcribe and record magnetically the information signals in the magnetic material layer of the magnetic recording medium, wherein said magnetic field includes an AC magnetic field and a DC magnetic field, said AC magnetic field is applied in a direction perpendicular to an oriented direction of said magnetic material layer of said magnetic recording medium, and said DC magnetic field is applied in said oriented direction.

4,422,108  
TAPE RECORDER  
Tooru Sempel, Naoya Fujita, Shigemitsu Higuchi, Masamichi Yamada, all of Yokohama, and Kouichi Tomatsuri, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Continuation of Ser. No. 66,652, Aug. 15, 1979. This application Jun. 1, 1982, Ser. No. 383,958  
Claims priority, application Japan, Aug. 16, 1978, 53-99024; Aug. 16, 1978, 53-99025; Sep. 28, 1978, 53-117922; Sep. 28, 1978, 53-117943  
Int. Cl.<sup>3</sup> G11B 5/45, 5/47  
U.S. Cl. 360—65  
11 Claims

1. A tape recorder including means for recording a signal







first gearing means for transmitting said first driving force both to said take-up reel and said capstan; a second motor adapted to provide a second driving force; second gearing means for transmitting said second driving force selectively to one of the take-up reel and feed reel at high speed for fast forwarding or fast rewinding of the tape.

4,422,115

# LIGHTWEIGHT DUAL HEAD SUPPORT ASSEMBLY FOR MAGNETIC DISK DRIVES

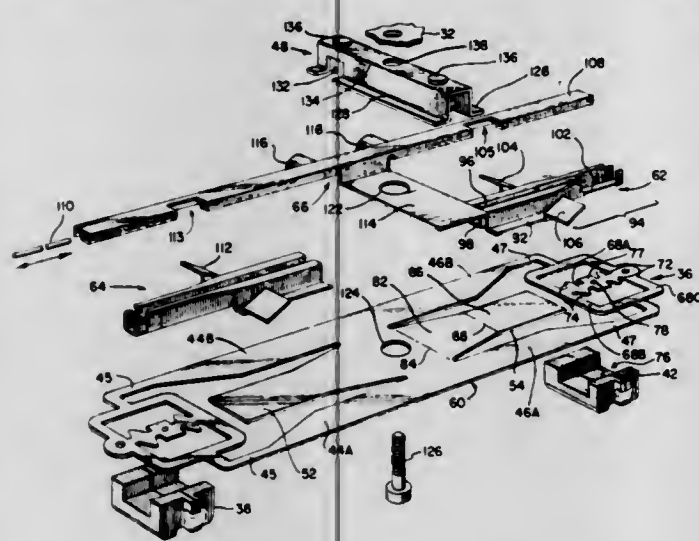
John L. Spash, Harvard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 126,020, Feb. 29, 1980, abandoned. This application Jul. 14, 1981, Ser. No. 283,163

Int. Cl.<sup>3</sup> G11B 5/48, 21/16

U.S. Cl. 360—104

3 Claims



1. In a disk drive mass storage unit of the type having at least a pair of read/write heads and a slider member associated with each head for creating an air bearing to support the head when the head is stationed over the surface over a rotating storage disk, each head and associated slider forming a head/slider assembly, and a head positioning arm member adapted to move the head slider assemblies across the surface of the disk, the improvement comprising:

head suspending means for suspendingly supporting each head from a common point on the arm member, in cantilevered fashion, with one head disposed on each side of the longitudinal axis of the arm member;

the head suspending member means including a unitary flexure member adapted to be secured to the arm member proximate the middle of the flexure member, the flexure member further having first and second ends distal the middle of the flexure, and, at each of such ends a slider frame adapted to support a head/slider assembly and further including, for each head/slider assembly, means for applying a pre-load force thereto;

the means for applying a pre-load force including, for each head/slider assembly, a resilient spring member and means for transferring a force from the spring to the head/slider assembly;

a channel-shaped member running the length of the flexure member along one side thereof and adapted to receive a stiff, elongate wire or needle therein;

the force-transferring means associated with each head/slider assembly including a ramp member depending toward the channel-shaped member;

the channel-shaped member having a cut-away portion adapted to receive the ramp from the force-transferring means;

a stiff, elongate wire adapted to be inserted in the channel member from one end thereof; and

the ramp members being adapted to ride up over the elongate wire when the wire is inserted into the channel mem-

ber from one end thereof, to remove the pre-load force from the head/slider assemblies.

4,422,116

# DEVICE FOR ADJUSTING SOUND HEAD PLATFORMS

Heinrich Cap, St. Georgen-Peterzell, Fed. Rep. of Germany, assignor to Papst Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

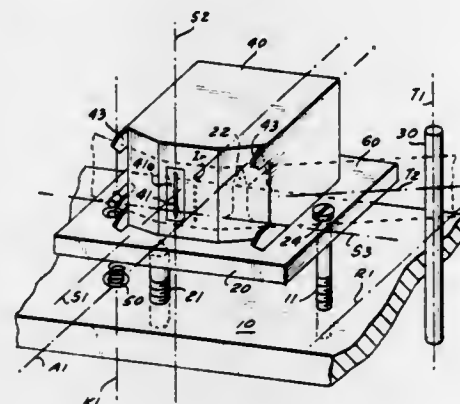
Filed Jul. 24, 1981, Ser. No. 286,550

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028856

Int. Cl.<sup>3</sup> G11B 5/56

U.S. Cl. 360—109

5 Claims



1. Device for adjusting a sound head platform with respect to a transport shaft in sound recorders, cassette sound recorders or digital data storage apparatus which include a transport shaft, a sound head platform for supporting a sound head having a main axis and a support for supporting the sound head platform, comprising a pivot bearing and a knife edge bearing mounted on said support; said pivot bearing and said knife edge bearing extending through a bearing axis which lies parallel to said main axis and beneath thereof, said bearing axis extending in a plane radial to the transport shaft, the sound head platform being supported on said pivot bearing and said knife edge bearing; a spring extended normal to the sound head platform and adapted to push the sound head platform against the pivot bearing and the knife edge bearing; and a counter bearing on which the sound head platform is supported, said counter bearing being mounted on said support and extended at a distance from said bearing axis towards said transport shaft, said spring rotating said sound head platform about said bearing axis until it is pushed against said counter bearing.

4,422,117

# THIN FILM MAGNETIC HEAD AND METHOD OF MAKING IT

Noboru Nomura, Kyoto; Kenji Kanai, Neyagawa; Nobuyuki Kaminaka, Moriguchi, and Norimoto Nouchi, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

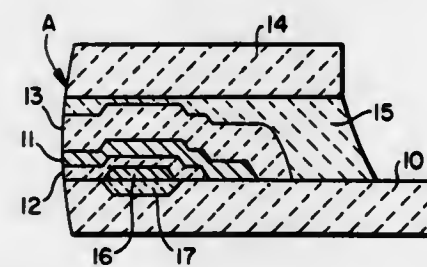
Filed Apr. 16, 1981, Ser. No. 254,662

Claims priority, application Japan, Apr. 11, 1980, 55-95392; Apr. 17, 1980, 55-51211; May 7, 1980, 55-60880

Int. Cl.<sup>3</sup> G11B 5/12, 5/20, 5/22

U.S. Cl. 360—126

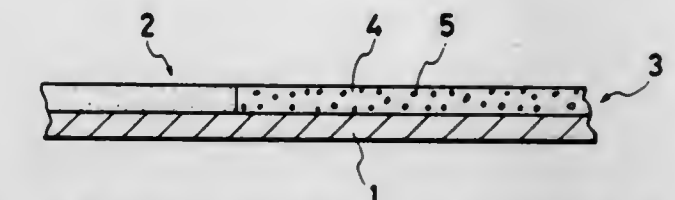
10 Claims



1. A thin film magnetic head comprising:

a substrate; thin film layers deposited on said substrate and including components of an electromagnetic transducing means, one of which is a magnetic layer; a wear resistant layer on said thin film layers; a protector plate means for covering the thin film layers; and a bonding layer bonding said protector plate means to said wear resistant layer, said bonding layer being a glass having a working temperature no higher than the highest temperature at which the magnetic properties of said magnetic layer are substantially retained and having a thickness less than 50  $\mu$ m.

ing film consisting essentially of a mixture of a polymeric binder, inorganic powder particles having a Mohs' hardness of



5 or above in an amount of not more than 5% by weight on the basis of the binder weight and an antistatic agent.

4,422,118

# INTEGRATED MAGNETIC TRANSDUCER

Michel Helle, Marq, and Jacques Desserre, Rambouillet, both of France, assignors to Compagnie Internationale pour l'Informatique, France

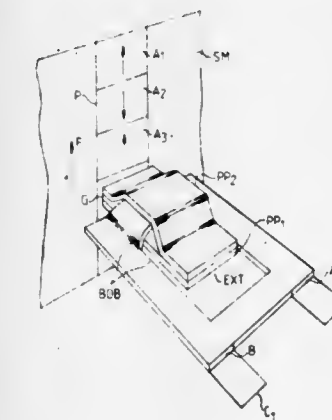
Filed Jun. 15, 1981, Ser. No. 273,617

Claims priority, application France, Aug. 27, 1980, 80 18599

Int. Cl.<sup>3</sup> G11B 5/16, 5/14, 5/20

U.S. Cl. 360—126

9 Claims



1. An integrated magnetic transducer for reading magnetic information recorded on a magnetic support adapted to be driven before it comprising:

a magnetic circuit formed of two pole pieces (PPI<sub>1</sub>, PPI<sub>2</sub>) separated by a gap (GI) parallel to the support (SM) and having a large dimension (L<sub>pm</sub>) perpendicular to the direction of movement of the support;

means (BOBI) coupled magnetically to this circuit, for transformation of magnetic flux of loss of information into an electric signal, the pole pieces (PPI<sub>1</sub>, PPI<sub>2</sub>) each comprising at the level of the gap (GI), a central part (PCI<sub>1</sub>, PCI<sub>2</sub>) bounded by two lateral parts (PLI<sub>1</sub> - PLI<sub>2</sub>, PLI<sub>3</sub> - PLI<sub>4</sub>) and spaced from such other such that the magnetic coupling between the central parts (PCI<sub>1</sub>, PCI<sub>2</sub>), at the level of the gap, is substantially less than the magnetic coupling between the corresponding lateral parts of the pole pieces (PLI<sub>1</sub>-PLI<sub>3</sub>, PLI<sub>2</sub>-PLI<sub>4</sub>).

4,422,119

# LEADER TAPE

Yoshio Kawakami; Masatoshi Okamura; Haruo Shiba, and Hideki Hotsuki, all of 13-1, Nihonbashi 1-chome, Chuo-ku, Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 285,835

Claims priority, application Japan, Jul. 28, 1980, 55-105688[U]

Int. Cl.<sup>3</sup> G11B 5/41

U.S. Cl. 360—128

9 Claims

1. A leader tape for magnetic recording tape, which comprises a plastic base film and a coating film thereon, said coat-

1. A combination starter-protector device for a winding circuit of a single phase induction motor adapted to be energized from an electrical power source, which device comprises:

a housing structure having separate starter and protector compartments separated by a perforated wall interposed therebetween, the housing structure including at least a first outer surface area facing in a first direction and a second outer surface area facing in a second direction, different than said first direction;

a PTC thermistor housed within the starter compartment and having a pair of opposite electrodes;

a bimetal switch housed within the protector compartment and including a bimetallic element and a pair of spaced contacts rigidly carried by the housing structure in face-to-face relationship with and operatively engaging the bimetallic element, said bimetallic element being capable of assuming a circuit interrupting position, in which said bimetal switch is opened, and a circuit completing position in which said bimetal switch is closed;

a first terminal means carried by the housing structure and having a pair of opposite ends, one of the ends of said first terminal means being formed by a tab-on terminal and being exposed to the outside of the housing structure and the other of said opposite ends being connected to one of the spaced contacts;

a second terminal means carried by the housing structure and having a pair of opposite ends, one of the ends of said second terminal means being formed by a socket and being exposed to the outside of the housing structure and the other of said opposite ends being connected to the other of the spaced contacts;

a third terminal means carried by the housing structure and



having a pair of opposite ends, one of said opposite ends of said third terminal means being formed by a tab-on terminal and being exposed to the outside of the housing structure and the other of said opposite ends being connected to one of the opposite electrodes of the thermistor;

a fourth terminal means carried by the housing structure and having a pair of opposite ends, one of said opposite ends of said fourth terminal means being formed by a socket and being exposed to the outside of the housing structure and the other of said opposite ends being connected to said one of the opposite electrodes of the thermistor;

a fifth terminal means carried by the housing structure and having a pair of opposite ends, one of said opposite ends of said fifth terminal means being formed by a tab-on terminal and being exposed to the outside of the housing structure and the other of said opposite ends being connected to the other of the opposite electrodes of the thermistor; and

a sixth terminal means having a pair of opposite ends exposed to the outside of the housing structure, one of said opposite ends of said sixth terminal means being formed by a tab-on terminal, another of said opposite ends of said sixth terminal means being formed by a socket, said sockets being oriented in a first direction extending through said first surface area of said housing structure, said tab-on terminals being oriented in a second direction extending through said second surface area of said housing structure.

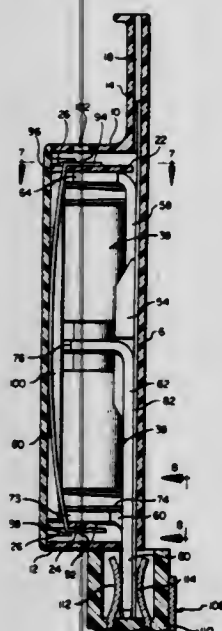
4,422,121

# LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT

Bertram W. Baumbach, Arlington Heights, Ill., assignor to Reliance Electric Company, Cleveland, Ohio  
Filed May 28, 1982, Ser. No. 383,278  
Int. Cl.<sup>3</sup> H02H 9/06

U.S. Cl. 361-119

6 Claims



1. A line protector for a communications circuit comprising a dielectric elongated housing open at one side for receiving the components of the protector, said housing having means interior thereof for supporting first and second surge voltage arresters in substantially coaxial relationship with the longitudinal axis of the housing, a first line terminal electrically connected to one arrester, a second line terminal electrically connected to the other arrester, the first line terminal extending from one end of the housing the full length of both arresters and to the other end of the housing, the second line terminal being substantially at said other end of the housing, a ground terminal connected to both arresters intermediate the ends of the housing and extending along only one of the two arresters to said other end of the housing, pins on each of said terminals projecting from said other housing end, a cover over said

opening, and a test contact in electrically conductive connection with said second line terminal and extending therefrom to a region at said one housing end, said housing having means at said one end for access to said first line terminal and said test contact by a test probe.

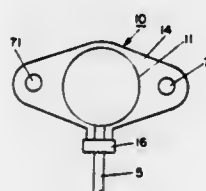
4,422,122  
SURGE ABSORBER

Ikuo Nagasawa, and Takashi Ishii, both of Yokosuka, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan  
Filed Feb. 3, 1982, Ser. No. 345,314  
Claims priority, application Japan, Feb. 19, 1981, 56-22598; Feb. 19, 1981, 56-22599

Int. Cl.<sup>3</sup> H02H 3/22

U.S. Cl. 361-127

4 Claims



1. A surge absorber comprising a lead wire connected to one of two electrodes provided on both surfaces of a voltage non-linear resistive element, and a terminal plate comprising a dish-shaped metal vessel having a surrounding wall, a center recessed portion and a planar peripheral brim surrounding said center recessed portion, wherein said resistive element is secured to the bottom surface of said metal vessel by one of said electrodes, wherein said lead wire is connected to the other electrode of said resistive element, and is insulated from, and passes through, the surrounding wall of said center recessed portion, wherein a resin coating layer is filled in said recessed portion to cover said resistive element and to be generally co-planar with the surface of said peripheral brim, and wherein at least two fitting holes are formed in a part of the brim for mounting the absorber to a supporting body.

4,422,123

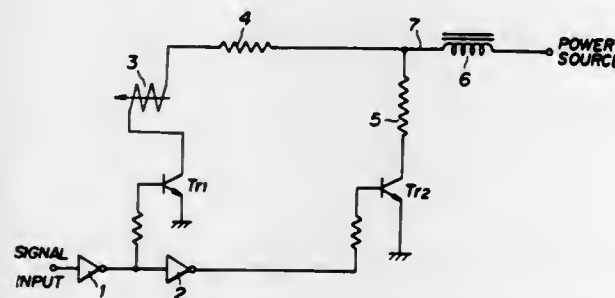
# CIRCUIT FOR DRIVING SOLENOID AT HIGH SPEED WITH CHOKE COIL

Noboru Tominari, and Shuichi Kamiyama, both of Tokyo, Japan, assignors to Mikuni Kogyo Co., Ltd., Tokyo, Japan  
Filed Jan. 28, 1982, Ser. No. 343,705

Int. Cl.<sup>3</sup> H01H 47/22

U.S. Cl. 361-152

5 Claims



1. A circuit for driving a solenoid at a high speed with a choke coil comprising:  
a pair of switching circuit means alternately turned ON and OFF by a switching element,

a first solenoid coil connected to one of said switching circuit means,  
a second solenoid coil defining a resistance element connected to the other of said switching circuit means, and said two circuit means being connected in parallel with a powerline having said choke coil.

4,422,124

# PUSH-BUTTON AND PERCUSSION TYPE PIEZOELECTRIC IGNITER

Jacques S. Challet, Ceaux d'Allegre, France, assignor to R. V. Constructions Electriques, France

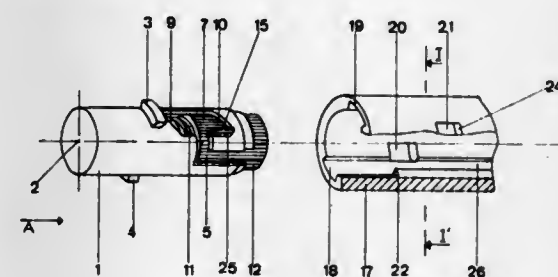
Filed Jan. 22, 1982, Ser. No. 341,616

Claims priority, application France, Jan. 23, 1981, 81 01420

Int. Cl.<sup>3</sup> H04R 17/00

U.S. Cl. 361-260

4 Claims



1. A push-button and percussion type piezoelectric igniter, consisting of:  
a cylindrical pushbutton body (1) comprising:  
(a) two diametrically opposite longitudinal parallel slots (5-6) joining two openings (7) wherein are provided two opposite parallel inclines (9-10),  
(b) two diametrically opposite stubs (3-4) located at the tip of each of the two inclines (9-10);  
a percussion mass (12) comprising two diametrically opposite stubs (15-16) displaceable on one of the inclines (10) on the body of the push-button (1), which inclines are arranged perpendicularly to, but slightly offset from, the stubs (3-4) of the push-button (1);  
a spring (11) resting inside the body of the push-button (1) and on the percussion mass (12) respectively, for propelling said mass (12);  
a casing (17) for receiving at one end the assembly comprising push-button (1), spring (11) and percussion mass (12), and at its other end the impact assembly comprising a striker (30), piezoelectric crystal (31), anvil (32), connection (33) and locking part (34), said casing (17) comprising:  
(a) on its inside surface two diametrically opposite longitudinal grooves (18-19-26) whose widths correspond to the widths of the stubs (3-4) of the push-button (1), and  
(b) two diametrically opposite apertures (20-21) slightly offset from said grooves receiving the stubs (15-16) of the percussion mass (12), said apertures (20-21) being tangential to the longitudinal grooves (18-19) inside the casing (17).

4,422,125

# PRESSURE TRANSDUCER WITH AN INVARIABLE REFERENCE CAPACITOR

Frank J. Antonazzi, and David H. Ohnesorge, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 21, 1982, Ser. No. 380,647

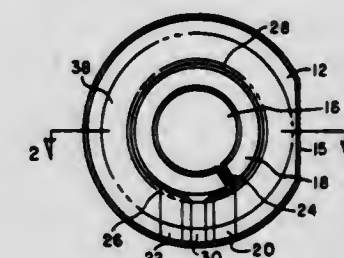
Int. Cl.<sup>3</sup> H01G 7/00

U.S. Cl. 361-283

7 Claims

1. A pressure transducer with an invariable reference capacitor comprising:  
a first substrate of insulative material and a second substrate of insulative material;  
wherein at least one substrate is flexible and will deform in response to a pressure change;

wherein said substrates are positioned to oppose each other across a gap;  
an annular frit joining said substrates and forming a chamber between them by sealing said gap to a reference pressure, said annular frit comprising an insulative material with a dielectric constant in excess of one;  
at least one sensing capacitor plate formed of a conductive material disposed on one of the substrates and located entirely within the area defined by said chamber;  
at least one reference capacitor plate formed of a conductive material disposed on said one substrate and located entirely within the annular area defined by the frit;



at least one common plate formed of a conductive material disposed on said other substrate and opposing said sensing plate in the area defined by said chamber to provide a sensing capacitance between said one common plate and said sensing plate; and  
another common plate formed of a conductive material disposed on said other substrate and opposing said reference plate in the area defined by the frit annulus to provide a reference capacitance between said other common plate and said reference plate.

4,422,126

# NONINDUCTIVE ELECTRICAL CAPACITOR

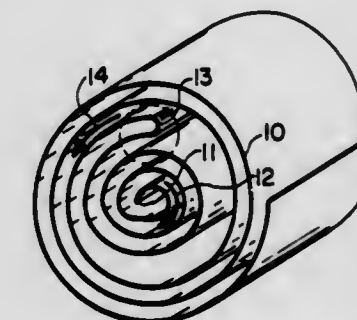
Stephen A. James, Hennepin County, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 14, 1982, Ser. No. 398,180

Int. Cl.<sup>3</sup> H01G 4/08, 13/00

U.S. Cl. 361-323

5 Claims



4. A convoluted wound electrical capacitor having alternate laminae of dielectric and conductive material, the laminae being folded and the direction of winding reversed when about half the desired length has been wound.

4,422,127

# SUBSTANTIALLY SMALL SIZED WOUND CAPACITOR AND MANUFACTURING METHOD THEREFOR

Bernard Lavene, Ocean, N.J., assignor to Electronic Concepts, Inc., Eatontown, N.J.

Division of Ser. No. 330,867, Dec. 15, 1981, Pat. No. 4,378,620, which is a continuation of Ser. No. 108,593, Dec. 31, 1979, abandoned. This application Mar. 31, 1983, Ser. No. 480,759

Int. Cl.<sup>3</sup> H01G 1/14

U.S. Cl. 361-323

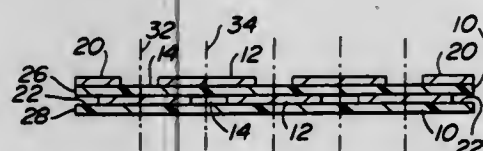
3 Claims

1. A substantially small sized capacitor which comprises:  
(a) a wound layered substantially rectangular coil compris-



ing a first dielectric web, said web having a plurality of continuous regularly spaced metallic electrodes deposited on one side of said web, said electrodes being parallel to the lengthwise dimension of said web and further being separated by a plurality of regularly spaced unplated openings, the entire arrangement being disposed so that the first of said electrodes lies along one edge of said web and the last of said electrodes lies along the other edge of said web,

a second web of dielectric material having a plurality of continuous regularly spaced metallic electrodes deposited on one side of said web, said electrodes being spaced parallel to the lengthwise dimension of said web and further separated by a plurality of regularly spaced unplated openings, the entire arrangement being disposed so that the first of said openings lies along one edge of said second web and the last of said web openings lies along the other edge of said second web,



said rectangular coil formed by mating said first web and said second web so that the unplated side of said first web is in physical contact with the plated side of said second web and arranged so that the first of said electrodes and the last of said electrodes on said first web lie over the first of said openings and the last of said openings on said second web, respectively, said webs wound to form a layered cylindrical coil, said cylindrical coil thereafter flattened to a substantially rectangular layered coils, then tempered without the addition of any separate adhesive, and then chopped to form a plurality of individual capacitors of wound continuous electrodes of the small size of ceramic capacitors on the order of  $0.090 \times 0.190 \times 0.190$ , and

(b) conductors attached to ends of said small sized capacitor by plating metal onto said ends and then attaching said conductors so that contact is made with each of the electrodes lying at said ends.

4,422,128

**PUSH-ON TERMINAL CLIP AND ASSEMBLY**

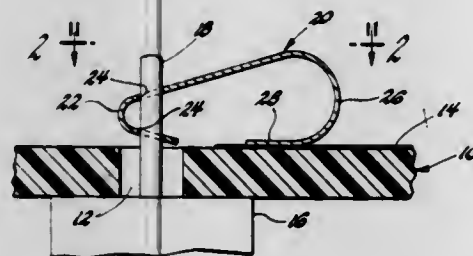
Donald B. Zurlinden, Goleta, and Reginald C. Heltmach, Jr., Santa Ynez, both of Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1981, Ser. No. 290,692

Int. Cl.<sup>3</sup> H05K 1/18

U.S. Cl. 361-408

3 Claims



1. An electrical connector for resiliently connecting a component lead to a circuit board conductor comprising a push-on clip formed of conductive spring material, the clip having lead gripping means including a substantially U-shaped end with divergent legs and a lead receiving aperture in each of the legs whereby the clip is adapted by spring action to securely grip a lead inserted through both apertures, and one of the legs hav-

ing a resilient portion extending from its aperture to terminal means for pressing flush against the circuit board conductor.

4,422,129

**HUMIDITY SENSOR**

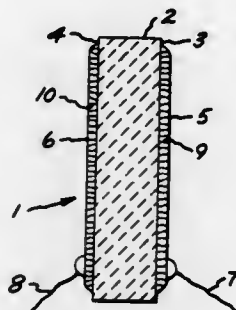
Jacqueline L. Briant, and Jeffrey A. Asher, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,767

Int. Cl.<sup>3</sup> H01G 9/00

U.S. Cl. 361-433

10 Claims



1. A humidity sensor which varies in electrical impedance with variations in humidity in the atmosphere, vacuum or partial vacuum in which it is placed consisting essentially of a ceramic body ranging in thickness from about 100 microns to about 2 centimeters, at least a pair of spaced electrodes disposed on said ceramic body in electrical contact therewith, and an electrical contact on each said electrode, said ceramic body being an electrolyte comprised of  $\text{Na}_{1+x}\text{Si}_x\text{Zr}_2\text{P}_3-x\text{O}_{12}$ , where x has a value ranging from about 1.5 to about 2.8, said ceramic body having a density ranging from about 90% to about 100% of the theoretical density for said  $\text{Na}_{1+x}\text{Si}_x\text{Zr}_2\text{P}_3-x\text{O}_{12}$ , each said electrode having a minimum thickness of about 10 Å and being in the form of a continuous interconnecting network which forms at least a sufficient plurality of non-linear recesses with the surface of the ceramic body which expose ceramic body surface to said atmosphere, vacuum or partial vacuum and produce a measurable electrical current impedance change when said atmosphere, vacuum or partial vacuum varies in relative humidity, said electrodes extending over from about 3% to about 95% of the surface of said ceramic body.

4,422,130

**PORTABLE RECHARGEABLE LIGHTING DEVICE**

Nomura Shigeo, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Morilguchi, Japan

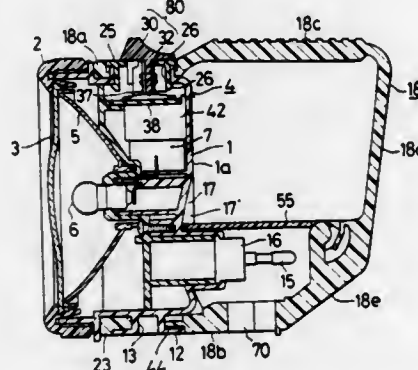
Filed Apr. 28, 1981, Ser. No. 258,544

Claims priority, application Japan, May 14, 1980, 55-64249

Int. Cl.<sup>3</sup> F21L 9/00, 7/00, 15/00

U.S. Cl. 362-183

14 Claims



1. A portable rechargeable lighting device comprising: a body including a light bulb and a rechargeable battery;

switch means for switchably coupling said light bulb to said battery; charging plug for receiving electric current for charging said battery; and a handle swingably coupled to said body positionable in a lighting position and a charging position, said handle covering said charging plug when in said lighting position.

4,422,131

**FINGER LIGHT**

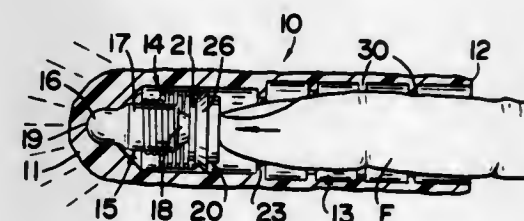
Richard A. Clanton, Seminole, and Raymond W. Simmons, Pinellas Park, both of Fla., assignors to Concept P.R. Inc., Clearwater, Fla.

Filed Sep. 7, 1982, Ser. No. 415,324

Int. Cl.<sup>3</sup> F21L 7/00

U.S. Cl. 362-186

4 Claims



1. A light comprising: a flexible, molded, one-piece housing having a closed end and an open end, said housing having a translucent section at least in an area adjacent said closed end; a light source in said housing comprising a bulb, a battery and means for biasing said bulb and battery apart, said bulb having a glass dome, a metal base and a contact, said glass dome being positioned adjacent the closed end of said housing and said contact facing said open end; said battery being normally spaced from said bulb in a direction toward said open end and having a first terminal facing in the direction of said contact and an opposite terminal facing said open end, said battery being securely held within said housing by an inwardly directed flange molded integral with said housing at a location intermediate its closed and open ends; said biasing means being an electrically conductive spring which makes contact with said metal base of said bulb and with said opposite terminal of said battery to thereby complete the circuit when said first terminal touches said contact of said bulb; said housing being substantially hollow between said flange and said open end and adapted to receive a human finger so that said light may be worn as an extension of said finger and pressure of said finger through said flange against said battery may effect activation of said light source.

4,422,132

**FLUORESCENT-TYPE FIXTURE HAVING IMPROVED FOLD-OUT LAMP SOCKET ASSEMBLIES**

Charles A. Trowbridge, Wrightstown, Pa., assignor to Sim Kar Lighting Fixture Co., Inc., Philadelphia, Pa.

Filed Dec. 14, 1981, Ser. No. 330,390

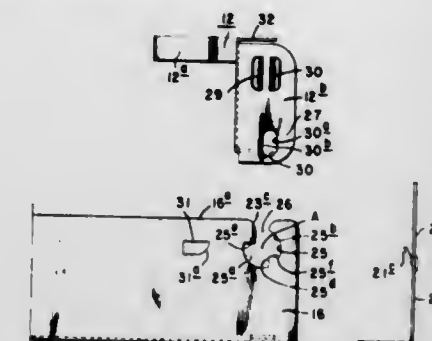
Int. Cl.<sup>3</sup> F21V 19/02

U.S. Cl. 362-220

9 Claims

1. In a lighting fixture having a channel member with a web and a pair of upstanding sidewalls terminating in edges and at least one fold-out socket assembly carried by said channel member, and means mounting said socket assembly to pivot from a folded-in shipping position to a folded-out usage position, the improvement wherein said mounting means includes: a shaped aperture located in each of said sidewalls and aligned with one another to provide a pivot axis for said socket assembly, means in each sidewall providing a slot connecting said shaped aperture with an edge of the sidewall, and a pair of ears struck outwardly from the socket assembly, said aperture and slot being sized relative to said ears to enable said socket assembly to be displaced into said channel when

said ears are aligned with said slot and being sized to prevent disengagement of said socket assembly from said channel after said socket assembly has been pivoted into its folded out usage configuration, and



latch means on said sidewalls and socket assembly cooperating to lock said socket assembly when said socket assembly is pivoted into said folded-out usage position.

4,422,133

**ILLUMINATING DEVICE WITH REFLECTOR PORTIONS AND VOIDS OPPOSITE THEREOF**

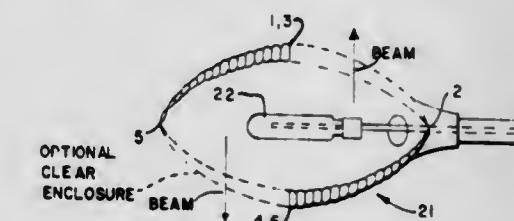
William B. Elmer, 2 Chestnut St., Andover, Mass. 01810

Filed Nov. 9, 1981, Ser. No. 319,251

Int. Cl.<sup>3</sup> F21V 7/10

U.S. Cl. 362-277

6 Claims



1. Lighting apparatus for producing at least two major beams of light in substantially different directions comprising, reflecting means having depending first and second side portions on opposite sides of the reflecting means lengthwise axis for reflecting light from a source therein, means for supporting a light source within said reflecting means so that said reflecting means may direct light energy from said light source into said at least first and second major beams of light in substantially different first and second directions respectively after reflection from said first and second side portions respectively, said reflecting means being formed with said first and second side portions being relatively displaced in a direction generally parallel to said lengthwise axis to create voids allowing each of said first and second major beams to bypass each other after reflection from said first and second side portions respectively and emerge from said reflecting means through said voids beside said second and first side portions respectively.

4,422,134

**LUMINAIRE WITH IMPROVED ILLUMINATION OF A VISUAL TASK FIELD**

John R. Brass, San Rafael, Calif., assignor to Metropolitan Furniture Corp., San Francisco, Calif.

Filed Jun. 22, 1981, Ser. No. 276,043

Int. Cl.<sup>3</sup> F21V 7/00

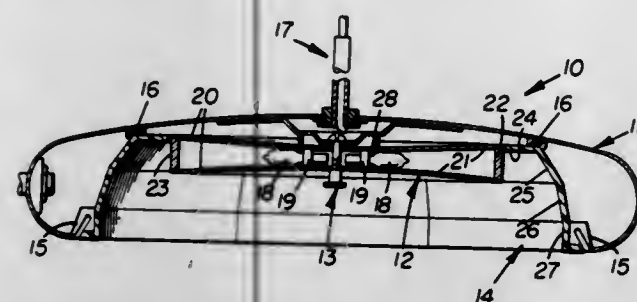
U.S. Cl. 362-300

21 Claims

1. A luminaire of the direct lighting type adapted for mounting adjacent to a visual task field comprising light source means for emitting a spherical light pattern,



first means for directly converting said spherical light pattern to only a radial light pattern, and



second means for directly receiving and reflecting said radial light pattern into a controlled and substantially uniform light pattern onto said visual task field.

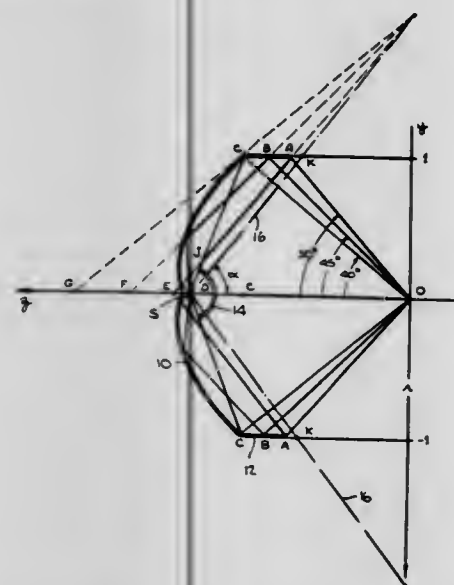
4,422,135

**ANNULAR ILLUMINATOR**

Calvin S. McCamy, Wappingers Falls, N.Y., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.  
Division of Ser. No. 83,618, Oct. 11, 1979, Pat. No. 4,320,442.  
This application Dec. 10, 1981, Ser. No. 329,411  
Int. Cl.<sup>3</sup> F21V 7/00

U.S. Cl. 362-346

2 Claims



1. A 45° annular illuminator for reflecting flux comprising: an elliptic reflector having a surface generated by rotating a segment of an ellipse about an optic axis, said segment intersecting said optic axis, the major axis of the ellipse forming an acute angle with said optic axis; and a cylindric reflector having a surface generated by rotating a straight linear segment about said optic axis, said cylindric reflector being connected to said elliptic reflector at its extremities and adapted both to receive flux reflected from the concave surface of said elliptic reflector and to reflect said flux to a point on said optic axis at angles of incidence of between about 40° and about 50°.

4,422,136

**SHOCK MOUNTING DEVICE FOR A LAMP**

Charles J. Newman, and Joseph T. Hodges, both of Madison, Ind., assignors to The Grote Manufacturing Company, Inc., Madison, Ind.

Filed Mar. 25, 1982, Ser. No. 361,587

Int. Cl.<sup>3</sup> F21V 15/04

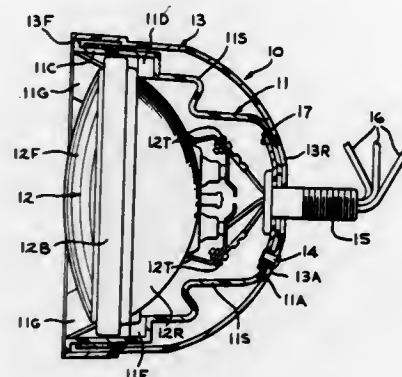
U.S. Cl. 362-390

8 Claims

1. A novel device for shock mounting a lamp within housing means for a lamp, comprising:  
(a) a hollow generally frustoconical resilient member having

a long central axis extending between centers of its opposite ends, with

(b) one of said opposite ends of said member including means for retaining, supporting and locating a lamp in a predetermined position, and  
(c) the other of said opposite ends of said member including



means for fastening said member to said lamp housing means, and

(d) said member including plural segments positioned around said axis and extending between said opposite ends of said member, with  
(e) each of said segments being generally serpentine in its longitudinal extension with respect to said axis.

4,422,137

**MAGNETIC MOUNTING SUPPORT FOR LIGHT FIXTURE INCLUDING SHOCK ABSORPTIVE ARRANGEMENT**

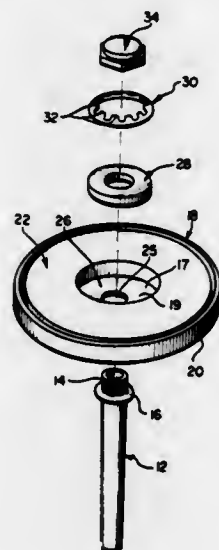
Thomas E. Watts, Shorewood, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jul. 26, 1982, Ser. No. 402,097

Int. Cl.<sup>3</sup> F21V 15/04

U.S. Cl. 362-390

8 Claims



1. A shock absorptive mounting support for a light fixture, including in combination:

a base including magnet means for magnetically securing said mounting support on a magnetic support surface, said base defining an aperture therethrough;

support means adapted for mounting said light fixture thereon, including an end portion dimensioned for receipt in said aperture of said base, said support means including a support shaft having a threaded end portion and a stop defined adjacent said threaded end portion, said threaded end portion being inserted into said aperture of said base, the extend of insertion of said threaded end portion being limited by said stop;

resilient shock absorptive means received on said end portion of said support means in abutting relation with said

base, said resilient shock absorptive means comprising resilient washer means received on said threaded end portion of said support shaft;  
fastener means received on said end portion of said support means in abutting relation with said resilient, shock absorptive means, said fastener means including a nut received on said threaded end portion, said nut being tightened down to secure said support shaft and said base in joined relation; and  
concave washer means received on said threaded end portion of said support shaft between said nut and said resilient washer means.

4,422,138

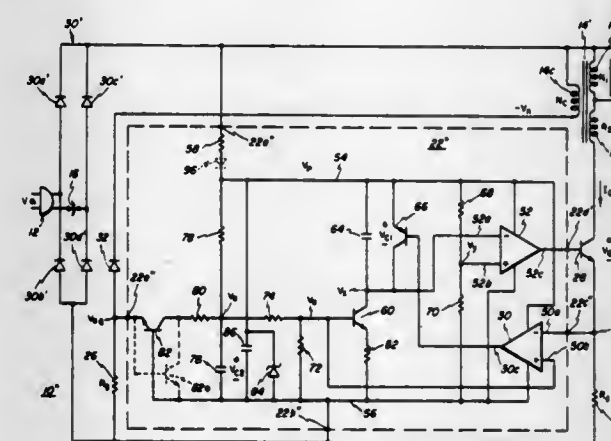
**POWER SUPPLY FOR LOW-VOLTAGE LOAD**  
William P. Kornrumpf, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,792

Int. Cl.<sup>3</sup> H02M 3/335

U.S. Cl. 363-21

22 Claims



1. A current-regulating power supply for energizing a load at a voltage magnitude less than the voltage magnitude provided by an A.C. source, comprising:  
an autotransformer having a tapped winding, said load being connected solely between a first end and the tap of said winding;  
switching means connected to said autotransformer only at a remaining end of said winding for enabling a flow of current from said source through said winding during the duration of a control signal;  
means for providing a sampling signal of magnitude responsive to the instantaneous current flowing through said switching means; and  
control circuit means for providing said control signal at an operating frequency at least an order of magnitude greater than the frequency of said A.C. source and for adjusting, responsive to said sampling signal magnitude, the proportion of time during each of a successive plurality of operating frequency cycles during which said switching means conducts current, to maintain the current through said load at a substantially constant value.

4,422,139

**TRANSFORMER COUPLED UP-DOWN CONVERTER**  
Lowell E. Burkhead, Springville, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 29, 1982, Ser. No. 362,730

Int. Cl.<sup>3</sup> H02P 13/22

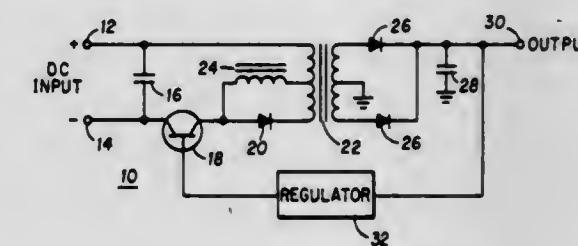
U.S. Cl. 363-21

12 Claims

1. A power converting apparatus comprising:  
input means for receiving DC power;  
transformer means coupled to receive power from said input means and provide an output; and  
conduction means coupled to said transformer means and said input means for conducting current from said input means and causing a charging current to flow from said input means through a first portion of said transformer

means during a first time period to provide said output and for blocking current flow from said input means and causing a discharging current to flow through a second portion of said transformer means during a second time period to provide said output, said conduction means including:

switch means having a first conducting state and a second non-conducting state coupled to said input means for providing said charging current flow when said switch means is in said first conducting state and for blocking



said current flow when said switch means is in said second non-conducting state;  
inductor means coupled to receive current flow from said switch means and provide said charging current through said first portion of the transformer means during said first time period; and  
rectifier means coupled for conducting said discharge current flow from said inductor means through said second portion of said transformer means during said second time period.

4,422,140

**MONITORING MEANS FOR INDUSTRIAL PROCESS PLANTS**

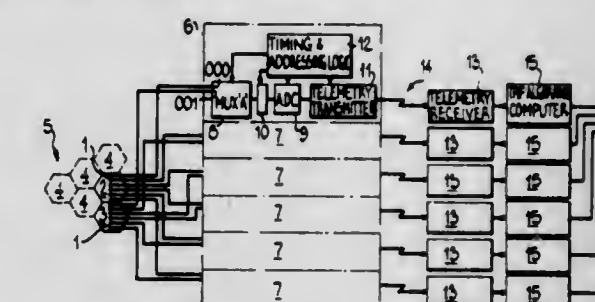
Albert B. Keats, Dorchester, England, assignor to United Kingdom Atomic Energy Authority, London, England  
Filed Sep. 2, 1980, Ser. No. 183,451

Claims priority, application United Kingdom, Sep. 12, 1979, 7931561

Int. Cl.<sup>3</sup> G06F 11/30, 15/46

U.S. Cl. 364-184

5 Claims



1. A monitoring means for an industrial process plant or apparatus which processes data signals from inputs from equipment or transducers associated with the processor apparatus and provides information or control signals therefor, the monitoring means including a data transmission assembly including a multiplexer arrangement, the data transmission assembly being physically wired with inputs in the assembly disposed in a test pattern, the test pattern including a plurality of input addresses in the multiplexer arrangement for receiving test signals, which addresses rotate through the pattern, the rotation being effected by the physical wiring connected to the addresses.







4,422,145

# THRASHING REDUCTION IN DEMAND ACCESSING OF A DATA BASE THROUGH AN LRU PAGING BUFFER POOL

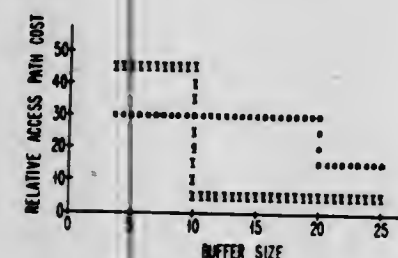
Giovanni M. Sacco, Turin, Italy, and Mario Schkolnick, Monte Sereno, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US81/01109, § 371 Date Oct. 26, 1981, § 102(e) Date Oct. 26, 1981, PCT Pub. No. WO83/00758, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 18, 1981, Ser. No. 334,272  
Int. Cl.<sup>3</sup> G11C 9/06

U.S. Cl. 364-300

9 Claims



COMPUTED ACCESS PATH COST FOR TWO WAYS OF PERFORMING 2-WAY JOIN

1. A CPU implementable method for minimizing thrashing among concurrent processes demand page accessing of a data base through an LRU page organized buffer pool, characterized in that the steps include:

- allocating to each new process an independent LRU page frame stack of buffer elements;
- ascertaining the set of pages over which there is looping access behavior by each process;
- scheduling for execution only those processes for which there exists a frame stack large enough to hold the counterpart set of pages; and
- upon the occurrence of a page fault, exercising an LRU page replacement discipline upon the counterpart stack.

4,422,146

# RECONSTRUCTION METHOD OF A COMPUTED TOMOGRAPHIC IMAGE FROM A FEW X-RAY PROJECTIONS

Shoichiro Yamaguchi, and Fujio Kobayashi, both of Tokyo, Japan, assignors to The President of Tokyo Institute of Technology, Tokyo, Japan

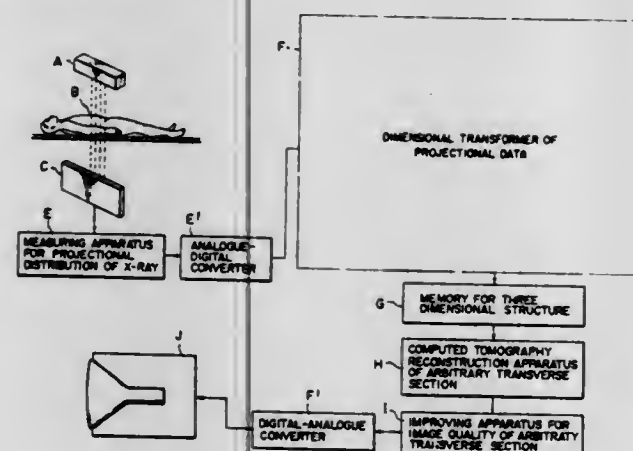
Filed Nov. 12, 1980, Ser. No. 205,909

Claims priority, application Japan, Nov. 22, 1979, 54-151461; Jan. 14, 1980, 55-002893; Jan. 14, 1980, 55-002894; Feb. 6, 1980, 55-013237

Int. Cl.<sup>3</sup> G06F 15/42

U.S. Cl. 364-414

11 Claims



1. A reconstruction method of a computed tomographic image from a few X-ray projections comprising:

- (a) projecting X-rays from two desired directions toward

tested tissue of a body for producing first and second X-ray projectional distributions of X-rays which have passed through the tested tissue;

- (b) measuring the values  $d_k$  ( $k$  is natural number) of X-ray density on said first X-ray projectional distribution at a plurality of positions spaced apart from each other from one end of said first X-ray projectional distribution toward the other end thereof, and at the same time measuring the values  $d_k'$  ( $k'$  is natural number) of X-ray density on said second X-ray projectional distribution at a plurality of positions spaced apart from each other from one end of said second X-ray projectional distribution toward the other end thereof, where said plurality of positions spaced apart from each other on the first and second X-ray projectional distributions for measurement of the values  $d_k$  and  $d_k'$  of X-ray density are selected according to the following three criteria, (i) that the tomographic plane of the tested tissue of a body to be reconstructed is expressed by a pseudo-tomographic plane which is constituted collectively by  $mn$  pieces of picture elements, with  $m$  pieces of picture elements in a row and  $n$  in a column (both  $m$  and  $n$  are natural numbers), which are formed by dividing said tomographic plane of the tested tissue of a body into small sections and each of which has a single piece of X-ray density information, and that said pseudo-tomographic plane is placed between an X-ray source and said two X-ray projectional distributions, (ii) that said pseudo-tomographic plane is divided into a first part of a plane constructed collectively by said picture elements with  $i$  pieces in a row ( $i$  is natural number,  $i < m$ ) and  $n$  picture elements in a column and a second part of a plane constituted collectively by said picture elements with  $(m-i)$  pieces in a row and  $n$  pieces in a column, (iii) that  $n$  rows, each of which is constituted by  $m$  pieces of picture elements are numbered in order 1, 2, . . . ,  $n$  from the left and that said  $m$  pieces of picture elements in each row are numbered respectively 1, 2, . . . ,  $m$ ;  $m+1$ ,  $m+2$ , . . . ,  $2m$ ; . . . ;  $(n-1)m+1$ ,  $(n-1)m+2$ , . . . ,  $mn$  from the side of said X-ray source toward the side of said two X-ray projectional distributions in order and that at least  $mn$  X-ray beams passing through said pseudo-tomographic plane from two directions comprise the first group of X-ray beams passing through respectively the left lower corner of each picture element in said first part of a plane and the second group of X-ray beams passing through respectively the left upper corner of each picture element in said second part of a plane, and said plurality of positions spaced apart from each other on said two X-ray projectional distributions for measurement of the values  $d_k$  and  $d_k'$  of X-ray density correspond to the positions on said two X-ray projectional distributions which have X-ray density information to be obtained by passing said X-ray beams through said pseudo-tomographic plane;

- (c) calculating the X-ray absorption coefficient  $\mu_t$  ( $t=1, 2, \dots, mn$  and  $t$  is a natural number) of each of  $mn$  pieces of picture elements based on the X-ray density values  $d_k$  and  $d_k'$  measured in step (b) and length of the X-ray beams passing through each of the picture elements;

- (d) reconstructing the computed tomographic image of said tested tissue of a body, where the picture elements having respective X-ray absorption coefficients  $\mu_1, \mu_2, \dots, \mu_{mn}$  calculated in step (c) are positioned at the locations of said picture elements numbered 1, 2, . . . ,  $mn$  of the pseudo-tomographic plane and wherein the complete collection of picture elements located in the  $m \times n$  array constitute the reconstructed computed tomographic plane of the tested tissue of body.

4,422,147

# WIND SHEAR RESPONSIVE TURBULENCE COMPENSATED AIRCRAFT THROTTLE CONTROL SYSTEM

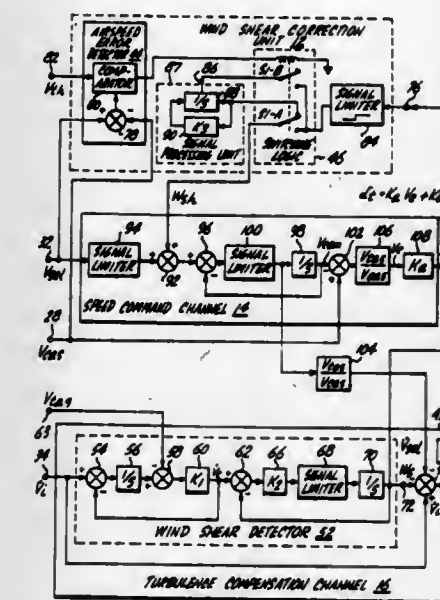
Charles R. Hanke, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 8, 1980, Ser. No. 185,299

Int. Cl.<sup>3</sup> G05D 1/08

U.S. Cl. 364-440

20 Claims



- 1. In an automatic control system of the type including a throttle controller that supplies a throttle control signal substantially represented by the expression  $K_a V_e + K_b V$ , where  $K_a$  and  $K_b$  are system gain factors,  $V_e$  is representative of the difference between the present airspeed of an aircraft utilizing said automatic control system and a selected airspeed, and  $V$  is representative of the longitudinal inertial acceleration of said aircraft, the improvement comprising:

wind shear correction means for supplying a compensation signal to supplement said throttle control signal during periods of time in which the difference between said present airspeed and said selected airspeed of said aircraft is at least partially due to atmospheric wind shear, said compensation signal being of the form  $W_s F(s)$ , where  $W_s$  is representative of the wind shear encountered by said aircraft and  $F(s)$  denotes a frequency dependent transfer function, said wind shear correction means including signal processing means responsive to a signal representative of said present airspeed of said aircraft and responsive to a signal representative of said longitudinal inertial acceleration of said aircraft for supplying said compensation signal to said throttle controller, said signal processing means including wind shear detection means, said wind shear detection means including means for deriving a signal which theoretically represents the acceleration of said aircraft from said signal representative of said present airspeed, means for determining the difference between said signal theoretically representative of said acceleration and said signal representative of said longitudinal inertial acceleration of said aircraft, means for filtering said difference signal to remove at least a portion of those signal components representative of atmospheric turbulence other than wind shear and means for coupling said filtered difference signal to said throttle controller as said compensation signal, said means for coupling said filtered difference signal to said throttle controller including means for determining that the difference between said present airspeed and said selected airspeed exceeds a predetermined value and means for supplying said filtered difference signal to said throttle controller only when said difference between said present airspeed and said selected airspeed exceeds said predetermined value, said means for coupling said filtered difference signal to said throttle controller further including means for combining said filtered difference signal with said throttle control signal

to provide a signal of the form  $K_a V_e + K_b V$  when said difference between said present airspeed and said selected airspeed is less than said predetermined value and to provide a signal of the form  $K_a V_e + K_b V + W_s F(s)$  when said difference between said present airspeed and said selected airspeed exceeds said predetermined value.

4,422,148

# ELECTRONIC POSTAGE METER HAVING PLURAL COMPUTING SYSTEMS

John H. Soderberg, Monroe, N.Y.; Alton B. Eckert, Norwalk, and Robert B. McFiggans, Stamford, both of Conn., assignors to Pitney Bowes Inc.

Division of Ser. No. 89,413, Oct. 30, 1979, Pat. No. 4,301,507.

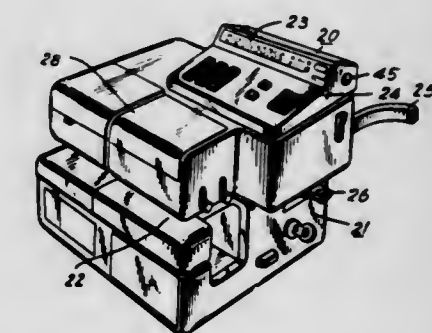
This application May 6, 1981, Ser. No. 261,001

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> G06F 15/20

U.S. Cl. 364-464

19 Claims



- 1. In a postal meter having a keyboard and display, central accounting and imprinting mechanism, and including accounting means, a control means, and a printer means, said accounting means controlling all of the accounting functions of the meter, said control means controlling all of the keyboard and display functions of the meter, and said printer means controlling the setting of the print mechanism and monitoring the mechanical functions thereof, the improvement wherein said postal meter comprises an interconnect means adapted to connect said control means to an external device, means for periodically scanning said interconnect means for signals, means responsive to a determined input on said interconnect means from an external device for transferring the function of said control means to signals at said interconnect means whereby said interconnect means represents said external device in communication with said accounting means and said printer means for providing data to said postal meter.

4,422,149

# PROCESS AND APPARATUS FOR THE CORRECTION OF THE CONTROL PROGRAM OF AN AUTOMATIC GLASS SHEET CUTTING MACHINE

Heinz-Josef Reinhold; Horst Mueha, and Wilhelm Arnoldi, all of Aachen, Fed. Rep. of Germany, assignors to Saint Gobain Vitrage, Neuilly-sur-Seine, France

Filed Jan. 14, 1981, Ser. No. 224,948

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1980, 3001954

Int. Cl.<sup>3</sup> G06F 15/46; G05B 19/18

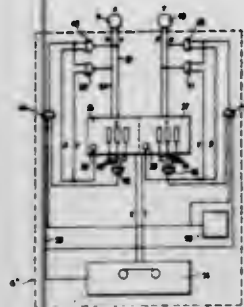
U.S. Cl. 364-473

6 Claims

- 1. Method for correcting the control program of an automatic glass cutting machine where said machine has a scanning head equipped with an X-pulse emitter and a Y-pulse emitter adapted to be guided along a closed path defined in Cartesian X and Y coordinates representing a line along which glass sheet is to be cut and has a memory for storing the signals emitted by the emitters, comprising the step of adding the signals emitted by the emitters in an X counter and in a Y



counter in the form of positive or negative pulses according to whether the scanning head moves in the positive or negative direction of the X and Y axes when moving along the closed path, the step of comparing the total number of pulses in each counter at the initial starting point of the movement of the recording head about the closed path with the total number of



signals in each counter at the termination point of the movement of the head about the closed path, and the step of adding to the program the required number of pulses to make the number of pulses in each counter at the end of the movement of the head about the closed path equal to the number in each counter at the initial start of movement of the head about the closed path.

4,422,150

#### MACHINE TOOL CONTROLLER AND PART INSPECTION MONITOR

Bruce E. Keller, Federal Way; Robert B. Andrews, Jr.; Charles F. Wylie, both of Puyallup, and Kenneth W. Brinkerhoff, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

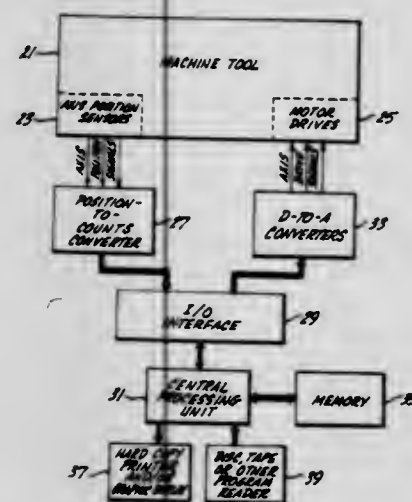
Continuation of Ser. No. 152,665, May 23, 1980, abandoned.

This application Jun. 24, 1982, Ser. No. 391,608

Int. Cl.<sup>3</sup> G06F 15/46

U.S. Cl. 364-475

13 Claims



11. In a machine tool controller for controlling a machine tool such that the relative position of a part to be machined and a cutter for machining said part follow a predetermined path, the improvement comprising:

- position sensors for continuously determining the relative position of the part to be machined and the cutter along predetermined axes and continuously producing axes position signals related thereto; and, data processing means connected to said position sensors for:
- (a) receiving said continuously produced axes position signals;
  - (b) continuously determining the transfer function of said machine tool based on the information contained in said continuously produced axes position signals; and,
  - (c)

utilizing said transfer function information to control the production of position command signals adapted to control said machine tool such that said cutter follows said predetermined path of travel.

4,422,151

#### LIQUID HANDLING APPARATUS

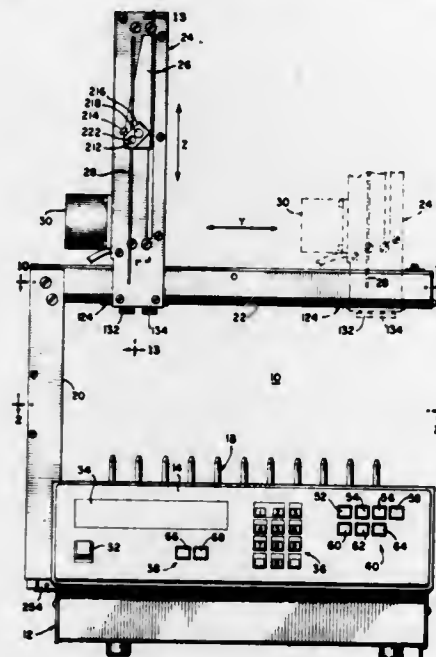
Robert E. Gilson, 4 N. Franklin Ave., Madison, Wis. 53705

Filed Jun. 1, 1981, Ser. No. 268,659

Int. Cl.<sup>3</sup> G06F 15/46, 15/20; G06G 7/58, 7/48

U.S. Cl. 364-496

33 Claims



1. Liquid handling apparatus comprising a table member; rack means supported on said table member for supporting a plurality of receptacles arrayed in predetermined positions above said table member; a subframe having a first portion mounted beneath said table member for rectilinear movement in a horizontal X direction; an X-drive motor supported in a fixed position relative to said table member; X-drive means interconnecting said X-drive motor and said subframe; said subframe including an upstanding portion extending above said table member and a horizontal portion overlying the table member; a Y-drive motor mounted on the first subframe portion; a carriage mounted on said subframe horizontal portion for rectilinear movement in a transverse, horizontal Y direction; Y-drive means interconnecting said Y-drive motor and said carriage; a gantry detachably supported on said carriage; a holder device mounted on said gantry for rectilinear movement in a vertical Z direction; a Z-drive motor mounted on said gantry; Z-drive means coupled between said holder device and said Z-drive motor; said gantry, holder device, Z-drive motor and Z-drive means being detachable from said carriage as a unit; and control means for selectively energizing said drive motors for moving said carriage into positions corresponding to said receptacle positions and for moving said holder device vertically with respect to said receptacles said X-, Y- and Z-drive motors cooperating with said X-, Y- and Z-drive means and with said control means for selectively moving said holder device in three mutually perpendicular directions.

4,422,152

#### AUTOMATIC FIXED-QUANTITY/VARIABLE-TIME ANTI-OXIDATION REPLENISHMENT CONTROL SYSTEM

Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Nov. 19, 1981, Ser. No. 323,073

Int. Cl.<sup>3</sup> G06F 15/46; G03D 3/06

U.S. Cl. 364-502

7 Claims

7. A computer-based control system for controlling anti-oxidation replenisher means for providing anti-oxidation replenishment to a processor of photosensitive material, the control system comprising:

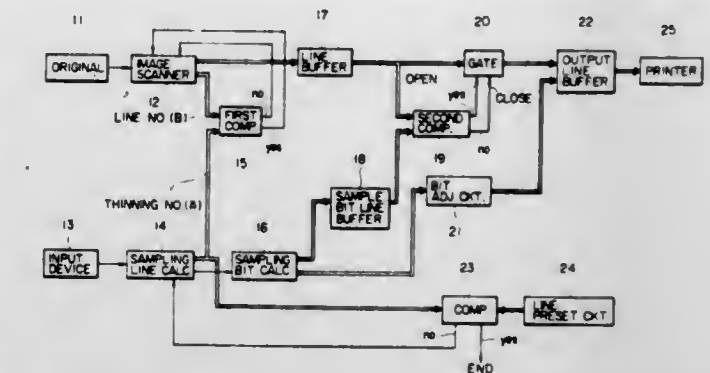
clock means for measuring a time interval and providing a signal indicative of expired time of the interval;

exhaustion replenishment means responsive to a first replenishment signal for providing exhaustion replenishment; means for providing a signal indicative of use of processor fluid;

anti-oxidation replenishment means responsive to a second replenishment signal for providing a predetermined amount of anti-oxidation replenishment; and

programmed digital computer means for: storing a digital value representing an exhaustion replenishment rate; receiving the signal indicative of use of processor fluid; storing a digital value representing an anti-oxidation replenishment rate; providing the first replenishment signal to the exhaustion replenishment means as a function of the use of processor fluid and the digital value representing

direction, compressing each line by reducing first and last portions of each scanning line by half of the number of said bits



thus thinned after said predetermined bits are thinned, and inserting white bits at said first and last portions of each scanning line to complete each scanning line.

4,422,154

#### TEMPERATURE COMPENSATION OF TUNABLE ACOUSTIC OPTICAL FILTERS

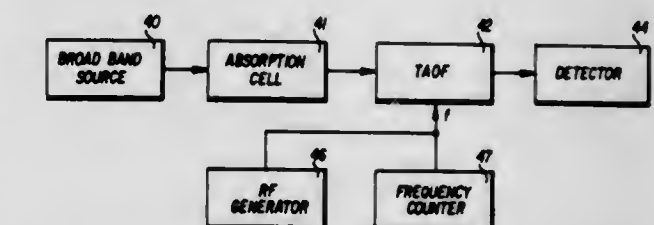
Leonard M. Smithline, and George J. Wolga, both of Ithaca, N.Y., assignors to Lansing Research Corporation, Ithaca, N.Y.

Continuation-in-part of Ser. No. 40,644, May 21, 1979, Pat. No. 4,272,825. This application Feb. 27, 1981, Ser. No. 238,916. The portion of the term of this patent subsequent to Jun. 9, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> G02F 1/135, 1/29; G05B 15/02

U.S. Cl. 364-571

2 Claims



2. Apparatus for compensating the tuning curve of a TAOF for variations in the temperature of the TAOF, said tuning curve being a temperature dependent relationship of the center wavenumber of the TAOF to the frequency of an acoustic beam, said apparatus comprising:

- (a) a broad band light source;
- (b) an absorption cell between said broad band source and said TAOF for absorbing radiation from said broad band source at preselected optical frequencies so as to provide light at a reference wavenumber to the optical input of the TAOF;
- (c) photodetector means for providing a signal representing the intensity of said light at an optical output of the TAOF;
- (d) means for providing a variable frequency acoustic beam to the TAOF;
- (e) means for varying the frequency of the acoustic beam to the TAOF in response to the signal representing the intensity of light from the TAOF until the signal is minimized by causing the center wavenumber of the TAOF to coincide with a reference wavenumber, and for holding the frequency of the acoustic beam constant at the point of coincidence; and
- (f) means for ratioing the frequency of the acoustic beam to the frequency of an acoustic beam corresponding to the reference wavenumber at a reference TAOF temperature, whereas the ratio of acoustic frequencies is a function of the temperature of the TAOF; and
- (g) means for storing values representing a tuning curve relationship of the center wavelength of the TAOF and the frequency of an acoustic beam at a reference condition

4,422,153

#### OBLIQUE PROJECTION ORIGINAL AND OBLIQUE PROJECTION ORIGINAL FORMING APPARATUS AND METHOD

Yoshio Arai; Hiroyuki Kataoka, and Nobuaki Endo, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1980, Ser. No. 187,033

Claims priority, application Japan, Sep. 14, 1979, 54-117362

Int. Cl.<sup>3</sup> G03B 21/00; G06F 15/20

U.S. Cl. 364-525

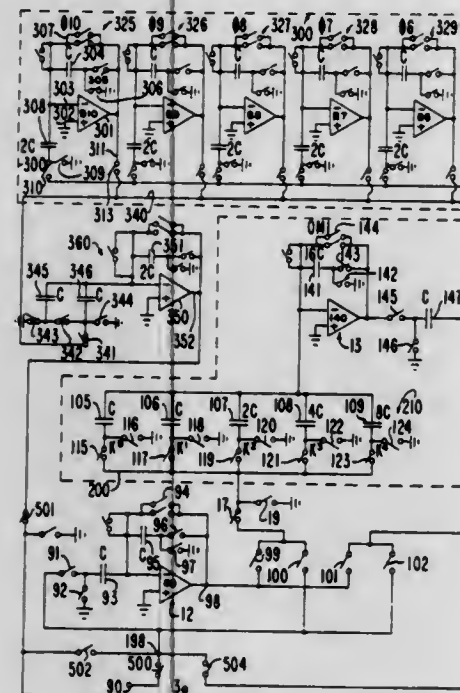
3 Claims

1. An oblique projection original formed by deforming an orthogonal projection original in such a manner that a rectangular original is transformed into a trapezoidal original by compressing said orthogonal projection original by thinning scanning lines in a horizontal direction by calculating line numbers for said orthogonal projection original which are selected as data lines for said oblique projection original, thinning predetermined bits in each scanning line in a vertical



and for modifying said values by the acoustic frequency ratio to correct for the temperature of the TAOF.

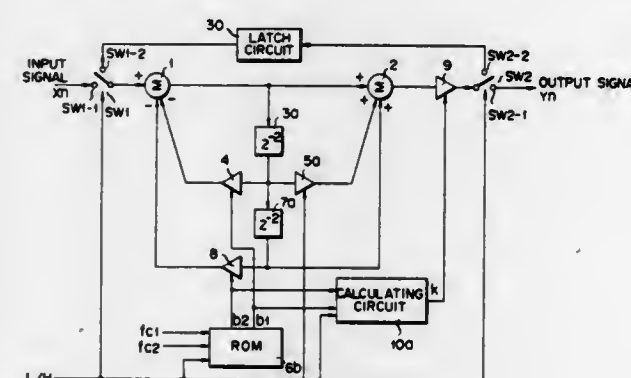
**4,422,155**  
**MULTIPLIER/ADDER CIRCUIT**  
 Gideon Amir, San Jose; Roubik Gregorian, Sunnyvale, and Ghanshyam Dujari, San Jose, all of Calif., assignors to American Microsystems, Inc., Santa Clara, Calif.  
 Filed Apr. 1, 1981, Ser. No. 249,775  
 Int. Cl.<sup>3</sup> G06J 1/00  
 U.S. Cl. 364—606 10 Claims



1. An analog multiplier circuit comprising:  
 an input terminal for the reception of an analog signal;  
 means for receiving a plurality of binary input signals;  
 a first plurality of sample and hold circuits connected in series for multiplying said analog signal by the number represented by said plurality of binary input signals;  
 a second plurality of gain controlling means, each uniquely associated with one of said plurality of sample and hold circuits for controlling the gain thereof;  
 switch means associated with each of said gain controlling means, each of said switch means controllable by a corresponding one of said binary input signals which is uniquely associated with said switch means;  
 whereby said binary input signals control the connection of

said gain controlling means and thus the gain of said analog multiplier circuit and the value of said output signal derived from said analog signal.

**4,422,156**  
**DIGITAL FILTER DEVICE**  
 Shigenori Sano, Higashi-Yamato, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan  
 Filed Apr. 21, 1981, Ser. No. 256,187  
 Claims priority, application Japan, Apr. 22, 1980, 55-53179; Apr. 22, 1980, 55-53181; Apr. 22, 1980, 55-53182  
 Int. Cl.<sup>3</sup> G06F 15/34  
 U.S. Cl. 364—724 10 Claims



1. A digital filter device comprising:  
 a digital filter means for filtering a digital input signal in accordance with a predetermined transfer function  $H(z)$ , said transfer function  $H(z)$  being

$$H(z) = \frac{K(1 \pm z^{-1})^2}{1 + b_1 z^{-1} + b_2 z^{-2}}$$

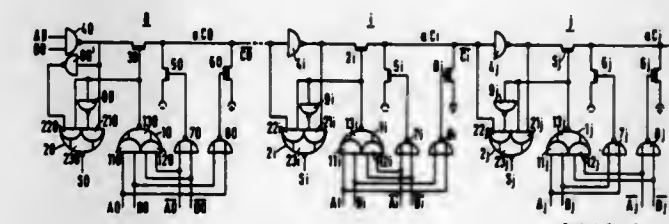
said digital filter means including means for carrying out a calculating operation;  
 a memory means coupled to said digital filter means for storing coefficients  $b_1$  and  $b_2$  and for selectively delivering said coefficients  $b_1$  and  $b_2$  to said digital filter means for using in a calculating operation in said digital filter means; and  
 a coefficient calculating means coupled to said memory means for calculating a coefficient  $K$  using coefficients  $b_1$  and  $b_2$  read out from said memory means, said coefficient calculating means performing an operation

$$K = (1 \pm b_1 + b_2)/4$$

to calculate the coefficient  $K$ , and said coefficient  $K$  being used for the calculating operation in said digital filter means;

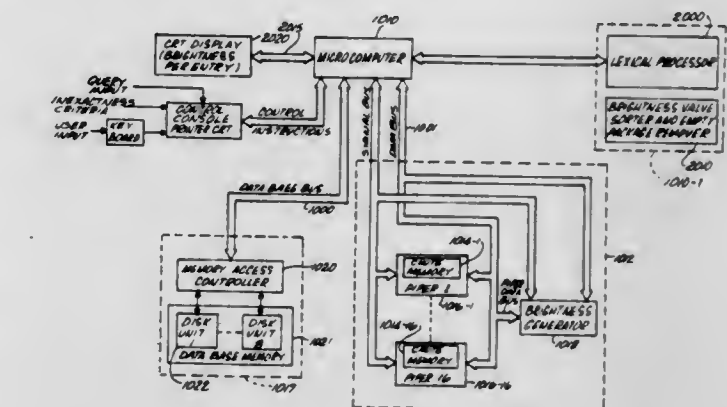
said coefficient calculating means including:  
 first and second registers to which are respectively supplied the coefficients  $b_1$  and  $b_2$  from said memory means;  
 a generating means for generating a data of numeral "1" (+V); and  
 an arithmetic means for receiving outputs from said first and second registers and data of numeral "1" generated from said generating means for performing the addition  $(1 \pm b_1 + b_2)$  and for shifting a decimal point of the addition result by 2 bits toward an upper digit for to obtain said coefficient  $K$ .

**4,422,157**  
**BINARY MOS SWITCHED-CARRY PARALLEL ADDER**  
 Arnold Uhlenhoff, Emmendingen, Fed. Rep. of Germany, assignor to IIT Industries Inc., New York, N.Y.  
 Filed Aug. 26, 1981, Ser. No. 296,398  
 Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035631  
 Int. Cl.<sup>3</sup> G06F 7/50  
 U.S. Cl. 364—786 6 Claims



1. A monolithic integrated n-stage parallel adder for two numbers each represented in an n-digit binary code, where n is an integer greater than one, each stage of said adder employing enhancement-mode insulated-gate field-effect transistors of the same conductivity type and having a carry signal switched therethrough by an electronic changeover switch, each of said n+stages comprising:  
 a first EXCLUSIVE-OR block including a first AND gate having two inputs each receiving a different one of an associated digit of said two numbers, a second AND gate having two inputs each receiving a different one of an inverse of said associated digit of said two numbers and a first NOR gate having two inputs each coupled to an output of a different one of said first and second AND gates;  
 a second EXCLUSIVE-OR block including third and fourth AND gates each having a first input coupled to the output of said first NOR gate and a second input coupled to a carry signal output of the next lower-order stage of said n+stages and a second NOR gate having two inputs each coupled to an output of a different one of said third and fourth AND gates to provide a sum signal for its associated one of said n+stages;  
 an ON/OFF transistor switch or said changeover switch having its controlled current path coupled between the output of an inverter coupled to said carry signal output of the next lower-order stage of said n+stages and a carry signal output of said associated one of said n+stages and a gate coupled to the output of said first NOR gate, said inverter in the lowest-order stage of said n+stages being replaced by a NAND block to combine said associated digits of said two numbers;  
 a first switching transistor having its controlled current path coupled between said carry signal output of said associated one of said n+stages and a first terminal of a power supply;  
 a second, depletion mode switching transistor having its controlled current path coupled between said carry signal output of said associated one of said n+stages and a second terminal of said power supply;  
 a first NOR block having two inputs each receiving a different one of said associated digits of said two numbers and an output coupled to a gate of one of said first and second switching transistors; and  
 a second NOR block having two inputs each receiving a different one of said inverse of said associated digit of said two numbers and an output coupled to a gate of the other of said first and second switching transistors.

**4,422,158**  
**METHOD AND MEANS FOR INTERROGATING A LAYERED DATA BASE**  
 Louis M. Galle, Culver City, Calif., assignor to System Development Corporation, Santa Monica, Calif.  
 Filed Nov. 28, 1980, Ser. No. 210,961  
 Int. Cl.<sup>3</sup> G06F 7/20, 15/40  
 U.S. Cl. 364—900 12 Claims



11. A method using a digital data processing system for locating in a stored data base, entries which have a variable degree of match, including either exact or inexact matches, with the entries of a query and for determining the degree of such match,  
 the data base comprising a plurality of layers ordered in a hierarchical order, each layer comprising a plurality of entries,  
 each of the entries of the query and of the data base having representations of one or more event types and of the order of occurrence of the event types in such entry, each of a plurality of the entries on one layer having a corresponding event type represented on a higher level layer in the hierarchical order,  
 the method comprising the steps of operatively controlling the digital data processing system for:  
 (a) processing representations of the event types and the order of occurrence thereof represented by each of the entries of the query with representations of the event types and the order of occurrence thereof in each of a plurality of the entries on a first data base layer in the hierarchy to thereby determine and form a corresponding package for each of a plurality of entries of the query, the packages having an assigned order,  
 each package comprising representations of one or more data base entries on the first data base layer and, corresponding to each such data base entry, a representation of a degree of match, the representation of a degree of match varying as a function of the degree of match of presence and order of occurrence of event types in a data base entry with like event types in a query entry; and  
 (b) processing representations of at least selected ones of the data base entries (also second level event types) represented in the packages and the assigned order of the packages in which such selected ones of the data base entries occur with representations of the event types and the order of occurrence thereof in each of a plurality of the entries on a second one of the data base layers which is at a higher level in the hierarchy than the level of the first data base layer to thereby determine and form representations of one or more of the data base entries on said second one of the data base layers and, to thereby determine and form for each of individual ones of such one or more of the data base entries on said second one of the data base layers, a representation of an additional degree of match as to presence and order of occurrence of event types resulting from the processing in this step (b),  
 the last recited step of processing including the step of pro-



cessing the representations of the degree of match associated with each of individual ones of the event types in a plurality of the packages in forming the representations of the additional degree of match as a function of the representations of the degree of match in the packages, each such representation of the additional degree of match thereby representing the degree of match as to the presence of and the order of the event types and the entries in the query as compared with the presence and the order of the event types in both said first and second data base layers.

4,422,159

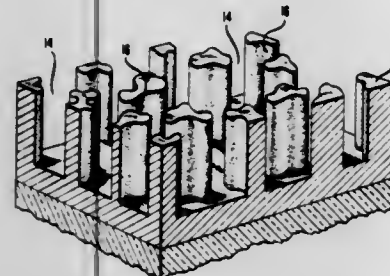
**OPTICAL INFORMATION STORAGE AND RETRIEVAL**  
Harold G. Craighead, Fair Haven, and Richard E. Howard, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 3, 1981, Ser. No. 299,172

Int. Cl.<sup>3</sup> G11C 13/04

U.S. Cl. 365—127

23 Claims



1. A process for storing information in a storage medium comprising the steps of treating said storage medium with a source of energy so that optical changes which define said information are produced in said storage medium characterized in that said storage medium comprises a material having a region that has a configuration including void volumes that delimit storage structures wherein the total area of all said storage structures in said region is between 10 and 90 percent of the area of a plane at the medium surface coextensive with said region wherein the characteristic distance of said configuration is equal to or smaller than the wavelength of the electromagnetic radiation ultimately used to read said information, and wherein an optical change is induced with said source of energy by altering the optical properties of said storage structures that are impacted by said energy in a region where information is to be stored.

4,422,160

**MEMORY DEVICE**

Hiroshi Watanabe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

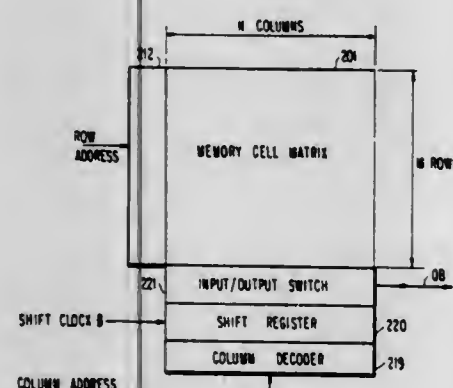
Filed Jan. 4, 1982, Ser. No. 336,986

Claims priority, application Japan, Jan. 8, 1981, 56-1684

Int. Cl.<sup>3</sup> G11C 13/00

U.S. Cl. 365—189

7 Claims



1. A memory device comprising a memory cell matrix in-

cluding a plurality of memory cells arrayed in rows and columns, a set of address terminals, means for receiving a row strobe signal, means for receiving a column address strobe signal, row address means for operatively incorporating row address signals through said address terminals in response to active state of said row strobe signal, row selection means for operatively enabling selected one of said rows based on the incorporated row address signals in response to the active state of said column address strobe signal that occurs at the first time after said row address strobe signal becomes active, second column control means for operatively generating a second signal in response to the respective active states of said column strobe signal under the active state of said row address strobe signal, column address means for operatively incorporating column address signals through said address terminals in response to said first signal, shift register means having a plurality of states whose outputs are adapted to select at least part of said columns of said memory cell matrix, and means for controlling shift operation of said shift register in response to said second signal.

4,422,161

**MEMORY ARRAY WITH REDUNDANT ELEMENTS**

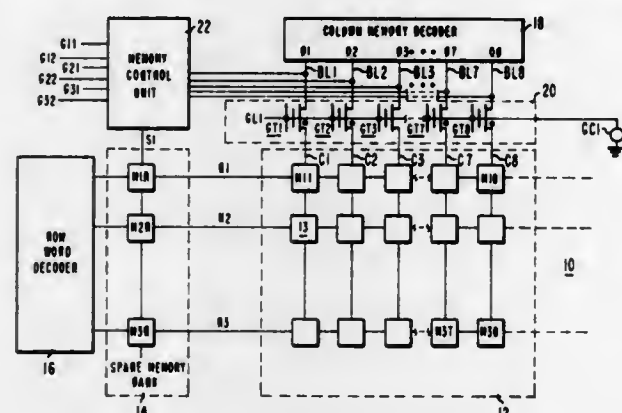
Henry Kressel, Elizabeth, and Sheng T. Hsu, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 8, 1981, Ser. No. 309,694

Int. Cl.<sup>3</sup> G11C 7/00

U.S. Cl. 365—200

8 Claims



2. A monolithic integrated circuit comprising:  
a standard memory array of cells arranged in rows and columns, with a row conductor per row of cells and a column conductor per column of cells;  
a row decoder and a column decoder;  
means coupling the row decoder to the row conductors;  
a plurality of programmable non-volatile electrically alterable elements, each one of said elements having a main conduction path and a control electrode;  
a first set of said non-volatile electrically alterable elements having their main conduction paths connected between the column decoder and the column conductors;  
a spare column of cells having the same number of rows as said standard array; and  
a second set of said non-volatile electrically alterable elements having their main conduction paths connected between said column decoder and said spare column.

4,422,162

**NON-DISSIPATIVE MEMORY SYSTEM**

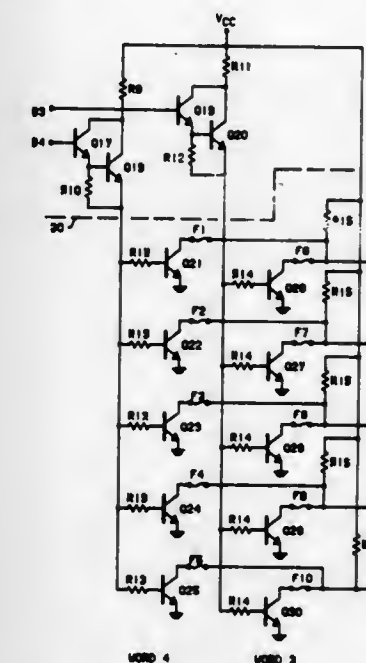
Walter L. Davis, Plantation, and Douglas R. Kraul, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1980, Ser. No. 192,678

Int. Cl.<sup>3</sup> G11C 11/40

U.S. Cl. 365—227

15 Claims



1. A memory system for a low powered device and comprising:  
multiple input terminals for selectively supplying memory addressing signals;  
decoder means coupled to and deriving all power from said memory addressing signals, providing ones of a predetermined number of separate word accessing signals in response to predetermined combinations of said input memory addressing signals;  
a plurality of output terminals; and  
an array of memory cells coupled to the decoder means and each cell providing predetermined signals at each of the output terminals in response to a respective one of the word accessing signals.

4,422,163

**POWER DOWN CIRCUIT FOR DATA PROTECTION IN A MICROPROCESSOR-BASED SYSTEM**

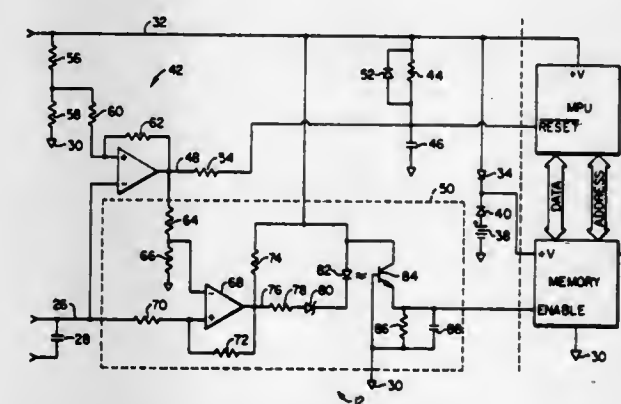
Ralph J. Oldenkamp, Foster City, Calif., assignor to Venc-A-Copy, Inc., Dallas, Tex.

Filed Sep. 3, 1981, Ser. No. 299,255

Int. Cl.<sup>3</sup> G11C 7/00

U.S. Cl. 365—229

4 Claims



1. In a microprocessor-based system having a digital memory device which is subject to erasure of contents upon loss of electrical power thereto and having a microprocessor unit, said digital memory device having an enable control for enabling and disabling operation of said digital memory device, and said

microprocessor unit having a reset control for reinitializing operation of said microprocessor unit, an apparatus for preventing loss of digital information stored in said digital memory device during periods of inadequate power from a main power supply, said apparatus comprising:

DC battery means switchably coupled to a power supply terminal of said digital memory device;  
means coupled to sense power level applied to said digital memory device at said power supply terminal and to sense power level applied to said microprocessor unit at a power supply terminal of said microprocessor unit for detecting a drop in power to said digital memory device and to said microprocessor unit, wherein said detecting means comprises a first comparator having as one input a reference voltage having a decay time constant greater than the decay time constant of said main power supply, said first comparator having as its other input voltage sense at the power supply terminal of said microprocessor unit, wherein the output of said first comparator is coupled to drive said switching means and with said microprocessor unit disabling means;  
means responsive to said detecting means for disabling said digital memory device immediately upon a detected drop in power to said digital memory device thereby to prevent erasure of information in said digital memory device, wherein said microprocessor unit disabling means comprises a resistor coupled between the output of said first comparator and a RESET terminal of said microprocessor unit and a capacitor coupled between said RESET terminal and ground to form an R-C network;  
means responsive to a sensed drop in power to said power terminal of said digital memory device and operative to switch said battery means to said power terminal of said digital memory device for preventing loss of information in said digital memory device, wherein said power loss preventing means comprises a first diode and a second diode, said first diode being disposed to conduct current between said battery and said power supply terminal of said digital memory device and said second diode being coupled to conduct power from said main power supply to said power supply terminal of said digital memory device, wherein said switching means comprises a second comparator having as one input said reference voltage and as its other input the output of said first comparator, and an isolation network coupled to receive an output of said second comparator, said isolation network having an output which is controllably switchable between a normally high voltage level and ground potential, said isolation network output being coupled to a control input of said digital memory device to enable operation, wherein said isolation network is coupled to said high voltage level at the power supply terminal of said microprocessor unit, and wherein said R-C network further includes a diode across said resistor which is normally forward biased only when voltage at said microprocessor unit power supply terminal is less than the voltage across said capacitor for assuring discharge of said capacitor; and  
means for disabling said microprocessor unit.

4,422,164

**ON-BOTTOM SEISMOMETER ELECTRONIC SYSTEM**

Edgar A. Bowden, Arlington; Gordon R. Deline, Carrollton, and Gerard D. Koetjman, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,757

Int. Cl.<sup>3</sup> G01V 1/24, 1/38

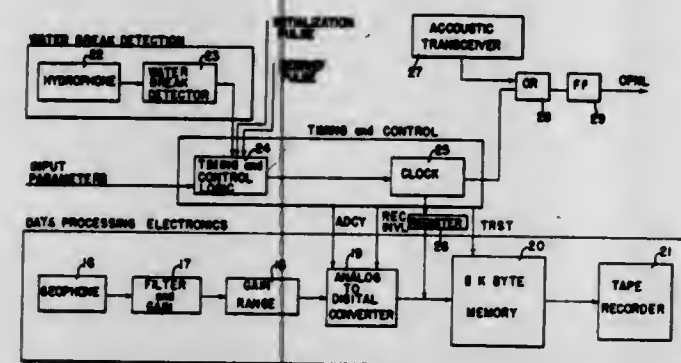
U.S. Cl. 367—15

14 Claims

1. An ocean bottom seismometer unit for recording waves traveling from a source of seismic pulses comprising:  
a hydrophone producing signals representing water break waves arriving at said hydrophone through the water from said source;  
a water break detector responsive to said hydrophone sig-



nals producing a water break signal representing the arrival of said water break waves at said hydrophone; means for digitizing the time of occurrence of said water break waves at said hydrophone; means for digitizing the time of occurrence of said water break signal; a digital memory; means for storing a plurality of said digitized water break signal times in said digital memory before recording them on said magnetic tape recorder unit whereby an array of



digitized water break signal times are stored in said memory after each seismic pulse; a magnetic tape recorder unit and; timing and control means for starting said magnetic tape recorder unit and transferring said digitized water break signal times from said digital memory to said recorder unit for recording after the occurrence of a seismic pulse and stopping said magnetic tape recorder unit after the recording of said digitized water break signal times and before the occurrence of the next seismic pulse.

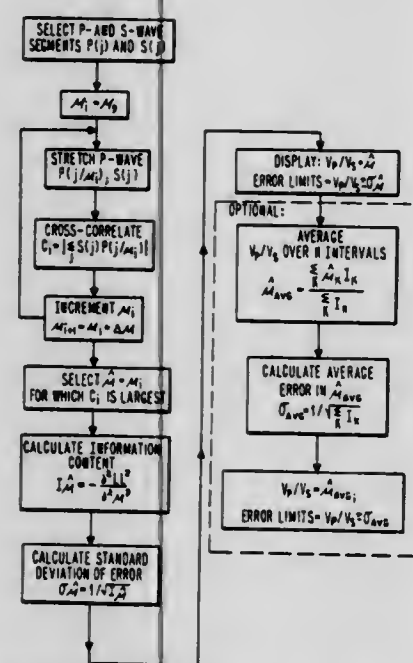
#### 4,422,165 MAXIMUM LIKELIHOOD ESTIMATION OF THE RATIO OF THE VELOCITIES OF COMPRESSIONAL AND SHEAR WAVES

Stephen W. Thomas, DeSoto, Tex., and Robert M. Otis, Littleton, Colo., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 11, 1981, Ser. No. 233,541  
Int. Cl.<sup>3</sup> G01V 1/36

U.S. Cl. 367-40

10 Claims



1. A method of seismic exploration by determining the ratio of the velocities of compressional and shear waves in subterranean formations comprising the steps of: recording the output of one or more detectors of seismic energy with respect to both compressional and shear

waves emitted from a single source and reflected from similar points defining an interval of interest in the earth's subterranean structure as a function of time; stretching the record of the compressional wave with respect to time by a predetermined stretch ratio; measuring the correlation of wave shape between the stretched record of the compressional wave and the record of the shear wave; recording the accuracy of the correlation; modifying the stretch ratio; re-performing said steps of stretching, correlating and recording; repeating said steps of changing the stretch ratio, stretching, correlating and recording; and selecting that stretch ratio which maximizes the correlation between the stretched compressional wave and the unstretched shear wave as the ratio of the velocities of compressional waves and shear waves in said interval of interest.

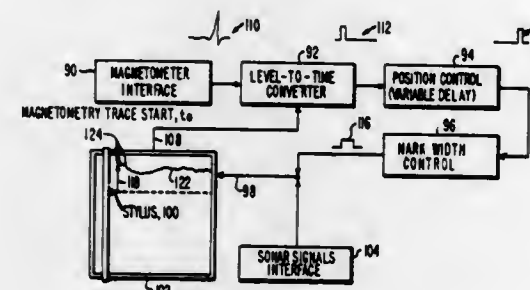
#### 4,422,166 UNDERSEA SONAR SCANNER CORRELATED WITH AUXILIARY SENSOR TRACE

Martin Klein, Salem, N.H., assignor to Klein Associates, Inc., Salem, N.H.

Filed Aug. 17, 1981, Ser. No. 293,656  
Int. Cl.<sup>3</sup> G01S 15/89

U.S. Cl. 367-115

15 Claims



1. A method for identification of undersea metallic objects comprising the steps of: providing an intensity modulated pictorial sonar echo record of sea bottom features with a scanning marker in response to a sonar signal from a sonar transducer; positionally associating a metal detector with said transducer; receiving an output signal from said metal detector associated with said transducer; converting the magnitude of the metal detector output signal to a pulse occurring at a time referenced to the start of scan of said marker; and activating said scanning marker with said pulse to provide a segregated record of the metal detector output adjacent to and positionally independent from the sonar echo intensity record on a single scanning marker.

#### 4,422,167 WIDE-AREA ACOUSTO-OPTIC HYDROPHONE

Peter Shajenko, Storrs, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

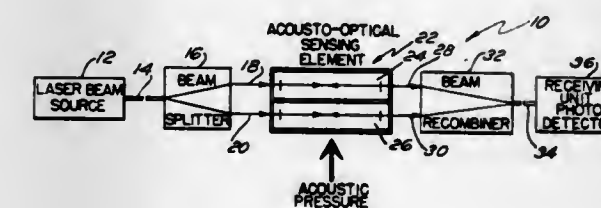
Filed Jun. 25, 1981, Ser. No. 277,297  
Int. Cl.<sup>3</sup> H04R 23/00

U.S. Cl. 367-149

4 Claims

1. An acousto-optic hydrophone system for sensing impinging acoustic pressure waves, said hydrophone system comprising: laser beam generating means for providing a source laser beam; beam splitting means for receiving said source beam and producing a signal beam and a reference beam therefrom;

hydrophone means, having an optically transparent bulk material sensing medium filling all voids over a wide area therein, for receiving said signal beam and said reference beam from said beam splitting means and directly distributing said signal beam and said reference beam in separate, fixed equal path length wide area patterns throughout said bulk material in such a way as to modulate said signal beam in proportion to dynamic pressure variations of said impinging acoustic waves while said reference beam is not so modulated, said modulation resulting solely from changes in the index of refraction of said bulk material proportional to said dynamic pressure variations, said hydrophone means further comprising a dual chambered box, the interior of which is separable into a first chamber and a second chamber, said first chamber having one side thereof open, a rigid dividing wall mounted within said dual chambered box essentially parallel to said open side for separating the internal volume of said box into said first chamber and said second chamber, a plurality of optical reflector pairs, one each reflector of said reflector pair being rigidly mounted to opposite sides of said dividing wall at each preselected location, said plurality of pairs being arranged in such equal path length patterns as to fold said signal beam and said reference beam over a relatively wide area of each of said first and second chambers using multi-reflection off said optical reflectors, a microhole through said dividing wall, said microhole

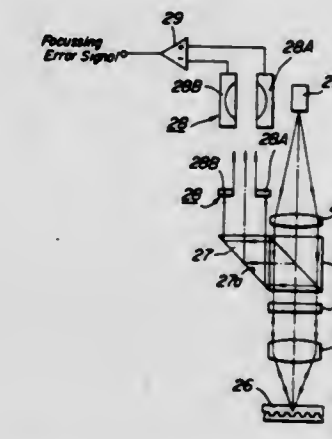


connecting said first chamber and said second chamber together, a plurality of optically transparent input windows mounted in an external wall common to said first chamber and said second chamber through which said signal beam and said unmodulated reference beam may pass, a plurality of optically transparent output windows mounted in said common external wall out through which said modulated signal beam and said unmodulated reference beam may pass, optically transparent bulk material of suitable compressibility through which said signal beam and said reference beam is made to directly pass, said bulk material filling remaining voids in said first chamber, said second chamber and said microhole, a flexible membrane, covering and fixedly attached to said open side of said first chamber, for transmitting said impinging acoustic pressure waves into said bulk material within said first chamber thereby varying the index of refraction thereof while said microhole filters said impinging acoustic pressure waves out of said second chamber; beam recombining means for receiving said modulated signal beam and said unmodulated reference beam from said hydrophone means and focusing said modulated signal beam and said unmodulated reference beam in such a way as to form a single recombined modulated beam; and laser beam receiving means for receiving and converting said single recombined modulated beam into an electrical signal proportional to said impinging acoustic pressure waves.

#### 4,422,168 METHOD AND APPARATUS FOR DETECTING A FOCUSING CONDITION OF AN OBJECTIVE LENS

Kenichi Ito, Tohru Musha, and Kitchi Kato, all of Hachioji, Japan, assignors to Olympus Optical Co. Ltd., Japan  
Filed Aug. 14, 1981, Ser. No. 292,929  
Claims priority, application Japan, Aug. 19, 1980, 55-114464  
Int. Cl.<sup>3</sup> G01J 1/36; G11B 7/00  
U.S. Cl. 369-45

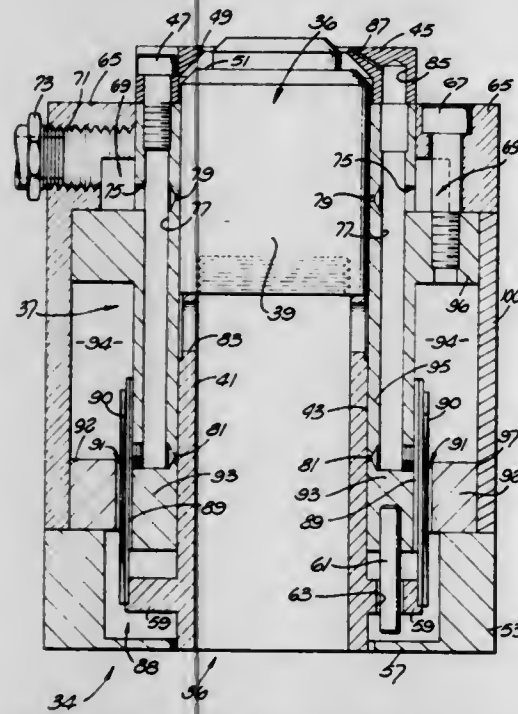
58 Claims





a manifold cover secured to said housing and cooperating therewith to define a manifold chamber in open flow communication with each of said flow risers, and including a port for connection to a supply of air under pressure for flow of the air through said port and into said manifold chamber, and further through said flow risers and said orifices to said sliding interface, a portion of the air exhausting through said exhaust vents;

a second plate of a magnetizable material disposed about one end of said cylindrical portion in radially spaced relation therewith, and in axially spaced relation with said first plate;



magnet means in magnetically coupled relation between said first and second plates for magnetizing said first plate and said cylindrical portion to have one polarity and said second plate to have an opposite polarity whereby said second plate and said cylindrical portion define an annular air gap about said cylindrical portion;

a flange projecting radially outwardly from said lens holder adjacent said one end of said cylindrical portion; and

a current conducting coil assembly mounted on said flange for movement within said lens holder and including a current conducting coil within said air gap, said coil being for responding to variations in current passing, there-through to apply a force to said lens unit and thereby adjust the position of said lens unit within said housing.

4,422,170

## TURNABLE APPARATUS

Mitsuru Seno, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

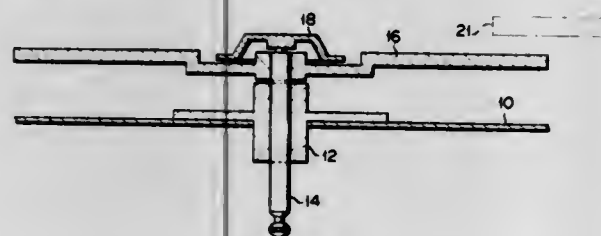
Filed Feb. 18, 1982, Ser. No. 349,822

Claims priority, application Japan, Feb. 19, 1981, 56-21449[U]

Int. Cl.<sup>3</sup> G11B 25/04

U.S. Cl. 369-270

9 Claims



1. A turntable apparatus which bears and rotates a disc inserted into a reproducing apparatus for signals recorded on the disc through a disc inlet opening formed in the reproducing apparatus, comprising:

a chassis;

a turntable having a disc mounting surface, a recess in the central portion of said mounting surface and an under surface, said turntable being rotatably supported on said chassis to move vertically between a first position where said disc mounting surface is located below said disc inlet opening and a second position where said disc mounting surface is located above said disc inlet opening to bear the disc thereon;

a center spindle having a surface for regulating a disc mounting position, supported coaxially with an axis of rotation of said turntable, and received in said recess to move vertically between a third position where said surface for regulating the disc mounting position is located below said disc mounting surface and a fourth position where said surface for regulating the disc mounting position is located above said disc mounting surface to regulate the disc mounting position; and

a moving mechanism for moving said center spindle from said third position to said fourth position as said turntable moves from said first position to said second position, and moving said center spindle from said fourth position to said third position as said turntable moves from said second position to said first position, said moving mechanism including at least one pin with its upper end attached to the center spindle and its lower end penetrating the bottom of the recess of the turntable to be led out downward, and at least one regulating member rockably mounted on the chassis and having a first portion capable of engaging the under surface of the turntable, the first portion and the pivotal point of the regulating member being spaced at a prescribed distance, and a second portion capable of engaging the pin, the second portion and the pivotal point being spaced at a distance greater than the prescribed distance.

4,422,171

## METHOD AND SYSTEM FOR DATA COMMUNICATION

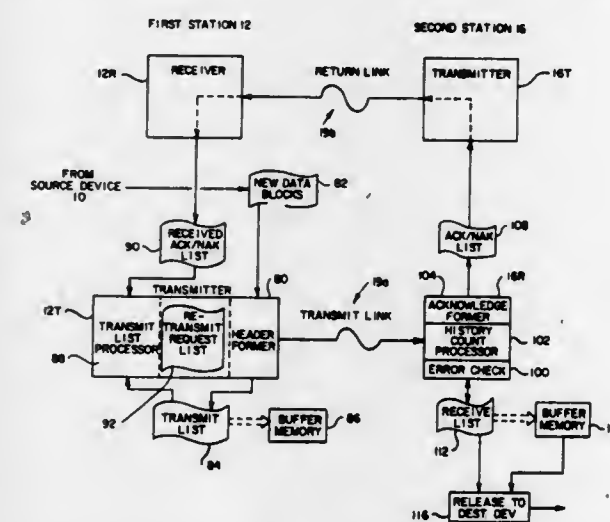
David L. Wortley, and Kenneth N. Larson, both of Thousand Oaks, Calif., assignors to Allied Corporation, Law Department, Morristown, N.J.

Filed Dec. 29, 1980, Ser. No. 221,058

Int. Cl.<sup>3</sup> G08C 25/02

U.S. Cl. 371-32

14 Claims



1. A system for transferring user data from a first station source to a second station destination via a communication path, said system comprising:

a transmitter connected to said first station source for transmitting data frames, each data frame comprising a bit stream defining an identification number, said identification number identifying the data frame and said bit stream including an information field for accommodating a block of user data originally supplied by said first station source device,

said first station transmitter including a transmit list means for storing a list of identification numbers, related to specific ones of said previously transmitted data frames,

said first station including buffer means for storing the said data blocks contained in the data frames previously transmitted and identified by said identification numbers stored in said transmit list means,

a receiver means located at said second station and coupled into said path for receiving data from said first station transmitter, said receiver means at said second station including means for receiving said data frames transmitted by said first station transmitter and for analyzing said received data frames to determine whether the received data frames need to be retransmitted,

said second station including transmitter means for transmitting data frames each comprising a bit stream, said second station transmitter bit stream containing acknowledgement data, said acknowledgement data including an identification number identifying the particular one of said data frames received from said first station transmitter and said second station transmitter means inserting in its said acknowledgement data, an acknowledgement code indicating whether or not the respective data frame should be repeated or not, and

said first station including a receiver means coupled to said path, said first station receiver means receiving said second station transmitted frames each comprising said bit stream,

said first station including processor means connected to said first station receiver means and responsive to the acknowledgement data in said bit stream from said second station transmitting means and to said identification numbers in said transmit list for selectively retransmitting said data blocks identified thereby.

4,422,173  
ELECTRODE COLUMN SNUBBER FOR ELECTRIC ARC FURNACE ELECTRODES

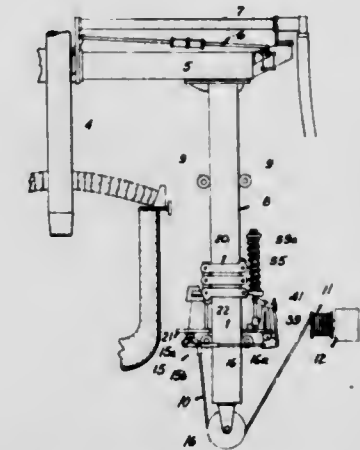
Milton F. Dahlke, Pasadena, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Mar. 15, 1982, Ser. No. 358,525

Int. Cl.<sup>3</sup> F27D 11/10; H05B 7/10

U.S. Cl. 373-94

21 Claims



4,422,172  
ELECTRODE SUPPORT MECHANISM AND METHOD

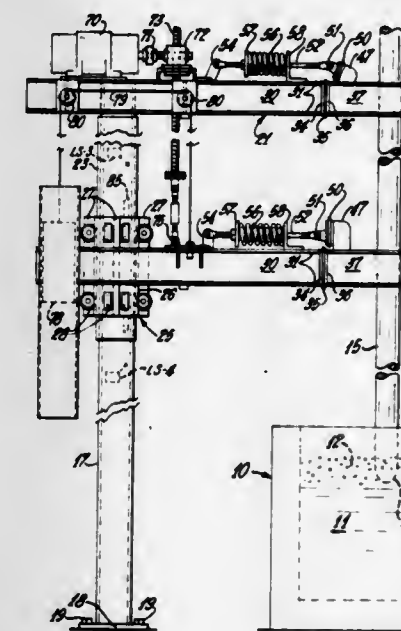
Charles S. Dunn, Pataskala, and Stephen Seng, Bladensburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 26, 1982, Ser. No. 342,870

Int. Cl.<sup>3</sup> H05B 7/10

U.S. Cl. 373-94

15 Claims



1. An electrode support for an arc-type furnace, comprising a vertical support post, a first support arm fixed to the post and cantilevered therefrom with its free end carrying electrode-engaging clamp means, a second support arm, means supporting said second arm on said post for vertical displacement relative thereto, said second arm being cantilevered from said support means with its free end carrying electrode-engaging clamp means vertically aligned with the clamp means of the

1. In an electric arc furnace construction of the type comprising a furnace vessel having a top opening, an electrode extending vertically through the opening into the vessel, a horizontally extending crosshead supporting at one end the upper end of the electrode, a vertically extending column connected to and supporting the opposite end of the crosshead at its upper end, said column being movable vertically to adjust the electrode height within the furnace vessel, and powered moving means for raising and lowering the column, the improvement in combination therewith comprising electrode column snubber means for catching the electrode column and structure attached thereto to prevent uncontrolled descent thereof in the event of failure of the moving means including:

first and second clamp plates disposed on opposite sides of the column, respectively, each of said plates including means on its inner face for frictionally engaging the adjacent outer surface of the column when pressed there-against, said plates being movable between a first position out of contact with the outer surface of the column to permit vertical movement of the column, and a second position wherein said plates are forced against the outer surface of the column to prevent downward movement of the column; and

means for shifting said plates to said second position in the event of failure of said powered moving means which would otherwise allow the column to fall in an uncontrolled manner.



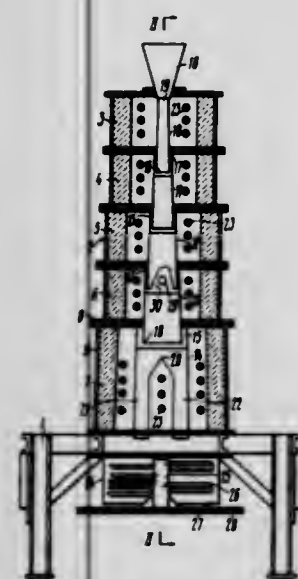
# 4,422,174 SHAFT FURNACE FOR HEAT TREATMENT OF MATERIALS

Dzhantore N. Abishev; Vitaly P. Malyshev; Ivan K. Bauer, all of Karaganda; Vladimir A. Yarygin, Balkhash; Mikhail E. Maisakov, Balkhash; Garifulla K. Gainutdinov, Balkhash; Alexandr M. Nazarov, Balkhash; Temirkhan A. Kusainov, Karaganda; Isaak A. Burovoi, Moscow, and Bulat N. Omarov, Karaganda, all of U.S.S.R., assignors to Khimiko-metallurgicheskoy Institut AN Kazakhskoi SSR, Karaganda, U.S.S.R.  
PCT No. PCT/SU79/00044, § 371 Date May 28, 1981, § 102(e) Date May 22, 1981, PCT Pub. No. WO81/00906, PCT Pub. Date Apr. 2, 1981

PCT Filed Sep. 28, 1979, Ser. No. 269,018  
Int. Cl.<sup>3</sup> H05B 3/00

U.S. Cl. 373-115

4 Claims



1. A shaft furnace for heat treatment of material comprising: a housing having a plurality of heating sections arranged in series over the vertical extent of the furnace, an upper section of said heating sections being arranged in the upper part of the furnace; a downwardly flaring furnace shaft arranged within said housing; tubular members arranged one in each of said sections along the longitudinal axis of said furnace, said tubular members having walls inclined at an angle of 3° to 4° to the longitudinal axis of said furnace, said tubular members forming interior spaces therebetween and having upper and lower portions, said tubular members having passages in said upper and lower sections, the flow areas of said passages of the lower portions of said tubular members of each of said sections being 20 to 25 percent smaller than the flow areas of said passages of the upper parts of the tubular members of the adjacent underlying sections, said lower portion of the tubular member in each of said sections being partially inserted into said upper portion of the tubular member of the adjacent underlying section, said lower and upper portions of the tubular members of said adjacent sections forming a gap, the size of said passage in the upper portion of the tubular member of said upper section ranging from 40×50 mm to 200×200 mm, the volume of said interior space of the tubular member of said upper section being 0.2 to 0.7 times that of the interior space of the tubular member of said adjacent underlying section; pockets provided in said upper portions of each of said tubular members; and outlet pipes for discharging gaseous and vaporous fumes, said outlet pipes being connected with said pockets.

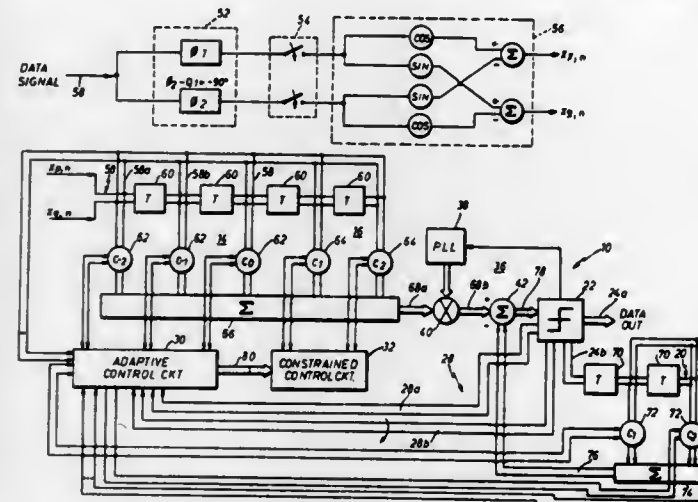
# 4,422,175 CONSTRAINED ADAPTIVE EQUALIZER

John A. C. Bingham, Palo Alto, and Jack H. Kurzwil, San Jose, both of Calif., assignors to Racal-Vadic, Inc., Sunnyvale, Calif.

Filed Jun. 11, 1981, Ser. No. 272,776  
Int. Cl.<sup>3</sup> H04B 3/04

U.S. Cl. 375-14

33 Claims



21. A constrained adaptive equalizer for quadrature amplitude modulation carrier type digital communication systems comprising:

- a constrained transversal adaptive equalizer having a means for correcting leading echoes by approximating phase equalization of a received digital signal thereby generating a phase equalized signal;
- a decision feedback equalizer having trailing multiplying coefficients for simulating trailing echoes in said phase equalized signal;
- means for generating an equalized signal representing the difference between the phase equalized signal and said simulated trailing echoes; and
- decision means adapted to receive said equalized signal for determining the value of said received digital signal and generating an output data signal indicative of that value.

# 4,422,176 PHASE SENSITIVE DETECTOR

Christopher P. Summers, London, England, assignor to U.S. Philips Corporation, New York, N.Y.

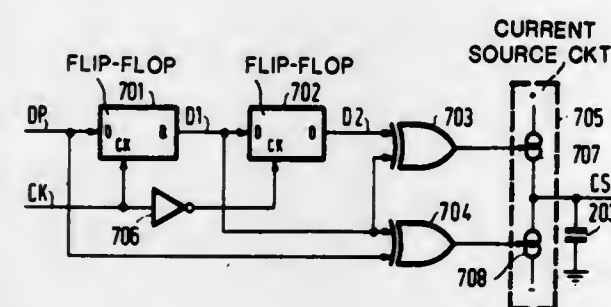
Filed Nov. 27, 1981, Ser. No. 325,480

Claims priority, application United Kingdom, Dec. 12, 1980, 8039873; Dec. 12, 1980, 8039874

Int. Cl.<sup>3</sup> H03L 7/06

U.S. Cl. 375-120

7 Claims



1. A phase sensitive detector for producing a control signal, which is indicative of phase discrepancy between data pulses of the NRZ type and clock pulses whose cycle period is equal to a data bit period and which can be used to correct the phase of the clock pulses to achieve a required phase relationship between the data pulses and the clock pulses, which phase sensitive detector comprises a first D-type flip-flop having a D input, a clock input and a logic output; characterized in that

said D input of said first D-type flip-flop is connected to receive said data pulses and said clock input is connected receive said clock pulses, and said phase sensitive detector further comprises a second D-type flip-flop having a D input connected to the logic output of said first D-type flip-flop, a clock input connected to receive said clock pulses via an inverter and a logic output, the logic outputs of said first and second D-type flip-flops being connected, respectively, to respective first inputs of first and second exclusive OR-gates, the outputs of which are connected to means for producing said control signal in accordance with logic values at these gate outputs.

# 4,422,177 CT SLICE PROXIMITY ROTARY TABLE AND ELEVATOR FOR EXAMINING LARGE OBJECTS

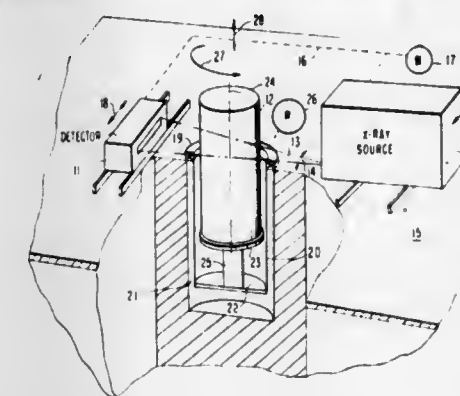
Richard Mastronardi, Medford; Alan DeCew, Newtonville, and David McMahon, Malden, all of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Jun. 16, 1982, Ser. No. 388,879

Int. Cl.<sup>3</sup> A61B 6/04; G01N 23/04, 23/18

U.S. Cl. 378-17

14 Claims



1. A Computerized Tomography system for inspecting large objects, comprising a rotary bearing having an inner diameter sufficiently large to encircle the object to be inspected, an elongated cup-like support structure attached to said bearing for rotation therewith, said support structure extending away from one face of said bearing in coaxial relation to said bearing, said support structure being adapted to receive and support an object to be examined with said object protruding outwardly of said support structure through said bearing and past the other face of said bearing, drive means coupled to said bearing for rotating said bearing, said support structure, and the object to be examined about the central axis of said bearing and support structure, a radiant energy source positioned to beam radiant energy toward the object to be examined in a direction transverse to the axis of rotation of said bearing, said beam passing through a diametral plane in said object closely adjacent to said bearing, detector means positioned adjacent said object for detecting the radiant energy opacity of said object at said diametral plane thereof, and translation means for selectively displacing said object along the axis of said support structure and through said bearing, to change the diametral plane of the object being examined without changing the position of the diametral plane under examination relative to said bearing.

# 4,422,178 RADIO COMMUNICATION RECEIVER HAVING AN OSCILLATOR CIRCUIT OF LOWER POWER-CONSUMPTION

Toshihiro Mori, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 336,988

Claims priority, application Japan, Jan. 20, 1981, 56-6292[U]

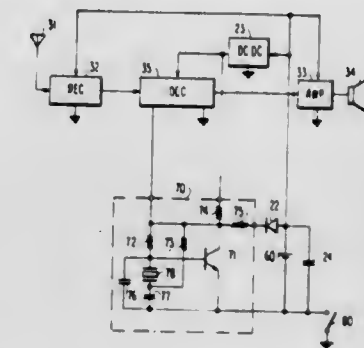
Int. Cl.<sup>3</sup> H04B 1/16

U.S. Cl. 455-343

7 Claims

1. A radio communication receiver comprising receiver means for demodulating received signals; decoding means for

decoding the demodulated signals; oscillator means connected to said decoder means for generating a reference timing signal; first power source means having first voltage; second power source means having second voltage which is higher than said first voltage; power switch means connected to said first and



- second power source means; and means connected between said first and second power source means for supplying said first voltage to said oscillator means in response to the turning-off of said power switch means and supplying said second voltage to said oscillator means in response to the turning-on of said power switch means.

# 4,422,179 ELECTRICAL-OPTICAL INTERFACE NETWORK

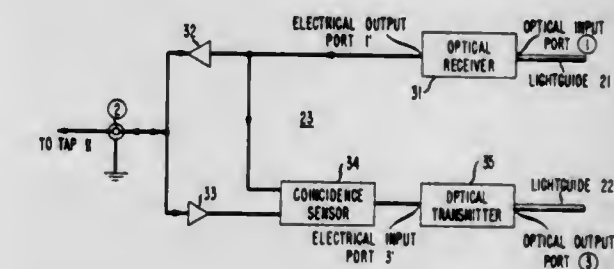
Andres Albanese, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 15, 1981, Ser. No. 283,434

Int. Cl.<sup>3</sup> H04B 9/00

U.S. Cl. 455-601

6 Claims



1. A network (23) for interfacing between an optical circuit (20) and an electrical circuit (5,7,9) comprising: receiving means (31) for converting optical signals into electrical signals disposed between a first lightguide (21) in said optical circuit (20) and said electrical circuit (5,7,9); transmitting means (35) for converting electrical signals into optical signals disposed between said electrical circuit (5,7,9) and a second lightguide (22); and means (32,33,34), including a coincidence sensor, for preventing the transmission of signals between said two lightguides (21,22).

# 4,422,180 CONTROL SIGNAL TRANSMITTING APPARATUS, PARTICULARLY FOR AIRCRAFT

Hans J. Wendt, Buxtehude, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,277

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032918; Mar. 25, 1981, 3111722

Int. Cl.<sup>3</sup> H04B 9/00

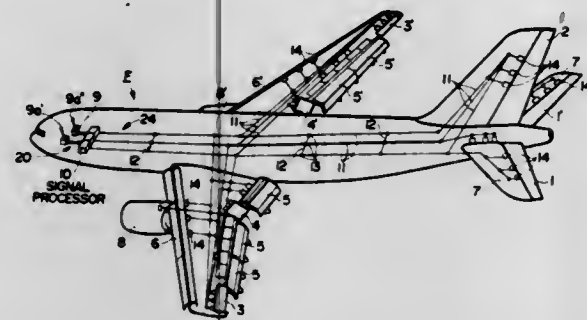
U.S. Cl. 455-603

21 Claims

1. In a system for transmitting control signals from a control source providing controlling signals to controlled units through signal light conductor network means operatively



interconnecting said control source and said controlled units, wherein a number of light conductors form redundant connection paths between said control source and said controlled units, the improvement comprising a first plurality of longitudinal light conductors and a further plurality of cross light conductors repeatedly intermeshing said longitudinal light conductors for forming said light conductor network means with a multitude of passive closed circuit paths intermeshed



with one another so that controlling signals can pass from said control source to a controlled unit even if some of these circuit paths should fail, said control source comprising means for producing said controlling signals in the form of digital light signals, signal processor means (10) including signal mixing means (15) and information processing means (16, 17, 18) operatively connected to said light conductor network means for addressing and actuating said controlled units.

4,422,181

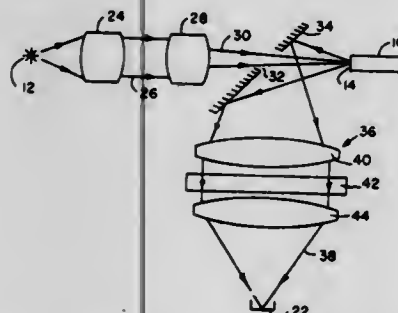
**BI-DIRECTIONAL FIBRE-OPTIC COUPLER**

David A. Grafton, Santa Monica; Eric B. Hochberg, Pasadena, and Ronald E. Purkis, Upland, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1980, Ser. No. 181,495

Int. Cl.<sup>3</sup> H04B 9/00

U.S. Cl. 455—606



1. A bi-directional coupler comprising an emitter source for emitting energy, collection and focusing optic means mounted for collecting energy from the emitter source and transmitting the energy in a narrow beam, a mirror having a reflective surface and a pinhole aperture therethrough and being mounted for passing said narrow beam through said pinhole aperture and to a flat and polished end surface of a fibre optic mounted normal to said narrow beam for receiving said narrow beam, said mirror surface being inclined relative to the end surface of said fibre optic for reflecting a second source of energy emanating from the end surface of said fibre optic, and detector and filter optic means mounted for receiving reflected

sound source energy from the reflective surface of the mirror and filtering out undesirable energy and focusing the remainder of the energy onto a detector mounted for reception thereof, said collection and focusing optic means including collection optics that collect as much flux from said emitter source as possible and transmits this flux as a collimated light means to focusing optics of said collection and focusing optic means, said focusing optics producing said narrow beam as a narrow, near collimated beam that is transmitted to said end surface of said fibre, and said flat and polished end surface being positioned about one inch from said pinhole aperture, whereby a portion of said narrow, near collimated beam is reflected back upon itself toward said emitter source, through said pinhole aperture and out of the field of view of said detector.

4,422,182

**DIGITAL MICROPHONE**

Hideyuki Kenjyo, Koganei, Japan, assignor to Olympus Optical Co. Ltd., Japan

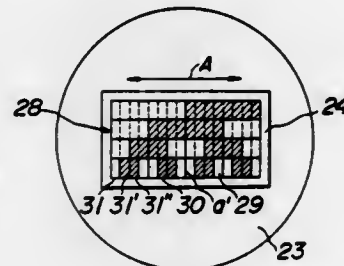
Filed Mar. 4, 1982, Ser. No. 354,702

Claims priority, application Japan, Mar. 12, 1981, 56-33380[U]

Int. Cl.<sup>3</sup> H04B 9/00; H04R 7/00, 23/00

U.S. Cl. 455—614

18 Claims



3 Claims

1. A digital microphone for converting an incident acoustic energy into an electric signal comprising:  
a housing having an opening portion;  
means fixedly provided in the housing for emitting a radiation beam;  
a vibrating means provided at the opening portion of the housing in a vibratory manner for converting the acoustic energy into a mechanical displacement;  
means mechanically coupled with the vibrating means for reflecting the radiation beam;  
means fixedly provided in the housing for transducing the radiation beam reflected by the reflecting means into the electric signal; and  
means having a code pattern and provided between the reflecting means and the transducing means for modulating the radiation beam in accordance with a variation of relative position of the code pattern and the radiation beam due to a displacement of the reflecting means wherein the reflecting means is constructed integrally with the vibrating means, and the modulating means is mounted on the reflecting means; whereby the electric signal which constitutes a digital signal designating the displacement of the vibrating means is directly obtained from the transducing means.

**DESIGNS**

DECEMBER 20, 1983

271,819

**BABY SHOE**

Jane E. Rhomberg, 1801 Baywood La., Davis, Calif. 95616

Filed Feb. 19, 1981, Ser. No. 235,978

Term of patent 14 years

Int. Cl. D2—04

U.S. Cl. D2—278



271,821

**SEWING AID**

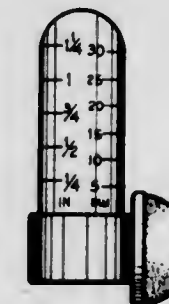
Shirley J. P. Kelson, 9238 35th Ave., S.W., Seattle, Wash. 98126

Filed Jun. 15, 1981, Ser. No. 273,980

Term of patent 14 years

Int. Cl. D2—07

U.S. Cl. D3—18



271,820

**BELT ATTACHED CONTAINER HOLDER**

Donald K. Allen, Paw Paw, Ill., assignor to Mark Anderson, Elmwood, Wis.

Filed Jan. 11, 1982, Ser. No. 338,343

Term of patent 14 years

Int. Cl. D02—07

U.S. Cl. D2—400



271,822

**CAMERA CASE**

Bruce N. Clancy, 520 Avenue B, #10, Redondo Beach, Calif. 90277

Filed Jul. 6, 1981, Ser. No. 280,698

Term of patent 14 years

Int. Cl. D3—02

U.S. Cl. D3—33





271,823

**DUFFEL SATCHEL**

Raymond Waites, New York, N.Y., assignor to Gear, Inc., New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,395

Term of patent 14 years

Int. Cl. D3-01

U.S. Cl. D3-71

271,825  
**CHAIR**

Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904

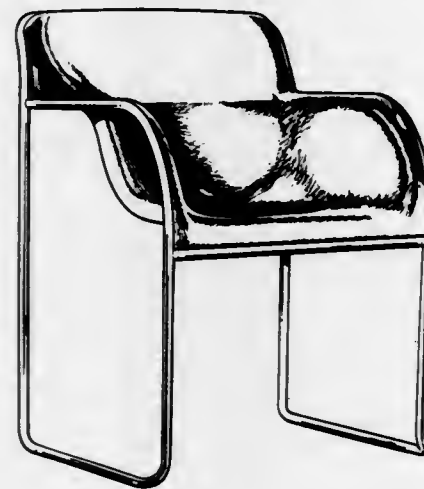
Continuation-in-part of Ser. No. 61,485, Jul. 27, 1979. This application Aug. 30, 1982, Ser. No. 412,847

The portion of the term of this patent subsequent to Jan. 11, 1983, has been disclaimed.

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-69



271,824

**HELIODON-TYPE DEVICE**

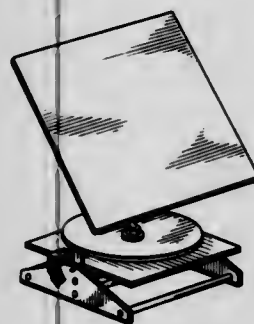
Jon Massaro, 2152 Stoneyale Ave., Tujunga, Calif. 91042

Continuation-in-part of Ser. No. 946,805, Sep. 28, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,942

Term of patent 14 years

Int. Cl. D6-03

U.S. Cl. D6-27

271,826  
**BED**

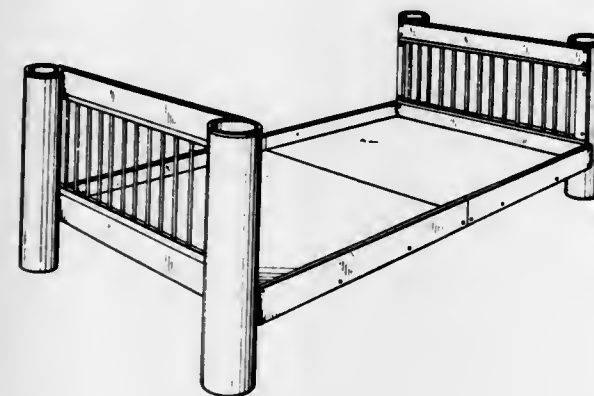
James R. Hull, 148 S. Westgate Ave., Los Angeles, Calif. 90049

Filed Jan. 26, 1981, Ser. No. 228,092

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-81

271,827  
**BED**

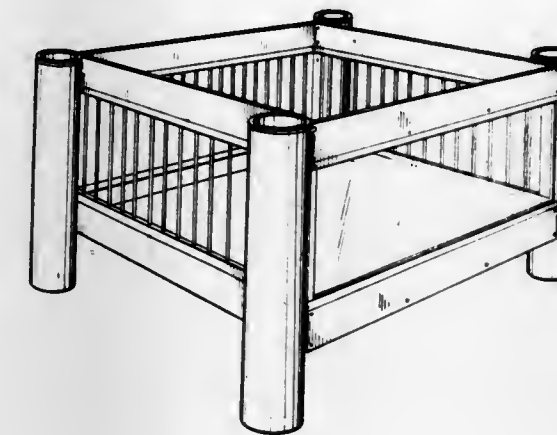
James R. Hull, 148 S. Westgate Ave., Los Angeles, Calif. 90049

Filed Jan. 26, 1981, Ser. No. 228,093

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-81



271,828

**TOILET-BIDET CABINET**

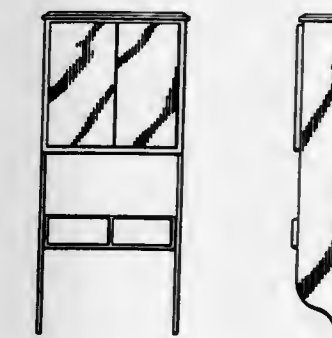
Gregory Wolf, West Reading; Scott Sandman, Fleetwood, and Clark Pearson, Birdsboro, all of Pa., assignors to The Tappan Company, Mansfield, Ohio

Filed May 26, 1981, Ser. No. 266,911

Term of patent 14 years

Int. Cl. D06-04

U.S. Cl. D6-86



271,829

**COMBINED SOAP AND RAG HOLDER**

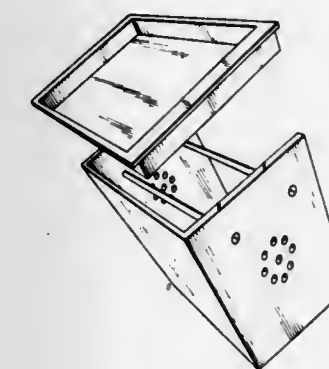
Arlene L. Mathews, 7634 Long, Shawnee Mission, Kans. 66216

Filed Apr. 17, 1981, Ser. No. 255,104

Term of patent 14 years

Int. Cl. D06-04

U.S. Cl. D6-89



271,830

**WINDSHIELD WIPER PRODUCTS CABINET**

Marvin L. Adenau, Hoffman Estates, Ill., assignor to Advertising Metal Display Company, Chicago, Ill.

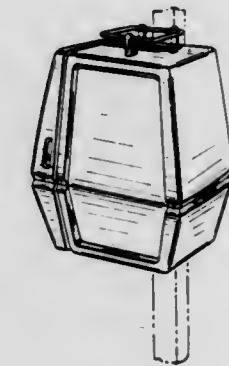
Division of Ser. No. 97,728, Nov. 26, 1979, Pat. No. 265,533.

This application Sep. 2, 1981, Ser. No. 298,730

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-127



271,831

**SUPPORT BRACKET FOR A FLOWER POT OR SIMILAR ARTICLE**

Peter D. McGain, 42 Mills St., Albert Park, Victoria, Australia

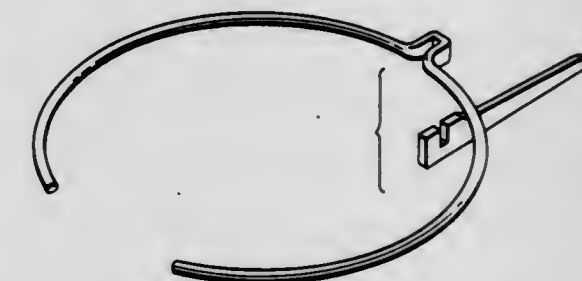
Filed Jul. 17, 1979, Ser. No. 58,368

Claims priority, application Australia, Mar. 9, 1979, 77281; Mar. 9, 1979, 77282

Term of patent 14 years

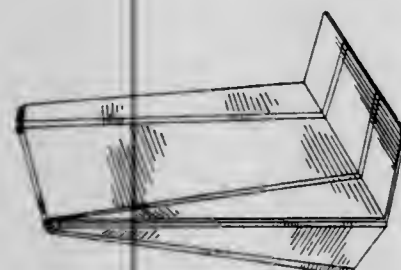
Int. Cl. D6-06; D8-08

U.S. Cl. D6-137

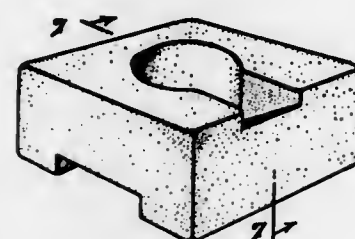




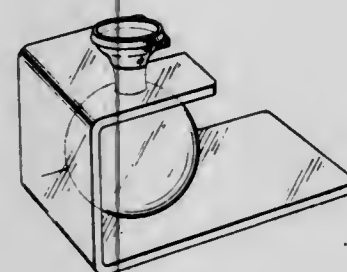
**271,832**  
**COLLAPSIBLE ARTICLE SUPPORT OR SIMILAR ARTICLE**  
 Donald B. Smith, R.R. No. 1, Mount Brydges, Ontario, Canada (NOL 1W0)  
 Division of Ser. No. 56,812, Jul. 12, 1979. This application Apr. 20, 1981, Ser. No. 255,426  
 Claims priority, application Canada, Jun. 4, 1979, 04-06-79-6  
 Term of patent 14 years  
 Int. Cl. D06—99  
 U.S. Cl. D6—180



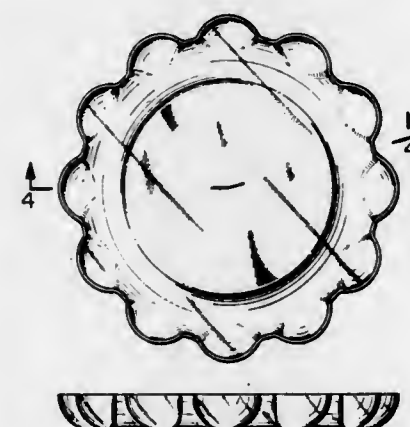
**271,834**  
**CUSHION**  
 Daniel F. Huntsinger, 15253 Jupiter St., Whittier, Calif. 90603  
 Filed Oct. 7, 1980, Ser. No. 194,767  
 Term of patent 14 years  
 Int. Cl. D6—09  
 U.S. Cl. D6—201



**271,833**  
**COMBINED VASE AND SUPPORT BRACKET THEREFOR**  
 Donald Okada, 711 W. 17th St., Suite D-7, Costa Mesa, Calif. 92627  
 Filed Dec. 17, 1981, Ser. No. 331,655  
 Term of patent 14 years  
 Int. Cl. D6—06; D11—02; D7—06  
 U.S. Cl. D6—182



**271,835**  
**FOOD BOWL**  
 Lawrence M. Knutson, Prior Lake, Minn., assignor to Decra Stone, Inc., Prior Lake, Minn.  
 Filed Jun. 20, 1980, Ser. No. 161,314  
 Term of patent 14 years  
 Int. Cl. D07—01  
 U.S. Cl. D7—29



**271,836**  
**COMBINED PILL GRATER AND DRINKING STRAW**  
 Robert N. Border, Box 270, Verdugo City, Calif. 91046  
 Filed Jun. 22, 1981, Ser. No. 275,893  
 Term of patent 14 years  
 Int. Cl. D07—06  
 U.S. Cl. D7—42



**271,837**  
 Patent Not Issued For This Number

**271,839**  
**INVERTIBLE CASSEOLE-ROASTER OR THE LIKE**  
 Robert M. Powers, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.  
 Filed Apr. 9, 1981, Ser. No. 252,411  
 Term of patent 14 years  
 Int. Cl. D07—02  
 U.S. Cl. D7—327



**271,838**  
**FORK OR SIMILAR ARTICLE OF FLATWARE**  
 David Rogers, Barrington, R.I., assignor to Textron Inc., Providence, R.I.  
 Filed Nov. 19, 1981, Ser. No. 322,777  
 Term of patent 14 years  
 Int. Cl. D07—03  
 U.S. Cl. D7—137





271,840  
ROASTER

Robert M. Powers, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.

Filed Apr. 9, 1981, Ser. No. 252,409

Term of patent 14 years

Int. Cl. D07—02

U.S. Cl. D7—360



271,841  
HANDLE FOR KITCHEN UTENSILS

Erik L. Hansen, Roskilde, Denmark, assignor to Rosti Plastic A/S, Ballerup, Denmark

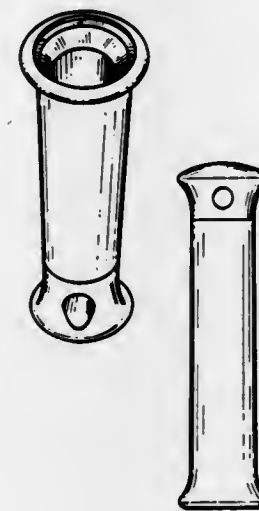
Filed Jan. 8, 1982, Ser. No. 338,398

Claims priority, application United Kingdom, Jul. 16, 1981, 811001525

Term of patent 14 years

Int. Cl. D07—02, 04

U.S. Cl. D7—395



271,842  
SPLITTING HEAD FOR A WOOD SPLITTING MACHINE

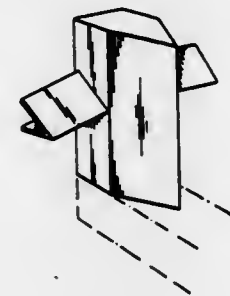
L. Douglas Nickerson, 306 Reid St., Sault Ste. Marie, Ontario, Canada (P6B 4V1)

Filed May 11, 1981, Ser. No. 262,485

Term of patent 14 years

Int. Cl. D8—03

U.S. Cl. D8—47



271,843  
KNOB

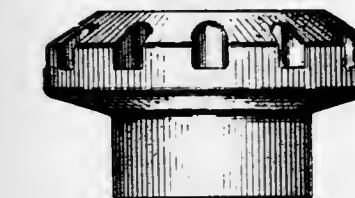
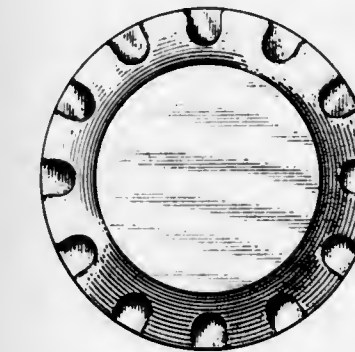
Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Aug. 19, 1981, Ser. No. 294,350

Term of patent 14 years

Int. Cl. D8—06

U.S. Cl. D8—312



271,845  
DOOR CLOSER

Yoshihiko Matsuo, Yokohama, and Takeshi Shohoji, Funabashi, both of Japan, assignors to Ryobi Limited, Hiroshima, Japan

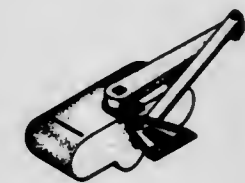
Filed Apr. 24, 1981, Ser. No. 257,201

Claims priority, application Japan, Nov. 4, 1980, 55-46256

Term of patent 14 years

Int. Cl. D8—07

U.S. Cl. D8—330



271,846  
SUPPORT FOR CONCRETE REINFORCEMENT BAR

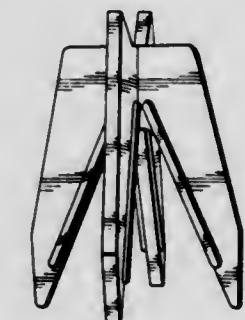
Ernest Hernandez, 1237 Thackery, West Covina, Calif. 91790

Filed Mar. 9, 1981, Ser. No. 241,929

Term of patent 14 years

Int. Cl. D8—08

U.S. Cl. D8—356



271,844  
HANDLE STUD FOR AN ARTICLE OF LUGGAGE OR THE LIKE

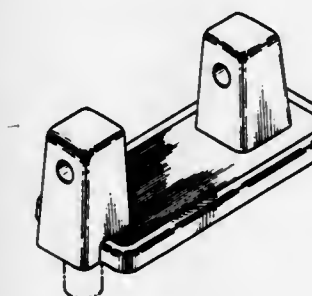
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Feb. 12, 1981, Ser. No. 233,637

Term of patent 14 years

Int. Cl. D8—06

U.S. Cl. D8—321



271,847  
CONCRETE REINFORCEMENT BAR SUPPORT

Ernest Hernandez, 1237 Thackery, West Covina, Calif. 91790

Filed May 18, 1981, Ser. No. 264,360

Term of patent 14 years

Int. Cl. D8—08

U.S. Cl. D8—356





271,848  
TAMPER-PROOF FASTENING DEVICE FOR TAGS AND  
THE LIKE

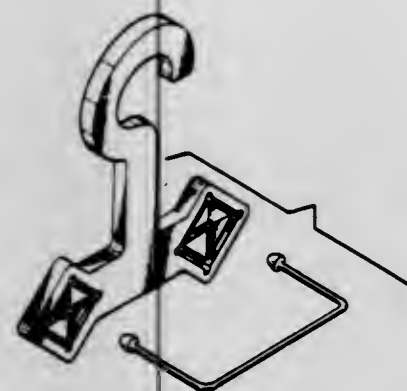
John K. Tcherneshoff, Fort Payne, Ala., assignor to Tcherneshoff Associates, Inc., Fort Payne, Ala.

Filed Dec. 8, 1980, Ser. No. 214,328

Term of patent 14 years

Int. Cl. D6—08; D8—08

U.S. Cl. D8—373



271,849  
FIRE STOP FOR USE BETWEEN WALL STUDS

Kendall C. Kunz, Box 1292, Idyllwild, Calif. 92349

Filed Apr. 29, 1981, Ser. No. 258,683

Term of patent 14 years

Int. Cl. D8—08

U.S. Cl. D8—384



271,850  
MAGNETIC CLIP

Ruediger Einhorn, Katonah, and Lee R. Chasen, Port Chester, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.

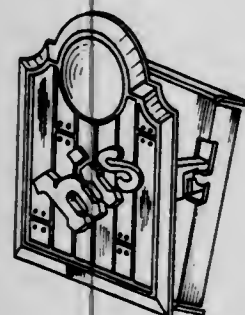
Division of Ser. No. 199,834, Oct. 23, 1980. This application

Feb. 16, 1983, Ser. No. 466,866

Term of patent 14 years

Int. Cl. D6—08; D19—02

U.S. Cl. D8—395



271,851  
TUBE CLAMP

Mark A. Lance, Pascoe Vale South, Australia, assignor to W. A. Deutscher Pty. Ltd., Moorabbin, Australia

Filed Aug. 28, 1981, Ser. No. 297,397

Claims priority, application Australia, Mar. 13, 1981, 83590

Term of patent 14 years

Int. Cl. D8—08

U.S. Cl. D8—396



271,852  
COMBINED BOTTLE AND SUPPORT BRACKET  
THEREFOR

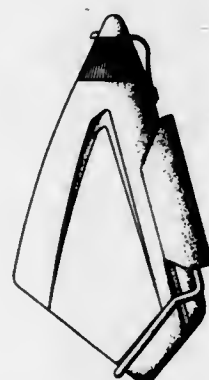
Keiu Kimura, Higashi-Osaka, Japan, assignor to Osaka Grip Mfg. Co., Ltd., Osaka, Japan

Filed Jun. 5, 1981, Ser. No. 271,003

Term of patent 14 years

Int. Cl. D9—01

U.S. Cl. D9—337



271,853  
BOTTLE

Tokumitsu Tsuno, Yokohama, Japan, assignor to Yakult Honsha Co., Ltd., Japan

Filed Apr. 30, 1981, Ser. No. 259,146

Term of patent 14 years

Int. Cl. D9—01

U.S. Cl. D9—349



271,854  
CAN BODY

Christopher Berry, Wantage, England, assignor to Metal Box Limited, Reading, England

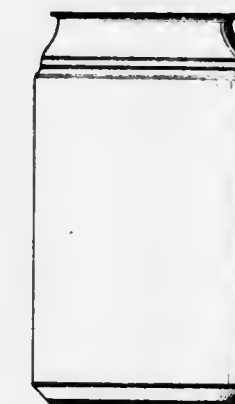
Filed Aug. 28, 1981, Ser. No. 297,494

Claims priority, application United Kingdom, Mar. 18, 1981, 999513

Term of patent 14 years

Int. Cl. D9—03

U.S. Cl. D9—351



271,856  
BOTTLE

John I. Suhajda; Robert E. Corba; Richard L. Davenport, and Allen D. Miller, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Oct. 26, 1981, Ser. No. 314,892

Term of patent 14 years

Int. Cl. D9—01

U.S. Cl. D9—375



271,857  
CUP LID

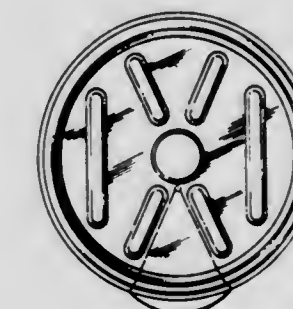
Paul V. Callahan, P.O. Box 112, Balfour, N.C. 28706

Filed May 11, 1981, Ser. No. 262,625

Term of patent 14 years

Int. Cl. D9—07

U.S. Cl. D9—438



271,855  
BOTTLE OR THE LIKE

James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 140,180, Apr. 14, 1980. This application

May 17, 1982, Ser. No. 378,635

Term of patent 14 years

Int. Cl. D9—01

U.S. Cl. D9—370



271,858  
CAN LID

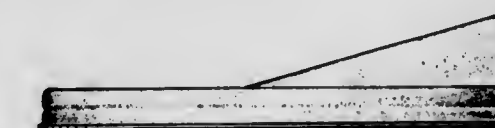
Walter S. Martin, Box 206, Rte. 2, Pekin, Ind. 47165, and Cleo B. Terrell, Pekin, Ind., assignors to Walter S. Martin, Pekin, Ind.

Filed Jun. 2, 1981, Ser. No. 269,654

Term of patent 14 years

Int. Cl. D9—07

U.S. Cl. D9—447





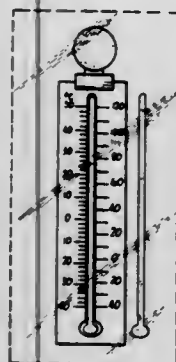
271,859

**COMBINED INSIDE AND OUTSIDE THERMOMETER**William Polson, 213 Nagle Ave., Apt. 4L, New York, N.Y. 10034  
Filed Dec. 16, 1980, Ser. No. 216,921

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-58



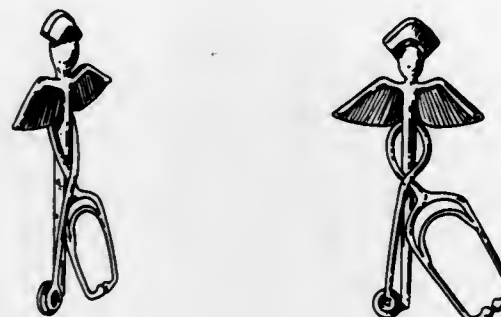
271,862

**MEDICAL SERVICE EMBLEM**Dorothy Boyd, 11230 S. Vernon, Chicago, Ill. 60628  
Filed Nov. 9, 1981, Ser. No. 319,308

Term of patent years

Int. Cl. D11-03

U.S. Cl. D11-105



271,860

**SEDIMENT INDICATOR**

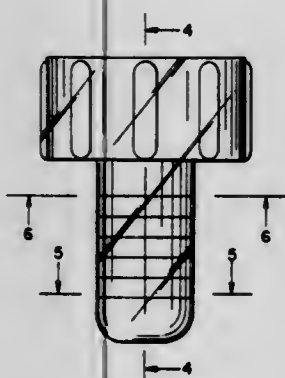
Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391

Filed Jan. 23, 1981, Ser. No. 227,789

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-96



271,863

**CONTAINER FOR FLOWERS, PLANTS OR THE LIKE**

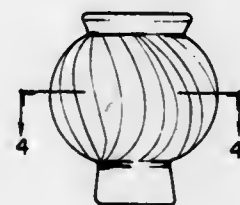
Marie P. Kowalik, Troy, Mich., assignor to Florists' Transworld Delivery Association, Southfield, Mich.

Filed Jul. 29, 1981, Ser. No. 288,032

Term of patent 14 years

Int. Cl. D11-02; D7-01; D26-01

U.S. Cl. D11-152



271,861

**SIGN**

Frederick K. Patton, 7 Black Duck Dr., Center Moriches, N.Y. 11934

Continuation of Ser. No. 38,234, May 11, 1979, abandoned. This application Jul. 14, 1982, Ser. No. 398,371

Term of patent 14 years

Int. Cl. D10-06

U.S. Cl. D10-114



271,864

**INTEGRAL TRUCK CAB WINDSHIELD ROOF AND DEFLECTOR UNIT**

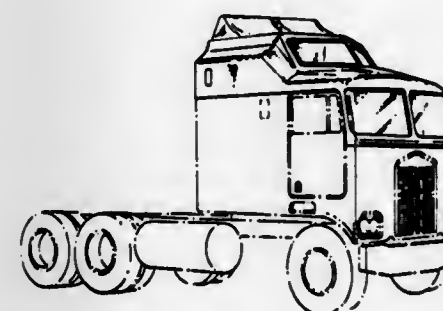
Timothy J. Kangas, Issaquah, Wash., assignor to PACCAR Inc., Bellevue, Wash.

Filed Oct. 22, 1979, Ser. No. 87,244

Term of patent 14 years

Int. Cl. D12-08

U.S. Cl. D12-96



271,866

**COMBINED SISSY BAR AND BACKREST PAD**  
Mark Turkington, and Philip Turkington, both of Willimantic, Conn., assignors to Connecticut Cycle Accessories, Inc., Willimantic, Conn.

Filed Jul. 20, 1981, Ser. No. 284,604

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-119



271,865

**MOTORCYCLE**

Minoru Morioka, Kawagoe; Yoshitaka Omori, Tsurugashima, and Mamoru Matsui, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,599

Claims priority, application Japan, Oct. 8, 1980, 55-41954

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-110



271,867

**MOTORCYCLE BACKREST**

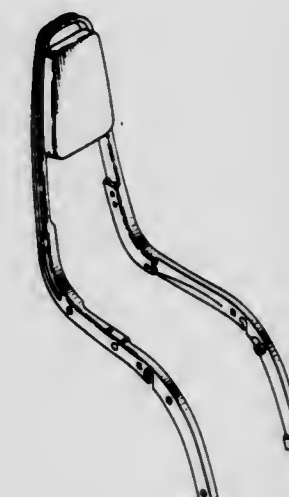
Bernard Danielson, 12007 Hwy. 55, Minneapolis, Minn. 55441

Filed Oct. 22, 1981, Ser. No. 314,031

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-119





271,868

**COLLAPSIBLE STROLLER**

Charles L. Voytko, and Robert J. Boudreau, both of Bedford, Pa., assignors to Brown Group Recreational Products, Inc., Bedford, Pa.

Filed Jan. 22, 1981, Ser. No. 227,153

Term of patent 14 years

Int. Cl. D12-12

U.S. Cl. D12-129



271,870

**MAGNETIC TAPE CASSETTE**

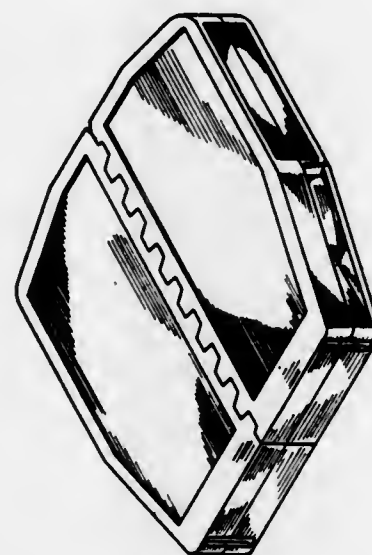
Klaus Schoettle, 70 Ladenburger Strasse, 6900 Heidelberg; Volker Richter, 34 Karl-Christ Strasse, 6900 Heidelberg 25, and Heinrich Wittkamp, 33 Staudenweg, 6800 Mannheim, all of Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 9,794

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D14-11



271,869

**ELECTRONIC RECEPTACLE HOUSING**

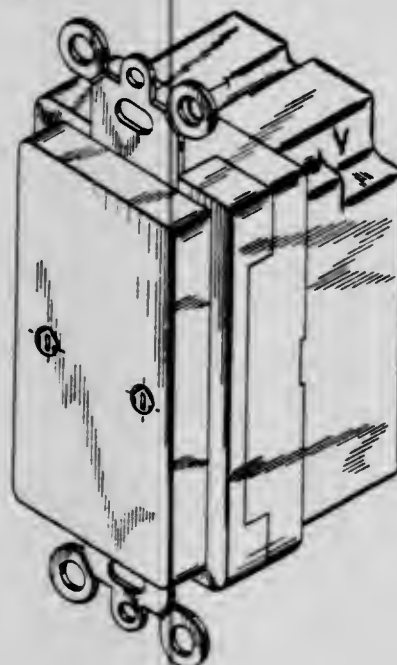
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Oct. 7, 1981, Ser. No. 309,354

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-30



271,871

**COMBINED TELEPHONE HANDSET AND BASE THEREFOR**

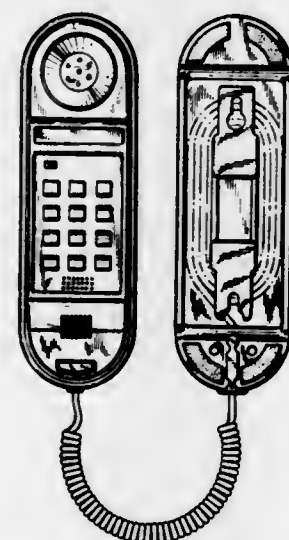
Yoshiharu Shimizu, Ichihara, Japan, assignor to Arrow Trading Co., Inc., New York, N.Y.

Filed Mar. 4, 1983, Ser. No. 472,231

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-53



271,872

**WALL TELEPHONE BASE HOUSING**

George M. Janda, Wheaton, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Oct. 1, 1981, Ser. No. 307,478

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-61



271,874

**COMPUTER DISPLAY TERMINAL**

Evert Endt, Paris, France, assignor to Thomson-CSF, Paris, France

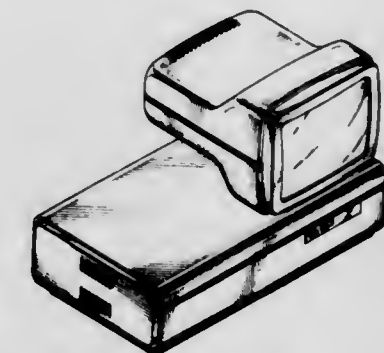
Filed Jan. 21, 1981, Ser. No. 226,661

Claims priority, application Hague, Jul. 21, 1980, 000276

Term of patent 14 years

Int. Cl. D10-02

U.S. Cl. D14-113



271,875

**FRONT DISCHARGE MIXER TRUCK WITH AUXILIARY REAR AXLE**

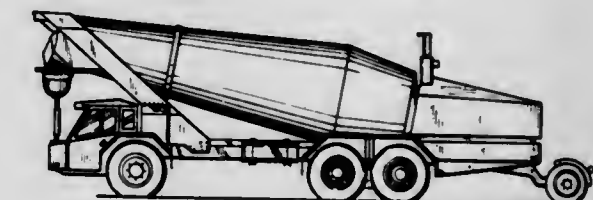
Frederick J. Silbernagel, 148-7th SE., Huron, S. Dak. 57350

Filed Mar. 25, 1981, Ser. No. 247,615

Term of patent 14 years

Int. Cl. D15-03

U.S. Cl. D15-19



271,873

**RADIO CONTROL UNIT**

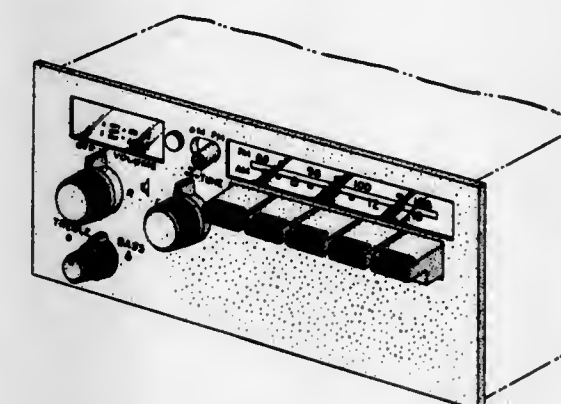
Walter K. Gierschick, West Bloomfield, and Keith Kesling, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 29, 1981, Ser. No. 277,678

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-76



271,876

**TRACTOR**

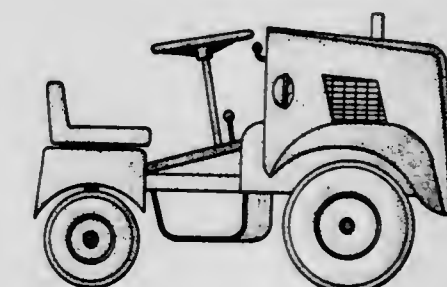
Albert E. Browning, Rte. 4, Box 425, Winnsboro, La. 71295

Filed Oct. 20, 1980, Ser. No. 198,961

Term of patent 14 years

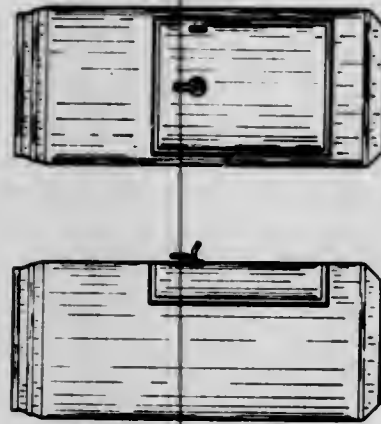
Int. Cl. D15-03

U.S. Cl. D15-23

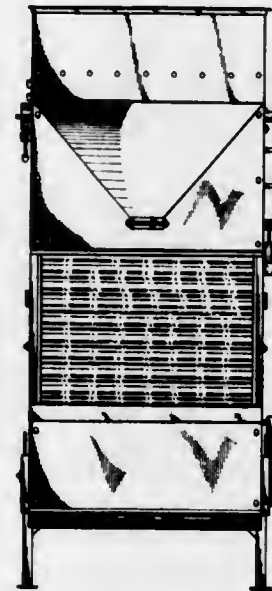




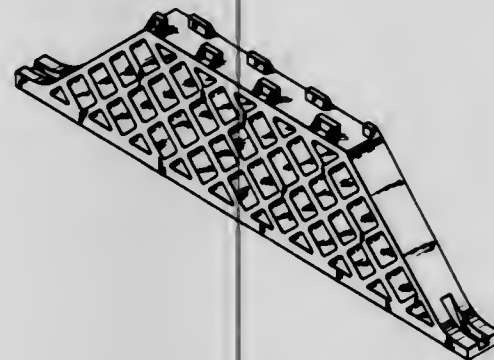
**271,877**  
**REFRIGERATOR WITH BEVERAGE DISPENSER**  
 Harvey B. Hoff, 5440 Franklin, Boise, Id. 83704  
 Filed Jun. 29, 1981, Ser. No. 278,875  
 Term of patent 14 years  
 Int. Cl. D15-07  
 U.S. Cl. D15-81



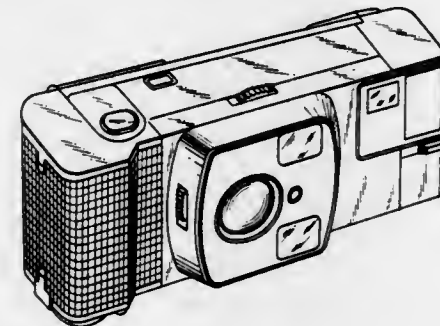
**271,879**  
**HOUSING FOR PNEUMATIC SEPARATOR**  
 David R. Neilson, 809 Second St., Woodland, Calif. 95695  
 Filed Aug. 7, 1978, Ser. No. 931,820  
 Term of patent 14 years  
 Int. Cl. D15-09  
 U.S. Cl. D15-147



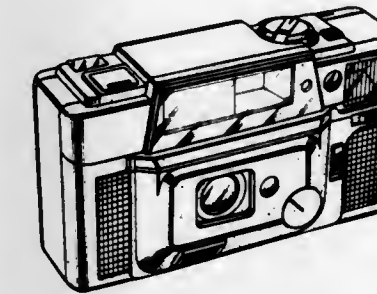
**271,878**  
**CONNECTOR FOR MOLDS USED IN THE MANUFACTURE OF CONCRETE CEILINGS**  
 Moshe Farhi, 4a Givat Dvora St., Haifa, Israel  
 Filed Aug. 5, 1980, Ser. No. 175,416  
 Claims priority, application Israel, Feb. 28, 1980, 8068  
 Term of patent 14 years  
 Int. Cl. D15-09  
 U.S. Cl. D15-138



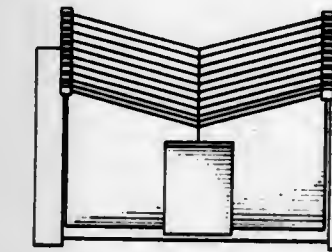
**271,880**  
**CAMERA**  
 Nobuhiro Agou, and Mutsuhide Matsuda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
 Filed Mar. 30, 1983, Ser. No. 480,335  
 Term of patent 14 years  
 Int. Cl. D16-01  
 U.S. Cl. D16-1



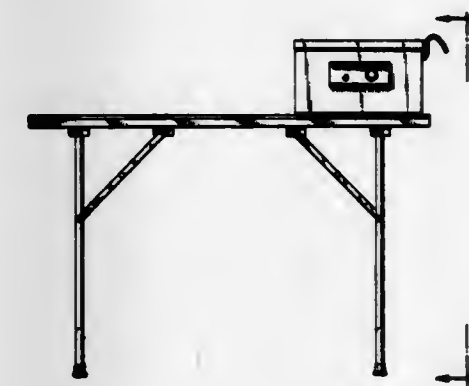
**271,881**  
**CAMERA**  
 Takaharu Kato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan  
 Filed Nov. 5, 1981, Ser. No. 318,423  
 Claims priority, application Japan, May 6, 1981, 56-19355  
 Term of patent 14 years  
 Int. Cl. D16-01  
 U.S. Cl. D16-6



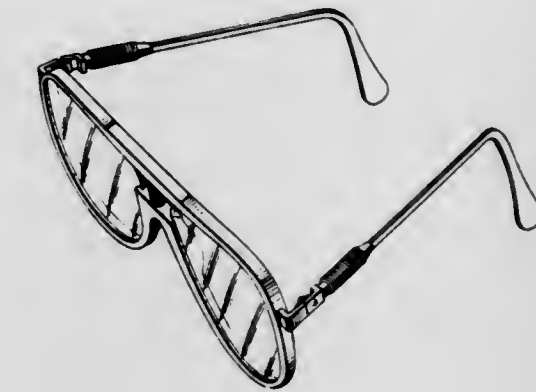
**271,882**  
**UNIVERSAL SORTER**  
 R. Clark DuBois, Fairfield, and John C. Hamma, Milford, both of Conn., assignors to Gradco/Dendoki, Inc., Santa Ana, Calif.  
 Filed Oct. 3, 1980, Ser. No. 193,423  
 Term of patent 14 years  
 Int. Cl. D16-03  
 U.S. Cl. D16-32



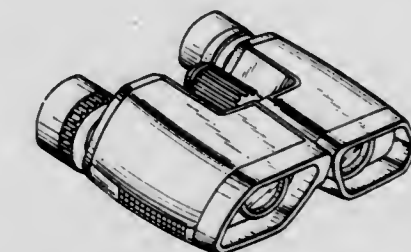
**271,883**  
**EXPOSURE UNIT FOR LITHOGRAPHIC PLATES**  
 Gerold Litschi, Lansdale, Pa., assignor to Master Etching Machine Company, Ambler, Pa.  
 Filed Sep. 14, 1981, Ser. No. 302,204  
 Term of patent 14 years  
 Int. Cl. D16-04  
 U.S. Cl. D16-33



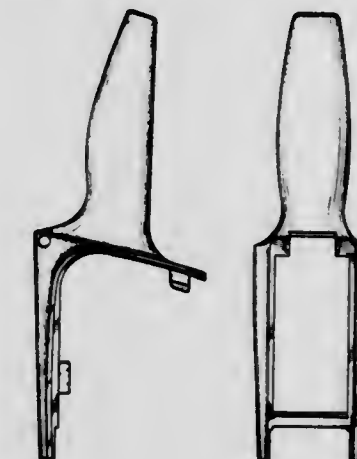
**271,884**  
**EYEGLASSES**  
 Angelo De Mejo, Belluno, Italy, assignor to G.D.S. International S.r.l., Belluno, Italy  
 Filed Aug. 19, 1981, Ser. No. 294,247  
 Claims priority, application Italy, Mar. 20, 1981, 61934/81[U]  
 Term of patent 14 years  
 Int. Cl. D16-06  
 U.S. Cl. D16-116



**271,885**  
**BINOCULARS**  
 Giorgetto Giugiaro, Turin, Italy, assignor to Nippon Kogaku K.K., Tokyo, Japan  
 Filed Nov. 20, 1980, Ser. No. 208,783  
 Claims priority, application Japan, May 24, 1980, 55-20548  
 Term of patent 14 years  
 Int. Cl. D16-06  
 U.S. Cl. D16-133



**271,886**  
**HANDLE FOR A LABELLING APPARATUS**  
 Wolfgang Reinke, Rothenberg, Fed. Rep. of Germany, assignor to Eselte Pendalfex Corporation, Garden City, N.Y.  
 Filed Dec. 17, 1980, Ser. No. 217,529  
 Claims priority, application Switzerland, Jul. 4, 1980, 111271  
 Term of patent 14 years  
 Int. Cl. D18-99  
 U.S. Cl. D18-19





271,887

**BOOK COVER**

Caldwell Williams, 179 Barrington Pl., Brentwood Village, Los Angeles, Calif. 90049, assignor to Caldwell Williams, Los Angeles, Calif.

Filed Sep. 21, 1981, Ser. No. 304,176

Term of patent 14 years

Int. Cl. D19-04

U.S. Cl. D19-26



271,889

**MARKING INSTRUMENT**

Peter A. Krüchel, Heroldsberg, and Gerhard Möck, Kirchheimbach, both of Fed. Rep. of Germany, assignors to Schwann-Stabilo Schwanhauser GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,850

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, MR VI 497

Term of patent 14 years

Int. Cl. D19-06

U.S. Cl. D19-43



271,890

**DART BASEBALL GAME BOARD**

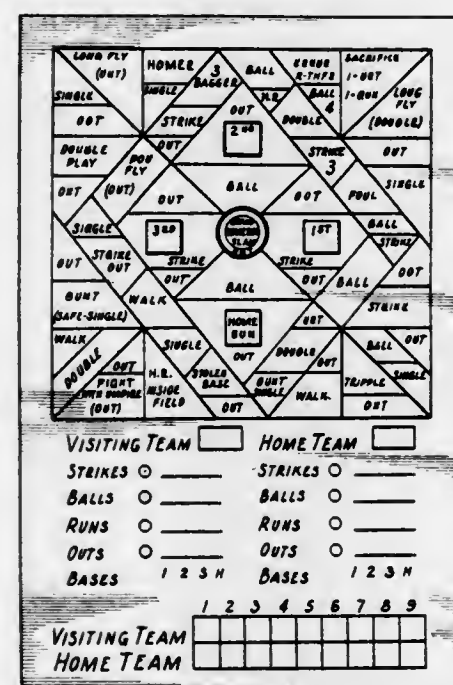
A. Carl Astwood, Sr., 314 Duane Ave., Schenectady, N.Y. 12307

Filed Oct. 28, 1981, Ser. No. 315,908

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-6



271,888

**BOOKMARK**

Michael Dolas, 1164 Crestline, Santa Barbara, Calif. 93105

Filed Mar. 17, 1982, Ser. No. 359,177

Term of patent 14 years

Int. Cl. D19-99

U.S. Cl. D19-34



271,891

**VIDEO GAME CONSOLE**

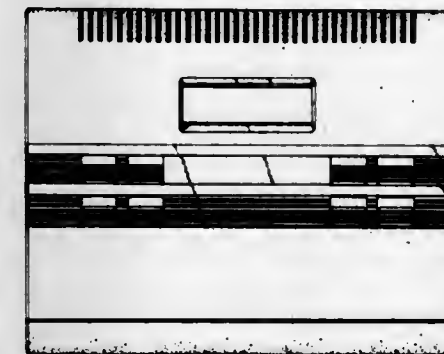
William J. Renteria, San Jose, Calif., assignor to Atari, Inc., Santa Clara, Calif.

Filed Jan. 7, 1982, Ser. No. 337,884

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-13



271,894

**GAME BOARD**

Frank Sims, 309-340 8th St., New Westminster, British Columbia, Canada

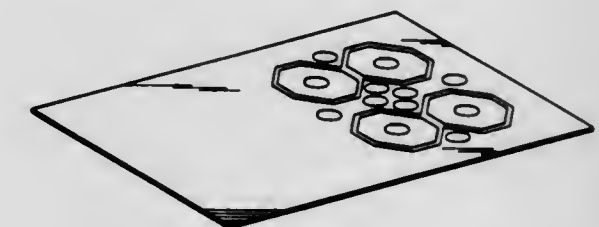
Filed Sep. 18, 1981, Ser. No. 303,562

Claims priority, application Canada, Sep. 14, 1981, 14-01-81-9

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-34



271,892

**GAME BOARD**

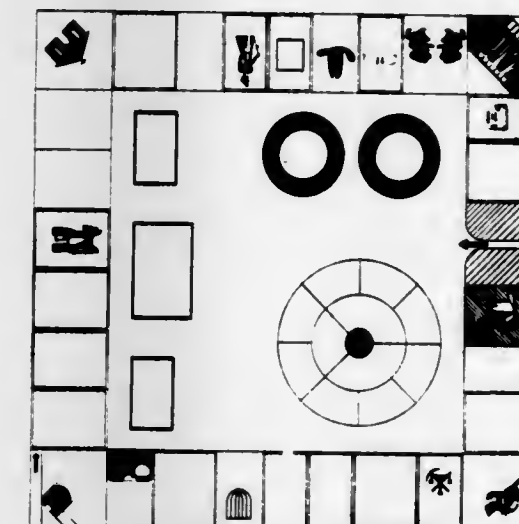
Steven M. Engel, 6480 Evergreen Ave., Apt. 302, Portage, Ind. 46368

Filed Oct. 9, 1981, Ser. No. 309,992

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-25



271,895

**BINGO-CARD HOLDER**

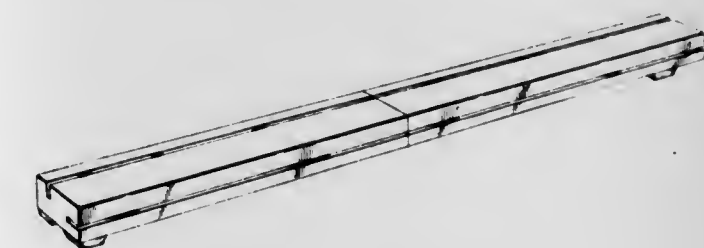
William E. Runions, 4859 W. 131st St., Hawthorne, Calif. 90250

Filed Oct. 19, 1981, Ser. No. 312,429

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-54



271,896

**SPACE TOY**

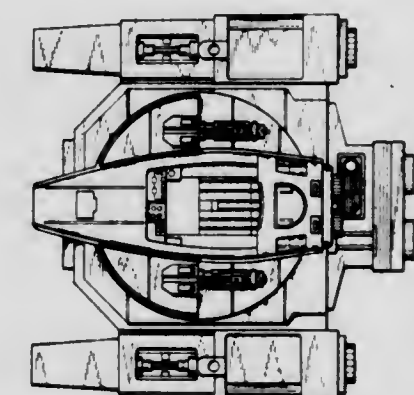
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 4, 1982, Ser. No. 345,745

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-87



271,893

**CASINO GAME BOARD**

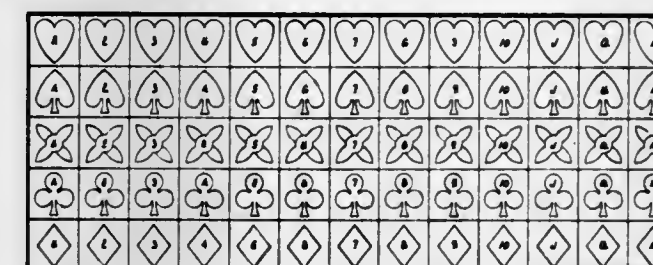
Frank J. Wirken, 9538 Ash, Overland Park, Kans. 66207

Filed Oct. 8, 1980, Ser. No. 195,119

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D21-26





271,897

## STACKING TOY

Hansan Ma, Hoffman Estates, Ill., assignor to Milton Bradley International, Inc., Springfield, Mass.

Filed Mar. 19, 1981, Ser. No. 245,621

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D21—104



271,898

## TOY PUZZLE

Peggy J. Hees, Oak Park, Ill., assignor to Milton Bradley International, Inc., Springfield, Mass.

Filed Mar. 19, 1981, Ser. No. 245,622

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D21—105



271,899

## GAME PADDLE

Maurice G. Hillesheim, Belleville, St. Clair County, Ill.  
Division of Ser. No. 882,584, Mar. 1, 1978, abandoned. This application Nov. 8, 1980, Ser. No. 204,481

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D21—211



271,900

## VENTILATION DEFLECTOR UNIT

Ernest Efstratis, 6775 Wing Lake Rd., Birmingham, Mich. 48010

Filed Jan. 11, 1981, Ser. No. 272,711

Term of patent 14 years

Int. Cl. D23—03

U.S. Cl. D23—138



271,901

## OPTICAL MEASURING INSTRUMENT

Donald Waslander, Paris, France, assignor to Essilor International (Compagnie Generale d'Optique), Creteil, France

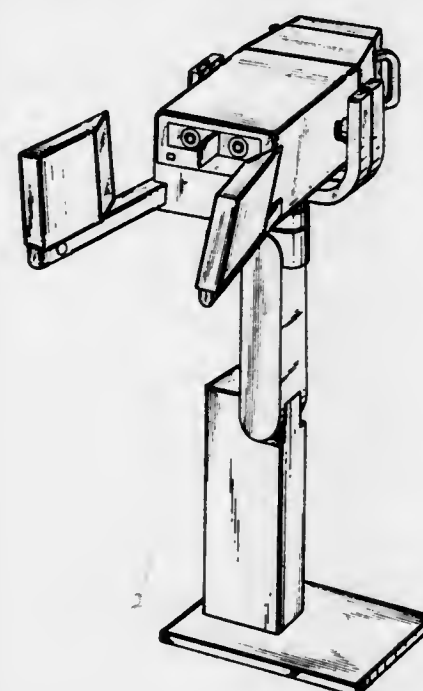
Filed Apr. 28, 1981, Ser. No. 258,538

Claims priority, application France, Nov. 4, 1980, 803397

Term of patent 14 years

Int. Cl. D24—01

U.S. Cl. D24—1.1



271,902

## EMBALMING TROCAR STERILIZER

Charles H. Campton, 525 Delaware Ave., Palmerton, Pa. 18071

Filed Feb. 26, 1981, Ser. No. 238,559

Term of patent 14 years

Int. Cl. D24—09

U.S. Cl. D24—09



271,904

## ANGIO-CATHETER/INFUSION TUBING LOCK

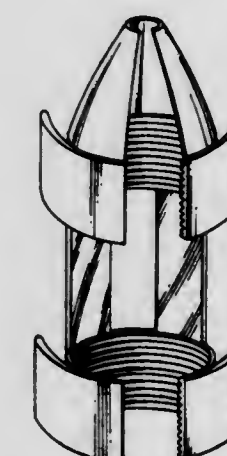
Annabelle D. Tucker, 4480 Sherman Oaks Cir., Sherman Oaks, Calif. 91403

Filed Jul. 31, 1980, Ser. No. 174,206

Term of patent 14 years

Int. Cl. D24—02

U.S. Cl. D24—54



271,903

## SURGICAL BONE BURRING BIT RACK

Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566

Filed Mar. 6, 1981, Ser. No. 241,123

Term of patent 14 years

Int. Cl. D24—02; D6—04

U.S. Cl. D24—31



271,905

## EXPANSION JOINT SEALING STRIP

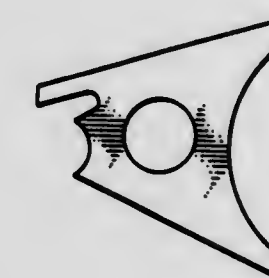
Neil S. Golden, Los Angeles, Calif., assignor to Albert H. Allen, Beverly Hills, Calif.

Filed Oct. 27, 1981, Ser. No. 315,644

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D25—74





271,906  
LAMP

Fritz E. Zabransky, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed Jul. 24, 1980, Ser. No. 171,915  
Claims priority, application Benelux, Jan. 29, 1980, 54388-01;  
Jan. 29, 1980, 54388-02  
Term of patent 14 years  
Int. Cl. D26-04  
U.S. Cl. D26-2

271,908  
LAMP

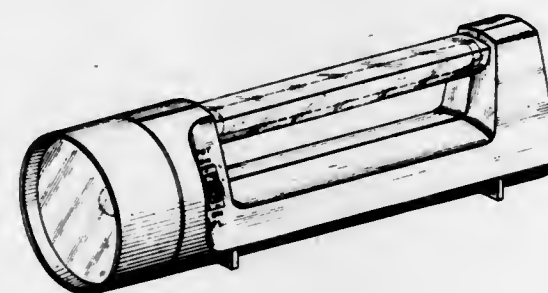
Yoshio Kojima, Yokohama; Masumi Nanba, Funabashi, and Hisaaki Katoh, Zushi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan  
Filed Dec. 23, 1981, Ser. No. 333,907  
Claims priority, application Japan, Aug. 27, 1981, 56-37494  
Term of patent 14 years  
Int. Cl. D26-04  
U.S. Cl. D26-3



## 271,909

## FLUORESCENT LANTERN

Henry R. Mallory, Greenwich, Conn., assignor to Duracell Inc., Bethel, Conn.  
Filed Dec. 18, 1980, Ser. No. 217,592  
Term of patent 14 years  
Int. Cl. D26-02  
U.S. Cl. D26-42



## 271,907

## COMPACT FLUORESCENT LAMP

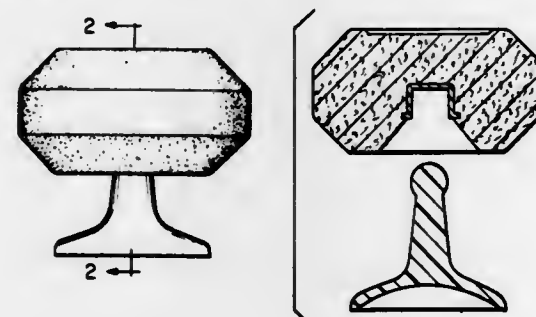
Masumi Nanba, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan  
Filed Dec. 23, 1981, Ser. No. 333,888  
Claims priority, application Japan, Dec. 18, 1980, 55-52553  
Term of patent 14 years  
Int. Cl. D26-04  
U.S. Cl. D26-3



## 271,910

## COMBINED SOAP BAR AND HOLDER

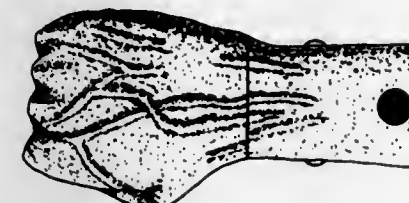
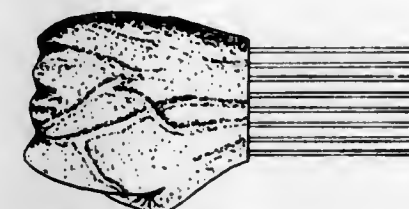
Henry Blaszkowski, P.O. Box 114, Southfield, Mich. 48034  
Continuation-in-part of Ser. No. 60,279, Jul. 25, 1979, Pat. No. Des. 263,885. This application Nov. 2, 1981, Ser. No. 316,785  
Claims priority, application Canada, Jan. 25, 1980, 25-01-80-3; Apr. 22, 1981, 25-01-80-16; Apr. 22, 1981, 25-01-80-17  
Term of patent 14 years  
Int. Cl. D28-03  
U.S. Cl. D28-8.1



## 271,911

## COMBINED COMB AND SHEATH

James R. Hunt, 115 River Dr., Cocoa, Fla. 32922  
Filed Apr. 27, 1981, Ser. No. 257,890  
Term of patent 14 years  
Int. Cl. D28-03  
U.S. Cl. D28-22



## 271,912

## HORSESHOE

Larry Kurpakus, R.D. #2, Ridge Rd., Gibsonia, Pa. 15044  
Filed Oct. 1, 1981, Ser. No. 307,185  
Term of patent 14 years  
Int. Cl. D30-95  
U.S. Cl. D30-35



## 271,913

## BABY BOTTLE DRYING RACK

William J. Nanfity, and Joann K. Nanfity, both of 7614 N. 33rd St., Omaha, Nebr. 68112  
Filed Oct. 5, 1981, Ser. No. 308,407  
Term of patent 14 years  
Int. Cl. D7-05  
U.S. Cl. D32-55





# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF DECEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Nattermann & Cie. GmbH: *See—*  
Ghycky, Miklos; Erdos, Adorjan; and Heidemann, Gunter, 4,421,747., Cl. 424-199.000.
- Abarot, Eugene V.; and Bonk, Leroy V., to United States Steel Corporation. Sliding gate valve having adjustable seal pressure. 4,421,256., Cl. 222-600.000.
- Abbott, Barry J.; and Silcox, William H., to Chevron Research Company. Sliding leg tower. 4,421,438., Cl. 405-227.000.
- Abbott Laboratories: *See—*  
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,421,673., Cl. 502-167.000.
- Arbir, Francis W.; Raden, Daniel S.; and Narducy, Kenneth W., 4,421,869., Cl. 521-126.000.
- Abel, William A.: *See—*  
Massey, Lester G.; George, David A.; Brabets, Robert I.; and Abel, William A., 4,421,722., Cl. 422-129.000.
- Abex Corporation: *See—*  
Hieronymi, Gabriel C.; and Hansen, Randall C., 4,420,954., Cl. 70-150.000.
- Abishev, Dzhanet N.; Malyshev, Vitaly P.; Bauer, Ivan K.; Yarygin, Vladimir A.; Maisakov, Mikhail E.; Gainudinov, Garifulla K.; Nazarov, Alexandr M.; Kusainov, Temirkhan A.; Burovoi, Isaak A.; and Omarov, Bulat N., to Khimiko-metallurgicheskii Institut AN Kazakhskoi SSR. Shaft furnace for heat treatment of materials. 4,422,174., Cl. 373-115.000.
- Abramovitz, Irwin J.: *See—*  
Berg, Norman J.; Abramovitz, Irwin J.; Casseday, Michael W.; and Lee, John N., 4,421,388., Cl. 350-358.000.
- Acampora, Alfonso: *See—*  
Lewis, Henry G., Jr.; and Acampora, Alfonso, 4,422,094., Cl. 358-37.000.
- ACCRA Manufacturing Co.: *See—*  
Stock, Carl R., 4,421,093., Cl. 124-86.000.
- Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG: *See—*  
Ruch, Jean; and Nelles, Josef, 4,421,322., Cl. 277-12.000.
- Accutest Corporation: *See—*  
Treagle, Paul W.; and Cielakie, Edward W., 4,421,370., Cl. 339-59.000.
- Adachi, Kinichi; Shimoda, Hisanori; Hirata, Yasushi; and Ohmukai, Yoshimi, to Matsushita Electric Industrial Co., Ltd. Combustion wick. 4,421,477., Cl. 431-325.000.
- Adams, Kenneth D.: *See—*  
Kornatowski, Boleslaw; and Adams, Kenneth D., 4,421,043., Cl. 112-260.000.
- Adcock, Thomas P. Concentrating/tracking solar energy collector. 4,421,104., Cl. 126-438.000.
- Adema, Carl M.; and Schatzberg, Paul, to United States of America, Navy. Situ incineration/detoxification system for antifouling coatings. 4,421,048., Cl. 114-222.000.
- Advanced Coating Technology, Inc.: *See—*  
Hollars, Dennis R., 4,421,622., Cl. 204-192.00P.
- Advanced Graphic Technology: *See—*  
Arnold, Raymond M., 4,421,816., Cl. 428-202.000.
- Advanced Micro Devices, Inc.: *See—*  
Chuang, Patrick T.; and Keswick, Paul D., 4,421,996., Cl. 307-530.000.
- AEPLC: *See—*  
Davies, Glyndwr J., 4,421,588., Cl. 156-308.200.
- AEW Engineering Co. Limited: *See—*  
Whitehouse, John A., 4,420,997., Cl. 83-105.000.
- AGA Aktiebolag: *See—*  
Lofstrom, Per, 4,421,273., Cl. 239-8.000.
- Agarwal, Pawan K.: *See—*  
Lundberg, Robert D.; Thaler, Warren A.; and Agarwal, Pawan K., 4,421,882., Cl. 524-31.000.
- Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*  
Bianchin, Christian; Deneuville, Alain F.; and Gerard, Philippe, 4,421,677., Cl. 252-501.100.
- Agency of Industrial Science & Technology: *See—*  
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; and Oguro, Keisuke, 4,421,718., Cl. 420-443.000.
- Agfa-Gevaert Aktiengesellschaft: *See—*  
Jung, Heinrich; and Biskup, Ulrich, 4,421,847., Cl. 430-621.000.
- Steube, Fritz, 4,421,399., Cl. 354-299.000.
- AgriGenetics Corporation: *See—*  
Jones, James L.; Keyser, E. Glen; and Phillips, James C., 4,421,544., Cl. 71-7.000.
- Aguzzi, Giovanni: *See—*  
Sacchetti, Massimo; Aguzzi, Giovanni; Bianchi, Gianvittorio; and Caroprese, Giuseppe, 4,421,532., Cl. 55-28.000.
- Ahlbeck, Stig G. Urine drainage device permitting training of the bladder. 4,421,510., Cl. 604-323.000.
- Ahner, Peter; Harer, Helmut; and Schustek, Siegfried, to Robert Bosch GmbH. Compact alternator for a self-contained on-board electric network, particularly for an automotive vehicle. 4,421,998., Cl. 310-68.00R.
- Aiba, Yasuaki, to Honda Giken Kogyo Kabushiki Kaisha. Device for preventing displacement of an engine in a motorcycle. 4,421,195., Cl. 180-228.000.
- Air Industrie: *See—*  
Buffet, Jean, 4,420,940., Cl. 62-3.000.
- Air Products and Chemicals, Inc.: *See—*  
Dalton, Augustine L., Jr.; Sheridan, John J., III; and Zagnoli, David A., 4,421,530., Cl. 55-26.000.
- Dalton, Augustine L., Jr.; Sheridan, John J., III; and Zagnoli, David A., 4,421,531., Cl. 55-26.000.
- Aizawa, Shirou: *See—*  
Murakami, Tadashi; Suzuki, Teruo; Inoue, Yukio; and Aizawa, Shirou, 4,421,635., Cl. 208-112.000.
- Akagiri, Kenzo; and Katakura, Masayuki, to Sony Corporation. Gain control circuit. 4,422,049., Cl. 330-134.000.
- Akagiri, Kenzo: *See—*  
Katakura, Masayuki; and Akagiri, Kenzo, 4,422,051., Cl. 330-278.000.
- Akaki, Kenji: *See—*  
Miura, Masayoshi; Oda, Gen; Akaki, Kenji; and Naito, Hiroshi, 4,422,086., Cl. 346-140.00R.
- Akimoto, Hidetoshi: *See—*  
Komuro, Takeo; Gomi, Kenichi; Arashi, Norio; Akimoto, Hidetoshi; Hishinuma, Yukio; Inuma, Hajime; and Kanda, Osamu, 4,421,732., Cl. 423-569.000.
- Akkerman, Neil H.: *See—*  
McStravick, David M.; and Akkerman, Neil H., 4,421,174., Cl. 166-374.000.
- Aktiebolaget Bofors: *See—*  
Hallstrom, Stig; and Horman, Lars, 4,421,004., Cl. 86-20.00D.
- Akutagawa Chocolate Co., Ltd.: *See—*  
Akutagawa, Tokuji, 4,421,773., Cl. 426-249.000.
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- Akzona Incorporated: *See—*  
ter Burg, Antonius W. M.; and den Hoedt, Gerrit, 4,421,439., Cl. 405-258.000.
- Albanese, Andres, to Bell Telephone Laboratories, Incorporated. Electrical-optical interface network. 4,422,179., Cl. 455-601.000.
- Alberti, Adriano, to Rockwell International Corporation. Upper feed dog device. 4,421,047., Cl. 112-311.000.
- Aldred, Fred C.; and Moseley, Charles R., to Courtaulds Limited. Man-made filaments and method of making wound dressings containing them. 4,421,583., Cl. 156-167.000.
- Alfa Romeo S.p.A.: *See—*  
Garcea, Giampaolo; Banfi, Ambrogio; and Di Stefano, Michele L., 4,421,074., Cl. 123-90.150.
- Allan, John; and Musgrove, Peter J., to Sir Robert McAlpine & Sons (Trade Investments) Limited. Wind powered turbine. 4,421,458., Cl. 416-117.000.
- Allen, Danny H.; and Sumner, John H., to Burlington Industries, Inc. Dobby-activated loom motion lock-nut device. 4,421,140., Cl. 139-1.00E.
- Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., to Colgate-Palmolive Company. Heavy duty laundry softening detergent composition and method for manufacture thereof. 4,421,657., Cl. 252-8.600.
- Allied Corporation: *See—*  
Schultz, Ronald W.; and Graham, Donald R., 4,421,246., Cl. 220-307.000.
- Allied Corporation, Law Department: *See—*  
Wortley, David L.; and Larson, Kenneth N., 4,422,171., Cl. 371-32.000.
- Allmer, Franz, to Canon Corporation. Compact bidirectionally operative tie exchanging apparatus. 4,421,034., Cl. 104-9.000.
- Allo, Vincent F.: *See—*  
Stafford, Donald C.; and Allo, Vincent F., 4,421,160., Cl. 165-76.000.
- Alloue, Raymond; and Mergey, Claude, to Carnaud S.A. Steel sheet carrying a protective layer and process for producing such a sheet. 4,421,828., Cl. 428-629.000.
- Almslatt, Ingemar H. G.: *See—*  
Parlervi, Paul; and Almslatt, Ingemar H. G., 4,421,488., Cl. 434-185.000.



- Alstom-Atlantique: See—  
Foucher, Gerard; and Hermand, Michel, 4,421,425, Cl. 384-123.000.  
Organi, Henri, 4,420,970, Cl. 73-46.000.  
Thurges, Edmond; Sigward, Pierre-Paul; Besson, Marcel; Van, Doan P.; and Nicolosi, Dante, 4,421,962, Cl. 200-144.0AP.  
Alten, Kurt, Ramp bridging device, 4,420,849, Cl. 14-71.300.  
Alvarez, Jose A. A., to T & R Chemicals, Inc. Antihypertension treatment, 4,421,743, Cl. 424-162.000.  
Alvino, William M., to Westinghouse Electric Corp. Flame-resistant aqueous epoxy impregnating compositions containing nonionic surface active agents, 4,421,877, Cl. 523-414.000.  
Amano, Kyosuke, to Asahi Kagaku Kogyo Kabushiki Kaisha. Bright wide-angle lens for compact color video cameras, 4,421,390, Cl. 350-459.000.  
Amano, Toshiaki, X-Y Plotter for producing diagrams from computer information, 4,420,886, Cl. 33-1.00M.  
AMCA International: See—  
Long, Gene M.; DeWitt, Terry E.; and Bell, John R., III, 4,420,913, Cl. 52-57.000.  
American Cyanamid Company: See—  
Kourtz, Raymond E.; and Daftary, Shashikumar H., 4,421,707, Cl. 264-182.000.  
Tomcufcik, Andrew S.; Meyer, Walter E.; and Dusza, John P., 4,421,753, Cl. 424-250.000.  
American Hoechst Corporation: See—  
Neumann, Don B.; Norton, Lyle K.; and Olson, Eric V., 4,422,083, Cl. 346-108.000.  
American Microsystems, Inc.: See—  
Amir, Gideon; Gregorian, Roubik; and Dujari, Ghanshyam, 4,422,155, Cl. 364-606.000.  
American Science and Engineering, Inc.: See—  
Mastroratti, Richard; DeCew, Alan; and McMahon, David, 4,422,177, Cl. 378-17.000.  
American Standard, Inc.: See—  
Parkison, Richard G.; and Hofstetter, Edward G., 4,421,294, Cl. 251-86.000.  
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Amhil Enterprises Ltd.: See—  
Van Melle, Hubert, 4,421,244, Cl. 220-306.000.  
Amir, Gideon; Gregorian, Roubik; and Dujari, Ghanshyam, to American Microsystems, Inc. Multiplier/adder circuit, 4,422,155, Cl. 364-606.000.  
AMP Incorporated: See—  
Coldren, Daniel R., 4,421,375, Cl. 339-97.00R.  
Cosmos, Pete; and McCleerey, Earl W., 4,421,376, Cl. 339-103.00M.  
Ritchie, Leon T.; Snyder, Clair W., Jr.; Toepfen, Thurston H.; and Woratyla, John A., 4,420,882, Cl. 29-837.000.  
Ampaya, Jaime P.; Heredy, Laszlo A.; and Kohl, Arthur L., to Rockwell International Corporation. Hydrocarbon treatment process, 4,421,631, Cl. 208-8.00R.  
Anatros Corporation: See—  
Danby, Hal C.; and Ritson, Carl, 4,421,506, Cl. 604-34.000.  
Anderson, Charles R.; and Oakes, Thomas R., to Economics Laboratory, Inc. Compatible enzyme and oxidant bleaches containing cleaning composition, 4,421,664, Cl. 252-94.000.  
Anderson, John C.: See—  
Sun, Lilla S.; and Anderson, John C., 4,421,857, Cl. 436-2.000.  
Anderson, William S., to United Technologies Corporation. Method of generating combustion gases utilizing polynorbornene-based combustible compositions, 4,420,931, Cl. 60-219.000.  
Andersson, Roland; Hoglund, Per-Erik; and Glimskar, Bo, to Byggonomilaboratoriet HB. Vibration-damping arrangement, 4,421,181, Cl. 173-162.00H.  
Ando, Atsuo: See—  
Yoshitsugu, Noritada; and Ando, Atsuo, 4,421,343, Cl. 280-752.000.  
Ando, Toshiaki: See—  
Furuto, Yoshio; Meguro, Shinichiro; Suzuki, Takuya; Ito, Ikuo; Ando, Toshiaki; Nishi, Masataka; and Shimamoto, Susumu, 4,421,946, Cl. 174-128.00S.  
Andrew, Sydney P. S., to Imperial Chemical Industries PLC. Cooling towers, 4,421,303, Cl. 261-109.000.  
Andrews, Robert B., Jr.: See—  
Keller, Bruce E.; Andrews, Robert B., Jr.; Wylie, Charles F.; and Brinkerhoff, Kenneth W., 4,422,150, Cl. 364-475.000.  
Anglo Mineral Resources, Inc.: See—  
Hunzel, Larry B., 4,421,724, Cl. 423-22.000.  
Ankeny, Donald: See—  
Lehnert, Stanley E.; and Ankeny, Donald, 4,422,020, Cl. 315-371.000.  
Antonazzi, Frank J.; and Ohnesorge, David H., to Bendix Corporation. The Pressure transducer with an invariable reference capacitor, 4,422,125, Cl. 361-283.000.  
Antunez, Bruce A. Float valve assembly with flow control and volume balancing means, 4,420,845, Cl. 4-366.000.  
Aoki, Hiroyuki: See—  
Ikezawa, Kenji; Takao, Hiroshi; Aoki, Hiroyuki; and Kimura, Shinji, 4,421,787, Cl. 427-126.200.  
Aoshima, Terutaka: See—  
Oota, Hiroyuki; Aoshima, Terutaka; Yamamori, Kenji; and Narita, Ryuho, 4,421,974, Cl. 219-441.000.  
Apparatebau Rothenhuhle Brandt & Kritzler GmbH: See—  
Sandmann, Herbert, 4,421,157, Cl. 165-4.000.  
Appels, Johannes A.: See—  
Vaes, Henricus M. J.; Appels, Johannes A.; and Ludikhuijs, Adrianus W., 4,422,089, Cl. 357-22.000.  
Appor Limited: See—  
Williamson, Audley B.; Banks, Stewart; and Rice, Francis J., 4,421,249, Cl. 222-88.000.  
Arai, Sakuji: See—  
Kajitani, Ikuo; Hayashi, Tadayoshi; Arai, Sakuji; and Hirayama, Yutaka, 4,420,933, Cl. 60-302.000.  
Arai, Yoshio; Kataoka, Hiroyuki; and Endo, Nobuaki, to Fuji Xerox Co., Ltd. Oblique projection original and oblique projection original forming apparatus and method, 4,422,153, Cl. 364-525.000.  
Araki, Toshio; and Fujikawa, Kenji, to Canon Kabushiki Kaisha. Electrical resistance regulator, 4,422,064, Cl. 338-162.000.  
Aral, Gurcan, to Measurex Corporation. Optimization of steam distribution, 4,421,068, Cl. 122-448.00B.  
Aramaki, Yoshimitsu; and Harao, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron tube having a photoelectric screen, 4,422,008, Cl. 313-524.000.  
Arashi, Norio: See—  
Komuro, Takeo; Gomi, Kenichi; Arashi, Norio; Akimoto, Hidetoshi; Hishinuma, Yukio; Inuma, Hajime; and Kanda, Osamu, 4,421,732, Cl. 423-569.000.  
Arbed S.A.: See—  
Metz, Paul; Legille, Edouard; Schleimer, Francois; and Weiner, Antoine, 4,421,555, Cl. 75-53.000.  
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., to Abbott Laboratories. Catalyst for making polyurethanes, 4,421,673, Cl. 502-167.000.  
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Archuleta, Jacobo R.: See—  
Potter, Robert M.; Archuleta, Jacobo R.; and Fink, Conrad F., 4,421,982, Cl. 250-260.000.  
Argela', Gianluigi: See—  
Buzio, Pierpaolo; Edefonti, Lucio; and Argela', Gianluigi, 4,421,780, Cl. 427-40.000.  
Ankawa, Tetsuro; and Yamada, Hideyuki, to Nippon Air Brake Co., Ltd. Brake fluid pressure control apparatus in skid control system, 4,421,361, Cl. 303-92.000.  
Arima, Sumitsugu; Tsuda, Hiroshi; and Fukunaga, Yukio, to Nissan Motor Company, Limited. Steering wheel with switch assembly, 4,421,960, Cl. 200-61.540.  
Armco Inc.: See—  
Dahlke, Milton F., 4,422,173, Cl. 373-94.000.  
Galle, Edward M., Jr., 4,421,164, Cl. 166-118.000.  
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Armstrong World Industries, Inc.: See—  
Bolgiano, Nicholas C.; and Sigman, William T., 4,421,782, Cl. 427-53.100.  
Armeson, Leonard A.: See—  
Pryputsch, Gunter G.; Leila, Lennox M.; Parkinson, Gerald E.; and Armeson, Leonard A., 4,421,018, Cl. 99-447.000.  
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Arnoldi, Wilhelm: See—  
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- Beavers, John A.; and Witten, Raymond L., to Hughes Tool Company. Submersible pump seal section with multiple bellows. 4,421,999, Cl. 310-87.000.
- Becker, Philip D., to Buell Industries, Inc. Method and apparatus for manufacturing welded capped wheel nuts. 4,420,848, Cl. 10-72.00R.
- Beckman Instruments, Inc.: See—  
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- Becton Dickinson and Company: See—  
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- Beecham Group Limited: See—  
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- Bell & Howell Company: See—  
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- Starai, Rudolph, 4,422,026, Cl. 318-640.000.
- Bell, John R., III: See—  
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- Bell Telephone Laboratories, Incorporated: See—  
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- Craighead, Harold G.; and Howard, Richard E., 4,422,159, Cl. 365-127.000.
- Shoji, Masakazu, 4,422,141, Cl. 364-200.000.
- Van Bosse, John G., 4,421,951, Cl. 179-2.0DP.
- Wallace, Robert L., Jr., 4,421,957, Cl. 179-121.00D.
- Bellah, Glen R.; Sobol, Lawrence M.; Idelman, Lloyd B.; and Thanh, Vo V., to International Harvester Co. Park lock interlock control system. 4,421,215, Cl. 192-4.00A.
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- Bendix Corporation, The: See—  
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- Hoffman, Fred W.; and Barrios, Raphael A., 4,421,211, Cl. 188-79.50K.
- Lewis, Donald J.; and Phipps, Jack R., 4,421,280, Cl. 239-585.000.
- Moore, Robert G., Jr., 4,421,089, Cl. 123-454.000.
- Ratchford, Lloyd G.; and Werth, Dee A., 4,421,373, Cl. 339-94.00M.
- Sanford, Richard; and Bourdon, Normand C., 4,421,378, Cl. 339-217.00R.
- Winner, Joe K., 4,422,073, Cl. 340-870.210.
- Benedikter, Lothar; and Kutter, Eberhard, to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung. Method of treating coronary heart disease with imidazo(4,5-b)pyridines. 4,421,755, Cl. 424-256.000.
- Benezra, Leo L.: See—  
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- Benkendorf, Sol; Calamito, Frank A.; and Zaccaria, Carmine M. Nitrocellulose lacquer composition containing gelatin and acrylic copolymers. 4,421,881, Cl. 524-24.000.
- Bennett, Peter C.: See—  
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- Benschoter, Barry R.: See—  
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- Berg, Norman J.; Abramowitz, Irwin J.; Casseday, Michael W.; and Lee, John N., to United States of America, Army. Acousto-optic time integrating frequency scanning correlator. 4,421,388, Cl. 350-358.000.
- Bergamini, John V. W. Roll-out layered expansible membranes (ROLEM). 4,421,203, Cl. 181-284.000.
- Bergwerksverband GmbH: See—  
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- Berkovits, Barouh V.; and McDonald, Ray S. Tachycardia treatment. 4,421,114, Cl. 128-419.0PG.
- Berns, Joseph F., Jr.: See—  
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- Bertin, Patrice; and Ledamoise, Claude, to Valeo Societe Anonyme. Power assisted steering device for a vehicle. 4,421,191, Cl. 180-132.000.
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- Bethlehem Steel Corporation: See—  
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- Bianchin, Christian; Deneville, Alain F.; and Gerard, Philippe, to Commissariat a l'Energie Atomique; and Agence Nationale de Valorisation de la Recherche (ANVAR). Transparent material having electrical conductivity which is dependent on the dose of optical radiation received. 4,421,677, Cl. 252-501.100.
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- Bildjukevich, Viktor L.; Turovsky, Leonid N.; Meleshko, Vyacheslav J.; Yakimovich, Dmitry T.; Lebedkova, Valentina A.; Demidovich, Boris K.; Plavnik, Gennady Z.; Dubrovsky, Nikolai N.; Proskolovich, Evgeny A.; and Pivovarov, Alexander I. Method of and apparatus for producing granulated products from a suspension. 4,421,594, Cl. 159-4.00R.
- Billar, Bruce A.; Scherer, Henry W.; and Swanson, Roy, to S&C Electric Company. Apparatus for associating an electrical device with a mounting therefor. 4,422,062, Cl. 337-171.000.
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- Billingsley, James D.; and Eden, Dayton D., to Vought Corporation. Dark field infrared telescope. 4,421,985, Cl. 250-353.000.
- Bingham, John A. C.; and Kurzweil, Jack H., to Racal-Vadic, Inc. Constrained adaptive equalizer. 4,422,175, Cl. 375-14.000.
- Binnig, Gerd; Nievergelt, Hermann; Rohrer, Heinrich; and Weibel, Edmund, to International Business Machines Corporation. Piezoelectric travelling support. 4,422,002, Cl. 310-328.000.
- Biotrine Corporation: See—  
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- Birgel, Warren J.; and Hajec, Chester S., to VS Systems, Inc. Windmill driven eddy current heater. 4,421,967, Cl. 219-10.510.
- Bish, Steven S.; Sagel, Paul J.; and Trinh, Toan, to Procter & Gamble Company. The floor mat with flock fibers adhesively bonded onto a thin polymeric film. 4,421,809, Cl. 428-90.000.
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- Bissett, Fred L. Tread powered ski. 4,421,193, Cl. 180-192.000.
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- Todero, Giuseppe, 4,420,885, Cl. 30-381.000.
- Blaszkowski, Henry. Suction cup. 4,421,288, Cl. 248-206.00R.
- Blazy, Pierre; Houot, Robert; Jousselet, Robert; Haicour, Philippe; and Tracez, Jean, to Ceca S.A. Enrichment process by flotation of phosphate-containing ores with carbonated and/or siliceous gangues, by amphoteric collecting agents. 4,421,641, Cl. 209-166.000.
- Bloomer, Milton D., to General Electric Company. Load resistance control circuitry. 4,421,993, Cl. 307-126.000.
- Bluthe, Norbert; Gore, Jacques; and Malacria, Max, to Rhone-Poulenc Sante. Process for the preparation of 8-ethylenic carbonyl compounds. 4,421,934, Cl. 568-341.000.
- Byltas, George C., to Shell Oil Company. Method of removing hydrogen sulfide from gases utilizing a stabilized metal chelate solution. 4,421,733, Cl. 423-573.00R.
- Bock, Anne B., to Western Electric Company, Inc. Handling bodies containing bonding material. 4,421,266, Cl. 228-180.00A.
- Bodas, Janos; Papp, Istvan; Palfalvi, Gyorgy; and Vadas, Zoltan, to Energiagazdalkodasi Intezet. Plant for utilization of low-potential waste heat of a gas-pipeline compressor station. 4,420,950, Cl. 62-402.000.
- Boden, Richard M., to International Flavors & Fragrances Inc. Smoking tobacco composition or smoking tobacco article containing 1-ethoxy-1-ethanol acetate and acetaldehyde. 4,421,125, Cl. 131-276.000.
- Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Methyl substituted-2-oxohexane derivatives and processes for preparing and using same. 4,421,679, Cl. 252-522.00R.
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- Boeing Company, The: See—  
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- Dickey, Fred M.; and Postlethwaite, Darrell M., 4,421,409, Cl. 356-354.000.
- Griest, Alfred H., Jr., 4,421,349, Cl. 292-19.000.
- Hanke, Charles R., 4,422,147, Cl. 364-440.000.
- Keller, Bruce E.; Andrews, Robert B., Jr.; Wylie, Charles F.; and Brinkerhoff, Kenneth W., 4,422,150, Cl. 364-475.000.
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- Nelsen, Murray D.; Kunze, Robert K., Jr.; Olsen, Robert F.; and Rushwald, Ira B., 4,421,201, Cl. 181-214.000.
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- Bohannon, Robert C. Hydrogen azide-oxygen fuel cell. 4,421,829, Cl. 429-15.000.
- Bohme, Georg; Kohler, Wolfgang; and Salaske, Manfred, to Kernforschungszentrum Karlsruhe G.m.b.H. Operating arm for a manipulator with length adjustment by telescoping means. 4,421,445, Cl. 414-4.000.
- Bohme, Rolf: See—  
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- Boisvenue, Rudolph J., to Eli Lilly and Company. Methods for controlling fire ants. 4,421,759, Cl. 424-273.00R.
- Bokelmann, Horst, to Metzeler Schaum GmbH. Foam molding machine. 4,421,468, Cl. 425-143.000.
- Bokros, Jack C., to Carbomedics, Inc. Plug-type fluid access devices. 4,421,507, Cl. 604-52.000.
- Bolgiano, Nicholas C.; and Sigman, William T., to Armstrong World Industries, Inc. Process for providing improved radiation-curable surface coverings and products produced thereby. 4,421,782, Cl. 427-53.100.
- Bond, Curtis J.; and Ulm, John G., to Liqui-Box Corporation. Quick-disconnect service-line connector and valve assembly. 4,421,146, Cl. 141-349.000.
- Bonerb, Timothy C.; and Bonerb, Vincent C. Bin for free flowing material. 4,421,250, Cl. 222-95.000.
- Bonerb, Vincent C.: See—  
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- Bonk, Leroy V.: See—  
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- Bonner, Jack D. Spa system. 4,420,846, Cl. 4-542.000.
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- Bradley, Richard S., to Weigh-Tronix, Inc. Fork lift scale. 4,421,186, Cl. 177-139.000.
- Bradt, Gordon E. Kinetic clock sculpture. 4,421,421, Cl. 368-229.000.
- Brager, Howard R.: See—  
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- Brandenstein, Manfred: See—  
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- Brandstetter, Franz: See—  
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- Briant, Jacqueline L.; and Asher, Jeffrey A., to General Electric Company. Humidity sensor. 4,422,129, Cl. 361-433.000.
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- Brixius, Darryl W., to Tarkett AB. Water based ink compositions using organic acid. 4,421,561, Cl. 106-27.000.
- Broadwith, Brian E.; and Skinner, Robert T. J., to Lucas Industries Limited. Fuel injection pumping apparatus. 4,421,084, Cl. 123-365.000.
- Broberg, Dewey O., Jr., to Du-Bro Products, Inc. Device for forming eyes and loops in wire. 4,421,145, Cl. 140-104.000.
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- Brouwer, Charles W., to Leesa Corporation. Fabric selvage forming. 4,421,141, Cl. 139-54.000.
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- Brown International Corporation: See—  
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- Brown, Milton F., Jr. Rotary actuation device. 4,421,342, Cl. 280-740.000.
- Brown, William F. Three-fingered spinner game of chance. 4,421,316, Cl. 273-274.000.
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- Bruhn, Hans-Athanas: See—  
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- Bruhne, Ulrich; Schoppel, Roman; and Harloff, Bernd, to Daimler-Benz Aktiengesellschaft. Arrangement for limiting bumper movement. 4,421,351, Cl. 293-132.000.
- Bruninx-Poesen, Leonce M. J.; Drop, Peter C.; Kaldenhoven, Lambert C. I.; Lorenz, Roland; and Endevoets, Willy J. C., to U.S. Philips Corporation. High-pressure mercury vapor discharge lamp. 4,422,011, Cl. 313-642.000.
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- Brunton, Billy R.; and Snyder, David E., to Axelson, Inc. Heat sensitive gate valve. 4,421,134, Cl. 137-72.000.
- Bryce, Rodney H.: See—  
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- Buell Industries, Inc.: See—  
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- Buffet, Jean, to Air Industrie. Thermo-electric installations. 4,420,940, Cl. 62-3.000.
- Buhler, Ulrich: See—  
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- Buhr, Gerhard; and Geus, Marie-Luise, to Hoechst Aktiengesellschaft. Process for the preparation of relief copies. 4,421,844, Cl. 430-326.000.
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- Burke, John A., to Greene, Tweed & Co., Inc. Oil well string member with static seal. 4,421,323, Cl. 277-12.000.
- Burke, John A., to Greene, Tweed & Co., Inc. Antifriction fluid seal assembly. 4,421,330, Cl. 277-188.00R.
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- Burkhead, Lowell E., to Rockwell International Corporation. Transformer coupled up-down converter. 4,422,139, Cl. 363-21.000.
- Burkholder, Harvey R.; and Fanslow, Glenn E., to Iowa State University Research Foundation, Inc. Method of recovering adsorbed liquid compounds from molecular sieve columns. 4,421,651, Cl. 210-672.000.
- Burleigh, Malcolm B., to Minnesota Mining and Manufacturing Company. Colorimetric indicators. 4,421,719, Cl. 422-57.000.
- Burlington Industries, Inc.: See—  
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- Pugh, Charles D., 4,421,144, Cl. 139-370.200.
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- Burril, Peter M.; and Westall, Stephen, to Dow Corning Limited. Treating textile fibres. 4,421,796, Cl. 427-387.000.
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- Burton, Colin K., to S. C. Johnson & Son, Inc. Hair conditioning composition and process for producing the same. 4,421,740, Cl. 424-70.000.
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- Butzen, Thomas J. Vent damper drive. 4,421,096, Cl. 126-285.00B.
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- Byrne, Kenneth G., to United States of America, Energy. Explosive actuated valve. 4,421,005, Cl. 89-1.00B.
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- Noda, Atsushi; and Hanakata, Takayoshi, 4,421,428, Cl. 400-120.000.
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- Carter, Randall R.: See—  
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- Casati, Francois M.: See—  
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- Casio Computer Co., Ltd.: See—  
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- Castellucci, Nicholas T.: See—  
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- Chappell, Richard C.: See—  
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- Fabrique Nationale Herstal: See—  
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- Falconer, David G. Combination anti-friction bearing and force-generating mechanism, 4,421,207, Cl. 185-29.000.
- Fanslow, Glenn E.: See—  
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- Far West Botanicals, Inc.: See—  
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- Farmer, Digby M.: See—  
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- Farnham, Robert A., to Chevron Research Company. Method and apparatus for supporting radial reactor centerpipes to accommodate thermal cycling, 4,421,723, Cl. 422-218.000.
- Farquhar, Robert L.; and Ball, David N., to Gravinier, Limited. Fire and explosion and detection suppression, 4,421,984, Cl. 250-339.000.
- Farrell, Roger A.: See—  
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- Feder, Friedrich R., to Wedco Inc. Heat treating of material in finely divided form, 4,421,703, Cl. 264-68.000.
- Federmann, Helmut; and Bausch, Joachim, to Felten & Guillaume Energietechnik GmbH. Fiber-reinforced drive shaft, 4,421,497, Cl. 464-181.000.
- Feenstra, Johannes; Tuin, Hermanus N.; and Schrederhof, Antonio, to U.S. Philips Corporation. Method of manufacturing printing heads for ink jet printers, 4,421,706, Cl. 264-157.000.
- Fehr, Ernst. Apparatus for manufacturing a yarn, 4,420,928, Cl. 57-401.000.
- Feil, Carol: See—  
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- Feinleib, Sidney. Mobile copier, 4,421,406, Cl. 355-84.000.
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- Ferris, Tom E. Auxiliary load-carrying apparatus, 4,421,331, Cl. 280-81.00R.
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- Finike Italiana Marposso S.p.A.: See—  
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- Fink, Conrad F.: See—  
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- Finkle, Louis J. Adjustable shock absorbing handlebar structure, 4,420,989, Cl. 74-551.200.
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- Fiorucci, Louis C.; and Morgan, Michael J., to Olin Corporation. Nonaqueous purification of mixed nitrate heat transfer media, 4,421,662, Cl. 252-70.000.
- Firestone Tire & Rubber Company, The: See—  
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- Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Multiple printing mode printing machine system, 4,421,027, Cl. 101-142.000.
- Fischer & Porter Company: See—  
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- Fischer, Werner K.; and Bosshard, Ernst, to Swiss Aluminum Ltd. Lower part of a fused salt electrolytic cell, 4,421,625, Cl. 204-243.00R.
- Fisons Limited: See—  
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- Fives-Cail Babcock: See—  
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- Fladt, Carl S.: See—  
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- Fleck, Franz, to ITT Industries, Inc. Brake control valve arrangement, 4,421,212, Cl. 188-152.000.
- Fleishman, Leonard; and Lynch, Henry J., to Jinnings, Orin H., a part interest. Pile driver, 4,421,180, Cl. 173-124.000.
- Fluid Power Research, Inc.: See—  
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- Flutec Fluidtechnische Gerate GmbH: See—  
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- FMC Corporation: See—  
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- Smith, Harry M.; and Williams, Raymond D., 4,421,936, Cl. 568-678.000.
- Wittman, Leroy L.; and Jensen, Lyle B., 4,421,241, Cl. 212-186.000.
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- Fohlen, George M.: See—  
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- Fontanesi, Maurizio: See—  
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- Forthstar Limited: See—  
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- Forsy, Edward L., to McDonnell Douglas Corporation. Multiple axis actuator, 4,421,997, Cl. 310-12.000.
- Foster Wheeler Energy Corporation: See—  
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- Fouassier, Claude; and Saubert, Bernadette, to Rhone Poulenc Industries. Luminescent substances having a base of double borate of magnesium and rare earths and low pressure mercury vapor lamp containing the same, 4,422,007, Cl. 313-486.000.
- Foucher, Gerard; and Hermand, Michel, to Alsthom-Atlantique. Fixed fad thrust bearing, 4,421,425, Cl. 384-123.000.
- Fox, Robert J.: See—  
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- Frank, Xaver. Support leg for mobile conveyors, 4,421,290, Cl. 248-558.000.
- Frank, George, to Simplex Time Recorder Co. Time recorder registration apparatus, 4,422,079, Cl. 346-1.100.
- Franz, John E.; and Kaufman, Robert J., to Monsanto Company. Amido and hydrazido derivatives of N-trifluoroacetyl-N-phosphinothioylmethylglycine esters, 4,421,549, Cl. 71-87.000.
- Frederick, Stanley H., to International Telephone and Telegraph Corporation. Swimming pool filtering system, 4,421,643, Cl. 210-138.000.

- Frediani, John K.: See—  
Couper, Robert A.; Frediani, John K.; and Lillie, Terrance L., 4,422,070, Cl. 340-723.000.
- Fredriksen, Nils, to Claas OHG. Self-propelled multiple-purpose agricultural machine with displaceable driver's cabin, 4,421,188, Cl. 180-327.000.
- Freemann, Johannes; and Malcherek, Dieter, to Carl Schmale KG. Automatic method and apparatus for feeding a textile piece to a sewing machine, 4,421,044, Cl. 112-262.300.
- Frey, Ernest. Fluid level control apparatus, 4,421,459, Cl. 417-38.000.
- Friauf, Walter S.; and Brooks, Rodney A., to United States of America, Health and Human Services. Nuclear pulse discriminator, 4,421,986, Cl. 250-369.000.
- Frick, Adolf, to Stoehchio-matic AG. Burner for the combustion of liquid fuels in the gaseous state, 4,421,475, Cl. 431-207.000.
- Friemel, Wolfgang F. R.; and Praxl, Werner O., to Dr. Werner Freyberg Chemische Fabrik Delitla Nachf. Phosphine producing pesticide and method of manufacture therefor, 4,421,742, Cl. 424-128.000.
- Frito-Lay, Inc.: See—  
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- Fritz, Harald: See—  
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- Frush, Don R.; and Coffman, Keith B., to Chore-Time Equipment, Inc. Nipple waterer, 4,421,060, Cl. 119-72.500.
- Fuji Electric Co., Ltd.: See—  
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- Fuji Jukogyo Kabushiki Kaisha: See—  
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- Fuji Photo Film Co., Ltd.: See—  
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- Fuji, Tsumeharu; Tsumura, Masakatsu; and Ishikawa, Takayoshi, to Matsushita Electric Industrial Co., Ltd. Band-pass filter having multilayered coil structures, 4,422,059, Cl. 333-202.000.
- Fuji Xerox Co., Ltd.: See—  
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- Fujii, Hiroyuki; Shimakawa, Joji; Hara, Yukio; and Kobayashi, Masatoshi, to Kabushiki Kaisha Suwa Seikosha, and Matsushimakogyo Kabushiki Kaisha. Quartz crystal oscillator, 4,421,621, Cl. 204-192.00C.
- Fujii, Koza: See—  
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- Fujii, Tsuneo: See—  
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- Fujikawa, Kenji: See—  
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- Fujimaki, Akira, to Zaidan Hojin Minsei Kagaku Kyokai. Substance effective for prevention or therapy of nephritis and method for preparation thereof, 4,421,683, Cl. 260-112.00R.
- Fujimori, Yukio: See—  
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- Fujioka, Masanobu: See—  
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- Fujishima, Tooru, to Hitachi, Ltd. Time base error correcting apparatus for video player, 4,422,104, Cl. 358-322.000.
- Fujita, Naoya: See—  
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- Fujitani, Yugo: See—  
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- Fujitsu Fanuc Limited: See—  
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- Fujitsu Limited: See—  
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Monma, Hideo; Takahashi, Masayuki; and Ishiguro, Masato, 4,422,038, Cl. 324-73.00R.
- Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, to Toyo Jozo Kabushiki Kaisha. Deoxydesmycosin, 4,421,911, Cl. 536-7.100.
- Fukuda, Kunio: See—  
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- Fukunaga, Yukio: See—  
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- Fukushima, Tom Y.: See—  
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- Fulkerson, Gregory M.: See—  
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- Funatsu, Tsuneo, to Fujitsu Limited. Method of producing an IIL semiconductor device utilizing self-aligned thickened oxide patterns, 4,420,874, Cl. 29-576.00W.
- Furuhashi, Shoji: See—  
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- Furukawa Electric Co., Ltd.: See—  
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- Furuto, Yoshio; Meguro, Shinichiro; Suzuki, Takuya; Ito, Ikuo; Ando, Toshinari; Nishi, Masataka; and Shimamoto, Susumu, 4,421,946, Cl. 174-128.00S.
- Nojiri, Akio; Sawasaki, Takashi; Noguchi, Isamu; Onobori, Shinji; and Sasazima, Junnosuke, 4,421,867, Cl. 521-82.000.
- Furukawa, Kaoru: See—  
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- Furukawa, Yoshio, to Hitachi, Ltd. Thrust bearing device, 4,421,426, Cl. 384-219.000.
- Furuto, Yoshio; Meguro, Shinichiro; Suzuki, Takuya; Ito, Ikuo; Ando, Toshinari; Nishi, Masataka; and Shimamoto, Susumu, to Furukawa Electric Co., Ltd., The; and Japan Atomic Energy Research Institute. High current capacity superconductor, 4,421,946, Cl. 174-128.00S.
- Futamura, Yoshisumi; Komeiji, Shigeki; Noro, Shuhei; Hasegawa, Junzo; Matsunari, Fumio; and Ikeda, Toshiaki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Toyota Chuo Kenkyusho Kabushiki Kaisha. Tripod type constant velocity universal joint, 4,421,494, Cl. 464-111.000.
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- Gaede, Hans: See—  
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- Gainutdinov, Garifulla K.: See—  
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- Gale, Anthony G.: See—  
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- Galie, Louis M., to System Development Corporation. Method and means for interrogating a layered data base, 4,422,158, Cl. 364-900.000.
- Galle, Edward M., Jr., to Armco Inc. Weight-set pack-off unit, 4,421,164, Cl. 166-118.000.
- Galli, Graziano: See—  
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- Gamon, Vicente: See—  
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- Gappa, Gunther: See—  
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- Garbacz, Michael, to Zenith Radio Corporation. Surface wave filter with reduced substrate size, 4,422,057, Cl. 333-194.000.
- Garcea, Giampaolo; Banfi, Ambrogio; and Di Stefano, Michele L., to Alfa Romeo S.p.A. Automatic timing variator for an internal combustion engine, 4,421,074, Cl. 123-90.150.
- Garcia, Guillermo E. Magnetically attachable timing gauge for a fuel injector, 4,420,973, Cl. 73-119.00A.
- Garcia, Roger, Jr., to General Electric Company. Battery flow restrictor, 4,421,831, Cl. 429-70.000.
- Garrett Corporation, The: See—  
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- Gartner, Eckhard: See—  
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- Gartner, Robert; Maass, Klaus-Dieter; and Senninger, Georg, to Hoechst Aktiengesellschaft. Cylindrical vessel with a base ring and with a coupling device, 4,421,234, Cl. 206-509.000.
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- Gault, Roger T.: See—  
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- Gausepohl, Hermann: See—  
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- Gazzara, Peter: See—  
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- Gedeon, Andras; Lundell, Ulf; and Pilenvik, Goran, to Engstrom Medical Aktiebolag. Method and apparatus for controlling lung ventilators, 4,421,113, Cl. 128-204.230.
- Gedye, Laurence R., to L.R. & N.R. Gedye Pty. Limited. Filter housing, 4,421,644, Cl. 210-233.000.
- Geer, Marjorie. Compact case with interchangeable cosmetic inserts, 4,421,127, Cl. 132-83.00R.



- Gehring, Heinz, to Maschinenfabrik Gehring Gesellschaft mit beschränkter Haftung & Co. Kommanditgesellschaft. Apparatus for holding workpieces during honing work. 4,420,912, Cl. 51-227.00R.
- Gehrke, Willard H.: See—  
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- General Dynamics Corporation, Electronics Division: See—  
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- General Electric Company: See—  
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Castleberry, Donald E., 4,420,897, Cl. 40-427.000.  
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Knecht, David C., 4,422,004, Cl. 313-25.000.  
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- General Foods Corporation: See—  
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- Genter, Claude: See—  
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- Gentric, Alain; and Frances, Andre. Commutator with several layers of cross-points. 4,421,965, Cl. 200-175.000.
- Genzling, Claude; and Mathieu, Michel. Cyclists' gloves. 4,420,843, Cl. 2-161.00A.
- George, David A.: See—  
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- Georgia-Pacific Corporation: See—  
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- Gerard, Francois; and Machat, Jean-Yves, to Compagnie Generale des Etablissements Michelin. Process for producing electrode with current outlets. 4,421,609, Cl. 204-16.000.
- Gerard, Philippe: See—  
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- Gerberding, Karl: See—  
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- Gerhold, Bruce W.: See—  
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- Gerry, Martin E. Distributed inductive-capacitive high voltage ignition cable. 4,422,054, Cl. 333-12.000.
- Geschwender, Mark J. Model flight simulator. 4,421,485, Cl. 434-32.000.
- Geus, Marie-Luise: See—  
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- Gfeller, Fritz R., to International Business Machines Corporation. Bus arrangement for interconnecting circuit chips. 4,422,088, Cl. 357-19.000.
- Ghyczy, Miklos; Erdos, Adorjan; and Heidemann, Gunter, to A. Nattermann & Cie. GmbH. Inflammation-preventing pharmaceutical composition of oral administration. 4,421,747, Cl. 424-199.000.
- Gibbons, Gregory C.: See—  
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- Gilbert, David J.; and Hollingsbee, Derek A., to Smith and Nephew Associated Companies Limited. Pharmaceutical compositions. 4,421,741, Cl. 424-104.000.
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- Gilman, Thomas; and Miller, Frank N., to Kendall Company, The. Scrub brush. 4,420,853, Cl. 15-111.000.
- Gilson, Robert E. Liquid handling apparatus. 4,422,151, Cl. 364-496.000.
- Giskehaug, Karl J.; Loiten, Kjell O.; and Mejdell, Glor T., to Norsk Hydro a.s. Method and apparatus for enriching compounds of low water solubility from aqueous suspensions of substantially inorganic solid substances. 4,421,649, Cl. 210-634.000.
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- Glacier Metal Company Limited, The: See—  
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- Glassman, Joel. Snap shoe. 4,420,894, Cl. 36-12.000.
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- Gleitsmann, Virginia E., executrix: See—  
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- Glori-Us Sportswear, Inc.: See—  
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- Golden, Raymond, to Babcock & Wilcox Company, The. Insertion-withdrawal mechanism for rack mounted circuit boards. 4,421,372, Cl. 339-75.0MP.
- Goldfarb, Adolph E. Coin clock. 4,421,415, Cl. 368-62.000.
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- Gordbegli, Manochehr, to Teledyne Industries, Inc. High efficiency boiler. 4,421,066, Cl. 122-264.000.
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- Gorondy, Emery J., to E.I. Du Pont de Nemours & Co. Printing process. 4,421,515, Cl. 8-444.000.
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- Gotomyo, Yasuo, to Toyo Kogyo Co., Ltd. Foot-operated, latch releasing mechanism for automobile doors. 4,421,350, Cl. 292-123.000.
- Gottschalk, Bernard, to United States of America, Energy. Timing discriminator using leading-edge extrapolation. 4,421,995, Cl. 307-361.000.
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- Graham, Boynton, to Du Pont de Nemours, E. I., and Company. Acrylic plastisols and organosols and photosensitive compositions and elements made therefrom. 4,421,619, Cl. 204-159.160.
- Graham, Donald R.: See—  
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- Graham, Paul M.; and Krinski, Thomas L., to Ralston Purina Company. Heat coagulable paper coating composition with a soy protein adhesive binder. 4,421,564, Cl. 106-154.00R.
- Graham, Robert L.: See—  
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- Granger, Donald W.: See—  
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- Granger, Erno: See—  
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- Granzow, Robert H.: See—  
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- Gratzel, Michael; and Kiwi, John, to Engelhard Corporation. Photolytic production of hydrogen from water. 4,421,617, Cl. 204-157.10R.
- Graue, William D.; and Oros, Leo J. Gas diffuser. 4,421,696, Cl. 261-123.000.
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- Graviner, Limited: See—  
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- Grayson, James I.; and Dinkel, Rolf, to Lonza Ltd. Process for the production of 3-picoline. 4,421,921, Cl. 546-251.000.
- Greber, Jorg F.; and Winkhaus, Gunter, to Vereinigte Aluminium-Werke Aktiengesellschaft. Resinous compositions containing modified alumina hydrate crystals. 4,421,876, Cl. 523-402.000.
- Greding, Robert; and Bryce, Rodney H., to Canadian General Electric Company Limited. Slitter indexing system. 4,420,996, Cl. 83-13.000.
- Greene, Tweed & Co., Inc.: See—  
Burke, John A., 4,421,323, Cl. 277-12.000.  
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- Gregorian, Roubik: See—  
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- Greier, Alfred H., Jr., to Boeing Company, The. Cowling latch. 4,421,349, Cl. 292-19.000.
- Grein, Arpad: See—  
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- Greskovich, Charles D.: See—  
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- Grimm, William G.; and Pott, Ronald W. Prefabricated adjustable handrail assembly. 4,421,302, Cl. 256-67.000.
- Grimmer, Johannes: See—  
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- Grootjans, Jacques F. J.: See—  
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- Gross, David R., to J. M. Smucker Company, The. Apparatus for the concentration of fruits. 4,421,020, Cl. 99-472.000.
- Grossman, William M.: See—  
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- Grote Manufacturing Company, Inc., The: See—  
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- Gruber, Werner; and Bruhn, Hans-Athanas, to Henkel Kommanditgesellschaft auf Aktien. Cynacrylic acid ester based glues with a content of a diester of a polyoxyalkylene glycol. 4,421,909, Cl. 528-362.000.
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- GTE Laboratories Incorporated: See—  
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- GTE Products Corporation: See—  
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- Guay, George W.: See—  
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- Gubbe, Bernd; Krause, Klaus-Dieter; Schonemann, Otto; and Neidhardt, Rudolf, to Triumph-Adler A.G. fur Büro-und Informationstechnik. Apparatus for locking a keyboard at selected inclinations to a horizontal reference. 4,421,035, Cl. 108-6.000.
- Gudgel, Howard S.; and Guier, William E., to Zena Equipment, Inc. Elevator transfer and support system. 4,421,447, Cl. 414-22.000.
- Guelde, Ted W.: See—  
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- Guenther, Kenneth L.; Zemke, Edward H.; and Warden, Gerald D., to Bell & Howell Company. Label feeder for fan folded documents. 4,421,587, Cl. 156-256.000.
- Guier, William E.: See—  
Gudgel, Howard S.; and Guier, William E., 4,421,447, Cl. 414-22.000.
- Gulden, Peter; Michel, Alfred; and Kostka, Hana, to Siemens Aktiengesellschaft. Gasification burner. 4,421,476, Cl. 431-243.000.
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- Gulf & Western Industries, Inc.: See—  
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- Gulf & Western Manufacturing Company: See—  
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- Gull Airborne Instruments, Inc.: See—  
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- Gunter, John B.; Quinn, George J.; Shields, Edward P.; Thomas, Burton S.; and Winkler, Clifford J., to Westinghouse Electric Corp. Baffle maintenance apparatus. 4,421,715, Cl. 376-245.000.
- Gupta, Desh B.; and Granzow, Robert H., to NCR Corporation. Process for reconditioning of currency and currency. 4,421,824, Cl. 428-211.000.
- Gurries, Raymond A., to Resonant Technology Company. Impact rail forger. 4,420,963, Cl. 72-407.000.
- Gutekunst, Ferdinand; Lehmann, Hans; and Schmid, Rolf, to Ciba-Geigy Corporation. One component systems based on crystalline epoxide resins. 4,421,897, Cl. 525-119.000.
- Guterman, Daniel C., to Texas Instruments Incorporated. High coupling ratio electrically programmable ROM. 4,422,092, Cl. 357-41.000.
- Guttig, Karl M., to Texas Instruments Incorporated. Microprocessor ALU with absolute value function. 4,422,143, Cl. 364-200.000.
- Haber, Edgar; and Khaw, Ban A., to Massachusetts General Hospital, The. Radiolabeled diagnostic compositions and method for making the same. 4,421,735, Cl. 424-1.100.
- Haberkorn, Herbert: See—  
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- Haemonetics Corporation: See—  
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- Hageman, James R.: See—  
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- Hagin, Faust, to M.A.N. Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft. Articulated vehicle, particularly a bus. 4,421,339, Cl. 280-460.00R.
- Haicour, Philippe: See—  
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- Haight, Robert E., to Deere & Company. Relief valve means for rotatable fluid-pressure mechanisms. 4,421,218, Cl. 192-106.00F.
- Hajec, Chester S.: See—  
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- Halewijn, Harry J., to Itek Corporation. Bi-directional clutchless film transport device. 4,421,263, Cl. 226-143.000.
- Hall, Robert D.: See—  
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- Hall, Robert N., to Tosco Corporation. Process for recovering carbonaceous liquids from solid carbonaceous particles. 4,421,603, Cl. 201-12.000.
- Halliburton Company: See—  
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- Nickles, R. Benton, 4,421,138, Cl. 138-89.000.
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- Szarka, David D., 4,421,165, Cl. 166-151.000.
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- Haluska, Loren A.; and Molzahn, Marcelle G., to Dow Corning Corporation. Tintable, dyeable, curable coatings and coated articles. 4,421,893, Cl. 524-588.000.
- Hamada, Satoshi: See—  
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- Hamano, Sachi-yuki; Kitamura, Shinichi; Igarashi, Toshiji; and Nakajima, Yoshikage, to Eisai Co., Ltd. Cyclohexane derivatives, process for preparation thereof and medicines containing these cyclohexane derivatives. 4,421,763, Cl. 424-285.000.
- Hambrecht, Juergen: See—  
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- Hamed, Gary R., to Firestone Tire & Rubber Company, The. Blends of natural and synthetic rubbers. 4,421,900, Cl. 525-218.000.



- Hammer, Edward E., to General Electric Company. Shaped discharge lamp with starting aid. 4,421,010, Cl. 313-594.000.
- Hammerle, Frederick A., to TRW Inc. Two-part panel fastener. 4,420,859, Cl. 24-585.000.
- Hammett, Dillard S., to Sedco, Inc. Auxiliary boom for emergency evacuation. 4,421,051, Cl. 114-264.000.
- Hanakata, Takayoshi: See—  
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- Hanke, Charles R., to Boeing Company. The. Wind shear responsive turbulence compensated aircraft throttle control system. 4,422,147, Cl. 364-440.000.
- Hanko, Leonard: See—  
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- Hanley, William, to Fram Corporation. Method of attaching closure member to filter housing. 4,421,444, Cl. 413-4.000.
- Hansen, James L. Aeration fan mounting system. 4,421,013, Cl. 98-55.000.
- Hansen, Randall C.: See—  
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- Harada, Saburo: See—  
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- Harao, Norio: See—  
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- Harato, Takuo: See—  
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- Hardin, Isaac H. Building spacer. 4,420,921, Cl. 52-749.000.
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- Harringer, Robert V., to Western Electric Company, Inc. Device for opening snap-locked housing sections of a cable connector. 4,420,879, Cl. 29-764.000.
- Harshman, Ronald W.; and Dietrich, Lynn A., to Walter Kidde & Company, Inc. Hydraulic selector valve having joy stick control. 4,421,135, Cl. 137-312.000.
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- Hasegawa, Junzo: See—  
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- Hasegawa, Toru; Muroi, Masayuki; and Tanida, Seiichi, to Takeda Chemical Industries, Limited. Macbecin derivatives. 4,421,687, Cl. 260-239.30B.
- Hashimoto, Hideaki: See—  
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- Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, to Sharp Kabushiki Kaisha. Speech synthesizer timepiece with a single command switch. 4,421,416, Cl. 368-63.000.
- Hashimoto, Takashi: See—  
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- Hasuly, Michael J.; Solarek, Daniel B.; and Jarowenko, Wadym, to National Starch And Chemical Corporation. Warp size. 4,421,566, Cl. 106-213.000.
- Hatakeyama, Yoshiharu; and Kimura, Susumu, to Yoshida Industry Co., Ltd. Method and apparatus for attaching sealing piece onto pour-out hole of plastic closure cap or container. 4,421,705, Cl. 264-153.000.
- Hattori, Hiroyuki: See—  
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- Hattori, Shuzo; Morita, Shinzo; and Fujii, Tsuneo, to Daikin Kogyo Co., Ltd. Process for forming film of fluoroalkyl acrylate polymer on substrate and process for preparing patterned resist from the film. 4,421,842, Cl. 430-296.000.
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- Hauck, Frederick A.: See—  
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- Hauser, Hans, to MTD Products Inc. Transmission filler. 4,420,990, Cl. 74-606.00R.
- Hayashi, Chihiro: See—  
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- Hayashi, Kazuhiko: See—  
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- Hayashi, Tsutomu; Kato, Masaie; and Saito, Mitsuru, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular anti-lock brake device. 4,421,359, Cl. 303-6.00A.
- Hayes, William V., to Dow Chemical Company. The. Preparation of nitroalkanes. 4,421,940, Cl. 568-948.000.
- Haygood, Jerry, to Reed Tubular Products Co. Method for rethreading tubular members. 4,420,865, Cl. 29-402.190.
- Haynes, Andrew, to Baker International Corporation. Valve operable under oppositely directed pressure differentials. 4,421,171, Cl. 166-331.000.
- Hazama, Katashi: See—  
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- Heckmann, Walter: See—  
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- Hector, Roger D.; and Jenkins, Harry H., Jr., to Atari, Inc. Electronic game apparatus using a three-dimensional image. 4,421,317, Cl. 273-313.000.
- Heddon, Will. Modular bowling lane system. 4,421,309, Cl. 273-51.000.
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- Heidemann, Gunter: See—  
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- Heinz, Theodore A., to Rockwell International Corporation. Recirculating ball disc actuator. 4,420,987, Cl. 74-99.00A.
- Heitzman, Charles J., to Auto-Cast International, Ltd. Apparatus for molding concrete articles and the like. 4,421,466, Cl. 425-125.000.
- Helft, John M.; and Noyes, Walter O. Intrusion alarm system for preventing actual confrontation with an intruder. 4,422,068, Cl. 340-514.000.
- Helle, Michel; and Desserre, Jacques, to Compagnie Internationale pour l'Informatique. Integrated magnetic transducer. 4,422,118, Cl. 360-126.000.
- Helsper, Gunter: See—  
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- Heltmach, Reginald C., Jr.: See—  
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- Hembling, William G., to Scott & Fetzer Company. The. Camming scissors. 4,420,884, Cl. 30-266.000.
- Hempel, Hans-Ulrich; and Schmadel, Edmund, to Henkel Kommanditgesellschaft auf Aktien. Powdery antifoaming compositions for aqueous systems, their preparation and use. 4,421,666, Cl. 252-140.000.
- Hench, John E.; and Fukushima, Tom Y., to S. Levy, Inc. Safety monitoring and reactor transient interpreter. 4,421,716, Cl. 376-216.000.
- Henderson, John G. N., to RCA Corporation. Television frequency synthesizer for nonstandard frequency carriers. 4,422,096, Cl. 358-191.100.
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- Herman, Marion J.: See—  
Arter, Nelson K.; Bartholet, Michael A.; Emeigh, Roger D.; and Herman, Marion J., 4,421,264, Cl. 227-2.000.
- Herrmann, Michel: See—  
Foucher, Gerard; and Herrmann, Michel, 4,421,425, Cl. 384-123.000.
- Herndier, Arnold W.: See—  
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- Herold, Wolf-Dietrich, to ESPE Fabrik pharmazeutischer Praeparate GmbH. Apparatus for irradiating dental objects. 4,421,987, Cl. 250-492.100.
- Herrington, Fox J., to Mobil Oil Corporation. Apparatus providing uniform resin distribution in a coextruded product. 4,421,465, Cl. 425-133.100.
- Herrmann, Berthold: See—  
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- Heskett, Don E., to Fluid Power Research, Inc. Fluid treating method. 4,421,652, Cl. 210-687.000.
- Hess, Hans-Peter, to Metallwerk Max Brose GmbH & Co. Window cable driving mechanism. 4,421,299, Cl. 254-342.000.
- Hessberg, Helmut: See—  
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- Hesterlee, Jerry M., to Southwire Company. Apparatus for controlled temperature accumulator for elongated materials. 4,421,304, Cl. 266-103.000.
- Hetman, Thomas, Jr., to Libbey-Owens-Ford Company. Material handling apparatus. 4,421,225, Cl. 198-345.000.
- Heuss, Valentin; and Miller, Helmut, to Escher Wyss Limited. Tidal power plant and method of operating the same. 4,421,990, Cl. 290-53.000.
- Hewitt, Michael J. Cored plastics profiles and manufacture of frames for windows and the like therefrom. 4,420,920, Cl. 52-309.150.
- Hewlett-Packard Company: See—  
Reynolds, Robert S., 4,422,110, Cl. 360-69.000.
- Hibbard, Ray W.; and Hines, Randal C., to Nuclear Systems, Inc. Smart switch. 4,421,992, Cl. 307-41.000.
- Hibi, Toru: See—  
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- Hieronymi, Gabriel C.; and Hansen, Randal C., to Abex Corporation. Flush mountable door latch mechanism. 4,420,954, Cl. 70-150.000.
- Higgins, Bobby L., to Thermwood Corporation. Workpiece gripping mechanism for industrial robots. 4,421,451, Cl. 414-739.000.
- Higuchi, Shigemitsu: See—  
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- Hinchcliffe, Dennis: See—  
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- Hines, Randal C.: See—  
Hibbard, Ray W.; and Hines, Randal C., 4,421,992, Cl. 307-41.000.
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- Hirano, Reiji: See—  
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- Hirano, Takao: See—  
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- Hirata, Yasushi: See—  
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- Hirayama, Yutaka: See—  
Kajitani, Ikuo; Hayashi, Tadayoshi; Arai, Sakuji; and Hirayama, Yutaka, 4,420,933, Cl. 60-302.000.
- Hirose, Noboru, to Brother Kogyo Kabushiki Kaisha. Cyclic drilling machine. 4,421,441, Cl. 408-17.000.
- Hiroshi, Yasuba; Masahiro, Umeda; and Osamu, Yuri, to Matsushita Electric Industrial Co., Ltd. Method of improving image sharpness of an electrophotographic photosensitive plate. 4,421,837, Cl. 430-31.000.
- Hirota, Hajime; and Watanabe, Hiroshi, to Kao Soap Co., Ltd. Liquid detergent composition comprising ammonium alkyl sulfate, polyoxyalkylene alkyl ether and fatty acid dialkanolamide. 4,421,681, Cl. 252-541.000.
- Hirth, Emil: See—  
Pietschmann, Helmut; Schmidt, Manfred; and Hirth, Emil, 4,421,483, Cl. 433-77.000.
- Hishinuma, Yukio: See—  
Komuro, Takeo; Gomi, Kenichi; Arashi, Norio; Akimoto, Hidetoshi; Hishinuma, Yukio; Iinuma, Hajime; and Kanda, Osamu, 4,421,732, Cl. 423-569.000.
- Hitachi Koki Company, Limited: See—  
Matsumoto, Yoshikane; Kobayashi, Tsuneki; Kurosawa, Makoto; and Seino, Minoru, 4,421,430, Cl. 400-121.000.
- Hitachi, Ltd.: See—  
Fujishima, Tooru, 4,422,104, Cl. 358-322.000.
- Furukawa, Yoshio, 4,421,426, Cl. 384-219.000.
- Karasaki, Koichi, 4,421,410, Cl. 356-378.000.
- Komuro, Takeo; Gomi, Kenichi; Arashi, Norio; Akimoto, Hidetoshi; Hishinuma, Yukio; Iinuma, Hajime; and Kanda, Osamu, 4,421,732, Cl. 423-569.000.
- Kuroiwa, Hiroshi; and Oyama, Yoshishige, 4,420,972, Cl. 73-118.000.
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- Yamada, Jun; and Hazama, Katashi, 4,422,000, Cl. 310-313.00D.
- Yoshinaga, Yoichi; Kobayashi, Hiromi; Ueda, Shinjiro; Takada, Yoshihiro; and Nishida, Hideo, 4,421,457, Cl. 415-211.000.
- Hitachi Metals, Ltd.: See—  
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- Hitachi Shipbuilding & Engineering Co., Ltd.: See—  
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- Hochberg, Eric B.: See—  
Grafton, David A.; Hochberg, Eric B.; and Purkis, Ronald E., 4,422,181, Cl. 455-606.000.
- Hochmann, Tibaud: See—  
Boulogne, Jean; Hochmann, Tibaud; Michelet, Jacques; and Morane, Bruno, 4,421,128, Cl. 132-88.500.
- Hocking, Paul R.; Straight, Jay G.; and Moore, Henry P., to Eskimo Pie Corporation. Cookie dispensing apparatus. 4,421,019, Cl. 99-450.400.
- Hodes, Gary: See—  
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- Hodges, Joseph T.: See—  
Newman, Charles J.; and Hodges, Joseph T., 4,422,136, Cl. 362-390.000.
- Hodigal s.a.s. di Luciano Moroni: See—  
Moroni, Ermes, 4,421,793, Cl. 427-272.000.
- Hodogaya Chemical Co., Ltd.: See—  
Jinbo, Susumu; Kohno, Shoichi; and Kashima, Koichi, 4,421,919, Cl. 546-159.000.
- Hoechst Aktiengesellschaft: See—  
Braun, Helmut; Rinno, Helmut; and Stelzel, Werner, 4,421,889, Cl. 524-381.000.
- Buhr, Gerhard; and Geus, Marie-Luise, 4,421,844, Cl. 430-326.000.
- Gartner, Robert; Maass, Klaus-Dieter; and Senninger, Georg, 4,421,234, Cl. 206-509.000.
- Lang, Hans-Jochen; Seuring, Bernhard; and Granzer, Erhold, 4,421,757, Cl. 424-270.000.
- Hoehn, Ernst; McKay, Curtis J.; and Murray, E. Donald. Production of high fructose syrup from inulin involving ultrafiltration. 4,421,852, Cl. 435-99.000.
- Hoff, Herbert L.; and Leaver, Daniel C., to Trane Company. The. Centrifugal oil pump. 4,421,453, Cl. 415-88.000.
- Hoffman, Fred W.; and Barrios, Raphael A., to Bendix Corporation. The. Connection mechanism for automatic slack adjuster. 4,421,211, Cl. 188-79.50K.
- Hoffmann, James A.: See—  
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- Hoffmann-La Roche Inc.: See—  
Le Dain, Michel; and Ritschard, Werner, 4,421,653, Cl. 210-692.000.
- Partridge, John J.; Shiuey, Shian-Jan; and Uskokovic, Milan R., 4,421,690, Cl. 260-397.100.
- Pauling, Horst, 4,421,749, Cl. 424-200.000.
- Hofmann, Peter; and Muller, Wolfgang H. E., to Chemische Werke Huls AG. Process for producing carboxylic acid alkylester after products extensively free from nitrogenated compounds. 4,421,692, Cl. 260-410.90R.
- Hofmann, Peter: See—  
Muller, Wolfgang H. E.; and Hofmann, Peter, 4,421,691, Cl. 260-410.90R.
- Hofstetter, Edward G.: See—  
Parkison, Richard G.; and Hofstetter, Edward G., 4,421,294, Cl. 251-86.000.
- Hogberg, Ebbe T., to Billerud Uddeholm Aktiebolag. Method relating to dissolving molten smelt. 4,421,596, Cl. 162-30.110.
- Hoglund, Per-Erik: See—  
Andersson, Roland; Hoglund, Per-Erik; and Glimskar, Bo, 4,421,181, Cl. 173-162.00H.
- Hogstrom, Per A. W.: See—  
Edstrom, Karl L.; and Hogstrom, Per A. W., 4,422,069, Cl. 340-691.000.
- Hokko Chemical Industry Co., Ltd.: See—  
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Kaneko, Kimiyoshi; Moriyma, Satoru; Kobayashi, Takashi; and Uchiyama, Tsugio, 4,421,750, Cl. 424-207.000.
- Nagai, Shigeki; Yorie, Takashi; Sugiyura, Hisao; Hibi, Toru; Sato, Katsumi; Wada, Takuo; and Miyahara, Masahiko, 4,421,761, Cl. 424-275.000.
- Holbrook, Franklin K., to Brown International Corporation. Citrus juice extractor having means for separating juice pulp and rag from peel. 4,421,021, Cl. 99-504.000.
- Hold, Peter; Tadmor, Zehev; and Valsamis, Lefteris N., to USM Corporation. Process and apparatus for processing plastic and polymeric materials. 4,421,412, Cl. 366-76.000.
- Hollars, Dennis R., to Advanced Coating Technology, Inc. Method of making sputtered coatings. 4,421,622, Cl. 204-192.00P.
- Hollingsbee, Derek A.: See—  
Gilbert, David J.; and Hollingsbee, Derek A., 4,421,741, Cl. 424-104.000.
- Hollister Incorporated: See—  
Schneider, Barry L.; and Beddow, David V., 4,421,509, Cl. 604-317.000.



- Hollister, Kenneth R.: See—  
Ponticello, Ignazio S.; Hollister, Kenneth R.; and Tuites, Richard C., 4,421,915, Cl. 544-317.000.
- Holset Engineering Company Limited: See—  
Ellis, Norman, 4,421,216, Cl. 192-58.00B.
- Holtz, R. Barry, to Spawn Mate, Inc. Nutrient for mushroom growth process for producing same, 4,421,543, Cl. 71-5.000.
- Holupko, Darrell, to General Signal Corporation. High efficiency mixing method, 4,421,414, Cl. 366-348.000.
- Holz, Peter; Patalon, Heinrich; and Hartkopf, Edgar, to Didier Engineering GmbH. Furnace for heating slabs, billets, rough castings and the like, 4,421,481, Cl. 432-239.000.
- Honda, Eiichi: See—  
Fujiwara, Tatsuro; Honda, Eiichi; Sakakibara, Hideo; and Hirano, Takao, 4,421,911, Cl. 536-7.100.
- Honda Giken Kogyo Kabushiki Kaisha: See—  
Aiba, Yasuaki, 4,421,195, Cl. 180-228.000.  
Hayashi, Tsutomu; Kato, Masaie; and Saito, Mitsuru, 4,421,359, Cl. 303-6.00A.  
Isono, Tokio; and Tanaka, Osami, 4,421,338, Cl. 280-279.000.  
Kajitani, Ikuo; Hayashi, Tadayoshi; Arai, Sakuji; and Hirayama, Yutaka, 4,420,933, Cl. 60-302.000.  
Kawasaki, Katsuyoshi, 4,421,194, Cl. 180-215.000.  
Kogure, Katsushige; Suzuki, Kenzo; and Kamimura, Masami, 4,421,080, Cl. 123-306.000.
- Honda, Shoichi: See—  
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- Honeywell Inc.: See—  
Bassett, William W.; and Rask, Dean R., 4,421,268, Cl. 236-10.000.  
Belcourt, Francis J.; and van Dyke, Martin J., 4,422,066, Cl. 340-500.000.  
Clark, Rodney L.; Landis, William R.; Patton, Paul B.; and Yancey, Charles B., 4,422,067, Cl. 340-508.000.  
James, Stephen A., 4,422,126, Cl. 361-323.000.  
Lieb, M. Jeremy, 4,421,432, Cl. 400-492.000.  
Nerheim, Eldon, 4,422,075, Cl. 343-6.00R.  
Podgorski, Theodore J., 4,421,386, Cl. 350-319.000.  
Shavit, Gideon, 4,421,271, Cl. 236-82.000.
- Hoover Company, The: See—  
Buchtel, Dean H., 4,421,964, Cl. 200-157.000.
- Horie, Shigeru; Asano, Takamasa; Ichihashi, Tetsuo; and Katoh, Hideo, to Teijin, Limited. Biaxially oriented polyester films, 4,421,887, Cl. 524-317.000.
- Horman, Lars: See—  
Hallstrom, Stig; and Horman, Lars, 4,421,004, Cl. 86-20.00D.
- Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Zwitterionic quaternary ammonium sulfates and lubricants containing same, 4,421,659, Cl. 252-33.000.
- Horowitz, Carl: See—  
Dichter, Michael; and Horowitz, Carl, 4,421,569, Cl. 148-6.14R.
- Horowitz, Martin: See—  
Orloff, Eugene F.; Horowitz, Martin; and Ritter, Charles H., 4,420,976, Cl. 73-304.00C.
- Horsma, David A.; and Diaz, Stephen H., to Raychem Corporation. Self-heating article with deformable electrodes, 4,421,582, Cl. 156-86.000.
- Horyu, Sakae, to Canon Kabushiki Kaisha. Communication device having coupling means, 4,421,950, Cl. 179-2.0DP.
- Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, to Canon Kabushiki Kaisha. Developing apparatus for electrostatic image, 4,421,057, Cl. 118-657.000.
- Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Video tone control circuit, 4,422,095, Cl. 358-166.000.
- Hostetler, Ronald E., to Crown Zellerbach Corporation. Tri-nip paper-making system, 4,421,600, Cl. 162-111.000.
- Hotsuki, Hideki: See—  
Kawakami, Yoshio; Okamura, Masatoshi; Shiba, Haruo; and Hotsuki, Hideki, 4,422,119, Cl. 360-128.000.
- Hough, George H., to Fortistar Limited. Method and apparatus for conducting remote surveys of the earth's crust, 4,421,981, Cl. 250-253.000.
- Houot, Robert: See—  
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- Howard, Richard E.: See—  
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- Hoxan Corporation: See—  
Kuraoka, Yasuo, 4,421,537, Cl. 62-22.000.
- Hoy, Robert W., to Peabody ABC Corporation. Sound attenuator, 4,421,202, Cl. 181-252.000.
- Hoyrup, S. Johannes; and Krause, Karl A., to Kjeklok Corporation. Apparatus and method for inverting and applying flanged lids to erected cartons, 4,420,924, Cl. 53-307.000.
- Hoyt, Richard E., to Omco, Inc. Bolt type lock puller, 4,420,864, Cl. 29-263.000.
- HPM Corporation: See—  
Richmond, Dennis W., 4,421,467, Cl. 425-136.000.
- Hsu, Sheng T.: See—  
Kressel, Henry; and Hsu, Sheng T., 4,422,161, Cl. 365-200.000.
- Huang, Yueh. Umbrella, 4,421,135, Cl. 135-22.000.
- Hubbard, Leo J., to Precision Handling Devices, Inc. Web feed tractor, 4,421,261, Cl. 226-74.000.
- Hudson Engineering Company: See—  
Napolitano, Pellegrino E., 4,421,325, Cl. 277-27.000.
- Huffman, Robert R., to C T Manufacturing, Inc. Centrifugal pump assembly, 4,421,456, Cl. 415-170.00A.
- Hughes Aircraft Company: See—  
Williams, Barry E.; Evans, Norol T.; and Propster, John A., 4,422,074, Cl. 343-5.0CF.
- Hughes Tool Company: See—  
Beavers, John A.; and Witten, Raymond L., 4,421,999, Cl. 310-87.000.  
Mullins, John M., 4,421,184, Cl. 175-337.000.
- Huhn, Karl: See—  
Marwitz, Heinrich; Ullrich, Kurt; and Huhn, Karl, 4,421,783, Cl. 427-54.100.
- Huhta-Koivisto, Esko, to Oy Finn-Aqua Ltd. Distillation apparatus utilizing thermocompressor principles, 4,421,605, Cl. 202-181.000.
- Huibers, Derk T. A., to Hydrocarbon Research, Inc. Process for making L-sugars and D-fructose, 4,421,568, Cl. 127-48.000.
- Hunnell, Larry B., to Anglo Mineral Resources, Inc. Extraction method for refractory precious metal ore, 4,421,724, Cl. 423-22.000.
- Hunsucker, Jerry H.; and Woods, Milton E., to International Minerals & Chemical Corp. Aminoplast resin crosslinking agents and nitroalkanol used to treat cellulose, 4,421,880, Cl. 524-14.000.
- Hunter Douglas International N.V.: See—  
Edixhoven, Gerardus H., 4,420,862, Cl. 29-24.500.
- Hurd, Billy G., to Mobil Oil Corporation. Surfactant waterflooding with graded salinity drive for oil recovery, 4,421,168, Cl. 166-273.000.
- Hurner, Erwin E. Oil changing system, 4,421,078, Cl. 123-196.00R.
- Husky Systems of Georgia, Inc.: See—  
Vargo, William R., 4,421,239, Cl. 211-187.000.
- Huusari, Erkki, to Yhtyneet Paperitehtaat oy Jylhavaara. Process for preparing thermomechanical pulp with heat recovery, 4,421,595, Cl. 162-23.000.
- Hydrocarbon Research, Inc.: See—  
Huibers, Derk T. A., 4,421,568, Cl. 127-48.000.
- Hypertherm, Incorporated: See—  
Couch, Richard W., Jr., 4,421,970, Cl. 219-121.0PV.
- Ichihashi, Tetsuo: See—  
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- Ichihayashi, Toshikazu, to Canon Kabushiki Kaisha. Automatic focusing system with interchangeable lens, 4,421,397, Cl. 354-400.000.
- Ida, Edward S., to Du Pont de Nemours, E. I., and Company. Photometric analyzer, 4,421,411, Cl. 356-418.000.
- Ideal Toy Corporation: See—  
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- Idelman, Lloyd B.: See—  
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- Igarashi, Toshiiji: See—  
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- Igarashi, Yoshiyuki: See—  
Itoh, Hajime; and Igarashi, Yoshiyuki, 4,422,024, Cl. 318-443.000.
- Igashira, Toshihiko: See—  
Kawai, Hisasi; Sada, Hiroshi; Igashira, Toshihiko; and Yoshinaga, Toru, 4,421,091, Cl. 123-620.000.
- Iida, Toshihide: See—  
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,421,402, Cl. 355-8.000.
- Iinuma, Hajime: See—  
Komuro, Takeo; Gomi, Kenichi; Arashi, Norio; Akimoto, Hidetoshi; Hishinuma, Yukio; Iinuma, Hajime; and Kanda, Osamu, 4,421,732, Cl. 423-569.000.
- Iizuka, Kiyoshi: See—  
Suzuki, Takashi; Iizuka, Kiyoshi; Ohtaka, Keiji; and Mizutani, Hidemasa, 4,421,398, Cl. 354-200.000.
- Ikeda, Akio: See—  
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiro, 4,421,571, Cl. 148-11.50R.
- Ikeda, Toshiaki: See—  
Futamura, Yoshisumi; Komeiji, Shigeki; Noro, Shuhei; Hasegawa, Junzo; Matsunari, Fumio, and Ikeda, Toshiaki, 4,421,494, Cl. 464-111.000.
- Ikeuchi, Satoru; Kanbe, Masaru; Takahashi, Jiro; Kobayashi, Ryui-chiro; Suganaka, Shunji; and Mizukura, Noboru, to Konishiroku Photo Industry Co., Ltd. Photographic element with reducible metal complex that releases photographically useful compound, 4,421,846, Cl. 430-559.000.
- Ikezawa, Hideo; Takahashi, Yoshiyuki; and Hashimoto, Hideaki, to Oji Paper Co., Ltd. Pressure-sensitive record color-developing sheet, 4,421,344, Cl. 282-27.500.
- Ikezawa, Kenji; Takao, Hiroshi; Aoki, Hiroyuki; and Kimura, Shinji, to Nissan Motor Company, Limited. Process for forming a thin dense sintered layer, 4,421,787, Cl. 427-126.200.
- Illers, Karl H.: See—  
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- Imanaga, Yasuhiko: See—  
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- Imlah, James: See—  
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- Imperial Chemical Industries Limited: See—  
Athey, Graham, 4,421,813, Cl. 428-195.000.
- Imperial Chemical Industries PLC: See—  
Andrew, Sydney P. S., 4,421,303, Cl. 261-109.000.  
Briggs, Peter J.; and McAloon, Kevin, 4,421,815, Cl. 428-198.000.  
Coffee, Ronald A.; and Bennett, Peter C., 4,421,281, Cl. 239-690.000.  
Gormley, James J., 4,421,744, Cl. 424-177.000.
- Inaba, Hajimu; Miyashita, Hideo; and Otsuka, Shoichi, to Fujitsu Fanuc Limited. System for controlling a plurality of microprocessors, 4,422,142, Cl. 364-200.000.
- Inagaki, Hiroshi: See—  
Kito, Tutomu; Nakasugi, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; and Shibahashi, Yutaka, 4,421,560, Cl. 106-21.000.  
Inanaga, Kazutoyo; and Nagawa, Yugi, to Takeda Chemical Industries, Ltd. Antiepileptics, 4,421,745, Cl. 424-177.000.
- Inao, Hiroshi: See—  
Yamamoto, Sakuei; Inao, Hiroshi; Tokumitsu, Kiyonori; Nishida, Mitsuhiro; and Kumamoto, Sadahiro, 4,421,324, Cl. 277-24.000.
- Inland Steel Company: See—  
Lyudkovsky, Grigory, 4,421,574, Cl. 148-111.000.
- Inoguchi, Kazuhiro; Nakanishi, Tomohiko; and Asano, Mitsuru, to Nippon Soken, Inc. Method for producing a cordierite body, 4,421,699, Cl. 264-56.000.
- Inoue, Tomoya: See—  
Kimoto, Yasuo; Yamamoto, Masahiko; Tamiya, Katsunori; Sakai, Yoshihito; Komura, Akio; Honda, Shoichi; Maehata, Hidehiko; Kamada, Hiroshi; Suzuki, Tomohiko; and Inoue, Tomoya, 4,421,624, Cl. 204-209.000.
- Inoue, Yukio: See—  
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- Institut Francais du Pétrole: See—  
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- Rojey, Alexandre; Larue, Joseph; and Barreau, Alain, 4,420,946, Cl. 62-101.000.
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- Institut für Energietechnik: See—  
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- Interceram, Inc.: See—  
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- International Minerals & Chemical Corp.: See—  
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- Seeny, Charles E.; Kraemer, John F.; and Varnum, Nancy C., 4,421,873, Cl. 523-145.000.
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- Isgur, Irving E.: See—  
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- Ishiguro, Masato: See—  
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- Ishii, Juichi: See—  
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- Ishii, Takashi: See—  
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- ITT Industries, Inc.: See—  
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- Ivers, John T.: See—  
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- Iwata, Seiichi: See—  
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- Izuta, Mitsugu: See—  
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- J. I. Case Company: See—  
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- J. M. Huber Corporation: See—  
Wason, Satish K., 4,421,527, Cl. 51-308.000.
- J. M. Smucker Company, The: See—  
Gross, David R., 4,421,020, Cl. 99-472.000.
- Jackson, Arnold H.: See—  
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- Jackson, Dennis E., to Cambridge Products, Ltd. Method for determining the concentration of selected ingredients in animal feeds, 4,421,858, Cl. 436-20.000.
- Jacobs, John J., to Carrier Corporation. Method of operating a motor compressor unit, 4,421,460, Cl. 417-53.000.
- Jaffe, Myron I., to Sintered Metals, Inc. Token mechanism with magnetic separation means, 4,421,220, Cl. 194-4.00D.
- Jakobs, Willy, to Klockner-Humboldt-Deutz AG. Worm centrifuge, 4,421,502, Cl. 494-7.000.



- James C. Barber and Associates, Inc.: See—  
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Japan Crown Cork Co., Ltd.: See—  
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Jidosha Kiki Co., Ltd.: See—  
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Jimbo, Susumu; Kohno, Shoichi; and Kashima, Koichi, to Hodogaya Chemical Co., Ltd.; and Mochida Seiyaku Kabushiki Kaisha. 4-Oximino-1,2,3,4-tetrahydroquinoline derivatives. 4,421,919, Cl. 546-159.000.  
Jinnings, Orin H.: See—  
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Johnson, Marvin M.: See—  
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Jones, James L.; Keyser, E. Glen; and Phillips, James C., to Agrigenetics Corporation. Legume-inoculating composition. 4,421,544, Cl. 71-7.000.  
Jorgensen, Robert A.; Farrell, Roger A.; and Gerhold, Bruce W., to General Electric Company. Dual stage-dual mode low emission gas turbine combustion system. 4,420,929, Cl. 60-39.060.  
Joswig, Siegfried; Liebscher, Johannes; Keils, Peter; and Tiwi, Peter, to International Standard Electric Corporation. Device for feeding potted plants. 4,420,904, Cl. 47-81.000.  
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Blazy, Pierre; Houot, Robert; Joussemet, Robert; Haicour, Philippe; and Tracez, Jean, 4,421,641, Cl. 209-166.000.  
Jun, Mong-Jon: See—  
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Jung, Heinrich; and Biskup, Ulrich, to Agfa-Gevaert Aktiengesellschaft. Process for the chain-lengthening of gelatine by partial hardening. 4,421,847, Cl. 430-621.000.  
Jurek, John J., to General Signal Corporation. System for monitoring heater elements of electric furnaces. 4,421,976, Cl. 219-506.000.  
JWI Ltd.: See—  
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Kabel und Metallwerke Gutehoffnungshutte AG: See—  
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Kabushiki Kaisha Ishida Koki Seisakusho: See—  
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Kabushiki Kaisha Meidensha: See—  
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Ushikoshi, Kenichi, 4,421,420, Cl. 368-229.000.  
Kagiura, Kazuo; Miyake, Hiroyuki; Kasama, Nobuhiro; Sagara, Seiji; Sasaki, Nobukazu; and Yonemori, Takaji, to Canon Kabushiki Kaisha. Image recording apparatus. 4,421,401, Cl. 355-3.0FU.  
Kahn, Marvin L.; and Lynch, Robert J., to Rich Products Corporation. Freezer stable whipped ice cream and milk shake food products. 4,421,778, Cl. 426-564.000.  
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Kajitani, Ikuo; Hayashi, Tadayoshi; Arai, Sakuji; and Hirayama, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust system. 4,420,933, Cl. 60-302.000.  
Kakeda, Teruyuki: See—  
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Kakumoto, Hiromi; and Furukawa, Kaoru, to Matsushita Electric Works, Ltd. Battery charging circuit for maintaining a substantially constant average value of charging current despite variations in charging voltage. 4,422,032, Cl. 320-39.000.  
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Kamiyama, Shuichi: See—  
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Kanai, Kenji: See—  
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Kaneko, Kimiyoshi: See—  
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Kansas State University Research Foundation: See—  
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Kataishi, Takao; and Yokoi, Nobufumi, to Misawa Home Co., Ltd. Corrosion protection pretreating apparatus. 4,421,130, Cl. 134-76.000.  
Katakura, Masayuki; and Akagiri, Kenzo, to Sony Corporation. Gain control circuit. 4,422,051, Cl. 330-278.000.  
Katakura, Masayuki: See—  
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Kataoka, Hiroyuki: See—  
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Katayose, Shinji; and Ohwada, Masatsugu, to Nissan Motor Company, Limited. Engine control apparatus. 4,421,082, Cl. 123-333.000.  
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Kato, Kimio: See—  
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Kato, Toshiyuki: See—  
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Kato, Yoshio: See—  
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Katoh, Hideo: See—  
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Kaufmann, Kenneth M., to Pako Corporation. Automatic fixed-quantity/variable-time anti-oxidation replenisher control system. 4,422,152, Cl. 364-502.000.  
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Kawakami, Yoshio; Okamura, Masatoshi; Shiba, Haruo; and Hotsuki, Hideki. Leader tape. 4,422,119, Cl. 360-128.000.  
Kawamoto, Isao; and Nakahara, Masaki, to Sankyo Company Limited. Anti-microbial diazole derivatives. 4,421,758, Cl. 424-273.00R.  
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Kawasaki, Katsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Tubing assembly in mutually movable portions of a three-wheeled motor vehicle. 4,421,194, Cl. 180-215.000.  
Kawasaki Steel Corporation: See—  
Irie, Toshio; Kato, Toshiyuki; and Takahashi, Isao, 4,421,573, Cl. 148-12.00F.  
Kayano, Masanori: See—  
Yamagiwa, Satoshi; Taguchi, Yoshio; and Kayano, Masanori, 4,421,738, Cl. 424-35.000.  
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Kayser-Roth Hosiery, Inc.: See—  
Safrit, Sam C.; and Cothran, William B., 4,421,258, Cl. 223-75.000.  
KB Denver, Inc.: See—  
Pounds, Walter R., 4,421,966, Cl. 200-309.000.  
Kearney & Trecker Corporation: See—  
Woythall, Robert T.; and Finet, Philip J., 4,421,443, Cl. 409-232.000.  
Keats, Albert B., to United Kingdom Atomic Energy Authority. Monitoring means for industrial process plants. 4,422,140, Cl. 364-184.000.  
Keegan, Patrick J.: See—  
Raleigh, William F.; and Keegan, Patrick J., 4,421,270, Cl. 236-20.00R.  
Keil, Joseph W.: See—  
Donatelli, Philip A.; and Keil, Joseph W., 4,421,656, Cl. 252-8.50P.  
Keils, Peter: See—  
Joswig, Siegfried; Liebscher, Johannes; Keils, Peter; and Tiwi, Peter, 4,420,904, Cl. 47-81.000.  
Kekish, George T.; and Batton, Carol B., to Nalco Chemical Company. Side release agent for coal cars. 4,421,791, Cl. 427-239.000.  
Keller, Bruce E.; Andrews, Robert B., Jr.; Wylie, Charles F.; and Brinkerhoff, Kenneth W., to Boeing Company. The Machine tool controller and part inspection monitor. 4,422,150, Cl. 364-475.000.  
Kelm, Gary R.: See—  
Dixon, Thomas J.; and Kelm, Gary R., 4,421,769, Cl. 424-358.000.  
Kendall Company, The: See—  
Gilman, Thomas; and Miller, Frank N., 4,420,853, Cl. 15-111.000.  
Kenjiyo, Hideyuki, to Olympus Optical Co. Ltd. Digital microphone. 4,422,182, Cl. 455-614.000.  
Kernforschungszentrum Karlsruhe G.m.b.H.: See—  
Bohme, Georg; Kohler, Wolfgang; and Salaske, Manfred, 4,421,445, Cl. 414-4.000.  
Schmidt, Kurt; and Jentsch, Klaus, 4,421,464, Cl. 417-412.000.  
Keswick, Paul D.: See—  
Chuang, Patrick T.; and Keswick, Paul D., 4,421,996, Cl. 307-530.000.  
Keyser, E. Glen: See—  
Jones, James L.; Keyser, E. Glen; and Phillips, James C., 4,421,544, Cl. 71-7.000.  
Khaw, Ban A.: See—  
Haber, Edgar; and Khaw, Ban A., 4,421,735, Cl. 424-1.100.  
Khimiko-metallurgichesky Institut AN Kazakhskoi SSR: See—  
Abishev, Dzhanot N.; Malyshev, Vitaly P.; Bauer, Ivan K.; Yarygin, Vladimir A.; Maisakov, Mikhail E.; Gainutdinov, Gari-fulla K.; Nazarov, Alexander M.; Kusainov, Temirkhan A.; Buro-voi, Isaak A.; and Omarov, Bulat N., 4,422,174, Cl. 373-115.000.  
Kida, Makoto: See—  
Muroi, Masayuki; and Kida, Makoto, 4,421,688, Cl. 260-239.00B.  
Kida, Shuji: See—  
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; Kida, Shuji; and Sugita, Hiroshi, 4,421,845, Cl. 430-544.000.  
Kienzie, Wolfgang; and Krauss, Rudolf, to Robert Bosch GmbH. Injection valve. 4,421,278, Cl. 239-533.120.  
Kiff, Ben W.; and Schreck, David J., to Union Carbide Corporation. Production of ethanol from acetic acid. 4,421,939, Cl. 568-885.000.  
Killing, Karl H., to Singer Company, The. Sewing machine head end module construction. 4,421,042, Cl. 112-259.000.  
Kilpper, Gerhard: See—  
Tonne, Peter; Ludwig, Winfried; Kilpper, Gerhard; and Grimmer, Johannes, 4,421,931, Cl. 564-139.000.  
Kim Hotstart Mfg. Co., Inc.: See—  
Stein, John, 4,421,975, Cl. 249-335.000.  
Kimball International, Inc.: See—  
Wilcox, Brian N.; and Robinson, John W., 4,421,001, Cl. 84-1.170.  
Kimoto, Yasuo; Yamamoto, Masahiko; Tamiya, Katsunori; Sakai, Yoshihito; Komura, Akio; Honda, Shoichi; Maehata, Hidehiko; Kamada, Hiroshi; Suzuki, Tomohiko; and Inoue, Tomoya, to Hitachi Shipbuilding & Engineering Co., Ltd. Apparatus for continuously processing a band-shape material. 4,421,624, Cl. 204-209.000.  
Kimura, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of controlling channel length by implanting through polycrystalline and single crystalline regions followed by diffusion anneal. 4,420,870, Cl. 29-571.000.  
Kimura, Shinji: See—  
Ikezawa, Kenji; Takao, Hiroshi; Aoki, Hiroyuki; and Kimura, Shinji, 4,421,787, Cl. 427-126.200.  
Kimura, Susumu: See—  
Hatakeyama, Yoshiharu; and Kimura, Susumu, 4,421,705, Cl. 264-153.000.  
King, Alton B.: See—  
Crane, Roscoe K.; and King, Alton B., 4,421,094, Cl. 126-61.000.  
King, Roderick V., to Ethyl Products Company. Apparatus for threading closures. 4,420,959, Cl. 72-113.000.  
Kinoshita, Koichi: See—  
Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, 4,421,057, Cl. 118-657.000.  
Kinsley, Homan B., Jr., to James River Corporation. Solvent removal via continuously superheated heat transfer medium. 4,421,794, Cl. 427-377.000.  
Kirchner, Robert D. Coolant recirculation system for dry cleaning plants. 4,421,158, Cl. 165-40.000.  
Kiselak, John A., II: See—  
Johnson, Lance H.; Kiselak, John A., II; Nadarzynski, Edward A.; and Pedersen, Raymond J., 4,422,144, Cl. 364-200.000.  
Kishi, Hirotoshi: See—  
Sato, Tadashi; Tsunoi, Haruo; and Kishi, Hirotoshi, 4,421,403, Cl. 355-8.000.  
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Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; Kida, Shuji; and Sugita, Hiroshi, 4,421,845, Cl. 430-544.000.  
Kissick, Thomas P.: See—  
Mueller, Richard H.; Cimarusti, Christopher M.; and Kissick, Thomas P., 4,421,686, Cl. 260-239.00A.  
Kitagawa, Hiroshi; Sato, Masaaki; and Shuto, Shoji, to Mitsubishi Rayon Co., Ltd. Process for the production of sheet-like material



- comprising split fibers and apparatus therefor. 4,421,584, Cl. 156-178.000.
- Kitajima, Nobuyuki: See—  
Kuzuoka, Shinichi; Tachibana, Yoshinori; Saito, Goro; and Kitajima, Nobuyuki, 4,421,599, Cl. 162-100.000.
- Kitamura, Shinichi: See—  
Hamano, Sachiyo; Kitamura, Shinichi; Igarashi, Toshiji; and Nakajima, Yoshikage, 4,421,763, Cl. 424-285.000.
- Kitao, Kazuhiko: See—  
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Kaneko, Kimiyoshi; Moriama, Satoru; Kobayashi, Takashi; and Uchiyama, Tsugio, 4,421,750, Cl. 424-207.000.
- Kitasato Institute, The: See—  
Kojima, Yasuhiko; Tamamura, Sadao; Konno, Seishi; and Hashimoto, Takashi, 4,421,746, Cl. 424-195.000.
- Kito, Tutomu; Nakasugi, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; and Shibahashi, Yutaka, to Pilot Ink Company Ltd. Thermochromatic materials. 4,421,560, Cl. 106-21.000.
- Kittredge, Lloyd G., to Pitney Bowes Inc. Printer control systems for electronic postage meter. 4,421,023, Cl. 101-45.000.
- Kittredge, Lloyd G., to Pitney Bowes Inc. Security system for electronic device. 4,421,977, Cl. 235-101.000.
- Kiwi, John: See—  
Gratzel, Michael; and Kiwi, John, 4,421,617, Cl. 204-157.10R.
- Klapper, Juergen: See—  
Kreiter, Ludwig; Klapper, Juergen; and Schober, Horst, 4,421,642, Cl. 209-384.000.
- Klausen, Glori J.: See—  
Klausen, Jack H.; and Klausen, Glori J., 4,421,117, Cl. 128-555.000.
- Klausen, Jack H.; and Klausen, Glori J., to Glori-Us Sportswear, Inc. Maternity garments. 4,421,117, Cl. 128-555.000.
- Klein Associates, Inc.: See—  
Klein, Martin, 4,422,166, Cl. 367-115.000.
- Klein, Martin, to Klein Associates, Inc. Undersea sonar scanner correlated with auxiliary sensor trace. 4,422,166, Cl. 367-115.000.
- Kleininger, Werner: See—  
Burger, Rainer; and Kleininger, Werner, 4,421,024, Cl. 101-415.100.
- Kliklok Corporation: See—  
Hoyrup, S. Johannes; and Krause, Karl A., 4,420,924, Cl. 53-307.000.
- Kline, Larry H. Lubricating object injector utilizing a single plunger. 4,421,504, Cl. 604-12.000.
- Klockner-Humboldt-Deutz AG: See—  
Jakobs, Willy, 4,421,502, Cl. 494-7.000.
- Knapp, Alan G.: See—  
Washington, Derek; and Knapp, Alan G., 4,422,005, Cl. 313-105.000.
- Knecht, David C., to General Electric Company. Transverse arc tube mounting. 4,422,004, Cl. 313-25.000.
- Knoll, Frank S.; and Jackson, Arnold H., to Carpc, Inc. Device for feeding particulate material. 4,421,148, Cl. 141-392.000.
- Kobald, Walter, to Robert Bosch GmbH. Hydraulic system. 4,420,935, Cl. 60-427.000.
- Kobayashi, Fujio: See—  
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- Kobayashi, Hiromi: See—  
Yoshinaga, Yoichi; Kobayashi, Hiromi; Ueda, Shinjiro; Takada, Yoshihiro; and Nishida, Hideo, 4,421,457, Cl. 415-211.000.
- Kobayashi, Masatoshi: See—  
Fujii, Hiroyuki; Shimakawa, Joji; Hara, Yukio; and Kobayashi, Masatoshi, 4,421,621, Cl. 204-192.000.
- Kobayashi, Ryuchiro: See—  
Ikeuchi, Satoru; Kanbe, Masaru; Takahashi, Jiro; Kobayashi, Ryuchiro; Suganaka, Shunji; and Mizukura, Noboru, 4,421,846, Cl. 430-559.000.
- Kobayashi, Takao: See—  
Morichika, Toshiaki; Sugitani, Junichi; and Kobayashi, Takao, 4,421,558, Cl. 75-128.000.
- Kobayashi, Takashi; Shikama, Takashi; Yamamoto, Tomoyuki; and Yokota, Atsuo, to Murata Manufacturing Co., Ltd. Combination starter-protector device. 4,422,120, Cl. 361-24.000.
- Kobayashi, Takashi: See—  
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Kaneko, Kimiyoshi; Moriama, Satoru; Kobayashi, Takashi; and Uchiyama, Tsugio, 4,421,750, Cl. 424-207.000.
- Kobayashi, Tsuneki: See—  
Matsumoto, Yoshikane; Kobayashi, Tsuneki; Kurosawa, Makoto; and Seino, Minoru, 4,421,430, Cl. 400-121.000.
- Koch, Friedbert; and Schweinsberg, Bernhard, to C. Otto & Comp. G.m.b.H. Apparatus for guiding material in strip form. 4,421,623, Cl. 204-206.000.
- Koch, Ulrich H.; and Babuder, Gerald A., to Whitey Co. End cap assembly. 4,421,293, Cl. 251-61.400.
- Kocher, Willi; and Zimmermann, Jakob, to Werkzeugmaschinenfabrik Oerlikon-Burle AG. Manual cocking device for an automatic firing weapon. 4,421,006, Cl. 89-1.000.
- Kockler, Barry C.: See—  
DuVall, Dale R.; and Kockler, Barry C., 4,422,100, Cl. 358-293.000.
- Koehne, Rainer, to Pressbau GmbH. Method and device for the dry-spray application of concrete to a substrate. 4,421,797, Cl. 427-403.000.
- Koehring Company: See—  
Zemke, Wayne P.; Maki, Clyde M.; and Smith, Brian J., 4,421,435, Cl. 404-113.000.
- Koeijmans, Gerard D.: See—  
Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., 4,422,164, Cl. 367-15.000.
- Kofler, Wilhelm, to Maschinenfabrik Benninger AG. Warp beam loading and unloading apparatus for a warping machine. 4,420,861, Cl. 28-196.000.
- Kogure, Katsushige; Suzuki, Kenzo; and Kamimura, Masami, to Honda Giken Kogyo Kabushiki Kaisha. Combustion chamber for internal combustion engine. 4,421,080, Cl. 123-306.000.
- Kohayakawa, Yoshimi: See—  
Matsumura, Isao; Ishikawa, Yasuyuki; Hirano, Reiji; Maruyama, Shigeo; and Kohayakawa, Yoshimi, 4,421,391, Cl. 351-211.000.
- Kohl, Arthur L.: See—  
Ampaya, Jaime P.; Heredy, Laszlo A.; and Kohl, Arthur L., 4,421,631, Cl. 208-8.00R.
- Kohler, George O.: See—  
Edwards, Richard H.; and Kohler, George O., 4,421,682, Cl. 260-112.00R.
- Kohler, Wolfgang: See—  
Bohme, Georg; Kohler, Wolfgang; and Salaske, Manfred, 4,421,445, Cl. 414-4.000.
- Kohno, Shiochi: See—  
Jinbo, Susumu; Kohno, Shiochi; and Kashima, Koichi, 4,421,919, Cl. 546-159.000.
- Kohsaka, Fusao: See—  
Ueda, Toshitsugu; and Kohsaka, Fusao, 4,421,381, Cl. 350-6.600.
- Kohshoh Limited: See—  
Noda, Taizo, 4,420,858, Cl. 24-170.000.
- Kojima, Yasuhiko; Tamamura, Sadao; Konno, Seishi; and Hashimoto, Takashi, to Kitasato Institute, The. Process for producing interferon inducers. 4,421,746, Cl. 424-195.000.
- Kokusai Denshin Denwa Kabushiki Kaisha: See—  
Mori, Hiromichi; Matsumoto, Jun; and Fujioka, Masanobu, 4,421,955, Cl. 179-18.00EA.
- Koley, Kolyo R.: See—  
Radomirov, Radomir V.; Koley, Kolyo R.; Enchev, Encho M.; and Ivanov, Ivan N., 4,422,065, Cl. 340-347.00P.
- Kollmorgen Technologies Corporation: See—  
McCamy, Calvin S., 4,422,135, Cl. 362-346.000.
- Komeiji, Shigeki: See—  
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- Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Electrophotographic device. 4,421,402, Cl. 355-8.000.
- Komoriya, Keiji: See—  
Okamura, Noriaki; Toru, Takeshi; Oba, Takeo; Tanaka, Toshio; Bannai, Kiyoshi; Watanabe, Kenzo; Kurozumi, Seizi; Naruchi, Tatsuyuki; and Komoriya, Keiji, 4,421,914, Cl. 544-278.000.
- Komura, Akio: See—  
Kimoto, Yasuo; Yamamoto, Masahiko; Tamiya, Katsunori; Sakai, Yoshihiro; Komura, Akio; Honda, Shiochi; Maehata, Hidehiko; Kamada, Hiroshi; Suzuki, Tomohiko; and Inoue, Tomoya, 4,421,624, Cl. 204-209.000.
- Komuro, Takeo; Gomi, Kenichi; Arashi, Norio; Akimoto, Hidetoshi; Hishinuma, Yukio; Iinuma, Hajime; and Kanda, Osamu, to Hitachi, Ltd. Process for dry desulfurization of flue gas. 4,421,732, Cl. 423-569.000.
- Komuro, Yoshiaki: See—  
Shinkawa, Tsutomu; Yoshino, Akihide; Konishi, Hitoshi; Komuro, Yoshiaki; Hamada, Satoshi; and Okumura, Saburo, 4,421,152, Cl. 164-258.000.
- Konaka, Yukio, to Shibuya Machine Company Ltd. Bottle packaging box. 4,421,232, Cl. 206-434.000.
- Kondo, Hiroyuki: See—  
Shinohara, Tatsuo; Oguri, Yukihiko; Fujimori, Yukio; and Kondo, Hiroyuki, 4,421,756, Cl. 424-258.000.
- Kondo, Tatsunori, to Kabushiki Kaisha Kawai Gakki Seisakusho. Envelope generator for electronic musical instruments. 4,421,003, Cl. 84-1.260.
- Kongo Co., Ltd.: See—  
Taniwaki, Genshi, 4,421,365, Cl. 312-198.000.
- Koninklijke Brinkers Margarinefabrieken B.V.: See—  
Brinkers, Bernardus H. C.; and Veenman, Willem B. A. N., 4,421,776, Cl. 426-502.000.
- Konishi, Hitoshi: See—  
Shinkawa, Tsutomu; Yoshino, Akihide; Konishi, Hitoshi; Komuro, Yoshiaki; Hamada, Satoshi; and Okumura, Saburo, 4,421,152, Cl. 164-258.000.
- Konishi, Kiyoshi: See—  
Morisawa, Yasuhiro; Konishi, Kiyoshi; and Kataoka, Mitsuru, 4,421,766, Cl. 424-311.000.
- Konishiroku Photo Industry Co., Ltd.: See—  
Ikeuchi, Satoru; Kanbe, Masaru; Takahashi, Jiro; Kobayashi, Ryuchiro; Suganaka, Shunji; and Mizukura, Noboru, 4,421,846, Cl. 430-559.000.
- Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; Kida, Shuji; and Sugita, Hiroshi, 4,421,845, Cl. 430-544.000.
- Konno, Seishi: See—  
Kojima, Yasuhiko; Tamamura, Sadao; Konno, Seishi; and Hashimoto, Takashi, 4,421,746, Cl. 424-195.000.

- Konstantinov, Mihail S.: See—  
Petrov, Alexander S.; and Konstantinov, Mihail S., 4,420,964, Cl. 72-451.000.
- Kontis, George E.; and Evans, Sherwood P., to United States of America, Army. Timed round stop for a sprocket fed weapon. 4,421,008, Cl. 89-33.00CA.
- Koppers Company, Inc.: See—  
Thurston, Kent W.; and Barnes, Jesse H., 4,421,328, Cl. 277-216.000.
- Korczak, Alexander; and Levis, William W., Jr., to BASF Wyandotte Corporation. Propylene oxide adducts of toluenediamine. 4,421,871, Cl. 521-167.000.
- Kornatowski, Boleslaw; and Adams, Kenneth D., to Singer Company, The. Convertible bed for a sewing machine. 4,421,043, Cl. 112-260.000.
- Kornrumpf, William P., to General Electric Company. Power supply for low-voltage load. 4,422,138, Cl. 363-21.000.
- Kornylak, Andrew T., to Kornylak Corporation. Tilting shelf, vertical conveyor. 4,421,227, Cl. 198-800.000.
- Kornylak Corporation: See—  
Kornylak, Andrew T., 4,421,227, Cl. 198-800.000.
- Kosak, Werner; and Matschinsky, Wolfgang, to Bayerische Motoren Werke. Individual wheel suspension for non-steered wheels of motor vehicles, especially automobiles. 4,421,332, Cl. 280-95.00R.
- Kosmahl, Henry G., to United States of America, National Aeronautics and Space Administration. Ladder supported ring bar circuit. 4,422,012, Cl. 315-3.500.
- Kosowski, Wojciech B., to Cooper Industries, Inc. Workpiece holding and alignment device. 4,421,305, Cl. 269-287.000.
- Kostka, Hana: See—  
Gulden, Peter; Michel, Alfred; and Kostka, Hana, 4,421,476, Cl. 431-243.000.
- Kosugi, Ikutaka: See—  
Matsubara, Hideyuki; Kosugi, Ikutaka; and Tsukamoto, Chiaki, 4,421,821, Cl. 428-323.000.
- Kotani, Shigenori: See—  
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Yoshizawa, Junji; and Kotani, Shigenori, 4,421,754, Cl. 424-250.000.
- Koto, Toshio; Murakami, Katsuhiko; and Fujitani, Yugo, to Kabushiki Kaisha Ishida Koki Saisakusho. Combinatorial weighing system. 4,421,185, Cl. 177-25.000.
- Kouno, Toshio. Cargo handling apparatus. 4,421,450, Cl. 414-719.000.
- Kourtz, Raymond E.; and Daftary, Shashikumar H., to American Cyanamid Company. Acrylic wet spinning process. 4,421,707, Cl. 264-182.000.
- Kovach, Curtis W.: See—  
Rossmore, Paul A.; Eckenrod, John J.; Kovach, Curtis W.; and Pinnow, Kenneth E., 4,421,557, Cl. 75-125.000.
- Kraemer, John F.: See—  
Seene, Charles E.; Kraemer, John F.; and Varnum, Nancy C., 4,421,873, Cl. 523-145.000.
- Kraft, Klaus: See—  
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- Kramer, Fritz, to Sanifoam, Inc. Method and apparatus for coating a substrate with foamed plastic. 4,421,788, Cl. 427-136.000.
- Kramer, Volker; and Helsen, Gunter, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Coupling means comprising a centering device and a locking mechanism for a motor driven utility unit having a complementary unit. 4,421,340, Cl. 280-478.00B.
- Kraul, Douglas R.: See—  
Davis, Walter L.; and Kraul, Douglas R., 4,422,162, Cl. 365-227.000.
- Kraus, Werner. Electrification attachment for an osteosynthesis implant. 4,421,115, Cl. 128-419.00F.
- Krause, Karl A.: See—  
Hoyrup, S. Johannes; and Krause, Karl A., 4,420,924, Cl. 53-307.000.
- Krause, Klaus-Dieter: See—  
Gubbe, Bernd; Krause, Klaus-Dieter; Schoneemann, Otto; and Neidhardt, Rudolf, 4,421,035, Cl. 108-6.000.
- Krauss, Rudolf: See—  
Kienzle, Wolfgang; and Krauss, Rudolf, 4,421,278, Cl. 239-533.120.
- Krausser, Werner: See—  
Dorffub, Klaus; and Krausser, Werner, 4,421,431, Cl. 400-124.000.
- Krebs, Rudolf: See—  
Egger, Caspar; Krebs, Rudolf; and Leuzinger, Hans, 4,421,469, Cl. 425-183.000.
- Kreis, Philipp, to Philipp Kreis GmbH & Co. Room heating apparatus for small spaces. 4,421,095, Cl. 126-91.00R.
- Kreitner, Ludwig; Klapper, Juergen; and Schober, Horst, to BASF Aktiengesellschaft. Device for separating grinding medium and milled suspension in a wet comminuting machine. 4,421,642, Cl. 209-384.000.
- Kressel, Henry; and Hsu, Sheng T., to RCA Corporation. Memory array with redundant elements. 4,422,161, Cl. 365-200.000.
- Kriesi, Ruedi: See—  
Posnansky, Mario; and Kriesi, Ruedi, 4,421,102, Cl. 126-438.000.
- Krinski, Thomas L.: See—  
Graham, Paul M.; and Krinski, Thomas L., 4,421,564, Cl. 106-154.00R.
- Krob, Erwin; and Bauer, Helmut, to TMC Corporation. Safety ski binding. 4,421,341, Cl. 280-628.000.
- Kroener, Michael: See—  
Brunnmüller, Fritz; Schneider, Rolf; Kroener, Michael; Mueller, Hans; and Linhart, Friedrich, 4,421,602, Cl. 162-168.200.
- Kroger, Harry, to Sperry Corporation. Superconductive tunnel junction device and method of manufacture. 4,421,785, Cl. 427-63.000.
- Kropielnicki, Jerzy J., to B.S.H. Electronics (Manchester) Limited. Electrical signal separating device for combined windshield antenna and heater grid. 4,422,077, Cl. 343-704.000.
- Krowech, Robert J., to Deltak Corporation. Apparatus and method for soot cleaning in high-pressure heat exchangers. 4,421,067, Cl. 122-390.000.
- Krueger, David C.: See—  
Suh, Kyung W.; Krueger, David C.; and Zehner, Burch E., 4,421,866, Cl. 521-79.000.
- Krueger, Robert T.: See—  
Revak, Timothy T.; and Krueger, Robert T., 4,421,529, Cl. 55-16.000.
- Kruger, Bruno; Winkler, Adolf; and Hentze, Gunter, to Bayer Aktiengesellschaft. Process for the preparation of nitroanilines. 4,421,694, Cl. 260-465.00E.
- Kubota Ltd.: See—  
Morichika, Toshiaki; Sugitani, Junichi; and Kobayashi, Takao, 4,421,558, Cl. 75-128.000.
- Kucharczyk, Eckard, to Siegenia-Frank KG. Closure hardware. 4,420,905, Cl. 49-192.000.
- Kudo, Takeo; Okada, Yasutaka; Morioishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, to Sumitomo Metal Industries, Ltd. Process for making high strength deep well casing and tubing having improved resistance to stress-corrosion cracking. 4,421,571, Cl. 148-11.50R.
- Kuhl, Henry Y. Cart washing apparatus. 4,421,132, Cl. 134-123.000.
- Kuhne, Christoph, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Position encoder with closed-ring diode array. 4,421,980, Cl. 250-231.05E.
- Kuipers, Peter, to Nordson Corporation. Tube forming shoe and method of forming a flexible web into a shoe. 4,421,499, Cl. 493-23.000.
- Kujawski, Edmund. Y Pattern valve. 4,421,298, Cl. 251-368.000.
- Kukes, Simon G.: See—  
Nowack, Gerhard P.; Johnson, Marvin M.; and Kukes, Simon G., 4,421,638, Cl. 208-251.00R.
- Kulischenko, Walter, to Pennwalt Corporation. Balanced composite flexible shaft assembly capable of operating in a tight radius. 4,421,495, Cl. 464-51.000.
- Kulprathipanja, Santi; and deRosset, Armand J., to UOP Inc. Separatory process using organic bound adsorbents. 4,421,567, Cl. 127-46.300.
- Kumamoto, Sadahiro: See—  
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- Kumata, Kiyoshi, to Sharp Kabushiki Kaisha. Electronic timepiece with variable melody alarm facilities. 4,421,422, Cl. 368-273.000.
- Kummerlin, Walter. Ladder. 4,421,206, Cl. 182-156.000.
- Kunze, Robert K., Jr.: See—  
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- Kuraoka, Yasuo, to Hoxan Corporation. Helium gas liquefying apparatus. 4,421,537, Cl. 62-22.000.
- Kuraray Co., Ltd.: See—  
Nakashima, Toshihide; Tanihara, Maso; and Takakura, Koichi, 4,421,684, Cl. 260-112.00B.
- Kuroiwa, Hiroshi; and Oyama, Yoshishige, to Hitachi, Ltd. Air intake measuring apparatus for internal combustion engine. 4,420,972, Cl. 73-118.000.
- Kuroki, Yoshiaki: See—  
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- Kurosawa, Makoto: See—  
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- Kurozumi, Seizi: See—  
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- Kurpie, William M., to Midland-Ross Corporation. Constant energy transfer rate strobe source. 4,422,016, Cl. 315-241.00S.
- Kurzweil, Jack H.: See—  
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- Kusaba, Yoshiaki; and Hayashi, Chihito, to Sumitomo Metal Industries, Ltd. Method for producing beam blank for universal beam. 4,420,961, Cl. 72-221.000.
- Kusainov, Temirkhan A.: See—  
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- Kushibiki, Junichi: See—  
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- Kusubayashi, Toshiaki: See—  
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- Kutter, Eberhard: See—  
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- Kuwahara, Toru: See—  
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- Kwoon Kwen Metal Ware Company Ltd.: See—  
Li, Sze Y., 4,420,956, Cl. 70-312.000.
- Kyle, James C., to Kyle, James C. Polycrystalline insulating material seals between spaced members such as a terminal pin and a ferrule. 4,421,947, Cl. 174-152.000.
- L.R. & N.R. Gedyne Pty. Limited: See—  
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- Labarre, Ernest D.: See—  
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- Labbe, Francis A. M.: See—  
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- Laky, Tibor; Lane, William C.; and Turner, Kebbie J., Sr., to Otis Engineering Corporation. Mooring system. 4,421,286, Cl. 244-116.000.
- Lambert, John S.; and Gleitsmann, Joseph W., deceased (by Gleitsmann, Virginia E., executrix), to Foster Wheeler Energy Corporation. Recovery of deasphalting solvent. 4,421,639, Cl. 208-309.000.
- Landis, William R.: See—  
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- Lane, William C.: See—  
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- Lang, Hans-Jochen; Seuring, Bernhard; and Granzer, Erno, to Hoechst Aktiengesellschaft. Thiazoline derivatives, processes for their preparation, their use and pharmaceutical preparations based on these compounds. 4,421,757, Cl. 424-270.000.
- Langdon, Roger M., to Marconi Company Limited, The. Mass flow measurement device. 4,420,983, Cl. 73-861.180.
- Langner, Carl G., to Shell Oil Company. Corrugated buckle arrestor. 4,421,437, Cl. 405-166.000.
- Lansing Research Corporation: See—  
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- LaRochelle, Ronald W.: See—  
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- Larson, Kenneth N.: See—  
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- Larue, Joseph: See—  
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- Latham, Allen, Jr.; and Schoendorfer, Donald W., to Haemonetics Corporation. Fluid processing centrifuge and apparatus thereof. 4,421,503, Cl. 494-17.000.
- Laughon, Thomas C.; and Philpott, Michael I., to Texas Instruments Incorporated. Electronic learning aid and game. 4,421,487, Cl. 434-169.000.
- Laura Metal B.V.: See—  
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- Laurer, George J.; and Stokes, Olen L., Jr., to International Business Machines Corporation. Decoding method for multicharacter labels. 4,421,978, Cl. 235-462.000.
- Lavelly, Frank E.: See—  
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- Lavene, Bernard, to Electronic Concepts, Inc. Substantially small sized wound capacitor and manufacturing method therefor. 4,422,127, Cl. 361-323.000.
- Lawrence, Bernard L. Fire rescue system. 4,421,204, Cl. 182-50.000.
- Leam, John A. Waste material treatment furnace. 4,421,037, Cl. 110-238.000.
- Leaver, Daniel C.: See—  
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- LeBaron, Marc, to Lincoln Plating Company. Article holder for electroplating process. 4,421,627, Cl. 204-297.000.
- Lebedkova, Valentina A.: See—  
Bildjukevich, Viktor L.; Turovsky, Leonid N.; Meleshko, Vyacheslav J.; Yakimovich, Dmitry T.; Lebedkova, Valentina A.; Demidovich, Boris K.; Plavnik, Gennady Z.; Dubrovsky, Nikolai N.; Proskolovich, Evgeny A.; and Pivovarov, Alexandr I., 4,421,594, Cl. 159-4.000.
- Leblanc, Conrad: See—  
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- Leconte, Andre: See—  
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- Le Dain, Michel; and Ritschard, Werner, to Hoffmann-La Roche Inc. Process for the deproteinization of biological fluids. 4,421,653, Cl. 210-692.000.
- Ledamoisel, Claude: See—  
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- Lederrey, Marc, to Montres Rado S.A. Watertight wrist-watch casing. 4,421,423, Cl. 368-291.000.
- Lee, Bert, to Morgan, Jeff D. Downhole pump. 4,421,463, Cl. 417-383.000.
- Lee, Chung J., to Plastics Engineering Company. Process for preparing polyimides end-capped with anhydride or isocyanate groups. 4,421,905, Cl. 528-56.000.
- Lee, Gim F., Jr.: See—  
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- Lee, James A.: See—  
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- Leeson Corporation: See—  
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- Legille, Edouard: See—  
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- Lehmann, Hans: See—  
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- Lehnen, James A. Arm rest construction. 4,421,358, Cl. 297-421.000.
- Lehner, August; Werther, Heinz U.; Naegele, Dieter; Lenz, Werner; Jun, Mong-Jon; Reimann, Horst; and Eckell, Albrecht, to Basf Aktiengesellschaft. Photopolymerizable recording material containing a diisocyanate modified nylon binder. 4,421,840, Cl. 430-273.000.
- Lehnert, Stanley E.; and Ankeny, Donald, to Zenith Radio Corporation. Vertical image correction for projection TV. 4,422,020, Cl. 315-371.000.
- Lehtinen, Alpo S. Heating boiler. 4,421,064, Cl. 122-15.000.
- Leila, Lennox M.: See—  
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- Leland Stanford Junior University, The Board of Trustees of the: See—  
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- Spicer, William E., 4,421,577, Cl. 148-187.000.
- Lemaster, Glenn A., to Sepco Enterprises, Inc. Air foil construction. 4,421,354, Cl. 296-1.005.
- Lenz, Werner: See—  
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- Leonard, Edward F., to Procter & Gamble Company. The. Articulated fabric formed by self-assembling fibers. 4,421,818, Cl. 428-222.000.
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- Les Cables de Lyon: See—  
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- Leva, Donn W. Adjustable fin system. 4,421,492, Cl. 441-79.000.
- Levens, Dennis L., to Minnesota Mining and Manufacturing Co. Ultraviolet polymerization of acrylate monomers using oxidizable tin compounds. 4,421,822, Cl. 428-343.000.
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- Rudy, Jerome; and Rapisarda, Anthony A., 4,421,792, Cl. 427-242.000.
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- Li, Sze Y., to Kwoon Kwen Metal Ware Company Ltd. Combination lock. 4,420,956, Cl. 70-312.000.
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- Lickei, Donald L.: See—  
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- Liebscher, Johannes: See—  
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- Lienau, Jeffrey A., to United States of America, Army. Magnet position sensing system. 4,422,041, Cl. 324-207.000.
- Ligorati, Ferdinando: See—  
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- Lillie, Terrance L.: See—  
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- Lin, Peter T., to RCA Corporation. Apparatus for coating recorded discs with a lubricant. 4,421,798, Cl. 427-421.000.
- Lin, Shao C. Heat-dissipating device operated by solar energy. 4,421,159, Cl. 165-44.000.
- Linares, Hubert: See—  
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- Lincoln Plating Company: See—  
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- Lindner, Christian; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Rubber powders. 4,421,901, Cl. 525-309.000.
- Lindstrom, Merlin R.: See—  
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- Lindstrom, Olle. Furnace. 4,421,040, Cl. 110-294.000.
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- Lipschitz, Abraham. Hydrodynamic non-contacting seal for rotary machines. 4,421,321, Cl. 277-3.000.
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- Liu, Yet-Zen, to Rockwell International Corporation. Backside illuminated imaging charge coupled device. 4,422,091, Cl. 357-24.000.
- Linares, Vincent, Jr., to Combustion Engineering, Inc. Pulverized coal-fired burner. 4,421,039, Cl. 110-263.000.
- Lloyd, Eugene A.; Madri, Peter; and Closson, William J. Contact lens cleaning composition containing lipid solvent and method of using. 4,421,665, Cl. 252-106.000.
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- Loew, Peter; and Zink, Rudolf, to Ciba-Geigy Corporation. Mixtures of cationic dyes: naphtho-lactam and oxazine dyes for polyacrylonitriles. 4,421,519, Cl. 8-644.000.
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- Miller, Raimund; and Tenud, Leander, 4,421,922, Cl. 549-313.000.
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- Louthan, Rector P.; Macdonell, Gary D.; and Lindstrom, Merlin R., to Phillips Petroleum Company. Sulfur based metal cleaners. 4,421,667, Cl. 252-156.000.
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- Lovgren, Eric M.: See—  
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- Lowe, Robert E., to General Foods Corporation. Linerless carton including easily openable pouring spout. 4,421,236, Cl. 206-621.000.
- Loyd, Ronald C.: See—  
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- Lucas Industries Limited: See—  
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- Seilly, Alec H., 4,421,088, Cl. 123-447.000.
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- Ludwig, Winfried: See—  
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- Lundell, Ulf: See—  
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- Lundman, Phillip L. Vehicle ramp. 4,421,300, Cl. 254-88.000.
- Lynch, Dan K., to Monsanto Company. Crystal purification. 4,421,937, Cl. 568-708.000.
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- M.A.N. Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft: See—  
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- M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: See—  
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- Fischer, Hermann, 4,421,027, Cl. 101-142.000.
- Maascom B.V.: See—  
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- Maass, Klaus-Dieter: See—  
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- Maass, Manfred: See—  
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- Mabon, Stuart P., to Microopolis Corporation. Stepping motor drive system. 4,422,113, Cl. 360-78.000.
- Macabrey, Louis: See—  
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- MacDonald, Angus, to Davis Instruments. Image combining sextant or the like. 4,421,407, Cl. 356-144.000.
- Macdonell, Gary D.: See—  
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- Maggelet, Charles E.: See—  
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- Mains, Douglas B.; and Merte, Kenneth E., to Minnesota Mining and Manufacturing Company. Tibial osteotomy guide assembly and method. 4,421,112, Cl. 128-92.00E.
- Maisakov, Mikhail E.: See—  
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- Makarov, Alexandr A.: See—
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- McLaughlin, Owen L. Wave powered electrical generator. 4,421,991, Cl. 290-53.000.
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- Meyerle, Michael: to Zahnradfabrik Friedrichshafen, AG. Drive system for track-laying vehicle. 4,420,991, Cl. 74-682.000.
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- Mitsubishi Chemical Industries Limited: See—  
Shimizu, Shigeki; and Oshima, Akinobu, 4,421,841, Cl. 430-285.000.
- Mitsubishi Denki Kabushiki Kaisha: See—  
Morita, Minoru, 4,421,046, Cl. 112-292.000.
- Ukai, Jun; Tetsu, Toyozo; and Shamoto, Kunio, 4,421,971, Cl. 219-128.000.
- Yamamoto, Sakuei; Inao, Hiroshi; Tokumitsu, Kiyonori; Nishida, Mitsuhiko; and Kumamoto, Sadahiro, 4,421,324, Cl. 277-24.000.
- Yoshino, Hozo, 4,420,947, Cl. 62-160.000.
- Mitsubishi Gas Chemical Co., Inc.: See—  
Moriya, Takehiko, 4,421,235, Cl. 206-524.200.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—  
Hirakawa, Tadashi; Kusubayashi, Toshiaki; and Oku, Yukio, 4,420,999, Cl. 83-345.000.
- Mitsubishi Rayon Co., Ltd.: See—  
Kitagawa, Hiroshi; Sato, Masaaki; and Shuto, Shoji, 4,421,584, Cl. 156-178.000.
- Mitsuoka, Toshihiro; and Seki, Shojiro, to Nissan Motor Company, Limited. Automotive door side molding structure. 4,421,802, Cl. 428-31.000.
- Mitutoyo Mfg. Co., Ltd.: See—  
Sakata, Hideo; Mizuno, Ichiro; Nakahara, Masao; and Sanpei, Takasi, 4,420,887, Cl. 33-147.00F.
- Wakao, Masato; and Sugizaki, Iwao, 4,420,888, Cl. 33-172.00R.
- Miura, Masayoshi; Oda, Gen; Akami, Kenji; and Naito, Hiroshi, to Matsushita Electric Industrial Company, Limited. Device for feeding constant pressure fluid. 4,422,086, Cl. 346-140.00R.
- Miyagawa, Hiroshi: See—  
Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,421,961, Cl. 200-144.00B.
- Miyagi, Hideo: See—  
Nagase, Masaomi; and Miyagi, Hideo, 4,421,085, Cl. 123-416.000.
- Miyahara, Masahiko: See—  
Nagai, Shigeki; Yorie, Takashi; Sugiyura, Hisao; Hibi, Toru; Sato, Katsumi; Wada, Takuo; and Miyahara, Masahiko, 4,421,761, Cl. 424-275.000.
- Miyajiri, Tetsuo: See—  
Nakahara, Motohiro; Miyajiri, Tetsuo; Yoshioka, Naoki; and Kuwahara, Toru, 4,421,540, Cl. 65-3.120.
- Miyake, Hiroyuki: See—  
Kagiura, Kazuo; Miyake, Hiroyuki; Kasama, Nobuhiro; Sagara, Seiji; Sasaki, Nobukazu; and Yonemori, Takaji, 4,421,401, Cl. 355-3.0FU.
- Miyake, Itsuo; Okamoto, Keizo; Bundo, Motonori; and Noda, Akihiro, to Bridgestone Tire Company Limited. Bead filler rubber composition. 4,421,891, Cl. 524-495.000.
- Miyamoto, Koichi: See—  
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 4,421,402, Cl. 355-8.000.
- Miyashita, Hideo: See—  
Inaba, Hajimu; Miyashita, Hideo; and Otsuka, Shoichi, 4,422,142, Cl. 364-200.000.
- Miyawaki, Toshio: See—  
Numata, Mitsuo; Mimamida, Isao; Yamaoka, Masayoshi; Shiraiishi, Mitsuru; and Miyawaki, Toshio, 4,421,912, Cl. 544-27.000.
- Mizukura, Noboru: See—  
Ikeuchi, Satoru; Kanbe, Masaru; Takahashi, Jiro; Kobayashi, Ryuchi; Suginaka, Shunji; and Mizukura, Noboru, 4,421,846, Cl. 430-559.000.
- Mizuno, Ichiro: See—  
Sakata, Hideo; Mizuno, Ichiro; Nakahara, Masao; and Sanpei, Takasi, 4,420,887, Cl. 33-147.00F.
- Mizutani, Hidemasa: See—  
Suzuki, Takashi; Iizuka, Kiyoshi; Ohtaka, Keiji; and Mizutani, Hidemasa, 4,421,398, Cl. 354-200.000.
- Mobil Oil Corporation: See—  
Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., 4,422,164, Cl. 367-15.000.
- Dolan, Michael J.; McGovern, Stephen J.; and Owens, Peter J., 4,421,636, Cl. 208-113.000.
- Herrington, Fox J., 4,421,465, Cl. 425-133.100.
- Horodysky, Andrew G.; and Kaminski, Joan M., 4,421,659, Cl. 252-33.000.
- Hurd, Billy G., 4,421,168, Cl. 166-273.000.
- Olson, David H.; and Rodewald, Paul G., 4,421,941, Cl. 585-467.000.
- Prader, Randolph D., 4,421,805, Cl. 428-35.000.
- Shih, Stuart S.; and Milstein, Donald, 4,421,633, Cl. 208-59.000.
- Thomas, Stephen W.; and Otis, Robert M., 4,422,165, Cl. 367-40.000.
- Mochida Seiyaku Kabushiki Kaisha: See—  
Jinbo, Susumu; Kohno, Shoichi; and Kashima, Koichi, 4,421,919, Cl. 546-159.000.
- Moeller, Gary D.; and Wolff, Robert E., to Minnesota Mining and Manufacturing Company. High capacity data cartridge system and preformatted cartridge for use therein. 4,422,111, Cl. 360-72.100.
- Mohlere, Richard D., to United States of America, Army. Linear motor controller. 4,422,027, Cl. 318-687.000.
- Moisson, Marc F., to N.V. Raychem S.A. Junction assembly. 4,421,945, Cl. 174-92.000.
- Molins, Desmond W.; Hinchcliffe, Dennis; and Clarke, Peter A., to Molins Limited. Conveyor systems for cigarettes and other rod-like articles. 4,421,223, Cl. 198-604.000.
- Molins Limited: See—  
Arthur, Hugh M.; and Labbe, Francis A. M., 4,421,055, Cl. 118-620.000.
- Molins, Desmond W.; Hinchcliffe, Dennis; and Clarke, Peter A., 4,421,223, Cl. 198-604.000.
- Moll, Manfred; Delorme, Jean J.; and Weber, Jean C. Apparatus for continuously measuring cells or particles in suspension in a liquid medium. 4,422,036, Cl. 324-71.400.
- Molzahn, Marcelle G.: See—  
Haluska, Loren A.; and Molzahn, Marcelle G., 4,421,893, Cl. 524-588.000.
- Momii, Isao; Chubachi, Noriyoshi; and Kushibiki, Junichi, to Olympus Optical Company Ltd. Ultrasonic microscope. 4,420,979, Cl. 73-644.000.

- Monma, Hideo; Takahashi, Masayuki; and Ishiguro, Masato, to Fujitsu Limited. Integrated circuit with frequency-dividing circuits capable of being tested at a high speed. 4,422,038, Cl. 324-73.00R.
- Monsanto Company: See—  
Franz, John E.; and Kaufman, Robert J., 4,421,549, Cl. 71-87.000.
- Lynch, Dan K., 4,421,937, Cl. 568-708.000.
- Van Dyke, James R., 4,421,333, Cl. 280-154.50R.
- Monsanto Europe S.A.: See—  
Price, Keith; and Mathews, Michael, 4,421,424, Cl. 374-48.000.
- Montgomery, Anthony J.: See—  
Goodridge, Francis; Montgomery, Anthony J.; and Wright, Alan R., 4,421,613, Cl. 204-74.000.
- Montilla, Lino M., Jr.; and Uchuck, Alexander, to Western Electric Company, Inc. Trifurcated insulation-penetrating terminal. 4,421,374, Cl. 339-97.00P.
- Montres Rado S.A.: See—  
Lederrey, Marc, 4,421,423, Cl. 368-291.000.
- Montress, Gary K.: See—  
Cullen, Donald E.; Montress, Gary K.; Gilden, Meyer; and Wagner, Robert A., 4,422,055, Cl. 333-151.000.
- Moody, Arlin R.; and Moody, Bobby J. Combination clean-out and drilling tool. 4,421,182, Cl. 175-65.000.
- Moody, Bobby J.: See—  
Moody, Arlin R.; and Moody, Bobby J., 4,421,182, Cl. 175-65.000.
- Moore, Henry P.: See—  
Hocking, Paul R.; Straight, Jay G.; and Moore, Henry P., 4,421,019, Cl. 99-450.400.
- Moore, Larry E. Back washing device. 4,420,850, Cl. 15-21.00R.
- Moore, Robert G., Jr., to Bendix Corporation. The fuel metering apparatus. 4,421,089, Cl. 123-454.000.
- Morane, Bruno: See—  
Boulogne, Jean; Hochmann, Tibaud; Michelet, Jacques; and Morane, Bruno, 4,421,128, Cl. 132-88.500.
- Morgan, Jeff D.: See—  
Lee, Bert, 4,421,463, Cl. 417-383.000.
- Morgan, Michael J.: See—  
Fiorucci, Louis C.; and Morgan, Michael J., 4,421,662, Cl. 252-70.000.
- Mori, Fumio; Itsubo, Junichi; Oda, Hiroyuki; and Matsuda, Gunji, to Japan Crown Cork Co., Ltd. Bottle for carbonated drink. 4,421,804, Cl. 428-35.000.
- Mori, Hiromichi; Matsumoto, Jun; and Fujioka, Masanobu, to Kokusai Den Shin Denwa Kabushiki Kaisha. Distributed switching system. 4,421,955, Cl. 179-18.00A.
- Mori, Tatsuo; and Ishii, Juichi, to Nippon Sanso K.K. Process for producing krypton and xenon. 4,421,536, Cl. 62-18.000.
- Mori, Toshihiro, to Nippon Electric Co., Ltd. Radio communication receiver having an oscillator circuit of lower power-consumption. 4,422,178, Cl. 455-343.000.
- Morichika, Toshiaki; Sugitani, Junichi; and Kobayashi, Takao, to Kubota Ltd. Iron-based heat-resistant cast alloy. 4,421,558, Cl. 75-128.00E.
- Morisawa, Yasuhiro; Konishi, Kiyoshi; and Kataoka, Mitsuru, to San-kyo Co., Ltd. Method of preserving organic materials from fungal attack and a composition for use in such a method. 4,421,766, Cl. 424-311.000.
- Morise, Heiji: See—  
Murata, Kyohei; Morise, Heiji; Yazaki, Yoichi; Maruyama, Kazushi; Nagayoshi, Haruyuki; and Kajiki, Etsuji, 4,421,575, Cl. 148-153.000.
- Morishige, Morio; and Sone, Hironao, to Casio Computer Co., Ltd. Electronic timepiece. 4,421,419, Cl. 368-73.000.
- Morishima, Hideki, to Rhythm Watch Co., Ltd. Clock adjustment switch system. 4,421,418, Cl. 368-69.000.
- Morishita, Noriaki: See—  
Taguchi, Kiyomi; Terada, Osamu; Morishita, Noriaki; Mihashi, Hiroshi; and Nagai, Seiji, 4,421,697, Cl. 264-30.000.
- Morita, Akitaka: See—  
Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, 4,421,416, Cl. 368-63.000.
- Morita, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Thread cutter assembly in sewing machine. 4,421,046, Cl. 112-292.000.
- Morita, Shinzo: See—  
Hattori, Shuzo; Morita, Shinzo; and Fujii, Tsuneo, 4,421,842, Cl. 430-296.000.
- Hattori, Shuzo; Morita, Shinzo; and Fujii, Tsuneo, 4,421,843, Cl. 430-322.000.
- Moriya, Takehiko, to Mitsubishi Gas Chemical Co. Inc. Oxygen absorbent-containing bag and container sealing member having the same. 4,421,235, Cl. 206-524.200.
- Moriyama, Satoru: See—  
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Kaneko, Kimiyoshi; Moriyama, Satoru; Kobayashi, Takashi; and Uchiyama, Tsugio, 4,421,750, Cl. 424-207.000.
- Morley, James P.; and Olsson, Burton K. Heavy duty end face seal with asymmetrical cross-section. 4,421,327, Cl. 277-84.000.
- Moroishi, Taishi: See—  
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,421,571, Cl. 148-11.50R.
- Moroni, Ermes, to Hodigal s.a.s. di Luciano Moroni. Selective galvanizing process using a calcium carbonate masking composition. 4,421,793, Cl. 427-272.000.
- Morris, Norman: See—  
Emerson, Reginald S.; and Morris, Norman, 4,421,496, Cl. 464-95.000.
- Moseley, Charles R.: See—  
Aldred, Fred C.; and Moseley, Charles R., 4,421,583, Cl. 156-167.000.
- Moser, Theo, to Robert Bosch GmbH. Method and apparatus for combined guidance, incorporating a register, of two continuously advanced foil strips. 4,420,923, Cl. 53-51.000.
- Moses, John R. Flat emergency exit sign utilizing an electro-illuminescence lamp. 4,420,898, Cl. 40-570.000.
- Motorola, Inc.: See—  
Barnes, Michael F., 4,421,952, Cl. 179-2.0EA.
- Davis, Walter L.; and Kraul, Douglas R., 4,422,162, Cl. 365-227.000.
- Viztmuller, Peter, 4,422,058, Cl. 333-202.000.
- Motoyama, Kazuyasu, to Olympus Optical Company Ltd. Tape recorder control system for automatically reversing tape. 4,422,107, Cl. 360-62.000.
- Moulton, David R.: See—  
Ferralli, Michael W.; and Moulton, David R., 4,421,200, Cl. 181-144.000.
- Moyer, Ross A.: See—  
Duncan, John R.; Rohrberg, Roderick G.; Moyer, Ross A.; and Wright, William E., Sr., 4,421,972, Cl. 219-137.0PS.
- Mozer, Frank H.: See—  
Michals, Richard A.; Mozer, Frank H.; and Zum Bahlen, Ralph E., 4,421,427, Cl. 400-94.000.
- MTD Products Inc.: See—  
Hauser, Hans, 4,420,990, Cl. 74-606.00R.
- Mucha, Horst: See—  
Reinhold, Heinz-Josef; Mucha, Horst; and Arnoldi, Wilhelm, 4,422,149, Cl. 364-473.000.
- Mucheyer, Norbert; and Schulte, Heinz, to G. L. Rexroth GmbH. Control circuit throttling valve. 4,421,012, Cl. 91-388.000.
- Mueller, Hans: See—  
Brunnmüller, Fritz; Schneider, Rolf; Kroener, Michael; Mueller, Hans; and Linhart, Friedrich, 4,421,602, Cl. 162-168.200.
- Mueller, Richard A., to Cities Service Company. Apparatus and process for selectively expanding to join one tube into another tube. 4,420,866, Cl. 29-421.00R.
- Mueller, Richard H.; Cimarusti, Christopher M.; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. 4-Norbornyl-sulfonyl azetidinone intermediates and process for preparing (S)-3-acylamino-4-substituted-2-azetidinones. 4,421,686, Cl. 260-239.00A.
- Mueller, Theodore R., to United States of America, Energy. High precision triangular waveform generator. 4,422,044, Cl. 328-181.000.
- Mueller, Udo, to Norsk Hydro a.s. Process for preparing rotund particles of salt-coated magnesium or magnesium alloy. 4,421,551, Cl. 75-0.50B.
- Muka, Richard S., to Eastman Kodak Company. Document feeder with improved vacuum system. 4,421,306, Cl. 271-5.000.
- Muka, Richard S.; and Russo, Carl J., to Varian Associates, Inc. Process for treating a semiconductor material by blackbody radiation source with constant planar energy flux. 4,421,479, Cl. 432-31.000.
- Mulder, Albertus J. Derivatives of 1,5-dimethylbicyclo [3,2,1] octane, the preparation of these compounds and their use as perfume compound. 4,421,689, Cl. 549-360.000.
- Muller, Alfred; and Sauer, Joseph, to Robert Bosch GmbH. Hydraulic regulating device for load operated gear shift systems. 4,420,994, Cl. 74-867.000.
- Muller, Jakob, to Textilma AG. Method for the production of a fabric, particularly tape fabric, loom for the performance of the method and fabric produced according to the method. 4,421,142, Cl. 139-117.000.
- Muller, Werner C.; and Miller, Franklyn D., to National Distillers and Chemical Corporation. Fermentable sugar from the hydrolysis of carbohydrate polymer. 4,421,856, Cl. 435-161.000.
- Muller, Wolfgang H. E.; and Hofmann, Peter, to Chemische Werke Huls AG. Preparation of fatty acid esters. 4,421,691, Cl. 260-410.90R.
- Muller, Wolfgang H. E.: See—  
Hofmann, Peter; and Muller, Wolfgang H. E., 4,421,692, Cl. 260-410.90R.
- Mullins, John M., to Hughes Tool Company. Rock bit with improved shirrtail ventilation. 4,421,184, Cl. 175-337.000.
- Mumola, Peter B.; Yoder, Paul R., Jr.; Casas, Raul E.; and Grossman, William M., to Perkin-Elmer Corporation. The Axisymmetric spatial/temporal encoder. 4,422,046, Cl. 330-4.300.
- Munck, Lars; Gibbons, Gregory C.; and Feil, Carol, to De Forenede Bryggerier A/S. Method for identifying botanical component parts of ground seeds. 4,421,772, Cl. 426-231.000.
- Munden, Jeffery E.: See—  
Masters, Adrian G.; and Munden, Jeffery E., 4,421,015, Cl. 99-332.000.
- Murakami, Katsuhiko: See—  
Koto, Toshio; Murakami, Katsuhiko; and Fujitani, Yugo, 4,421,185, Cl. 177-25.000.
- Murakami, Tadashi; Suzuki, Teruo; Inoue, Yukio; and Aizawa, Shirou, to Research Association for Residual Oil Processing. Process for simultaneously cracking heavy hydrocarbons into light oils and producing hydrogen. 4,421,635, Cl. 208-112.000.
- Murata, Hiroshi: See—  
Edahiro, Tadao; Yoshida, Kazuaki; Ogura, Kunio; Shibuya, Seiji; and Murata, Hiroshi, 4,421,539, Cl. 65-3.120.
- Murata, Kyohei; Morise, Heiji; Yazaki, Yoichi; Maruyama, Kazushi; Nagayoshi, Haruyuki; and Kajiki, Etsuji, to Nippon Steel Corporation. Method of cooling steel pipes. 4,421,575, Cl. 148-153.000.
- Murata Manufacturing Co., Ltd.: See—  
Kobayashi, Takashi; Shikama, Takashi; Yamamoto, Tomoyuki; and Yokota, Atsuo, 4,422,120, Cl. 361-24.000.



- Muroi, Masayuki; and Kida, Makoto, to Takeda Chemical Industries, Ltd. Macbecin derivatives. 4,421,688, Cl. 260-239.30B.
- Muroi, Masayuki: See—  
Hasegawa, Toru; Muroi, Masayuki; and Tanida, Seiichi, 4,421,687, Cl. 260-239.30B.
- Murphy, Ina H. Hole punching device. 4,421,000, Cl. 83-372.000.
- Murphy, Michael R. Hunting arrow with locating means. 4,421,319, Cl. 273-416.000.
- Murray, E. Donald: See—  
Hoeft, Ernst; McKay, Curtis J.; and Murray, E. Donald, 4,421,852, Cl. 435-99.000.
- Muryoi, Takeshi, to Nippon Kogaku K.K. Macro zoom lens barrel. 4,421,389, Cl. 350-429.000.
- Musgrove, Peter J.: See—  
Allan, John; and Musgrove, Peter J., 4,421,458, Cl. 416-117.000.
- Musha, Tooru: See—  
Ito, Kenichi; Musha, Tooru; and Kato, Kiichi, 4,422,168, Cl. 369-45.000.
- Muskogee Environmental Conservation Co.: See—  
Ricketts, William H., 4,420,916, Cl. 52-122.100.
- Myking, Reidar. Panel mounted connector. 4,421,369, Cl. 339-36.000.
- Nadarzynski, Edward A.: See—  
Johnson, Lance H.; Kiselak, John A., II; Nadarzynski, Edward A.; and Pedersen, Raymond J., 4,422,144, Cl. 364-200.000.
- Nadelson, Jeffrey: See—  
Brand, Leonard J.; and Nadelson, Jeffrey, 4,421,752, Cl. 424-248.400.
- Naegele, Dieter: See—  
Lehner, August; Werther, Heinz U.; Naegele, Dieter; Lenz, Werner; Jun, Mong-Joon; Reimann, Horst; and Eckell, Albrecht, 4,421,840, Cl. 430-273.000.
- Nagae, Michio: See—  
Tsuda, Katsuhiko; Tanaka, Hisao; Nagae, Michio; and Imanaga, Yasuhiko, 4,421,885, Cl. 524-295.000.
- Nagahara, Yasumori, to Ricoh Company, Ltd. Multiple mode copying apparatus. 4,421,405, Cl. 355-58.000.
- Nagai, Seiji: See—  
Taguchi, Kiyomi; Terada, Osamu; Morishita, Noriaki; Mihashi, Hiroshi; and Nagai, Seiji, 4,421,697, Cl. 264-30.000.
- Nagai, Shigeki; Yorie, Takashi; Sugiura, Hisao; Hibi, Toru; Sato, Katsumi; Wada, Takuo; and Miyahara, Masahiko, to Hokko Chemical Industry Co. Ltd.; and Ube Industries, Ltd. Thiophene derivatives. 4,421,761, Cl. 424-275.000.
- Nagai, Tadashi: See—  
Nakamura, Ken; Nagai, Tadashi; and Takami, Masanori, 4,421,081, Cl. 123-310.000.
- Nagasawa, Ikuo; and Ishii, Takashi, to Fuji Electric Co., Ltd. Surge absorber. 4,422,122, Cl. 361-127.000.
- Nagasawa, Kinzo; and Ogamo, Akira, to Seikagaku Kogyo Co., Ltd. Process for separation of carbohydrates. 4,421,650, Cl. 210-635.000.
- Nagase, Masao; and Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling the ignition timing of an internal combustion engine. 4,421,085, Cl. 123-416.000.
- Nagashima, Masayoshi: See—  
Takiguchi, Ryohei; and Nagashima, Masayoshi, 4,421,839, Cl. 430-164.000.
- Nagata, Koji; Nishikawa, Mamoru; and Sato, Shiro, to Sumitomo Light Metal Industries, Ltd. Method for coating the inner surface of long tubes of small diameter. 4,421,790, Cl. 427-236.000.
- Nagata, Masayoshi: See—  
Takeda, Keiji; Nirasawa, Mitsuharu; and Nagata, Masayoshi, 4,421,838, Cl. 430-58.000.
- Nagawa, Yugi: See—  
Inanaga, Kazutoyo; and Nagawa, Yugi, 4,421,745, Cl. 424-177.000.
- Nagayoshi, Haruyuki: See—  
Murata, Kyohei; Morise, Heiji; Yazaki, Yoichi; Maruyama, Kazu-shi; Nagayoshi, Haruyuki; and Kajiki, Etsuji, 4,421,575, Cl. 148-153.000.
- Nagel, Walter A.; and Walsh, David J., to Marathon Oil Company. System and method for determining the relative permeability of an earth formation surrounding a wellbore. 4,420,975, Cl. 73-155.000.
- Nagy, Gerald A. Bicycle exercise stand. 4,421,308, Cl. 272-73.000.
- Naito, Hiroshi: See—  
Miura, Masayoshi; Oda, Gen; Akami, Kenji; and Naito, Hiroshi, 4,422,086, Cl. 346-140.00R.
- Naito, Kazuhisa: See—  
Kaneko, Hideaki; and Naito, Kazuhisa, 4,421,789, Cl. 427-204.000.
- Nakagawa, Fumio: See—  
Shirai, Kenji; and Nakagawa, Fumio, 4,421,362, Cl. 303-115.000.
- Nakagawa, Satoshi: See—  
Uemura, Morito; Kishi, Kenichi; Nakagawa, Satoshi; Kida, Shuji; and Sugita, Hiroshi, 4,421,845, Cl. 430-544.000.
- Nakahama, Ryoji, to Yamaha Motor Co., Ltd.; and Sanshin Industries Co., Ltd. Exhaust silencer structure for outboard engines. 4,421,490, Cl. 440-89.000.
- Nakahara, Masaki: See—  
Kawamoto, Isao; and Nakahara, Masaki, 4,421,758, Cl. 424-273.00R.
- Nakahara, Masao: See—  
Sakata, Hideo; Mizuno, Ichiro; Nakahara, Masao; and Sanpei, Takasi, 4,420,887, Cl. 39-147.00F.
- Nakahara, Motohiro; Miyajiri, Tetsuo; Yoshioka, Naoki; and Kuwahara, Toru, to Nippon Telegraph & Telephone Public Corporation; and Sumitomo Electric Industries, Ltd. System for producing an optical fiber preform with gas volume control. 4,421,540, Cl. 65-3.120.
- Nakai, Mamoru: See—  
Umemura, Sumio; Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; and Kuroki, Yoshiaki, 4,421,925, Cl. 549-372.000.
- Nakajima, Yoshikage: See—  
Hamano, Sachiyuki; Kitamura, Shinichi; Igarashi, Toshiji; and Nakajima, Yoshikage, 4,421,763, Cl. 424-285.000.
- Nakama, Akihiro: See—  
Tokitsu, Tetsuya; Harada, Saburo; Yamasaki, Jiro; and Nakama, Akihiro, 4,421,480, Cl. 432-238.000.
- Nakamura, Ken; Nagai, Tadashi; and Takami, Masanori, to Nissan Motor Co., Ltd. Spark-ignition internal combustion engine. 4,421,081, Cl. 123-310.000.
- Nakamura, Kensaku. Resin pellet producing machine. 4,421,470, Cl. 425-311.000.
- Nakanishi, Tomohiko: See—  
Inoguchi, Kazuhiro; Nakanishi, Tomohiko; and Asano, Mitsuru, 4,421,699, Cl. 264-56.000.
- Nakano, Yoshitomo: See—  
Mita, Satoshi; Tanaka, Kouichi; Nakano, Yoshitomo; Saita, Harumi; and Nakayama, Akira, 4,421,954, Cl. 179-6.130.
- Nakashima, Toshihide; Tanihara, Maso; and Takakura, Koichi, to Kuraray Co., Ltd. Column for adsorption of blood proteins. 4,421,684, Cl. 260-112.00B.
- Nakasui, Norikazu: See—  
Kito, Tutomu; Nakasui, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; and Shibahashi, Yutaka, 4,421,560, Cl. 106-21.000.
- Nakayama, Akira: See—  
Mita, Satoshi; Tanaka, Kouichi; Nakano, Yoshitomo; Saita, Harumi; and Nakayama, Akira, 4,421,954, Cl. 179-6.130.
- Nakayama, Shozo; Kato, Kimio; Sugiura, Tsuneo; Kato, Yoshio; Shig-ura, Mikio; and Otu, Keiichi, to K. K. Toyoda Jidoshokki Seisaku-sho; and Taihou Kogyo Kabushiki Kaisha. Sliding shoe for a rotatable swash-plate type refrigerant gas compressor. 4,420,986, Cl. 74-60.000.
- Nalco Chemical Company: See—  
Kekish, George T.; and Batton, Carol B., 4,421,791, Cl. 427-239.000.
- Namdari, Bahram; and Namdari, Kathleen D. Motorized apparatus for dispensing cake icing. 4,421,251, Cl. 222-99.000.
- Namdari, Kathleen D.: See—  
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- Napolitano, Pellegrino E., to Hudson Engineering Company. Seal with dual metallic rings having contacting lips. 4,421,325, Cl. 277-27.000.
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Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,421,673, Cl. 502-167.000.
- Arbir, Francis W.; Raden, Daniel S.; and Narducy, Kenneth W., 4,421,869, Cl. 521-126.000.
- Narita, Ryuho: See—  
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- Naruchi, Tatsuyuki: See—  
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- Nashan, Gerd: See—  
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- National Distillers and Chemical Corporation: See—  
Muller, Werner C.; and Miller, Franklyn D., 4,421,856, Cl. 435-161.000.
- National Gypsum Company: See—  
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- National Starch And Chemical Corporation: See—  
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Radomirov, Radomir V.; Kolev, Kolyo R.; Enchev, Encho M.; and Ivanov, Ivan N., 4,422,065, Cl. 340-347.00P.
- Naylor, Douglas W. J.: See—  
Beakley, Bruce E.; and Naylor, Douglas W. J., 4,421,173, Cl. 166-336.000.
- Naylor, Nelson A. Micrometer adjustable backgauge. 4,420,890, Cl. 33-180.00R.
- Nazarov, Alexandr M.: See—  
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- NCR Corporation: See—  
Gupta, Desh B.; and Granzow, Robert H., 4,421,824, Cl. 428-211.000.
- Neidhardt, Rudolf: See—  
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- Nelles, Josef: See—  
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- Nelsen, Murray D.; Kunze, Robert K., Jr.; Olsen, Robert F.; and Rush-wald, Ira B., to Boeing Company, The. High efficiency broadband acoustic resonator and absorption panel. 4,421,201, Cl. 181-214.000.

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- Nerheim, Eldon, to Honeywell Inc. Proximity monitor. 4,422,075, Cl. 343-6.00R.
- Nestor, John M. Automatic fishing jigger. 4,420,900, Cl. 43-17.000.
- Netstal-Maschinen AG: See—  
Egger, Caspar; Krebsner, Rudolf; and Leuzinger, Hans, 4,421,469, Cl. 425-183.000.
- Netupsky, Boris, to Dyform Engineering Ltd. Large-panel concrete wall bearing components. 4,420,915, Cl. 52-98.000.
- Neumann, Don B.; Norton, Lyle K.; and Olson, Eric V., to American Hoechst Corporation. System and method for producing artwork for printed circuit boards. 4,422,083, Cl. 346-108.000.
- Newman, Charles J.; and Hodges, Joseph T., to Grote Manufacturing Company, Inc. The. Shock mounting device for a lamp. 4,422,136, Cl. 362-390.000.
- Newnham, Robert E.: See—  
Safari, Ahmad; Newnham, Robert E.; Cross, Leslie E.; and Schulze, Walter A., 4,422,003, Cl. 310-358.000.
- Newton, John. Apparatus for cleaning trays. 4,420,854, Cl. 15-302.000.
- Newton, Ronald O., to General Signal Corporation. Relay valve assembly. 4,421,360, Cl. 303-22.00A.
- Neynaber Chemie GmbH: See—  
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- NGK Insulators Ltd.: See—  
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- Nichiban Co. Ltd.: See—  
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- Nickles, R. Benton, to Halliburton Company. Dog locking sleeve. 4,421,138, Cl. 138-89.000.
- Nickles, R. Benton, to Halliburton Company. Plug for offshore platforms and the like. 4,421,139, Cl. 138-89.000.
- Nicoli, David F.: See—  
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- Nicoloso, Dante: See—  
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- Nievergelt, Hermann: See—  
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- Nijhuis, Gerrit J., to Machinefabriek G.J. Nijhuis B.V. Set of electrodes for an apparatus for electrically stunning slaughter cattle. 4,420,855, Cl. 17-1.00E.
- Nikolai, William L. Method of pollution control involving the absorption of sulfur dioxide from stack gases. 4,421,726, Cl. 423-242.000.
- Nilsen, Ole K. Electric insect trap power supply. 4,422,015, Cl. 315-209.00R.
- Ninomiya, Hiroshi: See—  
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- Nippon Air Brake Co., Ltd.: See—  
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- Nippon Electric Co., Ltd.: See—  
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- Watanabe, Hiroshi, 4,422,160, Cl. 365-189.000.
- Nippon Gakki Seizo Kabushiki Kaisha: See—  
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- Nippon Kayaku Kabushiki Kaisha: See—  
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- Nippon Kogaku K.K.: See—  
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- Nippon Kokan Kabushiki Kaisha: See—  
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- Nippon Mektron Co., Ltd.: See—  
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- Nippon Sanso K.K.: See—  
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- Nippon Soken, Inc.: See—  
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- Kawai, Hisasi; Sada, Hiroshi; Igashira, Toshihiko; and Yoshinaga, Toru, 4,421,091, Cl. 123-620.000.
- Nippon Steel Corporation: See—  
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- Tokitsu, Tetsuya; Harada, Saburo; Yamasaki, Jiro; and Nakama, Akihiro, 4,421,480, Cl. 432-238.000.
- Yamamoto, Takaaki; and Ohya, Yoshihiro, 4,422,061, Cl. 336-218.000.
- Nippon Telegraph & Telephone Public Corporation: See—  
Eda, Hiroshi; Yoshida, Kazuaki; Ogura, Kunio; Shibuya, Seiji; and Murata, Hiroshi, 4,421,539, Cl. 65-3.120.
- Nakahara, Motohiro; Miyajiri, Tetsuo; Yoshioka, Naoki; and Kuwahara, Toru, 4,421,540, Cl. 65-3.120.
- Nippon Zeon Co. Ltd.: See—  
Ogura, Shunichiro, 4,421,607, Cl. 203-60.000.
- Oyama, Motofumi; and Hashimoto, Kinro, 4,421,884, Cl. 524-209.000.
- Nira International B.V.: See—  
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- Nirasawa, Mitsuharu: See—  
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- Nishi, Masataka: See—  
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- Nishida, Hideo: See—  
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- Nishida, Mitsuhiro: See—  
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- Nishihira, Keigo: See—  
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- Nishikawa, Mamoru: See—  
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- Nishino, Hiroshi; and Suzuki, Masayuki, to Takeda Chemical Industries, Ltd. Method of removing ozone and composition therefor. 4,421,533, Cl. 55-68.000.
- Nissan Motor Company, Limited: See—  
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- Enoshima, Toshio; Furuhashi, Shoji; and Tamura, Hideyuki, 4,420,967, Cl. 73-35.000.
- Ikezawa, Kenji; Takao, Hiroshi; Aoki, Hiroyuki; and Kimura, Shinji, 4,421,787, Cl. 427-126.200.
- Katayose, Shinji; and Ohwada, Masatsugu, 4,421,082, Cl. 123-333.000.
- Mitsuoka, Toshihiro; and Seki, Shojiro, 4,421,802, Cl. 428-31.000.
- Nakamura, Ken; Nagai, Tadashi; and Takami, Masanori, 4,421,081, Cl. 123-310.000.
- Sasaki, Masahiro, 4,421,076, Cl. 123-179.00L.
- Udono, Jun, 4,420,934, Cl. 60-422.000.
- Nitto Chemical Industry Co., Ltd.: See—  
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- Niziol, Chester. Self-assembly furniture. 4,421,366, Cl. 312-257.00A.
- NL Industries, Inc.: See—  
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- Noble, Allen T., to Noble Linear Irrigation, Inc. Land irrigation system and method. 4,421,274, Cl. 239-183.000.
- Noble Linear Irrigation, Inc.: See—  
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- Noda, Akihiro: See—  
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- Noda, Atsushi; and Hanakata, Takayoshi, to Canon Kabushiki Kaisha. Thermal printer. 4,421,428, Cl. 400-120.000.
- Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,421,285, Cl. 242-221.000.
- Noda, Taizo, to Kohshoh Limited. Device for adjusting the length of a band or the like. 4,420,858, Cl. 24-170.000.
- Nogaj, Alfred: See—  
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- Noguchi, Isamu: See—  
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- Nojiri, Akio; Sawasaki, Takashi; Noguchi, Isamu; Onobori, Shinji; and Sasazima, Junnosuke, to Furukawa Electric Co., Ltd. The. Composition for a crosslinked polyolefin foam. 4,421,867, Cl. 521-82.000.
- Nolle, Dieter: See—  
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- Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, to Matsushita Electric Industrial Co., Ltd. Thin film magnetic head and method of making it. 4,422,117, Cl. 360-126.000.
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- Nordson Corporation: See—  
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- Norsk Hydro a.s.: See—  
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- North Star Ice Equipment Corporation: See—  
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- Northern Engineering Industries plc: See—  
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- Pan, Ali, 4,421,284, Cl. 242-158.00R.
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 Momii, Isao; Chubachi, Noriyoshi; and Kushibiki, Junichi, 4,420,979, Cl. 73-644.000.  
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 Omega Air Flow-21, Ltd.: See—  
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 O'Neill, Robert M., to Peavey Electronics Corp. Loud speaker with minimized magnetic leakage, 4,421,956, Cl. 179-120.000.  
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- Oota, Hiroyuki; Aoshima, Terutaka; Yamamori, Kenji; and Narita, Ryuho, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rice cooker, 4,421,974, Cl. 219-441.000.  
 Opto-Systems Ltd.: See—  
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 Orain, Michel A., to Glaenzer Spicer. Homokinetic transmission joint in particular for the driving wheel of a front wheel drive vehicle, 4,421,196, Cl. 180-257.000.  
 Orem, Howard L., to Cogswell, Richard B. Framing and layout square, 4,420,891, Cl. 33-476.000.  
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 Oros, Leo J.: See—  
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 Osamu, Yuri: See—  
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 Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; and Oguro, Keisuke, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Alloy for occlusion of hydrogen, 4,421,718, Cl. 420-443.000.  
 Otis Engineering Corporation: See—  
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 Otis, Robert M.: See—  
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 Palfreyman, Michael G.; and McDonald, Ian A., to Merrell Toraude et Compagnie. Compounds and methods for treating depression, 4,421,767, Cl. 424-319.000.  
 Palmer, Jay W.; and Gaynor, John C., to United States Gypsum Company. Process for purifying phosphogypsum, 4,421,731, Cl. 423-555.000.  
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 Cohen, Malcolm M.; Palumbo, James J.; Johanson, David C.; and Nelson, John G., 4,421,393, Cl. 351-224.000.  
 Pan, Ali, to Northern Telecom Limited. Reeling of cable, 4,421,284, Cl. 242-158.00R.  
 Pan, Peter N. Y.; and Fulkerson, Gregory M., to Paxall, Inc. Double tray case, 4,421,229, Cl. 206-44.00R.  
 Papajohn, Elissa D. Pantyhose with sanitary napkin holder, 4,421,512, Cl. 604-396.000.  
 Papastavros, Demos. Cooling system, 4,420,941, Cl. 62-402.000.  
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 Parkinson, Richard G., to American Standard, Inc. Valve diaphragm, 4,421,295, Cl. 251-86.000.  
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 Partridge, John J.; Shieue, Shian-Jan; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Process for the preparation of 24,24-difluoro-1a,25-dihydroxy vitamin D<sub>3</sub> and intermediates obtained therefrom, 4,421,690, Cl. 260-397.100.  
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 Paul, Berni, to Siemens Aktiengesellschaft. Control method and control apparatus for operating a reformed gas generator and an internal combustion engine connected thereto, 4,421,071, Cl. 123-1.00A.  
 Paul, Graham R. Cat ports, 4,421,058, Cl. 119-19.000.  
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 Mumola, Peter B.; Yoder, Paul R., Jr.; Casas, Raul E.; and Grossman, William M., 4,422,046, Cl. 330-4.300.  
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 Eischen, Gaston; Eulenberg, Thomas; Gower, Helmut; Grablowitz, Rainer; and Pernet, Michel, 4,421,541, Cl. 65-99.300.  
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- Petrofsky, Jerrold S.; and Glaser, Roger M., to Wright State University. Vehicle for the paralyzed. 4,421,336, Cl. 280-252.000.
- Petrov, Alexander S.; and Konstantinov, Mihail S., to V M E I "Lenin". Method of and apparatus for the pressworking of articles. 4,420,964, Cl. 72-451.000.
- Petzold, Manfred: See—  
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- Petzow, Gunter: See—  
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- Pfizer Inc.: See—  
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- PHD, Inc.: See—  
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- Philip Morris Incorporated: See—  
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- Philipp Kreis GmbH & Co.: See—  
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- Phillips Petroleum Company: See—  
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- Mathis, Ronald D.; Johnson, Marvin M.; and Kukes, Simon G., 4,421,638, Cl. 208-251.000.
- Nowack, Gerhard P.; Johnson, Marvin M.; and Kukes, Simon G., 4,421,638, Cl. 208-251.000.
- Pollock, Lyle W., 4,421,701, Cl. 264-60.000.
- Seefuth, Charles L., 4,421,874, Cl. 523-315.000.
- Philpott, Michael I.: See—  
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- Phipps, Jack R.: See—  
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- Piazza, John R., to Western Electric Co., Inc. Strippable resists. 4,421,814, Cl. 428-195.000.
- Picart, Francois, to Societe de Recherches Industrielles (S.O.R.I.). New cinnamoyl-cinnamic acid derivative, and its use as pharmaceutical. 4,421,927, Cl. 424-248.550.
- Pickles, Joseph, to Ferro Manufacturing Corporation. Window regulator. 4,420,906, Cl. 49-352.000.
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Reichardt, Manfred; Pieper, Christian; Nogaj, Alfred; Sandhu, Surinder S.; and Gartner, Eckhard, 4,421,708, Cl. 264-206.000.
- Pietschmann, Helmut; Schmidt, Manfred; and Hirth, Emil, to Sybron Corporation. Delivery system for dental instruments or the like. 4,421,483, Cl. 433-77.000.
- Pilenvik, Goran: See—  
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- Pilot Ink Company Ltd.: See—  
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- Pina, Felice; and Galli, Graziano. Method for making printable self-adhesive tapes and the self-adhesive tapes obtained thereby. 4,421,817, Cl. 428-207.000.
- Pinnow, Kenneth E.: See—  
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- Pioneer Electronic Corporation: See—  
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- Pitney Bowes Inc.: See—  
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- Dannatt, Hugh St. L., 4,421,400, Cl. 355-1.000.
- Kittredge, Lloyd G., 4,421,023, Cl. 101-45.000.
- Kittredge, Lloyd G., 4,421,977, Cl. 235-101.000.
- Pryor, Roger W., 4,422,063, Cl. 338-2.000.
- Soderberg, John H.; Eckert, Alton B.; and McFiggans, Robert B., 4,422,148, Cl. 364-464.000.
- Pitts Crick, Jonathan C.: See—  
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- Pitts Crick, Ronald; and Pitts Crick, Jonathan C. Apparatus for detecting visual field defects of the eye. 4,421,392, Cl. 351-224.000.
- Pivovarov, Alexandr I.: See—  
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- Planet Products Inc.: See—  
Stuermer, Karl H., 4,421,222, Cl. 198-382.000.
- Plant, Derek, to Scott Paper Company. Method of making a bonded corrugated nonwoven fabric and product made thereby. 4,421,812, Cl. 428-152.000.
- Plasson Maagan Michael Industries Ltd.: See—  
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- Shomer, Yair, 4,421,061, Cl. 119-81.000.
- Plastics Engineering Company: See—  
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- Platt, Clark I.: See—  
Brenner, Robert A.; Clearman, Jack F.; and Platt, Clark I., 4,420,952, Cl. 68-53.000.
- Clearman, Jack F.; Hageman, James R.; and Platt, Clark I., 4,420,951, Cl. 68-17.000.
- Plavnik, Gennady Z.: See—  
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- Pleass, Charles M. Linking sailboards. 4,421,491, Cl. 441-74.000.
- Pleass, Charles M.: See—  
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- Plueddemann, Edwin P., to Dow Corning Corporation. Metal extraction from solution and novel compounds used therefor. 4,421,654, Cl. 210-698.000.
- Poad, William J.; De Santis, Urbano J.; and McFadden, Lewis W., to Brockway Glass Company, Inc. Automatic glassware forming machine with automatic down and/or stuck ware rejection. 4,421,542, Cl. 65-158.000.
- Poad, William J.: See—  
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- Pocal Industries, Inc.: See—  
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- Podgorny, Anatoly N.: See—  
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- Podgorski, Theodore J., to Honeywell Inc. Stress-free window for laser applications. 4,421,386, Cl. 350-319.000.
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- Pollich, Gerhard, to Heidelberger Druckmaschinen AG. Delivery table for sheet-fed printing presses. 4,421,028, Cl. 101-240.000.
- Pollock, Lyle W., to Phillips Petroleum Company. Process for preparing iron-containing refractory balls for retorting oil shale. 4,421,701, Cl. 264-60.000.
- Polymex Pty. Limited: See—  
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- Ponghis, Nikolas; Poos, Arthur; and Vidal, Roland, to Centre de Recherches Metallurgiques. Process for operating a blast furnace. 4,421,553, Cl. 75-41.000.
- Pongrass, Robert G.; and Rutter, Christopher C. Self-closing fluid dispensing valves. 4,421,297, Cl. 251-310.000.
- Ponticello, Ignazio S.; Hollister, Kenneth R.; and Tuites, Richard C., to Eastman Kodak Company. Polymerizable ethylenically unsaturated amide compounds. 4,421,915, Cl. 544-387.000.
- Poos, Arthur: See—  
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- Porcina, John R. Security apparatus and method for a self-service fuel pumping station. 4,421,248, Cl. 222-25.000.
- Portilla, Mario. Automated thread trimming apparatus for use for sewing machines. 4,421,045, Cl. 112-288.000.
- Posnansky, Mario; and Kriesi, Ruedi. Process and apparatus for heating a transparent, gaseous medium by means of concentrated solar radiation. 4,421,102, Cl. 126-438.000.
- Possati, Mario; Golinelli, Guido; and Sella, Narciso, to Finike Italiana Marpos S.p.A. Plug comparator for checking the diameter of holes. 4,420,889, Cl. 33-178.000.
- Postlethwaite, Darrell M.: See—  
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- Postupack, Dennis S., to PPG Industries, Inc. Method for repairing silver image glass photomasks with Ni. 4,421,836, Cl. 430-5.000.
- Pott, Ronald W.: See—  
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- Potter, Robert M.; Archuleta, Jacobo R.; and Fink, Conrad F. Apparatus and method for downhole injection of radioactive tracer. 4,421,982, Cl. 250-260.000.
- Pouli, Dirk: See—  
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,421,626, Cl. 204-290.000.
- Pounds, Walter R., to KB Denver, Inc. Keyboard elastomeric cover with buttons having changeable legends. 4,421,966, Cl. 200-309.000.
- PPG Industries, Inc.: See—  
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- Postupack, Dennis S., 4,421,836, Cl. 430-5.000.
- PQ Corporation: See—  
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- Prader, Randolph D., to Mobil Oil Corporation. Slip-resistant shipping sacks. 4,421,805, Cl. 428-35.000.

- Pratt, George W., Jr., to Massachusetts Institute of Technology. Apparatus for establishing in vivo, bone strength. 4,421,119, Cl. 128-660.000.
- Pratt, Thomas A. Bicycle with resiliently yieldable wheel supports. 4,421,337, Cl. 280-277.000.
- Praxl, Werner O.: See—  
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- Precision Handling Devices, Inc.: See—  
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- Pressbau GmbH: See—  
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- Presto Lock, Inc.: See—  
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- Priebe, Edmund: See—  
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- Prisbylla, Michael P., to Stauffer Chemical Company. 4-Hydroxy-5-isopropyl-2-methylphenyl trimethylammonium, 1-piperidine carboxylate salt of N-phosphonomethylglycine and its use as a herbicide. 4,421,547, Cl. 71-86.000.
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- Procter & Gamble Company, The: See—  
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- Dixon, Thomas J.; and Kelm, Gary R., 4,421,769, Cl. 424-358.000.
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- Progressive Blasting Systems, Inc.: See—  
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- Proskolovich, Evgeny A.: See—  
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- Rayner, Maxwell A. Modular planting apparatus. 4,420,902, Cl. 47-66.000.
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- RCA Corporation: See—  
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- Reeve, Douglas W., to Erco Industries Limited. Bleaching procedure using chlorine dioxide and chlorine solutions. 4,421,598, Cl. 162-88.000.
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- Reinhold, Heinz-Josef; Mucha, Horst; and Arnoldi, Wilhelm, to Saint Gobain Vitrage. Process and apparatus for the correction of the control program of an automatic glass sheet cutting machine. 4,422,149, Cl. 364-473.000.
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- Rhythm Watch Co., Ltd.: See—  
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- Richardson GmbH: See—  
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- Ritchie, Leon T.; Snyder, Clair W., Jr.; Toeppen, Thurston H.; and Woratyla, John A., to AMP Incorporated. Method of mounting tilt latch zero insertion force connector to a substrate. 4,420,882, Cl. 29-837.000.
- Ritschard, Werner: See—  
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- Roberts, Peter M. Quick-release and positive locking mechanism for use on socket wrenches and on power and impact tools. 4,420,995, Cl. 81-60.000.
- Roberts, Victor D., to General Electric Company. Integrated multi-stage electrical filter. 4,422,056, Cl. 333-177.000.
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- Robertson, David A.; and Turner, Norman L., to Varian Associates, Inc. Beam scanning method and apparatus for ion implantation. 4,421,988, Cl. 250-492.200.
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- Robinson, Thomas; and Ohlsson, Willy, to Studsvik Energiteknik AB. Method and device for transmitting and receiving electro-magnetic ultrasound. 4,420,978, Cl. 73-643.000.
- Robson, David P. Boomerang. 4,421,320, Cl. 273-425.000.
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- Rohr Industries, Inc.: See—  
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- Rohrer, Heinrich: See—  
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- Romania, Samuel R.; and Smith, Grant M., to Burroughs Corporation. Heat exchanger for integrated circuit packages. 4,421,161, Cl. 165-80.00C.
- Ronen, Ram S., to Xerox Corporation. Self-aligned short channel MESFET. 4,422,087, Cl. 357-15.000.
- Rope, Eugene L.: See—  
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- Ross, John, to Collectors Box, The. Rotisserie accessory for preparing fowl. 4,421,017, Cl. 99-421.00R.
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- Rougemont, Raoul. Station for collecting wind energy. 4,421,452, Cl. 415-4.000.
- Roussel Uclaf: See—  
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- Ruch, Jean; and Nelles, Josef, to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG. Combination knife-edge and areal contact lip seal for movable electrodes. 4,421,322, Cl. 277-12.000.
- Rudolf, Karl; and Hessberg, Helmut, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung. Ammunition. 4,421,032, Cl. 102-307.000.
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- S&C Electric Company: See—  
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- S. Levy, Inc.: See—  
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- SAB Nife AB: See—  
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- Saban, John F., to Western Electric Company, Inc. Lead-receiving socket, multi-socket assembly incorporating same and method of effecting circuit interconnections therewith. 4,421,368, Cl. 339-17.00C.
- Sacchetti, Massimo; Aguzzi, Giovanni; Bianchi, Gianvittorio; and Caroprese, Giuseppe. Process for removing and recovering volatile organic substances from industrial waste gases. 4,421,532, Cl. 55-28.000.
- Sacco, Giovanni M.; and Schkolnick, Mario, to International Business Machines Corporation. Thrashing reduction in demand accessing of a data base through an LRU paging buffer pool. 4,422,145, Cl. 364-300.000.
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- Sagara, Seiji: See—  
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- Saito, Shizuo, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Fluid tank and device for detecting remaining fluid. 4,422,084, Cl. 346-140.00R.
- Sakai, Yoshihito: See—  
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- Sakakibara, Hideo: See—  
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- Sakashita, Keiichi: See—  
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- Sakata, Hideo; Mizuno, Ichiro; Nakahara, Masao; and Sanpei, Takasi, to Mitutoyo Mfg. Co., Ltd. Instrument for measuring a length. 4,420,887, Cl. 33-147.00F.
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- Sands, Bruce W., to PQ Corporation. Manufacturing process for hollow microspheres. 4,421,562, Cl. 106-75.000.
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- Sanpei, Takasi: See—  
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- Sanyo Electric Co., Ltd.: See—  
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- Sasaki, Masahiro, to Nissan Motor Co., Ltd. Starting auxiliary device for internal combustion engine. 4,421,076, Cl. 123-179.00L.
- Sasaki, Nobukazu: See—  
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- Sauer, Joseph: See—  
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- Saum, Arthur M., to Saum Enterprises, Inc. Orifice metering fan device. 4,420,969., Cl. 73-40.000.
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- Sawada, Tetsuya: See—  
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- Sawicki, Robert A., to Texaco Inc. Process. 4,421,675., Cl. 502-150.000.
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- Schatzberg, Paul: See—  
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- Scheffer, Bruce A. Web folding apparatus. 4,421,501., Cl. 493-439.000.
- Scheibe, Adolf, to Siemens Aktiengesellschaft. Method of producing a monolithically integrated two-transistor memory cell in accordance with MOS technology. 4,420,871., Cl. 29-571.000.
- Scherer, Henry W.: See—  
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- Schinke, Franz, to U.S. Philips Corporation. Nozzle for applying a liquid to the intermediate image carrier of an electrophoretic printer. 4,421,056., Cl. 118-645.000.
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- Schlapman, William J.; and Gault, Roger T., to J. I. Case Company. End drive rotary cultivator. 4,421,177., Cl. 172-63.000.
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- Schluchter, Martin; and Schroder, Paul, to BBC Brown, Boveri & Company, Limited. Device to compensate for critical speeds of machines. 4,421,291., Cl. 248-635.000.
- Schmadel, Edmund: See—  
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- Schmid, Rolf: See—  
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- Schmidt, Kurt; and Jentsch, Klaus, to Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung. Liquid helium pump. 4,421,464., Cl. 417-412.000.
- Schmidt, Lawrence R.; and Lovgren, Eric M., to General Electric Company. Method for making polyetherimide. 4,421,907., Cl. 528-128.000.
- Schmidt, Manfred: See—  
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- Schmoock, Roy F., to Fischer & Porter Company. Unitary electromagnetic flowmeter with sealed coils. 4,420,982., Cl. 73-861.120.
- Schmuck, Philip W.: See—  
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- Schneider, Barry L.; and Beddow, David V., to Hollister Incorporated. Leg bag for urinary incontinence. 4,421,509., Cl. 604-317.000.
- Schneider, Richard T.; and Hauck, Frederick A. Battery having replaceable electrodes. 4,421,830., Cl. 429-49.000.
- Schneider, Rolf: See—  
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- Schoen, Otmar, to Flutec Fluidtechnische Geräte GmbH. Manometer switching valve. 4,420,981., Cl. 73-756.000.
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- Schoenmaker, John: See—  
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- Schon, Romuald; Doms, Manfred; Vorberg, Peter; and Schroter, Horst. Displacement system for an ophthalmologic examination unit. 4,421,394., Cl. 351-245.000.
- Schonemann, Otto: See—  
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- Schoppel, Roman: See—  
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- Schreck, David J.: See—  
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- Schwarz, Albrecht, to Robert Bosch GmbH. Electric motor dynamic braking energy recuperating system. 4,422,021., Cl. 318-376.000.
- Schweinsberg, Bernhard: See—  
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- Seefluth, Charles L., to Phillips Petroleum Company. Polymer slurry washing. 4,421,874., Cl. 523-315.000.
- Seemuth, Paul D., to Ethyl Corporation. Diesel fuel composition. 4,421,522., Cl. 44-53.000.
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- Seikosha Co., Ltd.: See—  
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- Shell Oil Company: See—  
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- Blytas, George C., 4,421,733., Cl. 423-573.00R.
- Langner, Carl G., 4,421,437., Cl. 405-166.000.
- Van Broekhoven, Johannes A. M.; and John, Christopher S., 4,421,933., Cl. 568-403.000.
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- Shenvi, Ashokkumar B., to Du Pont de Nemours, E. I., and Company. Intermediates for octahydrobenzofuro[3,2-e]isoquinolines. 4,421,916., Cl. 546-14.000.
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- Shibuya Machine Company Ltd.: See—  
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- Shibuya, Morioki: See—  
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- Shinohara, Tatsuo; Oguri, Yukihiko; Fujimori, Yukio; and Kondo, Hiroyuki, to Daito Koei Kabushiki Kaisha. Quinoloneimine carboxylic acid anti-inflammatory and analgesic composition containing the compound. 4,421,756., Cl. 424-258.000.
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- Shoji, Masakazu, to Bell Telephone Laboratories, Incorporated. Microprocessor architecture for improved chip testability. 4,422,141., Cl. 364-200.000.
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- Sich, Mirko H. Cooking apparatus. 4,421,016., Cl. 99-402.000.
- Siebel, Peter: See—  
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- Siegle, Martin: See—  
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- Gulden, Peter; Michel, Alfred; and Kostka, Hana, 4,421,476., Cl. 431-243.000.
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- Sigman, William T.: See—  
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- Sigmetics Corporation: See—  
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- Simplex Time Recorder Co.: See—  
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- Singer Company, The: See—  
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- Kornatowski, Boleslaw; and Adams, Kenneth D., 4,421,043, Cl. 112-260.000.
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- Sinn, Adolf: See—  
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- Sir Robert McAlpine & Sons (Trade Investments) Limited: See—  
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- Skerhut, Reiner: See—  
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- SKF Kugellagerfabriken GmbH: See—  
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- Skinner, Robert T. J.: See—  
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- Slinger, John: See—  
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- Smith, Brian J.: See—  
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- Smith, Grant M.: See—  
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- Smith, Harry M.; and Williams, Raymond D., to FMC Corporation: Continuous alkoxidation process, 4,421,936, Cl. 568-678.000.
- Smith, James P., Jr. Pallet puller, 4,421,353, Cl. 294-82.00R.
- Smith, Jean E. Head warming pillow case, 4,420,847, Cl. 5-490.000.
- Smith, Michael C., to Southwire Company: Fail safe air wipe, 4,421,154, Cl. 164-158.000.
- Smith and Nephew Associated Companies Limited: See—  
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- Smith, Robert W.: See—  
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- Smith, Samuel C. Manually operable folding guide, 4,421,500, Cl. 493-405.000.
- Smith, Stuart B., to Thermocell Development, Ltd. Polyester-melamine thermosetting foam and method of preparation, 4,421,868, Cl. 521-112.000.
- SmithKline Instruments, Inc.: See—  
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- Smithline, Leonard M.; and Wolga, George J., to Lansing Research Corporation: Temperature compensation of tunable acoustic optical filters, 4,422,154, Cl. 364-571.000.
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- Snyder, David E.: See—  
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- Sobel, Lawrence M.: See—  
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- Societe de Recherches Industrielles (S.O.R.I.): See—  
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- Societe en Commandite par actions dite: Chauvin Arnoux: See—  
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- Solar Turbines Incorporated: See—  
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- Solc nec Hajna, Jitka, to Dow Chemical Company, The. Colloidal size hydrophobic polymers particulate having discrete particles of an inorganic material dispersed therein, 4,421,660, Cl. 252-62.540.
- Solo de Zaldivar, Jose, to U.S. Philips Corporation. Method of manufacturing a semiconductor device, 4,420,872, Cl. 29-571.000.
- Sone, Hironao: See—  
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- Sonnenberg, Berthold. Self-dumping bin, 4,421,448, Cl. 414-411.000.
- Sony Corporation: See—  
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- SP Industries, Inc.: See—  
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- Spanset Inter AG: See—  
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- Spector, Donald. Wall-mounted aromatic liquid dispenser assembly, 4,421,254, Cl. 222-180.000.
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- Sperry Corporation: See—  
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- McMahon, Donald H., 4,421,384, Cl. 350-96.290.
- Spicer, William E., to Leland Stanford, Junior University, The Board of Trustees of the Method for making Schottky barrier diodes with engineered heights, 4,421,577, Cl. 148-187.000.
- Spinner, Georg. Connector for HF coaxial cable, 4,421,377, Cl. 339-177.00R.
- Spire Corporation: See—  
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- Spooner, Archer M.: See—  
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- Sprague, Robert A., to Xerox Corporation. Extended thin film light modulator/scanner, 4,421,387, Cl. 350-356.000.
- Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., to Occidental Chemical Corporation. Binding layer for low overvoltage hydrogen cathodes, 4,421,626, Cl. 204-290.00R.
- Stafford, Donald C.; and Allo, Vincent F., to Chicago Bridge & Iron Company. Shell and tube heat exchanger with removable tubes and tube sheets, 4,421,160, Cl. 165-76.000.
- Stahl, Theo; and Buhler, Ulrich, to Cassella Aktiengesellschaft. Process for preparing discharge resist prints on hydrophobic textile materials, 4,421,516, Cl. 8-464.000.
- Stahlwerke Peine-Salzgitter AG: See—  
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- Stal-Laval Turbine A.B.: See—  
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- Standard Oil Company (Sohio): See—  
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- Stauffer Chemical Company: See—  
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- Steer, Peter L.; and Edwards, John V., to Craig Medical Products Limited. Female incontinence device, 4,421,511, Cl. 604-329.000.
- Steere, Robert E., Jr., to Silicon Technology Corporation. Wafering system, 4,420,909, Cl. 51-73.00R.
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- Steiger Tractor Inc.: See—  
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- Steinberg, Neil I., to Du Pont de Nemours, E. I., and Company. High capacity polymer quenching on thin shell wheels, 4,421,709, Cl. 264-216.000.
- Steller, Manfred, to Sulzer Brothers Limited. Control circuit, 4,422,025, Cl. 318-609.000.
- Stelzel, Werner: See—  
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- Stenograph Corporation: See—  
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- Stephan, Walter, to Fischer Gesellschaft M.B.H. Shoe comprising a system for supplying air to the interior of the shoe, 4,420,893, Cl. 36-3.00R.
- Stephens, James W., to Medical Valve Corporation. Disposable plastic reciprocating valve, 4,421,296, Cl. 251-149.700.
- Steube, Fritz, to AGFA-Gevaert Aktiengesellschaft. Processing arrangement for photosensitive articles including a heater and a fluid control device, 4,421,399, Cl. 354-299.000.
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- Stevens, Travis E.: See—  
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- Stock, Karl-Wilhelm; Brudney, Norman; and Wienecke, Horst G. P., to Richardson GmbH. Chocolate covered nutrient bars, 4,421,771, Cl. 426-94.000.
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- Strickman, Robert L.; and Strickman, Melvyn B., to Sherwood Research and Development Partnership. Polyurethane foam cleaning pads and a process for their manufacture, 4,421,526, Cl. 51-296.000.
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- Sugimoto, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Nuclear resonance apparatus including means for rotating a magnetic field, 4,422,042, Cl. 324-313.000.
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- Sugino, Yoshiharu, to Sugino Press Co., Ltd. Wheel stop apparatus, 4,421,210, Cl. 188-32.000.
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- Sumitomo Chemical Company, Ltd.: See—  
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- Sumitomo Electric Industries, Ltd.: See—  
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 Tada, Satoru: See—  
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 Tadmor, Zehev: See—  
 Hoid, Peter; Tadmor, Zehev; and Valsamis, Lefteris N., 4,421,412, Cl. 366-76.000.  
 Taguchi, Kiyomi; Terada, Osamu; Morishita, Noriaki; Mihashi, Hiroshi; and Nagai, Seiji, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for casting an inner lining amorphous refractory into a molten metal vessel. 4,421,697, Cl. 264-30.000.  
 Taguchi, Yoshio: See—  
 Yamaguchi, Satoshi; Taguchi, Yoshio; and Kayano, Masanori, 4,421,738, Cl. 424-35.000.  
 Taiho Pharmaceutical Company Limited: See—  
 Ito, Toshio; Ninomiya, Hiroshi; and Yamagami, Kunio, 4,421,737, Cl. 424-28.000.  
 Taihou Kogyo Kabushiki Kaisha: See—  
 Nakayama, Shozo; Kato, Kimio; Sugiura, Tusneo; Kato, Yoshio; Shugiura, Mikio; and Otu, Keiichi, 4,420,986, Cl. 74-60.000.  
 Takada, Yoshihiro: See—  
 Yoshinaga, Yoichi; Kobayashi, Hiromi; Ueda, Shinjiro; Takada, Yoshihiro; and Nishida, Hideo, 4,421,457, Cl. 415-211.000.  
 Takahashi, Isao: See—  
 Irie, Toshio; Kato, Toshiyuki; and Takahashi, Isao, 4,421,573, Cl. 148-12.00F.  
 Takahashi, Jiro: See—  
 Ikeuchi, Satoru; Kanbe, Masaru; Takahashi, Jiro; Kobayashi, Ryui-chiro; Suganaka, Shunji; and Mizukura, Noboru, 4,421,846, Cl. 430-559.000.  
 Takahashi, Masayuki: See—  
 Monma, Hideo; Takahashi, Masayuki; and Ishiguro, Masato, 4,422,038, Cl. 324-73.00R.  
 Takahashi, Toru: See—  
 Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, 4,421,057, Cl. 118-657.000.  
 Takahashi, Yoshiyuki: See—  
 Ikezawa, Hideo; Takahashi, Yoshiyuki; and Hashimoto, Hideaki, 4,421,344, Cl. 282-27.500.  
 Takakura, Koichi: See—  
 Nakashima, Toshihide; Tanihara, Maso; and Takakura, Koichi, 4,421,684, Cl. 260-112.00B.  
 Takami, Masanori: See—  
 Nakamura, Ken; Nagai, Tadashi; and Takami, Masanori, 4,421,081, Cl. 123-310.000.  
 Takaniemi, Tauno K. Automaton for dealing out food and drink. 4,421,364, Cl. 312-35.000.  
 Takao, Hiroshi: See—  
 Ikezawa, Kenji; Takao, Hiroshi; Aoki, Hiroyuki; and Kimura, Shinji, 4,421,787, Cl. 427-126.200.  
 Take, Yoshinari: See—  
 Yamaguchi, Kenzo; Take, Yoshinari; and Manabe, Akiyoshi, 4,421,614, Cl. 204-98.000.  
 Takeda Chemical Industries, Limited: See—  
 Hasegawa, Toru; Muroi, Masayuki; and Tanida, Seiichi, 4,421,687, Cl. 260-239.30B.  
 Inanaga, Kazutoyo; and Nagawa, Yugi, 4,421,745, Cl. 424-177.000.  
 Muroi, Masayuki; and Kida, Makoto, 4,421,688, Cl. 260-239.30B.  
 Nishino, Hiroshi; and Suzuki, Masayuki, 4,421,533, Cl. 55-68.000.  
 Numata, Mitsuo; Mimamida, Isao; Yamaoka, Masayoshi; Shiraishi, Mitsuru; and Miyawaki, Toshio, 4,421,912, Cl. 544-27.000.  
 Takeda, Keiji; Nirasawa, Mitsuharu; and Nagata, Masayoshi, to Fuji Photo Film Co., Ltd. Processes for preparing photoconductive elements and electrophotocopying materials. 4,421,838, Cl. 430-58.000.  
 Takei, Masayuki, to Toppan Printing Co., Ltd. Electronic cylinder making method. 4,422,101, Cl. 358-299.000.  
 Takiguchi, Ryohei; and Nagashima, Masayoshi, to Dai Nippon Printing Co., Ltd.; and Tokyo Shibaura Denki Kabushiki Kaisha. Heat-sensitive and photofixing recording sheet with diazosulfonate and acidic coupling agent therefore. 4,421,839, Cl. 430-164.000.  
 Tald, Gennady B.: See—  
 Mischenko, Anatoly I.; Tald, Gennady B.; Belogub, Alexandr V.; Podgorny, Anatoly N.; Makarov, Alexandr A.; Zhemerchenko, Anatoly T.; Domrachev, Anatoly I.; and Efremov, Petr K., 4,421,072, Cl. 123-1.00A.  
 Tamamura, Sadao: See—  
 Kojima, Yasuhiko; Tamamura, Sadao; Konno, Seishi; and Hashimoto, Takashi, 4,421,746, Cl. 424-195.000.  
 Tamiya, Katsunori: See—  
 Kimoto, Yasuo; Yamamoto, Masahiko; Tamiya, Katsunori; Sakai, Yoshihito; Komura, Akio; Honda, Shoichi; Maehata, Hidehiko; Kamada, Hiroshi; Suzuki, Tomohiko; and Inoue, Tomoya, 4,421,624, Cl. 204-209.000.  
 Tamura, Hideyuki: See—  
 Enoshima, Toshio; Furuhashi, Shoji; and Tamura, Hideyuki, 4,420,967, Cl. 73-35.000.  
 Tamura, Jun: See—  
 Matsui, Takahiro; and Tamura, Jun, 4,421,292, Cl. 251-60.000.  
 Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Laser recording method and apparatus simultaneously scanning and reading out adjacent data. 4,422,102, Cl. 358-302.000.  
 Tanaka, Akira: See—  
 Goto, Takeshi; Soeda, Takashi; Asai, Nobuyoshi; and Tanaka, Akira, 4,421,693, Cl. 260-464.000.  
 Tanaka, Hisao: See—  
 Tsuda, Katsuhiko; Tanaka, Hisao; Nagae, Michio; and Imanaga, Yasuhiko, 4,421,885, Cl. 524-295.000.  
 Tanaka, Kouichi: See—  
 Mita, Satoshi; Tanaka, Kouichi; Nakano, Yoshitomo; Saita, Harumi; and Nakayama, Akira, 4,421,954, Cl. 179-6.130.  
 Tanaka, Osami: See—  
 Isono, Tokio; and Tanaka, Osami, 4,421,338, Cl. 280-279.000.  
 Tanaka, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic recording and reproducing apparatus. 4,422,112, Cl. 360-77.000.  
 Tanaka, Shuji: See—  
 Umemura, Sumio; Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; and Kuroki, Yoshiaki, 4,421,925, Cl. 549-372.000.  
 Tanaka, Toshio: See—  
 Okamura, Noriaki; Toru, Takeshi; Oba, Takeo; Tanaka, Toshio; Bannai, Kiyoshi; Watanabe, Kenzo; Kurozumi, Seizi; Naruchi, Tatsuyuki; and Komoriya, Keiji, 4,421,914, Cl. 544-278.000.  
 Tanenbaum, Joseph M. Method for fabricating open web steel joists. 4,421,969, Cl. 219-107.000.  
 Tanida, Seiichi: See—  
 Hasegawa, Toru; Muroi, Masayuki; and Tanida, Seiichi, 4,421,687, Cl. 260-239.30B.  
 Tanihara, Maso: See—  
 Nakashima, Toshihide; Tanihara, Maso; and Takakura, Koichi, 4,421,684, Cl. 260-112.00B.  
 Taniwaki, Genshi, to Kongo Co., Ltd. Movable storage cabinet. 4,421,365, Cl. 312-198.000.  
 Taquai, Jean-Pierre, to B S L (Bignier Schmid-Laurent). Container, particularly for materials in particles. 4,421,243, Cl. 220-1.500.  
 Tarkett AB: See—  
 Brixius, Darryl W., 4,421,561, Cl. 106-27.000.  
 Tate & Lyle Limited: See—  
 Daniels, Michael J.; and Farmer, Digby M., 4,421,850, Cl. 435-41.000.  
 Tazaki, Kichiya: See—  
 Kasahara, Hideo; Tazaki, Kichiya; Fukuda, Kunio; and Suzuki, Hiroshi, 4,421,892, Cl. 524-514.000.  
 Teijin, Limited: See—  
 Horie, Shigeru; Asano, Takamasa; Ichihashi, Tetsuo; and Katoh, Hideo, 4,421,887, Cl. 524-317.000.

- Okamura, Noriaki; Toru, Takeshi; Oba, Takeo; Tanaka, Toshio; Bannai, Kiyoshi; Watanabe, Kenzo; Kurozumi, Seizi; Naruchi, Tatsuyuki; and Komoriya, Keiji, 4,421,914, Cl. 544-278.000.  
 Tektron Licensing BV: See—  
 Cunningham, Ian J.; and Evans, Harold R., 4,421,307, Cl. 272-72.000.  
 Tektronix, Inc.: See—  
 Meyer, William W., 4,422,019, Cl. 315-368.000.  
 Teledyne Industries, Inc.: See—  
 Gordbegli, Manochehr, 4,421,066, Cl. 122-264.000.  
 Raleigh, William F.; and Keegan, Patrick J., 4,421,270, Cl. 236-20.00R.  
 Tenud, Leander: See—  
 Miller, Raimund; and Tenud, Leander, 4,421,922, Cl. 549-313.000.  
 Terada, Osamu: See—  
 Taguchi, Kiyomi; Terada, Osamu; Morishita, Noriaki; Mihashi, Hiroshi; and Nagai, Seiji, 4,421,697, Cl. 264-30.000.  
 ter Burg, Antonius W. M.; and den Hoedt, Gerrit, to Akzona Incorporated. Supporting fabric for bearing bulk material and a method of building a road, dike or dam embankment. 4,421,439, Cl. 405-258.000.  
 Teroson GmbH: See—  
 Clausing, Rudiger; and Schunter, Werner, 4,421,807, Cl. 428-41.000.  
 Tessier, Jean: See—  
 Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,421,928, Cl. 560-177.000.  
 Tetsu, Toyozo: See—  
 Ukai, Jun; Tetsu, Toyozo; and Shamoto, Kunio, 4,421,971, Cl. 219-128.000.  
 Texaco Development Corporation: See—  
 Burns, Robert B., 4,421,436, Cl. 405-60.000.  
 Meador, Richard A., 4,422,043, Cl. 324-338.000.  
 Texaco Inc.: See—  
 Duranleau, Roger G., 4,421,863, Cl. 518-701.000.  
 Sawicki, Robert A., 4,421,675, Cl. 502-150.000.  
 Waddill, Harold G.; and Sellstrom, Kathy B., 4,421,906, Cl. 528-111.000.  
 Texas Instruments Incorporated: See—  
 Guterman, Daniel C., 4,422,092, Cl. 357-41.000.  
 Guttig, Karl M., 4,422,143, Cl. 364-200.000.  
 Laughon, Thomas C.; and Philpott, Michael I., 4,421,487, Cl. 434-169.000.  
 Textilma AG: See—  
 Muller, Jakob, 4,421,142, Cl. 139-117.000.  
 Thaler, Warren A.: See—  
 Lundberg, Robert D.; Thaler, Warren A.; and Agarwal, Pawan K., 4,421,882, Cl. 524-31.000.  
 Lundberg, Robert D.; and Thaler, Warren A., 4,421,898, Cl. 525-186.000.  
 Thanh, Vo V.: See—  
 Bellah, Glen R.; Sobol, Lawrence M.; Idelman, Lloyd B.; and Thanh, Vo V., 4,421,215, Cl. 192-4.00A.  
 Theisen, Henry J.; and Gehrke, Willard H., to Curwood, Inc. Flexible wrapping material and method of manufacture. 4,421,823, Cl. 428-349.000.  
 Theodor Kromer GmbH & Co. KG: See—  
 Marold, Ulrich, 4,420,955, Cl. 70-303.00A.  
 Thermocell Development, Ltd.: See—  
 Smith, Stuart B., 4,421,868, Cl. 521-112.000.  
 Thermwood Corporation: See—  
 Higgins, Bobby L., 4,421,451, Cl. 414-739.000.  
 Thomas, Burton S.: See—  
 Gunter, John B.; Quinn, George J.; Shields, Edward P.; Thomas, Burton S.; and Winkler, Clifford J., 4,421,715, Cl. 376-245.000.  
 Thomas, Stephen W.; and Otis, Robert M., to Mobil Oil Corporation. Maximum likelihood estimation of the ratio of the velocities of compressional and shear waves. 4,422,165, Cl. 367-40.000.  
 Thompson, Alan D.: See—  
 Wakeling, Antony J.; Thompson, Alan D.; and Sumner, Roy W., 4,421,484, Cl. 434-3.000.  
 Thompson, Robert G.: See—  
 DeLeu, Robert P.; and Thompson, Robert G., 4,421,498, Cl. 474-182.000.  
 Thorne, William D.; and Patterson, William A., to International Business Machines Corporation. Spring mounted torsionally rigid print hammer mechanism. 4,421,025, Cl. 101-93.040.  
 Thornton, William E., to United States of America, National Aeronautics and Space Administration. Method and apparatus for simulating gravitational forces on a living organism. 4,421,109, Cl. 128-25.00R.  
 Thrower, Anthony, to USS Engineers and Consultants, Inc. Metal pouring nozzle with gas inlet. 4,421,257, Cl. 222-600.000.  
 Thunes, Edmond; Sigward, Pierre-Paul; Besson, Marcel; Van, Doan P.; and Nicoloso, Dante, to Alsthom-Atlantique. Compressed gas circuit-breaker. 4,421,962, Cl. 200-144.0AP.  
 Thurston, Kent W.; and Barnes, Jesse H., to Koppers Company, Inc. Half-keystone compression ring. 4,421,328, Cl. 277-216.000.  
 Tieleman, Rudolf J. Spray head, suited for internally cleaning slaughtered poultry. 4,421,277, Cl. 239-456.000.  
 Tien-Kuei, Su, to Milliken Research Corporation. Process for producing fibrillated polyester. 4,421,513, Cl. 8-130.100.  
 Tilleguin, Jean, to Creusot-Loire. Heating equipment for an installation using steam and heated gas. 4,421,065, Cl. 122-155.00R.  
 Titcomb, Stanley C., to International Business Machines Corporation. Ink jet printing method and apparatus. 4,422,080, Cl. 346-1.100.  
 Tiwi, Peter: See—  
 Joswig, Siegfried; Liebscher, Johannes; Keils, Peter; and Tiwi, Peter, 4,420,904, Cl. 47-81.000.  
 TMC Corporation: See—  
 Krob, Erwin; and Bauer, Helmut, 4,421,341, Cl. 280-628.000.  
 Tobex Motivated Chair Company Limited: See—  
 Watkins, Cecil J.; and Watkins, Simon R., 4,421,189, Cl. 180-8.00A.  
 Toderò, Giuseppe, to Black & Decker Inc. Power tool with improved braking device. 4,420,885, Cl. 30-381.000.  
 Toepfen, Thurston H.: See—  
 Ritchie, Leon T.; Snyder, Clair W., Jr.; Toepfen, Thurston H.; and Woratyla, John A., 4,420,882, Cl. 29-837.000.  
 Tojiki, Hitomi: See—  
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 Tokitsu, Tetsuya; Harada, Saburo; Yamasaki, Jiro; and Nakama, Akihiro, to Chugai Ro. Kogyo Co., Ltd.; and Nippon Steel Corp. Ceiling beam construction for heating furnace. 4,421,480, Cl. 432-238.000.  
 Tokuhata, Kazuo: See—  
 Sakuma, Shinzo; Yanagisawa, Hifumi; Tokuhata, Kazuo; and Miyagawa, Hiroshi, 4,421,961, Cl. 200-144.00B.  
 Tokumitsu, Kiyonori: See—  
 Yamamoto, Sakuei; Inao, Hiroshi; Tokumitsu, Kiyonori; Nishida, Mitsuhiro; and Kumamoto, Sadahiro, 4,421,324, Cl. 277-24.000.  
 Tokuno, Masateru; and Sawada, Tetsuya, to Rengo Co., Ltd. Die cutter and die-cutting process. 4,420,998, Cl. 83-328.000.  
 Tokyo Institute of Technology, The President of: See—  
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 Aramaki, Yoshimitsu; and Harao, Norio, 4,422,008, Cl. 313-524.000.  
 Kimura, Minoru, 4,420,870, Cl. 29-571.000.  
 Oota, Hiroyuki; Aoshima, Terutaka; Yamamori, Kenji; and Narita, Ryuho, 4,421,974, Cl. 219-441.000.  
 Sawazaki, Norikazu, 4,422,106, Cl. 360-17.000.  
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 Sugimoto, Hiroshi, 4,422,042, Cl. 324-313.000.  
 Takiguchi, Ryohei; and Nagashima, Masayoshi, 4,421,839, Cl. 430-164.000.  
 Tanaka, Shigeo, 4,422,112, Cl. 360-77.000.  
 Yamaguchi, Ryoji, 4,421,385, Cl. 350-299.000.  
 Tolentino, Luisito A., to General Electric Company. Process for co-alkoxylation of halosilanes and separation of the resulting products. 4,421,926, Cl. 556-471.000.  
 Tollar, James E., to Dow Chemical Company. The Flat plate heat exchange apparatus. 4,421,162, Cl. 165-140.000.  
 Tomatsuri, Kouichi: See—  
 Sampei, Tohru; Fujita, Naoya; Higuchi, Shigemitsu; Yamada, Masamichi; and Tomatsuri, Kouichi, 4,422,109, Cl. 360-65.000.  
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 Tomcufcik, Andrew S.; Meyer, Walter E.; and Dusza, John P., to American Cyanamid Company. 1-(5-Amino-4H-1,2,4-triazol-3-yl)-4-substituted-piperazines. 4,421,753, Cl. 424-250.000.  
 Tominari, Noboru; and Kamiyama, Shuichi, to Mikuni Kogyo Co., Ltd. Circuit for driving solenoid at high speed with choke coil. 4,422,123, Cl. 361-152.000.  
 Tomita, Seisuke: See—  
 Yamazaki, Noboru; Okuyama, Michio; and Tomita, Seisuke, 4,421,899, Cl. 525-189.000.  
 Tomren, Raymond H., to Garrett Corporation. The Duct lining. 4,421,455, Cl. 415-119.000.  
 Tonne, Peter; Ludwig, Winfried; Kilpper, Gerhard; and Grimmer, Johannes, to BASF Aktiengesellschaft. Preparation of anthranilic acid amides. 4,421,931, Cl. 564-139.000.  
 Topor, Michael G.: See—  
 Baker, John E.; Topor, Michael G.; Ivers, John T.; and Stutz, H. Kent, 4,421,779, Cl. 426-660.000.  
 Toppan Printing Co., Ltd.: See—  
 Kuzuoka, Shinichi; Tachibana, Yoshinori; Saito, Goro; and Kitajima, Nobuyuki, 4,421,599, Cl. 162-100.000.  
 Takei, Masayuki, 4,422,101, Cl. 358-299.000.  
 Toru, Takeshi: See—  
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 Toyo Jozo Kabushiki Kaisha: See—  
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 Toyo Kogyo Co., Ltd.: See—  
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 Toyoda Gosei Co. Ltd.: See—  
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- Toyota Jidosha Kabushiki Kaisha: See—  
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- Toyota Jidosha Kogyo Kabushiki Kaisha: See—  
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Ito, Keiichi; Yamaguchi, Nobuyuki; Hayashi, Kazuhiko; Asami, Ken; Sato, Kazuo; and Ochiai, Takeshi, 4,421,192, Cl. 180-179.000.
- Itoh, Hajime; and Igarashi, Yoshiyuki, 4,422,024, Cl. 318-443.000.  
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- Tracez, Jean: See—  
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- Trager, Seymour F.; and Chylinski, Victoria S. Artificial tear aid, 4,421,748, Cl. 424-199.000.
- Trane Company, The: See—  
Hoff, Herbert L.; and Leaver, Daniel C., 4,421,453, Cl. 415-88.000.
- Treacle, Paul W.; and Cielakie, Edward W., to Accutest Corporation. Contact array, 4,421,370, Cl. 339-59.00M.
- Tri/Valley Growers: See—  
Reznik, David, 4,421,781, Cl. 427-46.000.
- Tricoles, Gus P.; and Rope, Eugene L., to General Dynamics Corporation, Electronics Division. Passive synthetic aperture system for locating a source of electromagnetic radiation, 4,422,076, Cl. 343-458.000.
- Trimmer, Raymond W.; and McCullagh, Morris B., to Polymex Pty. Limited. Cane crushing apparatus, 4,420,863, Cl. 29-121.500.
- Trinh, Toan: See—  
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- Tripp, James W.; and Schenmaker, John, to Universal Instruments Corporation. Insertion head for dip and dip socket components, 4,420,878, Cl. 29-741.000.
- Triumph-Adler A.G. fur Büro- und Informationstechnik: See—  
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- Troue, Harden H., to Union Carbide Corporation. Process for producing textured coatings, 4,421,784, Cl. 427-54.100.
- Troup, Alan G.: See—  
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- Trowbridge, Charles A., to Slim Kar Lighting Fixture Co., Inc. Fluorescent-type fixture having improved fold-out lamp socket assemblies, 4,422,132, Cl. 362-220.000.
- TRW Inc.: See—  
Asawa, Charles K.; and Yao, Shi-Kay, 4,421,979, Cl. 250-227.000.  
Hammerle, Frederick A., 4,420,859, Cl. 24-585.000.
- Ts'ao, Si-Ling. System for control of water temperature, 4,421,269, Cl. 236-12.120.
- Tsuda, Hiroshi: See—  
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Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, 4,421,416, Cl. 368-63.000.
- Tsuda, Katsuhiro; Tanaka, Hisao; Nagae, Michio; and Imanaga, Yasuhiko, to Dainippon Ink and Chemicals, Inc. Halogen-containing resin composition containing ester plasticizer, 4,421,885, Cl. 524-295.000.
- Tsukamoto, Chiaki: See—  
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- Tsumura, Masakatsu: See—  
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- Tsunoi, Haruo: See—  
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- Tuchscherer, Michael A.: See—  
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- Tuggle, Lloyd H.; and Loyd, Ronald C., to Emerson Electric Co. Portable power operated cultivator with axially adjustable shield, 4,421,176, Cl. 172-41.000.
- Tuin, Hermanus N.: See—  
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- Tuites, Richard C.: See—  
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- Turchi, Peter J.; and Vitkovitsky, Ihor M., to United States of America, Navy. MPD Intense beam pulser, 4,422,013, Cl. 315-111.810.
- Turner, Keblie J., Sr.: See—  
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- Turner, Norman L.: See—  
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- Turovsky, Leonid N.: See—  
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- Tuttle, Gary E., to Rockwell International Corporation. Downhole steam generator and turbopump, 4,421,163, Cl. 166-59.000.
- Twardowska, Helena, to ERCO Industries Limited. Stabilization of red phosphorus, 4,421,728, Cl. 423-265.000.
- Uba, Toshio, to Gates Rubber Company, The. Electrochemical cell, 4,421,832, Cl. 429-72.000.
- Ube Industries, Ltd.: See—  
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- Uchiyama, Tsugio: See—  
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- Uchuck, Alexander: See—  
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- Udono, Jun, to Nissan Motor Company, Ltd. Automotive vehicle hydraulic system, 4,420,934, Cl. 60-422.000.
- Ueda, Shinjiro: See—  
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- Uhlenhoff, Arnold, to ITT Industries Inc. Binary MOS switched-carry parallel adder, 4,422,157, Cl. 364-786.000.
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- Ulm, John G.: See—  
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- United Technologies Corporation: See—  
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- Universal Pioneer Corporation: See—  
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- University of Georgia Research Foundation, Inc.: See—  
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- USM Corporation: See—  
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- USS Engineers and Consultants, Inc.: See—  
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- Vagias, Ernest. Propulsion system for a vehicle, 4,421,217, Cl. 192-0.098.
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- Van Bosse, John G., to Bell Telephone Laboratories, Incorporated. Method and arrangement for signaling the transmission mode of a communication system, 4,421,951, Cl. 179-2.0DP.
- Van Broekhoven, Johannes A. M.; and John, Christopher S., to Shell Oil Company. Process for the co-production of ketones and monoolefins, 4,421,933, Cl. 568-403.000.
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- van Dam, Hendrik B. B.: See—  
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- Vandelli, Ambrogino: See—  
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- van der Aa, Herman H. M., to U.S. Philips Corporation. Solar collector, 4,421,099, Cl. 126-433.000.
- Vanderlans, Gerald J. Sealing device for use in grouting pipe joints and method of using same, 4,421,698, Cl. 264-40.100.
- Van Dyke, James R., to Monsanto Company. Assembly for mounting a vehicle spray suppression device, 4,421,333, Cl. 280-154.50R.
- van Dyke, Martin J.: See—  
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- Van Loveren, Augustinus G.: See—  
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- Van Melle, Hubert, to Amhil Enterprises Ltd. Plastic lid for containers, 4,421,244, Cl. 220-306.000.
- van Paassen, Nicolaas A. I.; and van Riel, Hermanus C. H., to Chem-Y Fabriek van Chemische Produkten B.V. Process for preparing a pumpable surface-active product based on polyester acetic acid, 4,421,930, Cl. 562-470.000.
- van Riel, Hermanus C. H.: See—  
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- Van Veldhuizen, John. Propeller driven vehicle with forward and reverse control air rudders, 4,421,489, Cl. 440-37.000.
- Varco International, Inc.: See—  
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- Vaus, Elvin M.: See—  
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- Vayssie, Charles: See—  
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- Veenman, Willem B. A. N.: See—  
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- Vend-A-Copy, Inc.: See—  
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- Venture Chemicals, Inc.: See—  
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- Verbrugghe, Pieter A., to Shell Oil Company. Process for the preparation of bicyclo [2.2.] heptene derivatives. 4,421,935, Cl. 568-343.000.
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- Vermette, Howard H.; and Daugherty, Andrew H., to Vermette Machine Company, Inc. Lift apparatus. 4,421,209, Cl. 187-9.00R.
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- Vicker, Wayne. Beverage preparation assembly. 4,421,014, Cl. 99-289.00P.
- Vidal, Frederick D.; and Jayaraman, Anantharaman, to Pennwalt Corporation. Gaseous antimicrobial treatments of storage grain with sulfur dioxide and ammonia. 4,421,774, Cl. 426-319.000.
- Vidal, Roland: See—  
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- Vigier, Ole K., to SAB Nite AB. Method and device for charging an electrical accumulator battery by means of solar-cells. 4,422,031, Cl. 320-2.000.
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- Vitkovitsky, Ihor M.: See—  
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- von Danwitz, Hans-Otto: See—  
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- Vought Corporation: See—  
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- Vrana, Charles K. Sound reflector type hearing aid. 4,421,199, Cl. 181-136.000.
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- VS Systems, Inc.: See—  
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- W. R. Grace & Co.: See—  
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- Updike, Mark H.; and Calton, Gary J., 4,421,853, Cl. 435-116.000.
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- Wacker-Chemie GmbH: See—  
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- Wada, Takuo: See—  
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- Waddill, Harold G.; and Sellstrom, Kathy B., to Texaco Inc. Water-based epoxy resin coating composition. 4,421,906, Cl. 528-111.000.
- Wade, Wallace R., to Ford Motor Company. Diesel engine combination fuel vaporizer and air/fuel mixer. 4,421,079, Cl. 123-255.000.
- Wagner, Robert A.: See—  
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- Wagstaff Engineering, Incorporated: See—  
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- Wagstaff, Frank E., to Wagstaff Engineering, Incorporated. Machine duplicatable, direct chill flat ingot casting mold with controlled corner water and adjustable crown forming capability. 4,421,155, Cl. 164-444.000.
- Wahlfahrt, Harald. Decoration stand in the form of a Christmas tree. 4,421,801, Cl. 428-19.000.
- Wakao, Masato; and Sugizaki, Iwao, to Mitutoyo Mfg. Co., Ltd. Dial gauge. 4,420,888, Cl. 33-172.00R.
- Wakeling, Antony J.; Thompson, Alan D.; and Sumner, Roy W., to Solatron Electronic Group Limited, The. Digital simulation apparatus. 4,421,484, Cl. 434-3.000.
- Walker Forge, Inc.: See—  
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- Walker, James D., to Welles Products Corporation. Tower for removing odors from gases. 4,421,534, Cl. 55-73.000.
- Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., to Wallace Mfg. Corp. Pruning apparatus of the compound action hook and blade type. 4,420,883, Cl. 30-251.000.
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- Wallace, Robert L., Jr., to Bell Telephone Laboratories, Incorporated. End-fire microphone and loudspeaker structures. 4,421,957, Cl. 179-121.00D.
- Walsh, David J.: See—  
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- Walter Kidde & Company, Inc.: See—  
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- Walter, Lothar: See—  
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- Walters, Eugene L., to Merrel Dow Pharmaceuticals Inc. Sustained release diethylpropion compositions. 4,421,736, Cl. 424-19.000.
- Wang, Taylor G.: See—  
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- Ward, Earl D., II: See—  
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- Wardell, George, to Fisons Limited. Method of treatment of an allergy to an ingested allergen. 4,421,762, Cl. 424-283.000.
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Guenther, Kenneth L.; Zemke, Edward H.; and Warden, Gerald D., 4,421,587, Cl. 156-256.000.
- Washington, Derek; and Knapp, Alan G., to U.S. Philips Corporation. Channel plate electron multiplier. 4,422,005, Cl. 313-105.00C.
- Wason, Satish K., to J. M. Huber Corporation. High fluoride compatibility dentifrice abrasives and compositions. 4,421,527, Cl. 51-308.000.
- Watanabe, Hiroshi, to Nippon Electric Co., Ltd. Memory device. 4,422,160, Cl. 365-189.000.
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- Yoshinaga, Toru: See—  
Kawai, Hisasi; Sada, Hiroshi; Igashira, Toshihiko; and Yoshinaga, Toru, 4,421,091, Cl. 123-620.000.
- Yoshinaga, Yoichi; Kobayashi, Hiromi; Ueda, Shinjiro; Takada, Yoshihiro; and Nishida, Hideo, to Hitachi, Ltd. Diffuser of centrifugal fluid machine. 4,421,457, Cl. 415-211.000.
- Yoshino, Akihide: See—  
Shinkawa, Tsutomu; Yoshino, Akihide; Konishi, Hitoshi; Komuro, Yoshiaki; Hamada, Satoshi; and Okumura, Saburo, 4,421,152, Cl. 164-258.000.
- Yoshino, Hozo, to System Homes Company, Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Heat pump air conditioning system. 4,420,947, Cl. 62-160.000.
- Yoshioka, Naoki: See—  
Nakahara, Motohiro; Miyajiri, Tetsuo; Yoshioka, Naoki; and Kuwahara, Toru, 4,421,540, Cl. 65-3.120.
- Yoshitsugu, Noritada; and Ando, Atsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Knee panel for front seat and knee panel mounting structure for vehicle. 4,421,343, Cl. 280-752.000.
- Yoshizawa, Junji: See—  
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Yoshizawa, Junji; and Kotani, Shigenori, 4,421,754, Cl. 424-250.000.
- Yu, Ying-Nien, to Ying Mfg. Corp. Thermosyphon heat pipe hot water appliance. 4,421,100, Cl. 126-435.000.
- Zaccaria, Carmine M.: See—  
Benkendorf, Sol; Calamito, Frank A.; and Zaccaria, Carmine M., 4,421,881, Cl. 524-24.000.
- Zagnoli, David A.: See—  
Dalton, Augustine I., Jr.; Sheridan, John J., III; and Zagnoli, David A., 4,421,530, Cl. 55-26.000.
- Dalton, Augustine I., Jr.; Sheridan, John J., III; and Zagnoli, David A., 4,421,531, Cl. 55-26.000.
- Zahnradfabrik Friedrichshafen, A.G.: See—  
Elser, Dieter, 4,421,010, Cl. 91-375.00R.
- Meyerle, Michael, 4,420,991, Cl. 74-682.000.
- Zahnradfabrik Friedrichshafen, A.G.: See—  
Elser, Dieter, 4,421,011, Cl. 91-380.000.
- Zaidan Hojin Minsei Kagaku Kyokai: See—  
Fujimaki, Akira, 4,421,683, Cl. 260-112.00R.
- Zaschke, Horst: See—  
Deutscher, Hans-Joachim; Richter, Sabine; Zaschke, Horst; Demus, Dietrich; and Boettger, Ute, 4,421,670, Cl. 252-299.620.
- Zauner, Otto, to Owens-Illinois, Inc. Article receiving and decelerating device. 4,421,226, Cl. 198-534.000.
- Zayatz, Robert A., to Wilson Greatbatch Ltd. Lithium-halogen cell. 4,421,833, Cl. 429-101.000.
- Zehner, Burch E.: See—  
Suh, Kyung W.; Krueger, David C.; and Zehner, Burch E., 4,421,866, Cl. 521-79.000.
- Zemke, Edward H.: See—  
Guenther, Kenneth L.; Zemke, Edward H.; and Warden, Gerald D., 4,421,587, Cl. 156-256.000.
- Zemke, Wayne P.; Maki, Clyde M.; and Smith, Brian J., to Koehring Company. Method and apparatus for applying a thin liquid film to a vibratory plate. 4,421,435, Cl. 404-113.000.
- Zena Equipment, Inc.: See—  
Gudgel, Howard S.; and Guier, William E., 4,421,447, Cl. 414-22.000.
- Zenith Radio Corporation: See—  
Garbacz, Michael, 4,422,057, Cl. 333-194.000.
- Lehnert, Stanley E.; and Ankeny, Donald, 4,422,020, Cl. 315-371.000.
- Zhemerenko, Anatoly T.: See—  
Mischenko, Anatoly I.; Talda, Gennady B.; Belogub, Alexandr V.; Podgorny, Anatoly N.; Makarov, Alexandr A.; Zhemerenko, Anatoly T.; Domrachev, Anatoly I.; and Efremov, Petr K., 4,421,072, Cl. 123-1.00A.
- Zielinski, Lech S., to Northern Telecom Limited. Telephone tactile alert system. 4,421,953, Cl. 179-2.0EC.
- Zimmermann, Jakob: See—  
Kocher, Willi; and Zimmermann, Jakob, 4,421,006, Cl. 89-1.00K.
- Zink, Rudolf: See—  
Loew, Peter; and Zink, Rudolf, 4,421,519, Cl. 8-644.000.
- Ziolko, Francis J., to Devro, Inc. Apparatus for processing stuffed sausage casing. 4,420,856, Cl. 17-34.000.
- Zulliger, Hans R., to Mettler Instrumente A.G. String-type measurement cell. 4,420,984, Cl. 73-862.590.
- Zum Bahlen, Ralph E.: See—  
Michals, Richard A.; Mozer, Frank H.; and Zum Bahlen, Ralph E., 4,421,427, Cl. 400-94.000.
- Zupancic, Ronald L., to Union Carbide Corporation. Liquid cathode cells with a glass fiber separator. 4,421,834, Cl. 429-105.000.
- Zurlinden, Donald B.; and Heltmach, Reginald C., Jr., to General Motors Corporation. Push-on terminal clip and assembly. 4,422,128, Cl. 361-408.000.



# LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF DECEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Arsenault, Denis J.: See—  
Robichaud, Vincent P., Re. 31,465, Cl. 135-102.000.  
B. F. Goodrich Company, The: See—  
Hsu, Chin C., Re. 31,468, Cl. 560-209.000.  
Riew, Changkiu K., Re. 31,469, Cl. 560-209.000.  
Bedard, Brian E.; and Boman, Bertho K., to Motorola, Inc. Stripline filter device. Re. 31,470, Cl. 333-204.000.  
Boman, Bertho K.: See—  
Bedard, Brian E.; and Boman, Bertho K., Re. 31,470, Cl. 333-204.000.  
Garcelon, Jean P., to Stein Surface. Process for the adjustment of the glass temperature in a float glasslehr and float glasslehr in order to bring this process into operation. Re. 31,466, Cl. 65-99.300.  
Hsu, Chin C., to B. F. Goodrich Company, The. Liquid reactive polymers. Re. 31,468, Cl. 560-209.000.  
Imperial Chemical Industries PLC: See—  
Jones, Geraint; and Thomson, David S., Re. 31,467, Cl. 260-395.000.  
Jones, Geraint; and Thomson, David S., to Imperial Chemical Industries PLC. Triaryl or diarylpyridyl methanes. Re. 31,467, Cl. 260-395.000.  
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., to Sperry Corporation. Damped apparatus for quick-stopping rotating members. Re. 31,464, Cl. 56-10.300.
- Motorola, Inc.: See—  
Bedard, Brian E.; and Boman, Bertho K., Re. 31,470, Cl. 333-204.000.  
Priepke, Edward H.: See—  
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., Re. 31,464, Cl. 56-10.300.  
Riew, Changkiu K., to B. F. Goodrich Company, The. Reactive liquid polymers. Re. 31,469, Cl. 560-209.000.  
Robichaud, Edward R.: See—  
Robichaud, Vincent P., Re. 31,465, Cl. 135-102.000.  
Robichaud, Eric A.: See—  
Robichaud, Vincent P., Re. 31,465, Cl. 135-102.000.  
Robichaud, Vincent P., to Robichaud, Eric A.; Robichaud, Edward R.; and Arsenault, Denis J. Compactible shelter. Re. 31,465, Cl. 135-102.000.  
Sperry Corporation: See—  
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., Re. 31,464, Cl. 56-10.300.  
Stein Surface: See—  
Garcelon, Jean P., Re. 31,466, Cl. 65-99.300.  
Thomson, David S.: See—  
Jones, Geraint; and Thomson, David S., Re. 31,467, Cl. 260-395.000.  
Wagstaff, Robert A.: See—  
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., Re. 31,464, Cl. 56-10.300.

# LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Anderson, Donald R.; and Frisque, Alvin J., to Nalco Chemical Co. Process for rapidly dissolving water-soluble polymers. B1 1,028,474, 12-20-83, Cl. 523-336.000.  
Aoshiro, Hisatake, to Machida Endoscope Co., Ltd. Endoscope with closed pressurized inner cavity. B1 4,216,767, 12-20-83, Cl. 128-6.000.
- Frisque, Alvin J.: See—  
Anderson, Donald R.; and Frisque, Alvin J., B1 1,028,474, Cl. 523-336.000.  
Machida Endoscope Co., Ltd.: See—  
Aoshiro, Hisatake, B1 4,216,767, Cl. 128-6.000.  
Nalco Chemical Co.: See—  
Anderson, Donald R.; and Frisque, Alvin J., B1 1,028,474, Cl. 523-336.000.

# LIST OF DESIGN PATENTEEES

- Adenau, Marvin L., to Advertising Metal Display Company. Wind-shield wiper products cabinet. 271,830, 12-20-83, Cl. D6-127.000.  
Advertising Metal Display Company: See—  
Adenau, Marvin L., 271,830, Cl. D6-127.000.  
Agou, Nobuhiro; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Camera. 271,880, 12-20-83, Cl. D16-1.000.  
Albertson, Robert V. Sediment indicator. 271,860, 12-20-83, Cl. D10-96.000.  
Allen, Albert H.: See—  
Golden, Neil S., 271,905, Cl. D25-74.000.  
Allen, Donald K., to Anderson, Mark. Belt attached container holder. 271,820, 12-20-83, Cl. D2-400.000.  
Amway Corporation: See—  
Powers, Robert M., 271,839, Cl. D7-327.000.  
Powers, Robert M., 271,840, Cl. D7-360.000.  
Anchor Hocking Corporation: See—  
Thrush, James L., 271,855, Cl. D9-370.000.  
Anderson, Mark: See—  
Allen, Donald K., 271,820, Cl. D2-400.000.  
Arrow Trading Co., Inc.: See—  
Shimizu, Yoshiharu, 271,871, Cl. D14-53.000.  
Astwood, A. Carl, Sr. Dart baseball game board. 271,890, 12-20-83, Cl. D21-6.000.
- Atari, Inc.: See—  
Renteria, William J., 271,891, Cl. D21-13.000.  
Berry, Christopher, to Metal Box Limited. Can body. 271,854, 12-20-83, Cl. D9-351.000.  
Blaszowski, Henry. Combined soap bar and holder. 271,910, 12-20-83, Cl. D28-8.100.  
Border, Robert N. Combined pill grater and drinking straw. 271,836, 12-20-83, Cl. D7-42.000.  
Boudreau, Robert J.: See—  
Voytko, Charles L.; and Boudreau, Robert J., 271,868, Cl. D12-129.000.  
Boyd, Dorothy. Medical service emblem. 271,862, 12-20-83, Cl. D11-105.000.  
Brown Group Recreational Products, Inc.: See—  
Voytko, Charles L.; and Boudreau, Robert J., 271,868, Cl. D12-129.000.  
Browning, Albert E. Tractor. 271,876, 12-20-83, Cl. D15-23.000.  
Callahan, Paul V. Cup lid. 271,857, 12-20-83, Cl. D9-438.000.  
Campton, Charles H. Embalming trocar sterilizer. 271,902, 12-20-83, Cl. D24-09.000.  
Canon Kabushiki Kaisha: See—  
Agou, Nobuhiro; and Matsuda, Mutsuhide, 271,880, Cl. D16-1.000.

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# LIST OF DESIGN PATENTEEES

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- Chasen, Lee R.: See—  
Einhorn, Ruediger; and Chasen, Lee R., 271,850, Cl. D8-395.000.  
Clancy, Bruce N. Camera case. 271,822, 12-20-83, Cl. D3-33.000.  
Coats & Clark, Inc.: See—  
Einhorn, Ruediger; and Chasen, Lee R., 271,850, Cl. D8-395.000.  
Connecticut Cycle Accessories, Inc.: See—  
Turkington, Mark; and Turkington, Philip, 271,866, Cl. D12-119.000.  
Corba, Robert E.: See—  
Suhajda, John I.; Corba, Robert E.; Davenport, Richard L.; and Miller, Allen D., 271,856, Cl. D9-375.000.  
Danielson, Bernard. Motorcycle backrest. 271,867, 12-20-83, Cl. D12-119.000.  
Davenport, Richard L.: See—  
Suhajda, John I.; Corba, Robert E.; Davenport, Richard L.; and Miller, Allen D., 271,856, Cl. D9-375.000.  
Decra Stone, Inc.: See—  
Knutson, Lawrence M., 271,835, Cl. D7-29.000.  
De Mejo, Angelo, to G.D.S. International S.r.l. Eyeglasses. 271,884, 12-20-83, Cl. D16-116.000.  
Dolas, Michael. Bookmark. 271,888, 12-20-83, Cl. D19-34.000.  
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle housing. 271,869, 12-20-83, Cl. D13-30.000.  
DuBois, R. Clark; and Hamma, John C., to Gradco/Dendoki, Inc. Universal sorter. 271,882, 12-20-83, Cl. D16-32.000.  
Duracell Inc.: See—  
Mallory, Henry R., 271,909, Cl. D26-42.000.  
Esfatrati, Ernest. Ventilation deflector unit. 271,900, 12-20-83, Cl. D23-138.000.  
Einhorn, Ruediger; and Chasen, Lee R., to Coats & Clark, Inc. Magnetic clip. 271,850, 12-20-83, Cl. D8-395.000.  
Endt, Evert, to Thomson-CSF. Computer display terminal. 271,874, 12-20-83, Cl. D14-113.000.  
Engel, Steven M. Game board. 271,892, 12-20-83, Cl. D21-25.000.  
Esselte Pendaflex Corporation: See—  
Reinke, Wolfgang, 271,886, Cl. D18-19.000.  
Essilor International (Compagnie Generale d'Optique): See—  
Waslander, Donald, 271,901, Cl. D24-1.100.  
Farhi, Moshe. Connector for molds used in the manufacture of concrete ceilings. 271,878, 12-20-83, Cl. D15-138.000.  
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Knob. 271,843, 12-20-83, Cl. D8-312.000.  
Florists' Transworld Delivery Association: See—  
Kowalik, Marie P., 271,863, Cl. D11-152.000.  
G.D.S. International S.r.l.: See—  
De Mejo, Angelo, 271,884, Cl. D16-116.000.  
Gear, Inc.: See—  
Waites, Raymond, 271,823, Cl. D3-71.000.  
General Motors Corporation: See—  
Gierschick, Walter K.; and Kesling, Keith, 271,873, Cl. D14-76.000.  
Gierschick, Walter K.; and Kesling, Keith, to General Motors Corporation. Radio control unit. 271,873, 12-20-83, Cl. D14-76.000.  
Giugiaro, Giorgetto, to Nippon Kogaku K.K. Binoculars. 271,885, 12-20-83, Cl. D16-133.000.  
Golden, Neil S., to Allen, Albert H. Expansion joint sealing strip. 271,905, 12-20-83, Cl. D25-74.000.  
Gradco/Dendoki, Inc.: See—  
DuBois, R. Clark; and Hamma, John C., 271,882, Cl. D16-32.000.  
GTE Automatic Electric Labs Inc.: See—  
Janda, George M., 271,872, Cl. D14-61.000.  
Hamma, John C.: See—  
DuBois, R. Clark; and Hamma, John C., 271,882, Cl. D16-32.000.  
Hansen, Erik L., to Rosti Plastic A/S. Handle for kitchen utensils. 271,841, 12-20-83, Cl. D7-395.000.  
Hees, Peggy J., to Milton Bradley International, Inc. Toy puzzle. 271,898, 12-20-83, Cl. D21-105.000.  
Hernandez, Ernest. Support for concrete reinforcement bar. 271,846, 12-20-83, Cl. D8-356.000.  
Hernandez, Ernest. Concrete reinforcement bar support. 271,847, 12-20-83, Cl. D8-356.000.  
Hillesheim, Maurice G. Game paddle. 271,899, 12-20-83, Cl. D21-211.000.  
Hirsh Company: See—  
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 271,843, Cl. D8-312.000.  
Hoff, Harvey B. Refrigerator with beverage dispenser. 271,877, 12-20-83, Cl. D15-81.000.  
Honda Giken Kogyo Kabushiki Kaisha: See—  
Morioka, Minoru; Omori, Yoshitaka; and Matsui, Mamoru, 271,865, Cl. D12-110.000.  
Hull, James R. Bed. 271,826, 12-20-83, Cl. D6-81.000.  
Hull, James R. Bed. 271,827, 12-20-83, Cl. D6-81.000.  
Hunt, James R. Combined comb and sheath. 271,911, 12-20-83, Cl. D28-22.000.  
Huntsinger, Daniel F. Cushion. 271,834, 12-20-83, Cl. D6-201.000.  
Janda, George M., to GTE Automatic Electric Labs Inc. Wall telephone base housing. 271,872, 12-20-83, Cl. D14-61.000.  
Kangas, Timothy J., to PACCAR Inc. Integral truck cab windshield roof and deflector unit. 271,864, 12-20-83, Cl. D12-96.000.  
Kato, Takaharu, to Ricoh Company, Ltd. Camera. 271,881, 12-20-83, Cl. D16-6.000.  
Katoh, Hisaaki: See—  
Kojima, Yoshio; Nanba, Masumi; and Katoh, Hisaaki, 271,908, Cl. D26-3.000.
- Kaufman, Jack W. Surgical bone burring bit rack. 271,903, 12-20-83, Cl. D24-31.000.  
Kelson, Shirley J. P. Sewing aid. 271,821, 12-20-83, Cl. D3-18.000.  
Kesling, Keith: See—  
Gierschick, Walter K.; and Kesling, Keith, 271,873, Cl. D14-76.000.  
Kimura, Keiu, to Osaka Grip Mfg. Co., Ltd. Combined bottle and support bracket therefor. 271,852, 12-20-83, Cl. D9-337.000.  
Knutson, Lawrence M., to Decra Stone, Inc. Food bowl. 271,835, 12-20-83, Cl. D7-29.000.  
Kojima, Yoshio; Nanba, Masumi; and Katoh, Hisaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Lamp. 271,908, 12-20-83, Cl. D26-3.000.  
Kowalik, Marie P., to Florists' Transworld Delivery Association. Container for flowers, plants or the like. 271,863, 12-20-83, Cl. D11-152.000.  
Kruckel, Peter A.; and Mock, Gerhard, to Schwan-Stabilo Schwan-hausser GmbH & Co. Marking instrument. 271,889, 12-20-83, Cl. D19-43.000.  
Kunz, Kendall C. Fire stop for use between wall studs. 271,849, 12-20-83, Cl. D8-384.000.  
Kurpakus, Larry. Horseshoe. 271,912, 12-20-83, Cl. D30-35.000.  
Lance, Mark A., to W. A. Deutsher Pty. Ltd. Tube clamp. 271,851, 12-20-83, Cl. D8-396.000.  
Leviton Manufacturing Co., Inc.: See—  
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 271,869, Cl. D13-30.000.  
Litschi, Gerold, to Master Etching Machine Company. Exposure unit for lithographic plates. 271,883, 12-20-83, Cl. D16-33.000.  
Ma, Hansan, to Milton Bradley International, Inc. Stacking toy. 271,897, 12-20-83, Cl. D21-104.000.  
Mallory, Henry R., to Duracell Inc. Fluorescent lantern. 271,909, 12-20-83, Cl. D26-42.000.  
Martin, Walter S.; and Terrell, Cleo B., to Martin, Walter S. Can lid. 271,858, 12-20-83, Cl. D9-447.000.  
Massaro, Jon. Heliodon-type device. 271,824, 12-20-83, Cl. D6-27.000.  
Master Etching Machine Company: See—  
Litschi, Gerold, 271,883, Cl. D16-33.000.  
Mathews, Arlene L. Combined soap and rag holder. 271,829, 12-20-83, Cl. D6-89.000.  
Matsuda, Mutsuhide: See—  
Agou, Nobuhiro; and Matsuda, Mutsuhide, 271,880, Cl. D16-1.000.  
Matsui, Mamoru: See—  
Morioka, Minoru; Omori, Yoshitaka; and Matsui, Mamoru, 271,865, Cl. D12-110.000.  
Matsuo, Yoshihiko; and Shohoji, Takeshi, to Ryobi Limited. Door closer. 271,845, 12-20-83, Cl. D8-330.000.  
McGain, Peter D. Support bracket for a flower pot or similar article. 271,831, 12-20-83, Cl. D6-137.000.  
Metal Box Limited: See—  
Berry, Christopher, 271,854, Cl. D9-351.000.  
Miller, Allen D.: See—  
Suhajda, John I.; Corba, Robert E.; Davenport, Richard L.; and Miller, Allen D., 271,856, Cl. D9-375.000.  
Milton Bradley International, Inc.: See—  
Hees, Peggy J., 271,898, Cl. D21-105.000.  
Ma, Hansan, 271,897, Cl. D21-104.000.  
Mock, Gerhard: See—  
Kruckel, Peter A.; and Mock, Gerhard, 271,889, Cl. D19-43.000.  
Morioka, Minoru; Omori, Yoshitaka; and Matsui, Mamoru, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 271,865, 12-20-83, Cl. D12-110.000.  
Nanba, Masumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Compact fluorescent lamp. 271,907, 12-20-83, Cl. D26-3.000.  
Nanba, Masumi: See—  
Kojima, Yoshio; Nanba, Masumi; and Katoh, Hisaaki, 271,908, Cl. D26-3.000.  
Nanfito, Joann K.: See—  
Nanfito, William J.; and Nanfito, Joann K., 271,913, Cl. D32-55.000.  
Nanfito, William J.; and Nanfito, Joann K. Baby bottle drying rack. 271,913, 12-20-83, Cl. D32-55.000.  
Neilson, David R. Housing for pneumatic separator. 271,879, 12-20-83, Cl. D15-147.000.  
Nickerson, L. Douglas. Splitting head for a wood splitting machine. 271,842, 12-20-83, Cl. D8-47.000.  
Nippon Kogaku K.K.: See—  
Giugiaro, Giorgetto, 271,885, Cl. D16-133.000.  
Okada, Donald. Combined vase and support bracket therefor. 271,833, 12-20-83, Cl. D6-182.000.  
Omori, Yoshitaka: See—  
Morioka, Minoru; Omori, Yoshitaka; and Matsui, Mamoru, 271,865, Cl. D12-110.000.  
Osaka Grip Mfg. Co., Ltd.: See—  
Kimura, Keiu, 271,852, Cl. D9-337.000.  
PACCAR Inc.: See—  
Kangas, Timothy J., 271,864, Cl. D12-96.000.  
Patton, Frederick K. Sign. 271,861, 12-20-83, Cl. D10-114.000.  
Pearson, Clark: See—  
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 271,828, Cl. D6-86.000.  
Peterson, Michael: See—  
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 271,843, Cl. D8-312.000.



## LIST OF DESIGN PATENTEES

- Polson, William. Combined inside and outside thermometer. 271,859, 12-20-83, Cl. D10-58.000.
- Powers, Robert M., to Amway Corporation. Invertible casserole-roaster or the like. 271,839, 12-20-83, Cl. D7-327.000.
- Powers, Robert M., to Amway Corporation. Roaster. 271,840, 12-20-83, Cl. D7-360.000.
- Presto Lock, Inc.: See—  
Stolarz, Edward M., 271,844, Cl. D8-321.000.
- Quaker Oats Company, The: See—  
Wilkes, Kenneth R., 271,896, Cl. D21-87.000.
- Reinke, Wolfgang, to Esselte Pendaflex Corporation. Handle for a labelling apparatus. 271,886, 12-20-83, Cl. D18-19.000.
- Renteria, William J., to Atari, Inc. Video game console. 271,891, 12-20-83, Cl. D21-13.000.
- Rhomberg, Jane E. Baby shoe. 271,819, 12-20-83, Cl. D2-278.000.
- Richter, Volker: See—  
Schoettle, Klaus; Richter, Volker; and Wittkamp, Heinrich, 271,870, Cl. D14-11.000.
- Ricoh Company, Ltd.: See—  
Kato, Takaharu, 271,881, Cl. D16-6.000.
- Rivera, Lester: See—  
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 271,869, Cl. D13-30.000.
- Rogers, David, to Textron Inc. Fork or similar article of flatware. 271,838, 12-20-83, Cl. D7-137.000.
- Rosenbaum, Saul: See—  
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 271,869, Cl. D13-30.000.
- Rosti Plastic A/S: See—  
Hansen, Erik L., 271,841, Cl. D7-395.000.
- Runins, William E. Bingo-card holder. 271,895, 12-20-83, Cl. D21-54.000.
- Ryobi Limited: See—  
Matsuo, Yoshihiko; and Shohoji, Takeshi, 271,845, Cl. D8-330.000.
- S. C. Johnson & Son, Inc.: See—  
Suhajda, John I.; Corba, Robert E.; Davenport, Richard L.; and Miller, Allen D., 271,856, Cl. D9-375.000.
- Sandman, Scott: See—  
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 271,828, Cl. D6-86.000.
- Schoettle, Klaus; Richter, Volker; and Wittkamp, Heinrich. Magnetic tape cassette. 271,870, 12-20-83, Cl. D14-11.000.
- Schwan-Stabilo Schwanhauser GmbH & Co.: See—  
Kruckel, Peter A.; and Moek, Gerhard, 271,889, Cl. D19-43.000.
- Shimizu, Yoshiharu, to Arrow Trading Co., Inc. Combined telephone handset and base therefor. 271,871, 12-20-83, Cl. D14-53.000.
- Shohoji, Takeshi: See—  
Matsuo, Yoshihiko; and Shohoji, Takeshi, 271,845, Cl. D8-330.000.
- Silbernagel, Frederick J. Front discharge mixer truck with auxiliary rear axle. 271,875, 12-20-83, Cl. D15-19.000.
- Sims, Frank. Game board. 271,894, 12-20-83, Cl. D21-34.000.
- Smith, Donald B. Collapsible article support or similar article. 271,832, 12-20-83, Cl. D6-180.000.
- Snodgrass, Warren H. Chair. 271,825, 12-20-83, Cl. D6-69.000.
- Stolarz, Edward M., to Presto Lock, Inc. Handle stud for an article of luggage or the like. 271,844, 12-20-83, Cl. D8-321.000.
- Suhajda, John I.; Corba, Robert E.; Davenport, Richard L.; and Miller, Allen D., to S. C. Johnson & Son, Inc. Bottle. 271,856, 12-20-83, Cl. D9-375.000.
- Sylvan, Richard: See—  
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 271,843, Cl. D8-312.000.
- Tappan Company, The: See—  
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 271,828, Cl. D6-86.000.
- Tcherneshoff Associates, Inc.: See—  
Tcherneshoff, John K., 271,848, Cl. D8-373.000.
- Tcherneshoff, John K., to Tcherneshoff Associates, Inc. Tamper-proof fastening device for tags and the like. 271,848, 12-20-83, Cl. D8-373.000.
- Terrell, Cleo B.: See—  
Martin, Walter S.; and Terrell, Cleo B., 271,858, Cl. D9-447.000.
- Textron Inc.: See—  
Rogers, David, 271,838, Cl. D7-137.000.
- Thomson-CSF: See—  
Endt, Evert, 271,874, Cl. D14-113.000.
- Thrush, James L., to Anchor Hocking Corporation. Bottle or the like. 271,855, 12-20-83, Cl. D9-370.000.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—  
Kojima, Yoshio; Nanba, Masumi; and Katoh, Hisaaki, 271,908, Cl. D26-3.000.
- Nanba, Masumi, 271,907, Cl. D26-3.000.
- Tsuno, Tokumitsu, to Yakult Honsha Co., Ltd. Bottle. 271,853, 12-20-83, Cl. D9-349.000.
- Tucker, Annabelle D. Angio-catheter/infusion tubing lock. 271,904, 12-20-83, Cl. D24-54.000.
- Turkington, Mark; and Turkington, Philip, to Connecticut Cycle Accessories, Inc. Combined sissy bar and backrest pad. 271,866, 12-20-83, Cl. D12-119.000.
- Turkington, Philip: See—  
Turkington, Mark; and Turkington, Philip, 271,866, Cl. D12-119.000.
- U.S. Philips Corporation: See—  
Zabransky, Fritz E., 271,906, Cl. D26-2.000.
- Voytko, Charles L.; and Boudreau, Robert J., to Brown Group Recreational Products, Inc. Collapsible stroller. 271,868, 12-20-83, Cl. D12-129.000.
- W. A. Deutsher Pty. Ltd.: See—  
Lance, Mark A., 271,851, Cl. D8-396.000.
- Waites, Raymond, to Gear, Inc. Duffel satchel. 271,823, 12-20-83, Cl. D3-71.000.
- Waslander, Donald, to Essilor International (Compagnie Generale d'Optique). Optical measuring instrument. 271,901, 12-20-83, Cl. D24-1.100.
- Wilkes, Kenneth R., to Quaker Oats Company, The. Space toy. 271,896, 12-20-83, Cl. D21-87.000.
- Williams, Caldwell, to Williams, Caldwell. Book cover. 271,887, 12-20-83, Cl. D19-26.000.
- Wirken, Frank J. Casino game board. 271,893, 12-20-83, Cl. D21-26.000.
- Wittkamp, Heinrich: See—  
Schoettle, Klaus; Richter, Volker; and Wittkamp, Heinrich, 271,870, Cl. D14-11.000.
- Wolf, Gregory; Sandman, Scott; and Pearson, Clark, to Tappan Company, The. Toilet-bidet cabinet. 271,828, 12-20-83, Cl. D6-86.000.
- Yakult Honsha Co., Ltd.: See—  
Tsuno, Tokumitsu, 271,853, Cl. D9-349.000.
- Zabransky, Fritz E., to U.S. Philips Corporation. Lamp. 271,906, 12-20-83, Cl. D26-2.000.

## LIST OF PLANT PATENTEES

- Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 5,163, 12-20-83, Cl. 76.000.
- L. Daehnfeldt Ltd.: See—  
Schelbeck, Erland V., 5,162, Cl. 68.000.
- Mikkelsen, James C., to Mikkelsen, Inc. Kalanchoe plant named Cinnabar. 5,160, 12-20-83, Cl. 68.000.
- Mikkelsen, James C., to Mikkelsen, Inc. Begonia plant named Lyric. 5,161, 12-20-83, Cl. 68.000.
- Mikkelsen, Inc.: See—  
Mikkelsen, James C., 5,160, Cl. 68.000.
- Mikkelsen, James C., 5,161, Cl. 68.000.
- National Seed Development Organisation Limited: See—  
Tydeman, Henry M., deceased; and Tydeman, William M., executor, 5,159, Cl. 37.000.
- Schelbeck, Erland V., to L. Daehnfeldt Ltd. Begonia plant named Dorthie. 5,162, 12-20-83, Cl. 68.000.
- Tydeman, Elizabeth M., executor: See—  
Tydeman, Henry M., deceased; and Tydeman, William M., executor, 5,159, Cl. 37.000.
- Tydeman, Henry M., deceased (by Tydeman, Elizabeth M., executor); and by Tydeman, William M., executor, to National Seed Development Organisation Limited. Cherry rootstock—cob variety. 5,159, 12-20-83, Cl. 37.000.
- Tydeman, William M., executor: See—  
Tydeman, Henry M., deceased; and Tydeman, William M., executor, 5,159, Cl. 37.000.
- Yoder Brothers, Inc.: See—  
Duffett, William E., 5,163, Cl. 76.000.

## CLASSIFICATION OF PATENTS

ISSUED DECEMBER 20, 1983

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2	CLASS 42	340	4,420,948	372	4,421,000	CLASS 118	CLASS 132
161 A	4,420,843	354	4,420,949	373 R	4,421,001	63	83 R
CLASS 4	CLASS 43	402	4,420,950	1.17	4,421,002	620	88.5
295	17	CLASS 44	CLASS 65	1.26	4,421,003	645	163
366	4,420,844	1	4,421,538	20 D	4,421,004	657	CLASS 134
542	4,420,845	3.12	4,421,539	19	4,421,005	51.12	76
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CLASS 8	53	CLASS 47	4,421,542	33 CA	4,421,008	CLASS 119	CLASS 135
130.1	CLASS 48	1.44	4,420,901	140	4,421,009	19	22
137	66	66	4,420,902	375 R	4,421,010	15	102
444	81	17 R	4,420,903	380	4,421,011	155 R	CLASS 136
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CLASS 15	CLASS 15	CLASS 51	CLASS 71	289 P	4,421,017	1 R	340
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22 R	104.3 SN	165.88	4,421,544	402	4,421,019	15	CLASS 138
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597	611	791	4,420,966	329	4,421,037	CLASS 126	11.5 R
611	739	CLASS 53	4,420,967	379	4,421,038	61	12 E
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741	764	307	4,420,969	9	4,421,040	91 R	111
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178 F	178 F	155	4,420,980	186	4,421,051	4	71
180 R	180 R	155	4,420,981	238	4,421,052	6	86
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12	12	155	4,420,987	259	4,421,058	92 EB	308.2
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570	570	155	4,420,991	292	4,421,062	419 PG	613
		155	4,420,992	311	4,421,063	419 PG	643
		155	4,420,993	CLASS 114	4,421,064	725	CLASS 159
		155	4,420,994	222	4,421,065	731	CLASS 162
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		155	4,420,996	256	4,421,067	782	30.11
		155	4,420,997	264	4,421,068	782	47
		155	4,420,998	CLASS 116	4,421,069	782	88
		155	4,420,999	34 R	4,421,070	782	100
		155	4,420,999	218	4,421,071	782	111
		155	4,420,999		4,421,072	782	162
		155	4,420,999		4,421,073	782	168.2
		155	4,420,999		4,421,074	782	4,421,595
		155	4,420,999		4,421,075	782	4,421,596
		155	4,420,999		4,421,076	782	4,421,597
		155	4,420,999		4,421,077	782	4,421,598
		155	4,420,999		4,421,078	782	4,421,599
		155	4,420,999		4,421,079	782	4,421,600
		155	4,420,999		4,421,080	782	4,421,601
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## CLASSIFICATION OF PATENTS

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40 4,421,158	372 4,421,221	10.55 F 4,421,968	61.4 4,421,293	27 4,421,324	384 4,422,022	384 4,422,022
44 4,421,159	382 4,421,222	107 4,421,969	149.7 4,421,294	50 4,421,325	443 4,422,023	443 4,422,023
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80 C 4,421,161	604 4,421,223	128 4,421,971	368 4,421,296	178 4,421,327	640 4,422,025	640 4,422,025
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59 4,421,163	814 4,421,228	441 4,421,974	CLASS 252	CLASS 280	753 4,422,028	753 4,422,028
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312 4,421,170	147 R 4,421,964	CLASS 222	74 4,421,662	277 4,421,337	CLASS 324	CLASS 324
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336 4,421,173	309 4,421,967	140 4,421,666	140 4,421,665	478 B 4,421,340	71.4 4,422,036	71.4 4,422,036
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383 4,421,175	1 4,421,604	174.12 4,421,668	174.12 4,421,668	752 4,421,343	73 R 4,422,038	73 R 4,422,038
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63 4,421,177	181 4,421,606	301.4 F 4,421,671	301.4 F 4,421,671	27.5 4,421,344	207 4,422,041	207 4,422,041
548 4,421,178	CLASS 202	301.1 4,421,672	301.1 4,421,672	CLASS 288	313 4,422,042	313 4,422,042
CLASS 173	10 4,421,607	511 4,421,673	511 4,421,673	223 4,421,345	338 4,422,043	338 4,422,043
44 4,421,179	60 4,421,607	522 R 4,421,674	522 R 4,421,674	346 4,421,346	CLASS 328	CLASS 328
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68.5 4,421,944	12 4,421,608	88 4,421,300	88 4,421,300	53 4,421,990	4.3 4,422,046	4.3 4,422,046
92 4,421,945	16 4,421,609	134.3 R 4,421,301	134.3 R 4,421,301	53 4,421,991	51 4,422,047	51 4,422,047
114 4,421,946	35 N 4,421,610	342 4,421,299	342 4,421,299	CLASS 292	109 4,422,048	109 4,422,048
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158 R 4,421,948	74 4,421,613	112 B 4,421,684	112 B 4,421,684	339 4,421,348	278 4,422,051	278 4,422,051
CLASS 175	98 4,421,614	112 R 4,421,685	112 R 4,421,685	CLASS 293	295 4,422,052	295 4,422,052
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CLASS 177	158 R 4,421,618	239.3 B 4,421,688	239.3 B 4,421,688	CLASS 294	CLASS 333	CLASS 333
25 4,421,185	159.16 4,421,619	395 4,421,688	395 4,421,688	74 4,421,352	12 4,422,054	12 4,422,054
139 4,421,186	181 C 4,421,620	397.1 4,421,690	397.1 4,421,690	82 R 4,421,353	131 4,422,055	131 4,422,055
CLASS 179	192 P 4,421,622	410.9 R 4,421,691	410.9 R 4,421,691	CLASS 296	177 4,422,056	177 4,422,056
2 DP 4,421,950	206 4,421,623	464 4,421,692	464 4,421,692	1 S 4,421,354	194 4,422,057	194 4,422,057
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121 D 4,421,957	10 4,421,229	CLASS 264	CLASS 264	6 A 4,421,359	218 4,422,061	218 4,422,061
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50 4,421,204	612 4,421,642	27 4,421,306	27 4,421,306	198 4,421,365	508 4,422,067	508 4,422,067
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156 4,421,206	116 4,421,286	72 4,421,307	72 4,421,307	CLASS 313	514 4,422,069	514 4,422,069
CLASS 185	223 4,421,287	73 4,421,308	73 4,421,308	105 CM 4,422,005	691 4,422,070	691 4,422,070
29 4,421,207	CLASS 210	CLASS 273	CLASS 273	483 4,422,006	723 4,422,071	723 4,422,071
CLASS 187	138 4,421,643	51 4,421,309	51 4,421,309	486 4,422,007	825.44 4,422,072	825.44 4,422,072
9 E 4,421,208	206 R 4,421,288	143 R 4,421,310	143 R 4,421,310	524 4,422,008	870.21 4,422,073	870.21 4,422,073
9 R 4,421,209	246 4,421,289	153 S 4,421,311	153 S 4,421,311	579 4,422,009	CLASS 343	CLASS 343
CLASS 188	635 4,421,291	236 4,421,312	236 4,421,312	642 4,422,011	5 CF 4,422,074	5 CF 4,422,074
605 4,421,648	CLASS 249	237 4,421,313	237 4,421,313	CLASS 315	6 R 4,422,075	6 R 4,422,075
634 4,421,649	335 4,421,975	238 4,421,314	238 4,421,314	3.5 4,422,012	458 4,422,076	458 4,422,076
79.5 K 4,421,210	CLASS 250	239 4,421,315	239 4,421,315	111.81 4,422,013	704 4,422,077	704 4,422,077
152 4,421,212	227 4,421,979	240 4,421,316	240 4,421,316	169.4 4,422,014	895 4,422,078	895 4,422,078
296 4,421,213	253 4,421,981	241 4,421,317	241 4,421,317	209 R 4,422,015		
CLASS 192	260 4,421,982	313 4,421,318	313 4,421,318			
0.098 4,421,217	339 4,421,983	395 4,421,318	395 4,421,318			
4 A 4,421,214	60 G 4,421,240					

## CLASSIFICATION OF PATENTS

CLASS 346		186	4,422,131	492	4,421,432	274	4,421,760	621	4,421,847	402	4,421,876
1.1	4,422,079	220	4,422,132		CLASS 401	275	4,421,761			414	4,421,877
	4,422,080	277	4,422,133	175	4,421,433	283	4,421,762	CLASS 431		454	4,421,878
33 ME	4,422,081	300	4,422,134		CLASS 403	285	4,421,763	76	4,421,473	500	4,421,879
75	4,422,082	346	4,422,135		4,421,434	308	4,421,764	115	4,421,474		
108	4,422,083	390	4,422,136		CLASS 404	309	4,421,765	207	4,421,475		CLASS 524
140 R	4,422,084		4,422,137			311	4,421,766	243	4,421,476	14	4,421,880
	4,422,085	CLASS 363		113	4,421,435	319	4,421,767	325	4,421,477	24	4,421,881
	4,422,086	21	4,422,138		CLASS 405	325	4,421,768	351	4,421,478	31	4,421,882
			4,422,139			358	4,421,769			127	4,421,883
3.72	4,421,379		CLASS 364	60	4,421,436		CLASS 435	31	4,421,479	209	4,421,884
3.78	4,421,380	184	4,422,140	166	4,421,437	125	4,421,466	238	4,421,480	295	4,421,885
6.6	4,421,381	200	4,422,141	227	4,421,438	133.1	4,421,465	239	4,421,481	310	4,421,886
96.20	4,421,382		4,422,142	258	4,421,439	136	4,421,467	246	4,421,482	317	4,421,887
96.21	4,421,383		4,422,143	282	4,421,440	143	4,421,468			371	4,421,888
96.29	4,421,384		4,422,144		CLASS 408	183	4,421,469		CLASS 433	381	4,421,889
299	4,421,385	300	4,422,145	17	4,421,441	311	4,421,470	77	4,421,483	431	4,421,890
319	4,421,386	404	4,422,146	115 R	4,421,442	421	4,421,471		CLASS 434	495	4,421,891
356	4,421,387	316	4,422,147		CLASS 409	527	4,421,472	3	4,421,484	514	4,421,892
358	4,421,388	440	4,422,147	232	4,421,443	89	4,421,770	44	4,421,485	588	4,421,893
429	4,421,388	464	4,422,148		CLASS 413	94	4,421,771	169	4,421,486		CLASS 525
459	4,421,390	473	4,422,149	4	4,421,444	231	4,421,772	185	4,421,487	28	4,421,894
		475	4,422,150		CLASS 414	249	4,421,773		4,421,488	53	4,421,895
211	4,421,391	502	4,422,151			319	4,421,774		CLASS 435	54.1	4,421,896
224	4,421,392	525	4,422,152			482	4,421,775	8	4,421,848	119	4,421,897
	4,421,393	571	4,422,153			502	4,421,776	32	4,421,849	186	4,421,898
245	4,421,394	606	4,422,155	17	4,421,445	553	4,421,777	32	4,421,849	189	4,421,899
		724	4,422,156	22	4,421,446	564	4,421,778	78	4,421,850	218	4,421,900
159	4,421,395	786	4,422,157	411	4,421,447	660	4,421,779	99	4,421,851	309	4,421,901
		900	4,422,158	685	4,421,448			116	4,421,852		CLASS 526
			CLASS 365	719	4,421,450		CLASS 427		4,421,853	317	4,421,902
25	4,421,396	127	4,422,159	739	4,421,451	40	4,421,780	129	4,421,854		CLASS 528
200	4,421,398	189	4,422,160		CLASS 415	46	4,421,781	161	4,421,855	15	4,421,903
299	4,421,399	200	4,422,161	8	4,421,452	53.1	4,421,782			27	4,421,904
400	4,421,397	227	4,422,162	4	4,421,453	54.1	4,421,783		CLASS 436	56	4,421,905
		229	4,422,163	88	4,421,454		4,421,784	2	4,421,857	111	4,421,906
1	4,421,400		CLASS 366	117	4,421,455	63	4,421,785	20	4,421,858	128	4,421,907
3 FU	4,421,401	76	4,421,412	119	4,421,456	82	4,421,786	86	4,421,859	181	4,421,908
8	4,421,402	307	4,421,413	170 A	4,421,457	126.2	4,421,787	518	4,421,860	362	4,421,909
	4,421,403	348	4,421,414	211	4,421,458	136	4,421,788		CLASS 440	388	4,421,910
14 CU	4,421,404		CLASS 367	117	4,421,458	204	4,421,789	37	4,421,489		CLASS 536
58	4,421,405	15	4,422,164		CLASS 417	236	4,421,790	89	4,421,490	7.1	4,421,911
84	4,421,406	40	4,422,165	38	4,421,459	242	4,421,792		CLASS 441		CLASS 544
		115	4,422,166	53	4,421,460	272	4,421,793	74	4,421,491	27	4,421,912
144	4,421,407	149	4,422,167	38	4,421,461	377	4,421,794	79	4,421,492	260	4,421,913
246	4,421,408		CLASS 368	310	4,421,462	385.5	4,421,795		CLASS 445	278	4,421,914
354	4,421,409	62	4,421,415	383	4,421,463	387	4,421,796	28	4,421,493	387	4,421,915
378	4,421,410	63	4,421,416	412	4,421,464	403	4,421,797		CLASS 455		CLASS 546
418	4,421,411	65	4,421,417		CLASS 419	421	4,421,798			14	4,421,916
		69	4,421,418	27	4,421,717	423	4,421,799	343	4,422,178	95	4,421,917
15	4,422,087	73	4,421,419		CLASS 420	424	4,421,800	601	4,422,179	153	4,421,918
19	4,422,088	229	4,421,420	443	4,421,718	19	4,421,801	606	4,422,181	159	4,421,919
22	4,422,089		4,421,421		CLASS 422	31	4,421,802	614	4,422,182	163	4,421,920
23	4,422,090	273	4,421,422			35	4,421,803		CLASS 464	251	4,421,921
24	4,422,091	291	4,421,423	57	4,421,719		4,421,804	51	4,421,495		CLASS 549
41	4,422,092		CLASS 369	97	4,421,720	36	4,421,806	95	4,421,496	313	4,421,922
		45	4,422,168	109	4,421,721	41	4,421,807	111	4,421,494	349	4,421,923
12	4,422,093	270	4,422,169	129	4,421,722	55	4,421,808	181	4,421,497	360	4,421,924
37	4,422,094		CLASS 371	218	4,421,723	90	4,421,809		CLASS 474	370	4,421,925
166	4,422,095				CLASS 423	109	4,421,810	182	4,421,498	372	4,421,926
191.7	4,422,096	32	4,422,171	22	4,421,724	116	4,421,811		CLASS 493		CLASS 556
227	4,422,097		CLASS 373	228	4,421,725	152	4,421,812			471	4,421,926
256	4,422,098	94	4,422,172	243	4,421,726	195	4,421,813	23	4,421,499		CLASS 560
293	4,422,099	115	4,422,173	252	4,421,727		4,421,814	405	4,421,500	177	4,421,928
	4,422,100		4,422,174	260	4,421,728	198	4,421,816	439	4,421,501	209	Re. 31,468
299	4,422,101		CLASS 374	478	4,421,730	202	4,421,817		CLASS 494		CLASS 562
302	4,422,102	43	4,420,965	555	4,421,731	211	4,421,824	7	4,421,502	465	4,421,929
320	4,422,103	48	4,421,424	569	4,421,732	222	4,421,818	17	4,421,503	470	4,421,930
322	4,422,104		CLASS 375	573 R	4,421,733	229	4,421,819		CLASS 501		CLASS 564
903	4,422,105			648 R	4,421,734	246	4,421,820	103	4,421,861	139	4,421,931
			CLASS 376		CLASS 424	323	4,421,821		CLASS 502	292	4,421,932
17	4,422,106			1.1	4,421,735	332	4,421,822	55	4,421,672		CLASS 568
62	4,422,107	14	4,422,175	19	4,421,736	343	4,421,823	150	4,421,675	341	4,421,934
65	4,422,108	120	4,422,176	28	4,421,737	349	4,421,823	150	4,421,675	343	4,421,935
	4,422,109		CLASS 377	35	4,421,738	394	4,421,826	150	4,421,675	403	4,421,936
69	4,422,110	127	4,421,713	47	4,421,739	418	4,421,827	154	4,421,674	474	4,421,938
72.1	4,422,111	204	4,421,714	104	4,421,740	629	4,421,828	167	4,421,673	678	4,421,939
77	4,422,112	216	4,421,716	177	4,421,741			185	4,421,676	708	4,421,940
78	4,422,113	245	4,421,715		4,421,742	15	4,421,829		CLASS 518	885	
96.4	4,422,114		CLASS 378		4,421,743	49	4,421,830	700	4,421,862	948	4,421,940
104	4,422,115			17	4,421,744	70	4,421,831	701	4,421,863		CLASS 585
109	4,422,116		CLASS 381		4,421,745	72	4,421,832		CLASS 521	467	4,421,941
126	4,422,117	98	4,421,949	195	4,421,746	101	4,421,833				CLASS 604
	4,422,118		CLASS 383	199	4,421,747	105	4,421,834	26	4,421,864	12	4,421,504
128	4,422,119	61	4,421,150		4,421,748	111	4,421,835	31	4,421,865	28	4,421,505
			CLASS 384	200	4,421,749			79	4,421,866	34	4,421,506
24	4,422,120	123	4,421,425	207	4,421,750	5	4,421,836	82	4,421,867	52	4,421,507
119	4,422,121	219	4,421,426	245	4,421,751	31	4,421,837	112	4,421,868	70	4,421,508
127	4,422,122		CLASS 400	248.4	4,421,752	58	4,421,838	126	4,421,869	317	4,421,509
152	4,422,123			248.55	4,421,927	164	4,421,839	160	4,421,870	323	4,421,510
260	4,422,124			230	4,421,753	273	4,421,840	174	4,421,871	329	4,421,511
283	4,422,125	94	4,421,427	256	4,421,754	285	4,421,841		CLASS 523	396	4,421,512
323	4,422,126	120	4,421,428	258	4,421,755	296	4,421,842	145	4,421,873		
	4,422,127		4,421,429	270	4,421,756	322	4,421,843	315	4,421,874		
408	4,422,128	121	4,421,430	273 R	4,421,758	326	4,421,844	335	4,421,875		
433	4,422,129	124	4,421,431		4,421,759	544	4,421,845	336	Re. 28,474		
						559	4,421,846				
183	4,422,130										



## CLASSIFICATION OF DESIGNS

D2— 278 271,819	D7— 201 271,834	D9— 396 271,851	129 271,867	33 271,883	D23— 211 271,899
400 271,820	29 271,835	337 271,852	116 271,868	116 271,884	138 271,900
D3— 18 271,821	42 271,836	349 271,853	30 271,869	133 271,885	1.1 271,901
33 271,822	137 271,838	351 271,854	11 271,870	19 271,886	09 271,902
71 271,823	327 271,839	370 271,855	53 271,871	26 271,887	31 271,903
D6— 27 271,824	360 271,840	375 271,856	61 271,872	34 271,888	54 271,904
69 271,825	395 271,841	438 271,857	76 271,873	43 271,889	74 271,905
81 271,826	47 271,842	447 271,858	113 271,874	6 271,890	2 271,906
271,827	312 271,843	477 271,859	19 271,875	13 271,891	3 271,907
86 271,828	321 271,844	58 271,860	23 271,876	25 271,892	42 271,908
89 271,829	330 271,845	96 271,861	81 271,877	26 271,893	8.1 271,910
127 271,830	356 271,846	114 271,862	138 271,878	34 271,894	22 271,911
137 271,831	373 271,848	105 271,863	147 271,879	54 271,895	35 271,912
180 271,832	384 271,849	152 271,864	1 271,880	87 271,896	55 271,913
182 271,833	395 271,850	110 271,865	6 271,881	104 271,897	
		119 271,866	32 271,882	105 271,898	

## CLASSIFICATION OF PLANTS

P— 37 5,159	68 5,160	5,161	5,162	76 5,163
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## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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Colorado .....	8	Mississippi .....	28	Texas .....	48
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Delaware .....	10	Montana .....	30	Vermont .....	50
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## PATENTS

1 : 4,421,104	4,421,698	4,422,055	4,420,941	4,421,534	4,421,295
4,421,231	4,421,716	4,422,167	4,421,014	4,421,567	4,421,429
4,421,371	4,421,721	4,421,521	4,421,039	4,421,587	4,421,556
4,422,027	4,421,723	4,420,857	4,421,148	4,421,647	4,422,040
4,422,041	4,421,727	4,420,924	4,421,199	4,421,652	4,420,942
4,420,922	4,421,751	4,420,931	4,421,309	4,421,661	4,421,092
4,421,455	4,421,770	4,420,958	4,421,333	4,421,673	4,421,176
4,421,421	4,421,788	4,420,973	4,421,486	4,421,676	4,421,508
4,420,845	4,421,806	4,421,002	4,421,489	4,421,704	4,421,545
4,420,877	4,421,811	4,421,005	4,421,707	4,421,791	4,421,637
4,420,890	4,421,857	4,421,033	4,421,731	4,421,816	4,421,655
4,420,891	4,421,860	4,421,097	4,421,830	4,421,869	4,421,678
4,420,914	4,421,947	4,421,100	4,421,939	4,421,938	4,420,898
4,420,917	4,421,972	4,421,118	4,422,073	4,421,951	4,421,048
4,420,938	4,421,973	4,421,124	4,422,098	4,421,952	4,421,111
4,420,939	4,421,979	4,421,131	4,422,131	4,422,015	4,421,205
4,420,974	4,421,995	4,421,134	4,422,162	4,422,014	4,421,314
4,420,976	4,421,996	4,421,276	4,420,951	4,422,020	4,421,320
4,420,977	4,422,070	4,421,305	4,421,239	4,422,026	4,421,328
4,420,987	4,422,072	4,421,380	4,421,304	4,422,057	4,421,374
4,420,989	4,422,074	4,421,577	4,421,305	4,422,062	4,421,388
4,421,009	4,422,083	4,421,734	4,421,597	4,422,121	4,421,491
4,421,021	4,422,091	4,421,764	4,421,764	1,028,474	4,421,527
4,421,038	4,422,128	4,421,997	4,421,868	4,420,921	4,421,712
4,421,068	4,422,134	4,422,054	4,422,076	4,421,022	4,421,853
4,421,068	4,422,155	4,422,080	4,422,081	4,421,466	4,421,854
4,421,117	4,422,158	4,422,087	4,422,087	4,421,775	4,421,089
4,421,163	4,422,169	4,422,093	4,421,724	4,421,724	4,421,137
4,421,175	4,422,171	4,422,113	4,422,110	4,421,202	25 : Re.31,465
4,421,179	4,422,175	4,422,163	4,420,853	4,421,209	4,420,859
4,421,183	4,422,181	4,421,520	4,420,879	4,421,498	4,420,860
4,421,270	4,422,191	4,421,603	4,420,880	4,421,501	4,420,864
4,421,313	4,420,975	4,421,829	4,420,925	4,421,546	4,420,873
4,421,315	4,421,193	4,421,832	4,420,966	4,421,574	4,420,883
4,421,317	4,421,264	4,420,992	4,421,112	4,421,585	4,420,943
4,421,329	4,421,301	4,420,884	4,421,145	4,421,759	4,421,052
4,421,334	4,421,404	4,420,965	4,421,160	4,421,784	4,421,106
4,421,348	4,421,629	4,421,662	4,421,215	4,421,873	4,421,110
4,421,353	4,421,966	4,421,890	4,421,230	4,421,880	4,421,114
4,421,387	4,422,099	4,421,924	4,421,240	4,422,125	4,421,119
4,421,407	4,420,848	4,422,063	4,421,247	4,422,136	4,421,120
4,421,415	4,421,023	4,422,063	4,421,271	4,420,911	4,421,122
4,421,438	4,421,039	4,421,319	4,421,272	4,421,218	4,421,220
4,421,442	4,421,077	4,421,411	4,421,289	4,421,261	4,421,261
4,421,473	4,421,287	4,421,461	4,421,316	4,421,263	4,421,263
4,421,506	4,421,302	4,421,550	4,421,316	4,421,451	4,421,265
4,421,529	4,421,306	4,421,619	4,421,318	4,422,139	4,421,356
4,421,543	4,421,400	4,421,916	4,421,326	4,421,201	4,421,383
4,421,547	4,421,412	4,421,700	4,421,327	4,421,245	4,421,384
4,421,582	4,421,592	Re.31,470	4,421,368	4,421,349	4,421,406
4,421,631	4,421,777	4,420,851	4,421,427	4,421,409	4,421,449
4,421,663	4,421,894	4,420,903	4,421,432	4,421,479	4,421,493
4,421,682	4,421,977	4,420,907	4,421,509		
	4,422,046	4,420,932			



## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,421,500		4,421,310		4,420,954		4,421,225		4,421,393		4,421,454
4,421,503		4,422,105		4,420,993		4,421,227		4,421,515		4,421,456
4,421,525	33	4,421,101		4,421,045		4,421,238		4,421,517		4,421,487
4,421,528		4,421,370		4,421,050		4,421,253		4,421,518		4,421,492
4,421,589		4,421,970		4,421,083		4,421,293		4,421,523		4,421,507
4,421,735		4,422,079		4,421,158		4,421,323		4,421,530		4,421,535
4,421,785		4,422,166		4,421,180		4,421,330		4,421,531		4,421,640
4,421,826	34	4,420,856		4,421,228		4,421,336		4,421,542		4,421,696
4,421,831		4,420,909		4,421,250		4,421,337		4,421,557		4,421,733
4,421,944		4,420,953		4,421,267		4,421,372		4,421,561		4,421,779
4,421,968		4,421,026		4,421,298		4,421,446		4,421,562		4,421,863
4,421,988		4,421,041		4,421,312		4,421,467		4,421,576		4,421,864
4,422,115		4,421,042		4,421,360		4,421,474		4,421,580		4,421,906
4,422,133		4,421,043		4,421,373		4,421,478		4,421,620		4,421,923
4,422,177		4,421,098		4,421,378		4,421,482		4,421,630		4,421,940
4,420,906	26	4,421,123		4,421,379		4,421,544		4,421,715		4,421,985
4,420,952		4,421,125		4,421,414		4,421,579		4,421,782		4,422,028
4,420,957		4,421,132		4,421,417		4,421,611		4,421,836		4,422,043
4,421,079		4,421,147		4,421,436		4,421,645		4,421,877		4,422,092
4,421,090		4,421,226		4,421,460		4,421,722		4,421,902		4,422,100
4,421,162		4,421,237		4,421,465		4,421,736		4,421,917		4,422,143
4,421,208		4,421,254		4,421,512		4,421,769		4,422,003		4,422,164
4,421,214		4,421,325		4,421,569		4,421,809		4,422,009		4,422,165
4,421,224		4,421,495		4,421,608		4,421,824		4,422,035		4,422,173
4,421,236		4,421,514		4,421,626		4,421,834		4,422,037	49	4,420,948
4,421,280		4,421,526		4,421,665		4,421,866		4,422,132		4,421,463
4,421,288		4,421,552		4,421,671		4,421,878		4,421,141		4,421,572
4,421,308		4,421,565		4,421,675		4,421,900	44	4,421,141		4,421,572
4,421,355		4,421,566		4,421,748		4,421,913		4,421,444	50	4,421,008
4,421,472		4,421,568		4,421,778		4,421,964	45	4,421,129	51	4,420,969
4,421,522		4,421,578		4,421,799		4,422,004		4,421,150		4,421,019
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4,421,186		4,421,792		4,422,018		4,421,667		4,421,703		4,421,030
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4,421,386		4,421,862		4,422,135		4,421,943		4,420,913		4,421,354
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4,421,967		4,421,922		4,422,154	42	Re.31,464		4,421,000	54	4,422,150
4,422,066		4,421,941	37	4,421,025		4,420,847		4,421,007		4,421,695
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4,422,111		4,422,048		4,421,140		4,420,959		4,421,134	55	4,420,919
4,422,126		4,422,052		4,421,144		4,420,982		4,421,164		4,420,962
4,422,152		4,422,094		4,421,258		4,420,982		4,421,166		4,421,096
4,421,260	28	4,422,096		4,421,258		4,421,031		4,421,167		4,421,177
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4,420,850	29	4,422,141		4,421,259		4,421,054		4,421,169		4,421,300
4,421,093		4,422,159	38	4,421,190		4,421,069		4,421,170		4,421,435
4,421,204		4,422,161	39	Re.31,468		4,421,135		4,421,171		4,421,443
4,421,242		4,422,179		Re.31,469		4,421,161		4,421,173		4,421,453
4,421,549	35	4,421,062		4,420,868		4,421,200		4,421,174		4,421,726
4,421,564		4,421,408		4,420,900		4,421,217		4,421,182		4,421,740
4,421,858		4,421,982		4,420,990		4,421,246		4,421,184		4,421,822
4,421,937	36	4,420,852		4,421,001		4,421,256		4,421,198		4,421,823
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4,421,485		4,420,878		4,421,020		4,421,275		4,421,331		4,421,959
4,421,627		4,420,896		4,421,146		4,421,367		4,421,345		4,421,976
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## DESIGN PATENTS

01 : 271,848		271,849	16 : 271,877		271,893	31 : 271,913		271,855
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271,827		271,904	271,897		271,900	271,869	44	271,838
271,833	09	271,905	271,898		271,910	271,890	46	271,875
271,834		271,866	271,899		271,910	271,896	53	271,821
271,836		271,882	18 : 271,858	27	271,835	271,903		271,864
271,846		271,909	271,892		271,860			
271,847	12	271,911	20 : 271,829		271,867	37 : 271,857	55	271,856

## PLANT PATENTS

06 : 5,163	39 : 5,160	5,161			
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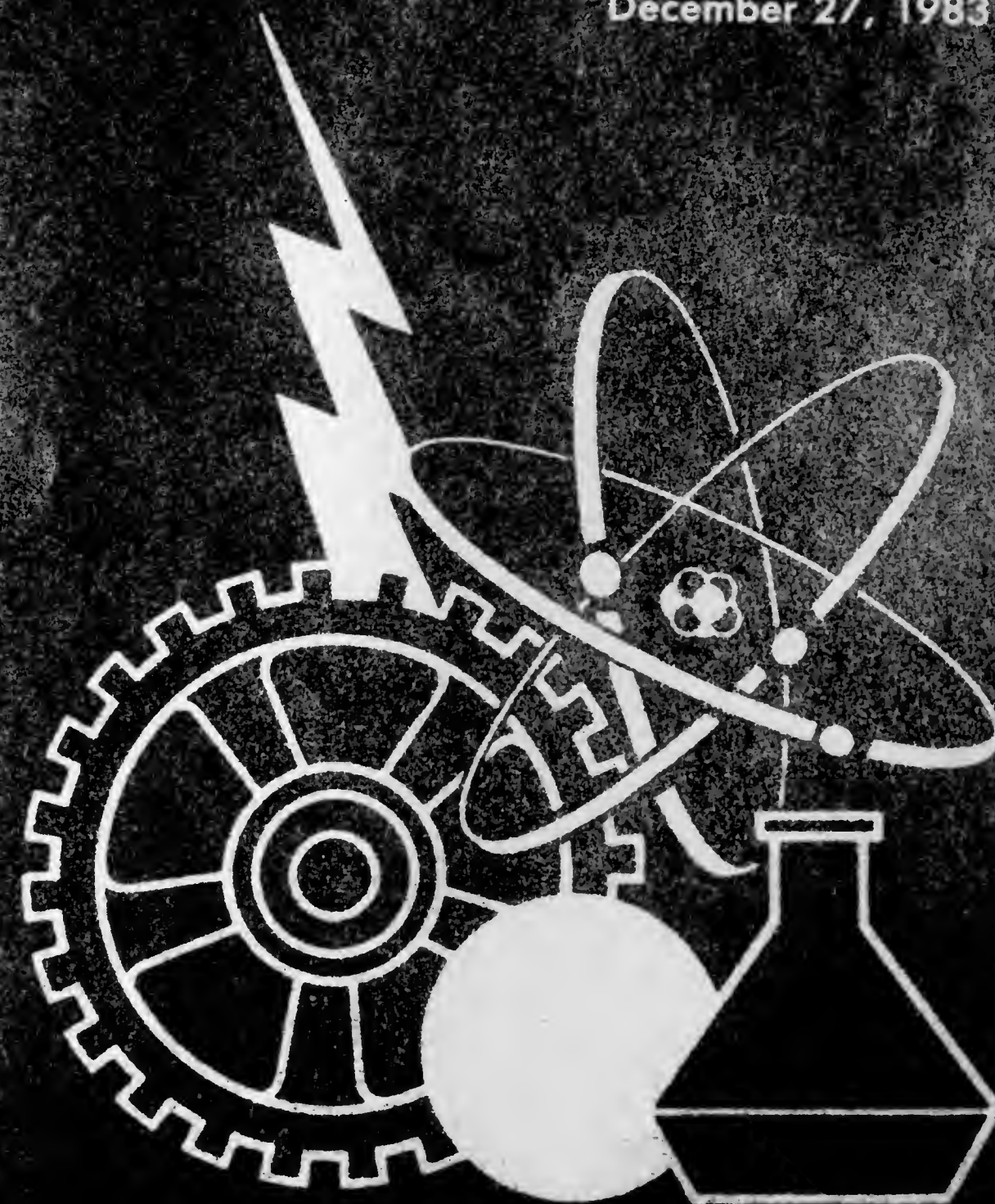
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U.S. DEPARTMENT OF COMMERCE  
Merrill B. Rothman, Secretary  
PATENT AND TRADEMARK OFFICE  
David R. Reardon, Commissioner



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## PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	\$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

Dec. 3, 1982. GERALD J. MOSSINGHOFF,  
Commissioner of Patents  
and Trademarks.

### Board of Appeals Decisions Rendered in the Month of Nov. 1983

Affirmed	198
Affirmed in Part	23
Reversed	72
Total	293

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,012,597, Re. S.N. 548,793, Filed Nov. 4, 1983, Cl. 179/2E, TRANSMISSION TRUNK MULTICHANNEL DISPATCH SYSTEM WITH PRIORITY QUEUING, Charles N. Lynk, Jr., et al., Owner of Record: Motorola, Inc., Chicago, Ill., Attorney or Agent: James W. Gillman, Ex. Gp.: 214

4,120,289, Re. S.N. 544,794, Filed Oct. 24, 1983, Cl. 123/271, REFRIGERANT CHARGED SOLAR WATER HEATING STRUCTURE AND SYSTEM, Edward W. Bottum, Owner of Record: Inventor, Attorney or Agent: Dale R. Small, Ex. Gp.: 344

4,200,765, Re. S.N. 538,866, Filed Oct. 4, 1983, Cl. 568/862, GLYCOL ALDEHYDE AND ETHYLENE

GLYCOL PROCESSES, Richard W. Goetz, Owner of Record: National Distillers and Chemical Corp., New York, N.Y., Attorney or Agent: John F. Scully, Ex. Gp.: 126

4,228,076, Re. S.N. 545,481, Filed Oct. 26, 1983, Cl. 264/321, METHOD OF DENSIFYING OPEN-CELLED POLYURETHANE MATERIAL, Winslow L. Pettingell, Owner of Record: Foam Cutting Engineers, Inc., Chicago, Ill., Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 147

4,253,478, Re. S.N. 542,204, Filed Oct. 14, 1983, Cl. 135/68, FOLDING CRUTCH, Emm ett O. Husa, Owner of Record: Inventor, Attorney or Agent: Joan H. Pauly, et al., Ex. Gp.: 334

4,291,062, Re. S.N. 534,140, Filed Sept. 21, 1983, Cl. 424/322, PHARMACEUTICAL COMPOSITIONS CONTAINING UREA, Steven Leigh, et al., Owner of Record: Phares Pharmaceutical Research N.V., Curacao, Netherlands, Attorney or Agent: John E. Lind, Ex. Gp.: 125

4,295,682, Re. S.N. 509,352, Filed June 30, 1983, Cl. 297/367, SUPERFINE TOOTH SEAT BACK ADJUSTER, Bernd A. Kluting, et al., Owner of Record: Keiper U.S.A., Inc., Battle Creek, Mich., Attorney or Agent: Lloyd M. Forster, Ex. Gp.: 355

4,300,088, Re. S.N. 549,731, Filed Nov. 8, 1983, Cl. 320/61, ELECTRIC CHARGING APPARATUS FOR GROUND VEHICLES, David E. Hicks, Owner of Record: Inventor, Attorney or Agent: Richard W. Hanes, Ex. Gp.: 214

4,304,177, Re. S.N. 544,025, Filed Oct. 21, 1983, Cl. 99/333, FOOD COOKING APPARATUS, Herbert H. Loeffler, et al., Owner of Record: Arthur D. Little, Inc., Cambridge, Mass., Attorney or Agent: Arthur H. Seidel, Ex. Gp.: 242

4,345,161, Re. S.N. 542,727, Filed Oct. 17, 1983, Cl. 290/55, MULTI-WHEEL WINDMILL ELECTRO-GENERATOR, George Crompton, Owner of Record: Inventor, Attorney or Agent: G. Lloyd Knight, Ex. Gp.: 217

4,351,494, Re. S.N. 536,898, Filed Sept. 28, 1983, Cl. 242/35.5A, BOBBIN TRANSPORT APPARATUS AND METHOD, Heinz Schippers, et al., Owner of Record: Barmag Barmer Maschinenfabrik Aktiengesellschaft Remscheid, Germany, Attorney or Agent: Charles B. Elderkin, Ex. Gp.: 245

4,353,780, Re. S.N. 540,933, Filed Oct. 11, 1983, Cl. 156/664, CHEMICAL MILLING OF HIGH TUNGSTEN CONTENT SUPERALLOYS, Robert E. Fishter, et al., Owner of Record: United Technologies Corp., Hartford, Conn., Attorney or Agent: Charles G. Nessler, Ex. Gp.: 161

4,359,015, Re. S.N. 545,841, Filed Oct. 27, 1983, Cl. 119/156, IDENTIFICATION TAG FOR LIVESTOCK, Eugene B. Ritchey, Owner of Record: Inventor, Attorney or Agent: Gary D. Fields, et al., Ex. Gp.: 333

4,372,303, Re. S.N. 548,186, Filed Nov. 2, 1983, Cl. 128/132D, BANDAGE FRAME AND METHOD, Frederic Grossman, Owner of Record: American Hospital Supply, Evanston, Ill., Attorney or Agent: Donald L. Barbeau, Ex. Gp.: 335

DECEMBER 27, 1983

U.S. PATENT AND TRADEMARK OFFICE

1037 OG 25

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for re-examination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

### No Publications This Issue

### Group Number on all Communications Going to the Examining Groups

Applicants and their attorneys or agents are reminded that the Group number should be typed on amendments and other communications relating to matters handled in the examining groups in order to expedite the processing of mail. The number of the Group should be placed on right-hand side, opposite the serial number or name of the applicant.

This reminder does not apply to notices and reasons of appeal to the United States Court of Appeals for the Federal Circuit. These communications should be sent to the Solicitor at the address below:

Solicitor  
Box 8  
U.S. Patent and Trademark Office  
Washington, D.C. 20231

Attention to these details will improve the efficiency and reduce the time necessary to process incoming mail.

Nov. 23, 1983. THERESA A. BRELSFORD,  
Assistant Commissioner  
for Administration.

### Mailing of Papers to the PTO in Patent Interference Proceedings

Effective immediately, attorneys and agents are requested to address all papers mailed to the Patent and Trademark Office in connection with an interference proceeding, and any patent or application involved in an interference proceeding, as follows:

BOX INTERFERENCE  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Use of this address will considerably assist the Board in its administration of patent interference proceedings.

Nov. 28, 1983. DONALD J. QUIGG,  
Deputy Commissioner of  
Patents and Trademarks.

### Department of the Treasury United States Customs Service

Application for Recordation of Trade Name:  
"Zahnradfabrik Friedrichshafen, AG."

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "ZAHNRADFABRIK FRIEDRICHSHAFEN, AG.," used by Zahnradfabrik Friedrichshafen, AG., a corporation organized under the laws of West Germany, located at D-7990 Friedrichshafen 1, West Germany.

The application states that the trade name is used in

connection with the following merchandise manufactured and distributed throughout the world: gear units for machines; machine parts; brake testing stands; testing instruments and parts for land vehicles.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before (60 days from date of publication).

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Room 2417, Washington, D.C. 20229.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

MARILYN G. MORRISON,  
Acting Director, Entry Procedures  
and Penalties Division.  
Oct. 21, 1983.

### National Technical Information Service

#### U.S. GOVERNMENT-OWNED INVENTIONS

#### Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

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Office of Government Inventions and Patents  
U.S. Department of Commerce  
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Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,  
Program Coordinator,  
Office of Government Inventions and Patents  
National Technical Information Service  
U.S. Department of Commerce.

#### DEPARTMENT OF AGRICULTURE

SN 6-524,179. A SIMPLE AND RAPID METHOD FOR EXTRACTION OF PROTEINS FROM BACTERIA.

#### DEPARTMENT OF COMMERCE

SN 6-525,771. OPTICAL FIBER THERMOMETER.

#### DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-202,727 (4,397,552). INSTRUMENT FOR MEASUREMENT OF EXPOSURE FROM A LASER RADIATION.

SN 6-254,097 (4,408,124). BRH TEST PATTERN FOR GAMMA CAMERA PERFORMANCE (AN EVALUATOR).

SN 6-319,995 (4,395,395). DETECTION OF NON-A, NON-B HEPATITIS ASSOCIATED ANTIGEN.  
SN 6-528,258. INACTIVATION OF VIRUSES CONTAINING ESSENTIAL LIPIDS.

#### DEPARTMENT OF THE AIR FORCE

SN 6-189,237 (4,397,147). POWER CIRCUIT UTILIZING SELF EXCITED HALL EFFECT SWITCH MEANS.



SN 6-210,476 (4,398,085). UNIVERSAL TIMING ARRAY.  
 SN 6-231,088 (4,398,792). HOLOGRAPHIC COUPLER FOR FIBER OPTIC SYSTEMS.  
 SN 6-235,488 (4,398,430). RUDDER PEDAL GRIP ASSEMBLY.  
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 SN 6-242,817 (4,398,685). AERIAL DAY/NIGHT REFUELING STATIONS.  
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 SN 6-253,453 (4,398,161). PHASE-SHIFTING AMPLIFIER.  
 SN 6-297,459 (4,399,733). SEMIAUTOMATIC SWAY-BRACE.  
 SN 6-305,667 (4,400,469). MAGNETOSTATIC WAVE DELAY LINE HAVING IMPROVED GROUP DELAY LINEARITY.  
 SN 6-308,974 (4,396,201). MISSILE MOUNTED SEAL.  
 SN 6-324,899 (4,396,171). AIRCRAFT EJECTION SEAT CATAPULT DEVICE.  
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 SN 6-401,164. RADAR SYSTEM FOR REDUCING ANGLE TRACKING ERRORS.

SN 6-418,886 (4,396,459). METHOD AND SOLUTION FOR ETCHING INDIUM ANTIMONIDE.  
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 SN 6-448,161 (4,400,421). FOUR-DIRECTIONAL STRUCTURE FOR REINFORCEMENT.  
 SN 6-497,443. DISTORTION FREE FIBER OPTIC SYSTEM.  
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 SN 6-518,275. ROBOTIC ORDER PICKING.  
 SN 6-518,590. METHOD OF PRODUCING A BURIED LONG PERIOD GRATING.  
 SN 6-520,386. TESTING APPARATUS FOR AIRBORNE MISSILE SYSTEM.  
 SN 6-521,778. FLOURIDE GLASS COMPOSITIONS.  
 SN 6-521,803. RANDOM TIMER.  
 SN 6-523,550. PROCESS FOR THE DEPOSITION OF III-V COMPOUNDS USING ULTRA-VIOLET RADIATION.  
 SN 6-73,478 (4,398,686). TOWPLATE SYSTEM.

## DEPARTMENT OF THE ARMY

SN 6-311,370 (4,401,670). METHOD FOR TREATING GONORRHEA INFECTIONS WITH 2-ACETYL- AND 2-PROPIONYL-PYRIDINE THIO-SEMICARBAZONES.  
 SN 6-529,427. X-200 ELECTRICALLY CONDUCTIVE ADHESIVE.  
 SN 6-533,089. A LINEAR ARRAY ANTENNA EMPLOYING THE SUMMATION OF SUB-ARRAYS.

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SN 6-258,076 (4,407,775). PRESSURELESS CONSOLIDATION OF METALLIC POWDERS.  
 SN 6-397,735 (4,409,189). RECOVERY OF TUNGSTEN FROM BRINES.  
 SN 6-460,102 (4,409,020). RECOVERY OF METALS FROM GRINDING SLUDGES.

## Status of PTO Services

The following is an update of the status of PTO services for November 1983:

Service Item	FY 1984 Performance Goal (Calendar Days)	Actual	Comment
Filing Receipts:			
Patents	22	24	
Trademarks	30	30	
Patent Copies:			
Window Coupons	5	98% within 5 days	
Mail Coupons	29	100% within 23 days	
Letter Orders	34	100% within 29 days	
Date of oldest unfilled order		Oct. 26, 1983	
Certified Copies:			
Trademark Registrations	30	11	
Applications-As-Filed	20	100% within 18 days	
File-Wrapper/Contents	N/A	100% within 8 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	17	
Filing Reg. Certificates	3	3	
Assignments:			
Patents	25	20	
Trademarks	25	11	
Avg. Days from Issue Fee Payment to Issue Date	90-100	91	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	On schedule	
Patent Copies Available	Issue Date	Avg. 7 days late	Due to GPO delays; being investigated.
Trademark Official Gazette:			
In Bookstore	Issue Date	Avg. 1 day late	
Mailed	Issue Date	Avg. 2 days late	
Trademark Regs. Mailed	Issue Date	Avg. 2 days late	

## IMPROVEMENTS TO SERVICES

- *File Wrapper Subscription Services Survey* — We plan to begin producing patented file wrapper microfiche in Jan. 1984. We are in the process of evaluating interest in a weekly subscription service for the patented file wrapper microfiche. The charge for this service may be as follows:
  - A. Initial yearly charge (includes one subclass) \$ 4.00
  - B. Yearly charge for each additional subclass \$ .40
  - C. Charge for each file furnished \$10.00
 Anyone interested should indicate the level of their interest (A. definite interest/would subscribe; B. tentative interest/may subscribe; or C. future interest/would subscribe in future) by writing:
 

Mr. Frank V. Caesar, Director  
 Office of Patent and Trademark Services  
 Crystal Plz. #2, Room 7D25  
 Washington, D.C. 20231
- *Group Number on all Communications Related to Pending Applications* — Applicants and their attorneys or agents are reminded that the Group number should be typed on amendments and other communications relating to matters handled in the examining groups in order to expedite the processing of mail. The number of the Group should be placed on the right-hand side, opposite the serial number or name of the applicant.

This reminder does not apply to notices and reasons

of appeal to the United States Court of Appeals for the Federal Circuit. These communications should be sent to the Solicitor at the address below:

Solicitor  
 Box 8  
 U.S. Patent and Trademark Office  
 Washington, D.C. 20231

Attention to these details will improve the efficiency and reduce the time necessary to process incoming mail.

- *Transmittals for Use of Deposit Accounts* — When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.
- *Subject Matter Directory* — In the Nov. 29, 1983, Official Gazette, an up-to-date telephone directory was published. Following is an alphabetic directory, by subject or type of inquiry.

Dec. 2, 1983.

THERESA A. BRELSFORD,  
 Assistant Commissioner  
 for Administration.



## PATENT NOTICES

### Certificates of Correction for the Week of Dec. 27, 1983

D. 252,042	4,376,879	4,390,507	4,404,762
D. 267,834	4,377,831	4,391,290	4,405,056
D. 269,968	4,379,495	4,393,110	4,405,305
3,855,079	4,379,672	4,393,237	4,405,494
4,042,397	4,379,761	4,395,876	4,405,746
4,249,735	4,380,303	4,397,913	4,405,887
4,289,842	4,381,052	4,398,031	4,406,286
4,289,844	4,381,570	4,399,008	4,406,673
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4,328,810	4,383,556	4,401,134	4,407,935
4,339,990	4,383,887	4,401,743	4,408,184
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4,366,621	4,386,220	4,403,383	4,414,129
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4,368,298	4,387,229	4,404,180	
4,371,063	4,387,966	4,404,733	

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### Disclaimer

3,848,115.—*Edwin A. Sloane and Charles L. Heizman*, Los Altos, Calif. VIBRATION CONTROL SYSTEM. Patent dated Nov. 12, 1974. Disclaimer filed Oct. 11, 1983, by the assignee, *Genrad, Inc.*

Hereby enters this disclaimer to claim 15 of said patent.

4,364,397.—*Paul Citron*, New Brighton, *Dennis G. Hepp*, Coon Rapids, and *Thomas L. Jirak*, Plymouth, Minn. APPARATUS FOR MONITORING THE RHYTHM OF A PATIENT'S HEARTBEAT. Patent dated Dec. 21, 1982. Disclaimer filed Sept. 26, 1983, by the assignee, *Medtronic, Inc.*

The term of this patent subsequent to Nov. 23, 1999, has been disclaimed.

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Journal of Patent Office Society (JPOS)

Editor, Gerald H. Bjorge  
Managing Editor, J. Robert Largen

Note: All questions should be addressed to:

Box 2600  
Arlington, Virginia 22202

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 Office of Publications -  
 Allowed Files Section  
 Crystal Plaza 2 Room-10C28  
 Washington, D.C. 20231

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 Chicago, IL 60673

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 litigation and any subsequently filed papers  
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Box 8 -- All papers for the Office of the Solicitor.

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 Commissioner of Patents and Trademarks  
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	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
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Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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\*Collection organized by subject matter.

\*\*Call only between the hours of 10:00 a.m. and 5:00 p.m.

## PATENT EXAMINING CORPS RENE D. TEGTMEYER, Assistant Commissioner WILLIAM FELDMAN, Deputy Assistant Commissioner CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

### PATENT EXAMINING GROUPS

	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
<b>GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director</b>	1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
<b>GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director</b>	11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
<b>HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director</b>	3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthetics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	
<b>COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director</b>	3-09-82
Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	
<b>SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director</b>	1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
<b>INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director</b>	5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	
<b>SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director</b>	3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	
<b>INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director</b>	1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
<b>RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director</b>	5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	
<b>ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director</b>	8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
<b>DESIGN, GROUP 290—KENNETH L. CAGE, Director</b>	1-30-81
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
<b>HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director</b>	5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
<b>MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director</b>	7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding; Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	
<b>AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director</b>	8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	
<b>HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director</b>	11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	
<b>GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director</b>	9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive  
Plant Patents ..... Numbers 2,616 to 2,627 inclusive



# REISSUES

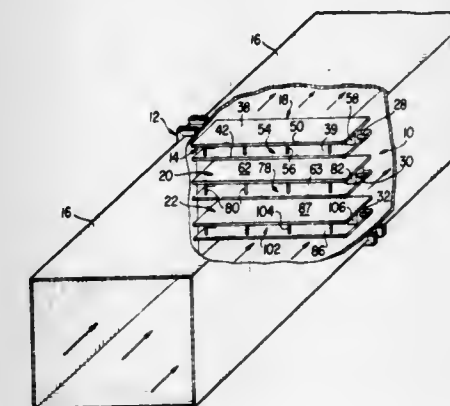
DECEMBER 27, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,471  
**MULTIPLE BLADE DAMPER ASSEMBLY**  
 Donald K. Hagar, Allentown, Pa., assignor to Damper Design, Inc., Allentown, Pa.  
 Original No. 4,191,212, dated Mar. 4, 1980, Ser. No. 798,166, May 18, 1977. Continuation of Ser. No. 156,673, Jun. 5, 1980, abandoned. Application for reissue Jan. 11, 1982, Ser. No. 338,557

Int. Cl.<sup>3</sup> F16K 1/22; F24F 13/16  
 U.S. Cl. 137—601

23 Claims



20. A damper for a duct comprising a frame defining a rectangular opening and mountable in said duct and at least two blades extending across said opening and journaled in said frame to rotate about parallel axes from edge-to-edge closed positions forming a common barrier across said opening to open positions in parallel planes, each blade including a pair of spaced, flat parallel plates joined together with connecting members, the space between the plates of each blade defining a substantially unrestricted open fluid passageway through such blade, each plate of each blade including a pair of edges extending parallel to the axis of rotation of each blade, one edge of one plate and one edge of the other plate defining a first open aperture of each blade, the other edge of said one plate and the other edge of said other plate defining a second open aperture, one of said apertures providing an inlet and the other of said apertures providing an outlet to said fluid passageway of each blade to permit flow of fluid therethrough, each plate including sides parallel to said edges of said plates and in face-to-face relationship with said frame, means for maintaining a predetermined clearance between said sides and said frame, said maintaining means including a movable member disposed on one of said sides of each blade and between said plates thereof, a bearing between said frame and said movable member and biasing means urging said movable member toward said frame, said movable member having an outer extremity disposed adjacent said frame, said bearing being so disposed with respect to said movable member and said frame as to provide the predetermined clearance between said outer extremity and said frame, said biasing means allowing said moving means to move with respect to said blade upon thermal expansion to maintain said predetermined clearance.

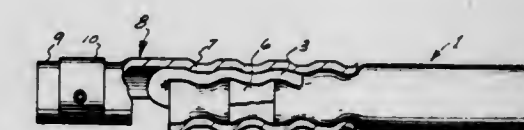
Re. 31,472  
**IGNITION CABLE TERMINAL CONSTRUCTION**  
 James M. Keller, Burtchville Township, Saint Clair County, Mich., assignor to Allied Corporation, Morristown, N.J.  
 Original No. 4,284,322, dated Aug. 18, 1981, Ser. No. 100,771, Dec. 6, 1979. Application for reissue Nov. 27, 1981, Ser. No. 325,474

Int. Cl.<sup>3</sup> H01R 11/08, 43/04  
 U.S. Cl. 339—223 S

9 Claims

8. A method of attaching a terminal to a cable, said cable having a central conductive core, and an outermost insulating

layer concentric with and surrounding said central conductive core, comprising the steps of:  
 forming an exposed core end portion by removing said outermost layer from said central conductive core for a predetermined distance from an end of said cable; then  
 placing a narrow strip of conductive sheet material in a circumferential direction with respect to said cable and in contact with substantially more than half of the circumference of said outermost insulating layer adjacent said core end portion; then  
 bending said core end portion back over said sheet material; and then  
 clamping a terminal ferrule over said core end portion, said



sheet material and said outermost insulation layer to make direct electrical contact between said core end portion and said ferrule.

9. A cable assembly having an outermost insulating layer and a central conductive core and a terminal ferrule fastened to said cable at an end thereof, characterized in that a predetermined length of said conductive core is exposed at said end of said cable, a portion of said exposed core is bent back over said outermost insulating layer, and a narrow strip of sheet material is disposed in a circumferential direction with respect to said cable and in contact with substantially more than half of the circumference of said outermost insulating layer and interposed between said bent back portion of said exposed core to form a permanent electrical connection between said core and said ferrule.

Re. 31,473  
**SYSTEM FOR FABRICATION OF SEMICONDUCTOR BODIES**

Jack S. Kilby, Dallas; William R. McKee, Plano, and Wilbur A. Porter, College Station, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original No. 4,188,177, dated Feb. 12, 1980, Ser. No. 766,223, Feb. 7, 1977. Application for reissue Mar. 2, 1982, Ser. No. 354,015

Int. Cl.<sup>3</sup> B29C 23/00; B29D 31/00  
 U.S. Cl. 425—6

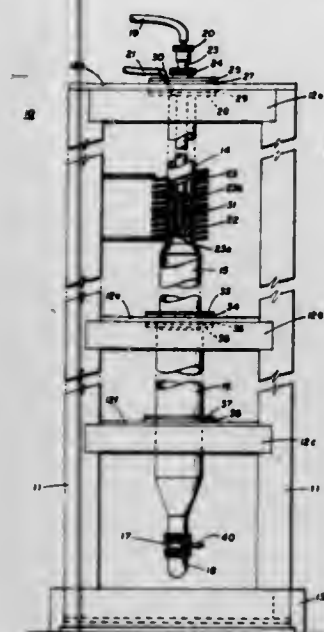
3 Claims

[5. The combination set forth in claim 4, wherein] A system for forming small semiconductor bodies of near uniform size with minimal grain boundaries from bodies of semiconductor material, which comprises:

- (a) a feed tube for receiving said bodies;
- (b) a heat susceptor encircling said feed tube and encompassing a free fall path below said feed tube;
- (c) a tube enclosing said susceptor; and
- (d) heating means encircling said tube for establishing a temperature level near said feed tube above the melting point of said semiconductor material and establishing a predetermined temperature gradient over the next lower portions of said free fall path to a temperature below said melting point, said



heating means [is] being an induction heating coil of uneven diameter and turn density along the length thereof



for maintaining said temperature level and gradient over said free fall path.

Re. 31,474

#### TREATMENT OF ALLOYS

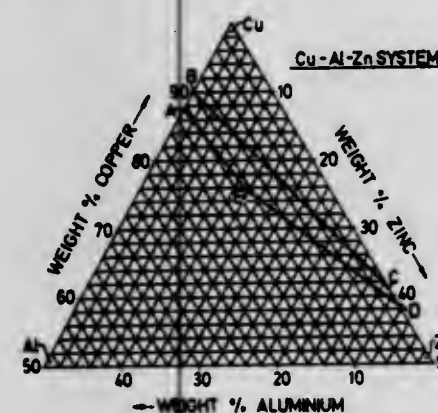
Greville B. Brook, Beaconsfield, England, and Roger F. Iles, Foster City, Calif., assignors to Fulmer Research Institute Limited, Stoke Poges, England  
Original No. 3,783,037, dated Jan. 1, 1974, Ser. No. 88,596, Nov. 12, 1970. Application for reissue Aug. 25, 1975, Ser. No. 607,553

Claims priority, application United Kingdom, Nov. 12, 1969, 55482/69; Nov. 14, 1969, 55969/69

Int. Cl.<sup>3</sup> C22F 1/08, 1/14

U.S. Cl. 148—11.5 R

34 Claims



1. A method of making a heat-recoverable article, which method comprises cooling an alloy in a first shape from a first temperature to a lower temperature, said alloy comprising an intermetallic compound of copper which compound undergoes a shear transformation to a banded martensite below the  $A_f$  temperature and which compound in the cooled condition has an anomalously low modulus of elasticity during loading, and then plastically deforming the alloy into a second shape at the lower temperature, the temperature and rate of cooling being such that on reheating the article at least partly resumes its first shape, said alloy containing at least 50% by weight of copper in the form of an intermetallic compound and said martensite having pseudo-cubic symmetry.

Re. 31,475

#### CARBURETOR

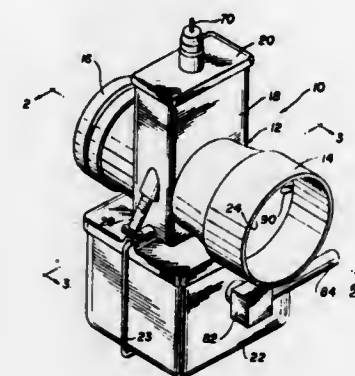
William H. Edmonston, 14831 Dakota Rd., Apple Valley, Calif. 92307

Original No. 4,221,747, dated Sep. 9, 1980, Ser. No. 928,292, Jul. 26, 1978. Application for reissue Sep. 8, 1982, Ser. No. 416,089

Int. Cl.<sup>3</sup> F02M 9/06

U.S. Cl. 261—44 B

16 Claims



11. A carburetor, comprising:

a body having an inlet end, an outlet end, an intermediate slide supporting portion, and a throat extending therethrough from said inlet end to said outlet end;

an insert fixedly mounted within said slide supporting portion, said insert comprising an upper portion having an aperture therethrough that corresponds substantially in size and shape to the adjacent portions of said throat, the upper end of said upper insert portion being open and comprising an end face;

a fuel supply tube secured to the bottom of said upper insert portion and having an outlet at its upper end in communication with said insert aperture and said throat;

a throttle slide member movably mounted within said slide supporting portion for substantially transverse movement across said insert aperture and said throat to vary the open portion thereof, said throttle slide member being movable through said open upper end of said upper insert portion and being engageable with said end face of said open upper end of said upper insert portion to limit the transverse movement of said throttle slide member; and

a metering rod secured to said throttle slide member and extending downwardly into said fuel supply tube to control the flow of fuel therethrough.

Re. 31,476

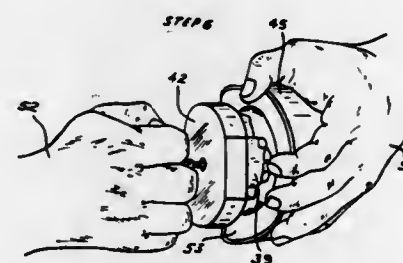
#### CAST EJECTOR

Roger W. Mercer, 1340 Arlington Dr., Fairborn, Ohio 45324  
Original No. 3,975,489, dated Aug. 17, 1976, Ser. No. 550,109, Feb. 13, 1975. Application for reissue Mar. 24, 1978, Ser. No. 889,993

Int. Cl.<sup>3</sup> B29C 1/02, 5/00; A61C 11/00, 13/00

U.S. Cl. 264—16

3 Claims



2. The method of making a master dental cast and duplicating mold therefor comprising the steps of: (a) forming a negative impression of a patient's tooth and gum structure in a suitable impression material contained in a dental impression tray; (b)

pouring said negative impression with dental stone or the like to form a positive cast and allowing said stone to partially set; (c) temporarily affixing a plastic button on a flat slab, said button having a threaded recess facing said slab; (d) covering and surrounding said button on the slab with additional dental stone in the unhardened state; (e) inverting said tray and, with said positive cast centered on said threaded recess, joining the partially set dental stone of the positive cast with that on said slab to bond the two together; (f) allowing the dental stone to harden; (g) removing the joined positive cast and additional stone from said slab, and the tray and impression material from the positive cast, leaving a master dental cast having a flat surface with said plastic button embedded therein; (h) pouring a hydrocolloid or the like mold material about said master cast in a duplicating mold, leaving the flat surface of the master dental cast containing said button exposed, and allowing said mold material to set; (i) threading a handle into said button; and (j) holding said flask in one hand and the handle in the other, ejecting said master cast from the set mold material with a quick snap-like straight outward pull.

3. In a master dental cast made of dental stone or the like having on one side a replica of the tooth and gum structure of a patient and having the reverse side a flat surface, the improvement comprising a plastic button embedded in said stone and centrally located relative to said tooth and gum structure, said button having a threaded recess centrally located relative to the tooth and gum structure with the open end of said recess substantially flush with said flat surface, and means for locking said button in the stone.

Re. 31,477

#### FLAT MULTI-SIGNAL TRANSMISSION LINE CABLE WITH PLURAL INSULATION

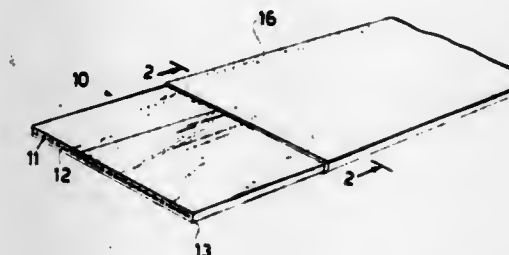
Joseph Marshall, Toyonaka, Japan, assignor to Thomas & Betts Corporation, Raritan, N.J.

Original No. 3,763,306, dated Oct. 2, 1973, Ser. No. 235,723, Mar. 17, 1972. Continuation-in-part of Ser. No. 163,199, Jul. 16, 1971, abandoned. Application for reissue Apr. 16, 1979, Ser. No. 17,491

Int. Cl.<sup>3</sup> H01B 7/08

U.S. Cl. 174—115

14 Claims



1. A composite multi-signal transmission line cable for transmitting fast rise time electrical pulses with minimum far-end crosstalk comprising:

a flat multi-conductor cable including a plurality of generally parallel conductors embedded in a planar sheet of insulation material having a dielectric constant, adjacent conductors being spaced apart at a predetermined pitch with selected conductors adapted to be connected to ground, while remaining conductors are used as signal-carrying conductors the ratio of the thickness of the insulation material to said pitch being at least 2.0 such that at least about 98

percent of the transverse electromagnetic (TEM) field propagates within said insulation material; and an insulator jacket surrounding the flat multi-conductor cable and in intimate contact with said insulation material; said insulator jacket being made of a dielectric material having a dielectric constant greater than the dielectric constant of said insulation material whereby the electrical effect of the composite of the insulation material and the insulator jacket is to establish a balance between the inductive and capacitive coupling coefficients between adjacent signal-carrying conductors thereby minimizing the far-end cross-talk.

Re. 31,478

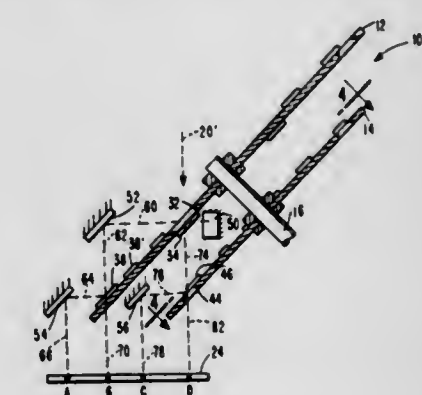
ROTARY BEAM CHOPPER AND SCANNING SYSTEM  
Colin S. McArthur, and Douglas C. Clark, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Original No. 4,118,619, dated Oct. 3, 1978, Ser. No. 821,103, Aug. 2, 1977. Application for reissue Aug. 30, 1979, Ser. No. 71,334

Int. Cl.<sup>3</sup> B23K 27/00

U.S. Cl. 219—121 LK

25 Claims



1. A rotary optical shutter and scanner for dividing a substantially continuous beam of light into a plurality of discrete light impulses and for repetitively scanning the impulses across a series of target areas, comprising:

a plurality of [coaxial] rotatable discs; at least one annular shutter ring on each said disc and at least two concentric annular shutter rings on at least one of said discs, each shutter ring including at least one group of segments, said rings having corresponding, angularly aligned groups, the segments of each group being arranged in complementary coded sequences of reflective surfaces and through apertures to define multiple light paths between a light source and a target;

means for directing a substantially continuous beam of light toward at least one of said shutter rings for reflection from a reflective surface or passage through an aperture thereof and for subsequent direction toward a first target area or toward a second shutter ring for reflection from a reflective surface thereon or passage through an aperture thereof for direction toward a second target area; and means for rotating said discs to move said segments of said annular rings into successive alignment with said beam of light whereby said beam is directed successively along said multiple light paths to each of said target areas, continued rotation causing said beam to repetitively traverse said target areas in a scanning motion.



## PLANT PATENTS

GRANTED DECEMBER 27, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,164

### NEW ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Aug. 25, 1982, Ser. No. 411,357

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—7

1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by heavily petaled, high centered yellow orange blooms with near white outer petals that quill to star-like points.

5,165

### ROSE PLANT CV. KRICARLO

Michel Kriloff, Antibes, France, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Aug. 20, 1982, Ser. No. 409,902

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—18

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized in its long pointed buds that open slowly with a distinctively classical spiral form; its flowers are borne mostly one-to-a-stem on long strong stems which are suitable for cutting; its extremely long vase-life as a cut rose; its unique warm orange-pink coloration that holds well throughout the life of the flower; its extremely vigorous bush is easy-to-grow and produces a profusion of flowers nearly continually throughout the growing season, making a very attractive garden specimen; its consistently fine performance in a wide variety of climatic conditions; and its abundant deep green foliage attractively clothes the entire plant.

5,166

### CHRYSANTHEMUM PLANT

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 18, 1982, Ser. No. 340,108

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct plant of *Chrysanthemum morifolium*, Ramat., known by the cultivar name of Mellow, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; dark yellow ray floret color; diameter across face of capitulum ranging from 70 to 90 mm. at maturity; uniform nine week flowering response; tall plant height when grown single stem; 15-20 cm. peduncles on open, normally terminal sprays, and slow development of tight green discs.

5,167

### CHRYSANTHEMUM PLANT

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 10, 1982, Ser. No. 356,917

Int. Cl.<sup>3</sup> A01H 5/00

U.S. Cl. Plt.—79

1 Claim

1. A new and distinct plant of *Chrysanthemum morifolium*, Ramat., known by the cultivar name of Rawhide, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; dark bronze ray floret color; diameter across face of capitulum ranging from 90 to 115 mm. at maturity; uniform ten week flowering response; tall plant height when grown single stem; 12.5 to 22.5 cm. peduncles; normally terminal sprays, and 13° C. minimum temperature tolerance for initiation and development of flowering buds.



## PATENTS

GRANTED DEC. 27, 1983

### ERRATA

For CLASS	See PATENT NO.
383-039 .....	4,422,672
502-025 .....	4,422,954
502-169 .....	4,422,955
502-158 .....	4,422,956
502-177 .....	4,422,957
502-217 .....	4,422,958
502-247 .....	4,422,959
502-206 .....	4,422,960
502-301 .....	4,422,961
339-176 .....	4,423,288
381-071 .....	4,423,289
381-051 .....	4,423,290
381-043 .....	4,423,291



# PATENTS

GRANTED DECEMBER 27, 1983

## GENERAL AND MECHANICAL

4,422,183

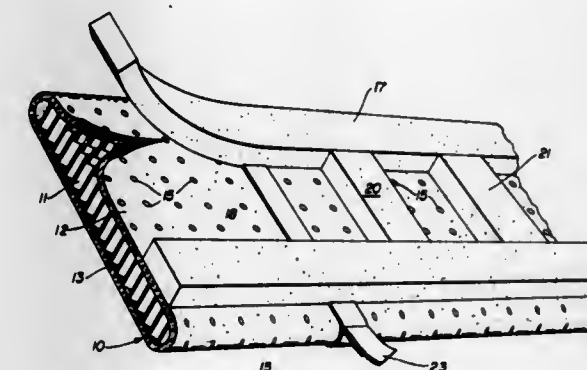
### PROTECTIVE BODY SHIELD

Curtis L. Landi, and Susan L. Wilson, both of 257 San Carlos #5, Sausalito, Calif. 94965

Continuation-in-part of Ser. No. 47,233, Jun. 11, 1979, abandoned. This application Oct. 3, 1980, Ser. No. 193,630

Int. Cl.<sup>3</sup> A41D 13/00

U.S. Cl. 2—2



1. A protective shield comprising a core of lightweight, flexible, cellular, honeycomb construction having the axes and walls of the cells thereof perpendicular to the largest plane of said shield, flexible hinges formed by the intersection of one wall with another, and resilient, flexible, foam elastomer covering the open ends of said cells whereby said shield is highly flexible in its largest plane and is less flexible in planes perpendicular to said largest plane.

4,422,184

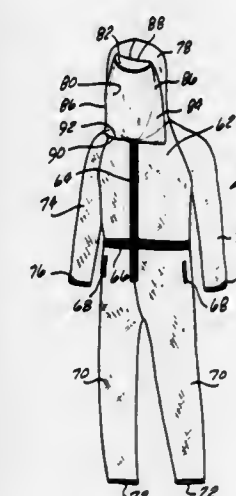
### INSECT PROTECTIVE GARMENT

Noreen Myers, 3345 Sandysore, Metamora, Mich. 48455

Continuation-in-part of Ser. No. 252,380, Apr. 9, 1981. This application Jun. 30, 1982, Ser. No. 393,670

Int. Cl.<sup>3</sup> A42B 3/00; A41D 10/00

U.S. Cl. 2—4



1. An insect proof garment comprising:  
an interconnected pair of arms and body portion, each formed of an insect excluding mesh, the body portion adapted to cover at least a portion of the wearer's body;  
a hood formed of an insect excluding mesh joined to the body portion, the hood including:  
a front aperture;  
a visor joined to the hood at the upper end of the front aperture;  
a cover member made of an insect excluding mesh joined at certain of its edges to the hood and covering the front aperture in the hood; and  
weight means disposed along the bottom edge of the cover

member for urging the cover member downward across the front aperture in the hood towards the body portion of the garment.

4,422,185

### WELDING HELMET

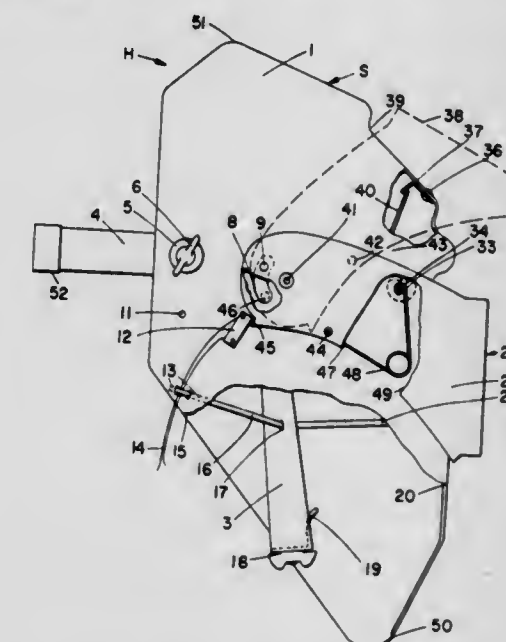
Reuben E. Cook, Box 600, Loup City, Nebr. 68853

Continuation-in-part of Ser. No. 836,516, Sep. 26, 1977, abandoned. This application Jun. 11, 1980, Ser. No. 158,368

Int. Cl.<sup>3</sup> A61F 9/06

U.S. Cl. 2—8

28 Claims

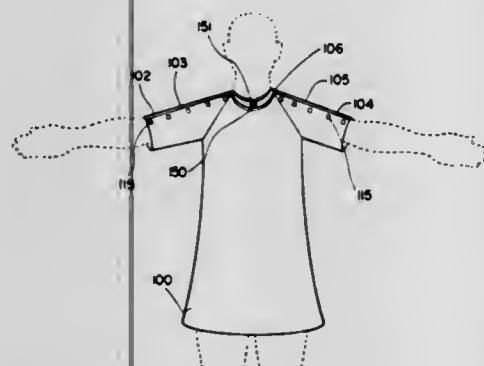


1. A welding helmet comprising a face protective hood having a concave rearward side for receiving an operator's face, means for attaching said hood to the upper portion of the head of said operator, said hood having a forward side having a viewing opening therethrough in a position for being in front of the eyes of said operator while said hood is fixed to the operator's head by said attaching means, a light-filtering module, said module having as at least one of its sections a transparent dark plate for disposition in a covering position for filtering light passing through said opening toward the rearward side of said helmet, means movably mounting said module on said hood so that said dark plate is at times in said covering position and at times in an uncovering position for uncovering at least a substantial portion of said viewing opening, a module controller inside of said concave rearward side of said hood, said module controller being operatively correlated with said module and being adapted to be engaged by the jaw of said operator so that by moving his jaw said operator can cause said module controller to move said module so as to move said dark plate between said covering and uncovering positions, said module controller comprising a chin strap assembly on the rearward side of said hood, said chin strap assembly having a lower chin-engageable portion below said viewing opening and extending generally horizontally from right to left, said chin strap assembly having right and left side portions extending upwardly from its said lower chin-engageable portion, visor-strap connecting means attaching at least one of said chin strap assembly side portions to said light-filtering module so that as said lower chin-engageable portion of said strap assembly is caused to move in one direction said module will move to cause said dark plate to uncover at least a substantial portion of said viewing opening, said module and said strap assembly defining a module and strap combination assembly, said module and strap assembly forming a module-strap component, said light-filtering module comprising a visor having a forward



portion and left and right rearwardly extending portions which latter are disposed alongside the left and right sides of said helmet respectively, pivot connection means attaching said right and left sides of said visor to said hood, said dark plate comprising a forward portion of said visor, when in a position for maximum uncovering of said viewing opening, said visor being disposed so that a substantial portion of said dark plate is upwardly of said viewing opening, said hood-to-head attaching means having a head-opening therein for receiving the head of an operator, said head opening having a head-engaging surface for engaging the head of the operator, said means for attaching said hood to the upper portion of the head of said operator comprising head band means defining a substantially horizontal band and right and left pivot attachment means attaching said head band means to said hood in a manner for the pivoting of said hood about said head band upwardly and downwardly about a horizontal axis so that the lower end of said hood can be swung upwardly until at least the majority of said hood is disposed above said pivot connection axis, a stop means for stopping said hood from pivoting downwardly about said axis beyond a position in which said viewing opening is lower than said head band and in a position for sight therethrough by said operator, said stop means having two cooperative parts, one part being mounted on said hood and one part on said head band.

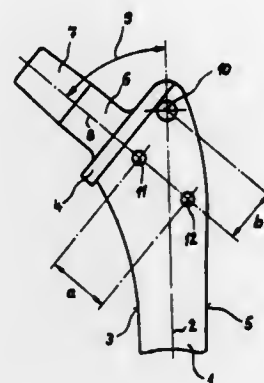
**4,422,186**  
**HOSPITAL GARMENT**  
Ann M. Loney, 2525 W. Washington, Las Vegas, Nev. 89106  
Continuation of Ser. No. 215,675, Dec. 12, 1980, abandoned.  
This application Sep. 17, 1982, Ser. No. 419,641  
Int. Cl.<sup>3</sup> A41B 9/00  
U.S. Cl. 2—114



1. A hospital garment comprising:
  - a gown for covering at least the shoulders and the upper arms of a patient, the gown being divided to form an opening extending from the patient's neck over the shoulders and along the arms so that access may be provided to the upper body of the patient without removing the gown;
  - a first plurality of pieces of opposing mating fabric material affixed to the gown on opposite sides at preselected intervals along the edges of the opening for fastening together and closing the edges of the gown; and
  - a first plurality of removable extension strips for coupling the edges of the opening of the gown in an open position, to permit the gown to be fastened when the edges of the opening cannot be brought together, each removable extension strip having a piece of opposing mating fabric material on opposite sides of each end for mating with the opposing mating fabric material affixed to the gown.

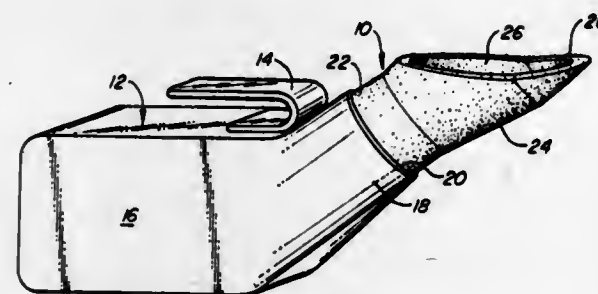
**4,422,187**  
**SHANK FOR A JOINT ENDOPROSTHESIS**  
Karl Zweymüller, Vienna, Austria, assignor to Sulzer Brothers Limited, Winterthur, Switzerland  
Filed Dec. 30, 1980, Ser. No. 221,254  
Claims priority, application Switzerland, Jan. 14, 1980, 256/80

Int. Cl.<sup>3</sup> A61F 1/04  
U.S. Cl. 3—1.913 4 Claims



1. A shank for a joint endoprosthesis, said shank having a blade widening from a distal end along a longitudinal median axis and a pin at a remote end extending along a pin axis intersecting with said median axis, said blade having three circular bores disposed therein in a triangular array, each said bore having a center designating a predetermined point with one of said points on said longitudinal axis and two of said other points on said pin axis, said points being disposed at predetermined measured distances from each other whereby after implanting a measurement of said points on subsequently taken x-ray photographs indicate changes in the reproduction scale of an x-ray photograph and changes in angular position of the photographing direction to said blade.

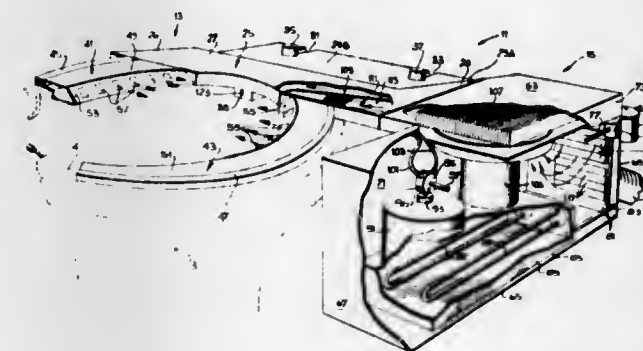
**4,422,188**  
**MICTURITION ADAPTOR FOR CONVERSION OF A MALE BED URINAL TO FEMALE USE**  
Bernice M. Strutton, 3344 St. James Pl., Antioch, Calif. 94509, and Robert R. Moore, 4010 East Ave., Hayward, Calif. 94542  
Filed Oct. 13, 1981, Ser. No. 310,919  
Int. Cl.<sup>3</sup> A47K 11/00  
U.S. Cl. 4—144.4 7 Claims



1. A micturition adaptor for converting to female use a conventional male bed urinal having a container portion and a neck portion with a circular orifice, the adaptor comprising: a molded member fabricated from a soft, flexible material of tubular configuration with a first orifice end of circular cross section constructed to connect to the neck portion of the male urinal and a second end having a substantially oblique cross-sectional orifice with an inwardly tipped deformable terminal lip; said second end being contoured for placement against the genital area of a female in a substantially sealing manner during micturition, wherein said tipped lip is pressed and deformed against the user's perineum while the user is in a prone position with her thighs comfortably spread said deformed lip reassum-

ing a slightly raised position as the urinal and said adaptor are removed from the pressed placement against the user's vaginal area to inhibit inadvertent runoff or drip during withdrawal of the urinal and said adaptor.

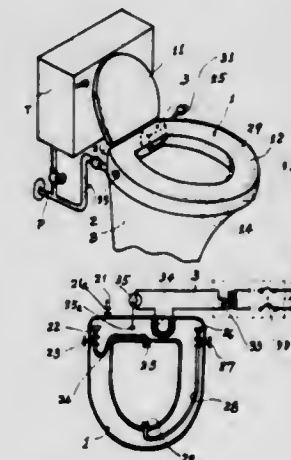
**4,422,189**  
**TOILET SEAT SANITARY FIXTURE**  
Guy Couvrette, 135, 19e Rue, Laval, Quebec, Canada H7N 1E7  
Filed Nov. 17, 1981, Ser. No. 322,323  
Int. Cl.<sup>3</sup> A47K 4/00  
U.S. Cl. 4—420.2 9 Claims



1. A bidet for use in combination with a standard toilet including a toilet bowl and a toilet seat located in a toilet room, said bidet comprising:
  - (A) a thin oval-shaped element fixed to the toilet bowl between the upper periphery of the toilet bowl and the toilet seat, said thin element comprising:
    - (a) means for fixing it to the toilet bowl;
    - (b) an air duct extending along the whole length of the element;
    - (c) a plurality of air vents symmetrically arranged with respect to the longitudinal axis of the toilet bowl which extend between the air duct and the closed space defined by the upper periphery of the toilet bowl;
    - (d) a first water conduct connected to a first nozzle located in the middle of the rear part of the thin element for spraying water toward the center of the closed space defined by the upper periphery of the toilet bowl;
    - (e) means for orientating and adjusting the pressure of the first nozzle spray;
    - (f) a second water conduct connected to a second nozzle located in the middle of the front part of the toilet bowl for spraying water toward the center of the closed space defined by the upper periphery of the toilet bowl; and
    - (B) a small casing having an upper wall rigidly fixed to the rear of the thin element and extending in a direction parallel to the longitudinal axis of the toilet bowl without overheighting the plane in which extends the toilet seat, said casing comprising:
      - (a) a water supply conduct connected to a supply of cold water under pressure, external to the casing;
      - (b) a first valve controlled from the outside of the casing for opening or closing the water supply conduct;
      - (c) a water tank provided with an inlet connected to the water supply conduct, and an outlet;
      - (d) electrical heating means adjustable from the outside of the casing for heating water inside the tank;
      - (e) distribution means connecting the outlet of the tank to the first and second water conducts of the thin element said distribution means including a second valve controlled from the outside of the casing for directing the water contained in the tank either to the first nozzle via the first conduct or to the second nozzle via the second conduct or to both nozzles via both conducts;
      - (f) a reversible fan controlled from the outside of the casing and connected to the air duct extending along the thin element for drawing or blowing air through the air vents of said thin element;

- (g) a first clack-valve allowing entry of ambient air inside the casing in order to supply the fan when this fan is blowing;
- (h) a second clack-valve allowing exit of the air drawn by the fan when the fan is drawing, toward an exhaust external to the casing and connected to the outside of the toilet room; and
- (i) electrical heating means controlled from the outside of the casing for heating the ambient air drawn by the fan and blown through the air vents of the thin element.

**4,422,190**  
**SAFETY TOILET SEAT**  
Chuan-Chih Huang, 10-4 Fl., No. 62, Chang Chun Rd., Taipei, Taiwan  
Filed Jun. 1, 1982, Ser. No. 383,996  
Int. Cl.<sup>3</sup> A47K 4/00, 3/20  
U.S. Cl. 4—420.3 6 Claims



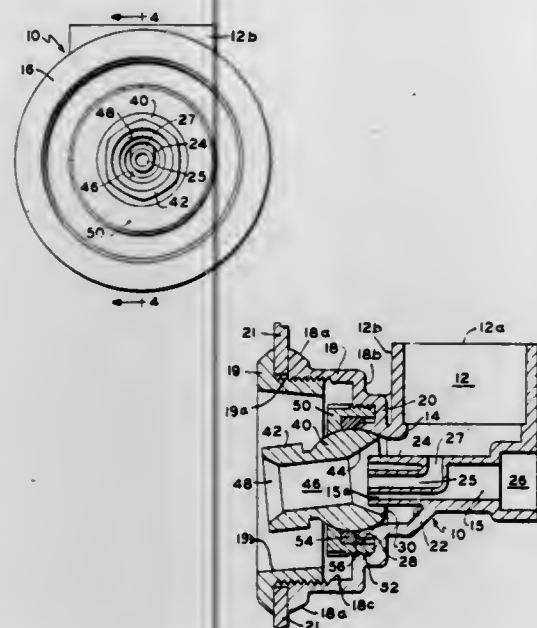
1. A safety toilet seat comprising:
  - a cassette jacket-type seat which is composed of a toilet seat cover, a top plate, a side plate and a bottom plate, said top plate, and said side plate and said bottom plate being fixed to form an integrated closed water jacket to correspond to the top edge of a toilet bowl;
  - a water transporting system connected to a source of water under pressure and the inlet of the associated water closet tank, conduit means intermediate said water transporting system and said jacket, whereby water is diverted from said water transporting system to said jacket, and
  - an electric heating control system provided to heat the water within said jacket to provide heated water for washing the genital area of a user and a heated seat surface for sitting.

**4,422,191**  
**HYDROTHERAPY JET FOR TUBS, SPAS OR POOLS**  
William R. Jaworski, Minneapolis, Minn., assignor to Jope Manufacturing Company Inc., Minneapolis, Minn.  
Filed Sep. 29, 1982, Ser. No. 427,847  
Int. Cl.<sup>3</sup> A04H 3/18; A61H 33/02; E03C 1/02  
U.S. Cl. 4—496 14 Claims

1. A hydrotherapy jet comprising a housing, a movable nozzle having a passage therethrough with a fluid inlet and a fluid outlet at opposite ends of the passage, the movable nozzle being supported in the housing for movement about a center point to enable the outlet to be pointed in different directions, means at the inlet end of the nozzle defining a central water stream aligned axially with the passage in the nozzle and flowing toward it, means at the inlet end of the nozzle defining an outer annular water stream also flowing toward the inlet in the nozzle, an annular air stream located between the water streams and being spaced outwardly from the axis of the passage in the nozzle whereby the impact of the two water



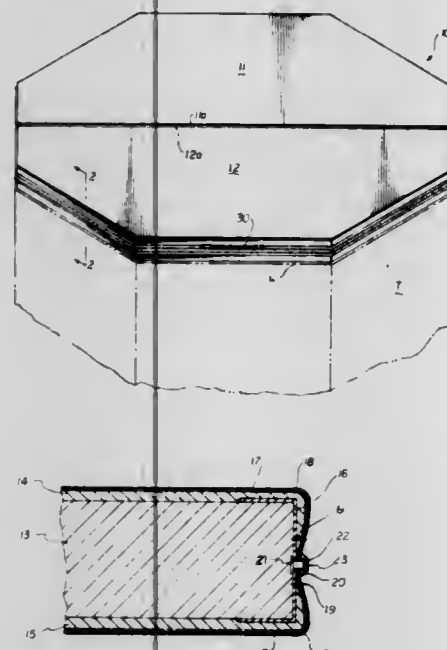
streams vigorously striking one another enhances the entrainment of air from the intermediate lamina of air located between



them to form a combined stream of water and air flowing out of said nozzle.

**4,422,192**  
**SPA OR HOT TUB COVER**  
Terry Jacobs, P.O. Box 478, Cedar Ridge, Calif. 95924  
Filed Nov. 24, 1982, Ser. No. 444,316  
Int. Cl.<sup>3</sup> E04H 3/16, 3/18  
U.S. Cl. 4—498

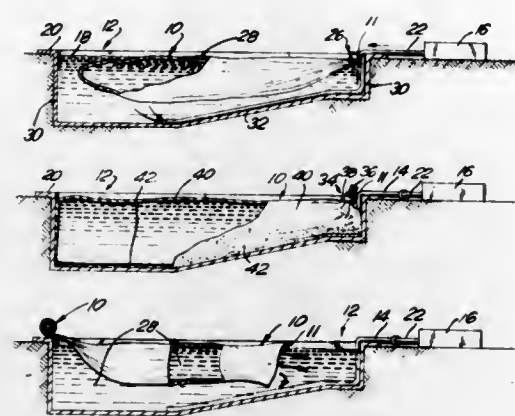
5 Claims



1. An insulative spa or hot tub cover comprising, in combination, at least one, substantially flat, inner, insulative foam core surrounded on a peripheral edge by a continuous, inwardly disposed, C-shaped support channel, a relatively softer foam layer applied to the upper and lower surfaces of said foam core and tucked over the edges of said foam core, a seam sealed, film, vapor barrier envelope completely enclosing said foam core, said channel, and said insulative foam layer, an overlapping outer vinyl cover layer, and a trim strip directly overlying said overlap of said outer cover along the peripheral edge of said inner core, riveted to said channel by rivet means.

**4,422,193**  
**PARTITIONING DEVICE AND METHOD FOR POOLS**  
Ricahrd E. Kravath, 6 Scott St., Dobbs Ferry, N.Y. 10522  
Filed Apr. 5, 1982, Ser. No. 365,177  
Int. Cl.<sup>3</sup> E04H 3/19, 3/18  
U.S. Cl. 4—505

6 Claims



1. A swimming pool partitioning device for efficient treatment and storage of water in a swimming pool, said partitioning device for use with a swimming pool having a water pumping and treating system comprising a water treatment device for filtering and chemically treating the water, an egress conduit in communication with the water in the swimming pool and with the water treatment device for accommodating the flow of water from the pool to the water treatment device, an ingress conduit in communication with said water treatment device for accommodating the flow of treated water from said water treatment device, and a pump for urging the flow of water from the swimming pool, through the egress conduit, the water treatment device and the ingress conduit, said swimming pool partitioning device comprising:

- a water tight, flexible container means having at least one opening and having a size and shape enabling said container means to substantially occupy the swimming pool, said container means being unattached to said pool to enable removal of said container means from the pool when the container means is empty; and
- a coupling means for releasably securing the opening of said container means to said ingress conduit of said pumping and treating system, whereby water from said swimming pool treated by the water treatment device of said pumping and treating system is urged through said ingress conduit and into said partitioning device thereby separating the water in said swimming pool that has passed through the pumping and treating system from the water in said swimming pool that has not passed through the pumping and treating system.

**4,422,194**  
**FLUID FILLED BODY SUPPORTING DEVICE**  
Gundar E. Viesturs, and Eric A. Viesturs, both of Southbury, Conn., assignors to Connecticut Aircraft Corp., Naugatuck, Conn.

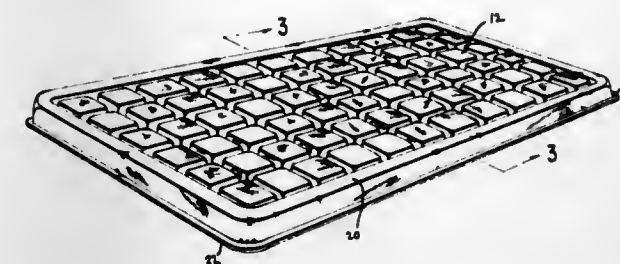
Filed Aug. 24, 1981, Ser. No. 295,504  
Int. Cl.<sup>3</sup> A47C 27/08; A61G 7/04

U.S. Cl. 5—451

5 Claims

1. A body supporting device comprising:  
a first plastic section having oppositely disposed inner and outer surfaces, the outer surface being disposed above the inner surface and permanently defining a plurality of closely spaced raised regions of like size and contour which are interconnected by channels disposed below the regions, the inner surface permanently defining a like plurality of deep recesses, each deep recess constituting the inside of a corresponding region, said deep recesses being interconnected by shallow recesses, each shallow recess constituting the inside of a corresponding channel; and  
a second plastic section sealed to the inner surface of the first

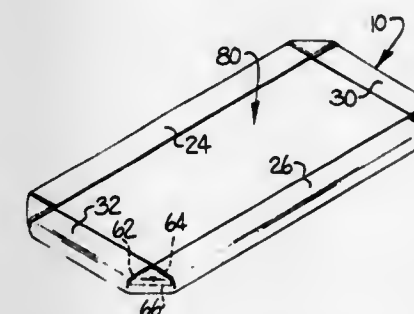
section in a manner in which said deep and shallow recesses communicate with each other; and  
a flexible hollow tube disposed around the periphery of said sections and secured thereto, said tube having a wall with



openings which connect the tube interior to said shallow recesses, said tube and sections being sealed to each other to prevent air and water leakage between the interior of the tube and sections and the outside thereof.

**4,422,195**  
**FITTED BED SHEET AND METHOD OF MANUFACTURE**  
Joseph L. Russo, and Richard Sonder, both of New York, N.Y., assignors to Simmons Universal Corporation, New York, N.Y.  
Filed Oct. 13, 1981, Ser. No. 310,454  
Int. Cl.<sup>3</sup> A47G 9/02  
U.S. Cl. 5—497

13 Claims



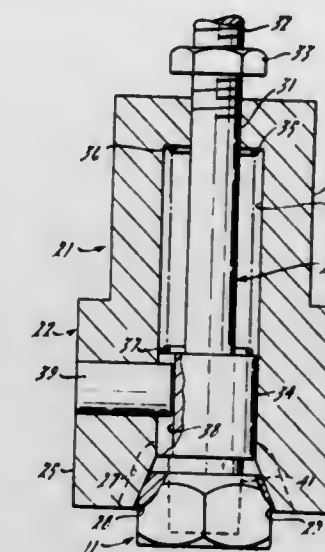
1. A fitted bed sheet for use in association with an octagonal mattress, said fitted sheet comprising an octagonal panel whose perimeter defines a pair of opposed sides, a pair of opposed ends and four corners each corner joining a side to an adjacent end each of said opposed sides being at least twice as long as each of said opposed ends, and a continuous panel integrally joined to said octagonal panel along a juncture comprised of fold lines running the entire perimeter of said octagonal panel.

**4,422,196**  
**METHOD OF FORMING A TORQUE NUT**  
James H. Skinner, Birmingham, Mich., assignor to Federal Screw Works, Detroit, Mich.  
Filed Jan. 16, 1981, Ser. No. 225,800  
Int. Cl.<sup>3</sup> B21D 53/24; B21K 1/70  
U.S. Cl. 10—86 A

7 Claims

1. The method of forming a female thread torque fastener comprising the steps of forming a contiguous, uninterrupted female thread in a member defining a threaded hole therein, inserting a mandrel into said threaded hole of said member, said mandrel having at least one recess portion and portions adjacent said recess portion for contacting the crest of said thread in said member to internally support said thread, and deforming at least one localized portion of said thread radially

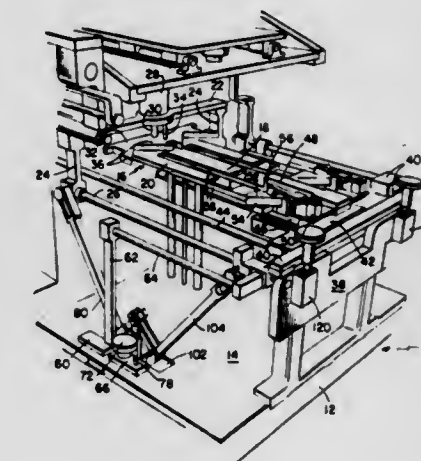
inwardly into said recess portion of said mandrel, while simultaneously substantially precluding deformation of said thread



adjacent said locally deformed portion by internally supporting said thread by said adjacent portions of said mandrel.

**4,422,197**  
**WORKPIECE TRANSPORTING MECHANISM**  
Frederick L. Christenbery, Derry, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.  
Filed May 5, 1982, Ser. No. 375,508  
Int. Cl.<sup>3</sup> A43D 21/00  
U.S. Cl. 12—1 A

3 Claims



1. A mechanism for so transporting a workpiece rearwardly to a work station that a prescribed portion of the workpiece is in registry with a prescribed portion of the work station comprising: a carrier; a front gauge mounted to the carrier for forward-rearward movement; a back gauge, located rearwardly of the front gauge, mounted for forward-rearward movement; a work support mounted to the front gauge and extending rearwardly towards the back gauge; gauge moving means for moving the front gauge rearwardly with respect to the carrier and the back gauge forwardly at different speeds until the gauges intersect the opposite ends of the workpiece that is on the work support; means, operative after the intersection of the gauges with the opposite ends of the workpiece, to lock the front gauge to the carrier and to hold the workpiece on the work support; and means for thereafter transporting the carrier rearwardly a prescribed distance to thereby transport the workpiece to the work station with said prescribed portions in registry; characterized in that said gauge moving means comprises: adjusting means for adjusting the ratios at which the gauge moving means moves the front gauge rearwardly and the back gauge forwardly.



4,422,198

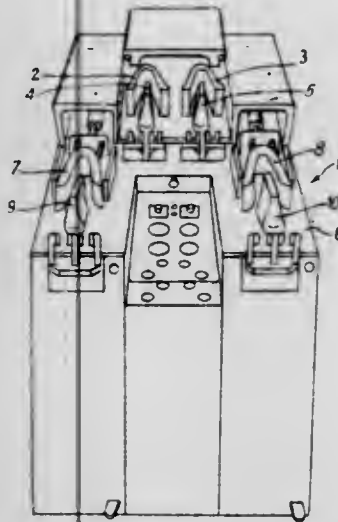
**MACHINES FOR BENDING FOOTWEAR COUNTERS**  
Lucien Bichet, Draveil, France, assignor to Anver, Maisons  
Alfort, France

Filed Apr. 12, 1982, Ser. No. 367,353

Claims priority, application France, May 5, 1981, 81 08843  
Int. Cl.<sup>3</sup> A43D 11/00

U.S. Cl. 12—54.3

3 Claims



1. Machine for bending long footwear counters comprising a first automatically operating double shaper/punch located on a frame at a first station, said shaper/punch being adapted for hot reactivation of the thermoplastic material constituting the counter of the footwear, a second double shaper/punch located at a second station, for stabilizing the counter while at a refrigerated temperature, said machine being characterized in that it includes at two double stations a very long punch or last bent to the shape of the counter and further that the shaper, at said second station is formed from a single piece of plastic and exhibits in its last edge a hardness clearly greater than that exhibited at the upper part of the shaper.

4,422,199

**DOCKBOARD SEAL**

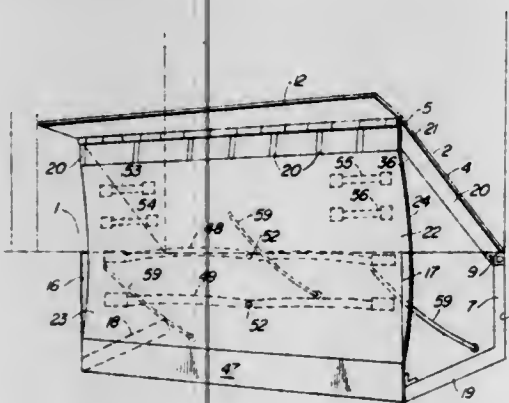
Sylvan J. Frommelt, Peosta, Iowa, assignor to Frommelt Industries, Inc., Dubuque, Iowa

Filed Oct. 9, 1981, Ser. No. 310,328

Int. Cl.<sup>3</sup> E01D 1/00

U.S. Cl. 14—71.1

12 Claims



9. In an adjustable dockboard for spanning the gap between a loading dock and the bed of a carrier in loading or unloading position in front of the dock, the dockboard embodying a stationary mounting structure, a ramp having front and rear portions, with the rear portion hingedly connected to said mounting structure so that the ramp can swing up and down around a horizontal axis between a raised position wherein it is disposed at a forwardly opening acute angle to the horizontal above the floor of the loading dock and a lowered position wherein it is substantially flush with said floor of said loading dock, and said mounting structure including a depression in

said loading dock, said depression embodying two oppositely disposed side walls, between which said ramp is disposed when it is disposed in said lowered position, a rear wall and an open front, and wherein the bottom of said ramp comprises a plurality of elongated beams extending between the front and rear edges thereof in substantially parallel spaced relation to each other, the combination of

- a. means disposed between said beams at said front portion of said ramp for closing the spaces therebetween,
- b. a flexible sheet member having
  - (1) a top,
  - (2) a bottom, and
  - (3) two oppositely disposed side portions,
- c. means securing said top of said sheet member to the bottom of said beams across substantially the full width of said front portion of said ramp,
- d. means securing said bottom of said sheet member to the bottom of said depression across substantially the full width of said depression between said side walls thereof,
- e. said sheet member being movable upwardly and downwardly by said ramp between said raised and lowered positions of the latter, and
- f. elongated resilient members extending laterally across one face of said sheet member in position to hold said side portions of said sheet member in wiping engagement with respective ones of said sides of said depression in all positions of said sheet member.

4,422,200

**TEXTILE SPINDLE CLEANING APPARATUS**

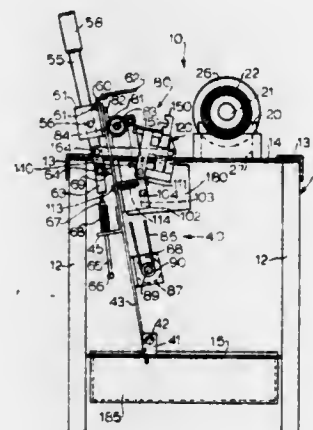
William M. Atwater, 114 E. Salisbury St., Pittsboro, N.C. 27312

Filed Sep. 16, 1982, Ser. No. 419,049

Int. Cl.<sup>3</sup> A46B 13/02

U.S. Cl. 15—21 D

8 Claims



1. An apparatus for cleaning dried glue, cot debris, and the like, from the cot-mounting shaft portions extending outwardly from the bearing portion of a textile spinning roller spindle from which the cots have been stripped, comprising:

- (a) a frame;
- (b) powered brush structure mounted and rotatable about a fixed axis on said frame and having cleaning brush surfaces adapted when engaged with the cot mounting end shaft surfaces of a cot stripped spindle to clean such surfaces of glue, cot particles, and the like;
- (c) spindle support structure mounted for tilting about a fixed axis on said frame parallel to said brush structure axis rearwardly to a spindle loading position, forwardly to a spindle cleaning position and therebetween to a discharge position at which the cleaned spindle is ejected, said spindle support structure including and having mounted thereon:
  - (i) holder means positionable for receiving and releasably locking the central bearing portion of a cot stripped spindle to be cleaned enabling the same to rotate about an axis parallel to the axis of rotation of said brush structure when the outer cot supporting shaft ends of

4,422,202

**INVERTIBLE FLOOR BROOM**

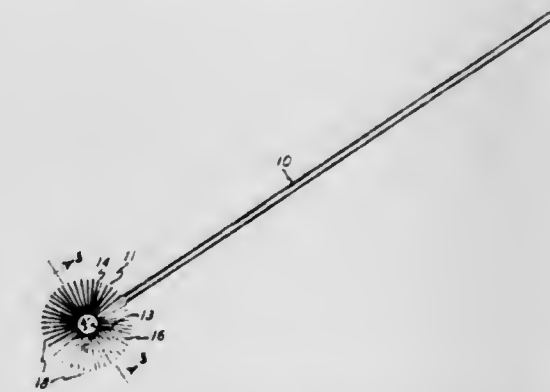
William A. Malvasio, 608 S. Browns Lake Dr., Burlington, Wis. 53105

Filed Mar. 18, 1982, Ser. No. 359,299

Int. Cl.<sup>3</sup> A46B 9/00

U.S. Cl. 15—106

5 Claims



1. A floor broom, comprising an elongate member, and an elongate handle releasably connected to said member on either diametrically opposite face of said member to extend perpendicular to the length of said member and with the length of said handle extending along a plane extending on the length of and through said member and defining two opposite sides of said member, a first group of flexible bristles attached to said member and extending along the length thereof throughout one of said two opposite sides of said member and being of a uniform stiffness, a second group of flexible bristles attached to said member and extending along the length thereof throughout the other of said two opposite sides of said member and being of a stiffness less than said uniform stiffness, all of said bristles terminate in their extent from said member in the formation of a full cylinder of 360 degrees of angulation of said bristles, all for alternating selective sweeping use of either group of said bristles, and all for selection of any one of the four quadrants of the 360 degrees being presentable closest to the floor to be swept and when said handle is at 45 degrees to the horizontal.

4,422,201

**LINT REMOVER**

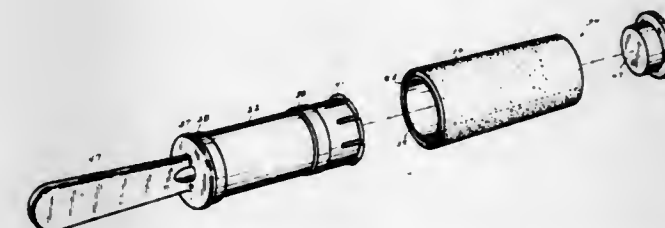
Nicholas D. McKay, Grand Blanc, Mich., assignor to Helmac Products Corporation, Flint, Mich.

Filed Aug. 6, 1981, Ser. No. 290,785

Int. Cl.<sup>3</sup> A47L 25/00

U.S. Cl. 15—104 A

9 Claims



6. In a lint remover assembly, the combination comprising: a unitary integrally formed adhesive tape roll sleeve-engaging hollow support cylinder having an open outer end, said hollow support cylinder provided with a plurality of resiliently mounted radially extending adhesive tape roll sleeve-engaging flange elements provided along the outer peripheral edge of said open outer end of said hollow support cylinder, said hollow support cylinder having an integral elongate handle portion extending axially outwardly from one end thereof, said hollow support cylinder provided with an adhesive tape roll sleeve-engaging annular stop flange at the handle end of said hollow support cylinder, said annular stop flange being in axially aligned spaced-apart register with said sleeve-engaging flange elements, said annular stop flange and said sleeve-engaging flange elements cooperating to selectively slidably retain an adhesive tape roll sleeve assembly mounted therebetween against relative axial movement on said hollow support cylinder while permitting selective rotational movement of the adhesive tape roll sleeve assembly on said hollow support cylinder; and a closure plug provided for selective frictional engagement with said open outer end of said hollow support cylinder, said closure plug cooperating with said hollow support cylinder so as to define a storage compartment therein.

4,422,203

**PLASTIC MOP HOLDER**

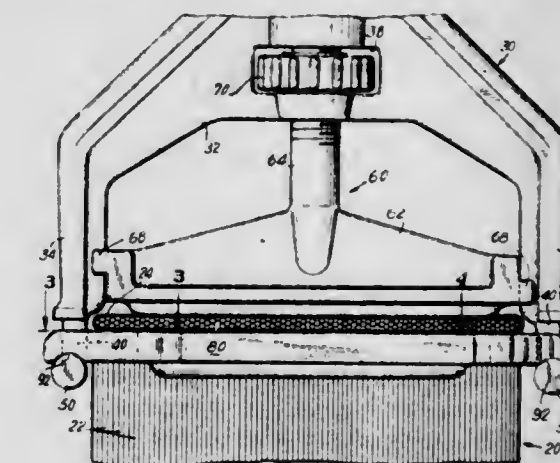
Franz R. Zenker, Johnstown, N.Y., assignor to White Mop Wringer Company, Fultonville, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,599

Int. Cl.<sup>3</sup> A47L 13/258

U.S. Cl. 15—150

5 Claims

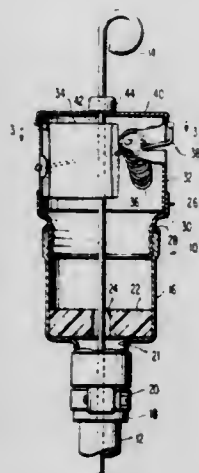


1. A plastic holder for a mop head comprising: a first yoke having a base and two laterally spaced, substantially parallel longitudinal arms, each arm having a free end portion and a mounted end portion, the mounted end portions of the arms being connected together by the base, and the free end portion of each arm including a longitudinal



nally extending post terminating at the free end of the arm in a retention member extending transversely to the yoke plane defined by the longitudinal axes of the arms;  
 a mop head support member pivotally mounted on the yoke so as to extend between the posts, one end portion of the support member defining an aperture through which the adjacent post passes, the other end portion of the support member defining a second yoke between the arms of which the adjacent post passes, parts of the end portions of the support member contacting the retention members to prevent the support member from slipping off the free ends of the arms of the first yoke when the posts are respectively disposed in the aperture and between the arms of the second yoke, the aperture and associated post cooperating to allow the support member to be moved longitudinally in the yoke plane to retract the second yoke from the associated post and to thereafter allow the support member to be pivoted at least 180° about the post passing through the aperture; and  
 means mounted on the yoke for releasably clamping a mop head against the support member.

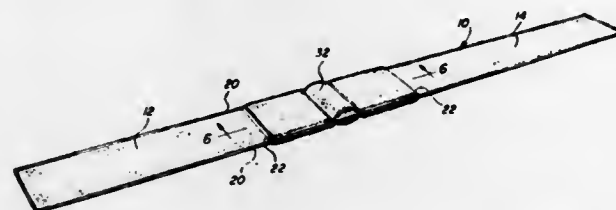
**4,422,204**  
**APPARATUS FOR CLEANING A DIPSTICK**  
 Arvin Long, Jr., 4334 Rock Creek Rd., Alexandria, Va. 22306  
 Filed Jul. 29, 1982, Ser. No. 403,000  
 Int. Cl.<sup>3</sup> F01M 11/12  
 U.S. Cl. 15—210 B 7 Claims



1. Apparatus for cleaning a dipstick, said apparatus comprising:
  - (a) a cup-shaped member adapted to be mounted over the dipstick receiving orifice of a crankcase, said cup-shaped member having an opening in the bottom thereof positioned to act as a continuation of the dipstick receiving orifice and sized to pass the dipstick;
  - (b) an absorbent member removably placed in the bottom of said cup-shaped member, said absorbent member having an opening therethrough sized and positioned to closely receive the dipstick but to allow the dipstick to pass therethrough;
  - (c) a hollow cylindrical member releasably mounted on said cup-shaped member so that the interior of said hollow cylindrical member constitutes a continuation of the interior of said cup-shaped member;
  - (d) a pair of wiper lips fabricated from an absorbent material mounted in said hollow cylindrical member;
  - (e) first means for biasing said wiper lips towards a position in which the dipstick can be passed therebetween without contacting said wiper lips;
  - (f) second means for moving said wiper lips against the bias of said first means into a position in which they will contact and wipe the dipstick as it is passed therebetween; and
  - (g) a cap mounted over the top opening of said hollow cylindrical member, said cap having an opening therein sized and positioned to permit the dipstick to pass through

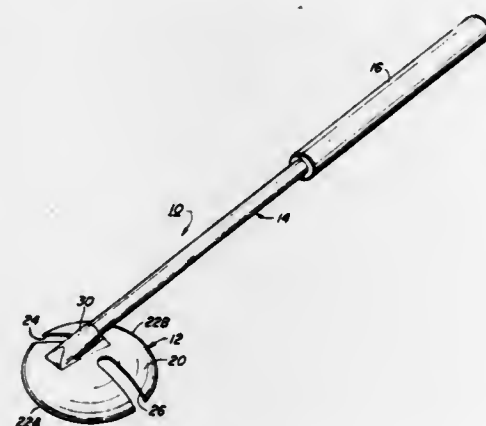
while the portion of said cap surrounding the opening acts as an abutment surface for the dipstick stop.

**4,422,205**  
**BATHING APPLIANCE**  
 Lorenzo C. Braxter, Sr., 502 First Ave., Selma, Ala. 36701  
 Continuation-in-part of Ser. No. 943,703, Oct. 10, 1978, abandoned. This application Jan. 19, 1982, Ser. No. 340,831  
 Int. Cl.<sup>3</sup> A47K 7/03  
 U.S. Cl. 15—222 9 Claims



1. A bathing appliance for washing and scrubbing the user's back and enabling thorough cleansing of the central depressed vertically extending area of the back registered with the user's spinal column, said appliance including an elongated flexible strip having at least one side thereof defining a rough scrubbing surface, said one side including a transversely extending, convexly rounded hump centrally intermediate its opposite ends, said strip including a pair of thin opposite side panels of flexible material and a central thicker panel of resilient material sandwiched between said opposite side panels.

**4,422,206**  
**ICE SCRAPER**  
 Arthur W. Brace, 48 N. Lincoln, Lombard, Ill. 60148, and James M. Chmielewski, 8 Waynewood Dr., West Chicago, Ill. 60185  
 Filed Jun. 18, 1982, Ser. No. 389,609  
 Int. Cl.<sup>3</sup> B60S 1/04  
 U.S. Cl. 15—236 R 5 Claims

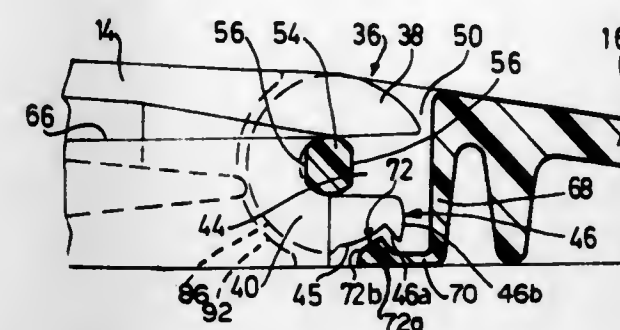


1. A scraping tool comprising a dished member formed of plastic and having first and second arcuate scraper edges lying in a common plane, said member having first and second aligned radial slots separating the rim of said dished member into said two scraper edges.

**4,422,207**  
**PLASTIC WIPER BLADE**  
 Giuseppe A. Malocco, Rivoli, and Sergio Vidoni, Torini, both of Italy, assignors to Champion Spark Plug Italiana S.p.A., Druento, Italy  
 Filed Jul. 8, 1982, Ser. No. 396,262  
 Int. Cl.<sup>3</sup> B60S 1/38  
 U.S. Cl. 15—250.42 7 Claims

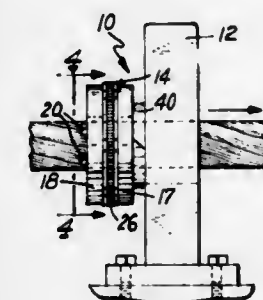
1. A plastic wiper blade comprising a main bridge and two secondary yokes, pivotally linked to the end portions of the main bridge, each of said secondary yokes being provided with

an aperture wherein extends a transverse pivot and the main bridge being provided at each of its two end portions with a fork, the limbs of which extend substantially in the prolongation of the main bridge and define a seat for said transverse



pivot of each secondary yoke, characterized in that the forks and the secondary yokes are each provided with cooperating first and second stop means spaced from said transverse pivots and capable of preventing the withdrawal of the transverse pivots from their respective seats.

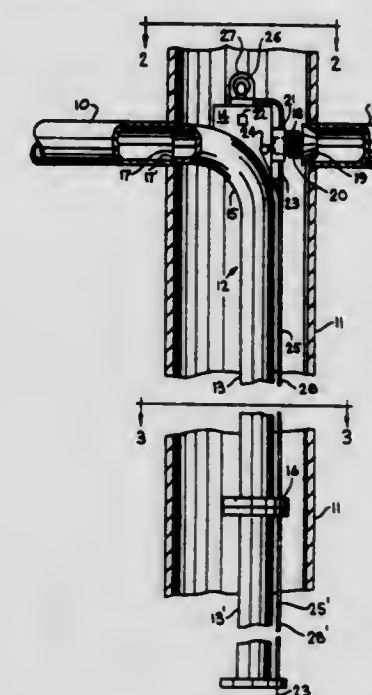
**4,422,208**  
**WIRE ROPE CLEANING TOOL**  
 Galen V. Rohrbaugh, Rte. 3, Box 98, Oakland, Md. 21550  
 Continuation of Ser. No. 288,017, Jul. 29, 1981, abandoned. This application Dec. 1, 1982, Ser. No. 445,822  
 Int. Cl.<sup>3</sup> B08B 1/02, 1/04, 11/00  
 U.S. Cl. 15—256.6 5 Claims



1. A wire rope cleaning tool combined with a bumper stop means having a U-shaped guide for the rope to be cleaned and an anti-friction thrust washer located between said U-shaped guide and the wire rope cleaning tool, said tool comprising:
  - a pair of apertured side plates in the shape of a washer, one for the right hand and the other for the left hand side of the rope, the rope passing through the circular aperture of said plates,
  - a plurality of pie-shaped segments each of which is secured to the plates by two bolt means, one bolt means in each segment provided for one of said pair of plates and the other bolt means for the other of said pair of plates, said plurality of segments providing alternating spaces between adjacent segments for inserting and holding there between a hardened plastic scraping bit there being one scraping bit for each helical junction in a cross-section of the rope,
  - a plurality of scraping bits, each scraping bit consisting of a rectangular body of hardened plastic formed with rectangular sides and at its bottom with a V-shaped arcuate scraping surface and a sharp edge at the vertex of the V which fits into a helical junction of the rope to scrape the junction free from dirt and grease with each scraping bit being formed at its top with a channel adapted to hold a circular tension spring within the channel after the plurality of bits are mounted in circular array with the rectangular sides held between the alternating spaces between said plates,
  - a circular tension spring which fits over the top of the plurality of segments mounted between said plates and into the

channel portion within the sides of the channel portion of each of the bits, said tension spring urging the bits into radial pressing engagement with the rope for scraping the helical junctions of the rope, and  
 a closing and opening clamp which is fitted between the ends of said circular tension spring and is adapted to expand and open the spring when said clamp is opened and adapted to tension and tighten the spring when said clamp is closed to force the V-edge of the bits into the helical junctions of the rope for scraping away dirt and grease.

**4,422,209**  
**MANIFOLD TOOL GUIDE**  
 Aleksandar Djordjevic, Thousand Oaks, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
 Filed Jul. 8, 1982, Ser. No. 396,191  
 Int. Cl.<sup>3</sup> B08B 9/04  
 U.S. Cl. 15—257 R 13 Claims



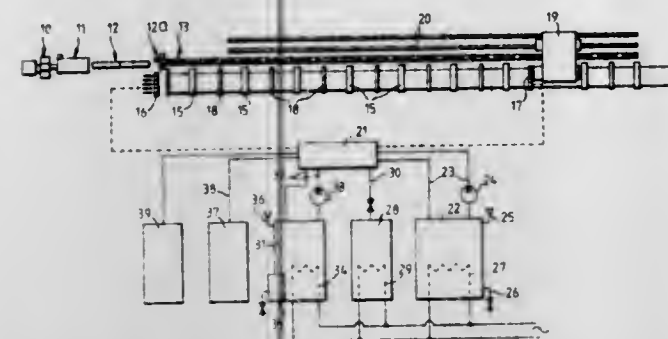
1. A tool guide for use in the inspection and cleaning of pipes of a manifold system comprising: a guide tube defining an axis and having an angled end section; and a locking device mounted on said guide tube for retaining the end of said end section of said guide tube in contact with a pipe to be cleaned; said locking device including a plurality of adjustable leg members extending outwardly from said axis, a spring-loaded slide member extending outwardly from said axis, and means for moving said slide member.

**4,422,210**  
**INSTALLATION FOR INTERNAL CLEANING OF TUBES**  
 Arne Bergsund, Floda, and Henryk Marsland, Västra Frölunda, both of Sweden, assignors to Göteborgs Maskinkonsult Aktiebolag, Gothenburg, Sweden  
 Filed Nov. 12, 1981, Ser. No. 320,719  
 Claims priority, application Sweden, Nov. 12, 1980, 8007923  
 Int. Cl.<sup>3</sup> A47L 5/38  
 U.S. Cl. 15—302 9 Claims

1. An installation for internal cleaning of tubes, said tubes having a front end and a rear end, the installation comprising a first means for connecting a first fluid conduit to one end of said tubes; a second means for connecting a second fluid conduit to the other end of said tubes; containers for two different fluid cleaning agents; a steam source; and means for connecting respectively said containers and said steam source with said fluid conduits for causing fluid flow through said conduits



according to a pre-determined sequence in order to first flush through the tubes one of the fluid cleaning agents, then subject-



ing the tubes to a period of clean blowing with steam, and then to flush through the tubes the other fluid cleaning agent.

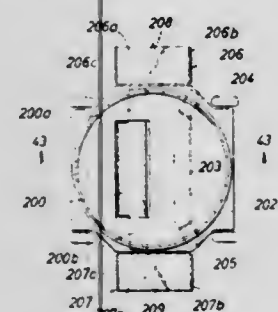
#### 4,422,211 VACUUM CLEANER ATTACHMENT FOR ROTARY LAWNMOWERS

Allen A. Chernosky, 4015 Turnberry, Houston, Tex. 77025  
Division of Ser. No. 293,593, Aug. 17, 1981, which is a continuation-in-part of Ser. No. 3,284, Jan. 15, 1979, Pat. No. 4,306,331, which is a continuation-in-part of Ser. No. 680,486, Apr. 26, 1976, abandoned, which is a division of Ser. No. 499,830, Aug. 23, 1974, Pat. No. 3,995,348. This application Nov. 18, 1982, Ser. No. 442,562

Int. Cl.<sup>3</sup> A47L 9/00

U.S. Cl. 15—328

5 Claims



1. A removable attachment for converting a rotary mower to a vacuum cleaner for picking up debris on sidewalks, driveways, and the like, where the mower has a propeller-type grass-cutting blade rotating in a housing having a discharge port and an opening in the bottom thereof through which grass normally extends to be cut by the rotating blade, said attachment comprising a baffle member extending across the opening in the housing and having an opening therein smaller than the opening in the housing, said baffle member including a flap member attached to the baffle member and extending under the opening, said flap member being inclined downwardly to provide an inclined surface up which debris can be moved into the opening by air pulled through the opening by the rotating blade of the mower, means attaching the flap member to the baffle member for pivotal movement around a horizontal axis to allow the flap member to pivot toward and away from the baffle member as required by the surface over which the mower is moving, an air flow controlling means positioned below the baffle member to direct air toward the opening and the inclined surface of the flap member, and means for releasably attaching the baffle member to the housing to restrict the flow of air between the member and the housing sufficiently to cause most of the air pulled into the housing by the blade to flow through the opening.

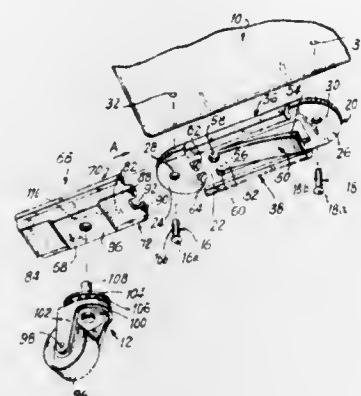
#### 4,422,212 NON-READILY DETACHABLE LUGGAGE SUPPORT UNIT

Julius Sheiman, and Samuel Sheiman, both of 247 Centre St., Crest Lock Co., Inc., New York, N.Y. 10013  
Filed Jul. 7, 1981, Ser. No. 281,074

Int. Cl.<sup>3</sup> B60B 33/00

U.S. Cl. 16—29

10 Claims



1. A detachable ground-engaging accessory unit for supporting luggage to be moved from place to place, comprising:

- a stationary base member adapted to be secured to the luggage, said base member having an elongated substantially planar base wall and a pair of side rails each extending at least partially along opposite respective longitudinal side edges of the base wall, said base member also having an elongated cantilever leaf spring which includes one spring end connected to the base wall, an opposite free spring end acting as a locking bolt, and a resilient offset spring portion intermediate the spring ends and having a normal position lying out of the plane of the base wall; and
- a movable slide member having an elongated main body for operatively engaging the ground on which the luggage is to be supported, and a pair of side tracks each extending at least partially along opposite respective longitudinal side edges of the main body, said side tracks slidably engaging the side rails for mounting the slide member on the base member for guided sliding movement between a disassembled and an assembled condition, said slide member having a leading detent portion for cammingly engaging and thereby urging the offset spring portion during said sliding movement towards the base wall until the leading detent portion of the slide member is slid past the locking bolt end of the spring, whereupon the spring due to its inherent resilience engages behind the detent portion with snap-type action to thereby secure the slide member and the base member in said assembled condition, said slide member also having in the vicinity of the leading detent portion an access opening which extends through the slide member to expose the spring locking bolt located therebelow in the assembled condition, said access opening being dimensioned to receive therethrough a disassembly tool operative for displacing the offset spring portion back towards the base wall until the free spring end locking bolt clears the detent portion, whereby the slide member is quickly and easily removed from the base member, said leading detent portion in the assembled condition covering and extending beyond the periphery of the offset spring portion and the free spring locking bolt, except at the access opening, to thereby prevent external forces other than from the tool from displacing the offset spring portion and effecting the disassembled condition, whereby the slide member is not readily detachable from the base member during transport of the object.

#### 4,422,213 DOOR CLOSER SHAFT

Mario Marinoni, Magenta, Italy, assignor to Casma di Vi Marinoni & Figli, Maggio, Italy

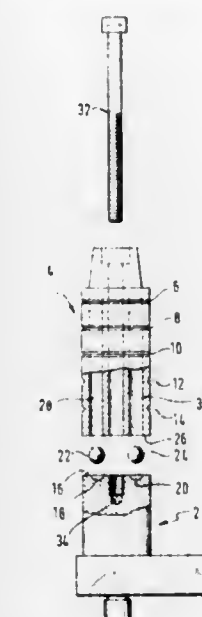
Filed Aug. 4, 1981, Ser. No. 289,905

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033363

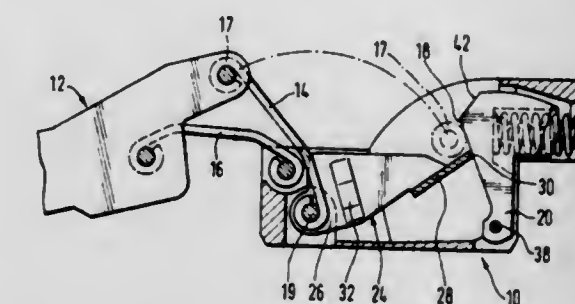
Int. Cl.<sup>3</sup> E05F 3/00

U.S. Cl. 16—71

6 Claims



1. An axially extending closer shaft for a door closer comprises a first axially extending section arranged to be mounted in a door closer housing where it is under the influence of a closing spring and a damper, and a second axially extending section in alignment with said first section and connected to said first section, said second section arranged to be located outside the door closer housing and to be connected to a door, wherein the improvement comprises that said second section has a plurality of annular grooves extending around the axis thereof with said grooves spaced apart in the axial direction of the closer shaft, said first section has an end surface extending transversely of the axis of the closer shaft adjacent to the second section and said end surface having at least two recesses formed therein, a coupling ball located in each of said recesses, and said second section has an axially extending bore extending from the end surface of said second section adjacent the end surface of said first section and aligned with each one of said recesses in said first section so that said balls seat within said bores for providing a coupling between said first and second sections.



element being a rocking lever which is fulcrumed within the plug-in cup in an area opposite the pivot axis of said tongue and which has a free end pointing toward the tongue, and which terminates in said abutment edge disposed parallel to said pivot axis, said rocking lever being constructed for pivoting upwardly in the cup interior from a position wherein the abutment edge is below said profile surface of the tongue to a position in which said abutment edge holds said tongue just in its dead-center position.

#### 4,422,215 SHEATHED HOLLOW STICK OF SHIRRED CASING

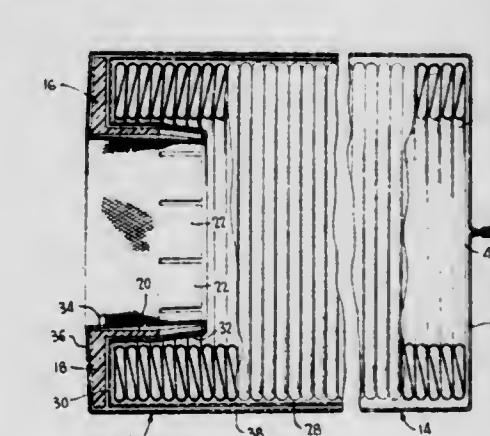
J. Alfons F. Liekens, Olen, and Ivo G. M. Hendriks, Overpelt, both of Belgium, assignors to Teepak, Inc., Chicago, Ill.

Filed May 27, 1981, Ser. No. 267,283

Int. Cl.<sup>3</sup> B65B 5/00, 11/00

U.S. Cl. 17—1 R

10 Claims



#### 4,422,214 OVER-CENTER HINGE

Karl Lautenschläger, and Gerhard Lautenschläger, both of Reinheim, Fed. Rep. of Germany, assignors to Karl Lautenschläger KG, Reinheim, Fed. Rep. of Germany

Filed May 7, 1981, Ser. No. 261,472

Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018184

Int. Cl.<sup>3</sup> E05D 11/10; E05F 1/12

U.S. Cl. 16—291

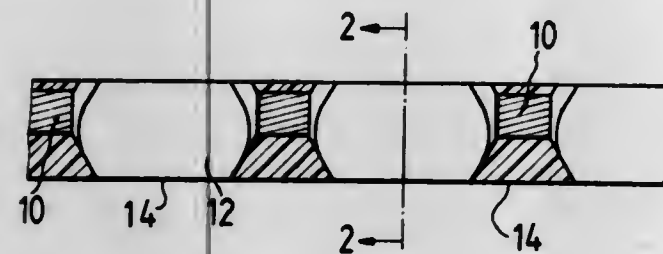
10 Claims

1. An over-center hinge for a cabinet door, said hinge comprising: a supporting-wall-related part adapted to be fastened to the supporting wall of a cabinet, a door-related part constructed as a plug-in cup for insertion in a door, a linkage mechanism pivotally joining the supporting-wall-related part to the door-related part, a tongue mounted in said cup, a compression spring biasing said tongue toward the interior of the cup, said tongue being mounted for pivoting about an axis over a given angle and having a profile surface projecting slantingly into the interior of the cup, a contact surface being provided at the link end of the supporting-wall-related part, said contact surface sliding during a portion of the opening and closing movement of the hinge between the hinge closed position and

1. A sheathed hollow stick of shirred casing comprising an elongated shirred casing stick, a net-like sheathing telescoped over said stick in shape retaining relation and a unitary holding means comprising, a single flexible calibrated ring telescoped in one end of said stick, said ring including an inwardly projecting sleeve portion and said holding means being retained in said stick by a reversely folded portion of said sheathing.

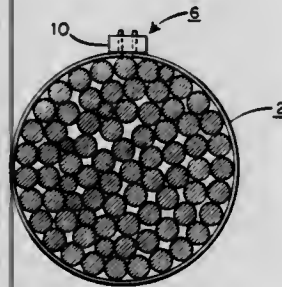


**4,422,216**  
**DEVICE FOR SEPARATING MEAT FROM BONES**  
 Markus Spötl, Forstenrieder Allee 128 b, D-8000 München 71,  
 Fed. Rep. of Germany  
 Continuation-in-part of Ser. No. 170,445, Jul. 21, 1980,  
 abandoned. This application Jan. 20, 1982, Ser. No. 340,962  
 Claims priority, application Fed. Rep. of Germany, Jul. 23,  
 1979, 2929836; Jan. 21, 1981, 3101842  
 Int. Cl.<sup>3</sup> A22C 17/04  
 U.S. Cl. 17—1 G 9 Claims



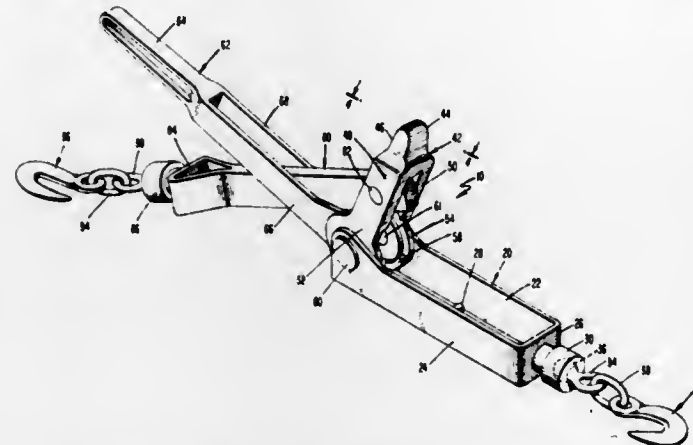
1. A device for separating meat from bones, comprising:  
 a drive element; and  
 an elongated, flexible cutting strand coupled to said drive  
 element for movement along a travel path parallel to its  
 longitudinal direction, said strand being unsupported over  
 a portion of its length, and being provided with spaced-  
 apart cutting elements having their cutting edges aligned  
 and extending in the longitudinal direction of said cutting  
 strand.

**4,422,217**  
**PACKAGING FASTENER**  
 Richard P. Barrette, 8 Lee St., South Lancaster, Mass. 01523  
 Filed Jul. 2, 1981, Ser. No. 280,116  
 Int. Cl.<sup>3</sup> B65D 63/00, 67/02  
 U.S. Cl. 24—16 R 4 Claims



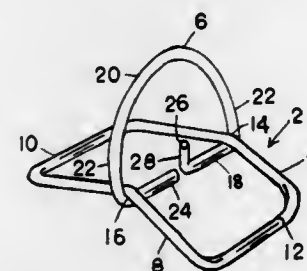
1. A packaging fastener for use with a flexible strap compris-  
 ing  
 a molded body having substantially parallel first and second  
 passageways therein each defining means for receiving an  
 end portion of said strap,  
 bridge means formed integrally with said body and forming  
 at least a partial separation between said passageways,  
 an anchor member having a base portion positioned within  
 said body and supported by said bridge means, and  
 first and second locking ears forming an integral part of said  
 anchor member and extending from opposite ends of said  
 base, said ears being flexibly retained in said body and  
 extending respectively into said first and second passage-  
 ways at an acute angle with respect to the longitudinal  
 axis of the respective passageway,  
 whereby when said strap is inserted in a first direction into  
 either of said passageways the respective locking ear  
 flexes to permit passage of said strap in said first direction  
 and engages the strap to resist movement in the opposite  
 direction.

**4,422,218**  
**LEVER-TYPE LOAD BINDER**  
 Gerald G. Brasseux, Abbeville, La., assignor to Dominion Chain  
 Inc., Ontario, Canada  
 Filed Apr. 21, 1980, Ser. No. 141,975  
 Int. Cl.<sup>3</sup> B66F 3/00  
 U.S. Cl. 24—68 CT 13 Claims



5. A lever-type load binder comprising:  
 a lever member;  
 first means for engaging the load binder to a first load, which  
 first means is pivotably connected to said lever member to  
 enable said lever member to pivot with respect to said first  
 engaging means about a pivot axis;  
 second means for engaging the load binder to a second load,  
 which second engaging means is pivotably connected to  
 said lever member at a point displaced from the point of  
 attachment of said first engaging means; and  
 actuating means for pivoting said lever member about said  
 pivot axis, said actuating means being pivotably connected  
 to said first engaging means and pivotable with respect to  
 said lever member.

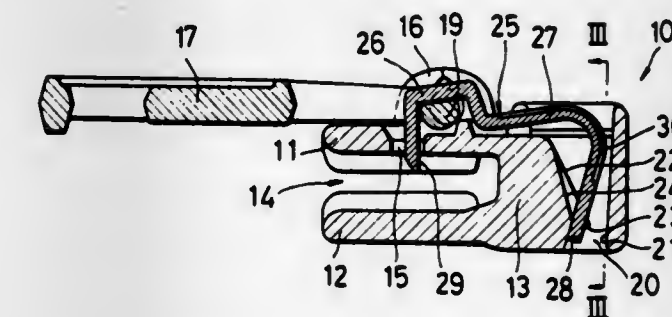
**4,422,219**  
**BUCKLE**  
 Joseph Kepiro, R.D. #2, Parkesburg, Pa. 19365  
 Filed Jul. 1, 1982, Ser. No. 394,315  
 Int. Cl.<sup>3</sup> A44B 11/24; B68B 5/00  
 U.S. Cl. 24—176 1 Claim



1. A method of making a buckle comprising:  
 (a) bending a first wire with two ends into a generally rect-  
 angular shape with two long sides and two short sides and  
 fastening together said two ends,  
 (b) bending the rectangular shape at the midregion of the  
 two long sides to form an obtuse angle between the two  
 long sides,  
 (c) bending a second wire with two ends into a generally  
 dome-shaped second shape with one straight long side,  
 one curved long side and two short sides,  
 (d) bending one end of said second wire into the area and  
 plane of said second shape so formed at the midregion of  
 said long straight side,  
 (e) fastening the second wire to the first wire with the long  
 side of the second wire having the bent end positioned at  
 the midpoint of the two long sides of the first wire, and

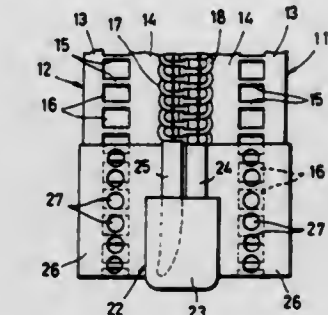
said bent end extending perpendicular to a plane parallel  
 to and intersecting with the two short sides of the first  
 wire and away from the obtuse angle of that first wire.

**4,422,220**  
**AUTOMATIC LOCK SLIDER FOR SLIDE FASTENERS**  
 Kiyoshi Oda, Namerikawa, Japan, assignor to Yoshida Kogyo K.  
 K., Tokyo, Japan  
 Filed Feb. 24, 1982, Ser. No. 351,745  
 Claims priority, application Japan, Feb. 25, 1981, 56-25510  
 Int. Cl.<sup>3</sup> A44B 19/30  
 U.S. Cl. 24—421 5 Claims



1. An automatically locking slider for a slide fastener having  
 a pair of coupling element rows, said slider comprising:  
 (a) a slider body including a pair of first and second wings  
 joined at one end by a neck so as to define therebetween  
 a generally Y-shaped guide channel for the passage of the  
 pair of coupling element rows, said first wing having an  
 aperture communicating with said guide channel, said  
 neck having a pair of laterally spaced cam surfaces extend-  
 ing from said first wing and each terminating in a trans-  
 verse abutment to jointly define a locking-member retain-  
 ing nose adjacent to said second wing;  
 (b) a pair of laterally spaced lugs on said first wing, one on  
 each side of said aperture;  
 (c) a pull tab pivotably connected to said lugs and having a  
 transverse spindle journaled thereby; and  
 (d) a locking member pivotably supported on said slider  
 body and including a resilient strip having  
 (1) a U-shaped base extending around said transverse  
 spindle and normally urged thereagainst by the resili-  
 ence of said strip, said base being angularly movable  
 away from said first wing in response to the pivotal  
 movement of said pull tab against the bias of said strip,  
 (2) an anchor extending from one end of said base and  
 terminating in a shank having a pair of shoulders pro-  
 jecting from the distal end thereof, said shank lying  
 between said cam surfaces, and said shoulders each  
 being trapped by said abutments thereof within said  
 neck, said distal end being urged against said nose by  
 the resilience of said strip and thereby prevented from  
 coming out of interlocking engagement with said nose,  
 and  
 (3) a locking prong extending from the other end of said  
 base for normally projecting into said guide channel  
 through said aperture to lockingly engage with a pair of  
 coupling element rows, said locking prong being re-  
 tractable from said guide channel into said aperture in  
 response to the angular movement of said base away  
 from said first wing.

**4,422,221**  
**SEPARABLE SLIDING CLASP FASTENER**  
 Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K. K.,  
 Tokyo, Japan  
 Filed Dec. 17, 1981, Ser. No. 331,876  
 Claims priority, application Japan, Dec. 24, 1980, 55-182103  
 Int. Cl.<sup>3</sup> A44B 19/00  
 U.S. Cl. 24—434 7 Claims



1. A separable slide fastener comprising:  
 (a) a pair of stringer tapes each having a series of openings  
 spaced longitudinally thereof at first intervals;  
 (b) a pair of rows of coupling elements mounted on and  
 along a pair of opposite longitudinal edges of said stringer  
 tapes, respectively;  
 (c) a slider movable along said pair of rows of coupling  
 elements for engaging and disengaging the latter;  
 (d) a separable bottom end stop comprising a box and a box  
 pin extending therefrom, which are mounted on one of  
 said stringer tapes at one end thereof, and a locking pin  
 mounted on the other stringer tape at one end thereof and  
 receivable in said box; and  
 (e) a reinforcement strip of textile material mounted on each  
 of said stringer tapes at said one end and adjacent to said  
 separable bottom end stop, said strip having a plurality of  
 apertures spaced longitudinally thereof at second intervals  
 and arranged substantially in alignment with said openings  
 in each of said stringer tapes.

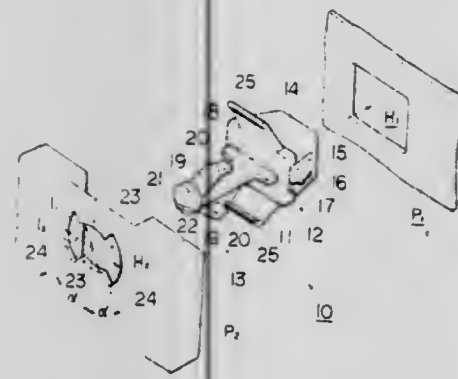
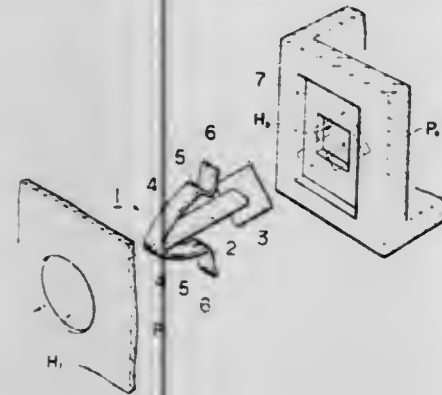
**4,422,222**  
**FASTENING STRUCTURE**  
 Yoshiaki Notoya, Zushi, Japan, assignor to Nifco Inc., Yoko-  
 hama, Japan  
 Filed Oct. 21, 1981, Ser. No. 313,521  
 Claims priority, application Japan, Nov. 5, 1980, 55-  
 157333[U]

Int. Cl.<sup>3</sup> A44B 17/00, 21/00  
 U.S. Cl. 24—614 3 Claims

1. A fastener for detachably fastening first and second work-  
 pieces together, said first workpiece having a through aperture  
 of predetermined shape, said second workpiece having a  
 through aperture of predetermined shape including a first small  
 diameter portion having first opposed edges spaced apart a first  
 predetermined distance and a second annularly displaced por-  
 tion having second opposed edges spaced apart a second rela-  
 tively larger predetermined distance, said fastener comprising:  
 a base, a first catch portion integral with and extending out-  
 wardly from a first side of said base, said first catch portion  
 being insertable into and engageable within said first work-  
 piece aperture for securing the fastener with respect to the first  
 workpiece; a second catch portion integral with and extending  
 outwardly from said base oppositely from said first catch  
 portion, said second catch portion including an axially twist-  
 able resilient stem twistable in rotation relative to and indepen-  
 dently of the base and the first catch portion remaining in  
 engagement with the first workpiece from a normal relaxed  
 position to a twisted rotated position reactively urged to return  
 to the normal position and a pair of resilient catch members on  
 the stem in distal relation to the base and normally assuming an  
 outward position, said catch members including workpiece  
 engageable surfaces normally spaced apart a distance greater  
 than said first predetermined distance and less than said second



predetermined distance, said catch members being resiliently collapsible upon axial insertion between said first opposed edges defining the first predetermined distance for enabling said surfaces to be snapped through said second workpiece aperture for engaging said first opposed edges and securing the second workpiece with respect to the fastener; and means integral with an outer end of said stem for enabling the stem to be twisted from its normal position relative to the base to its rotated position with bodily similar rotation of the catch mem-



bers with the outer end of the stem relative to the base for angularly spacing said catch members in their normal outward positions for disengagement from said first opposed edges by registry thereof between the second opposed edges and for withdrawal from the second workpiece aperture between said second opposed edges whereby, upon disengagement of the fastener, the stem with the catch members is reactively rotated to the normal positions thereof in readiness for repeated snap reengagement of the catch members with the first opposed edges to assemble the fastener with the disengaged workpiece.

4,422,223

**FIXED CLOTH SPEED INSPECTION MACHINE**

Robert L. Haines, 17 Wolf Ave., Reisterstown, Md. 21136  
Filed Aug. 1, 1980, Ser. No. 174,467

Int. Cl.<sup>3</sup> D06H 3/04

U.S. Cl. 26—70

16 Claims

1. In a cloth inspection machine having a supply mount from which cloth may be drawn, a take-up mount about which said cloth may be wound and accumulated, a cloth viewing area between said supply and take-up mounts, drive means for rotating said take-up mount to wind and accumulate said cloth thereon including a motor and means for changing the speed of said drive means, the improvement being said speed change means comprising:  
means for sensing the speed of said cloth at said viewing area when it is being inspected;  
control means responsive to said sensing means output for varying directly the speed of said motor to maintain a sub-

stantially constant linear speed of said cloth as it passes through said viewing area;

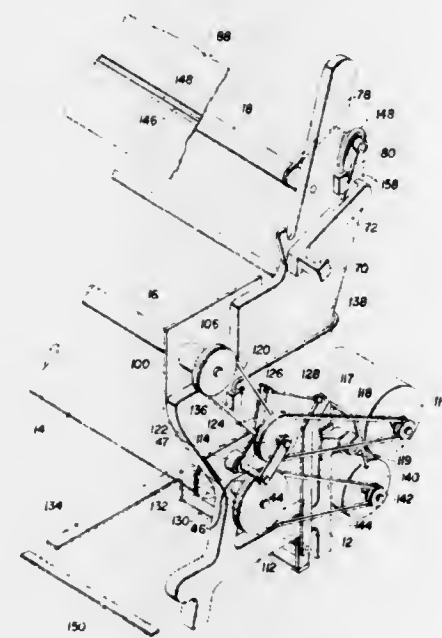
said drive means including a fixed ratio drive system interconnecting said motor and said take-up mount;

a rotatable measuring drum positioned between said supply mount and said take-up mount;

means connected to said measuring drum for detecting that said sensing means cannot monitor the speed of the end of the cloth after the end of the cloth has moved past said measuring drum and yet is not completely accumulated on said take-up mount and out of the viewing area; and

means responsive to said detecting means for substituting a fixed input to said control means for the input from said sensing means.

16. In a cloth inspection machine having a supply mount, a take-up mount, a cloth viewing area between said supply and take-up mounts, drive means for rotating said take-up mount including a motor means for changing the speed of said drive means, the improvement comprising:  
said speed change means including means for sensing the speed of the cloth being inspected and control means responsive to said sensing means output for varying the speed of said



motor to maintain a substantially constant linear speed of said cloth;

including a drive means for rotating said supply mount and a reversing means for energizing said supply mount drive means wherein said supply mount drive means includes a second motor and a second control means for running said second motor at a fixed speed when said reversing means is activated;

said take-up mount drive means including means for interconnecting said take-up mount motor and said take-up mount and wherein said interconnecting means includes a first pulley on the output of said take-up mount motor, a second pulley on said take-up mount, a third and fourth pulley on a common shaft, a belt between said first and fourth pulleys, a belt between said second and third pulleys, said common shaft being mounted to move relative to said take-up mount; and

said reversing means including a disabling means connected to said common shaft to move the axis of said common shaft relative to said take-up mount to slacken the belt between said second and third pulley to effectively disconnect said take-up motor from said take-up mount when said reversing means is activated.

4,422,224

**APPARATUS FOR INTERLACING MULTIFILAMENT YARN**

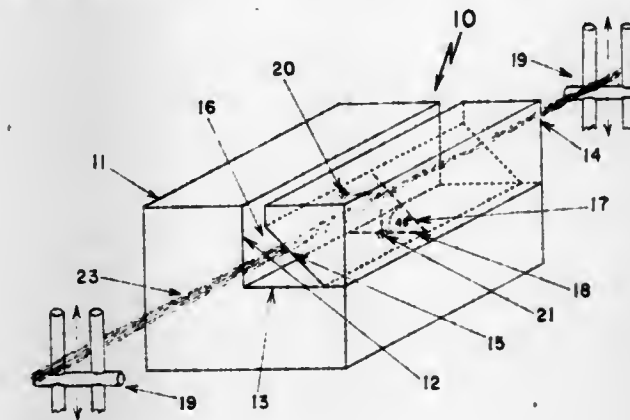
James A. Gusack, Williamsburg, Va.; David O. Bird, Arnprior, Canada; Ernest C. Thomm, Sarnia, Canada, and William A. Reltz, Renfrew, Canada, assignors to Badische Corporation, Williamsburg, Va.

Filed Dec. 17, 1981, Ser. No. 331,868

Int. Cl.<sup>3</sup> D02G 1/16; D02J 1/08

U.S. Cl. 28—272

3 Claims



1. A device for interlacing multifilament yarn, which device comprises the cooperative combination of:

(a) a body member having two planar orthogonal yarn-treating faces;

(b) a cover member secured to the body member, the cover member having a coating surface which is spaced from the first yarn-treating face to form a yarn passageway, the coating surface of the cover member so positioned with respect to the yarn-treating faces that an angle of about 45 degrees is formed by the intersection of: (1) a line resulting from the intersection of the coating surface and any plane mutually orthogonal to the coating surface and to the yarn-treating faces and (2) a line resulting from the intersection of said orthogonal plane and the second yarn-treating face;

(c) means for controlling the velocity and direction of travel of a multifilament yarn into and out of the yarn passageway;

(d) a coactive pair of fluid conduits in the body member, one conduit terminating perpendicularly to each of the yarn-treating faces in an orifice therein which is positioned to direct fluid against the coating surface of the cover member, the longitudinal axes of the conduits at the terminations thereof lying in a plane mutually orthogonal to the coating surface and to the yarn-treating faces; and

(e) means for the supply of fluid to the conduits.

4,422,225

**APPARATUS FOR DEPOSITING A MOVING FIBER STRAND AS FOLDED LOOPS**

Herbert Kurzke, Bobingen, Fed. Rep. of Germany, assignor to Vepa Aktiengesellschaft, Riehen, Switzerland

Filed Sep. 19, 1979, Ser. No. 77,157

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1978, 2840664; Oct. 21, 1978, 2845881

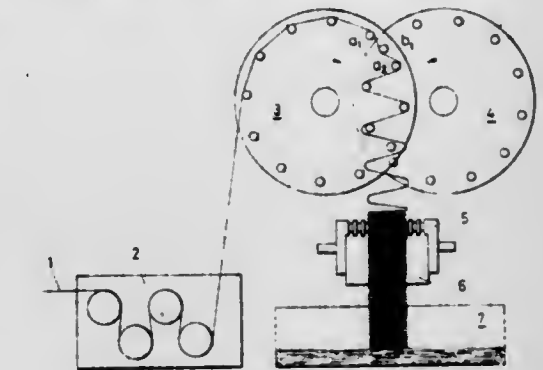
Int. Cl.<sup>3</sup> B65H 57/76; D01D 7/00

U.S. Cl. 28—289

1 Claim

1. An apparatus for depositing a moving fiber strand as folded loops into a storage means, which comprises a strand feeding device, an intermediate depositing means consisting of two driven wheels rotating in mutually opposite directions and having annularly arranged guide pins for conveying and guiding the strand in a zigzag path to form the strand into a plurality of folded loops, said two wheels being arranged parallel to each other so that the guide pins of each wheel will be successively interspaced during rotation of the wheels and so that the space between the wheels is greater than a length of a guide pin, the pins being axially aligned on each wheel and the pins on each wheel being mutually displaced from each other and being sufficient in number so that more than three pins are simultaneously in contact with the strand during passage

through the intermediate depositing means; a conveyor means for receiving the folded loops falling from said intermediate depositing means and for conveying said folded loops so that the loops will be deposited in close juxtaposition within said storage means, said conveyor means being arranged below the



intermediate depositing means and above the storage means for decelerating the fall of said loops; and the storage means being arranged for receiving the loops by free fall from the conveyor means; said conveyor means comprising a driven conveyor drum provided with circumferentially parallel grooves engaged by a finger-like strand stripper.

4,422,226

**PROCESS FOR PRODUCING CRYSTAL RESONATORS**

Roger W. Hunt, Greensboro, N.C.; Brian T. Miller, Leland, and Donald R. Schroeder, Sandwich, both of Ill., assignors to CTS Corporation, Elkhart, Ind.

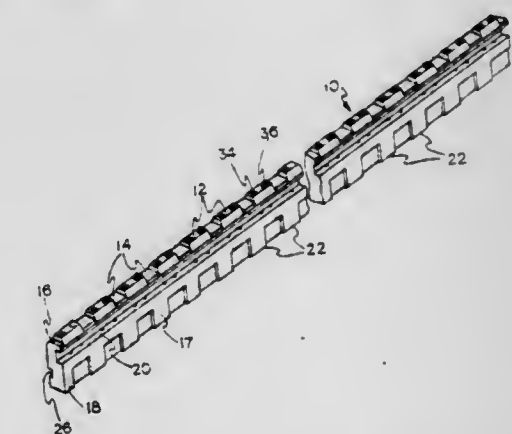
Division of Ser. No. 177,983, Aug. 14, 1980, Pat. No. 4,371,078.

This application Sep. 24, 1982, Ser. No. 422,574

Int. Cl.<sup>3</sup> H01L 41/22

U.S. Cl. 29—25.35

10 Claims



1. A process for producing electrical components having a plurality of terminals, including the steps of mounting said components upon a pallet having a plurality of regularly spaced bosses and teeth means, each of said bosses including openings for receiving the terminals of the respective components, passing such terminals through a longitudinal groove of said pallet to provide access to respective pairs of said terminals for operations such as the individual testing of said components, mounting said pallet for longitudinal slideable guided movement, and thereafter advancing the pallet by means complementary with said teeth means engaging said teeth means to move the pallet, through a station in which one of said operations is completed as said components move through the station.



4,422,227

## ROLLER ASSEMBLY

Peter Illg, Schlaitdorf, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

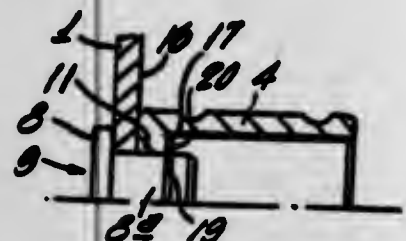
Filed Dec. 8, 1980, Ser. No. 213,847

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950841

Int. Cl.<sup>3</sup> B21B 31/02

U.S. Cl. 29—116 R

2 Claims



1. A tension roller assembly adapted to be mounted on a holder having an opening therein comprising an elongated guide bolt member having an axial bore therethrough, a radially inwardly directed annular collar of small axial extension at one end of said guide bolt member adjacent the face thereof abutting a front face of the holder, said collar forming an opening of essentially the same size as said opening in said holder and smaller than the remainder of said axial bore, a fastening member having an enlarged head portion abutting the rear face of the holder and a shank portion engaging through said opening in the holder and having abutment means for securing it to said guide bolt member adjacent said annular collar and a roller body member circumscribing said annular collar comprising an expanding ring engageable in an annular slot on the generatrix of the fastening member and confronting said annular collar and a plurality of rolling elements in the annular space between the roller body member and the guide bolt member which engage in raceways formed in said confronting surfaces, said collar being located outside the zone of the raceways for the rolling elements.

4,422,228

## MOLDBOARD BIT INSTALLING TOOL AND METHOD

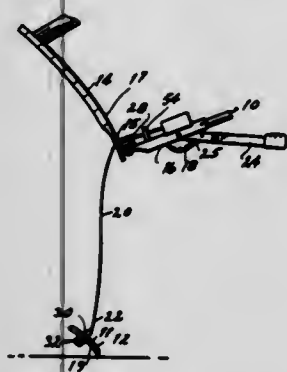
Orville B. Chapman, Box 414, Chewelah, Wash. 99109, and George O. Prufer, Rte. 2, Box 488, Deer Park, Wash. 99006

Filed Jun. 25, 1981, Ser. No. 277,235

Int. Cl.<sup>3</sup> B21H 7/00; B21K 19/00

U.S. Cl. 29—148.3

7 Claims



1. A method for bolting an elongated apertured bit having front and back surfaces to a similarly apertured moldboard having front and back surfaces with a moldboard bit installing tool comprising:

securing the moldboard bit installing tool to a back surface of the moldboard by inserting studs outwardly projecting from an elongated base of the tool into mating apertures in the moldboard;

inserting a free end of a winch cable from the tool through an aperture in the moldboard from the back of the mold-

board and through a corresponding aperture in the bit from a back surface of the bit;

securing the cable free end to the bit by fastening a terminal affixed to the cable free end to the bit at a front surface of the bit;

hoisting the bit into mounting position in relation to the moldboard by operating a handle means that winds the cable about a winch drum;

bolting the bit into position by installing bolts through the apertures in the bit and moldboard;

removing the cable free end from the bit by releasing the terminal affixed to the cable free end from the bit front surface;

removing the bit inserting tool from the moldboard by disengaging the tool studs from the moldboard;

installing bolts through apertures in the moldboard and bit previously occupied by the tool studs and cable.

2. A moldboard bit installing tool for hoisting and lowering an elongated, apertured bit to and from a mounting position in relation to a similarly apertured moldboard, said tool comprising:

a winch frame;

a winch drum rotatably mounted to the winch frame;

winch cable on the winch drum, the cable extending to a free end;

handle means operably connected to the winch drum for forcibly rotating the winch drum to wind and unwind the cable on the drum;

an elongated base frame mounted to the winch frame;

outwardly projecting studs on the base frame, each stud spaced from one another by a multiple of a distance corresponding to spacing between apertures along the moldboard;

the studs being received through appropriate moldboard apertures such that the winch drum and cable are in alignment with an aperture in the moldboard;

a cable terminal affixed to the free cable end and adapted to be inserted through corresponding moldboard and moldboard bit apertures; and

means on the cable terminal for releasably securing the cable terminal to the moldboard bit through an aperture thereof.

4,422,229

## METHOD OF MAKING AN AIRFOIL MEMBER FOR A GAS TURBINE ENGINE

John H. R. Sadler, Aston-on-Trent; George Pask, Stanton-by-Bridge, and Wilfred H. Wilkinson, Turnditch, all of England, assignors to Rolls-Royce Limited, London, England

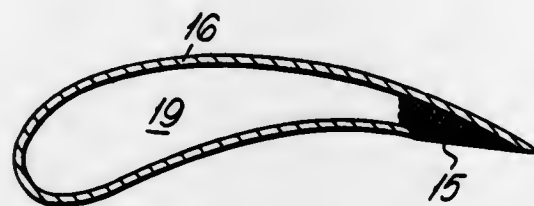
Division of Ser. No. 121,481, Feb. 14, 1980, abandoned. This application Dec. 16, 1981, Ser. No. 331,201

Claims priority, application United Kingdom, Feb. 24, 1979, 7906623

Int. Cl.<sup>3</sup> B23P 15/02, 13/00

U.S. Cl. 29—156.8 H

5 Claims



1. A method of making an airfoil member for a gas turbine engine, the airfoil member having an airfoil-shaped exterior surface and a hollow interior with a plug of reticulated porous material filling a region of the hollow interior and forming at least a part of the exterior surface of the airfoil member whereby cooling fluid can pass from the hollow interior

through the plug to the exterior of the aerofoil member, said method comprising the steps of:

forming a composite core having a solid portion defining the hollow interior of the aerofoil member and a porous portion of reticulated foam material defining the region for and the pores for the plug of porous material;

providing a mold around the core with a clearance therebetween to define the exterior surface of the aerofoil member;

then casting metal into the clearance formed between the composite core and the mold and into the porous portion of reticulated foam material of the composite core so that the reticulated porous plug is cast as an integral part of the hollow aerofoil member;

and then removing the mold and the composite core from the cast aerofoil blade member.

4,422,230

## METHOD FOR PRODUCING WORKBENCH FOR A WIG

Nobuo Nemoto, Chofu, Japan, assignor to Aderans Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 123,231, Feb. 21, 1980, abandoned.

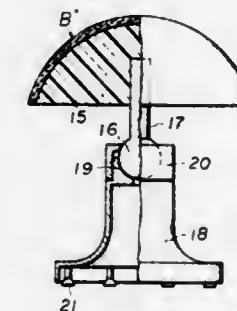
This application Aug. 25, 1981, Ser. No. 295,979

Claims priority, application Japan, Feb. 28, 1979, 54-21924; Feb. 28, 1979, 54-21925

Int. Cl.<sup>3</sup> B29C 24/00, 5/00, 23/00

U.S. Cl. 29—434

4 Claims



1. In a method for producing a workbench for a wig, fitted to the head of the person who is to wear the wig, the steps comprising:

holding a semitranslucent sheet of trans-1,4-polyisoprene, having a tensile strength about 290 kg/cm<sup>2</sup>, elongation about 450%, Shore C hardness about 78, density about 0.96 g/cm<sup>3</sup>, having a length and width about 33 cm, having a melting point of about 67° C. and a thickness of about 2 mm, in a perimetral clamping frame while heating the sheet as a whole to a temperature beyond that at which it softens and until it turns transparent;

allowing the sheet to partially cool to a temperature at which it is still soft and moldable but can be touched by a human hand;

pressing the partially cooled sheet against the top of the head of the person who is to wear the wig sufficient to cause said head to bulge the central portion of said sheet to the shape of the top of said head and maintaining said bulge by holding the clamping frame by hand until the sheet has further cooled sufficient to turn semitranslucent again;

then removing the sheet from the head and marking a line on said bulge to indicate the portion thereof desired for a wig base for use of said bulge as a female mold;

coating a fluorine plastic lubricant on the inside of said female mold;

mixing a fluid workable resin comprising a phenolic foam containing an epoxy resin and phenol balloons with a modified aliphatic polyamine hardening agent;

pouring the thus-obtained mixture into the lubricant coated female mold and spreading same to said marked line to form an open bowl-like layer of the workable resin in a thickness of about 5 mm and leaving same to harden;

4,422,231

## METHOD OF FORMING A BLOCK FOR A METAL BELT

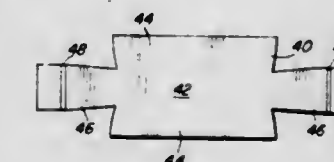
Kenneth A. Braybrook, Letchworth, England, assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 167,261, Jul. 9, 1980, abandoned. This application Feb. 18, 1982, Ser. No. 349,806

Int. Cl.<sup>3</sup> B21D 39/00; B23P 11/00

U.S. Cl. 29—509

4 Claims



1. In a method for constructing a power transmission drive belt, especially adaptable for use in transmissions having variable pulleys, having a continuous metal-containing band with upper and lower surfaces and drive blocks connected thereto, each drive block having side surfaces adapted to frictionally engage the flanges of said pulleys of said transmission; the improvement which comprises the steps:

(a) providing a plurality of essentially cross-shaped blanks each having a body with extending side and end portions;

(b) bending said side portions of each blank to form a hollow central member having an upper surface and a lower surface;

(c) bending said end portions of each blank to extend upwardly of said upper surface;

(d) assembling each so formed blank with its upper surface in juxtaposition to the lower surface of said band and its end portions extending above the upper surface of said band; and

(e) bending said end positions extending above the upper surface of said band over said band.

4,422,232

## ELECTRONIC COMPONENT INSERTION MACHINE

Stanley R. Vanclette, Manchester, N.H.; Robert D. DiNozzi, Marblehead, Mass., and Mark V. Pierson, Binghamton, N.Y., assignors to USM Corporation, Farmington, Conn.

Filed Nov. 5, 1980, Ser. No. 203,562

Int. Cl.<sup>3</sup> H05K 3/30

U.S. Cl. 29—564.2

14 Claims

1. A machine for inserting electronic components, said components having a body and dual in-line parallel leads extending from the sides thereof, said machine comprising:

a picker means for inserting said components;

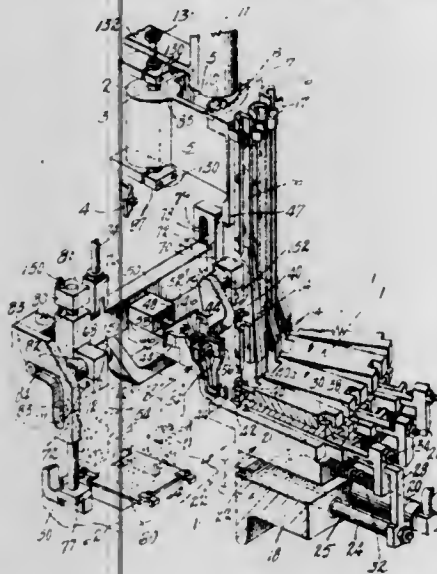
at least one transfer unit with a magazine having side walls formed therein;

means movably supporting said at least one transfer unit for movement with respect to said picker means;

means for retaining a component supply movable with said transfer unit, said component supply holding said components in a predetermined orientation, said retaining means



being arranged to dispose said components supply above said magazine whereby said components can drop, one at a time, into said magazine;  
former means and ejector means disposed in said transfer unit, said former means being arranged to urge the leads of said component toward the side walls to shape them, said ejector means being arranged to engage one side of the



body of the component for transfer from the magazine; and  
said picker means including a pusher, said pusher being arranged to engage the other side of the body of the component whereby it can be disposed between said ejector and said pusher for transfer from said magazine into said picker.

4,422,233

#### METHOD FOR PRODUCING HIGH TEMPERATURE ELECTRICAL CONNECTION

Edward P. Habdas; Jon D. Aaron, both of Decatur, and Timothy H. Whitten, Hartselle, all of Ala., assignors to UOP Inc., Des Plaines, Ill.

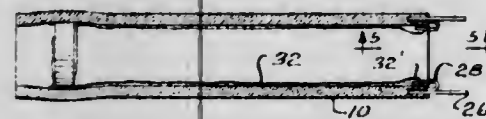
Division of Ser. No. 297,908, Aug. 31, 1981, Pat. No. 4,378,279.

This application Sep. 30, 1982, Ser. No. 429,339

Int. Cl.<sup>3</sup> H01G 9/24

U.S. Cl. 29—570

10 Claims



1. An improved method for attaching a lead wire of considerable thickness to a surface of a ceramic member which shrinks when fired and which then undergoes considerable thermal expansion relative to the wire during use comprising the steps of: selecting a length of a primary lead connection wire having a sufficient thickness to withstand substantial flexure after assembly to the ceramic member but too much thickness to be capable of maintaining a glass frit bond with said surface of said member during repeated cyclings of the member to elevated temperatures; selecting a length of a secondary lead attachment wire having a thickness which is insufficient to withstand substantial flexure after assembly to the ceramic member and small enough to be capable of maintaining a glass frit bond with said member after said member expands at a different rate than said secondary lead wire when heated repeatedly during use; attaching one end of said secondary lead attachment wire relative to said primary lead attachment wire so it contacts said primary wire at a location where said primary wire cannot be flexed after assembly; forming an opening in said ceramic member and placing at least said primary wire in said opening before said ceramic member is fired;

firing said ceramic member to cure it and to cause the inside surface of said opening to shrink and lockingly engage at least said primary wire; applying a coating of conductive frit to said surface of the ceramic member and to the other end of said secondary wire after it is bent over into contact with said surface; and again firing said ceramic member frit and lead wire assembly to fuse said conductive frit and bond said secondary lead wire to said surface.

6. An improved method of assembling a lead connection to the reference end of an oxygen sensor of the type having a generally tubular ceramic body which is closed at a sensing end by a portion of ceramic which is a solid electrolyte, said method comprising the steps of: selecting a primary lead connection wire of a material capable of withstanding the firing and operating temperatures of said sensor and of a thickness sufficient to withstand normal flexing during the life of the sensor, but too great to be capable of being retained in a bonded relationship to said ceramic body by a glass frit seal when differential expansion takes place between the ceramic and primary lead wire during a plurality of heating cycles; forming an opening in the reference end of said ceramic body while said body is in a green or unfired state, said opening being sized so that shrinkage of said body during firing will cause the internal wall of said opening to mechanically clamp said primary lead wire; selecting a secondary lead wire which is capable of resisting the firing and operating temperatures of said sensor and is thin enough so as to be capable of being retained in a bonded relationship to said ceramic body by a glass frit seal during a plurality of heating cycles, said secondary wire being too thin to withstand repeated flexing; placing at least the primary lead wire in said opening; firing said ceramic body to cure said ceramic and shrink the sides of said opening into clamping engagement with said primary wire; attaching one end of said secondary wire to a non-flexing portion of said primary wire; placing the other end of said secondary wire in contact with one end of a glass frit conductive lead stripe on the surface of the tubular body which is joined at its other end to an electrode coating on the solid electrolyte; covering said other end of said secondary wire with a paste layer of glass frit conductive material; and again firing the ceramic body to fuse said paste layer to said secondary wire.

4,422,234

#### METHOD OF MAKING A DYNAMOELECTRIC MACHINE COMMUTATOR STRUCTURE

William B. Penn, and Martin A. Zraggen, both of Erie, Pa., assignors to General Electric Company, Research Triangle Park, N.C.

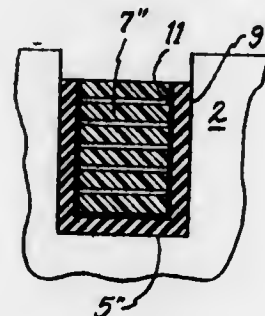
Division of Ser. No. 244,586, Mar. 17, 1981, Pat. No. 4,341,972.

This application Jan. 26, 1982, Ser. No. 342,872

Int. Cl.<sup>3</sup> H01R 43/06

U.S. Cl. 29—597

4 Claims



1. A method of making a commutator comprising the steps of:  
(a) mounting a plurality of conductive commutator segments on a supporting hub in a cylindrical array and in insulated relationship to one another and to the hub,  
(b) providing at least one annular groove in the outer cylin-

drical surface of the commutator segments for receiving a dielectric banding therein,  
(c) coating the sidewalls of said groove with a solution of room temperature curable, flexible, thermally stable and electrical track resistant material and then allowing said coating material to at least partially cure,  
(d) providing a layer of release material having one etched side, positioning the etched side of the layer of release material against the coating material in the groove and adhering the layer of release material to said coating material, thereby positioning it between the coating material and the commutator banding when the banding is positioned in the groove by step (c), so that thermal cycling of the banding will pull it away from the layer of release material but will not produce fissures between the coating material and the commutator segments,  
(e) positioning a commutator banding in said groove against said coating, and  
(f) applying more or said coating material over the edges of the radially outer surface of the banding to completely seal the junctions between the banding and the commutator segments against the deposit of electrically conductive contaminants in cracks or fissures at said junctions.

4,422,235

#### TOOL FOR JOINING CONNECTORS

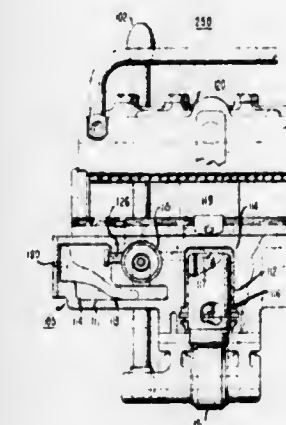
Edward W. Becker, Winder; Paul R. Harville, Lilburn, both of Ga., and Glen E. MacLeod, Los Angeles, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 8, 1982, Ser. No. 338,120

Int. Cl.<sup>3</sup> H01R 43/04

U.S. Cl. 29—749

19 Claims



1. A tool for assembling a connector including a plurality of elements, the tool comprising:  
means for supporting connector elements during their assembly;  
means for applying a force to a particular element positioned in the supporting means;  
means for mounting the force applying means for reciprocal movement between a first and second position; the mounting means including:  
first and second chambers with a passageway therebetween; fluid contained within the first and second chambers and the passageway;  
means responsive to the movement of the force applying means for transferring fluid from one chamber to another; and  
means for blocking the flow of fluid between the chambers to hold the force applying means in a particular position.

4,422,236

#### METHOD OF EXTRUDING PARTS WITH CAPTURED FIXTURE

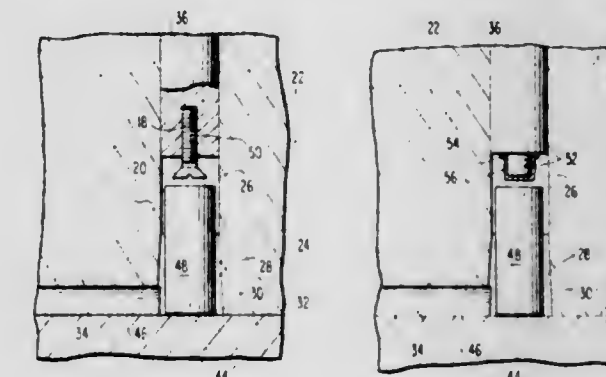
James K. Ware, Jr., and Edward O. Wolcott, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Oct. 1, 1981, Ser. No. 307,696

Int. Cl.<sup>3</sup> H01R 43/00

U.S. Cl. 29—876

1 Claim



1. A method of extruding a lead or lead alloy battery terminal of essentially pore-free material in which is captured a fixture comprised of a material harder than said lead or lead alloy, said fixture extending away from said battery terminal, said battery terminal having an essentially cylindrical boss and a radially extending arm element protruding from said boss, said method comprising:

providing a first die element having a rigid body with a cavity having the desired final geometry of said battery terminal cylindrical boss and a first bore extending from said cavity, said first die element further comprising a passage extending radially from said bore and having a geometry corresponding to the desired external geometry of said radially extending arm element;  
providing a second die element disposed in contact with said first die element and defining therewith at least a portion of said cavity and a portion of said passage;  
positioning within said first bore a third die element for axial movement therewithin and having an essentially cylindrical external geometry corresponding to the geometry of said first bore;  
affixing said fixture of harder material to the end of the third die element facing toward said cavity;  
positioning within said cavity a billet of material comprised substantially of lead, said material having a first porosity; forcing said third die element and said fixture into contact with said billet thereby causing said material to extrude around said fixture affixed to said third die element to frictionally capture the fixture within said cylindrical boss and further causing said billet to extrude into said cavity to form said cylindrical boss, said forcing step further causing said billet to extrude into said passageway to form said radially extending arm element;  
densifying said material of said first porosity by said forcing step sufficiently so as to provide a second porosity less than said first porosity and thereby provide an essentially pore-free battery terminal;  
separating said first and second die element;  
ejecting said terminal and said fixture from said cavity; and detaching said fixture from said third die element.

4,422,237

#### RAZOR HANDLE

Robert A. Trotta, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 25, 1982, Ser. No. 352,146

Int. Cl.<sup>3</sup> B26B 21/14

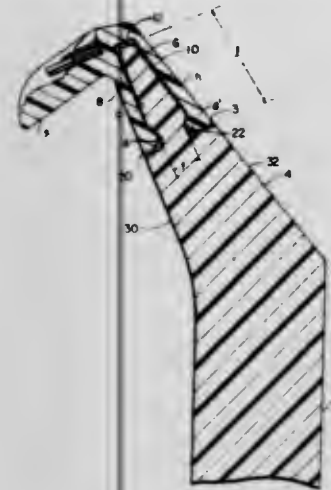
U.S. Cl. 30—85

1 Claim

1. A razor handle comprising an elongated grip portion, a neck portion extending from one end of said grip portion, and



a protrusion extending from an end of said neck portion remote from said grip portion, said protrusion having first and second major surfaces extending from a free end of the protrusion at which said surfaces are closest to each other, to a base portion of said protrusion at which said surfaces are farthest apart from each other, substantially wedge-shaped end walls interconnecting said surfaces along side edges of said surfaces, first and second lesser surfaces extending inwardly from said base por-



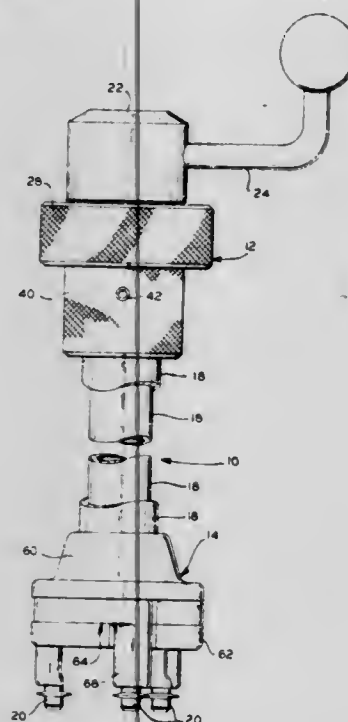
tion and toward said end of said neck portion, a connecting web extending from said first and second lesser surfaces of said protrusion to said end of said neck portion, said connecting web being of lesser thickness than said protrusion base portion, whereby to provide recess means defined by said end of said neck portion and said protrusion web and said first and second lesser surfaces, said protrusion being in substantial alignment with said neck portion, and said grip portion, neck portion, web and protrusion being a unitary member.

4,422,238

**SHOCK ABSORBER SHROUD CUTTING TOOL**

Kenneth D. Kloster, 6649 Mill Ridge Rd., Maumee, Ohio 43537  
Filed Oct. 26, 1981, Ser. No. 314,706  
Int. Cl.<sup>3</sup> B23D 21/08; B26D 3/16  
U.S. Cl. 30—101

10 Claims



1. A tool for severing a cylindrical body comprising: an elongate support member having a longitudinal axis; cutting means mounted on one end of said support member and having at least one cutting element adapted to engage the outer wall of the cylindrical body, said cutting element being movable toward and away from the longitudinal axis of said support member, said cutting means including

a lower support surface defining a cylindrical body engaging portion for supporting said cutting means on one end of the cylindrical body, said cutting element being positioned a predetermined distance below the lower support surface for severing the cylindrical body a predetermined distance from the one end of the body; and

control means mounted on the opposite end of said support member and coupled to said cutting means for selectively moving said cutting element toward and away from the longitudinal axis of said support member, said control means including means for revolving said cutting element about the longitudinal axis of said support member while simultaneously moving said cutting element toward the longitudinal axis whereby said cutting element is moved into engagement with the outer wall of the cylindrical body.

4,422,239

**POWERED HANDTOOL**

Peter Maier, Gerokstr. 1, 7311 Neidlingen/Teck, and Hans-Dieter Tschacher, Hohenzollernstr. 4, 7313 Reichenbach, both of Fed. Rep. of Germany

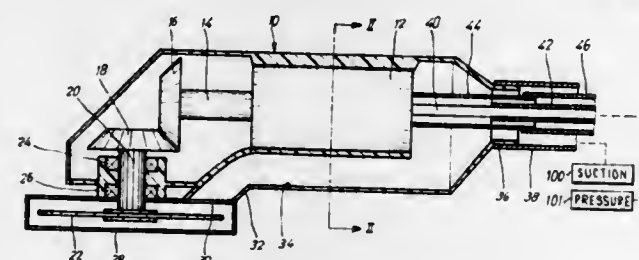
Filed Oct. 1, 1981, Ser. No. 307,457

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038489

Int. Cl.<sup>3</sup> B26B 25/00

U.S. Cl. 30—124

5 Claims



1. In a hand tool which includes a housing having a handle part which can be manually gripped, a tool rotatably supported on said housing, a motor provided in said housing, means for releasably drivingly connecting said motor to said tool, a protective hood which is supported on said housing and partially surrounds said tool, means defining a suction channel which communicates with said protective hood and with a connecting piece which is provided on said housing at a location remote from said tool, and a suction device having a hose which leads to and is releasably secured to said connecting piece and communicates with said suction channel, said handle part being elongate and said suction channel extending appropriately parallel to said handle part, the improvement comprising wherein said motor is provided in said handle part of said housing and, viewing said handle part in cross section, is arranged eccentrically in said handle part, and wherein said suction channel is provided within said handle part and extends past said motor on one side thereof.

4,422,240

**CUTTING IMPLEMENTS**

Edward M. Wallace, Longmeadow; Robert G. Gosselin, Springfield, and Ernest D. Labarre, Holyoke, all of Mass., assignors to Wallace Mfg. Corp., Enfield, Conn.

Filed Mar. 18, 1982, Ser. No. 359,244

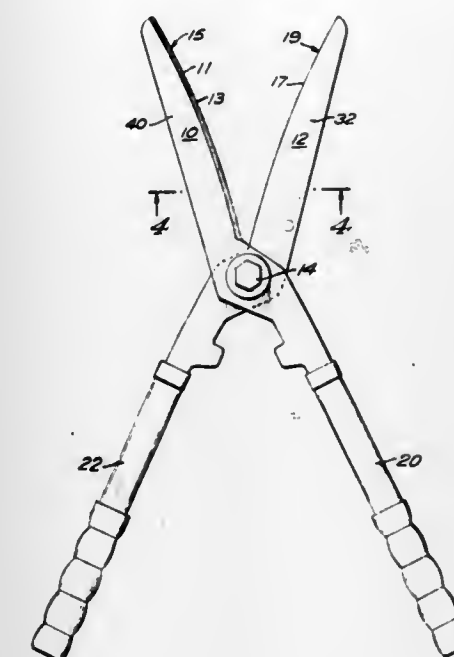
Int. Cl.<sup>3</sup> B26B 13/06

U.S. Cl. 30—254

9 Claims

1. A cutting device comprising in combination: a first elongate blade having a generally convex work-engaging-edge for engaging the work to be cut and an elongate handle portion, a second elongate blade having a generally convex work-engaging-edge for engaging the work to be cut and an elongate handle portion,

a pivot means for pivotally linking together the first and second blades whereby the work-engaging edges of the blades oppose one another in facing relationship and in swinging in the closing stroke toward each other define an included angle,



the defined included angle between the work-engaging edges of the blades at any point of their intersection from the initiation to the termination of the closing stroke being a constant value,

the work-engaging-edges having bevels with the totality of the included angles of the edges being in the order of at least 80° and not in excess of 120°.

4,422,241

**MARK LOCATOR AND METHOD OF USING SAME**

David M. Meeker, Saratoga, Calif., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 116,908, Jan. 30, 1980, abandoned. This application May 18, 1982, Ser. No. 379,492

Int. Cl.<sup>3</sup> G01B 5/14

U.S. Cl. 33—1 BB

1 Claim



1. A mark locator having indicia thereon for verifying conformity of markings of a mail article as being within the limits of postal specifications, said markings comprising a series of parallel lines of predetermined width, length and spacing, comprising:

a single rectangular transparent plate having opposed top and bottom edges and opposed side edges and having an upper and a lower surface, said upper and lower surfaces being parallel and planar;

first and second planar, perpendicularly oriented edge surfaces comprising rectangular bar members fixed to the lower surface of said plate adjacent and parallel to two adjacent edges of said plate and lying in first and second

planes, respectively, substantially perpendicular to a plane containing said lower surface; and

indicia provided on said plate at predetermined locations defining an area relative to said first and second edge surfaces, said plate having coextensive first and second dimension lines of predetermined lengths parallel to said first edge surface and perpendicular to said second edge surface, said plate having a third dimension line of predetermined length parallel to said second edge surface and perpendicular to said first edge surface, said third dimension line extending from said first edge surface for a predetermined length and being in perpendicular relationship to said coextensive first and second dimension lines, said first dimension line extending from said second edge surface for a predetermined length to a point where the said second dimension line starts, said indicia comprising a replica of said markings, said replica being located in an area defined by said first edge surface, the length of said second dimension line and the length of said third dimension line, said plate having a pair of lines which overlie said first and second edge surfaces to define the position thereof.

4,422,242

**THROTTLE VALVE LINKAGE ADJUSTMENT GAUGE AND METHOD THEREFOR**

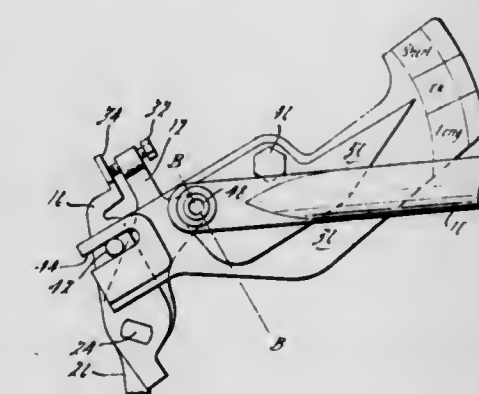
Raymond Stocker, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 30, 1981, Ser. No. 249,578

Int. Cl.<sup>3</sup> G01B 5/00, 5/25

U.S. Cl. 33—181 AT

5 Claims



1. A gauge for adjusting the position of a first attachment on a first member with respect to a second attachment on a second member comprising:

a gauge plate carrying a pivot and having a first joint adapted to connect the plate to the first attachment, means to position and support the gauge plate with respect to a pin providing a surface on which the gauge plate can move with respect to said pin, and markings on the surface of the gauge plate spaced radially from the pivot defining angular ranges about the pivot; and

a pointer rotatably connected to the gauge plate at the pivot having an indicator arm extending radially from the pivot and having a second joint thereon spaced radially from the pivot adapted to connect the pointer to the second attachment whereby the indicator arm points to the angular range markings according to the angular position of the second joint about the pivot.



4,422,243

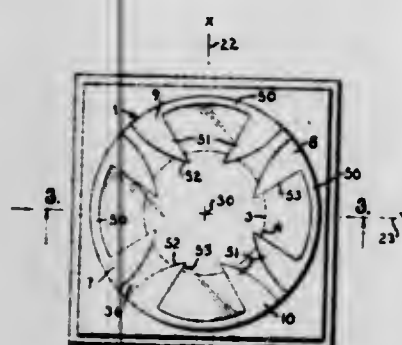
**DUAL AXIS CAPACITIVE INCLINATION SENSOR**  
Amber N. Brunson; Deighton E. Brunson, both of Independence,  
and Walter W. Ray, Jr., Kansas City, all of Mo., assignors to  
Brunson Instrument Co., Kansas City, Mo.

Filed May 24, 1982, Ser. No. 381,010

Int. Cl.<sup>3</sup> G01C 9/06

U.S. Cl. 33—366

15 Claims



5. A capacitive inclination sensing vial for varying capacitance in proportion to the inclination thereof and comprising:
- a vessel for containing a fluid, said vessel having associated therewith a horizontal axis about which inclination of said vial is to be sensed and a vial axis intersecting said inclination axis and perpendicular thereto, said vial axis being vertical when said vial is placed on a horizontal surface;
  - a dielectric fluid contained and movable within said vessel;
  - a common capacitor plate positioned on said vessel on one side of said fluid;
  - an axis capacitor plate positioned on said vessel on an opposite side of said fluid from said common plate and defining a capacitor in cooperation with said common plate, the position of said fluid in relation to said axis plate and said common plate changing in response to the inclination of said vial about said inclination axis thereby changing the capacitance of said capacitor in proportion to the angle of said inclination; and
  - said axis plate having a shape defined by:
    - a web portion spaced from said vial axis and extending in a direction which is generally parallel to said inclination axis; and
    - a pair of end portions connected at opposite ends of said web portion and extending generally toward said vial axis.

4,422,244

**ELEVATION INDICATOR**

Louis Gauthier, 115 Manning St., Hudson, Mass. 01749

Filed Dec. 4, 1981, Ser. No. 327,607

Int. Cl.<sup>3</sup> G01C 5/04

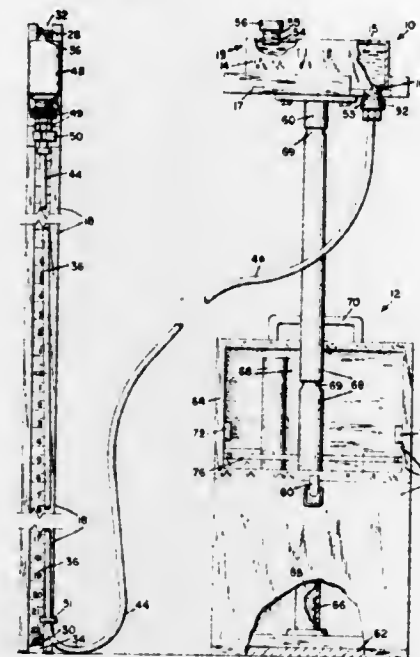
U.S. Cl. 33—367

8 Claims

1. Elevation indicator, comprising:
- a supporting base,
  - a reservoir for holding a quantity of liquid and supported on the base, said reservoir having a bottom opening,
  - an elongated staff,
  - an elongated scale mounted on the staff for longitudinal movement relative to the staff,
  - a transparent tube mounted on the staff and extending along one side of the staff adjacent the scale,
  - a flexible tube operatively connecting the bottom opening of the reservoir to the bottom of the transparent tube, so that liquid can flow from the reservoir to the transparent tube,
  - a check valve comprising:
    - a housing having a top opening and a bottom opening

which is operatively connected to the top of the transparent tube,

- a partition between said top and bottom openings for dividing said housing into an upper chamber and a lower chamber, said partition having an opening extending between said chambers and a valve seat facing said lower chamber, and



- a ball located in said lower chamber between said bottom opening and the valve seat, said ball being capable of floating in the liquid which is in the reservoir so that when said lower chamber is filled with said liquid, the ball will rise into sealing engagement with the valve seat.

4,422,245

**TRIPOD OPEN THROAT T-SQUARE AND DRAFTING BOARD**

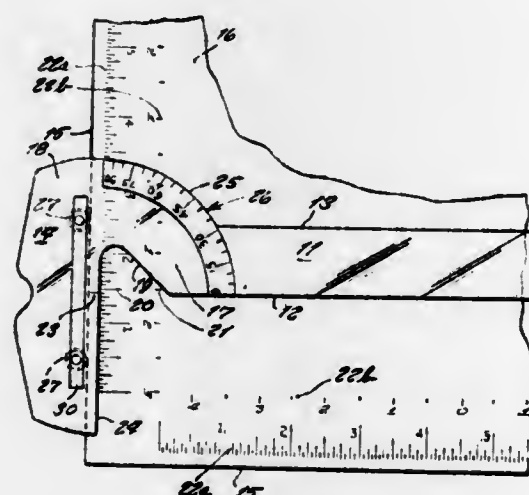
Saul Schiller, 1709 Ave. I, Brooklyn, N.Y. 11230

Continuation-in-part of Ser. No. 28,198, Apr. 9, 1979, abandoned. This application May 14, 1980, Ser. No. 149,711

Int. Cl.<sup>3</sup> B43L 13/02

U.S. Cl. 33—403

4 Claims



1. A scribing T-square comprising a blade having a straight edge along a first longitudinal axis of the blade, and a helve head unitary and rigidly connected with a proximal end of the blade, said helve head having a second longitudinal axis extending substantially at a right angle to said straight edge, and three spaced-apart rollers mounted in triangular relationship to one-another on said helve head at different locations of which each roller at least two locations relative to each other are substantially aligned along said second longitudinal axis and of which at least two locations relative to each other are sub-

stantially aligned in a direction substantially transverse to each of said first and second longitudinal axes such that a tripod support arrangement of the three spaced-apart rollers is formed, the three spaced-apart rollers being mounted on axes extending at substantially right angles to said first and second longitudinal axes such that support by said tri-pod support arrangement of rollers is preventative of wobbling of said helve head and said blade relative to a scribing board's upper surface during use of the scribing T-square when said three spaced-apart rollers are positioned on a first upright edge of a scribing board.

4,422,246

**PROCESS FOR FEEDING SLURRY-PRESSURIZED AND SOLVENT-DEWATERED COAL INTO A PRESSURIZED ZONE**

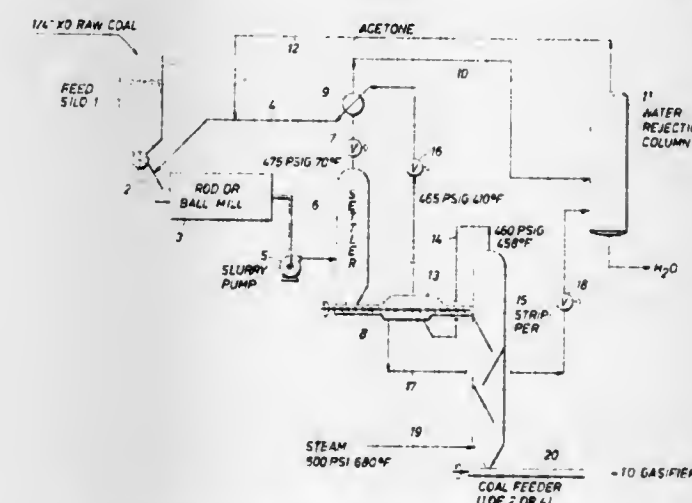
Donald E. Hardesty, Brookshire, and Glenn R. McCullough, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 15, 1982, Ser. No. 358,168

Int. Cl.<sup>3</sup> F26B 3/00, 7/00

U.S. Cl. 34—9

5 Claims



1. A process for feeding substantially dry coal fines into a pressurized zone comprising:
- mixing moist coal fines with enough water-miscible, volatile, organic solvent containing from 1 to 4 carbon atoms to form a pumpable slurry of coal fines in water-containing liquid organic solvent;
  - pumping the slurry into a settling container, in which the solids are free to sink while the liquid rises, at a pressure exceeding the pressure in said pressurized zone;
  - separating organic solvent from the liquid which rises in said settling container and flowing the separated organic solvent into contact with said moist coal fines;
  - displacing the coal fines which sink in said settling container into heat exchange relationship with at least one hot pressurized gas which evaporates at least a significant portion of the water and organic solvent from the coal fines at a pressure exceeding the pressure in said pressurized zone to be fed; and
  - displacing the resulting pressurized and relatively dry coal fines into the pressurized zone to be fed.

4,422,247

**LOW VOLTAGE SENSOR FOR A DRYER**

Clifford L. Deschaaf, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 29, 1981, Ser. No. 278,869

Int. Cl.<sup>3</sup> F26B 21/10

U.S. Cl. 34—48

9 Claims

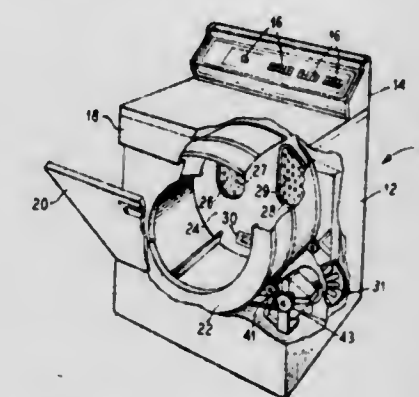
1. A control circuit for a dryer comprising:
- a source of timing pulses;
  - a resettable counter arranged to be incremented in accordance with said timing pulses;
  - moisture sensing means operative to sense the moisture

content of the clothes load and reset said counter at a rate proportional to the sensed moisture content;

a moisture sensing means comprising

a conductivity sensor arranged to contact the fabric load and a microcomputer input/output port means for charging a capacitance means;

said capacitance means arranged to discharge through said conductivity sensor;



said port means arranged to selectively read the charged value of said capacitance means and reset said counter if said charged value is less than a predetermined value; and

control logic means for terminating the drying operation upon accumulation of a preselected count in said resettable counter.

4,422,248

**SYSTEM FOR KEEPING THE FOOT AND THE LEG IN POSITION**

Jean R. Bataille, and Nicole J. J. Charollais Bataille, both of 20, rue du Commandant René Mouchotte, Paris, France

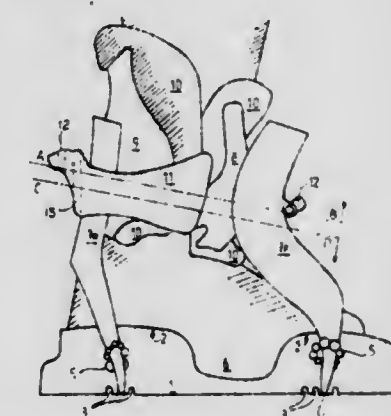
Filed Sep. 4, 1980, Ser. No. 184,083

Claims priority, application France, Sep. 12, 1979, 79 22838; Aug. 19, 1980, 80 18134

Int. Cl.<sup>3</sup> A43B 5/04

U.S. Cl. 36—121

13 Claims



1. A system for maintaining the foot and the leg in position, comprising two independent stirrups of unitary construction, each stirrup passing under and within a transverse groove of a rigid sole, one stirrup toward the front and one at the back of the foot, the lateral borders of the sole being raised along the edges of the foot, said stirrups cooperating respectively with a fore support assembly and a rear support assembly located on either side of the ankle.



4,422,249

**KICKING APPARATUS**

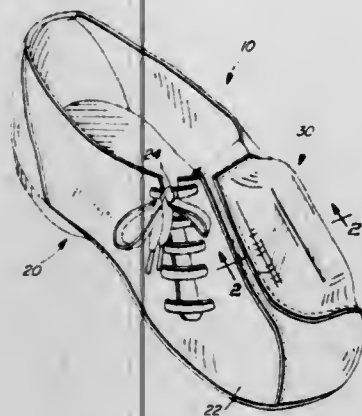
William M. Hannah, 4011 W. Camelback, Apt. J-10, Phoenix, Ariz. 85019

Filed Mar. 16, 1981, Ser. No. 243,794

Int. Cl.<sup>3</sup> A43B 5/00

U.S. Cl. 36—133

9 Claims



1. A soccer-style place kick type of kicking apparatus, comprising:
- cover means for permitting a releasable attachment to a foot of a kicker; and
  - pad means coupled to said cover means having at least a defined elongated, planar football striking portion located substantially parallel to and surface overlying the inside instep portion of said foot for providing a regular striking surface with which to impact a place kicked football so that the control over the flight of the football can be improved.

4,422,250

**EMBROIDERY HOOP**

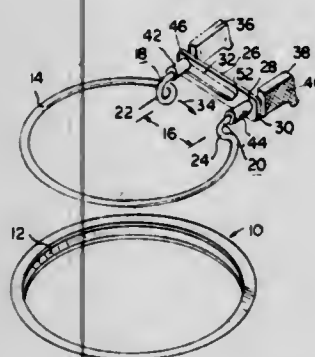
Dan Golan, 165 W. 66 St., New York, N.Y. 10023

Filed Jul. 12, 1982, Ser. No. 397,600

Int. Cl.<sup>3</sup> D05C 1/04; D06C 3/08

U.S. Cl. 38—102.2

10 Claims



1. A spring-type embroidery hoop or knitting ring comprising:
- (a) an outer, circular, continuous, annular ring, said outer ring having an inner perimetral groove or the like in its inner surface;
  - (b) an inner circular ring, said inner ring having a gap and being composed of a springy material, so that said inner ring is resiliently deformable to a smaller generally circular shape than said outer ring, said inner ring being concentrically disposed within said outer ring, so that said inner ring nests in said groove;
  - (c) two spaced-apart fingers, each of said fingers extending generally radially outwards from said inner ring at one end of said gap; and
  - (d) restraining means comprising a clip member, said means extending between said fingers to curtail and prevent excessive lateral displacement of said two fingers away from each other beyond and greater than a fixed spacing distance upon removal of the outer ring from the inner

ring, while permitting lateral movement and displacement of said two fingers towards each other, so that squeezing manipulation of said two fingers causes said two fingers to be spaced from each other a distance less than said fixed spacing distance, while concomitantly reducing the circumferential dimension of said inner ring, so that said inner ring may be moved in or out of said groove.

4,422,251

**APPARATUS FOR QUILTING**

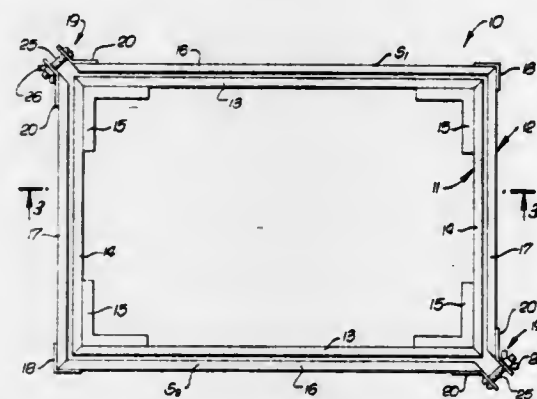
Virginia L. Hedrick, 1027 E. Francis St., Corona, Calif. 91720

Filed Apr. 16, 1979, Ser. No. 30,316

Int. Cl.<sup>3</sup> D05C 1/04

U.S. Cl. 38—102.2

3 Claims



1. In a quilting matrix supporting apparatus, the combination of:
- an inner rigid horizontal rectangular matrix-supporting frame;
  - an outer rectangular frame snugly fitting around said inner frame in co-planar relationship therewith, said outer frame being divided approximately along one of its diagonals into two right-angle-forming sections, each section embodying two contiguous rigidly united members of said outer frame; and
  - manually operable clamp means located at the apices of said diagonal of said outer frame to expansibly and contractibly unite the contingent pairs of ends of said two sections into which said outer frame is divided.

4,422,252

**DATA STORAGE CARDS AND METHOD OF HANDLING THEREOF**

Anthony J. Wicks, Baughurst, Nr. Basingstoke, England, assignor to Wicks and Wilson Limited, Basingstoke, England

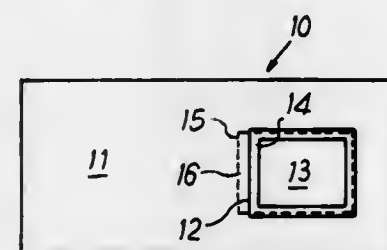
Filed Apr. 28, 1981, Ser. No. 258,292

Claims priority, application United Kingdom, Feb. 18, 1981, 8105088

Int. Cl.<sup>3</sup> A47G 1/06

U.S. Cl. 40—159

12 Claims



1. In a data storage card having an aperture for receiving a photographic image, said aperture having at least in part an adhesive border, and including a disposable sheet which protects said adhesive border and which is mounted on said border but has release characteristics in relation thereto, characterized in that at one or more sides of said aperture said sheet extends

4,422,253

**MULTIPLE SEGMENTED DISPLAY DEVICE**

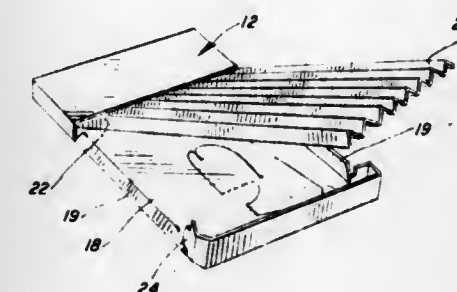
Marion G. Babberl, San Mateo, Calif., assignor to Rapid Mounting &amp; Finishing Company, Chicago, Ill.

Filed Sep. 7, 1982, Ser. No. 414,969

Int. Cl.<sup>3</sup> G09F 19/14

U.S. Cl. 40—453

19 Claims



1. A display device comprising:
- a pleated sheet having a plurality of parallel folds defining corrugated front and rear surfaces, the pleated folded sheet defining opposite ends and opposite sides; and
  - a carrier defining a first end pocket for receiving one end of the pleated sheet, an opposite second end pocket for receiving the opposite end of the pleated sheet, and stop wall means at opposite sides thereof abutting by opposite side portions of the pleated sheet for limiting lateral expansion of the pleated sheet, the spacing between said stop wall means being preselected to maintain the folds of the pleated sheet at suitable angles to have a height substantially equal to the depth of said pockets for snug reception therein, said carrier being constructed to expose at least one of said corrugated surfaces for forming a pair of segmented displays thereon.

4,422,254

**SAFETY MECHANISM FOR FIREARMS**

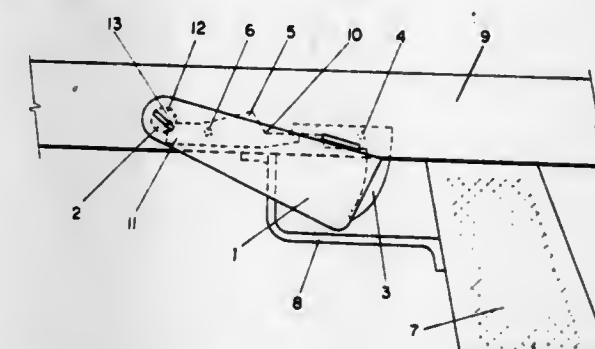
Sidney J. McQueen, 414 Coors Blvd. SW., Albuquerque, N. Mex. 87105

Filed Feb. 8, 1982, Ser. No. 346,635

Int. Cl.<sup>3</sup> F41C 17/00

U.S. Cl. 42—1 Y

3 Claims



1. A safety mechanism for firearms having a pivoting sear, said sear being forward of a trigger, said safety mechanism comprising:
- a safety shaft having a safety flat, said safety shaft being rotatably installed through safety holes in side plates of the firearm, said safety holes being adjacent to a safety end of the sear; and said safety shaft having on each end an ear, said ear being essentially flat, and the plane of each ear being perpendicular to the plane of the safety flat; and
  - a safety channel having a back and two runners, a mounting end and a free end, and said safety channel having horizontal slots in the runners at the mounting end, said horizontal slots being sized to mate with the ears, and said

safety channel having a trigger clearance slot in its back, and said safety channel having finger tabs on the runners at the free end to permit one-motion-movement of the safety channel and insertion of a trigger finger to the trigger, and said runners having a design and shape so that they will block access to the trigger; and wherein the safety channel is mated to the safety shaft so that when the mechanism is in the safe position, the safety flat blocks movement of the sear.

4,422,255

**MATCHLOCK CONVERTOR**

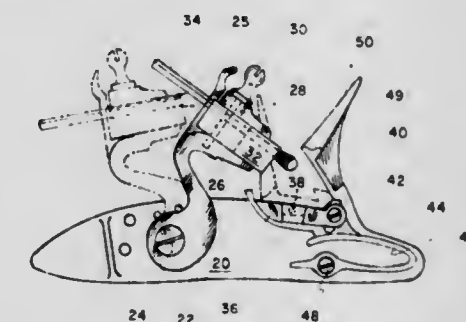
Michael L. Lapp, Box 221, Jerome, Pa. 15937

Filed Mar. 29, 1982, Ser. No. 363,060

Int. Cl.<sup>3</sup> F41C 11/02

U.S. Cl. 42—69 R

1 Claim



1. In a firing mechanism for a flintlock rifle wherein an igniting means is carried within upper and lower jaws of a hammer, said jaws being tightened by a screw, and upon triggered release of the hammer the igniting means snaps forward and strikes an upstanding frizzen disposed above a flashpan thereby igniting flashpowder within said pan, the improvement comprising:

Said igniting means being a matchlock convertor which comprises:

- Upper and lower surfaces parallel to each other and to the jaws of the hammer;
- a cut-out for the screw to pass through;
- and angled holes passing through the convertor converging toward the end of the convertor nearest the frizzen, through which holes pyrophoric friction matches extend with their heads in contact with each other thereby increasing the likelihood of ignition upon firing.

4,422,256

**ADJUSTABLE CHEEK-PIECE FOR A SHOULDER FIREARM**

Hans Maucher, Elchingen; Georg Zanner, Langenau, and Otto Repa, Oberndorf, all of Fed. Rep. of Germany, assignors to Carl Walther GmbH, Ulm, Fed. Rep. of Germany

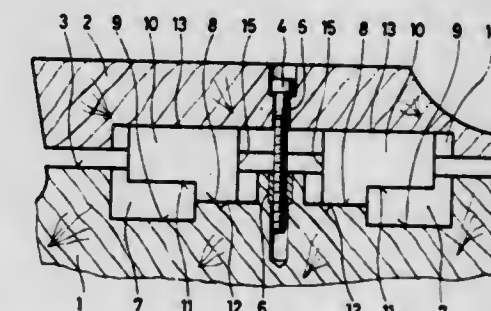
Filed Jun. 11, 1982, Ser. No. 387,660

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129182

Int. Cl.<sup>3</sup> F41C 23/00

U.S. Cl. 42—73

11 Claims



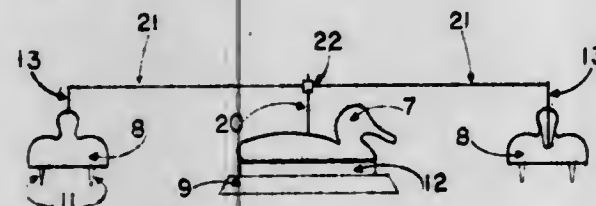
1. In a shoulder firearm, a cheek-piece adjustable with respect to a gunstock, and at least one spacer member position.



able between a portion of said gunstock and said cheek-piece, said spacer member having a plurality of pairs of opposed parallel surfaces and the distances between each pair of parallel surfaces being different, each of said pairs of surfaces being positionable between the cheek-piece and the portion of the gunstock such that the distance between the cheek-piece and the gunstock can be varied to correspond to the distance between the pair of surfaces interposed between the gunstock and cheek-piece.

**4,422,257**  
**CARROUSEL WILDFOWL DECOY**  
Roy E. McCrory, 4044 Bishops Bridge Rd., Memphis, Tenn. 38118

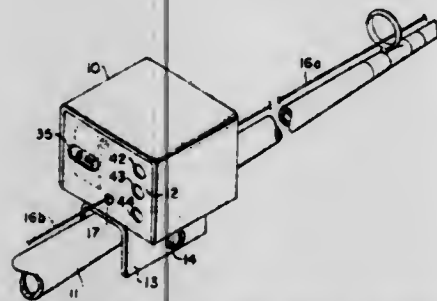
Filed Dec. 21, 1981, Ser. No. 333,015  
Int. Cl.<sup>3</sup> A01M 31/06  
U.S. Cl. 43-3



1. A carousel wildfowl decoy comprising an array of auxiliary wildfowl decoy elements of hollow body construction, formed in the image of a duck, goose, or other wildfowl and, by suspension means, operatively connected to each other, also featuring as an element of the decoy a control decoy element similarly imaged, housing therein an electric circuit, said circuit including a battery and a motor, and means attached to said battery and motor for operatively connecting and pulling the array of auxiliary decoy elements to revolve around the control decoy element.

**4,422,258**  
**SIGNALLING DEVICE AND MEASUREMENT OF PULL ON A FISHING LINE**  
Billy R. Adams, P.O. Box 2526, Jacksonville, Fla. 32203, and William C. Burchett, 843 Bellefonte Princess Rd., Ashland, Ky. 41101

Filed Mar. 24, 1982, Ser. No. 361,237  
Int. Cl.<sup>3</sup> A01K 97/12  
U.S. Cl. 43-17



1. A signalling device for use with a fishing rod and activated by a fishing line comprising  
a compartment for the signalling device,  
entering and exit passages to said compartment allowing a fishing line to pass through said passages and said compartment,  
a switching means in said compartment to signal the amount of pull on the fishing line including  
movable means moved by the fishing line a distance determined by the intensity of the force of the pull on the fishing line,  
opposing means to exert a force to oppose the force of the fishing line on said movable means,  
a plurality of contact means extending in the path of said

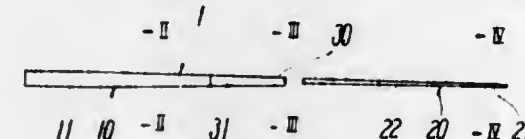
movable means to close an electrical circuit when establishing contact with said movable means,  
a plurality of lamps, each of said lamps in a circuit with one of said contact means,  
a source of power for said lamps,  
and means to extinguish one of said lamps when another of said lamps is lit.

**4,422,259**  
**ELLIPTICAL SHAPED STREAMLINED FISHING ROD**

Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

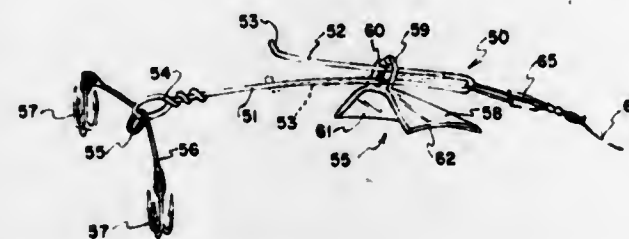
Filed Apr. 7, 1981, Ser. No. 251,762  
Claims priority, application Japan, Apr. 25, 1980, 55-57604[U]; Nov. 27, 1980, 55-170731[U]; Nov. 27, 1980, 55-170732[U]

Int. Cl.<sup>3</sup> A01K 87/00  
U.S. Cl. 43-18.1



1. A fishing rod comprising first, second and third rods, said first rod being provided with a grip and tapering toward a fore end, said third rod interconnecting said first and second rods, said second rod being provided with a tip and a connection portion connected to the fore end of said third rod and tapering toward said tip, said first and third rods each having an ellipse-like cross-sectional shape which includes a major axis and a minor axis, a ratio of the major axis to the minor axis of said third rod being larger than that of said first rod; said tip at said second rod having a round-like cross-sectional shape; and said connecting portion having a cross-sectional shape which changes in cross section from an ellipse-like shape at a portion adjacent said third rod to a round-like shape.

**4,422,260**  
**BAIT HOLDER**  
James D. Perrick, 9757 Copplestone Cir., Sandy, Utah 84092  
Filed Sep. 14, 1981, Ser. No. 301,737  
Int. Cl.<sup>3</sup> A01K 83/02, 83/04, 83/06  
U.S. Cl. 43-44.8



1. A bait holder comprising  
a support frame having a pair of joined legs, at least one of said legs being movable into close side-by-side relationship with the other of said legs and being resiliently movable away from said side-by-side relationship;  
a control member having a water reaction portion and a tab projecting from said water reaction portion, said tab having an elongate slot therethrough whereby said tab will slide over the legs at the joined ends thereof and will be held on said legs by movement of one leg away from the other leg; and  
a fish hook carried by at least one leg at the end of said legs opposite the joined ends thereof.

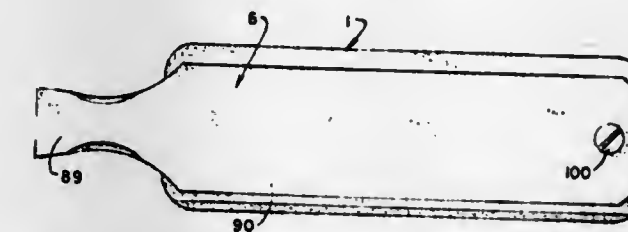
**4,422,261**  
**TOY CAPABLE OF PIVOTAL MOVEMENT ON A SUPPORT SURFACE**  
Michihiro Kozuka, and Masayuki Tonokura, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan  
Filed Jun. 30, 1982, Ser. No. 393,883  
Int. Cl.<sup>3</sup> A63H 11/10

U.S. Cl. 46-104



1. A toy which comprises:  
an articulated body divided into a lower body section and an upper body section, said body having a front, left and right sides, and a back, said upper body section pivotable from side to side with respect to said lower body section about a longitudinal axis passing through said front and said back of said body;  
motor means located in said body;  
wheel means located in said lower body section and operatively connected to and driven by said motor means to propel said toy across a support surface;  
moving means operatively associated with said motor means and capable of pivoting said upper body section from side to side with respect to said lower body section about said longitudinal axis in response to movement imparted to said moving means by said motor means;  
left and right upper body extension means extending from said upper body section toward said support surface and movable in combination with said upper body section in response to pivoting of said upper body section, said left upper body extension means contacting said support surface and said right upper body extension means lifting free from said support surface as said upper body section pivots to the left side and said right upper body extension means contacting said support surface and said left upper body extension means lifting free from said support surface as said upper body section pivots to the right side;  
said toy pivoting about said left side upper body extension means when it contacts said surface as said wheel means propels said toy on said support surface and said toy pivoting about said right side upper body extension means when it contacts said support surface as said wheel means propels said toy on said support surface.

**4,422,262**  
**GAME CALL HAVING BLADES OF DIFFERING HEIGHT**  
Robert R. Moss, Rte. 2, Cole Camp, Mo. 65325  
Filed Apr. 1, 1982, Ser. No. 364,441  
Int. Cl.<sup>3</sup> A63H 5/00  
U.S. Cl. 46-189



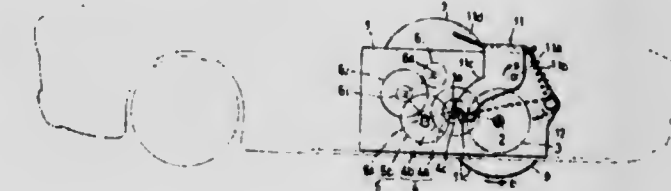
1. In a game call of the striker and blade type including a base, the improvement comprising a a paddle-type striker attached to said base, said striker being pivotally mounted at one end and having a convex undersurface, a plurality of

blades attached to said base, side by side but spaced from one another and extending generally in a common direction away from the pivot end of said striker, a first one of said blades being taller than a second, immediately adjacent blade, both of said blades being beveled in the same direction along their top edges, said edges being adapted to engage the convex undersurface of the striker sequentially as the striker is moved in one direction, but to remain at least momentarily in concurrent engagement therewith, said blades being constructed and arranged to produce sounds of different pitches.

**4,422,263**  
**GEAR CHANGING MECHANISM FOR TOY VEHICLE DRIVING DEVICES**

Hiroshi Masubuchi, Utsunomiya, Japan, assignor to Tonka Corporation, Hopkins, Minn.

Filed Sep. 14, 1978, Ser. No. 942,428  
Claims priority, application Japan, Oct. 14, 1977, 52-138565  
Int. Cl.<sup>3</sup> A63G 29/20; F03G 3/08; F16H 35/00  
U.S. Cl. 46-209



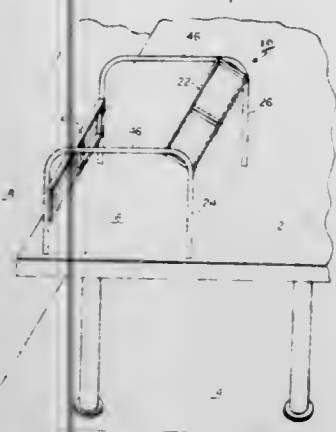
1. A toy vehicle power source including a flywheel secured on an axle; gear means interconnecting said flywheel to toy vehicle wheels, said gear means including a first gear path to interconnect said flywheel to wheels at one gear ratio when said vehicle is moved in one direction and a second gear path when said flywheel drives said wheels; and shifting means for changing said gear means from one path to the other path, said shifting means including an idler gear, said idler gear being shiftable from a position of non-engagement to a position of engagement in said first gear path, said idler gear being shiftable from a position of engagement to a position of non-engagement in said second gear path and said idler gear being shiftable from a position of engagement in said second gear path to a position of non-engagement, said shifting means further including a second idler gear, said second idler gear being engagable in said first gear path by the lifting action of said first-mentioned idler gear when said first idler gear is being driven.

**4,422,264**  
**SAFETY GATE ASSEMBLY**  
William S. Harris, Moravia, N.Y., assignor to Roly-Door Sales Company of Rochester, Inc., Rochester, N.Y.  
Filed Sep. 29, 1982, Ser. No. 428,170  
Int. Cl.<sup>3</sup> E05F 17/00  
U.S. Cl. 49-121

1. An assembly for controlling access to a pre-selected area comprising:  
first and second generally U-shaped tracks disposed on first and second sides of said pre-selected area;  
a first movable gate including means for engaging said tracks and for guiding said gate in said tracks between a raised and lowered position, said gate disposed generally on a third side of said pre-selected area;  
a second movable gate including means engaging said tracks and movable between a raised and lowered position and disposed generally on a fourth side of said pre-selected area; and  
means coupling said first and second gates for lowering said



first gate when said second gate is raised and vice versa for preventing said first and second gates from being raised



simultaneously, thereby controlling access to said pre-selected area.

4,422,265

**MULTISTATION GRINDING MACHINE**

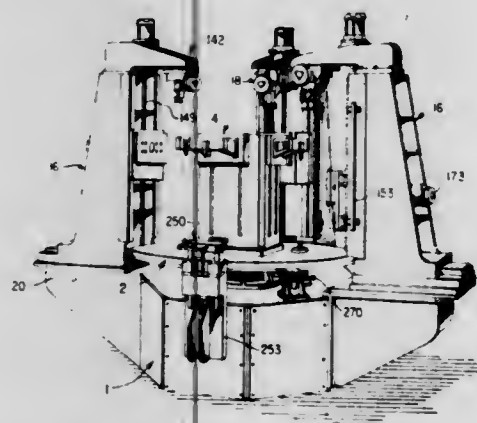
Keith Branston, Windsor, Canada, assignor to Jacobi-Branston Inc., Windsor, Canada

Filed Jun. 15, 1981, Ser. No. 273,779

Int. Cl.<sup>3</sup> B23F 19/05

U.S. Cl. 51—52 R

24 Claims



1. A multi-station grinding machine comprising a machine bed;

a worktable mounted on said machine bed to rotate thereon about a principal axis, said worktable comprising a plurality of workpiece holding means mounted thereon at equal angular intervals around said axis and uniformly spaced therefrom, each holding means defining parallel to said principal axis a support axis for a workpiece to be held therein;

a loading/unloading station and a plurality of work stations positioned around said bed, said stations being distributed about said principal axis at angular spacings corresponding to the angular intervals between said holding means, and each work station including machining means operative to effect material removal from a workpiece;

table index means operative between said table and said bed to effect angular indexing of said table about said principal axis through a series of registered positions in each of which one holding means has its support axis in precise register with said loading/unloading station and others of said holding means have their support axes in precise register with respective ones of said work stations, indexing of said table being effective to bring a workpiece successively into register with each of said work stations; brake means selectively operable to lock said table when in a registered position and to release said table for rotation between registered positions;

individual workpiece index means positioned in said machine bed at each said work station in a fixed location

radially of said principal axis and in axial alignment with a said holding means when the table is in a registered position, each said workpiece index means being independently operable to drive the associated holding means and effect predetermined incremental indexing rotation of a workpiece held therein to present preselected portions of the workpiece for engagement by the associated machining means; and

coupling means for forming a rigid rotary drive connection between each indexing means and the associated axially aligned holding means in the registered position of the table, said coupling means being selectively disengageable to permit rotation of the table between registered positions.

4,422,266

**BUILDING PANEL**

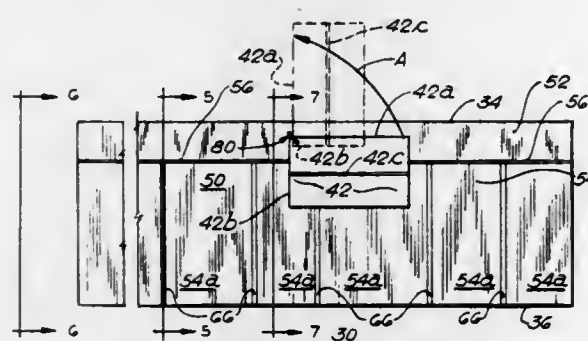
Donald H. Slocum, Villa Park, and James W. Eaton, Sleepy Hollow, both of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed May 3, 1982, Ser. No. 374,281

Int. Cl.<sup>3</sup> E04D 1/00

U.S. Cl. 52—58

14 Claims



1. A building panel having inner and outer faces outlined by opposite ends and by upper and lower edges, said opposite ends of said panel adapted to closely face the end of an adjacent panel in the same course, said outer face having a lower portion of substantially larger surface area adapted for exposure and an upper portion of relatively smaller surface area adapted to underlie a lower portion of one or more of said panels positioned in a next higher course; and

a flashing element mounted on said panel for pivotal movement between a first position wherein said element lies entirely within the outline of the panel bounded by said opposite ends and said edges and a second position wherein said element extends outwardly across said outline for flashing a joint between adjacent panels.

4,422,267

**GEODESIC DOME-TYPE BUILDING STRUCTURE**

Oliver D. Whitehouse, 9610 Frascatti Way, Santee, Calif. 92071

Filed Aug. 13, 1981, Ser. No. 292,609

Int. Cl.<sup>2</sup> E04B 1/32

U.S. Cl. 52—81

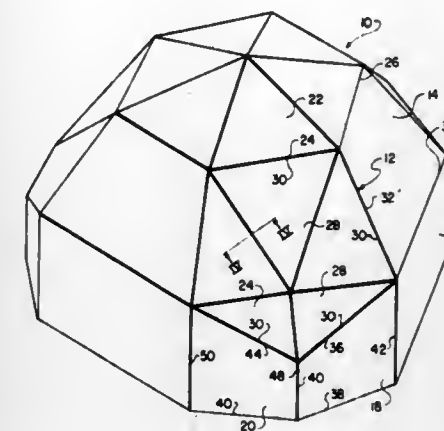
7 Claims

1. A self supporting modular building shell structure comprising:

a peripheral vertical wall structure defined by rectangular panels separated by pairs of irregular quadrilateral panels, the base of said peripheral vertical wall defining an irregular nonagon;

a generally dome shaped roof defined by a single central equilateral hexagonal unit surrounded by alternate equilateral pentagonal and equilateral trapezoidal units support on said peripheral wall structure, wherein each trapezoid

roof panel is supported on top of a rectangular wall panel, and



said pentagonal roof units are each supported on a pair of quadrilateral units.

4,422,268

**BARREL-VAULT ROOFING ELEMENT**

Dieter Mueller, Pfungstadt; Inge Löblg, Darmstadt, and Klaus Kerk, Griesheim, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

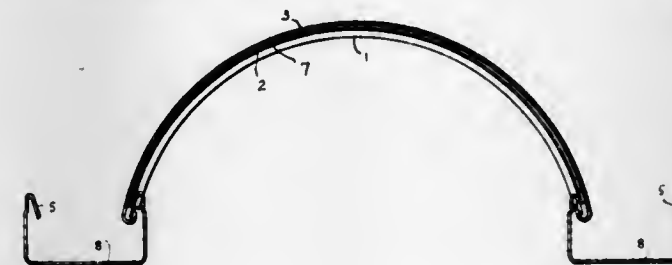
Filed Apr. 13, 1981, Ser. No. 253,798

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1980, 8010662[U]

Int. Cl.<sup>3</sup> E04B 1/32

U.S. Cl. 52—86

4 Claims



1. A roofing member comprising at least one arch-shaped carrying rib, a cylindrically curved plastic sheet resting on the carrying rib; at least one nonextensible strap spanning said plastic sheet and having opposed ends, at least one of which is releasably secured to said rib, said at least one end of the strap having a releasable catch thereon slidably engaged with a catch connected to said rib, said catches overlapping by a dimension T in the direction of strap length; and at least one strip of soft flexible material positioned between the plastic sheet and either said strap or said carrying rib, the thickness of said strip being selected such that the strip is compressed by at least one third of the dimension T when said catches are engaged and the ends of the strap are attached to the rib thereby to tension the strap and hold the plastic sheet on the rib.

4,422,269

**MASONRY PRODUCT**

Robert L. Giard, High Road, Gilbertville, Mass. 01031

Filed Apr. 17, 1981, Ser. No. 255,320

Int. Cl.<sup>2</sup> E04B 1/20

U.S. Cl. 52—100

10 Claims

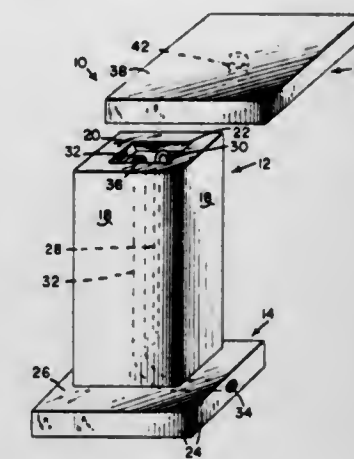
7. A masonry structure comprising:

(a) a concrete core which is rectangular in horizontal cross-section and having four surfaces, a flat horizontal top surface and a horizontal ledge extending about the lower periphery of said vertical surfaces,

(b) a vertical rib along each vertical corner of said vertical surfaces, that extends from the ledge to the top horizontal surface,

(c) a plurality of masonry elements supported on the ledge

and covering the ledge and vertical surfaces of the core between said ribs, and



(d) a flat horizontal cover that rests on the top surface and overlies the masonry elements.

4,422,270

**MODULAR, SELF SUPPORTING FLIGHT OF STAIRS**  
Leopold Lapointe, Val David, and Donat Pelletier, St-Philippe, both of Canada, assignors to G.R.S. International Inc., Montreal, Canada

Filed Jan. 19, 1982, Ser. No. 340,891

Claims priority, application Canada, Jan. 21, 1981, 369021

Int. Cl.<sup>2</sup> E04F 11/00

U.S. Cl. 52—182

15 Claims



1. A stringer unit for the fabrication of a modular, self-supporting flight of stairs, said unit comprising:

a vertical side plate provided with an horizontal, upper flange;

a vertical front plate defining a rectangular dihedron with the side plate, said front plate being also provided with an horizontal, upper flange defining together with the upper flange of the side plate, a rigid L-shaped support very stable in use for supporting one end of a step tread; and

a small fixation plate integrally extending the side plate in the same plane as, or in a plane parallel to, the plane of said side plate, said fixation plate being so positioned as to come into contact with the surface of the side plate of another, upper or lower stringer unit, the surface of the fixation plate and the surface of the side plate of the unit with which the fixation plate of a further, upper or lower stringer unit comes into contact, being each provided with at least one punched hole positioned in such a manner as to be in front of a corresponding hole punched in the same direction through the surface of the fixation plate or the surface of the side plate of said further upper or lower



stringer unit for allowing riveting or bolting of said further unit to said unit, said punching of the holes ensuring some kind of engagement of the holes one inside the other during the riveting or bolting step and thus an improved reinforcement of the flight against the vertical shearing forces.

4,422,271

**DOUBLE-WALLED MASONRY**

Hedwig Anzinger, Birkenstrasse 11, A-4600 Wels, Austria

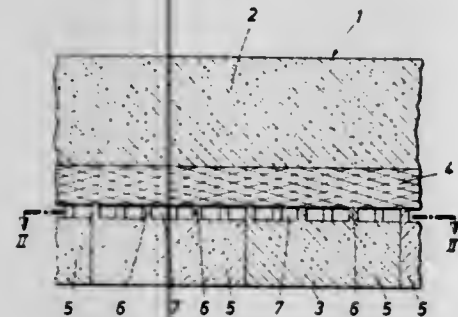
Filed Apr. 23, 1981, Ser. No. 256,789

Claims priority, application Austria, Apr. 25, 1980, 2228/80

Int. Cl.<sup>3</sup> E04B 1/74, 1/70

U.S. Cl. 52—302

3 Claims



1. Double-walled masonry comprising
  - (a) an inner supporting wall,
  - (b) an outer wall defining a free space with the inner wall, the outer wall being comprised of
    - (1) individual building blocks having perpendicularly extending ribs projecting into the free space and defining slots therebetween to constitute the free space, the ribs having an average width which is smaller than the average width of the slots, and
  - (c) an interior insulating layer between the inner supporting wall and the ribs, the ribs projecting to the insulating layer for holding the same in place and the slots permitting airing of the double-walled masonry.

4,422,272

**COSMETIC COVER FOR CHANNELLED TYPE GRID SYSTEMS**

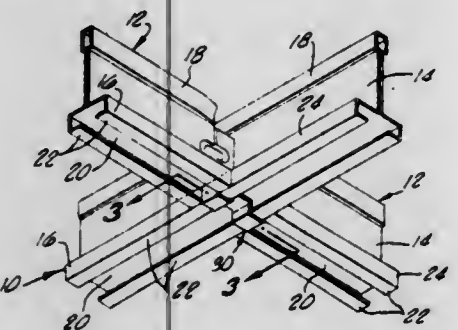
Ormond Sutter, Placentia, Calif., assignor to Lok Products Company, Fullerton, Calif.

Filed Dec. 4, 1980, Ser. No. 212,982

Int. Cl.<sup>3</sup> E04B 5/52

U.S. Cl. 52—311

2 Claims



1. A ceiling grid system comprising (a) a support member and (b) a pair of opposing transverse members intersecting with and abutting against the support member, the support member and transverse members each having a configuration comprising a vertical web and a lower support channel, each support channel comprising external vertical sidewalls and a downward facing groove having a downward facing interior wall of a first color, and downward facing flats on either side of the groove, the flats being of a second color, the first and second colors being different from each other, the grid system further comprising (c) means for connecting each transverse member to the support member, and (d) a resilient clip engaging the groove of the support member and covering the flats of the support member at the location the support member is intersected by the transverse members, the clip comprising two exterior upwardly extending arms and an interior upward projection, the interior upward projection being sized to resiliently fit into the groove of the support member, each arm being spaced apart from the interior upward projection a distance about equal to the width of the flats so that the arms slide over the side walls of the support member when the clip is in position, the downwardly facing surface of the clip being of the first color so that the appearance of the two opposing transverse members in combination with the clip is that of a single continuous member.

the groove of the support member and covering the flats of the support member at the location the support member is intersected by the transverse members, the clip comprising two exterior upwardly extending arms and an interior upward projection, the interior upward projection being sized to resiliently fit into the groove of the support member, each arm being spaced apart from the interior upward projection a distance about equal to the width of the flats so that the arms slide over the side walls of the support member when the clip is in position, the downwardly facing surface of the clip being of the first color so that the appearance of the two opposing transverse members in combination with the clip is that of a single continuous member.

4,422,273

**THERMAL INSULATING SYSTEM PARTICULARLY ADAPTED FOR BUILDING CONSTRUCTION**

Harrison G. Dyar, P.O. Box 185, Tampa, Fla. 33601

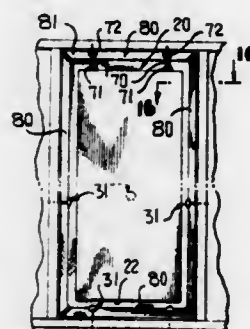
Division of Ser. No. 215,083, Dec. 10, 1980, Pat. No. 4,334,395.

This application May 3, 1982, Ser. No. 374,259

Int. Cl.<sup>3</sup> E04B 1/78

U.S. Cl. 52—407

6 Claims



1. A system for insulating building walls, ceilings, floors or like structure comprising wall means for forming a hollow insulating panel defining an interior chamber under negative pressure, means contacting a limited exterior surface area of said panel for supporting said panel in generally spaced relationship from an associated building wall, ceiling, floor or like structure, means normally spaced from the exterior surface of said panel for contacting a limited exterior surface area of said panel only upon said first-mentioned contacting means becoming inoperative which would in the absence of said second-mentioned contacting means result in direct contact between said panel and the associated building wall, ceiling floor, or like structure, said second-mentioned contacting means being an elongated pin-like element of relatively small cross-sectional configuration whereby thermal conduction transfer there-through is substantially negligible, said panel having a peripheral outline of a predetermined size and shape, and a peripheral skirt of flexible material bordering said panel peripheral outline and being adapted to span any space between the panel peripheral outline and the associated building wall, ceiling, floor or like structure.

4,422,274

**INSULATED PANEL**

William H. Holliday, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 215,017, Dec. 10, 1980, abandoned.

This application Nov. 19, 1982, Ser. No. 443,016

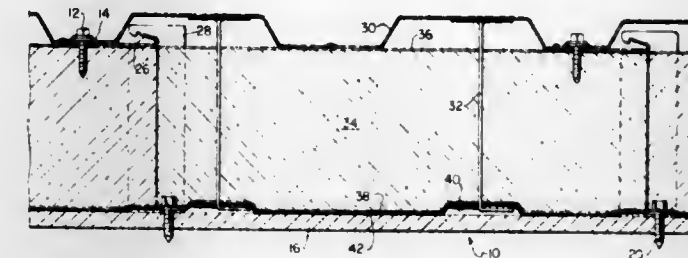
Int. Cl.<sup>3</sup> E04B 5/00

U.S. Cl. 52—410

8 Claims

1. In a panel structure for insulating vessels, said panel structure including a plurality of surface panels, insulation material, means for fastening said surface panels to one another and means for fastening said panel structure to said vessel, the improvement wherein said surface panels have a side portion thereof fastened to a region adjacent to and inwardly spaced from the opposite side portion of an adjacent surface panel and wherein the opposite side portions of said surface panels are

fastened to said vessel by said means for fastening said panel structure to said vessel, said means for fastening said panel structure to said vessel comprising fastening clips, said fastening clips each having a grooved panel receiving portion and a nose portion extending into said panel receiving portion, said



panel receiving portion and said nose portion cooperating to snappingly receive said opposite side portions of said surface panels therebetween, said opposite side portions and said surface panels being reverse folded, to thereby firmly retain said surface panels while permitting thermal expansion and contraction of said surface panels.

4,422,275

**ANCHOR POCKET SYSTEM FOR CUT STONE TRIM AND THE LIKE**

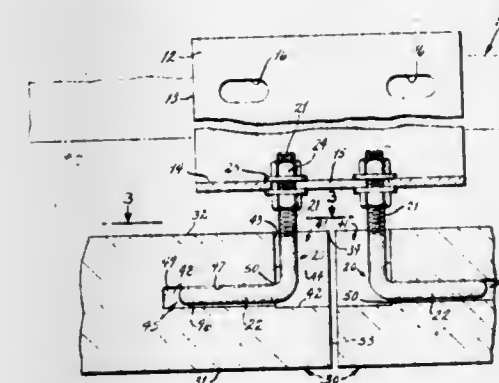
Kenneth J. Bactje, St. Louis, Mo., assignor to Midwest Cut Stone Co., St. Louis, Mo.

Filed Nov. 18, 1981, Ser. No. 322,420

Int. Cl.<sup>3</sup> E04B 1/38

U.S. Cl. 52—509

3 Claims



1. For use as building trim and the like, a cut stone to be supported in alignment with similar stones by a plurality of rod anchor bolts of the type having a threaded shank for bolting to a building structural member and a supporting end bent perpendicular to the shank, the stone having an outer surface to be exposed on erection and having, to be unexposed on erection, a back surface and a joint surface perpendicular thereto and meeting in a common edge, characterized in having, for each of such anchor bolts,

an anchor pocket in the common edge and including a sinkage and a cavity extending from the sinkage, said sinkage being of an extent, measured inward from said common edge, at least two and a half times the thickness of such anchor bolt and, measured along said common edge, greater than three times said thickness, and of a depth measured from said back surface greater than three times said thickness, the cavity having a floor and ceiling spaced from each other sufficiently to accommodate the thickness of such supporting end of the rod anchor bolt and having side walls which at the cavity mouth are spaced from each other more than twice such bolt thickness, and in which the spacing of said cavity side walls from each other at the cavity mouth is less than the length of the supporting ends of such rod anchor bolts, whereby on erection to permit adjustment of alignment of the cut stone with adjacent stones.

4,422,276

**DOOR TRIM FASTENER ASSEMBLY**

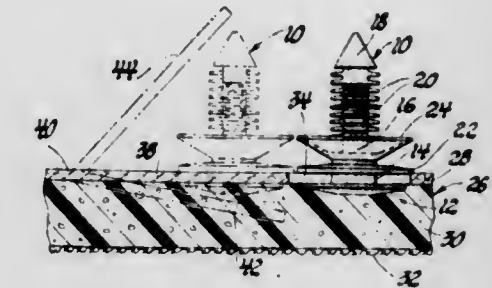
Reno R. Paravano, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1981, Ser. No. 291,570

Int. Cl.<sup>3</sup> E04B 1/38

U.S. Cl. 52—511

3 Claims



1. A door trim fastener assembly, comprising, in combination,

a fastener having a head portion and a neck portion of smaller size than the head portion,  
a trim panel including a planar backing layer and a resilient layer beneath the backing layer, the backing layer having a slot with a closed end and an open end through which the neck portion of the fastener is receivable and having a width less than the width of the head portion of the fastener,  
the planar backing layer further including a flap hinged thereto of a width sufficient to receive the fastener head portion through the backing layer as the head portion moves the flap between a first position substantially coplanar with the backing layer and at least partially traversing the slot to block removal of the neck portion of the fastener from the slot and a second position resiliently compressed into the resilient layer as the fastener is moved substantially perpendicularly to the backing layer to allow insertion of the neck portion of the fastener through the open end of the slot, the flap moving back to first position under the resiliency of the resilient layer to retain the fastener.

4,422,277

**PANEL JOINT**

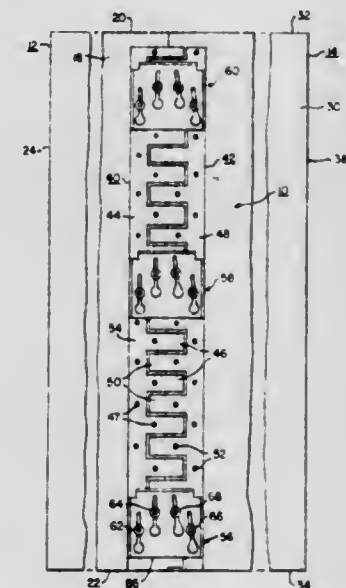
Gurdip S. Bains, Bethel Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1981, Ser. No. 262,370

Int. Cl.<sup>3</sup> E04C 1/10

U.S. Cl. 52—584

1 Claim



1. A panel joint, comprising:  
first and second adjoining, upstanding non-metallic wall



panel members having front and rear surfaces, and flat adjacent edges, with said flat adjacent edges being butted against one another, and with the front surfaces of the panels being in a common plane, and joining means disposed adjacent to the rear surfaces of said first and second wall panel members, said joining means including first and second metallic alignment plates, a plurality of metallic spacer members, and a plurality of metallic plate members, said joining means holding said wall panel members tightly together to provide a tight joint between their front surfaces, devoid of visible joining means, while aligning the front surfaces in a common plane at the joint.

said first and second metallic alignment plates having first and second major, flat surfaces, said first and second alignment plates each having a back portion and a plurality of spaced finger portions which extend outwardly from a common side thereof, the first major flat surfaces of said back portions of the first and second alignment plates being fixed to the rear surfaces of said first and second wall panel members, respectively, along their adjacent edges, with their finger portions extending outwardly from the associated wall panel member to vertically interleave with one another and contact the rear surface of the other wall panel member,

said plurality of metallic spacer members having head and shank portions, said spacer members being fixed in vertically spaced pairs to each of said first and second metallic alignment plates, with the spacer members of each pair being substantially horizontally spaced,

said plurality of metallic plate joining members each comprising a flat section having first and second major, flat, parallel opposed surfaces defining first, second third and fourth elongated slots which extend between the opposed surfaces, said first and second slots being disposed on one side of a vertically extending longitudinal axis of the joining member, and said third and fourth slots being disposed on the opposite side, said first and second slots each having sides which are parallel with the longitudinal axis, and said third and fourth slots each having sides which are parallel with one another, but slightly inclined relative to the longitudinal axis,

said plurality of joining members being disposed with their first surfaces in flat, surface-to-surface contact with the second major flat surfaces of said first and second alignment plates, with a pair of spacer members on said first alignment plate being captured by said first and second slots, and a pair of spacer members on said second alignment plate being captured by the third and fourth slots, to provide a plurality of vertically spaced joining assemblies, with the first and second alignment plates being common to all of said joining assemblies,

said plurality of joining members being in a downwardly displaced, frictional locking position, with the inclined third and fourth slots forcing the associated pair of spacer members on the second wall panel member towards the first wall panel member, to urge the adjoining flat edges of said first and second wall panel members tightly together, at least certain of said spacer members including means which forces the first major, flat surfaces of the metallic joining members tightly against the second major, flat surfaces of said first and second metallic alignment plates, forcing the first surfaces of the first and second panel members into a common plane at the location of each joining assembly, and with the first and second alignment plates, being common to all the spaced joining assemblies, promoting such alignment between the metallic joining members.

4,422,278

## PANEL FITTING DEVICE

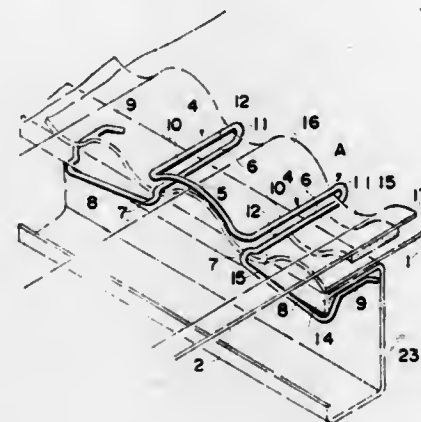
Sansei Fujihira, Yokohama, and Sigeyaki Matuda, Kasukabe, both of Japan, assignors to Toko Kogyo Co.Ltd., Japan

Filed Jun. 5, 1981, Ser. No. 270,891

Claims priority, application Japan, Aug. 22, 1980, 55-115749, 55-119210; Nov. 14, 1980; 55-162849; Dec. 20, 1980; 55-184039, Int. Cl.<sup>3</sup> E04B 5/52

U.S. Cl. 52-714

10 Claims



1. A panel fitting device for fitting a corrugated panel to a framework member comprising:

- a pair of spaced-apart substantially parallel panel-holding sections each comprising a main part and a pressing part connected to one end of said main part and defining a clearance space therewith for receiving an upper panel;
- a supporting leg connected to each main part at an opposite end thereof, extending away from said clearance space;
- a hitching part connected to each supporting leg at an end of each leg opposite to each respective main part, each hitching part extending substantially parallel to said holding sections and shaped to engage a framework member with a lower panel held between said main part and the framework member;
- a panel pressing section connected between each pressing part of each holding section at an end of each pressing part opposite a connection between each pressing part and each main part, said panel pressing section being curved in a direction away from each clearance space for engagement around a corrugation of an upper corrugated panel to be fitted.

4,422,279

## METHOD FOR CONSTRUCTING A REINFORCED FOUNDATION

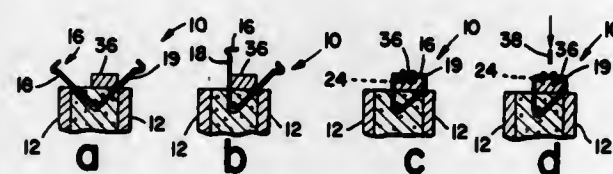
John M. Powell, 5169 Alum Rock Ave. San Jose, Calif. 95127

Filed Sep. 4, 1981, Ser. No. 299,800

Int. Cl.<sup>3</sup> E04B 1/00

U.S. Cl. 52-741

7 Claims



1. The method of constructing a reinforced foundation comprising the steps of:

- (a) fabricating an open top form for a foundation wall of given length, height and thickness;
- (b) fabricating a plurality of manually bendable elongated members having a length substantially greater than said given foundation wall thickness;
- (c) bending each of said plurality of elongated members to define a pair of substantially rectilinear legs extending at an angle to each other with a spacing between the free

ends of said rectilinear legs greater than said given foundation wall thickness;

(d) placing said plurality of elongated members in spaced relation to each other across said open top of said form with said rectilinear legs extending into said open top of said form;

(e) placing an elongated reinforcing rod within said form with its long dimension extending along said given length in supported relation between said legs of each of said plurality of elongated members at a height less than said given height;

(f) filling said form with concrete to said given height whereby said reinforcing rod and adjacent portions of said legs of each of said plurality of elongated members are embedded in said concrete; and

(g) before said concrete has set, bending the one of said legs of each of said plurality of elongated members which is on the same given side of said given length up through said concrete to a given spacing from said other of said legs of each of said plurality of elongated members.

4,422,280

## INSULATING GLASS UNIT

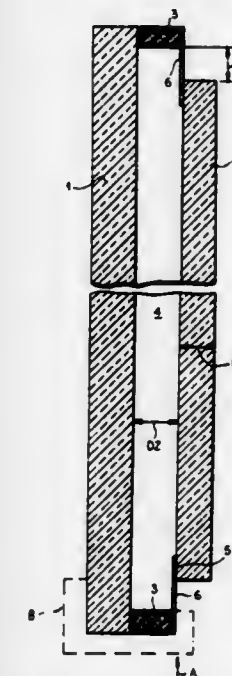
Dietrich Martin, Witten; Paul Derner, and Wolf von Reis, both of Gelsenkirchen, all of Fed. Rep. of Germany, assignors to BFG Glassgroup, Paris, France

Filed Apr. 21, 1981, Ser. No. 255,994

Int. Cl.<sup>2</sup> E04C 2/54

U.S. Cl. 52-788

10 Claims



1. An insulating window unit with improved acoustic damping, comprising:

- an inner glass pane;
- an outer glass pane;
- a spacer frame connected to said panes around the peripheries thereof and spacing said panes apart to define a gas-filled compartment between the panes; and
- at least one membrane strip bonded to a face of one of said panes along an edge zone thereof and connected to said frame, said membrane strip being of a material and dimensioned to follow deformation of said edge zone without significant resistance thereto, said strip having a flexural stiffness substantially less than that of said one of said panes at least in the region of said edge zone, the bending resistance of said in said zone being by a factor of 10<sup>-2</sup> to 10<sup>-6</sup> less than that of said one of said panes whereby transverse oscillations of said one of said panes correspondingly deform said strip.

4,422,281

## CONTAINER PACKAGE AND ITS MANUFACTURE

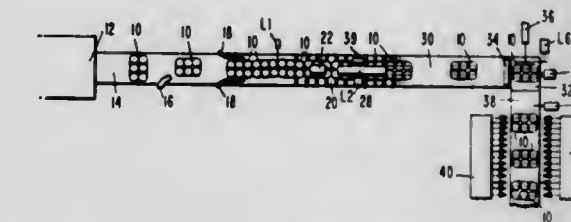
Jürgen G. Rensner, Philadelphia, Pa., assignor to Pepel Co., Inc., Purchase, N.Y.

Continuation of Ser. No. 26,772, Apr. 3, 1979, Pat. No. 4,294,058, which is a continuation of Ser. No. 812,327, Jul. 1, 1977, abandoned, which is a division of Ser. No. 697,578, Jun. 18, 1976, Pat. No. 4,078,659. This application Oct. 3, 1980, Ser. No. 193,472

Int. Cl.<sup>3</sup> B65B 61/14

U.S. Cl. 53-134

17 Claims



1. Apparatus for attaching thermoplastic film handles to packages of articles wrapped in thermoplastic film comprising: a source of thermoplastic ribbon-like handle film for forming successive handles each having handle end portions on opposite sides of a handle middle portion;

a support surface; means for conveying packages of articles wrapped in thermoplastic wrap film on said support surface with said packages in end-to-end relationship; means for positioning handle end portions of respective handles of the handle film from said source into contact with opposite non-supported side portions of the wrap films on each package of said packages on said support surface; said positioning means including means for positioning handle end portions into contact with adjacent side portions of each pair of adjacent packages of said packages,

means for tacking the handle end portions of said handle film to the side portions of the wrap films on each of said packages leaving the middle portions of the handle film free of any tacking on each of said packages;

means for severing said handle film between the resulting tacked portions of said handle film between each pair of said adjacent packages; and

heating means for heating said tacked handle end portions by hot gas or radiant energy to seal said handle end portions to the side portions of the wrap films of said packages leaving the middle portions of the handles free of any seal on each of said packages.

4,422,282

## MACHINE FOR CLOSING THE UPPER FLAPS OF PARALLELEPIPEDAL CARTONS WITH FOLDABLE FLAPS

Augusto Marchetti, Piazza Sicilia 7, 20146 Milano, Italy

Filed Jul. 27, 1981, Ser. No. 287,197

Claims priority, application Italy, Sep. 15, 1980, 22757/80[U] Int. Cl.<sup>3</sup> B65B 7/20

U.S. Cl. 53-374

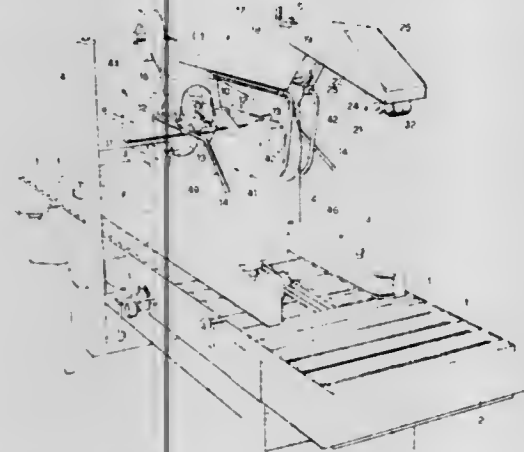
8 Claims

1. A machine for closing the upper flaps of parallelepipedal cartons with foldable flaps, the machine comprising:

- a support plane for the cartons;
- advancing means for advancing the cartons along said support plane and arranged thereabove along the path of advancement of the cartons;
- a first closing member capable of engaging the front end flap of the cartons to cause the folding thereof to a closed position;
- said first closing member consisting of a pair of substantially vertical rods constantly inserted in the path of advancement of the front flap of the cartons;
- a second closing member capable of engaging the rear end



flap of the cartons to cause the folding thereof to the closed position;  
said second closing member consisting of a rotatable shovel pivoted on one end of a rigid arm displaceable on command along a stationary guide having a box-like shape, said guide having a first horizontal section and a second upwardly sloping section, said rigid arm being formed by a succession of segments arranged at angles, the segment most distant from the connection end of said shovel being slidably housed in said guide and being kept restingly in said upwardly sloping section of said guide, said rigid arm



being capable of rotary-translatory movement from said rest position which is displaced upward and backward with respect to the sense of advancement of the cartons to a lowered and advanced working position to engage from behind the rear flap of the cartons;  
control means for causing said most distant segment of the rigid arm to slide towards and inside said horizontal section of said guide; and  
urging means adapted to urge, by reaction, the rotation of said shovel from said rest position to said horizontal working position to fold said rear flap to the closed position during the end part of said movement of the arm.

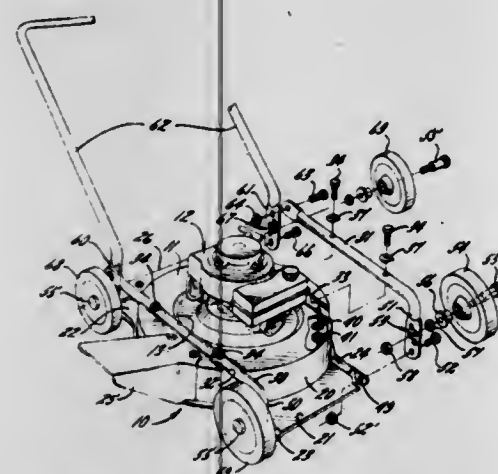
#### 4,422,283 LAWNMOWER WITH LONGITUDINAL SUPPORT FRAME

Joseph E. Scanland, Savannah, Ga., assignor to Roper Corporation, Kankakee, Ill.

Filed Dec. 28, 1981, Ser. No. 334,462  
Int. Cl.<sup>3</sup> A01D 35/26, 67/00

U.S. Cl. 56—320.2

11 Claims



1. A rotary lawn mower comprising, in combination, a mower deck including an inverted pan-shaped housing made of thin gauge metal having a horizontal top and a generally cylindrical side wall with a lower edge portion and defining a central space, a rotary power source mounted on the top of the housing and having a shaft extending into the central space, a blade mounted on the lower end of the shaft, the deck having

pairs of front and rear corner positions, separately mounted left and right longitudinal frame members each having a central portion which extends bridgely in horizontal position above the housing between respective front and rear corner positions, the frame members having downward extensions disposed adjacent said corner positions, wheels secured to the respective downward extensions, means for rigidly fastening the central portion of each frame member to the top of the mower housing, a handle extending rearwardly and upwardly from the mower deck for guiding the mower, and bracing means including rigid connections between each downward extension and the adjacent lower edge portion of the housing to minimize relative movement therebetween.

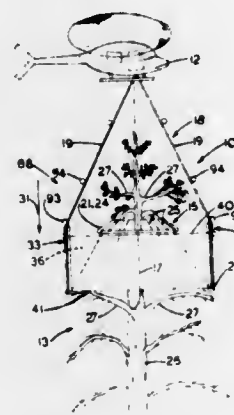
#### 4,422,284 APPARATUS AND METHOD FOR HARVESTING SEED BEARING CONES

Helmut E. Fandrich, 2461 Sunnyside Pl., Clearbrook, British Columbia, Canada V2T 4C4, and Fred Fandrich, Agassiz, Canada, assignors to Helmut Edward Fandrich, Clearbrook, Canada

Filed Apr. 11, 1980, Ser. No. 139,577  
Int. Cl.<sup>3</sup> A01D 46/00

U.S. Cl. 56—328 R

19 Claims



10. Apparatus for harvesting cones from a tree, the apparatus having a retrieving means and a holding means cooperating with the retrieving means so as to collect cone containing material retrieved from the tree, the retrieving means being characterized by:

- a lower portion having guide means adapted to encircle the tree and to permit generally axial movement of the retrieving means relative to trunk of the tree,
- an upper portion with an upper periphery having separating means to separate cone containing material from the tree resulting from relative movement between the retrieving means and the tree, the upper periphery having a plurality of recesses to receive portions of the tree therein, structure defining the recesses being stationary and non-rotationally mounted relative to the lower portion and to a central longitudinal axis of the apparatus, the recesses facing inwardly and having the separating means to separate the cone containing material from the tree upon generally axial movement of the retrieving means along the trunk with negligible rotational movement of the separating means,
- each recess being defined by a pair of generally parallel straight side edges provided with generally upwardly extending knives, the side edges being spaced apart at a knife spacing to accept maximum thickness of the tree trunk at a lowermost position of the apparatus on the trunk, the knives providing the separating means.

#### 4,422,285 APPARATUS AND PROCESS FOR MAKING A FUR YARN

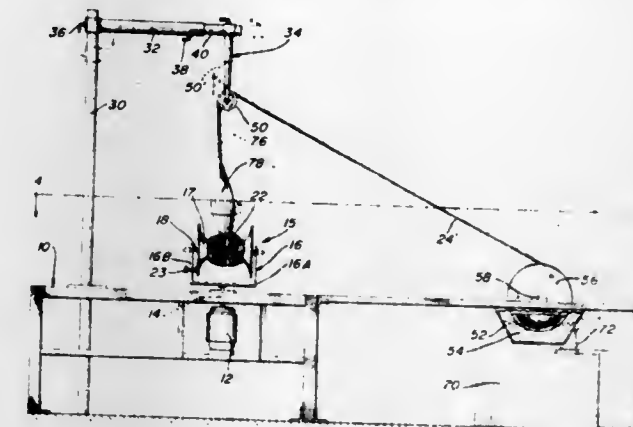
Gabriel Rol, 64 de Bretagne, St-Lambert Quebec, Canada

Filed Oct. 28, 1981, Ser. No. 316,031

Int. Cl.<sup>3</sup> A41H 41/00; C14B 15/10; D02G 3/06

U.S. Cl. 57—31

12 Claims



1. An apparatus for making a fur yarn comprising: rotatable bobbin means having wound thereon a strand of animal fur consisting of a narrow elongated skin portion and of hair extending from one face of the skin portion; means drawing said strand from said bobbin means; means for rotating said bobbin means to impart a twist to said strand as it is drawn from said bobbin means; spring-biased support means located above said rotatable bobbin means receiving said strand being twisted; said drawing means including drum means receiving thereon said twisted strand downstream of said support means and means for rotating said drum means; and means for wetting said twisted strand on said drum means to allow said strand to maintain its twisted shape and to form a fur yarn.

#### 4,422,286 FIBER REINFORCED PLASTIC IMPREGNATED WIRE ROPE

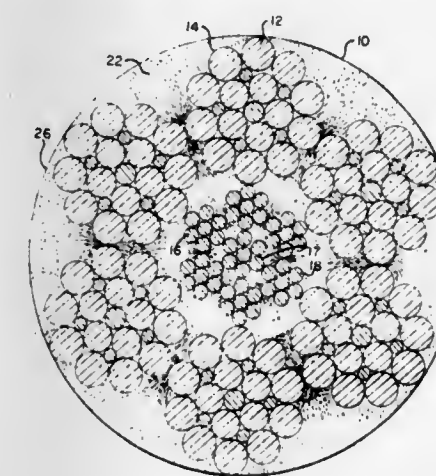
Neville H. Simpson, Kenosha, Wis.; Peter P. Riggs, Ballaugh Glen, Isle of Man, and Warren W. Rasmussen, Geneva, Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Feb. 8, 1982, Ser. No. 346,949

Int. Cl.<sup>3</sup> D07B 1/00, 1/14

U.S. Cl. 57—221

28 Claims



1. A method of making a wire rope comprising the steps of: winding individual wires into strands; forming a plurality of outer strands about a lubricated core into a multistrand rope while coating the outer strands with a lubricant; and impregnating the rope with a coating reinforced with discontinuous predispersed fibers, said coating extending between said core and said outer strands and between said outer strands.

#### 4,422,287 FUEL CONTROL FOR GAS TURBINE ENGINES

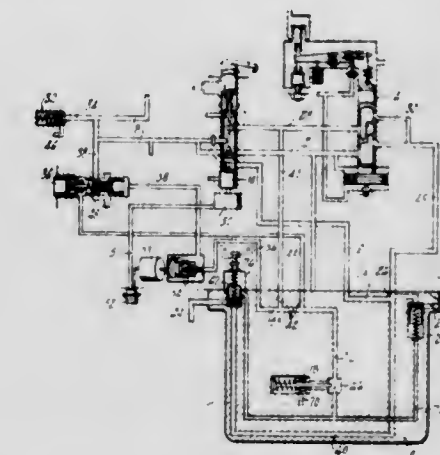
Charles F. Stearns, East Longmeadow, Mass., and Herbert W. Tutherly, Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 29, 1980, Ser. No. 191,548

Int. Cl.<sup>3</sup> F02C 9/28

U.S. Cl. 60—39.281

3 Claims



1. A fuel control adapted for different gas turbine engine configurations including:  
a main control housing having an interface thereon;  
a throttle valve in said housing;  
said housing having inlet and outlet passages for said throttle valve said outlet passage terminating at the interface;  
a condition responsive valve in said housing;  
said housing having an inlet passage from the throttle valve to said condition responsive valve and an outlet passage from said condition responsive valve to the interface;  
a pressure regulating valve in said housing for maintaining the pressure drop across the throttle valve;  
said housing having a first passage and a second passage comprised of a series of passages from the inlet and outlet passages respectively of the throttle valve to said pressure regulating valve;  
said housing having another fluid passage from the throttle valve to said interface;  
an adapter block removably attached to said housing at said interface, said block having a cooperating interface;  
control means in said block to affect the flow of fuel to the engine;  
said block having a fuel passage having its inlet at said interface to mate with the outlet passage from the condition responsive valve and an outlet in said block spaced from the interface for connection to the engine;  
said block having a branch passage from said fuel passage to the interface to mate with the outlet passage from the throttle valve to the interface;  
pressure responsive means in said fuel passage in the block and responsive to said control means; and  
said block having another fluid passage from the interface through the control means to the pressure responsive means, said another fluid passage in said block having its inlet end at the interface to mate with said another fluid passage in said housing.

#### 4,422,288 AFT MOUNTING SYSTEM FOR COMBUSTION TRANSITION DUCT MEMBERS

Charles E. Steber, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,437

Int. Cl.<sup>3</sup> F02C 7/20

U.S. Cl. 60—39.32

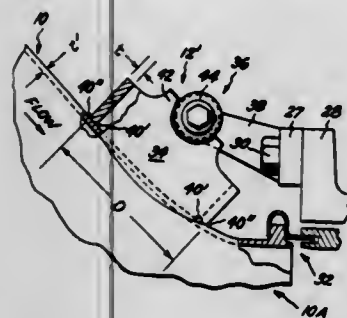
18 Claims

1. A support system for attaching the aft end of a gas turbine



combustion transition duct member to a functionally related structural member comprising:

- (a) a cylindrical shaped base member contoured to mate with the surface of said transition duct member and rigidly attached thereto;
- (b) a pivoting hinge assembly comprising:
  - (i) boss means rigidly attached to said base member;
  - (ii) a bracket having a first end adapted to be nested with said boss means and to be nested with said boss means and a



second end adapted to be attached to said functionally related structural member;

- (iii) interconnecting means fitted through said boss and said bracket for retaining said boss means and said bracket in close cooperating relationship, and providing a pivot axis for enabling pivotal relative motion therebetween; and
- (iv) said interconnecting means being configured to apply a predetermined force between said boss means and said bracket to resist, in controlled part, said pivotal relative motion.

4,422,289

#### FUEL CONTROL APPARATUS FOR A GAS TURBINE ENGINE

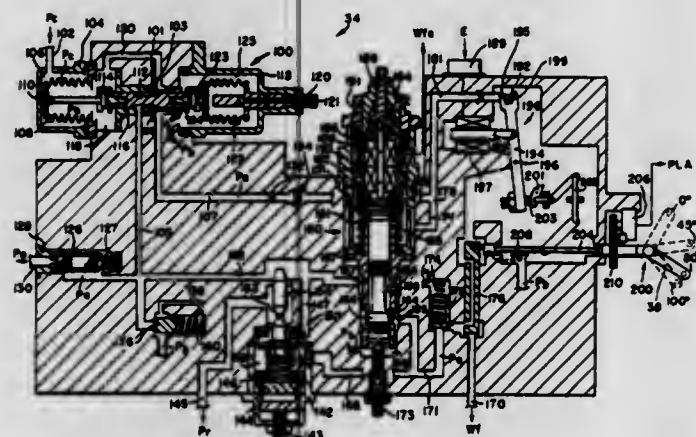
Roy Langton, Simsbury, Conn., assignor to Aviation Electric Ltd., Montreal, Canada

Filed May 12, 1981, Ser. No. 262,868

Int. Cl.<sup>3</sup> F02C 9/28

U.S. Cl. 60—39.281

14 Claims



1. In a fuel control system for a gas turbine engine having an electronic governor which generates an electrical signal indicative of a desired fuel/air ratio of the engine, a fuel control apparatus comprising:

- a metering valve having a position proportional to the fuel flow therethrough, said metering valve being positioned in response to a hydraulic control pressure;
- means for generating said hydraulic control pressure proportional to the pneumatic discharge pressure of the compressor of the engine; and
- means for modulating said control pressure in response to said electrical signal by regulating the area of a control orifice communicating with said control pressure.

4,422,290

#### HYDRAULIC CONTROL SYSTEM FOR GOVERNING STEERING AND IMPLEMENT ACTUATORS

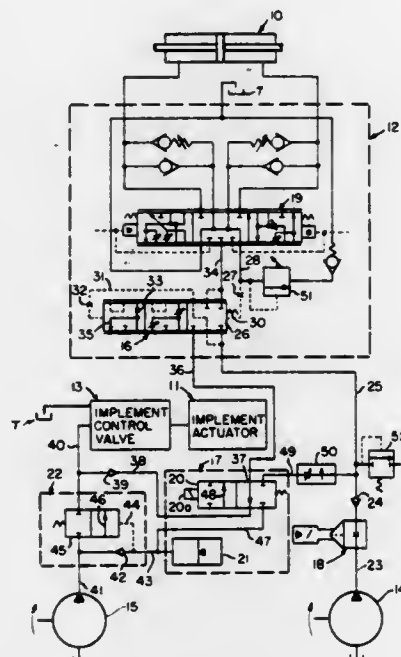
Theron M. Huffman, Paw Paw, Mich., assignor to General Signal, Stamford, Conn.

Filed Aug. 26, 1981, Ser. No. 296,282

Int. Cl.<sup>3</sup> F15B 13/06, 13/09, 20/00

U.S. Cl. 60—404

3 Claims



1. A hydraulic control system for governing steering and implement actuators comprising steering control means and implement control means having steering and implement pump means respectively for selectively operating the steering and implement actuators, pressure compensating means for delivering excess fluid pressure from the steering control means to the implement control means, and emergency fluid pressure supply means for the steering control means, wherein improved emergency fluid pressure supply means comprises:

- (a) steering control means for supplying fluid to the steering actuator from the steering pump wherein output of the steering pump is delivered successively through a pressure sensing switch, a check valve, a pressure compensating valve for delivering excess fluid pressure from the steering control means to the implement control means and a direction control means,
- (b) emergency steering control means comprising:
  - (1) accumulator means connected through a check valve to an output supply passage of the implement pump to give charging of the accumulator means preference over pressurization of the implement actuator,
  - (2) emergency control valve means having a solenoid control subject to energization by the pressure switch when the pressure switch senses loss of pressure in the output of the steering pump,
  - (3) emergency control means responsive to actuation of the emergency control valve means upon energization of the solenoid for connecting output of the accumulator to input of the pressure compensating means through a pressure compensated flow control valve for pressurizing the steering control means from the implement pump, and
  - (4) the emergency control valve being effective to prevent flow from the pressure compensating means to the implement control means as long as the solenoid remains energized.

4,422,291

#### HOT GAS ENGINE HEATER HEAD

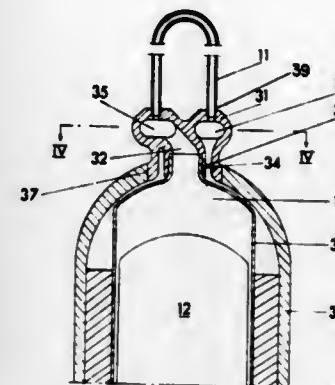
John O. Bernell, Staffanatorp, Sweden, assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,249

Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—517

7 Claims



1. A hot gas engine heater head in which an oscillating flow of gaseous working medium is heated and circulated between a cylinder and a regenerator cavity surrounding said cylinder, said heater head comprising:

- a plurality of tubes, each being connected at one end to a first manifold providing entrance to said cylinder and at the other end to a second manifold providing entrance to said regenerator cavity;
- said first manifold being connected to said cylinder top via a central duct;
- said second manifold being connected with said regenerator cavity via a second duct surrounding said central duct and having an annular cross section.

4,422,292

#### CLOSED CYCLE IN-LINE DOUBLE-ACTING HOT GAS ENGINE

Yasunari Hoshino, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

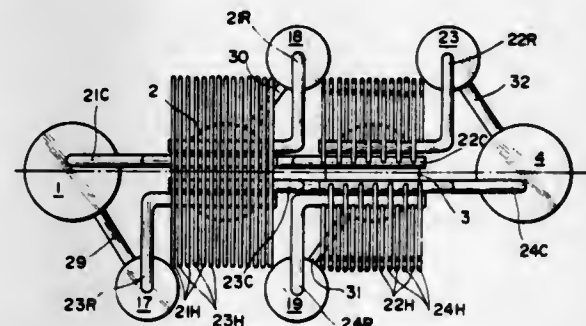
Filed Jun. 8, 1981, Ser. No. 271,124

Claims priority, application Japan, Jun. 9, 1980, 55-76624; Jun. 30, 1980, 55-87719; Sep. 5, 1980, 55-122344

Int. Cl.<sup>3</sup> F02G 1/04

U.S. Cl. 60—525

7 Claims



1. A closed cycle in-line double-acting hot gas engine, which comprises:

- (a) four cylinders arranged in a straight line in the order of the first cylinder, the second cylinder, the third cylinder, and the fourth cylinder, said cylinders being operated in the order of the first cylinder, the third cylinder, the second cylinder, and the fourth cylinder;
- (b) four regenerator/coolers arranged independently and symmetrically with respect to the cylinder line, the first regenerator/cooler, and the third regenerator/cooler being arranged on one side, the second regenerator/cooler and the fourth regenerator/cooler being arranged on the other side, said respective regenerator/coolers

being connected to the respective compression spaces of said cylinders; and

- (c) four heaters arranged symmetrically with respect to the cylinder line, the first heater being connected between the first cylinder and the second regenerator/cooler, the second heater being connected between the second cylinder and the fourth regenerator/cooler, the fourth heater being connected between the fourth cylinder and the third regenerator/cooler, and the third heater being connected between the third cylinder and the first regenerator/cooler, said first heater and said third heater being both gathered so as to form a single cylindrical heat exchanger in such a way that a plurality of parallel arranged circular U-shaped heater tubes of said first heater and a plurality of parallel arranged circular U-shaped heater tubes of said third heater are disposed alternately as one group, and said second heater and said fourth heater being both gathered so as to form a single heat exchanger in such a way that a plurality of parallel arranged circular U-shaped heater tubes of said second heater and a plurality of parallel arranged circular U-shaped heater tubes of said fourth heater are disposed alternately as the other group, said two heaters being disposed over said cylinders horizontally and symmetrically with respect to the center line of said two cylindrical heaters.

4,422,293

#### CLOSED-CENTER HYDRAULIC SERVO APPARATUS

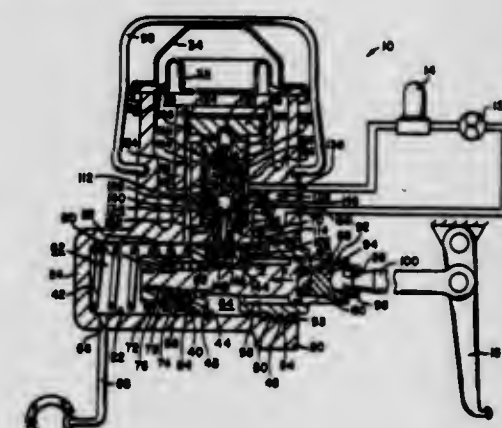
Jerome T. Ewald, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 12, 1981, Ser. No. 273,148

Int. Cl.<sup>3</sup> B60T 13/00

U.S. Cl. 60—547.1

6 Claims



1. A closed-center hydraulic servo apparatus comprising a housing defining a pair of intersecting bores therein, a partition member movably received in one of said pair of bores and sealingly cooperating with said housing to substantially bound a variable-volume pressure chamber, an inlet communicating pressurized fluid from a source thereof into the other of said pair of bores, an outlet communicating a reservoir with said one bore, a passage opening on said one bore to communicate said pressure chamber and said other bore, valve means received in said other bore for in a first position closing fluid communication from said inlet to said pressure chamber, said valve means shifting to a second position to communicate pressurized fluid from said inlet to said pressure chamber, said valve means including a valve plunger extending from said other bore into said one bore, axial movement of said valve plunger shifting said valve means between said first and second positions, an input member reciprocally received in said one bore, said input member movably cooperating with said valve plunger to axially move the latter in said other bore in response to reciprocation of the former in said one bore, said partition member defining a socket leading to said pressure chamber, said socket movably and sealingly receiving a portion of said input member and said portion of said input member defining a first reaction area for opposing an operator input force applied



to said input member, said valve plunger being exposed to the fluid pressure within said pressure chamber via said other bore and said valve plunger being exposed to said reservoir via said one bore to define a second reaction area for opposing said operator input force.

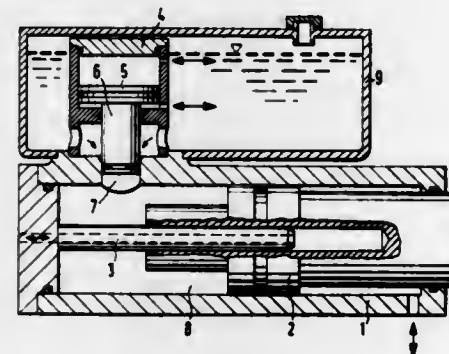
2. A closed-center hydraulic brake booster comprising:  
a housing defining a first bore therein;  
a partition member reciprocally and sealingly received in said first bore, said housing carrying an abutment member engageable by said partition member to define a nonbraking position for the latter, said partition member defining a socket communicating axially therethrough;  
an input member sealingly and reciprocally received in said first bore and in said socket, said partition member and said input member cooperating with said housing to bound an outlet chamber therewithin, said outlet chamber communicating with a fluid reservoir via an outlet, said partition member coupling for movement in unison with said input member via a lost motion connection and cooperating with said housing to bound a pressure chamber;  
first resilient means for yieldably biasing said input member to an axially extended position relative said partition member, said lost motion connection defining a nonbraking position for said input member;  
said housing defining a second bore mutually perpendicular to and intersecting said first bore, said second bore including a small diameter portion opening to said outlet chamber and cooperating with the remainder of said second bore to define a step thereon;  
a valve plunger reciprocally and sealingly received in said small diameter bore portion and extending into said first bore;  
an annular valve disc sealingly received in said second bore and engaging said step;  
a bushing member sealingly received in said second bore and defining a pocket opening toward said valve disc;  
a valve stem reciprocally received in said second bore and sealingly received in said pocket, said valve stem carrying a valve ball sealingly engageable with said valve disc;  
second resilient means for yieldably biasing said valve stem toward said valve disc so that said valve ball engages said valve disc to define a first position for said valve stem; said valve disc, valve ball, bushing member and valve stem cooperating with said housing to bound an inlet chamber therewithin, said valve disc and valve plunger cooperating with said housing to bound a cavity therewithin;  
an inlet communicating pressurized fluid from a source thereof into said inlet chamber, and a passage communicating said cavity with said pocket, said passage opening on said first bore immediately adjacent said partition member to communicate said cavity with said pressure chamber;  
said valve plunger extending into said cavity and defining an annular varying surface sealingly engageable with said valve ball, a duct extending through said valve plunger from within said annular valving surface to said outlet chamber;  
third resilient means for yieldably biasing said valve plunger toward said input member,  
said valve plunger and said input member defining coacting means for reciprocating the former in response to reciprocation of the latter;  
said coacting means opposing said third resilient means to support said valve plunger in a first position spacing said valving surface from said valve ball when said input member is in its nonbraking position to communicate said cavity to said outlet chamber via said duct;  
said input member moving within said housing to a first braking position in response to an operator input force to sequentially shift said valve plunger to a second position sealingly engaging said valving surface with said valve ball and to a third position moving said valve ball from its first position to a second position spaced from said valve disc to communicate pressurized fluid to said cavity, said passage communicating pressurized fluid to said pressure chamber;  
said input member further moving to a third braking position coupling for movement with said partition member via said

lost motion coupling, said input member moving said partition member across said passage opening to interrupt fluid communication between said pressure chamber and said cavity.

4,422,294

**HYDRAULIC ACTUATING AND LOCKING DEVICE**  
Heinz H. Klein, Rossbach, Fed. Rep. of Germany, assignor to Dr. Boy GmbH, Fernthal, Fed. Rep. of Germany  
Continuation of Ser. No. 64,747, Aug. 8, 1979, abandoned. This application Apr. 16, 1981, Ser. No. 254,594  
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834895

Int. Cl.<sup>3</sup> B60T 17/00  
U.S. Cl. 60—565 6 Claims



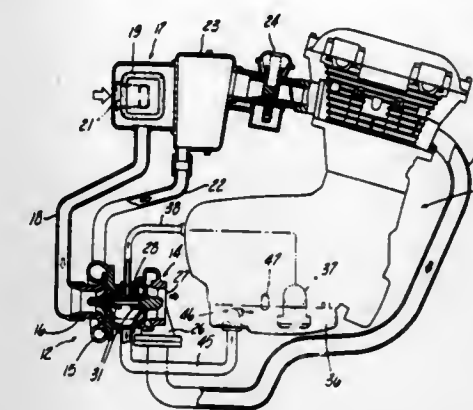
1. An hydraulic actuating and locking device including a locking piston, a first cylinder, said locking piston mounted within said first cylinder for movement along the axis of the same between a first and a locking position, said locking piston having a rear surface, a space behind said locking piston within the confines of said first cylinder, a second cylinder formed in said rear surface of said locking piston, an actuating piston mounted to said first cylinder sealingly received into said second cylinder, an oil reservoir, a passage through the wall of said first cylinder disposed at an angle relative to said axis communicating the oil in said oil reservoir to said space, a pressure multiplier disposed in said oil reservoir including a high pressure piston movable into and out of said passage, means communicating said second cylinder to a source of pressure whereby upon pressurization of said second cylinder said locking piston moves relative to said actuating piston to said locking position and during movement oil is sucked into said space behind said locking piston, and said high pressure piston of said pressure multiplier upon movement into said passage sealing said passage and pressurizing said space to lock said locking piston in said locking position.

4,422,295

**LUBRICATING SYSTEM FOR TURBO-CHARGERS**  
Shunji Minami, Fukuroi, and Hiroshi Kimura, Iwata, both of Japan, assignors to Yamaha Motor Co., Ltd., Japan  
Filed Oct. 1, 1981, Ser. No. 307,645  
Claims priority, application Japan, Oct. 31, 1980, 55-153479  
Int. Cl.<sup>3</sup> F01M 1/08

U.S. Cl. 60—605 8 Claims  
1. In a lubricating system for the supercharger of an internal combustion engine including a supercharger drive shaft supported by bearing means and a lubricating system including a sump for delivering oil to said bearing means when the engine is running, the improvement comprising means defining a generally open fluid conduit extending between said sump and said bearing means, said bearing means being positioned rela-

tive to the normal oil level in said sump so that said bearing means are at or below said normal oil level for return of oil to

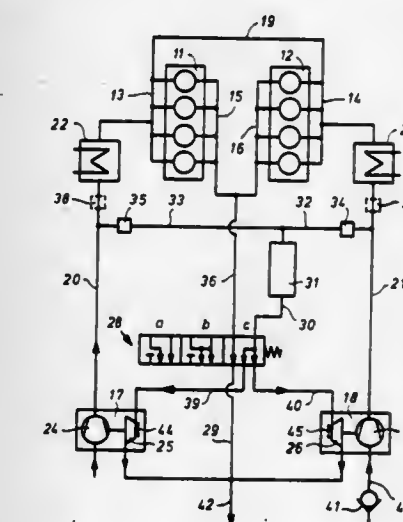


said bearing means through said fluid conduit when the engine is stopped.

4,422,296

**INTERNAL COMBUSTION ENGINE WITH SUPERCHARGING BY EXHAUST GAS TURBOCHARGERS AND AN AUXILIARY COMBUSTION CHAMBER**  
Hans Dinger, Friedrichshafen, and Helmut Klotz, Tettnang, both of Fed. Rep. of Germany, assignors to MTU-Motoren- und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany  
Filed Aug. 4, 1981, Ser. No. 289,839  
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046876

Int. Cl.<sup>3</sup> F02B 37/00  
U.S. Cl. 60—606 15 Claims

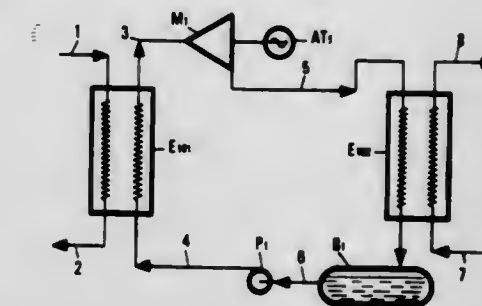


1. An internal combustion engine with supercharging by exhaust gas turbocharger means having turbine and compressor means and with an auxiliary combustion chamber means whose exhaust gases are temporarily fed to the turbine means of the exhaust gas turbocharger means for improving the acceleration characteristics of the engine, characterized in that at least two exhaust gas turbocharger means operating in parallel are provided, each including a turbine means and a compressor means, and means during acceleration of the engine for enabling the exhaust gases of the internal combustion engine to bypass the turbine means of the at least two exhaust gas turbocharger means and for feeding the exhaust gases from the auxiliary combustion chamber means to the turbine means of the at least two exhaust gas turbocharger means so that the exhaust gases of the auxiliary combustion chamber means alone effect drive of the at least two turbocharger means during such acceleration.

4,422,297

**PROCESS FOR CONVERTING HEAT TO MECHANICAL POWER WITH THE USE OF A FLUIDS MIXTURE AS THE WORKING FLUID**  
Alexandre Roje, Garches, France, assignor to Institut Français du Pétrole, Ruell-Malmison, France  
Filed May 22, 1981, Ser. No. 266,569  
Claims priority, application France, May 23, 1980, 80 11649  
Int. Cl.<sup>3</sup> F01K 25/06

U.S. Cl. 60—651 12 Claims



1. A process for producing mechanical power, comprising (a) progressively vaporizing at least one portion of a fluids mixture (M) comprising at least two constituents which do not form an azeotrope in the vaporization conditions, by recovering vaporization heat at least partly from an external fluid I whose temperature varies in a temperature interval A' during the exchange, the temperature of the mixture varying in a temperature interval A defined as the interval between the bubble point ( $T_{LB}$ ) of the liquid and the dew point of the vapor ( $T_{VR}$ ) during said vaporizing step, (b) expanding the resultant vapor phase to produce mechanical power, (c) progressively condensing, in a temperature interval B defined as the interval between the dew point of the vapor and the bubble point of the liquid during the condensing step, the resultant vapor while delivering heat to at least one external fluid II whose temperature varies in a temperature interval B', the width of the temperature interval B being at least 7° C. and at most 30° C., and (d) recycling to step (a) the liquid phase from step (c), the heat exchanges effected with the external fluids I and II in the steps (a) and (c) respectively being operated counter-currently, the mixture of fluids vaporizing in step (a) according to an increasing temperature evolution parallel to the decreasing temperature evolution of the external fluid I and condensing in step (c) according to a decreasing temperature evolution parallel to the increasing temperature evolution of the external fluid II.

4,422,298

**LIQUEFIED NATURAL GAS-FREON ELECTRICITY GENERATION SYSTEM**

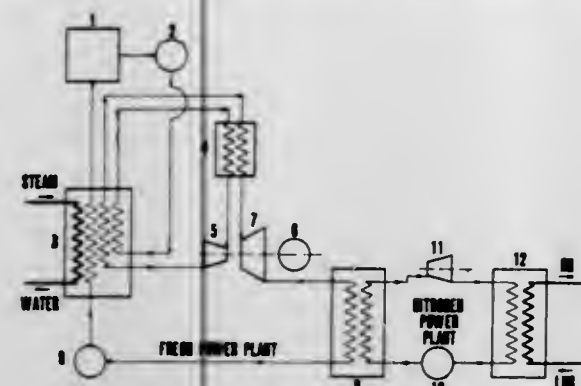
Reikichi Nozawa, To-7-204 Tamagawa Jyutaku, 3-1-71, Somechi, Chohfu-shi, Tokyo, Japan  
Division of Ser. No. 973,735, Dec. 28, 1975, Pat. No. 4,330,998.  
This application Oct. 13, 1981, Ser. No. 315,581  
Claims priority, application Japan, Dec. 29, 1977, 52/159500  
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.  
Int. Cl.<sup>3</sup> F01K 23/04

U.S. Cl. 60—655 13 Claims

1. A method for generating power utilizing a refrigerant as the working fluid and for limiting the temperature of the working fluid below its decomposition range of temperature, the method including steps of circulating the working fluid in a closed circuit through a storage tank, a compressor, heating means, a high pressure gas turbine, reheating means, a low pressure gas turbine, a condensing means, a pump, and a heater, characterized in that the temperature of the working



fluid in the circuit is maintained below the temperature of its substantial decomposition and in that a temperature below the

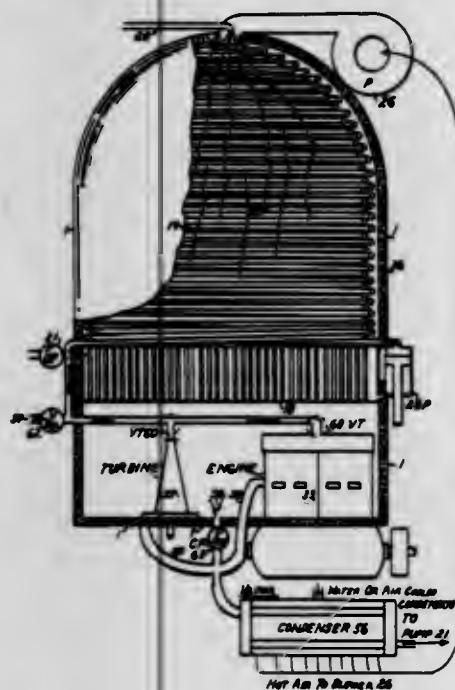


critical temperature of the working fluid is maintained at the outlet of said high pressure gas turbine.

**4,422,299**  
**FLASH SYSTEM POWER GENERATOR**  
George C. Sorensen, 589 SE. 4th St., Ontario, Oreg. 97914  
Continuation-in-part of Ser. No. 76,435, Sep. 17, 1979,  
abandoned. This application Jan. 8, 1981, Ser. No. 223,417  
Int. Cl.<sup>3</sup> F01K 19/00

U.S. Cl. 60—681

2 Claims



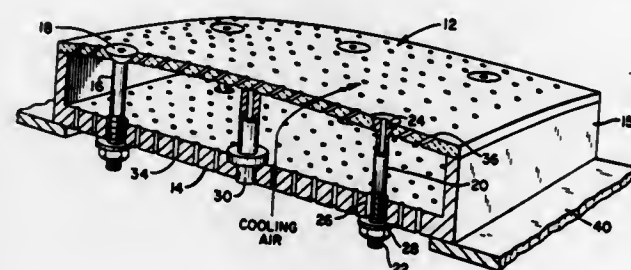
1. A safety self-cleaning flash system power generator consisting of; a plenum chamber, a combustor situated in the upper portion of said plenum chamber, said combustor having a blower for providing pressurized air and means for supplying fuel for combustion with the pressurized air, a low pressure pump for circulating a working fluid, a low pressure heat exchanger situated in the lower portion of said plenum chamber in heat exchange communication with the combustion gases from said combustor, said low pressure pump circulating the working fluid through said low pressure heat exchanger, a high pressure pump in fluid communication with said low pressure heat exchanger for pressurizing the working fluid which has been heated to near its boiling point in said low pressure heat exchanger, said pressurized working fluid being introduced to a high pressure heat exchanger, said high pressure heat exchanger leading said pressurized working fluid in an upward path towards said combustor, said high pressure heat exchanger consisting of at least a single high pressure tube which upon reaching the upper end of said plenum chamber proceeds in a winding downward path causing said working fluid to continuously clean said high pressure heat exchanger, said working fluid being flashed by means of a throttle valve upon reaching the end of said winding downward path, an

engine situated in the lower portion of said plenum chamber receiving said flashed working fluid to generate power and exhausting said working fluid to a condenser, said condenser also receiving the combustion gases from said combustor so that the combustion gases and exhausted working fluid are condensed for recirculation to the low pressure pump.

**4,422,300**  
**PRESTRESSED COMBUSTOR LINER FOR GAS TURBINE ENGINE**  
James A. Dierberger, Hebron; William Ackermann, East Hartford, and Arthur D. Fine, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.  
Filed Dec. 14, 1981, Ser. No. 330,759  
Int. Cl.<sup>3</sup> F02C 7/12

U.S. Cl. 60—757

3 Claims

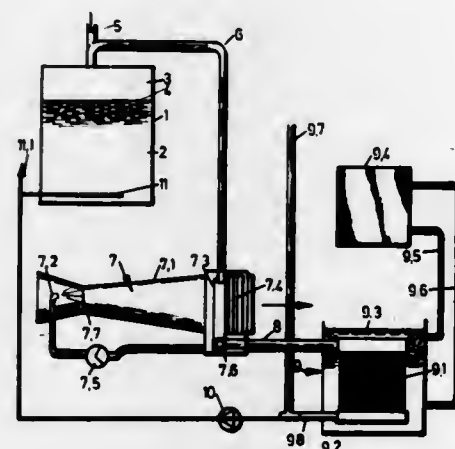


1. A combustor having a liner formed from a plurality of segments supported on a frame in an axial and circumferential direction defining an annularly shaped combustion chamber, each frame being a relatively open ended box-like member having radially extending side walls complementing the shape of its cooperating segment so that the side edge of each segment is contiguous with the top surface of said side walls, means for affixing said segments to the frame and for supporting said segments so that each are prestressed to bear against the top surface of said side walls, whereby said segment distorts when said combustor is operating at its normal temperature level and is in a relatively free stress condition, and means for cooling said segments to its operating temperature.

**4,422,301**  
**EVAPORATIVE LOSS REDUCTION**  
Robert H. Watt, 3 River Rd., Rivonia, Transvaal, South Africa; Richard H. Ladd, Transvaal, South Africa, and Walter S. Wright, deceased, late of Happy Venture, Portion 30, Farm Stryfontein, 4771 R, Dist. Vereeniging, South Africa by Albert C. Fleischack, administrator, assignors to Robert H. Watt, Transvaal; William F. Hastie, Umkomaas and Walter Stockdale Wright, Vereeniging, all of, South Africa  
Filed May 7, 1980, Ser. No. 147,688  
Int. Cl.<sup>3</sup> F17C 13/00

U.S. Cl. 62—54

8 Claims



1. A process for recovering a vapour contained with air in a space above a volatile liquid stored in a container comprising

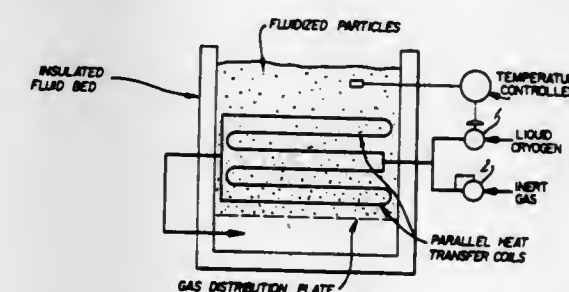
causing a predetermined pressure above ambient air to be generated in the space, leading the vapour and any admixed air to a region for extraction of heat from the vapour, extracting heat from the vapour sufficiently to condense it at least partially at a pressure which is less than the pressure in the region for extraction of heat, transferring condensed liquid to a store and venting any uncondensed vapour together with any admixed air to ambient air, in which for the extraction of heat from the vapour at least as a first stage, a venturi evaporative cooling process is operated to provide a cooling medium to extract heat from the vapour.

**4,422,302**  
**PROCESS FOR COOLING AND FLUIDIZING**  
Robert B. Davis, Nyack, and Mark A. Delano, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 3, 1982, Ser. No. 404,762  
Int. Cl.<sup>3</sup> F25D 17/00

U.S. Cl. 62—57

2 Claims



1. In a process for cooling and fluidizing a bed of particles by passing a cryogen through the bed, said bed being first cooled to a desired operating temperature, the improvement comprising:

- admixing a liquid cryogen and an inert gas, said gas being at ambient temperature, at a point external, but proximate, to the bed to provide a mixture of liquid cryogen and gas at a temperature sufficiently low to maintain the bed at about the desired operating temperature;
- introducing the mixture from step (a) into at least two heat transfer coils connected in parallel and located in the bed whereby the desired operating temperature is imparted to the bed, and the liquid cryogen in the mixture vaporizes; and
- removing the mixture of vaporized liquid cryogen and gas formed in step (b) from the coils and introducing the mixture into the bed to fluidize the bed.

**4,422,303**  
**PROCESS FOR COOLING A CONTINUOUSLY MOVING MATERIAL TO A PREDETERMINED TEMPERATURE**  
Douglas H. Rothenberg, Shaker Heights, and Ronald L. Nicholson, Brunswick, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 25, 1982, Ser. No. 392,406  
Int. Cl.<sup>3</sup> F25D 13/06

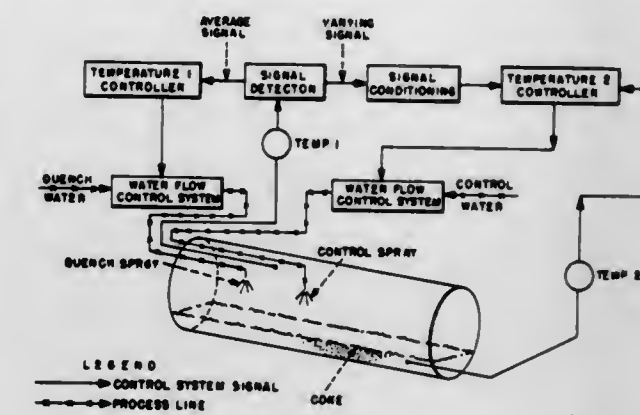
U.S. Cl. 62—63

9 Claims

1. A continuous process for cooling a material to a predetermined temperature comprising continuously conveying said material along a travel path having an upstream portion and a downstream portion, the process comprising

- contacting the material in the upstream portion of said travel path with a first amount of a cooling fluid at a predetermined flowrate to at least partially cool said material,
- continuously measuring the temperature of the cooling fluid after it contacts said material,
- contacting the material in the downstream portion of said travel path with an additional amount of a cooling fluid to further cool said material, and

(d) adjusting the flowrate of said additional cooling fluid in response to said measured temperature so that said mate-

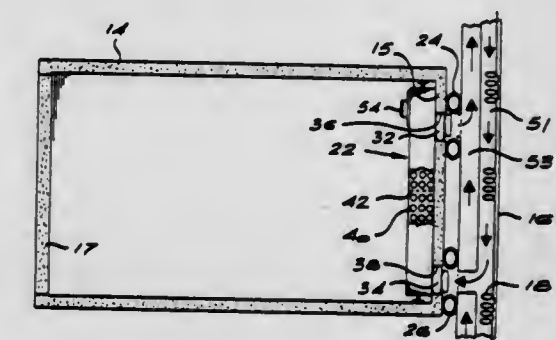


rial is cooled approximately to said predetermined temperature.

**4,422,304**  
**TRANSPORTATION OF PERISHABLE PRODUCTS**  
Brian W. Kuttel, Capetown, South Africa, assignor to TransFRESH Corporation, Salinas, Calif.  
Division of Ser. No. 213,004, Dec. 4, 1980, Pat. No. 4,356,702.  
This application Aug. 9, 1982, Ser. No. 406,631  
Claims priority, application South Africa, Dec. 10, 1979, 79/6691; Jun. 26, 1980, 80/3803; Nov. 6, 1980, 80/6855  
Int. Cl.<sup>3</sup> F24F 3/16

U.S. Cl. 62—78

8 Claims



1. A sealed and insulated container adapted for the transportation of perishable food products inside said container on conveyance means having a source supplying a temperature-modifying fluid at a predetermined temperature for entry into said container from its exterior, said container having an aperture for the entry from the exterior of said temperature-modifying fluid at a predetermined temperature and an aperture for its discharge, said container including a heat exchange unit in which said temperature-modifying fluid is adapted to circulate and to undergo heat exchange with a second fluid comprising a modified atmosphere suitable for direct contact with, and for preservation of at least one perishable food product inside said container, said second fluid being sealed in the container and maintained separate from said temperature-modifying fluid.

**4,422,305**  
**COLD STORAGE ELEMENT, MOUNTING ASSEMBLY AND AIR CONTROL SLATS THEREFOR**  
Peter V. Grosskopf, Am Ruhrstein 25, 4300 Essen 1, Fed. Rep. of Germany

Filed Apr. 1, 1982, Ser. No. 364,355  
Int. Cl.<sup>3</sup> F25D 11/00

U.S. Cl. 62—430

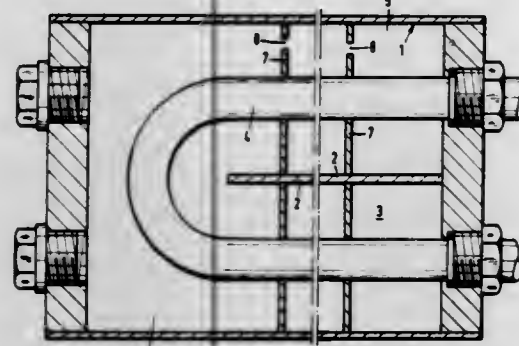
9 Claims

1. In an element for cold storage in a vehicle, the element having at least one container for an eutectic brine, the element having a refrigerant-conducting pipeline passing therethrough for bringing



the eutectic brine to a temperature for the cold storage, the improvement to the element comprising:

- a plastic shell (1) of rectangular cross section for forming the container for the brine;
- a longitudinal web (2) interconnecting opposite side walls inside the plastic shell (1) for dividing the plastic shell (1)



into upper and lower compartments (5,6) in the orientation of the plastic shell (1) in the vehicle in use; and a hair-pin turn in one end of the refrigerant-conducting pipeline (4) in the element for passing the refrigerant-conducting pipeline (4) through both the upper and lower compartments (5,6) of the plastic shell (1).

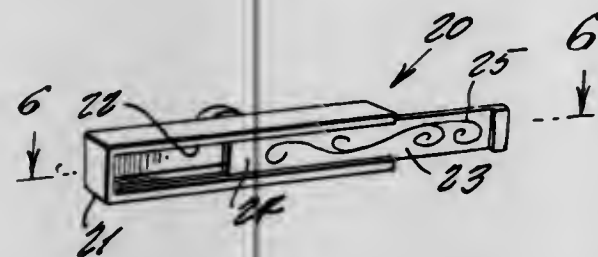
4,422,306

#### GARMENT ATTACHMENT INCLUDING OPENABLE ENCLOSURE

Ted Larson, P.O. Box 22, San Martin, Calif. 95046  
Filed Oct. 31, 1978, Ser. No. 956,340  
Int. Cl.<sup>3</sup> A44C 25/00

U.S. Cl. 63—1 R

3 Claims



1. An attachment for garments comprising a hollow enclosure member adapted for use as a storage means having a front side and another side, an opening at said front side, means movably attached to said enclosure member to close and open said front side, said movable means including a movable member having a decorative side facing away from said opening and an apertured portion located within the opening when said movable means closes said front side; means for removably securing said attachment to a garment and simultaneously securing said movable means in closed relation including a wall at said other side, an aperture in said wall, means for penetrating said garment, passing through said wall aperture and entering said portion aperture, and means for detachably retaining said penetrating means in said garment and apertures.

4,422,307  
SOCK

James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677  
Filed May 24, 1982, Ser. No. 381,531  
Int. Cl.<sup>3</sup> D04B 9/46

U.S. Cl. 66—172 E

9 Claims

1. A sock including integrally knit upper and lower leg portions, each of said leg portions being knit throughout of body yarn with elastic yarn incorporated in continuously repeated predetermined courses throughout said upper and lower leg portions, said body yarn in said lower leg portion being nonstretchable, having moisture wicking characteristics

and being knit in every course of said lower leg portion, said body yarn in said upper leg portion being stretchable and being knit in every course of said upper leg portion, said elastic yarn cooperating with said stretchable body yarn in said upper leg



portion to provide resiliency for supporting the leg of the sock on the leg of the wearer, and said elastic yarn cooperating with said moisture wicking body yarn in said lower leg portion to maintain said lower leg portion in close contact with the leg to aid in the removal of moisture from the leg of the wearer.

4,422,308

#### APPARATUS FOR SPREADING A MOVING WEB OF TEXTILE MATERIAL

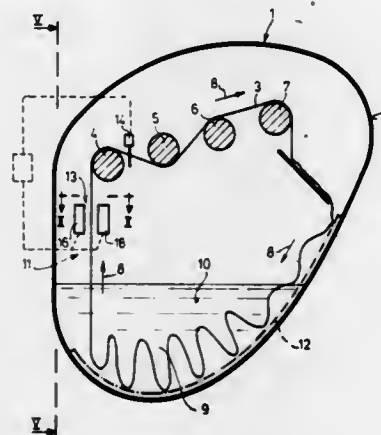
Manfred Pfeiffer, Michelstadt-Steinbach, and Manfred Schuler, Michelstadt, both of Fed. Rep. of Germany, assignors to Bruckner Apparatebau GmbH, Erbach, Fed. Rep. of Germany  
Filed Jun. 12, 1981, Ser. No. 273,230

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025154

Int. Cl.<sup>3</sup> D06B 23/00; B65H 25/26

U.S. Cl. 68—13 R

15 Claims



1. In apparatus for treating a flat web of textile material having opposite edges, means for moving said web from a treatment and storage zone upwardly through a spreading station, and means downstream from said station for turning said web transversely to follow a path back to said zone, the improvement comprising sensing means for sensing movement of either one of said edges of said web from a preselected position toward the other of said edges; means mounting said sensing means downstream from said turning means; web shifting means mounted at said spreading station, said shifting means comprising a first nozzle unit overlying a part of said web and a second nozzle unit independent of said first nozzle unit and overlying the remainder of said web, one of said nozzle units having fluid passages for directing a stream of fluid obliquely onto said web in a direction toward one edge thereof and the other of said nozzle units having fluid passages for directing a stream of fluid obliquely onto said web in a direction toward the other edge thereof; means for delivering fluid to a selected one or both of said nozzle units for discharge

through the respective fluid passages; and control means responsive to the sensing of movement of either one or both of said edges from said position toward the other to operate said delivering means to deliver fluid to the nozzle unit associated with said one or both of said edges, whereby said one or both of said edges may be returned to its or their preselected position or positions.

4,422,309

#### TUNNEL-TYPE BATCH WASHING MACHINE

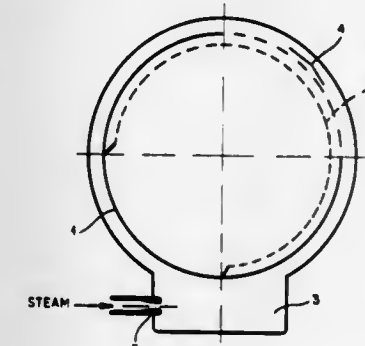
Herbert Schmidt, Arsolsen, and Hans Steinort, Hildesheim-Itzum, both of Fed. Rep. of Germany, assignors to Senkingwerk GmbH, Hildesheim, Fed. Rep. of Germany  
Division of Ser. No. 168,458, Jul. 10, 1980, This application May 28, 1982, Ser. No. 383,173

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927874

Int. Cl.<sup>3</sup> D06F 21/04, 37/08

U.S. Cl. 68—16

3 Claims



1. A tunnel-type batch washing machine comprising: a tunnel-forming housing tube centered on a horizontal axis; a screw rotatable in said tube about said axis and having a plurality of flights defining a plurality of axially succeeding compartments adapted to receive respective batches of articles to be washed; a sleeve surrounding and fixed to said screw between same and said tube and formed at one of said compartments with at least one throughgoing aperture; means for introducing water to the interior of said sleeve at one axial end thereof; a pocket formed on and opening upwardly into said tube at said one compartment; means for heating liquid in said pocket; and means for rotating said screw and sleeve in said tube about said axis and thereby aligning said aperture with said pocket for liquid exchange between said pocket and the interior of said sleeve at said one compartment, said sleeve is formed with a plurality of such apertures in a perforated zone having an angular dimension of less than 180°, said sleeve being provided internally with a perforated member covering said zone and extending axially substantially therebeyond.

4,422,310

#### TENSIONING DEVICE

Larry Eggenberger, 616 NW. Lorna St., Burleson, Tex. 76028  
Filed Sep. 1, 1981, Ser. No. 298,280

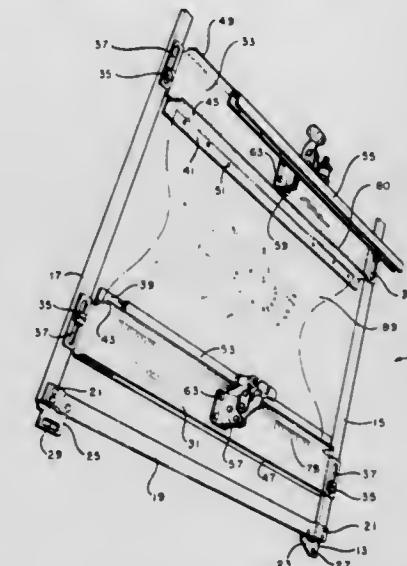
Int. Cl.<sup>3</sup> C14B 1/26

U.S. Cl. 69—19.3

3 Claims

1. Method of clamping and tensioning a boot quarter prior to stitching, comprising the steps of: providing a pallet with a pair of adjustable base strips mounted on said pallet in spaced-apart relationship, each of said strips having an inner edge adapted to receive an opposing edge of the boot quarter to be stitched; mounting a pivoting bar on each of said base strips by a toggle mechanism, said bars being pivotable between an open position for receiving the opposing edges of the boot quarter to be stitched and a closed position longitudinally

aligned with the inner edges of said base strips for clamping and tensioning said boot quarter; providing said pivoting bars with a plurality of pins on the underside thereof adapted to pierce said boot quarter edges and providing said base strip inner edges with corresponding holes selectively positioned for receiving said pins when said bars are closed;



placing one edge of the boot quarter to be stitched along said inner edge of one of said base strips and clamping said boot quarter edge onto said inner edge with one of said pivoting bars; and placing the opposing edge of the boot quarter to be stitched along the inner edge of the other of said base strips and tensioning the boot quarter by moving the other of said pivoting bars to the closed position.

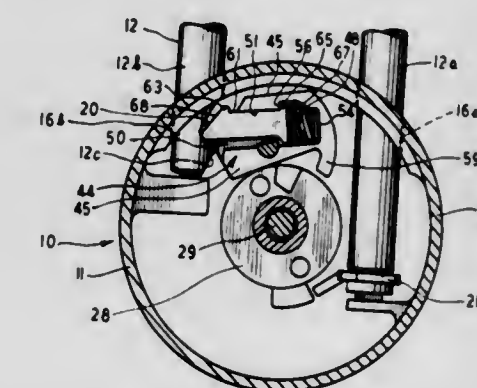
4,422,311  
PADLOCK

Herbert E. Zabel, Wheaton, and William Lelyk, Roselle, both of Ill., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,545  
Int. Cl.<sup>3</sup> E05B 37/10, 67/22

U.S. Cl. 70—25

3 Claims



1. A padlock comprising a body member having shackle leg receiving openings therein, a shackle having legs slidable in said openings, one of said shackle legs having a notch therein, a shackle bolt having an end portion adapted to cooperate with said shackle leg notch so as to effect the locking and unlocking of the shackle, a bolt housing positioned within said body member and provided with a recess to slidably accommodate the shackle bolt therein, spring means arranged within said recess to urge the shackle bolt outwardly whereby to dispose said shackle bolt end portion into locking engagement with said shackle leg notch, said shackle bolt having two upstanding spaced apart shoulder portions, one shoulder portion being disposed outside the housing and positioned to engage the



housing so as to prohibit sliding movement of the shackle bolt into the housing, the other shoulder portion being disposed within the bolt housing recess, means formed in said recess cooperating with said other shoulder portion to maintain said one shoulder portion in its position to engage the housing, and means for moving said shackle bolt out of locking engagement with said shackle leg notch and returning the shackle bolt to locking engagement disposition after the shackle leg notch is removed from said locking engagement disposition.

4,422,312

**LOCK ASSEMBLY**

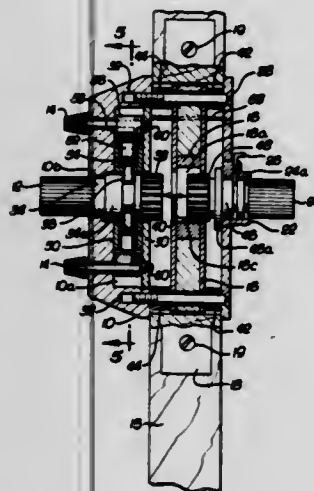
Israel Chermoni, 20 Shoham, Haifa, Israel

Filed Dec. 4, 1980, Ser. No. 213,898

Int. Cl.<sup>3</sup> E05B 15/10, 15/14, 37/12, 65/06

U.S. Cl. 70—133

6 Claims



## 1. A lock assembly comprising:

an exterior cover member including an actuation knob shaft opening and a plurality of combination knob shaft openings;

an exterior knob assembly including an exterior knob located to the outside of the cover member, a shaft passing through the actuation knob shaft opening and attached to the exterior knob and a first toothed gear connected to the end of the shaft opposite the exterior knob, said shaft including a groove substantially perpendicular to the axis thereof located to the inside of the cover member, wherein said knob assembly is axially movable within said opening;

a latchbolt housing;

a latchbolt movable within said housing, said latchbolt including a toothed gear surface, wherein said knob assembly is axially movable to enable the toothed gear to be moved into and out of engagement with the gear surface of the latchbolt;

an interior cover member including a hub having an opening therein;

an interior knob assembly including an interior knob, a shaft passing through the hub of the interior cover member and coupled to the interior knob and a second toothed gear attached to the end of the shaft opposite the interior knob, wherein said second toothed gear engages the gear surface of the latchbolt;

locking means for preventing the exterior knob assembly from being axially moved into engagement with the latchbolt, said locking means including a lock pin housing located adjacent the groove of said first shaft, a plurality of lock pins carried within the lock pin housing and movable into and out of engagement with said groove, spring means for biasing each lock pin away from said groove, and a control assembly for each lock pin, each control assembly including a control knob located to the outside of the exterior cover member, a shaft which passes through one of said combination knob shaft openings and is coupled to the control knob and a cylinder eccentrically

connected to the shaft, wherein said cylinder is in contact with its associated locking pin and rotation of the cylinder will cause the locking pin to move into and out of engagement with said groove;

wherein said exterior knob assembly can be engaged with the latchbolt only when there is no locking pin located within said groove;

said lock assembly further including friction means, located adjacent each offset cylinder, for applying a frictional force to each cylinder which increases the force required to rotate the cylinder, said friction means aiding in the prevention of detection of the combination of said lock assembly, wherein said friction means includes a rear cover plate coupled to the rear of said front cover plate and carrying a plurality of adjustable set screws, one located adjacent the rear surface of each offset cylinder, each of said set screws being movable into contact with its corresponding offset cylinder so as to provide said frictional force.

4,422,313

**CONTAINER INSIDE LOCKING SYSTEM**

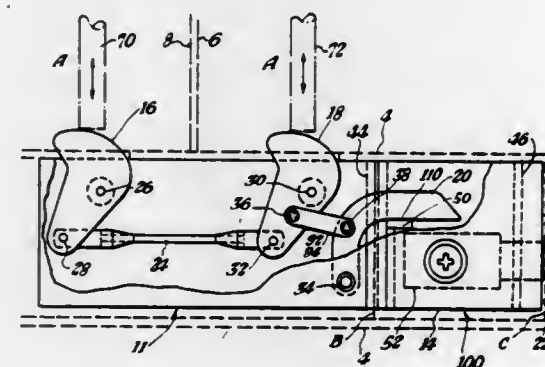
James VanderWyde, 1730 NW 87 Ave., Plantation, Fla. 33322

Filed Oct. 5, 1981, Ser. No. 308,812

Int. Cl.<sup>3</sup> B65D 55/14; E05B 65/08; E05C 3/06, 9/16

U.S. Cl. 70—167

4 Claims



a cam lock assembly having a housing, a cam actuator lever, at least one cam lock, and interconnecting linkage between said lever and said cam lock;

said lever and said cam lock mounted for rotation within said housing;

said linkage operably connected between and translating the pivoting movement of said lever into rotation of said cam lock;

said cam lock rotation effectuating locking engagement or releasing disengagement of said cam lock into a locking cavity in the lower edge of the access door system; and a removable lock assembly having a lock plate with a generally central key hole, a dead-bolt lock connected to the inner surface of said lock plate, a cover plate integral to and covering the outer surface of and partially extending beyond each vertical edge of said lock plate and having a generally central key hole, and a positioning plate integral and perpendicular to the inner surface of said lock plate;

said cover plate engaging adjacent the outer surface of the adjacent said housing to securely position one side of said lock assembly;

said dead-bolt lock releasably engaging said housing to securely position the other side of said lock assembly;

said cover plate preventing insertion of tools to disengage said locking system when said lock assembly is in place;

said key holes in said lock plate and said cover plate positioned so that a key will pass through said key holes into said lock;

said lock assembly enclosing said lever to prevent access to said lever;

said positioning plate contacting and securing said lever in either a lever-open position or a lever-locked position in relation to said cam lock.

4,422,314

**LOCK FOR A FUEL LINE VALVE**

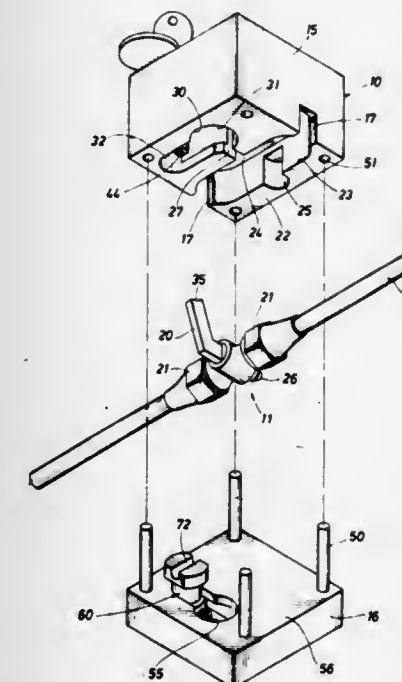
Wilbur H. Cooper, 2558 Munger, Houston, Tex. 77023

Filed Mar. 13, 1981, Ser. No. 243,595

Int. Cl.<sup>3</sup> B60R 25/04; E05B 15/16, 65/12; F16K 35/10

U.S. Cl. 70—242

3 Claims



1. An anti-theft device for protecting vehicles against theft by locking a fuel line valve in a closed position comprising:

a solid body member constructed of aluminum and having a recess for receiving a fuel line valve and valve handle in a closed position for preventing flow through the valve, said recess having openings for receiving piping attached to the valve;

a lid member constructed of aluminum and adapted to cover said recess and said openings for enclosing a fuel line valve in a closed position within said body member;

pin means extending transverse to said lid member and disposed within said lid member and said body member when said lid member covers said recess, said pin means being constructed of hardened steel;

locking means for interconnecting and releasing said lid member relative to said body member including lug means in one of said lid member and said body member said lug means being rotatable between an interconnecting position locking said lid member to said body member and a released position unlocking said lid member relative to said body member and including key operating means in the other of said lid member and said body member for rotating and lug means, said key operating means and said lug means having means for connecting said key operating means and said lug means to one another when said lid member covers said recess.

4,422,315

**KEY HOLDER**

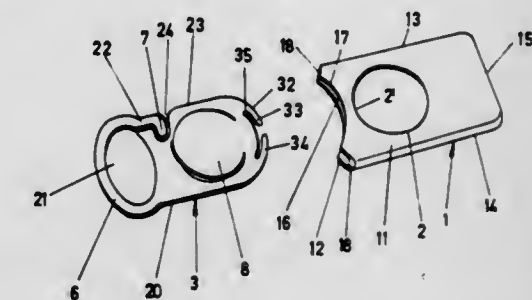
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Präsen KG Weber & Co., Solingen, Fed. Rep. of Germany  
Filed Jul. 7, 1981, Ser. No. 280,970

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3027979

Int. Cl.<sup>3</sup> A44B 15/00; A45C 11/32

U.S. Cl. 70—456 R

14 Claims



1. In a key holder having at least one elastic ring which can be inserted through a hole in a key head, which ring is continued by sections which can be inserted into a flat sleeve and held therein in a detent position, the improvement wherein said sleeve has a wall forming at least one shaft and an opening formed in said wall,

at least one plate having the ring extending from one side edge of said plate in one piece therewith and in the same plane therewith, said plate being insertable into said shaft of said flat sleeve,

said plate is made of elastic material and is formed with a notch on another side edge thereof, said notch in an inserted position of said plate in said sleeve is disposed within said shaft of said flat sleeve,

said ring has an end extending freely with inherent elastic biasing into said notch such that said end is bendable out of said notch and automatically returnable therein upon release by the elastic biasing,

said plate forms a detent pawl formed as a push button, said detent pawl snaps into said opening in said wall of said flat sleeve in said inserted position,

said sleeve constitutes means for securing said end of said ring in three dimensions in cooperation with said notch when said plate is in said inserted position in said sleeve, whereby said end of said ring is held substantially immovable in three-dimensions in said inserted position of said plate in said shaft of said sleeve, via said sleeve and said notch, and respectively when said end of said ring is moved out of said shaft after release of said detent pawl from said opening said end of said ring is automatically free to be bent open out of said notch for the insertion and removal of keys.

4,422,316

**KEY CASE**

Richard D. Thomas, 5816 W. 55th St., Chicago, Ill. 60638, and  
William R. Kjeldsen, 10352 S. Homan Ave., Oak Lawn, Ill. 60655

Filed Jul. 16, 1981, Ser. No. 283,995

Int. Cl.<sup>3</sup> A47G 29/10

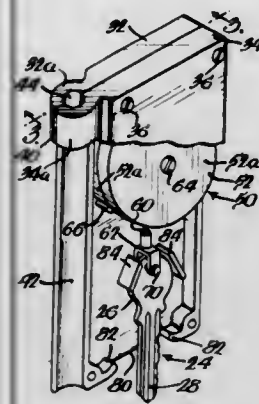
U.S. Cl. 70—456 R

5 Claims

1. In combination with a door attached to a door frame by hinge means having a removable pin and including a lock on said door having a lock cylinder for receiving a key for operating said lock cylinder, a key case having a sleeve adapted to be aligned with the hinge means of the door and to receive said removable pin for securement to said hinge means, a retracting mechanism in said key case including a flexible member having a length at least as great as the spacing between said hinge means and said lock cylinder attached at the free end of the flexible member, an opening in the key case for admitting the key, and stop means within the key case defining a stored

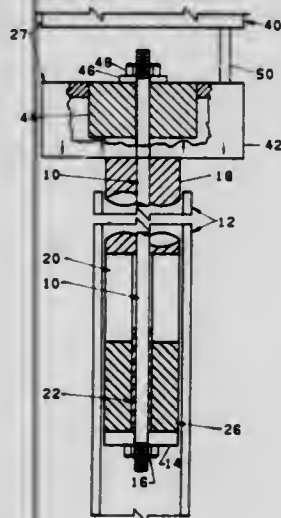


position for said key whereby a portion of the key extends outwardly through the opening in the key case, said portion of the key being adapted to be gripped in an emergency situation



and moved to said lock cylinder to operate it and said retracting mechanism being adapted to return said key to its stored position when released or dropped.

**4,422,317**  
**APPARATUS AND PROCESS FOR SELECTIVELY EXPANDING A TUBE**  
Richard A. Mueller, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.  
Filed Jan. 25, 1982, Ser. No. 342,338  
Int. Cl.<sup>3</sup> B21D 39/08  
U.S. Cl. 72—58

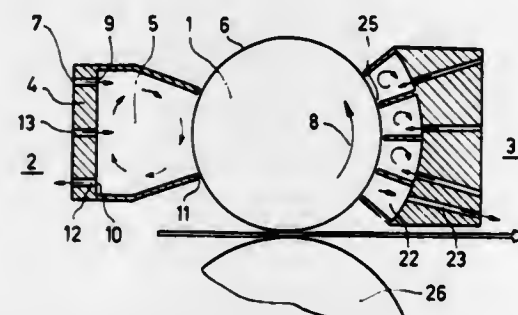


1. An apparatus for radially expanding the wall of a tube at selective locations about the circumference of the tube comprising:

- (a) a shaft extending axially inside the tube;
- (b) an inner cap bound to the shaft for longitudinal axial movement in combination with the shaft with respect to the tube;
- (c) an outer cap slidably mounted on and along the shaft for longitudinal axial movement on and along the shaft with respect to the tube, said outer cap including at least one prong means bound thereto;
- (d) a bushing means slidably mounted on and along the shaft between the outer cap and the inner cap for longitudinal axial movement on and along the shaft with respect to the tube, said bushing means including a structure defining at least one longitudinal slot longitudinally traversing said bushing means, said longitudinal slot registering said prong means therein;
- (e) an elastomeric means slidably lodged within the longitudinal slot of said bushing means; and
- (f) a means for pulling the shaft in one axial direction while simultaneously pushing the outer cap in the opposite axial direction, such that when the inner cap contacts the bushing means and the prong means contacts the elastomeric means the continuing respective axial forces from pulling

and pushing, in combination with the prong means of the outer cap in contact with the elastomeric means within the longitudinal slot, compress and thereby radially expand the elastomeric means at predetermined selective locations against the wall of said tube resulting in selective radial expansion of the tube wall.

**4,422,318**  
**ROLLER WITH A ROLLER SURFACE WHICH IS TO BE HEATED OR COOLED**  
Alfred Christ, Zurich; Rolf Lehmann, Rudolfstetten, and Beat Schlatter, Mutschellen, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland  
Filed Jan. 19, 1981, Ser. No. 226,540  
Claims priority, application Switzerland, Jan. 25, 1980, 603/80  
Int. Cl.<sup>3</sup> B21B 27/06  
U.S. Cl. 72—200



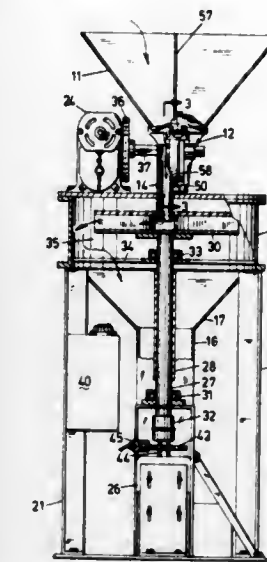
1. A roller having a surface which is to be heated or cooled by means of a fluid and equipped with heat exchange apparatus comprising at least one chamber for said fluid which is adjacent and opens toward said surface and has a substantially square internal cross section in a plane transverse to the roller axis; chamber walls which coact with said roller surface to form a fluid gap; means clamping the chamber in the circumferential direction of the roller; an inlet duct having a mouth through which said fluid is introduced into the chamber and which duct is sized to cause the inflowing fluid to experience a pressure drop of less than 5 bar; and a fluid outlet duct located behind the mouth of the inlet duct in the direction of movement of the roller surface and through which fluid leaves the chamber, the combination of said chamber cross section and relative duct orientation serving to create turbulence in the fluid within the chamber and the heat exchange apparatus serving to limit the pressure in the chamber to less than 5 bar.

**4,422,319**  
**APPARATUS FOR TESTING GRAINS FOR RESISTANCE TO DAMAGE**  
Marshall F. Finner, Middleton, and Shiv S. Singh, Madison, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.  
Filed Sep. 21, 1981, Ser. No. 303,966  
Int. Cl.<sup>3</sup> G01N 3/30  
U.S. Cl. 73—12

1. Apparatus for testing agricultural grains for resistance to damage, comprising:

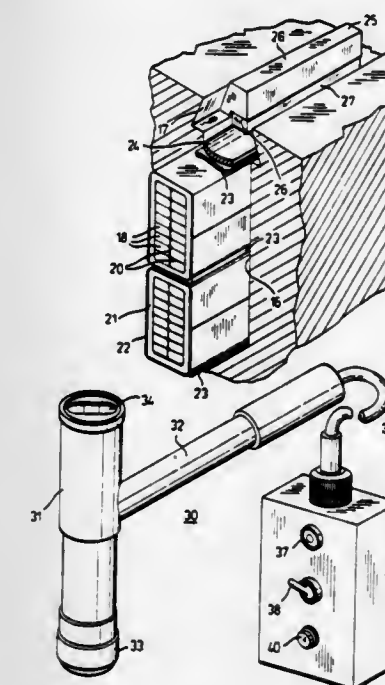
- (a) a housing having a smooth, cylindrical inner impact wall;
- (b) an impeller mounted for rotation within the housing having a cylindrical disk body with two opposite faces and a cylindrical peripheral rim, radial channels formed in one of the faces extending most of the distance of the radius of the disk body and intersecting at the center of the disk body and adapted to receive grains for testing at such

center, the channels being narrow relative to the diameter of the disk body, and;



(c) means for rotating the impeller at a substantially constant rotational speed.

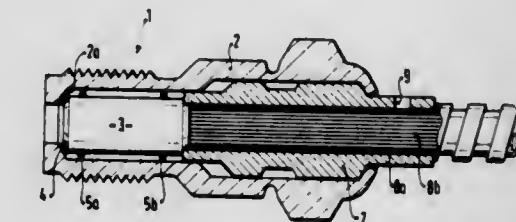
**4,422,320**  
**WEDGE TIGHTNESS MEASURING DEVICE**  
Donald G. Moorby; Graham T. McMillen, and Ralph S. Flemmons, all of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada  
Filed Feb. 1, 1982, Ser. No. 344,795  
Claims priority, application Canada, Feb. 20, 1981, 371363  
Int. Cl.<sup>3</sup> G01M 3/30; G01M 7/00  
U.S. Cl. 73—12



1. A device for determining the tightness of an object where tightness is related to the spring-like quality of the object, comprising:

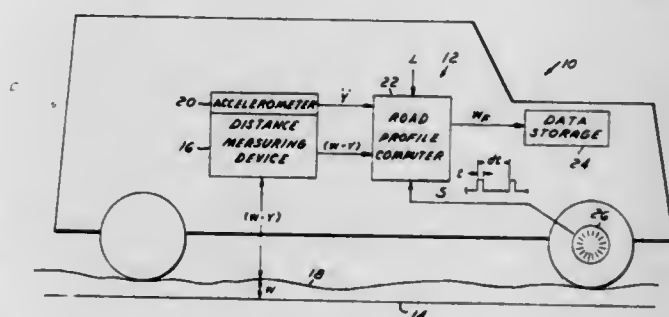
- a tapping unit for tapping the object whose tightness is to be determined;
- an accelerometer mounted to said tapping unit for providing a pulse signal having a time duration representing the time interval said tapping unit is in contact with said object;
- means connected to said accelerometer for receiving said pulse and providing an output representing said time duration only when the time integral of said pulse is between a predetermined upper and a lower limit; and,
- display means for receiving said output and responsive thereto for displaying a value proportional to said time duration and representing tightness.

**4,422,321**  
**COMBUSTION PROCESS SENSOR CONSTRUCTION**  
Klaus Müller, Tamm, and Franz Rieger, Aalen-Wasseraffingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Oct. 26, 1981, Ser. No. 314,651  
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042399  
Int. Cl.<sup>3</sup> G01L 23/22  
U.S. Cl. 73—35



1. Combustion process sensor structure to determine physical processes occurring in the combustion space of a combustion chamber in an internal combustion engine, having a tubular housing (2) having a central opening; a light guide cable (8b) extending into the opening of the housing; a quartz-glass rod (3) located in the opening of the housing, said housing comprising an inwardly extending shoulder (2a) formed on one end portion of the housing to receive and support a first end portion of the quartz-glass rod facing the combustion chamber; a sealing ring interposed between the first end portion of the quartz-glass rod and said inwardly extending shoulder; and an abutment sleeve (7) bearing against the other end portion of the quartz-glass rod, received and secured in fixed axial position within the housing to thereby retain the quartz-glass rod in position in the housing and in sealing engagement with said sealing ring (4), the light guide cable (8b) extending through the abutment sleeve (7) and being retained therein and positioned in light-transmitting relationship with respect to the other end portion of the quartz-glass rod (3).

**4,422,322**  
**METHOD AND SYSTEM FOR MEASUREMENT OF ROAD PROFILE**  
Elson B. Spangler, Bloomfield Hills, Mich. 48013  
Filed Apr. 27, 1982, Ser. No. 372,322  
Int. Cl.<sup>3</sup> G01B 5/28  
U.S. Cl. 73—105



1. In a method of measuring road surface profile which includes the steps of providing a vehicle having a suspended mass adapted to be propelled over a road surface, measuring distance from the suspended mass to the road surface as the vehicle is propelled over the road surface, determining acceleration of said suspended mass with respect to the road surface as the vehicle is propelled over the road surface, and determining road surface profile as a combined function of said distance and acceleration, the improvement for measuring said road surface profile independently of variations in vehicle speed over said



road surface comprising the steps of determining spatial domain acceleration of said suspended mass as a conjoint function of acceleration of said suspended mass with respect to said road surface and distance traveled over said road surface, and then determining said road surface profile in the spatial domain as a conjoint function of said spatial domain acceleration, said distance to the road surface.

4,422,323

# COMBUSTION PROCESS OBSERVATION ELEMENT CONSTRUCTION

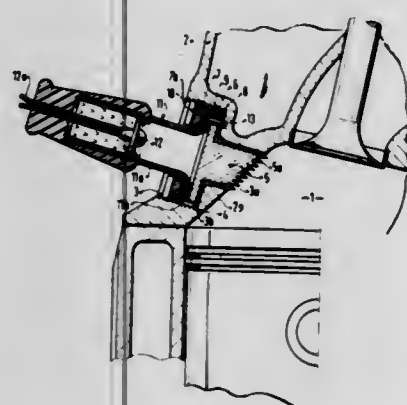
Ernst Linder, Mühlacker; Helmut Maurer, Vaihingen, and Klaus Muller, Tamm, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Jan. 22, 1982, Ser. No. 341,841

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106330

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73-116

9 Claims



1. The combination of a combustion chamber formed in a structural block (2, 22) particularly for observation of combustion within the cylinder block of an internal combustion engine to monitor combustion occurring therein,

a combustion process observation element for observation of combustion within the combustion chamber, wherein

the block is formed with an opening (3, 3') through which the observation element is introducible, and for retention therein, the opening including

a stepped bore, having an inner portion (3a) adjacent the combustion chamber (1) of a predetermined diameter, and an outer portion (3b) remote from the combustion chamber, and which has a diameter larger than said predetermined diameter of the inner portion,

and a seating surface (4) separating said inner and outer portions;

and wherein the observation element includes

a separable assembly comprising

a tubular housing (11) and light-sensitive pick-up means (12) located in the housing;

a window (5) closing off the opening and separating the interior of the combustion chamber (1) from the light-sensitive means (12),

the window having an inner portion (5a) having a cross section to fit into the inner portion (3a) of the opening, and an outer flange (6) having a cross section larger than said cross section of the inner portion and fitting against said seating surface (4) of the opening (3, 3') in the block; the tubular housing (11) being formed with a flange (11b) fitting against the flange (6) on the window;

and releasable positioning means (7, 14) securing and clamping the window and the housing in position with one surface of the flange (6) on the window fitting against the seating surface (4) of the opening (3), and one surface of the flange (11b) of the tubular housing (11) seated against an opposite surface of the flange (6) of the window (5), the

releasable positioning means (7, 14) bearing against the opposite surface of the flange (11b) of the tubular housing, the tubular housing providing an unobstructed light path between the window and the light-sensitive pick-up means (12) and being separable from the window to permit separate, individual removal and replacement of the window, and of the housing with the light-sensitive pick-up means therein, respectively.

4,422,324

# FOUR CHAMBER DIRECT DRIVE GAS METER

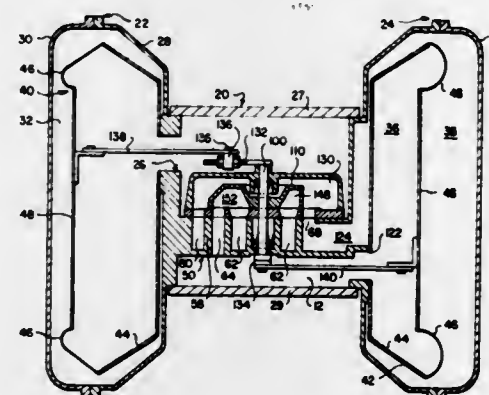
John L. Esola, Falls Creek, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1981, Ser. No. 323,330

Int. Cl.<sup>3</sup> G01F 3/20

U.S. Cl. 73-266

12 Claims



1. A gas meter comprised of two spaced diaphragm compartments each containing a diaphragm which divides its respective compartment into inner and outer discrete measuring chambers, a control chamber pressure sealed with respect to said measuring chambers and the exterior of the meter, discrete passage means extending between each of said measuring chambers and said control chamber, inlet passage means extending between said control chamber and the inlet to said meter, outlet passage means extending between said control chamber and the outlet of said meter, valve means within said control chamber, rotatable shaft means having a first portion enclosed within said control chamber and which is drive connected with said valve means and a second portion which extends exteriorly of said control chamber, crank means drive connected with said second portion of said shaft means, and means connecting said diaphragms to said crank means whereby upon concomitant reciprocating movement of said diaphragms said valve means will be driven to connect each of said discrete passages sequentially with said inlet passage means and said outlet passage means, the second portion of said shaft being comprised of two extensions of said shaft each extending from an opposite side of said control chamber, and said crank means is comprised of a crank arm secured to each of said extensions, each of said diaphragms being respectively connected to one of said crank arms.

4,422,325

# DUAL PURPOSE WATER METER COVER

Ray Sutherland, Hopewood, and Mark S. Wood, Lemont Furnace, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1982, Ser. No. 351,828

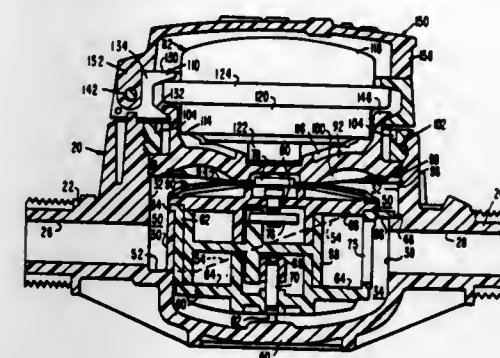
Int. Cl.<sup>3</sup> G01F 15/14

U.S. Cl. 73-273

9 Claims

1. A water meter comprised of a generally hollow main case having an opening, a closure member for closing said opening, securing means associated with said closure member and en-

gaging said main case for releasably retaining said closure member in said opening, a register cover removably mounted



in a normal case where the charges waste is molten in the furnace; and  
(6) monitoring the pressure P to detect a shift of the pressure P from the relationship obtained in step (5) to thereby detect the formation of a bridge inside the furnace comprising non-molten solid matter of the charged waste.

4,422,327

# LIQUID LEVEL INDICATOR APPARATUS

Stig Anderson, V. Frölunda, Sweden, assignor to Ingenjörfirman Installationsjäst AB, Hisings Backa, Sweden

Filed Mar. 18, 1981, Ser. No. 244,894

Int. Cl.<sup>3</sup> G01F 23/00; B65G 11/20

U.S. Cl. 73-303

1 Claim

on said meter, means on said cover for disengaging said securing means from said main case.

4,422,326

# METHOD OF ASCERTAINING THE STATE INSIDE MELTING FURNACE FOR RADIOACTIVE WASTE

Noriaki Sasaki, Tokai, Japan, assignor to Doryokuro Kakunensho Kaihatsu Jigyodan, Tokyo, Japan

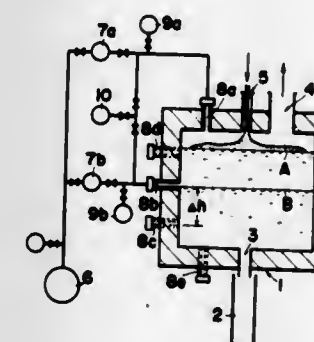
Filed May 19, 1981, Ser. No. 266,063

Claims priority, application Japan, Aug. 26, 1980, 55-117342

Int. Cl.<sup>3</sup> G01F 23/14

U.S. Cl. 173-291

4 Claims



1. A method of ascertaining the state inside a melting furnace for a radioactive waste, which method comprises the steps of:

- (1) blowing a gas into a molten matter in the melting furnace by using a least two slender tubes including a first tube opening into the furnace at an upper point thereof and a second opening into the furnace at a lower point thereof with a gap  $\Delta h$  between the upper and lower points;
- (2) detecting a back pressure difference  $\Delta P$  at the openings of the first and second tubes to determine the density  $\rho$  of the molten matter in accordance with the following equation:

$$\rho = \Delta P / g \Delta h$$

where  $g$  is the gravitational acceleration;

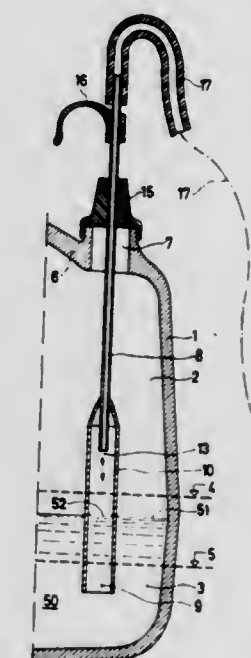
- (3) detecting a minimum pressure  $P$  required for releasing gas bubbles into the molten matter from one of the at least two slender tubes;
- (4) determining the level  $h$  of the molten matter in the furnace using the density determined in step (2) and in accordance with the following equation:

$$h = \frac{P - P_0 - 2\gamma/r}{\rho g}$$

where

$P_0$  is the pressure on the surface of the molten matter,  $\gamma$  is the surface tension of the molten matter, and  $r$  is the radius of the one of the at least two slender tubes;

- (5) determining the relationship between a quantity of the waste charged into the melting furnace and the pressure  $P$



1. In a vehicle: an apparatus for indicating the level of at least two bodies of different liquids in said vehicle, a relatively flat housing mounted in said vehicle, and having a front and a rear,

a chamber in said housing and having a display tube containing an indicator liquid and being arranged at the front of said housing,

selecting means arranged at the rear of said housing, an air passage connected between said chamber and said selecting means,

at least two air conduits connected between said selecting means and said at least two bodies of liquid,

at least two dip tubes immersed respectively in said bodies of liquid and connected each to one of said air conduits,

air displacing means arranged within said housing and operatively connected to said air passage,

whereby upon operation of said air displacing means the volume portion of a selected one of said bodies of liquid present inside the selected dip tube is expelled therefrom by air pressurized inside the selected one of said air conduits, whereupon the pressure of said selected body of liquid is brought into communication with said chamber containing said indicator liquid so as to raise the level of said indicator liquid inside said display tube to a level corresponding to the level of said selected body of liquid,

said selecting means comprising a switching member for individually connecting a selected one of said air conduits with said air passage, said switching member consisting of an arm pivotally supported at one of its ends, the other end carrying a grip protruding laterally from said housing,

also comprising a series of notches adapted to receive said arm, each of said notches defining a switching position of said switching member, and a series of projections respectively separating said series of notches, and also comprising a spring arrangement biasing said switching member



against a selected one of said notches for a positive guidance thereof, whereby upon said switching member approaching any one of said switching positions it is guided for a movement axially of said air passage, and whereby in the switching position of said switching member a sealed connection between said switching member and said air passage is established through the action of said spring bias and one of said notches.

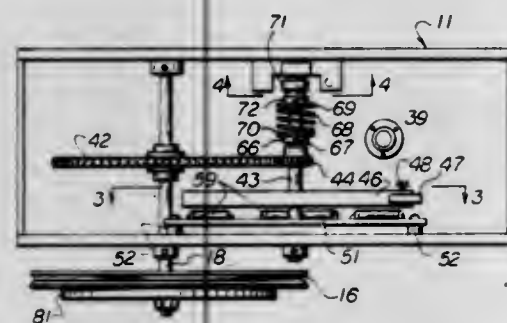
4,422,328

## LIQUID LEVEL SENSOR

Charles E. Luchessa, San Rafael, and Timothy E. Brown, Danville, both of Calif., assignors to Sierra Misco, Berkeley, Calif.  
Filed Oct. 13, 1981, Ser. No. 310,792  
Int. Cl.<sup>3</sup> G01F 23/12

U.S. Cl. 73—313

7 Claims



1. A liquid level sensor comprising a shaft, means for turning said shaft dependent upon the upper surface level of the liquid to be sensed, an arm pivotable about an axis as said shaft turns, a magnet on said arm, a board parallel to the plane of movement of said magnet, a plurality of reed switches on said board disposed radially with respect to said axis and angularly spaced apart so that as said magnet turns said switches are closed one-by-one, and an electric circuit including an electronic digital accumulator and said switches, said accumulator counting the number of times said switches are closed and adding or subtracting from the previous number depending on the direction of rotation of said arm, a countershaft parallel to said first-mentioned shaft and means for turning said countershaft proportional to turning of said first-mentioned shaft, said arm being fixed to said countershaft, first, second and third concentric arcuate conductors on said board, connected into said electric circuit, a first series of switches being connected to the first and second conductors, a second series of said switches being connected to the first and third conductors, switches of said first and second series alternating around said board.

4,422,329

## APPARATUS AND METHOD FOR MEASURING CHANGES IN AMBIENT GRAVITY FIELDS

Christopher Richards, Arvada, and Karl Pelegrin, Evergreen, both of Colo., assignors to Delta-G Instruments, Inc., Evergreen, Colo.

Filed Feb. 17, 1981, Ser. No. 234,893

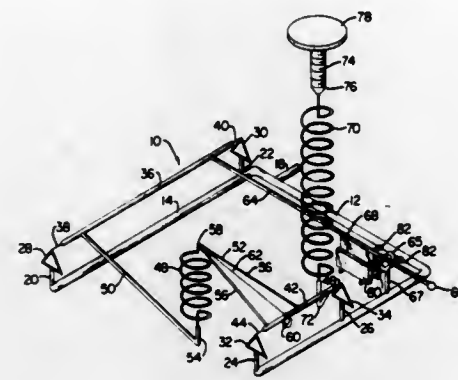
Int. Cl.<sup>3</sup> G01V 7/08

U.S. Cl. 73—382 R

21 Claims

1. In a gravity meter mounted to a rigid framework and having a reaction mass mounted on a weight beam coupled to a suspension system whereby said beam is movable in response to changes in the ambient gravitational field, the improvement comprising a nulling and position sensor assembly including a dielectric mass and a pair of spaced-apart conductors, one of said dielectric mass and said pair of conductors being rigidly secured to said weight beam for movement in a first plane parallel to the plane of movement of said weight beam and the other of said dielectric mass and said pair of conductors being rigidly and immovably secured to said framework, said conductors having a cavity therebetween and oriented in places parallel to and on either side of said first plane and a portion of

said dielectric mass extending into said cavity, movement of said beam causing corresponding transverse movement of said dielectric in said first plane and into and out of said cavity,



4,422,330

## LOW SUSCEPTIBILITY PROOF MASS FOR A SINGLE AXIS DRAG COMPENSATION SYSTEM

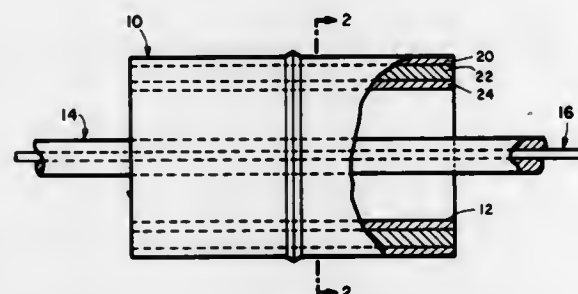
Robert E. Fischell, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 7, 1981, Ser. No. 261,353

Int. Cl.<sup>3</sup> G01P 15/08

U.S. Cl. 73—517 R

8 Claims



1. A satellite single axis drag compensation system of the type including a cylindrical proof mass of predetermined length and a longer conductive rod extending coaxially through a central bore of said proof mass and adapted to carry a current for inducing eddy currents in said proof mass for suspension thereof by repulsion forces, said system being characterized by the improvement comprising:

an elongate, permanent magnet element, carried by said conductive rod, said element being coaxial with said rod and having a length greater than said predetermined length and being magnetized perpendicularly to its axis and uniformly along its length whereby movements of said proof mass are damped; and said proof mass comprising a plurality of concentric cylindrical layers of conductive material, said layers of conductive material being alternately of diamagnetic and of paramagnetic susceptibility, whereby total susceptibility of said proof mass is below a level that will interact with said permanent magnet element with sufficient force to overcome said repulsion forces.

4,422,331

## PHASE MODULATOR LASER ACCELEROMETER

Clifford G. Walker, 915 Weatherly Rd., Huntsville, Ala. 35803

Filed Apr. 2, 1982, Ser. No. 364,745

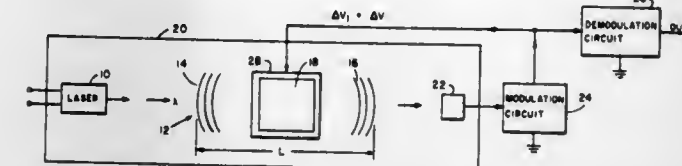
Int. Cl.<sup>3</sup> G01P 15/13

U.S. Cl. 73—517 B

10 Claims

1. A phase modulation laser accelerometer comprising: a laser for generating a beam of coherent light, photodetection

means, a resonant cavity, made of a material having refractive index that changes in response to pressure, disposed between said laser and said photodetection means for providing an optical path therebetween, a proof mass disposed adjacent to said resonant cavity for subjecting said cavity to pressure in response to acceleration substantially normal to the direction



of said laser beam, phase modulation means disposed for shifting the phase of laser light passing through said cavity, and feedback means responsive to said photodetection means for providing a variable voltage feedback to said phase modulation means in response to acceleration forces, said variable voltage feedback being indicative of said acceleration forces.

4,422,332

## DYNAMIC FOCUSING AND SECTORIAL SCANNING ECHOGRAPHY DEVICE

Jean-Charles Dubuis, Saint Martin d'Heres; Michel Martin, Eybens; Bernard Piaget, Gieres; Jean-Francois Piquard, Vizille, and Jacques Vacher, Seyssinet, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

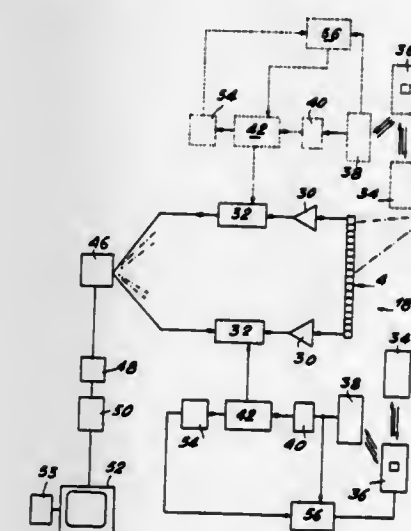
Filed May 18, 1981, Ser. No. 264,576

Claims priority, application France, May 19, 1980, 80 11109

Int. Cl.<sup>3</sup> G01N 29/00

U.S. Cl. 73—625

6 Claims



1. An echography device containing a linear bar of juxtaposed piezoelectric transducers, said bar comprising a transmitting portion, said transmitting portion comprising transmitting transducers adapted to transmit ultrasonic waves, said transmitting transducers being energized by delayed electric signals so that said transmitted ultrasonic waves are oblique with respect to said bar, and a receiving portion, said receiving portion comprising receiving transducers adapted to receive ultrasonic waves reflected from echo-points, each of said receiving transducers being electrically connected to a separate shifting analog register controlled by clock signals delivered by an associated oscillator, each of said shifting registers being adapted to generate a delay equal to the clock period, wherein said oscillators are frequency-controlled and each of said oscillators is associated with a frequency servo-device adapted to render the frequency delivered by said oscillator equal to a reference frequency, and further comprising:

(a) means for digitally storing a value related to said clock signals of each of said oscillators so as to store the plurality of delays provided by said shifting registers in order that the signals detected by said receiving transducers correspond to the ultrasonic waves reflected by a single echo-

point, said means permitting the modification of said delays for each echo-point and at any moment, said delays being determined by said reference frequency which is dependent on the transmitting direction of said ultrasonic waves; and

(b) an adder connected to said shifting analog registers, the output signal provided by said adder corresponding to the amplitude of the ultrasonic waves reflecting from said single echo-point.

4,422,333

## METHOD AND APPARATUS FOR DETECTING AND IDENTIFYING EXCESSIVELY VIBRATING BLADES OF A TURBOMACHINE

Robert L. Leon, Roslyn, Pa., assignor to The Franklin Institute, Philadelphia, Pa.

PCT No. PCT/US80/01341, § 371 Date Apr. 29, 1982, § 102(e)

Date Apr. 29, 1982, PCT Pub. No. WO82/01416, PCT Pub.

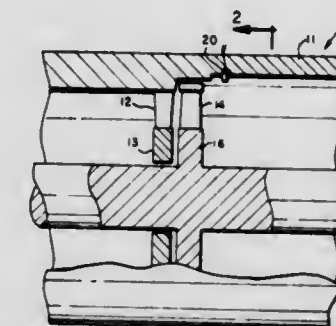
Date Apr. 29, 1982

PCT Filed Oct. 10, 1980, Ser. No. 385,661

Int. Cl.<sup>3</sup> G01M 15/00

U.S. Cl. 73—660

9 Claims



1. A method for detecting and identifying an excessively vibrating blade of the rotating portion of a turbomachine by analysis of the characteristic Doppler waveform resulting from the vibrating blade comprising the steps of:

sensing the acoustic energy at a fixed location proximate the rotating portion of the turbomachine to generate a composite electrical signal; synchronous time averaging the composite signal to remove random noise and non-order related components therefrom; blanking out the order related noise components of the synchronous time averaged signal to reveal the characteristic Doppler waveform of the vibrating blade; and displaying the resulting characteristic Doppler waveform to indicate the location of the excessively vibrating blade and its relative vibration amplitude.

4,422,334

## HYDROSTATIC BEARING TYPE COUPLING FOR USE IN VIBRATING MACHINE

Osamu Yasuda, Yokosuka, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1981, Ser. No. 312,837

Int. Cl.<sup>3</sup> B06B 1/10; G01M 7/00

U.S. Cl. 73—665

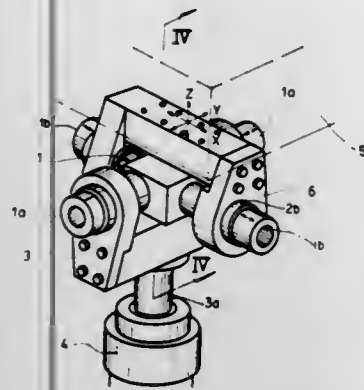
5 Claims

1. A device for coupling a vibrating test table to a vibrator, comprising:

(a) a first pair of spaced axially aligned shafts, (b) a second pair of spaced axially aligned shafts which are spaced equally to the spacing of the first pair, and the axis of which intersects the axis of the first pair midway between the shafts of the first pair, whereby the shafts are positioned in co-planar relation at 90° intervals about the point of intersection of their axes, (c) a hydrostatic bearing for each shaft which permits rotational and sliding movement of the shaft in the bearing,



(d) means connecting the hydrostatic bearings for one pair of aligned shafts to a vibrator, and



(e) means connecting the hydrostatic bearings for the other pair of aligned shafts to a vibration table.

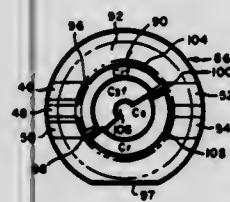
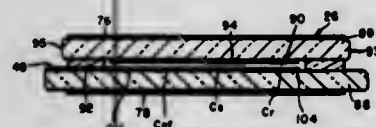
#### 4,422,335 PRESSURE TRANSDUCER

David H. Ohnesorge, and Frank J. Antonazzi, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 25, 1981, Ser. No. 247,482  
Int. Cl.<sup>3</sup> G01L 9/12

U.S. Cl. 73-724

14 Claims

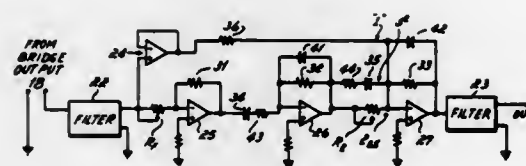
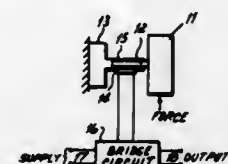


1. A capacitive pressure transducer comprising:  
a first substrate of insulative material;  
a second substrate of insulative material;  
at least one of said substrates being flexible and deforming in response to a pressure change;  
a first signal plate of electrically conductive material formed on a surface of said first substrate;  
a second signal plate of electrically conductive material formed on said first substrate surface;  
a third signal plate of electrically conductive material formed on said first substrate surface;  
a fourth signal plate of electrically conductive material formed on said first substrate surface;  
a fifth common plate of electrically conductive material formed on a surface of said second substrate;  
said first and second substrates positioned from each other such that a gap exists between said plates on said first and second surfaces wherein first, second, third, and fourth capacitors are formed between said first, second, third, and fourth plates and said fifth plate, respectively, said fifth plate serving as a common plate for combining excitation signals input to said signal plates into a single signal; and  
wherein said signal plates are formed on said first substrate and said common plate is formed on said second substrate such that the capacitance versus pressure characteristics for said first, second, third, and fourth capacitors have a predetermined relationship which does not vary because of the production variables of the transducer.

4,422,336  
INSTRUMENTATION RESONANCE COMPENSATION  
James C. Beebe, Medina, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio  
Filed Dec. 2, 1981, Ser. No. 326,558  
Int. Cl.<sup>3</sup> G01B 7/16

U.S. Cl. 73-769

6 Claims



1. An electronic compensation network, for compensating for mechanical instrumentation resonance in an instrumentation system which is responsive to a mechanical actuation to produce an electrical instrumentation output signal, the instrumentation system having a mechanical response characteristic representative of mechanical resonance which is substantially that of a simple resonant system having an equivalent transfer function in the form of an electrical second order filter comprising an electronic circuit having:  
an input coupled to the electrical instrumentation output signal of the instrumentation system,  
a plurality of sections which are interconnected to produce the inverse of the transfer function of the instrumentation resonance, the sections being interconnected to combine a first function representative of a constant term, a second function representative of a first derivative term, and a third function representative of a second derivative term, all of which operate upon the signal at the input to the compensation circuit, and  
coupled to the combined outputs of the interconnected circuit sections, an output at which is produced a compensation network output signal which is a substantially accurate representation of the mechanical actuation.

4,422,337  
METHOD OF COMPENSATING THE INTERFERENCE  
DC VOLTAGES IN THE ELECTRODE CIRCUIT IN  
MAGNETIC-CONDUCTIVE FLOW MEASUREMENT  
Peter Hafner, Therwil, Switzerland, assignor to Flowtec AG, Reinach, Switzerland  
Continuation-in-part of Ser. No. 254,634, Apr. 16, 1981, Pat. No. 4,382,387. This application Sep. 21, 1981, Ser. No. 304,169  
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037283; Aug. 17, 1981, 3132471  
Int. Cl.<sup>3</sup> G01F 1/60

U.S. Cl. 73-861.17

6 Claims

1. A method of compensating interference voltages occurring in the electrode circuit of an inductive flow measurement circuit where a periodically reversed DC magnetic field is applied to a flowing electrically conductive liquid and at least two electrodes are disposed in the liquid from which an alternating signal voltage is obtained, sampling said signal voltage during first and second sampling intervals respectively occurring during successive, opposite polarities of the signal voltage,

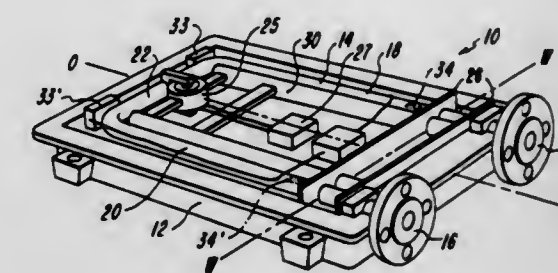
#### 4,422,338 METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT

James E. Smith, Boulder, Colo., assignor to Micro Motion, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 235,268, Feb. 17, 1981, abandoned. This application Jul. 6, 1981, Ser. No. 280,297  
Int. Cl.<sup>3</sup> G01F 1/84

U.S. Cl. 73-861.38

27 Claims

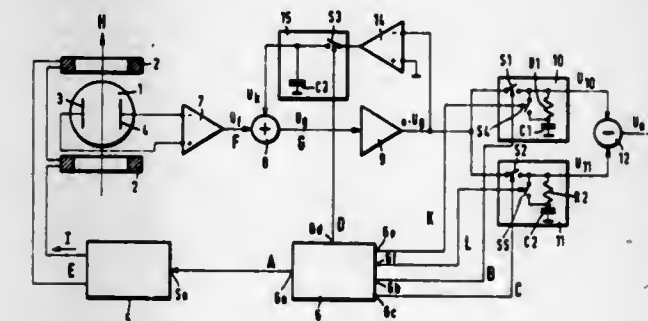


storing each sample value obtained during the first sampling interval in a first integrating storage member, storing each sample value obtained during the second sampling interval in a second integrating storage member and forming the difference of the sample values stored in the integrating storage members, said method comprising the steps of:

sampling the full instantaneous value of the signal voltage during a brief interval occurring at the beginning of each sampling interval and storing the sampled instantaneous value in its associated integrating storage member; and  
integrating the signal voltage by means of the associated integrating storage member during the remainder of each sampling interval subsequent to said brief interval.

5. Apparatus for effecting inductive flow measurement of an electrically conductive liquid flowing in a conduit, comprising:  
a magnetic field generator for generating a periodically reversed magnetic field passing through the conduit perpendicularly to the flow direction;

a measuring amplifier;  
two electrodes disposed in the conduit for applying to the measuring amplifier an alternating signal voltage;  
first and second integrating storage members, each comprising a resistor and a capacitor;  
first switching means connected between the output of said measuring amplifier and said first integrating storage member;  
second switching means connected between the output of said measuring amplifier and said second integrating storage member;



third switching means connected in parallel to the resistor of said first integrating storage member;  
fourth switching means connected in parallel to the resistor of said second integrating storage member;  
control means controlling said first and third switching means to connect said first integrating storage member to the output of said measuring amplifier during a first sampling interval occurring during each first polarity of the signal voltage and to short circuit the resistor of said first integrating storage member for a first brief interval occurring at the beginning of each said first sampling interval to thereby charge the capacitor of the first integrating storage member to the full instantaneous value of the signal voltage occurring during the first brief interval, said control means further controlling said second and fourth switching means to connect said second integrating storage member to the output of said measuring amplifier during a second sampling interval occurring during each second polarity of the signal voltage and to short circuit the resistor of said second integrating storage member for a second brief interval occurring at the beginning of each said second sampling interval to thereby charge the capacitor of the second integrating storage member to the full instantaneous value of the signal voltage occurring during the second brief interval; and  
circuit means connected to the outputs of said first and second integrating storage members for forming the difference of the stored sample values.

1. In a Coriolis force mass flow rate meter including at least one continuous curved conduit solidly mounted at the open ends of leg portions thereof, which conduit is adapted to oscillate about an axis passing substantially through the mounting points of the legs, and further including mass flow rate readout means adapted to indicate mass flow rate as a function of the time delays in each direction of oscillation between the passage of one side leg of the curved conduit through a predetermined point of its oscillation and the passage of the other side leg of said conduit through a corresponding predetermined point of its oscillation, the improvement which comprises:

at least one pair of sensors, one member of each pair being mounted on opposite side legs of the conduit, the sensors being adapted to generate an analog signal linearly representative of the actual oscillatory movement of the sides of the curved conduit at the location of the respective sensor; and

means to electronically detect the time delay between the analog sensor signals corresponding to the time difference in the passage of the opposite sides of the curved conduit through points near the mid-plane of oscillation; whereby the magnitude of the time delay between the sensor outputs representing the time difference in passage through the mid-plane of oscillation is a measure of the mass flow rate through the curved conduit.

#### 4,422,339 ORIFICE FITTING FOR A GAS PRESSURE DIFFERENTIAL-MEASURING SYSTEM

Adam F. Gall, and Howard P. McJunkin, Jr., both of Charleston, W. Va., assignors to McJunkin Corporation, Charleston, W. Va.

Filed Oct. 25, 1982, Ser. No. 436,458  
Int. Cl.<sup>3</sup> F15D 1/02

U.S. Cl. 73-861.61

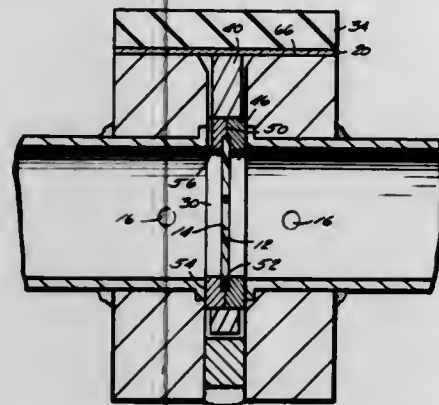
4 Claims

1. An orifice fitting for a gas pressure differential-measuring system, comprising:

- two block members, each having means defining an inner face and means defining a throughbore intersecting and extending through that face;
- two lengths of pipe each being flared at an inner end thereof so as to define a respective radially outwardly projecting circumferential flange;
- each pipe projecting into a respective said throughbore through the inner face of the respective block member and having an outer end portion of that pipe protruding from the opposite end of the respective throughbore to provide a pipe stub extending from the respective block member;
- a circumferential weldment joining each pipe stub to the respective block where that pipe stub emerges from the respective throughbore thus constituting two respective orifice block assemblies;



(e) a U-shaped spacer having two legs and a bridge, said two orifice block assemblies, disposed inner faces inwards, being disposed in sandwiching relation to said U-shaped spacer, and a weldment being provided about the external periphery of said U-shaped spacer, between the U-shaped spacer and both said blocks, thereby constituting a unitary body having a laterally opening slot through one side,



between the legs of the U-shaped spacer and in communication with the inner ends of both of said pipes;  
(f) said side of said body being constructed and arranged for mounting and sealing of an orifice holder assembly thereto; and  
(g) means defining a pressure tap through each said orifice block assembly spacedly adjacent said slot.

4,422,340

#### DIFFERENTIAL PRESSURE FLOWMETER FOR A GAS COOLED HIGH TEMPERATURE REACTOR BLOWER

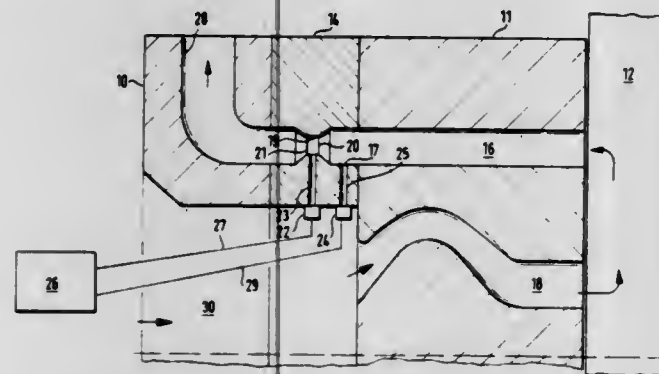
Jurgen Kolodzey, Ketsch; Josef Schoening, Hambruecken; Hans-Georg Schwieters, Ketsch, and Wilfried Stracke, Osterheim, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany  
Filed Jul. 31, 1981, Ser. No. 289,089

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031215

Int. Cl.<sup>3</sup> G01F 1/44

U.S. Cl. 73—861.63

2 Claims



1. An apparatus for measuring the flow of gas in a blower of a gas cooled high temperature nuclear reactor comprising:  
a blower shield communicating with a blower;  
an inlet conduit in said blower shield for conducting gas flow to said blower;  
an exit conduit in said blower shield for conducting gas flow from said blower;  
a venturi tube in said exit conduit, a first measuring channel communicating with the gas flow in said venturi tube, a second measuring channel communicating with the gas flow in said exit conduit upstream from said venturi tube and means for converting the relative gas flow in said first and second measuring channels into meaningful reactor information.

4,422,341

#### SNAP-IN DRAFT SENSOR

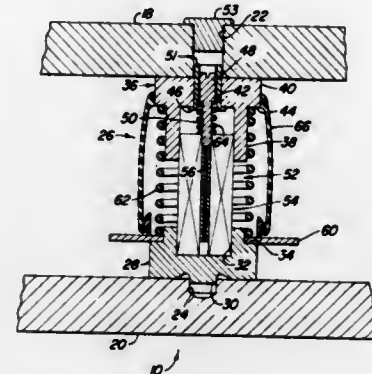
Eugenio Espiritu Santo, and Kenneth D. Baxter, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 21, 1981, Ser. No. 332,577

Int. Cl.<sup>3</sup> G01L 1/14, 5/13

U.S. Cl. 73—862.64

5 Claims



1. A force sensor comprising:  
a deformable frame having spaced-apart portions defining an opening therebetween, and having a variable separation depending on force-induced deformation of the frame, each spaced-apart portion including a recess extending therein from the opening; and  
a snap-in, spring-loaded transducer means releasably mountable in the opening for sensing variations in separation between the spaced-apart portions of the frame, the transducer means including a base member having a projection which is releasably receivable by one of the recesses, a cap member having a stub which is releasably receivable by the other of the recesses and resilient means acting between the base and the cap members and biased for releasably maintaining the projection and the stub in their respective recesses, the transducer means further comprising a linear position sensor having a first member fixed to the base member and a second member movable with respect to the first member and coupled for movement with the cap member, the cap including means for adjusting the position of the second member with respect to the first member.

4,422,342

#### TEMPORARY VANES TO STRAIGHTEN GAS FLOW IN SCRUBBERS

Donald L. Smith, Bethel Park; Zenon V. Kosowski, McMurray, both of Pa., and Robert R. Marks, Jr., Fairmont, W. Va., assignors to Conoco Inc., Wilmington, Del.

Filed Mar. 15, 1982, Ser. No. 358,126

Int. Cl.<sup>3</sup> G01N 1/22

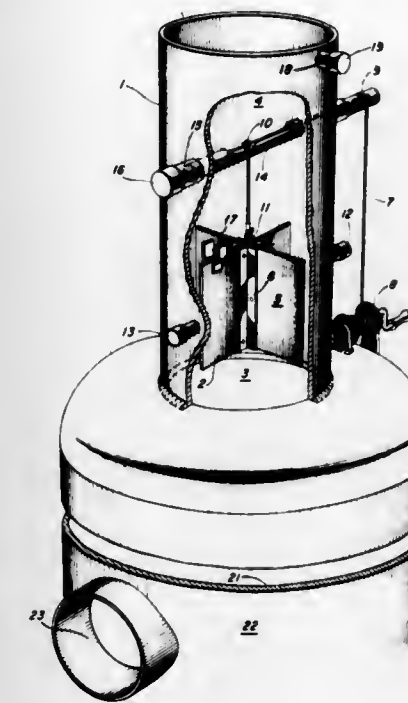
U.S. Cl. 73—863.43

5 Claims

1. A method of flow straightening and sampling gas in the stack of a gas scrubber said gas during normal operation of the scrubber having substantially nonaxial flow so as to retain within said stack droplets carried by said gas, comprising the sequence of steps as follows:

- providing a plurality of flow straightening panels and a flow straightening panel support means in the chamber of the gas scrubber, said panels connected to said panel support means to form a flow straightener,
- providing upper lifting support means to support said flow straightener,
- lifting said flow straightener from said scrubber chamber into said scrubber stack using said lifting support means,
- providing said flow straightener with a lower safety support means to support said flow straightener in said stack,
- conveying gas through said scrubber stack and through said flow straightener, whereby said gas flow is straightened to more closely approximate axial flow,

- sampling gas in said stack after said gas has passed through said flow straightener,
- removing said safety support means and lowering said flow straightener into said scrubber chamber,



- disconnecting said panels from said panel support means and removing said panels and panel support means from said scrubber chamber,
- conveying gas through said scrubber stack in substantially droplet retaining nonaxial flow.

4,422,343

#### KITCHEN APPLIANCE WITH INTERCHANGABLE ATTACHMENTS

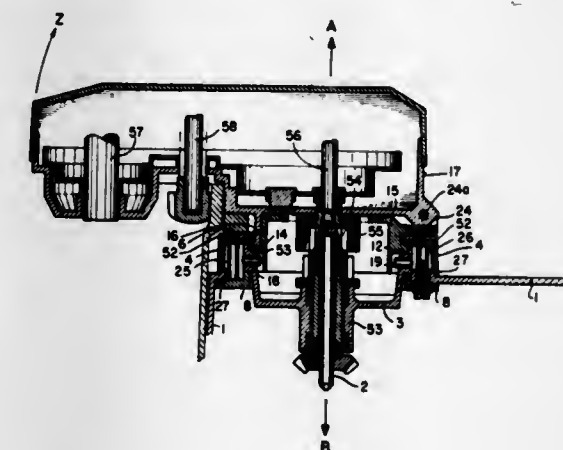
Günther Falkenbach, Eschborn; Dieter Seuwen, Frankfurt; Jürgen Schneider, Kronberg, and Hartwig Kahlcke, Bad Soden, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 360,074

Int. Cl.<sup>3</sup> A47J 43/44

U.S. Cl. 74—16

13 Claims



1. A kitchen appliance, comprising:  
a motor base;  
a power takeoff shaft extending outwardly from said motor base;  
a retainer ring surrounding said power takeoff shaft and rigidly secured to said motor base, said retainer ring having a plurality of radially and inwardly extending pins;  
a tension ring having a circular flange portion with a plurality of recesses and a radially and outwardly extending activation arm;  
a clamping ring;  
means for interconnecting said tension and clamping rings to thereby form a tension ring assembly, wherein said re-

tainer ring is clamped between said tension and clamping rings such that said tension ring assembly is rotatable about said power shaft but is substantially nondisplaceable in the longitudinal direction of said power shaft;  
a tool attachment having a base with radially outward extending protrusions for extending through said tension ring recesses to secure said tool attachment to said tension ring assembly; and  
a container attachment having a base with a plurality of recesses for receiving said pins to secure said container attachment to said retainer ring.

4,422,344

#### LOAD PROPORTIONAL ANTIBACKLASH GEAR DRIVE SYSTEM

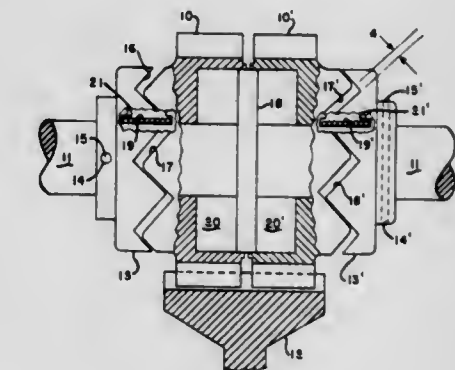
Hermann A. Wuthrich, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 7, 1981, Ser. No. 281,148

Int. Cl.<sup>3</sup> F16H 55/18, 57/00, 55/12

U.S. Cl. 74—409

2 Claims



1. A load proportional antibacklash single step gear drive system for transmitting to a driven gear torque applied to a rotating drive shaft which comprises:

- a split pinion gear supported by said drive shaft, said gear having a first pinion half and a second pinion half axially spaced on said shaft, each of said halves having a first tooth means for engaging said driven gear and a second tooth means;
- a first driving member, mounted for rotation with said drive shaft, and having tooth means for driving engagement with said second tooth means of said first pinion half;
- a second driving member, mounted for rotation with said drive shaft, and having tooth means for backlash eliminating engagement with said second tooth means of said second pinion half in opposite rotational sense to said first driving member; and
- means, responsive to the applied torque on said drive shaft, for urging said first pinion half into engagement with said first driving member, and for urging said second pinion half into engagement with said second driving member.

4,422,345

#### TWO-WAY CONTROL LEVER ROTATABLE IN CAB WALL FOR SOUND SEALING

Merlin G. Green, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 11, 1981, Ser. No. 301,166

Int. Cl.<sup>3</sup> G05G 9/04

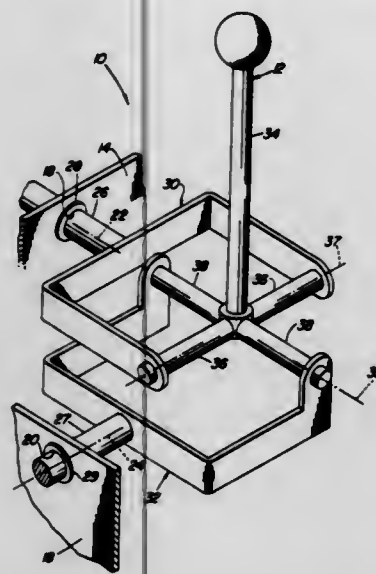
U.S. Cl. 74—471 XY

2 Claims

1. A two-way control lever mounted inside a cab for controlling functions exteriorly of the cab, comprising: said cab having a wall section provided with first and second holes respectively located in first and second vertical planes intersecting within the cab; first and second shafts respectively



pivotaly mounted in said first and second holes; first and second crank arms respectively fixed to said first and second shafts and having respective portions located for rotation in said second and first planes; and an upright handle having a



first lower end portion mounted in said first crank arm for rotation about a first axis located in the second vertical plane and having a second lower end portion mounted in said second crank arm for rotation about a second axis located in the first vertical plane.

4,422,346

**TILTABLE STEERING MECHANISM**

Masumi Nishikawa, Toyake, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

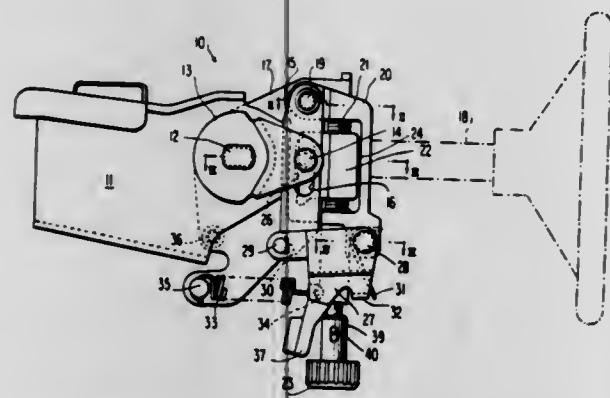
Filed Jul. 14, 1981, Ser. No. 283,248

Claims priority, application Japan, Jul. 16, 1980, 55-10049[U]; Jul. 18, 1980, 55-102629[U]

Int. Cl.<sup>3</sup> B62D 1/18

U.S. Cl. 74-493

5 Claims



1. A tiltable steering mechanism comprising a first bracket adapted to be secured a vehicle body, a second bracket for rotatably supporting a steering shaft pivotally mounted on said first bracket, a sub-bracket secured to one side of said first bracket and having pin means at one end thereof, a first pivot pin secured to second bracket substantially above said pin means, a first locking lever pivotally mounted on said first pivot pin and having an elongated slot slidably engageable with said pin means, a tilt lever pivotally mounted on said first pivot pin, a second pivot pin secured to said tilt lever in spaced relation to said first pivot pin, a second locking lever pivotally supported on said second pivot pin, complementary locking means on said first and second locking levers for normally holding said tilt lever adjacent said first locking lever and latch means adjustably mounted on said tilt lever for movement toward and away from said first pivot pin and engageable with said pin means to hold said second bracket in adjusted position relative to said first bracket.

4,422,347  
**TORSIONAL BALANCER DEVICE WITH A VISCOUS DAMPING MEDIUM**

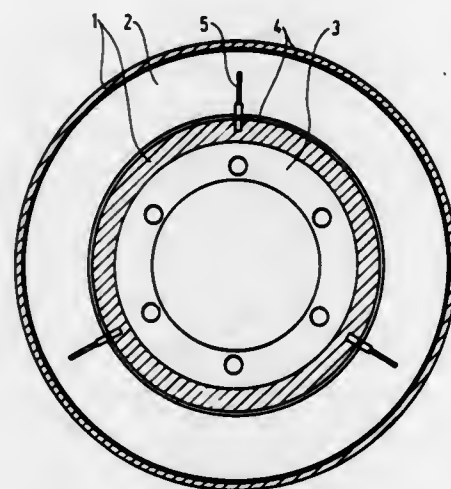
Joachim Conseur, Berlin, Fed. Rep. of Germany, assignor to Carl Hasse & Wrede GmbH, Berlin, Fed. Rep. of Germany  
Filed May 29, 1981, Ser. No. 268,264

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 3020993

Int. Cl.<sup>3</sup> F16F 15/10

U.S. Cl. 74-574

8 Claims



1. A torsional balancer device for a rotary shaft and the like, comprising a rotationally symmetrical member having means thereon for connecting said member to a rotary shaft to be balanced, a rotationally symmetrical seismic mass rotatably mounted closely spaced from said rotational member and defining gap spaces therebetween, a viscous damping agent in said gap spaces, and a plurality of curved, substantially closed spring elements, each having closely spaced ends connected respectively to said rotational member and said seismic mass, said ends of each spring element are disposed in an axial plane of the balancer and are directed toward each other.

4,422,348

**CONNECTING ROD**

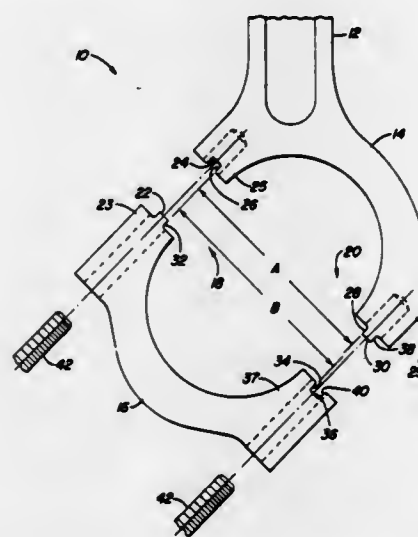
Gary L. Campbell, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 27, 1982, Ser. No. 423,756

Int. Cl.<sup>3</sup> G05G 1/00

U.S. Cl. 74-579 E

1 Claim



1. In a connecting rod having a shank, a head and a cap joined to the head by a pair of tongue and groove connections, the improvement wherein one of the connections is comprised of a press-fit connection and the other connection is comprised of a snap-fit connection, the connection farthest from the shank being the snap-fit connection, the head having first and second

arms, an end of the first arm being nearer the shank than an end of the second arm, the end of the first arm having a groove which receives in a press-fit manner a tongue which extends from a corresponding first arm of the cap, the end of the second arm having a tongue extending therefrom for insertion into a corresponding groove in a corresponding second arm of the cap, the groove in the second cap arm having a width which is greater than the width of the tongue of the second head arm, the groove and tongue of the cap having a separation which is greater than the separation of the groove and tongue of the head.

4,422,350  
**GEAR SHIFT CONTROL IN MOTOR VEHICLES WITH AUTOMATIC TRANSMISSIONS**

Alfred Muller, Leonberg; Gerhard Eschrich, Gerlingen, and Achim Schreiber, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

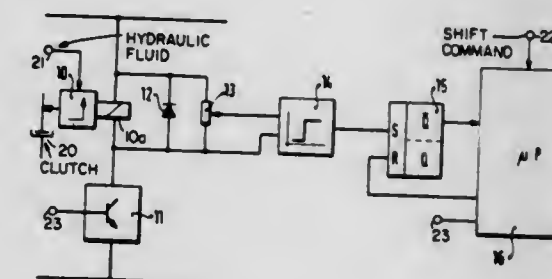
Filed Feb. 18, 1981, Ser. No. 235,523

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010865

Int. Cl.<sup>3</sup> F16H 3/44

U.S. Cl. 74-753

5 Claims



4,422,349  
**TORQUE TRANSFER DEVICE FOR A FOUR WHEEL DRIVE VEHICLE**

Gohichi Matsumoto, Okazaki, and Yohichi Hayakawa, Toyake, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

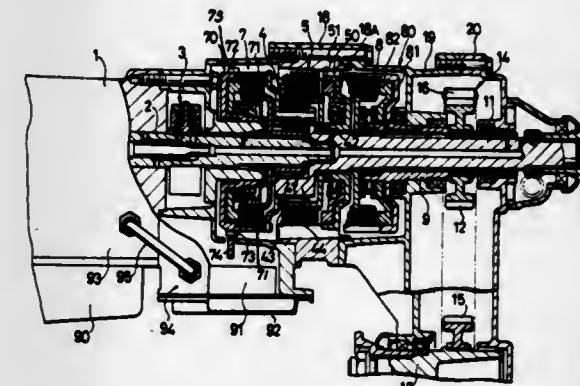
Filed Nov. 18, 1980, Ser. No. 207,836

Claims priority, application Japan, Nov. 26, 1979, 54-153277

Int. Cl.<sup>3</sup> F16H 37/06, 57/10

U.S. Cl. 74-665 GE

10 Claims



1. A torque transfer device for a four wheel drive vehicle having front and rear axles, comprising:  
an input shaft receiving torque from a gear transmission;  
a first output shaft rotatably coupled with either one of said front and rear axles;  
a second output shaft rotatably coupled with the other one of said axles;  
a planetary gear set including a sun gear, a ring gear, a planetary pinion, and a planetary pinion carrier, said sun gear being coupled with said input shaft, said carrier being coupled with said first output shaft;  
friction brake means for selectively and reversibly engaging said ring gear of said planetary gear set with a stationary portion of said torque transfer device;  
first friction clutch means for selectively and reversibly engaging said planetary pinion carrier and said sun gear of said planetary gear set with each other;  
a linkage mechanism including a sleeve rotatably mounted on said first output shaft, and a rotation transmitting mechanism provided between said sleeve and said second output shaft, and  
second friction clutch means between said first output shaft and said sleeve for selectively and reversibly engaging said sleeve and said output shaft with each other, whereby torque received at said input shaft is deliverable at said first and second output shafts simultaneously when said second friction clutch means is engaged and only at said first output shaft when said second friction clutch means is disengaged.

1. Automatic transmission control system for use in an automotive vehicle having  
friction elements (20);  
electrical current controlled hydraulic pressure regulator means (10) having a solenoid winding through which electrical current passes in operation, operating the friction elements;  
control means (22, 16, 23) for controlling the pressure regulator means for disengagement, and engagement, of the friction elements of an engaged gear and a newly selected, to be engaged gear, respectively, to overlapping engagement with said friction elements, during shifting between the gears;  
a threshold circuit (14) sensing an electrical signal pulse appearing across the solenoid winding upon changing of state of the friction element associated with the newly selected, to be engaged gear representative of when a hydraulic unit of the newly selected, to be engaged gear is filled;  
and connection means (15) connecting said signal pulse to said control means (22, 16, 23), said control means controlling overlap over disengagement, and engagement of the friction elements of the engaged, and newly selected, to be engaged gear in response to said signal pulse.

4,422,351

**TRACTION ROLLER TRANSMISSION**

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Jul. 10, 1981, Ser. No. 281,983

Int. Cl.<sup>3</sup> F16H 13/06, 13/00

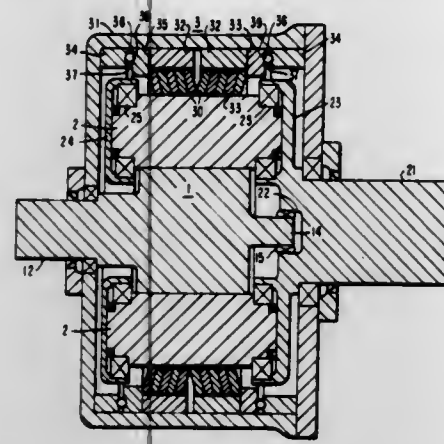
U.S. Cl. 74-798

7 Claims

1. A traction roller transmission comprising a traction ring structure having inner traction surfaces, a sun roller centrally disposed within the traction ring structure and having a circumferential traction surface spaced from the traction surface of said traction ring structure, planetary traction rollers supported in the space between the sun roller and the traction ring structure, and engagement means for forcing said traction rollers into frictional engagement with said traction ring structure and said sun roller; wherein at least one of said traction surfaces is formed by a stack of Belleville-type spring rings, and means are provided for axially compressing said Belleville-type spring rings when a torque is transmitted through said transmission so as to cause radial expansion of the spring rings for firm frictional engagement of said spring rings with the



adjacent traction rollers, said spring rings having adjacent said planetary traction rollers radial end surfaces curved in the axial



direction of the sun roller and providing rolling contact with said planetary traction rollers.

4,422,352

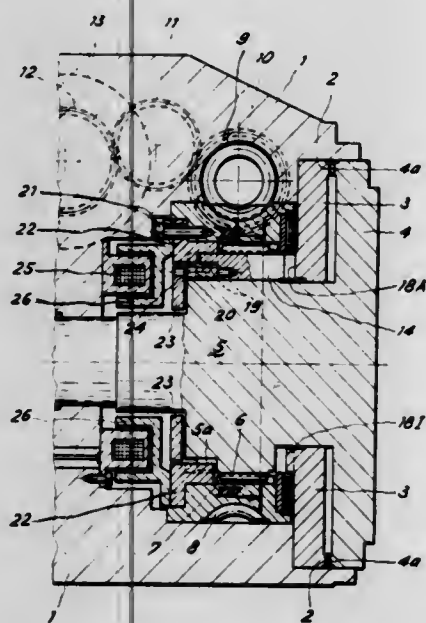
**APPARATUS FOR ROTATING IN EITHER DIRECTION A TURRET THAT CARRIES PLURAL TOOL HOLDERS**  
Pier C. Boffelli, Milan, Italy, assignor to Baruffaldi Frizioni S.p.A., Milan, Italy

Filed Oct. 20, 1981, Ser. No. 313,187

Claims priority, application Italy, Oct. 23, 1980, 25537 A/80  
Int. Cl.<sup>3</sup> B23B 29/24

U.S. Cl. 74—813 L

5 Claims



1. A rotary turret comprising a rotatable tool post body having a hub, a plurality of blocks carried by the hub for sliding movement relative to the hub in a direction parallel to the axis of rotation of the hub, a fixed member having slots into which said blocks are selectively insertable, an electromagnet, a keeper juxtaposed to said electromagnet and secured to said blocks, the keeper approaching the electromagnet when the blocks leave the slots and receding from the electromagnet when the blocks enter the slots, means urging the blocks toward the slots, the spacing between the keeper and the electromagnet being such that the electromagnet can retain the keeper against movement away from the electromagnet only when the blocks are out of the slots, and means for rotating the hub in either direction.

# **LOCK-UP CONTROL METHOD OF AND SYSTEM FOR AUTOMATIC TRANSMISSION FOR AUTOMOTIVE VEHICLE HAVING ENGINE PROVIDED WITH FUEL CUT MEANS**

Masaaki Suga, Yokohama; Yoshiro Morimoto, Yokosuka; Hideo Hamada, Yokosuka; Masaaki Futagi, Yokosuka, and Tadashi Suzuki, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

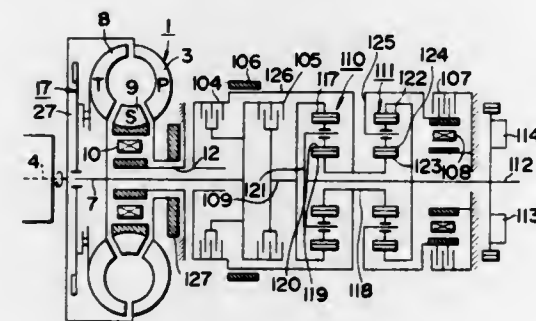
Filed Oct. 5, 1981, Ser. No. 308,663

Claims priority, application Japan, Oct. 3, 1980, 55-137718

Int. Cl.<sup>3</sup> B60K 41/02, 41/18

U.S. Cl. 74—858

10 Claims



1. A control system for a lock-up type automatic transmission for an automotive vehicle having an engine and an accelerator pedal, the lock-up type automatic transmission having a lock-up type torque converter, the engine having fuel cut means for suspending the supply of fuel to the engine after the accelerator pedal has been released to cause the automotive vehicle to begin a coasting operation, the suspension of the supply of fuel to the engine being kept as long as the engine operates in a predetermined state which allows the engine to resume combustion to operate again upon resumption of the supply of fuel to the engine, said control system comprising: means for forcing the lock-up type torque converter to lock up at least when the engine operates in the predetermined state, means for supplying fuel to the engine when the engine operates in a second predetermined state, and means for releasing the lock-up of the lock-up torque converter only after a predetermined condition after the fuel is supplied to the engine by said fuel supplying means.

4,422,354

# **ENGINE OVERHEAT PROTECTION SYSTEM FOR DUAL HORSE POWER ENGINE**

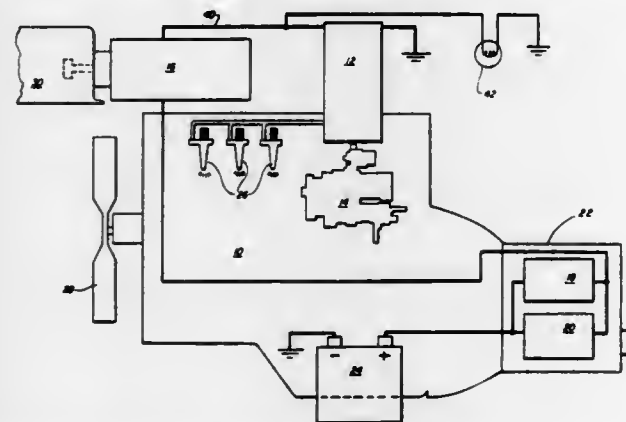
Larry L. Bandy, Springfield, Ill., assignor to Fiat Allis North America, Inc., Deerfield, Ill.

Filed Jan. 29, 1982, Ser. No. 344,198

Int. Cl.<sup>3</sup> B60K 41/06; F02M 39/00

U.S. Cl. 74—860

11 Claims



1. A system for controlling horsepower of an internal combustion engine having means for circulating coolant there-through and a variable speed transmission connected to a work

load comprising temperature sensitive means disposed in a portion of said means for circulating coolant responsive to changes in temperature of the engine coolant, pump means providing a source of fuel for said engine, fuel valve means receiving fuel from said pump means adaptable to selectively supply fuel to said engine in accordance with the requirements of said work load, speed sensitive means disposed in said transmission responsive to changes therein due to fluctuations of the work load, a source of electrical power for supplying current to said speed sensitive means, said speed sensitive means being electrically connected in series to said temperature sensitive means and said fuel valve means, said fuel valve means being effective upon receiving a signal from said speed sensitive means to increase the supply of fuel to said engine when said transmission is shifted from a lower to a higher speed range and thereby increase horsepower output of the engine.

4,422,355

# **SPARKLING WINE BOTTLE OPENER**

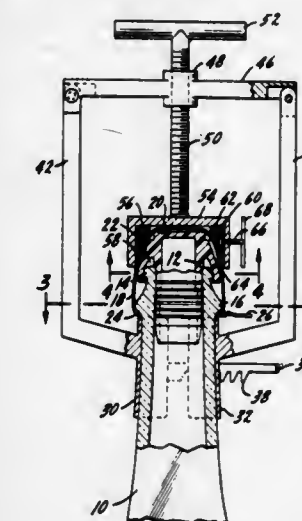
William T. Burns, Jr., 175 E. Delaware Pl., Apt. 6017, Chicago, Ill. 60611

Filed Apr. 13, 1981, Ser. No. 253,673

Int. Cl.<sup>3</sup> B67B 7/02

U.S. Cl. 81—3.36

2 Claims



1. Means for controllably removing a bottle stopper from a bottle containing a liquid and natural high pressure gas, such as a sparkling wine, in which the stopper is held in place, at least in part, by a wire hood, including a pair of oppositely-positioned clamping members, each having a generally curved surface for gripping the bottle adjacent the pouring lip, but free of the wire hood, means for moving said clamping members toward and away from an intermediately positioned bottle, means for gripping the stopper, which means permits a loosening of the wire hood, including a cup-shaped member having movable interior gripping means, a threaded member mounted upon said clamping members, said cup-shaped member being mounted upon said threaded member for movement toward and away from the stopper, and means for applying an axial turning movement to said cup-shaped member to slowly move it relative to the clamping members and remove the stopper and permit the controlled release of gas from within the bottle after the wire hood has been loosened and while maintaining the clamping members in clamping engagement with the bottle adjacent the pouring lip.

4,422,356

# **CUTTING TOOL BIT HOLDER**

John E. Pertle, Garden Valley, Calif., assignor to Tri Tool Inc., Rancho Cordova, Calif.

Filed Jun. 15, 1982, Ser. No. 388,709

Int. Cl.<sup>3</sup> B23B 29/04

U.S. Cl. 82—36 R

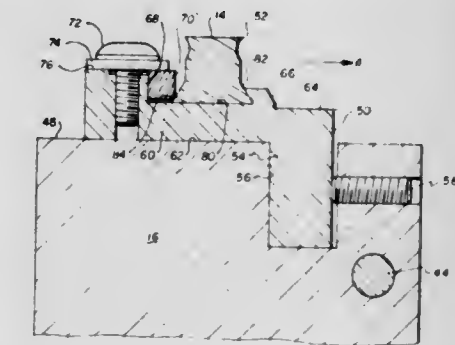
10 Claims

1. A cutting tool holder for removably holding a cutting tool bit on a machine tool support fixture arranged to receive the

holder in an axially extending opening of the fixture and to carry same about a circular orbital path for performing a surface cutting operation on a workpiece, comprising:

a generally L-shaped holder base including a proximal first leg shaped to enable it to be mounted within a corresponding, axially extending opening of a machine tool support fixture and a second leg extending perpendicular to the first leg and in a direction extending away from the cutting direction of the tool bit, said second leg including a distal surface disposed on the side thereof opposite the side from which the first leg extends;

a female dovetail gib, and a stop surface extending parallel to and spaced away from female gib disposed on said distal surface, the gib and stop surface extending upwardly from the distal surface;



a clamp bar having a pair of opposed generally parallel surfaces, the clamp bar disposed with one of said surfaces contiguous with said stop surface and with the opposite surface facing towards but spaced apart from the bit to define a tool bit receiving slot along the distal surface between the bit and said opposite surface;

said clamp bar including a lower surface adjacent said distal surface, said opposite surface including a cam surface sloped towards said bottom surface and said surface contiguous with said stop surface, whereby said cam surface and female gib form a pair of female gibs for receiving a pair of male gibs presented on a tool bit locatable in said tool bit receiving slot;

removable fastener means retaining said clamp bar adjacent said stop surface and urging same towards said distal surface.

4,422,357

# **APPARATUS FOR ADVANCING A PREDETERMINED LENGTH OF STRIP-SHAPED MATERIAL**

Mogens D. Larsen, Teglværksvej 22, DK-4450 Jyderup, Denmark

PCT No. PCT/DK80/00061, § 371 Date Jun. 11, 1981, § 102(e) Date Jun. 11, 1981, PCT Pub. No. WO81/00999, PCT Pub. Date Apr. 16, 1981

PCT Filed Oct. 13, 1980, Ser. No. 276,371

Claims priority, application Denmark, Oct. 15, 1979, 4346/79  
Int. Cl.<sup>3</sup> B26D 5/32

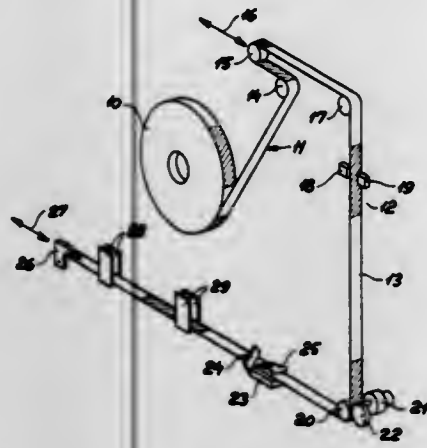
U.S. Cl. 83—210

6 Claims

1. An apparatus for advancing a predetermined length of strip-shaped material from a supply roll to a delivery point, comprising: a pull-off mechanism having a reciprocable pull-off means over which the strip runs, a one-way means through which the strip runs, said one-way means being disposed between said mechanism and the delivery point, a gripper arranged to be reciprocated in synchronism with said pull-off means and, at its one extreme position, to grip the end of the



strip of material, a strip brake, and a detector arranged to detect a mark on the strip and in response thereto cause the



gripper to open so as to release the strip, and said strip brake to be actuated.

4,422,358

# APPARATUS FOR CUTTING A CONTINUOUS NARROW STRIP INTO SHORT SECTIONS

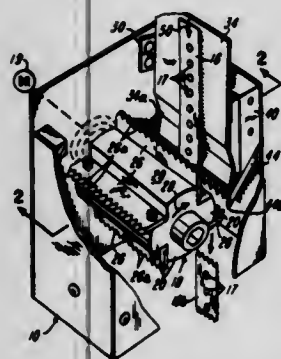
Harvey C. Hull, Kettering, and Robert W. Henz, Sr., Dayton, both of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Apr. 6, 1981, Ser. No. 250,230

Int. Cl.<sup>3</sup> B26D 1/38

U.S. Cl. 83—356.3

4 Claims



1. Apparatus for cutting a continuously moving continuous strip into short sections, comprising:

- a housing,
- a yoke supported within the housing and rotatable about a generally horizontal axis, the axis of rotation of the yoke being at a given elevational level within the housing, the yoke having a plurality of radially extending lobes,
- a plurality of first blades, there being a first blade attached to each of the lobes of the yoke and movable with rotation of the yoke, each of the first blades having a substantially horizontal row of teeth, each of the teeth having a protruding cutting edge,
- a stationary blade positioned within the housing adjacent the yoke, the upper surface of the stationary blade having a portion above the axis of rotation of the yoke and sloping downwardly toward the yoke, the stationary blade having a lower end portion closely adjacent the yoke and at substantially the same elevational level within the housing as the axis of rotation of the yoke, the stationary blade having a horizontal row of teeth as the lower end portion thereof, each of the teeth of the stationary blade having a cutting edge which is substantially vertical,
- an elongate guide member oriented substantially vertically within the housing and supported at a position substantially above the yoke and the stationary blade, the elongate guide member having a resilient portion extending downwardly from the position of support thereof, the elongate guide member having a lower end portion which

is positioned generally above the lower end portion of the stationary blade and closely adjacent thereto, the yoke rotating in a direction so that the first blades travel downwardly toward the stationary blade and the teeth of the first blades mesh with the teeth of the stationary blade as the yoke rotates,

a continuous strip traveling downwardly within the housing and being guided by the elongate guide member to a position adjacent the lower end portion of the stationary blade, the first blades engaging a part of the continuous strip and urging said part of the continuous strip into engagement with the lower end portion of the guide member as the yoke rotates, the strip being directed by the guide member to a position between the teeth of the stationary blade and the teeth of a first blade and being severed by the teeth of the first blade and the teeth of the stationary blade as the yoke rotates.

4,422,359

# ADJUSTABLE SLITTER BLADE HOLDER

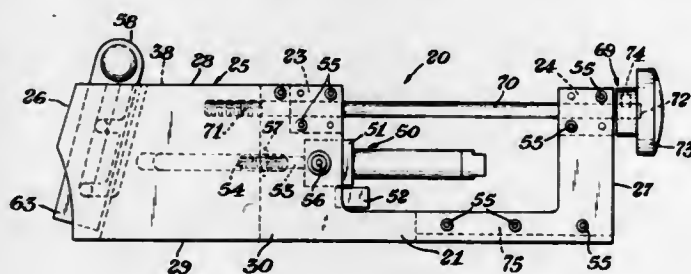
William E. Leboeuf, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 7, 1981, Ser. No. 309,314

Int. Cl.<sup>3</sup> B26D 1/03

U.S. Cl. 83—546

10 Claims



1. A slitter blade carrier which comprises, in cooperative combination:

- (a) a frame;
- (b) a blade holder which is in slideable engagement with, and which is contained within the frame, the blade holder comprising a sliding block, the sliding block being in slideable engagement with the frame, in cooperative combination with a blade guide member, the blade guide member being in slideable engagement with the sliding block, said sliding block having a first end and a second end, the sliding block also having defined therein a generally angularly disposed recess, a first generally angularly disposed slot and a second generally angularly disposed slot, the first slot and the second slot being generally parallel to each other and to the recess, the first slot and the second slot further being in communication with the recess;
- (c) an actuator means for causing the blade carrier to move slideably within the frame, said actuator means being connected to the frame and to the blade holder; and
- (d) a blade engagement adjustment means, said adjustment means being operatively connected to the frame and to the blade holder.

4,422,360

# DEVICE FOR IMPROVING PIANO TONE QUALITY

Barry E. Carter, 1721 10th Ave., San Francisco, Calif. 94122

Continuation-in-part of Ser. No. 82,740, Oct. 9, 1979,

abandoned. This application Aug. 25, 1981, Ser. No. 296,000

Int. Cl.<sup>3</sup> G10H 3/00

U.S. Cl. 84—1.11

9 Claims

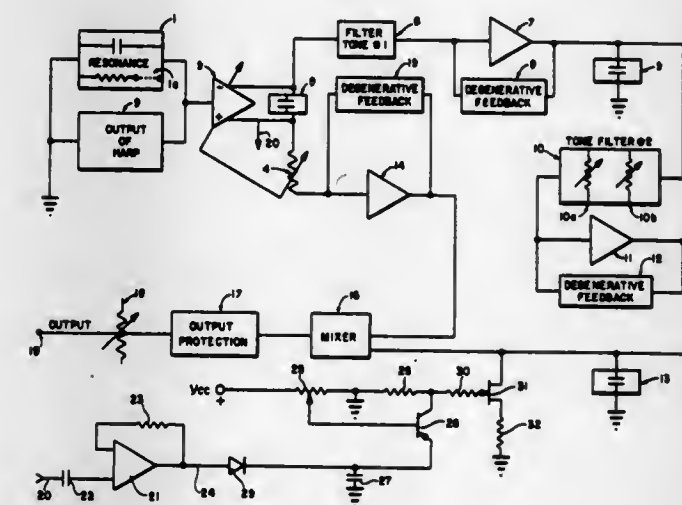
1. In a device for controlling the tone quality put out by an electronic piano characterized by a harp for producing vibratory signals and by inductive transducers configured to detect said vibratory signals and convert them into electrical signals, an improved circuit interposed between said piano and subse-

quent amplifier and loudspeaker means, said circuit being characterized by a main signal path carrying fundamental tones of the piano and having a substantially flat frequency response throughout the audible spectrum above a predetermined low frequency, and by an overtone signal path having three separate bands, a bass boost band below a predetermined first frequency and a treble boost band above a predetermined second frequency higher than said predetermined first frequency with amplitude boosted tones therein, and a midrange null band between said bass boost band and said treble boost band with amplitude nulled tones therein, said circuit comprising:

input means for connecting to said transducers and receiving said electrical signals;

first amplifier means connected to said input means, for amplifying said electrical signals and for providing one output to said main signal path, and another output to said overtone signal path;

second amplifier means connected to said first amplifier means in said main signal path for amplifying said tones passing through said main signal path and including amplitude control means for controlling the amplitude in said main signal path;



tone filter network means connected to said first amplifier means in said overtone signal path, for passing tones in said bass boost band and said treble boost band and for nulling tones in said midrange null band;

third amplifier means connected to said tone filter network means in said overtone path, for amplifying the tones in said bass boost band and said treble boost band by a controlled amount and having control means for controlling the amplification of tones in said bass boost band and in said treble boost band;

mixer means connected to said second amplifier means in said main signal path and to said third amplifier means in said overtone path for combining said tones from said paths in proper phase relationship into a single composite signal and for providing an output to said subsequent amplifier and loudspeaker means;

gate control means having an input connected to said output to said main channel of said first amplifier means and to said mixer means, for disabling said overtone path at the input to said mixer means whenever the signal level in said main signal path is below a predetermined threshold amplitude level.

4,422,361

# ELECTRONIC MUSICAL INSTRUMENT

Hiroshi Ishii, Tachikawa, and Hideaki Ishida, Hachioji, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,529

Claims priority, application Japan, Jun. 20, 1980, 55-83582; Jun. 20, 1980, 55-83583; Jun. 20, 1980, 55-83585

Int. Cl.<sup>3</sup> G10H 3/06; G10B 15/00

U.S. Cl. 84—1.18

8 Claims



1. A bar code recording and reproducing system comprising: a medium on which is recorded bar code information which includes at least code table areas containing a plurality of code data, table reference areas containing a plurality of symbol data corresponding to respective ones of said code data arranged in a given sequence, and separator areas containing separator information and separating said code table areas from said table reference areas;

a bar code reader for reading said bar code information recorded on said medium;

discriminating means coupled to said bar code reader for discriminating code data information of said code table areas and symbol data information of said table reference areas by detecting separator information of said separator areas among the information read out by said bar code reader; and

converting means coupled to said discriminating means and responsive to said information read out by said bar code reader for converting said plurality of symbol data read out from said table reference areas into a corresponding plurality of code data arranged in said given sequence according to the result of discrimination performed by said discriminating means.

4,422,362

# ELECTRONIC MUSICAL INSTRUMENT OF A FORMANT SYNTHESIS TYPE

Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 10, 1981, Ser. No. 300,993

Claims priority, application Japan, Sep. 19, 1980, 55-129164

Int. Cl.<sup>3</sup> G10H 1/06, 7/00

U.S. Cl. 84—1.19

15 Claims

1. An electronic musical instrument comprising: note selection means for selecting a note among a plurality of notes;

phase generation means for generating phase angle data whose value varies at rate corresponding to a center frequency of a fixed formant, said fixed formant center frequency being independent of the frequency of the note selected by said note selection means;

reset means for repeatedly resetting the value of said phase angle data to a predetermined value with a frequency corresponding to the fundamental frequency of said se-







4,422,368

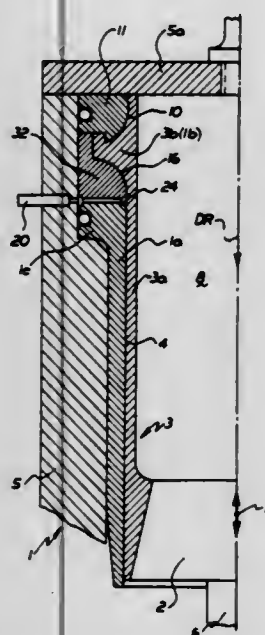
**CYLINDER-PISTON ARRANGEMENT**

Bernhard Frey, Schaffhausen, Switzerland, assignor to Hydrowatt Systems Limited, Great Britain  
Continuation of Ser. No. 138,698, Apr. 9, 1980, abandoned. This application Nov. 8, 1982, Ser. No. 439,906  
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914695

Int. Cl.<sup>3</sup> F01B 19/00

U.S. Cl. 92—105

9 Claims



1. An apparatus comprising a piston and a cylinder, said piston being in part located in said cylinder and said piston and said cylinder being relatively movable, an elastic sealing element sealingly engaging said piston and said cylinder at spaced locations and at least partially defining a working chamber, said sealing element having a surface portion bearing against a bearing surface via a lubricant space, a first part of said bearing surface comprising a transition surface section extending oblique to the axis of said cylinder and a second part of said bearing surface comprising a cylindrical surface parallel to the axis of said cylinder, said sealing element having a radially thickened section mounted on a part of said transition surface section, and means for feeding lubricant between said oblique transition surface section and said sealing element, said means comprising a lubricant feed mouth located immediately adjacent a part of said transition surface section which is aligned approximately normal to the axis of said cylinder and radially outwardly from said cylindrical surface and opening radially inwardly, said transition surface section at least partially comprising a surface of a separate annular body, the apparatus further comprising an annular spacer ring located radially outward of said separate annular body and in facing relation thereto, said lubricant feed mouth comprising an annular recess formed in said annular spacer ring or in said transition surface section.

4,422,369

**METHOD AND APPARATUS FOR STERILIZING A GAS, AND DEVICE FOR CONDITIONING AND PROTECTING A ZONE FROM A SPACE**

Willy Smets, Uccle, Belgium, assignor to E.N.I. Electrische Nijverheidsinstallaties and E.N.I. l'Electro navale et industrielle, both of Aartselaar, Belgium  
Continuation of Ser. No. 149,713, May 14, 1980, abandoned.  
This application Sep. 30, 1982, Ser. No. 430,887  
Claims priority, application Luxembourg, May 18, 1979, 81292

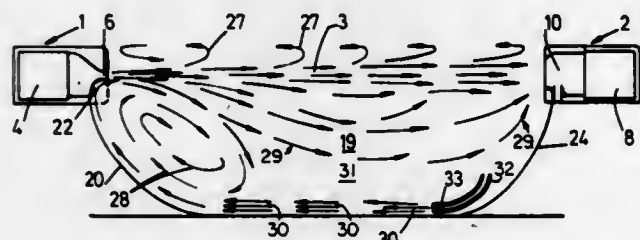
Int. Cl.<sup>3</sup> F24F 9/00; A61G 13/00

U.S. Cl. 98—36

9 Claims

1. A method of conditioning and protecting a particular part of a preselected zone, said part being one in which a manipula-

tion is to be effected, against contaminating agents entering from the outside environment, said method comprising: providing a substantially laminar stream of an essentially sterile gas which has an upstream end and a downstream end, said laminar stream forming a gas curtain that defines one boundary side of the preselected zone; delivering into said particular part of said zone a substantially continuous flow of an essentially sterile conditioned gas, said flow being adjacent the boundary of said zone remote from said gas curtain and in a direction opposite to that of said laminar gas stream and being at a preselected speed adjusted relative to the speed of the laminar gas stream;



and deflecting said flow arcuately toward the upstream end of said laminar stream to produce an interaction between said flow and said stream which directs said flow along said stream toward the downstream end and thus controls intrusion of said laminar stream into said zone and generates above said part of said zone a very slow, substantially stable circulation of gas which is continuously renewed at a low speed by said flow of sterile conditioned gas and by an exchange between gas from the flow and gas from the laminar stream.

4,422,370

**METHOD TO RECOVER HEAT FROM TREATMENT PREMISES AND APPARATUS FOR ACHIEVING THE METHOD**

Roy Gustavson, Vaxjo, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

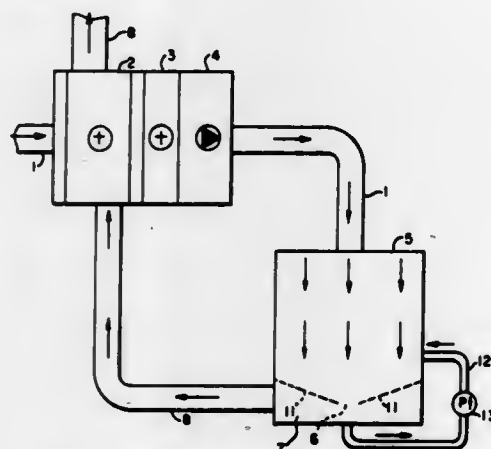
Filed Jun. 2, 1981, Ser. No. 269,691

Claims priority, application Sweden, Jun. 5, 1980, 80041866

Int. Cl.<sup>3</sup> B05C 15/00

U.S. Cl. 98—11.5 SB

12 Claims



1. A method of recovering heat from treatment premises where relatively warm air is exhausted and relatively cold supply air enters into the said premises, comprising the steps of contacting the exhausted air with a liquid heat-exchange medium in a heat-absorption area adjacent the ventilation outlet of the premises, separating the liquid heat-exchange medium from the exhausted air and recirculating at least one part of the liquid medium from said area to a heat exchanger for recovery of heat, warming the supply air with the heat recovered from said liquid heat-exchange medium by a said heat exchanger, and returning said one part to said heat-absorption area, and recirculating a second part of said liquid medium from said

area directly back to said area at a rate of flow to assure optimum heat absorption in said area.

4,422,371

**AERATED DRINKS MACHINE**

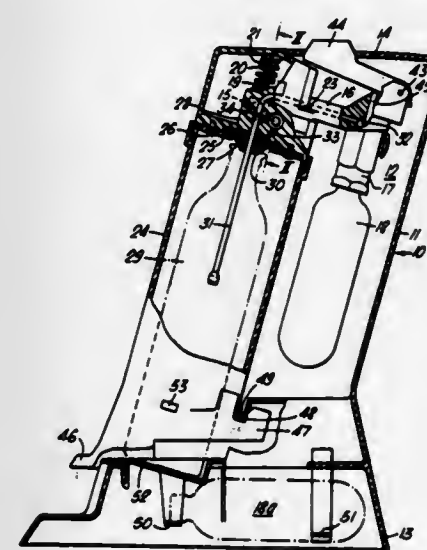
Robert P. Child, Cosham, and Barry G. Charles, Rowlands Castle, both of England, assignors to Thorn EMI Domestic Electrical Appliances Limited, London, England  
Filed Feb. 22, 1982, Ser. No. 350,740

Claims priority, application United Kingdom, Feb. 24, 1981, 8105758; Jun. 5, 1981, 8117220

Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 99—323.1

8 Claims



1. An appliance for making an aerated beverage, said appliance comprising a casing, a connection carried by said casing for mounting a container of pressurized liquid carbon dioxide, a shatterproof housing for a bottle of water, a nozzle within said housing, a stopper for engaging in the neck of a bottle, means for supporting the bottle in said housing so that the stopper is engaged therein, a safety pressure valve connected to the interior of the bottle when the stopper is engaged in its neck, and a pivotal mounting for the shatterproof housing on the casing mounting the housing for pivotal movement between a first position in which the bottle can be introduced into or removed from the housing and a second position in which the means for supporting the bottle engage the bottle to prevent its removal, said shatterproof housing also being axially reciprocable relative to the casing in addition to its pivotal movement.

4,422,372

**FOOD EXTRUDER**

Doug Hoezee, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.

Filed Nov. 12, 1981, Ser. No. 320,288

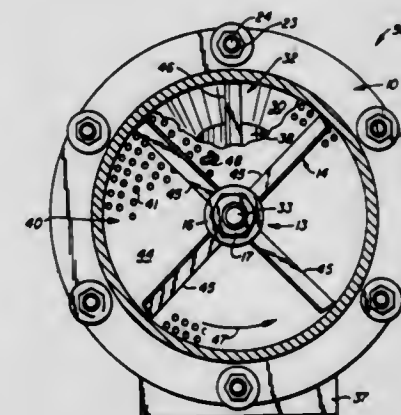
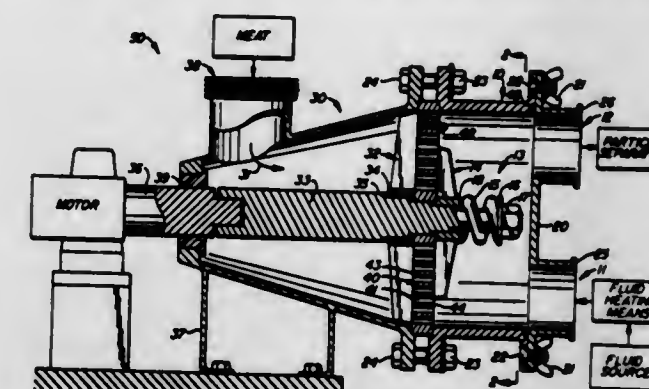
Int. Cl.<sup>3</sup> A47J 27/18

U.S. Cl. 99—353

9 Claims

1. A food extruder including: an extruder plate having an inside surface, and outside surface and at least one perforation between the surfaces; means for advancing food toward the inside surface of the extruder plate and through the perforations in the extruder plate; means adjacent a surface of the extruder plate for cutting the food as it passes through the perforation; means for propelling a fluid past the outside surface of the

extruder plate to carry the cut food away from the extruder plate; the fluid propelling means including a housing mounted to overlie the outside surface of the extruder plate, the hous-



4,422,373

**THROAT CONTROL APPARATUS IN AN OPEN THROAT, ROTARY BALER**

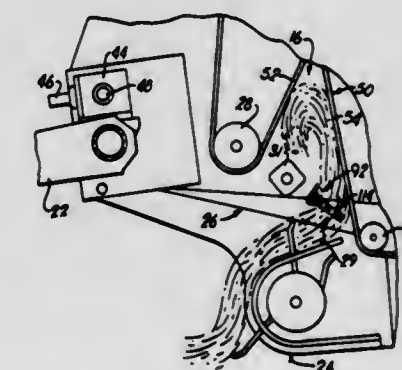
Melvin V. Gaeddert, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Aug. 31, 1981, Ser. No. 297,969

Int. Cl.<sup>3</sup> B30B 5/04

U.S. Cl. 100—88

10 Claims



1. In a rotary baler having an internal chamber in which crop material is coiled into a cylindrical bale by coacting,



oppositely moving surfaces respectively directed generally toward and away from an open non-compactive crop supply throat leading to and communicating with said chamber, the improvement comprising:

- a one-way control gate operably associated with said throat, and
- means mounting said gate for moving actuation by incoming crop material from a first position partially spanning the throat to an open position blocking retrograde crop flow from the chamber while permitting inwardly directed crop flow thereto.

4,422,374

# BALING MACHINE WITH AIR SPRING MEANS FOR MAINTAINING APRON TENSION

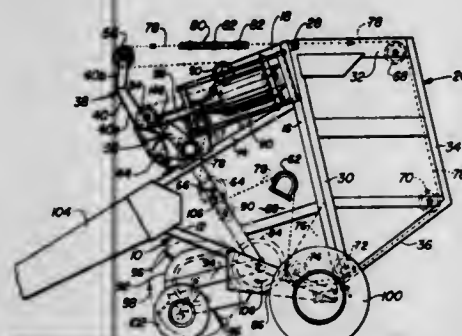
Willis R. Campbell, Ephrata, and Edward T. Eggers, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Dec. 21, 1981, Ser. No. 333,205

Int. Cl.<sup>3</sup> B30B 5/06

U.S. Cl. 100—88

3 Claims



1. In a roll baling machine having a frame, apron means supported on said frame defining an expandable bale chamber, said apron means moving from one position to another position during formation of a roll bale in said expandable bale chamber, the improvement comprising:

- (a) an arm assembly rotatably mounted on said frame for supporting said apron means, said arm assembly rotating from a first position to a second position as said apron means goes from said one position to said another position during formation of a roll bale;
- (b) air spring means connected to said arm assembly normally urging said arm assembly toward said first position in order to dispose a portion of said apron means which is located outside said expandable bale chamber in a substantially S-shaped configuration in side elevation, said air spring means including an air bag for containing air under pressure and a piston movable into said air bag; and
- (c) the rotating movement of said arm assembly from said first position to said second position causing said piston to be moved into said air bag to increase the air pressure therein acting on said piston.

4,422,375

# ROLLER PRESS

Luigi Morganti, 3224 Harrison Ave., Reading, Pa. 19605

Filed May 6, 1982, Ser. No. 375,353

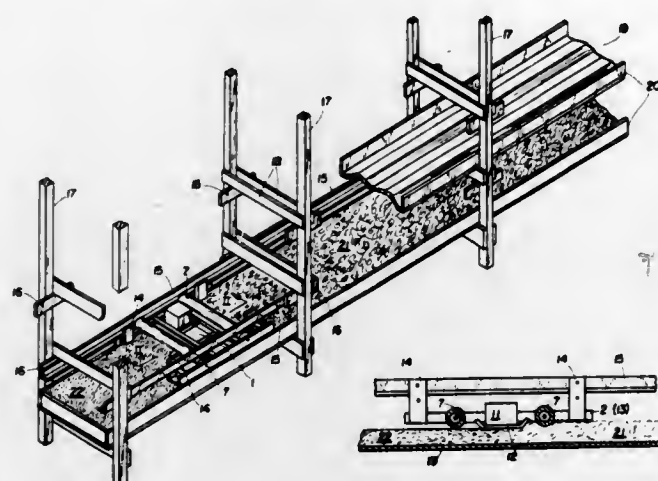
Int. Cl.<sup>3</sup> B30B 3/02

U.S. Cl. 100—210

2 Claims

1. A roller press assembly for compacting mushroom beds, comprising a roller press including a pair of parallel frames, extending horizontally, a pair of rollers mounted on said frames at right angles to form a carriage, a central frame located between said rollers and supported by said parallel frames, a vertically adjustable smoothing plate mounted on

said central frame substantially coextensive with said rollers and depending from said central frame, drive motor means including speed reducing means controlled by a reversing switch and mounted on said central frame for driving said rollers, successively, in one direction and in an opposite direction at reduced speed, a bunk bed comprising a plurality of



horizontally extending guide rails mounted on vertical posts in vertically spaced relationship, a mushroom bed mounted underneath each of said guide rails so as to enable said roller press to be successively moved to different tiers of said bunk bed and guided by said guide rails while traversing and compacting the associated mushroom bed.

4,422,376

# PRINTING CONTROL APPARATUS FOR A LABEL PRINTER

Kazuharu Teraoka, Tokyo, Japan, assignor to Teraoka Seikoshu Co., Ltd., Tokyo, Japan

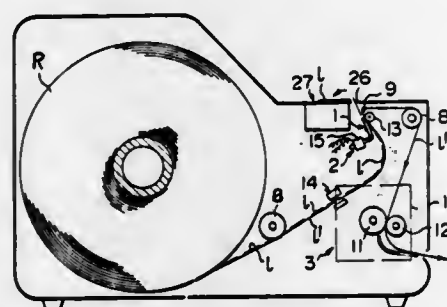
Filed Jan. 30, 1981, Ser. No. 230,004

Claims priority, application Japan, Feb. 16, 1980, 55-19016[U]; Jul. 18, 1980, 55-98882; Jul. 22, 1980, 55-103394[U]; Sep. 2, 1980, 55-15104

Int. Cl.<sup>3</sup> B41J 1/20

U.S. Cl. 101—69

26 Claims



1. Printing control apparatus used in conjunction with a thermal label printer, said printer comprising a thermal head having a plurality of transversely disposed thermal elements, said head adapted to be placed into contact with a printable surface of a thermosensitive color label and said thermal elements adapted to be energized in accordance with printing information received, at least one of said head and label adapted to be moved parallel to said printing surface and perpendicularly to said transversely disposed thermal elements for printing predetermined indicia on said label, said print control apparatus including means for selectively preventing said thermal head from being placed into an operative printing condition, wherein said means for selectively preventing said thermal head from being placed into an operative condition comprise a thermal head drive circuit and control means for selectively activating and deactivating said drive circuit when said control means detects any abnormal contact between said thermal head and said label.

4,422,377

# PRINT HAMMER AND COIL ASSEMBLY

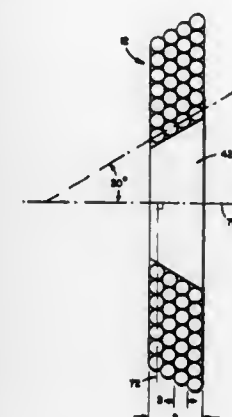
Val K. Jezbera, Thousand Oaks, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 23,739, Mar. 26, 1979, abandoned. This application Jan. 9, 1981, Ser. No. 223,937

Int. Cl.<sup>3</sup> B41J 9/38

U.S. Cl. 101—93.29

7 Claims



7. A print hammer for use in high speed printers or the like, said print hammer including:

- a flat sided elongated multilayered coil characterized when viewed in a plane including the central axis of the coil in that each layer of the coil contains the same number of turns, the number of layers of turns exceeds the number of turns in each layer, the wire is packed in a hex fashion, the axis of each wire at one end of every layer lies in a line parallel to a first side of the coil, and the axis of each wire at the other end of every layer lies in another line parallel to the other side of the coil and parallel to the first side of the coil, wherein the number of turns in each layer of the coil is less than ten;
- a honeycomb matrix of adhesive in which the wires of the coil are embedded; and
- a pair of metal plates, one adjacent to each side of the coil and attached to the adhesive matrix, wherein at least one of the metal plates includes a centering boss embossed on one side thereof for positioning the coil with respect to the plates.

4,422,378

# MEANS FOR AND A METHOD OF INITIATING EXPLOSIONS

Bohumil M. J. Plichta, Kempton Park, South Africa, assignor to Imperial Chemical Industries PLC, London, United Kingdom

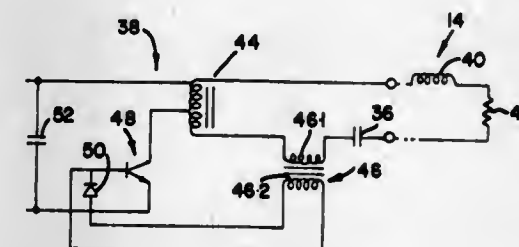
Filed Dec. 14, 1981, Ser. No. 330,584

Claims priority, application South Africa, Dec. 11, 1980, 80/7774

Int. Cl.<sup>3</sup> F42C 11/00

U.S. Cl. 102—206

9 Claims



1. A means for initiating explosions which includes a power oscillator means for generating an oscillating electric initiating signal of sufficient power at a variable frequency and having a current controllable element; an output connecting means for connection to a primary wire of an A.C. operable detonating system for supplying the initiating signal thereto; and

4,422,379

# MEANS FOR AND A METHOD OF INITIATING EXPLOSIONS

John M. E. Geller, Loans, and John P. Wilson, Kilwinning, both of Scotland, assignors to Imperial Chemical Industries PLC, Millbank, England

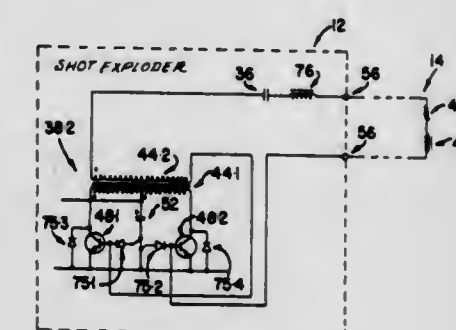
Filed Dec. 15, 1981, Ser. No. 331,081

Claims priority, application United Kingdom, Jun. 22, 1981, 8119236

Int. Cl.<sup>3</sup> F42C 11/00; F42D 1/00

U.S. Cl. 102—206

14 Claims



1. A means for initiating explosions which includes a power oscillator means for generating an oscillating electric initiating signal of sufficient power at a variable frequency; a frequency setting means to which the oscillator means is responsive whereby, in use, when the power oscillator means is connected to a load it automatically generates a signal at the resonant frequency of the load.

4,422,380

Patent Not Issued For This Number

4,422,381

# IGNITER WITH STATIC DISCHARGE ELEMENT AND FERRITE SLEEVE

Joseph A. Barrett, Collegeville, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 20, 1979, Ser. No. 96,080

Int. Cl.<sup>3</sup> F42B 3/10

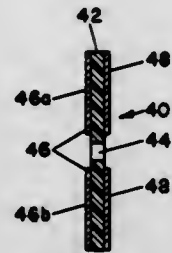
U.S. Cl. 102—202.2

9 Claims

1. An electroexplosive device comprising: (a) an electrically conductive casing having an opening therein; (b) a heat ignitable charge in said casing; (c) means for igniting said charge including a bridge element in proximity with said charge and conductor means comprising at least one lead for supplying an electric current to said bridge element; (d) a static discharge element for preventing accidental electrostatic discharge of said device, said element com-



prising a nonconductive substrate having an opening therein to permit said conductor means to extend therethrough, a thin electrically conductive layer covering a portion of at least one face of said substrate, said conductive layer being in electrical contact with said casing but out of contact with said opening means and said conductor means, said conductive layer have a boundary, a portion of which is disposed in proximity with but entirely



out of contact with the adjacent edge of said opening, whereby a spark gap is provided between said lead wires and said conductive member; and  
(e) a ferrite sleeve having opening means extending longitudinally therethrough to permit said conductor means to extend therethrough, means for insulating the sleeve from said conductor means, and means for providing electrical contact between the sleeve and the casing.

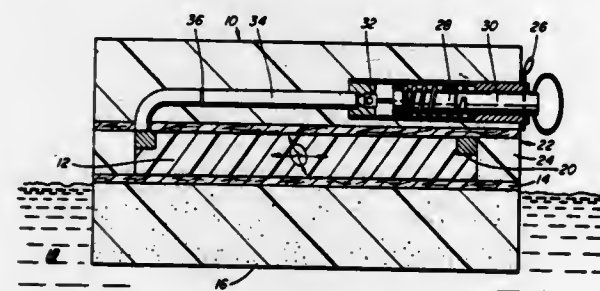
**4,422,382**  
**EXPLOSIVE CONTAINER OF INTERCONNECTED THERMOPLASTIC FILM PACKAGES**  
Horst F. Marz, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada  
Filed Oct. 8, 1980, Ser. No. 195,344  
Claims priority, application Canada, Oct. 24, 1979, 338324  
Int. Cl.<sup>3</sup> F42B 3/02  
U.S. Cl. 102—331



1. Blasting explosive packages in the form of a train of integrally connected individual containers, joined together in

alignment by narrow neck-like tubular film channels and adapted for continuous and automatic filling with flowable explosive mixtures, the said individual containers comprising superimposed front and back rectangular panels of thermoplastic film edge-sealed around the panel periphery to form sealed compartments having top and bottom ends and opposed side edges, each of the said top and bottom ends of each compartment having a narrow, extended, neck-like, tubular thermoplastic film aperture near its mid point and integral with the said panels, the said neck-like tube providing a connecting channel between compartments from the top edge of one compartment to the bottom edge of an adjacent compartment, the said train of containers thus describing a continuous line of individual containers having narrow neck-like, connecting conduits therebetween.

**4,422,383**  
**PERIPHERAL BURNING INCENDIARY DEVICE**  
Joseph E. G. Couture, St-Augustin, and Philip A. Twardawa, Shannon, both of Calif., assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada  
Filed Oct. 14, 1981, Ser. No. 284,819  
Claims priority, application Canada, Dec. 2, 1980, 365909  
Int. Cl.<sup>3</sup> F42B 25/14, 27/04  
U.S. Cl. 102—364

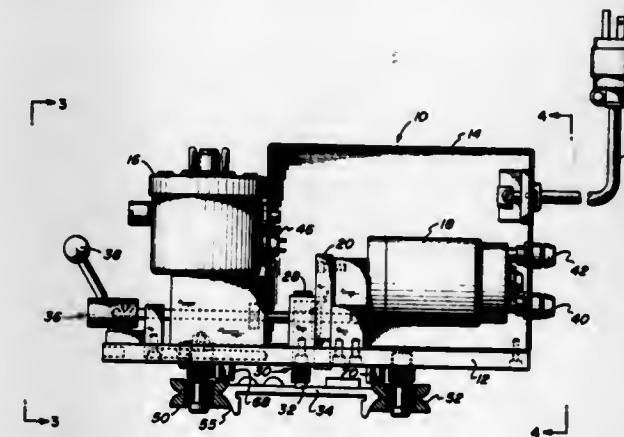


1. A floating incendiary device for igniting a combustible material on the surface of a body of water, comprising an incendiary composition; flotation means for maintaining the incendiary composition above the surface of the water; firing means for igniting the incendiary composition peripherally so that the incendiary composition burns inwardly; and directing means for directing the resulting flame radially outwardly over the surface of the combustible material during the burn time of the incendiary composition.

**4,422,384**  
**ALL POSITION TRACTOR**  
David E. Johnson, Pataskala; Kenneth E. McCall, and William J. Coughlin, both of Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio  
Filed Jun. 16, 1981, Ser. No. 274,091  
Int. Cl.<sup>3</sup> B23Q 9/00; B23K 7/10  
U.S. Cl. 105—29 R

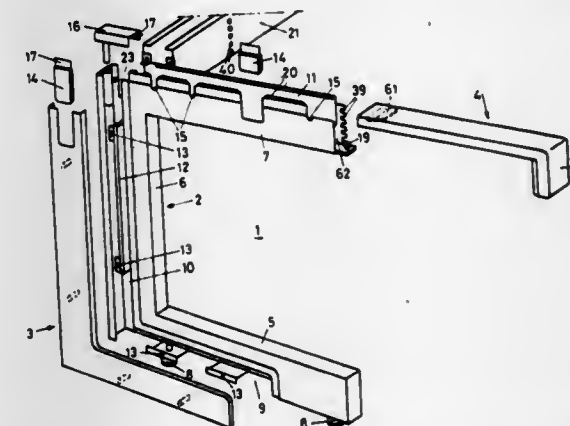
1. A tractor adapted for mounting on an elongated track fixed to a workpiece so that said tractor can carry a metal working tool along a fixed path defined by said track, comprising in combination:  
a base plate having four sides generally perpendicular to each other, said base plate adapted to have a low center of

gravity and to position associated drive means and accessory equipment along the center line of said track; drive means mounted on said base plate and adapted to mate with means on said track to propel said tractor along said track; depending from said base plate a first pair of wheels mounted for rotation about an axis perpendicular to said base plate, said axes generally parallel to one side of said base plate, said first pair of wheels adapted to support said tractor on said track by frictionally engaging one side of said track; a third wheel depending from said base plate and mounted for rotation about an axis perpendicular to said base plate, said wheel being in a plane defined by said first pair of wheels and said third wheel said plane generally parallel



to but spaced below said base plate, said third wheel positioned so that the axes of rotation of said wheels in said plane define a triangle with the axis of said third wheel being at the apex of said triangle, said third wheel further adapted to be moved in a direction generally perpendicular to a line extending between and perpendicular to the axes of rotation of said pair of wheels; whereby said third wheel can be moved laterally from said pair of wheels to permit ready mounting of said tractor to said track; and  
a plurality of rests buttons depending from said base plate said rest buttons adapted to aid positioning of said tractor to said track without contacting said track during operation of said tractor.

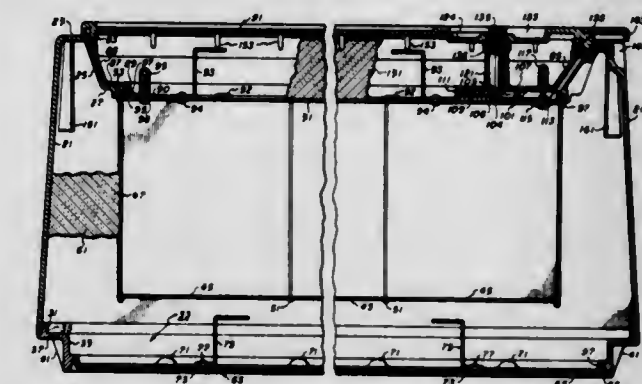
**4,422,385**  
**OFFICE FURNITURE**  
Wendolin Rutsche, Ruti, and Urs Langenegger, Hiltman, both of Switzerland, assignors to Embru-Werke, Mantel & Cia., Ruti, Switzerland  
Filed Nov. 28, 1980, Ser. No. 211,031  
Int. Cl.<sup>3</sup> A47B 3/06  
U.S. Cl. 108—153



1. Furniture in a modular design for setup at the work place, such that the modular unit has at least two generally U-shaped side parts connected by a transverse connecting beam, and each side part consists of a hollow upright column support

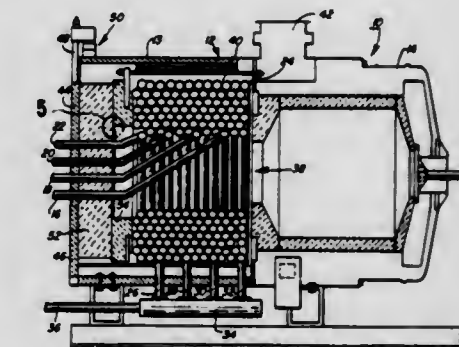
with a projecting arm support and a projecting foot piece, characterized by the fact that at least the column support (6), the arm support (7) and the connecting beam (21) form a closable cable-carrying channel which allows uninterrupted access from the outside, and part of the channel in the arm support (7) is shaped in the form of a longitudinal slit (11) that is open at the top and is covered by a separate, displaceable covering strip (4) which is slidably inserted from the front inwardly toward the connecting beam, that the channel also runs through the foot piece, and wherein a vertical recess (10) in the column support (6) and a horizontal recess (9) in the foot piece (5) are closed by a displaceable L-shaped side cover (3).

**4,422,386**  
**SAFE AND METHOD OF MAKING THE SAME**  
Britt C. Carpenter, Penfield, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.  
Filed Mar. 23, 1981, Ser. No. 246,864  
Int. Cl.<sup>3</sup> E05G 1/026  
U.S. Cl. 109—59 R



9. The method of assembling a safe which comprises the steps of providing a hollow structure to receive a heat-resistive filling, pouring a quantity of such filling into the structure, discontinuing the pouring of filling when the space within the structure is less than completely full, so as to avoid spillage over the upper edges of the structure, and applying to the structure, over the filling, a covering member having an area which is mainly out of contact with the filling, the covering member having certain portions inwardly from the edges thereof which extend into firm contact with the filling.

**4,422,387**  
**DOOR SEAL**  
Robert T. Brady, Elmhurst, and James G. Guyon, Chicago, both of Ill., assignors to Vapor Corporation, Chicago, Ill.  
Filed Sep. 8, 1981, Ser. No. 300,242  
Int. Cl.<sup>3</sup> F23M 7/00  
U.S. Cl. 110—173 R



1. A kit including component parts capable of being assembled in the field for sealing the interior surface of a door of a combustion chamber of a steam generator to protect said sur-



face from deterioration due to impingement of combustion products, the kit comprising:

- a gasket pad adapted to be fitted over said surface and configured to include portions that extend beyond said surface, and
- adhesive material for placement on said gasket pad and said surface for securing said pad to said surface, and
- tape for securing said portions of said gasket pad to said door beyond said surface to hold said pad on said surface until said adhesive was set.

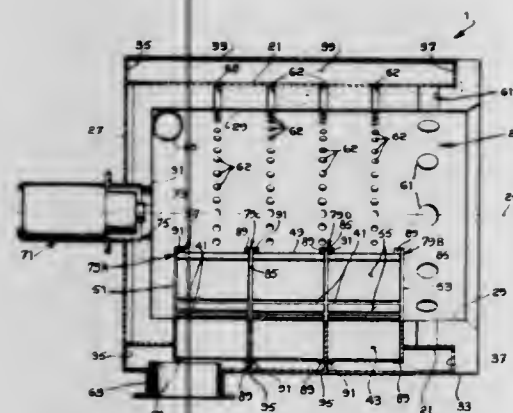
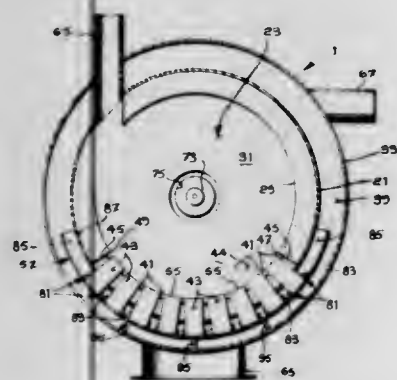
4,422,388

**WOOD AND OTHER SOLID REGISTER BURNER**  
Jean F. Raskin, 2255 Laird Blvd., Ville Mont-Royal, Quebec, Canada H3P 2V7

Filed Dec. 1, 1981, Ser. No. 326,050  
Int. Cl.<sup>3</sup> F23C 1/10

U.S. Cl. 110—261

3 Claims



1. A burner having:  
a burning chamber defined by a substantially cylindrical wall provided with a heat resistant inner lining, the longitudinal axis of said chamber being generally horizontal, an outer wall encircling the wall to form an annular distributing chamber about the burning chamber, means for closing one end of the substantially cylindrical wall, means adjacent said one end for introducing a material to be burnt, tangentially into the chamber, means at said one end to ignite the material to have it burn as it moves spirally through the chamber away from the one end, means for supplying air under pressure through said distributing chamber into the burning chamber to support the combustion, a set of air inlets provided in the bottom portion of the burning chamber and connected to the air supplying means both to support combustion of the material to be burnt in the burning chamber and to fluidize the material being burnt with the pressurized air supplied, said air inlets comprising a plurality of narrow slots arranged in longitudinal columns and circumferential rows to provide

vide a regular array extending over most of the length of the chamber in the bottom third thereof, said slots being formed by gaps left between a regular array of firebricks mounted in spaced apart relationship in an opening formed in both the walls of the chamber and the inner lining, said regular array of firebricks being arranged in longitudinal columns and circumferential rows, supported in the opening by a grid, so that the inner surfaces of said firebricks are generally flush with the inner surface of the chamber lining, one longitudinal column of firebrick supported by the grid being higher than the others and extending inwardly into the burning chamber to disturb at least partially the spiral movement of the material being burnt.

4,422,389

**SOLID-FUEL BURNER**

Ulrich Schröder, Krefeld, Fed. Rep. of Germany, assignor to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

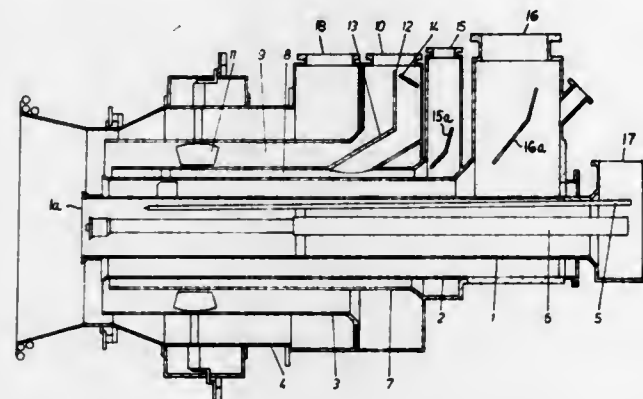
Filed Jun. 25, 1982, Ser. No. 392,354

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125901

Int. Cl.<sup>3</sup> F23M 7/00

U.S. Cl. 110—264

11 Claims



1. In a burner for the combustion of solid fuel in pulverulent form and having a first conduit for primary combustion-supporting fluid, the first conduit being spacedly surrounded by a second conduit for the pulverulent solid fuel, and a third conduit for secondary combustion-supporting fluid spacedly surrounding the second conduit, a combination comprising an intermediate conduit between said second and third conduits and subdividing the space therebetween into two annular channels;  
first means for admitting combustion-supporting fluid into one of said channels;  
second means for selectively admitting combustion-supporting fluid, or a mixture of such fluid with pulverulent solid fuel, into the other of said channels;  
a main inlet pipe communicating with said third conduit for admitting combustion-supporting fluid thereto; an auxiliary inlet pipe communicating with said other channel; and means for selectively blocking and unblocking the flow of combustion-supporting fluid through said auxiliary pipe into said other channel.

4,422,390

**PROCESS AND APPARATUS FOR COLLECTION OF GASES AND PARTICULATES IN A FURNACE FEED SYSTEM**

Arthur J. Henriksen, Pocatello, Id.; Klaus F. Thiel, Foster City, Calif., and Carl F. Peterson, Pocatello, Id., assignors to FMC Corporation, Philadelphia, Pa.

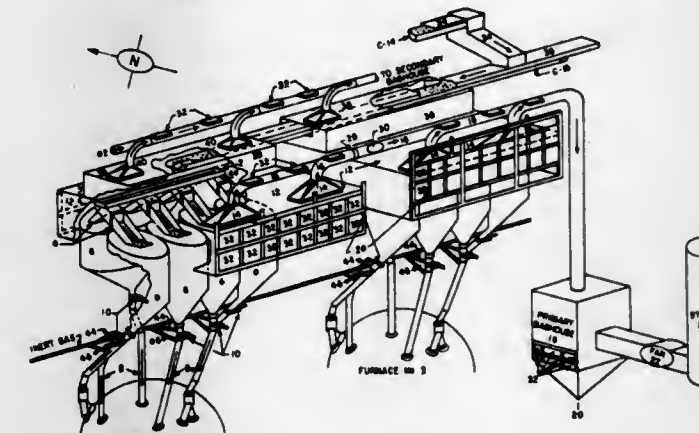
Division of Ser. No. 169,248, Jul. 16, 1980, Pat. No. 4,368,676.

This application Feb. 8, 1982, Ser. No. 346,826

Int. Cl.<sup>3</sup> F23B 7/00

U.S. Cl. 110—341

3 Claims



1. A process for feeding a furnace with furnace feed and collecting the dust created by the feeding process which comprises positioning a reversible shuttle conveyor over feed bin chutes, feeding material from said conveyor into said feed bin chutes in sequential order until a feed bin sensor in each feed bin indicates the feed bin is full and forwards said conveyor to the next feed bin chute requiring filling, passing the feed material into feed bins located below the feed bin chutes until they are full, collecting the dust formed about the feed bin chutes and feed bins in an enclosure surrounding the feed bin chutes and feed bins, conveying the dust and gases within said enclosure through exhaust openings in the enclosure to a duct, heating the duct and the dust and gases therein sufficiently to maintain the dust and gases at above the dew point, conveying the gas stream to a separator, separating the dust from the gases, and discharging the gases from the separator.

4,422,391

**METHOD OF COMBUSTION OF PULVERIZED COAL BY PULVERIZED COAL BURNER**

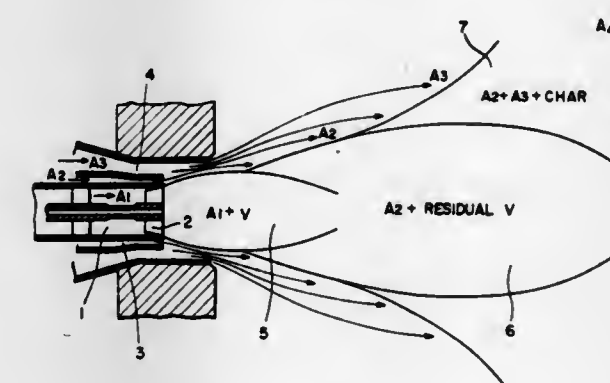
Akira Izuba, Koganei; Tomoyuki Shinano, Yokohama; Yuho Shibayama, Warabi; Chikatoshi Kurata, Akashi, and Kenichi Fujii, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 12, 1981, Ser. No. 242,950

Int. Cl.<sup>3</sup> F23D 1/00

U.S. Cl. 110—347

2 Claims



1. A method of combustion of pulverized coal by a pulverized coal burner, comprising the steps of:  
combusting the pulverized coal by supplying thereto air for combustion mixed with exhaust gas in a proportion of

35-60% of the air necessary for carrying out combustion in a first stage of combustion; and  
supplying to a flame formed in the first stage of combustion air for combustion in a proportion of 25-35% of the air necessary for carrying out combustion.

4,422,392

**SEED DRILL WITH DISK-TYPE FURROW OPENERS**  
Heinz Dreyer, Hasbergen-Gaste, and Benno Wiemeyer, Osnabrück-Pye, both of Fed. Rep. of Germany, assignors to Amazonen Werke AG H. Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany

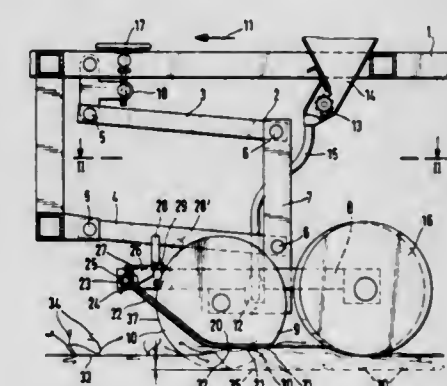
Continuation of Ser. No. 170,215, Jul. 18, 1980, abandoned. This application May 26, 1982, Ser. No. 382,340

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929622; Feb. 8, 1980, 3004587

Int. Cl.<sup>3</sup> A01C 5/00

U.S. Cl. 111—52

7 Claims



1. In a seed drill having a frame, furrow opener disks rotatably mounted at an acute angle with respect to the direction of travel on supports which are movable vertically with respect to the frame, a seed outlet disposed at the inside soil nonworking surface of each disk, a skid for each disk and means mounting a skid to each support at the outside soil working surface of the disk and at an angle with respect to the direction of travel, the improvement wherein: each skid comprises a trailing portion configured to have a slidably engagable surface disposed above the depth of penetration of the disk in the ground, a leading portion bent upwardly in the direction of travel and having a recess defined in the side thereof facing the disk, the recess extending beyond the forwardmost portion of the disk in the direction of travel and the means mounting each skid comprises means releasably connecting the leading portion of the skid to the support for the pivotal movement of the trailing portion of the skid towards and away from the ground, spring means for biasing the trailing portion of the skid towards the ground and adjustable stop means to limit the pivotal movement of the trailing portion of the skid towards the ground whereby soil acted upon by the disk will be substantially prevented from being turned over but will be returned to the furrow formed by the disk in substantially the same profile as before the furrow was formed.

4,422,393

**SEWING MACHINE HAVING AUTOMATIC PALLET HANDLING**

Herbert Johnson; Richard M. Elliott, both of Beverly; Donald F. Herdeg, So. Hamilton, and Alan M. Peck, Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed May 22, 1981, Ser. No. 266,144

Int. Cl.<sup>3</sup> D05C 9/04

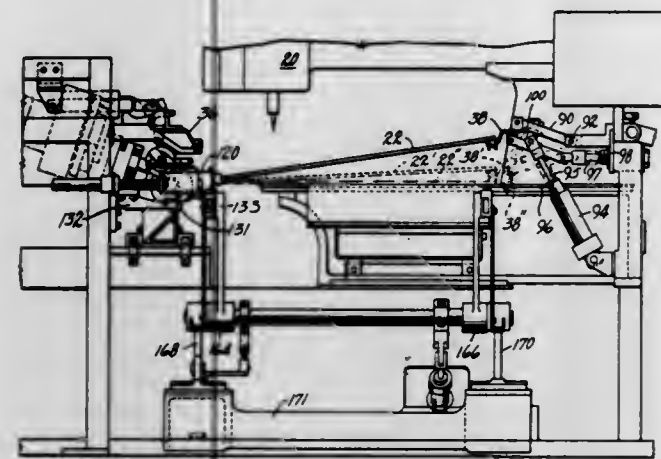
U.S. Cl. 112—121.15

87 Claims

1. In an automatic sewing machine system, apparatus for automatically processing a plurality of workpieces prearranged within pallets, said apparatus comprising:  
means for receiving a prearranged workpiece within a pallet;



means, located below said receiving means, for automatically attaching a pallet transmitted from said receiving means to a means for automatically positioning the prearranged workpiece relative to a sewing needle so as to produce a sewn workpiece;



means located below said automatic positioning means, for automatically ejecting the pallet containing the sewn workpiece; and  
means for automatically controlling said receiving means, said automatic attaching means, and said automatic ejecting means so as to process received pallets.

#### 4,422,394 SEWING GUIDE OF A SEAM PATTERN SEWING MACHINE

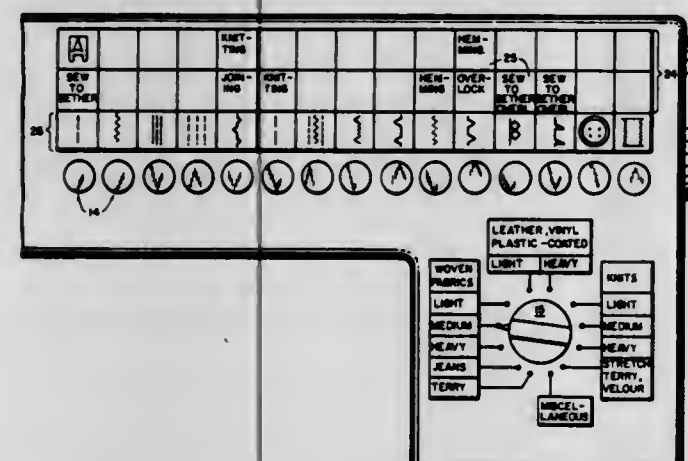
Bengt A. Bergvall, Huskvarna, Sweden, assignor to Huskvarna Aktiebolag, Huskvarna, Sweden

PCT No. PCT/SE81/00090, § 371 Date Nov. 19, 1981, § 102(e) Date Nov. 19, 1981, PCT Pub. No. WO81/02751, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 19, 1981, Ser. No. 325,429  
Claims priority, application Sweden, Mar. 19, 1980, 8021397  
Int. Cl.<sup>3</sup> D05B 3/02

U.S. Cl. 112-158 F

8 Claims



1. In a seam pattern sewing machine having a seam pattern selector including a plurality of switch means and means responsive to the operation of the switch means for selectively creating seam selection codes, and separate indicator means associated with each of said switch means; the improvement comprising a second selector having positions corresponding to characteristics of a material to be sewn, and encoding means coupled to said second selector for energizing selected ones of said indicators at each position of said second selector, for indicating the seams that may be sewn on the chosen material.

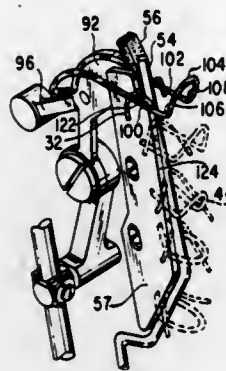
#### 4,422,395 THREAD HANDLING ARRANGEMENT WITH FIBER CARRYING STRIP AND CAM

Donald Rodda, Butler, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Mar. 12, 1982, Ser. No. 357,446  
Int. Cl.<sup>3</sup> D05B 49/00

U.S. Cl. 112-254

7 Claims



1. In a sewing machine wherein a sewing needle and loop-taker cooperate in the formation of lockstitches in a fabric, the combination comprising: a thread source, thread tensioning means to which thread extends from the thread source; a thread handling device into which thread extends from the tensioning device and beyond which the thread extends to the needle, the thread handling device including an elongate rigid member and a fiber supporting strip from which resilient fibers project outwardly into contact with said rigid member and the thread in the thread handling member; a takeup for setting stitches and pulling thread through the tensioning device from the supply, the takeup being movable in one direction with thread to a stitch setting position at one end of its operating range whereat the thread is disposed for temporary retention by said thread handling device, and movable in the opposite direction free of the thread to the other end of said operating range to enable thread to move in the thread handling device away from the temporary retention position to a position of reengagement with the takeup at said other end of its operating range and during such movement shorten the path for thread between the tensioning device and needle to supply a quantity of thread for use by the needle and loop-taker; and a cam in the thread path between the thread handling device and needle, said cam being located with respect to the thread handling device to engage thread exiting from the thread handling device, the cam including a gentle slope at the extreme upper end of an effective edge of the cam on which descent of the thread from its temporary retention position is delayed.

#### 4,422,396 BELT RETAINER GUARD FOR SEWING MACHINE

Jan Szostak, Lincroft, N.J., assignor to The Singer Company, Stamford, Conn.

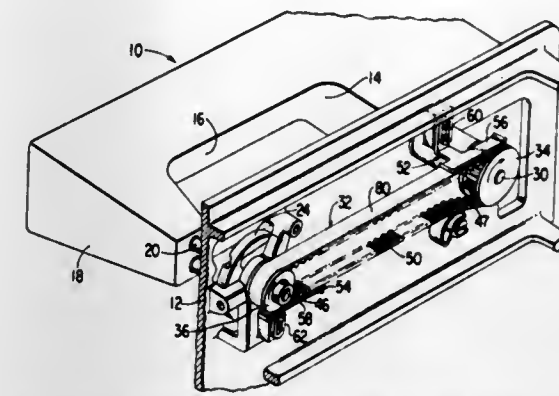
Filed Jul. 14, 1982, Ser. No. 398,025  
Int. Cl.<sup>3</sup> D05B 83/00

U.S. Cl. 112-261

3 Claims

1. In a sewing machine, a toothed driving pulley, a toothed driven pulley, a toothed timing belt extending over and in toothed engagement with both said pulleys for imparting rotation to the driven pulley when the driving pulley is rotated, a belt guard for each pulley, each belt guard being located for a predetermined direction of rotation of the driving pulley on the belt entering side only of the pulley with which the belt is associated and being disposed closely adjacent to the outside surface of the belt where the belt enters the pulley to thereby guide the belt onto the pulley and prevent teeth on the belt from jumping over teeth on the pulley, and inwardly acting belt deflecting means in engagement with a length of the timing belt extending between the unguarded belt exiting side of one pulley and guarded thread entering side of the other pul-

ley, said length of timing belt being engaged by the belt deflecting means at a location therealong which is closer to the un-



guarded belt exiting side of the said one pulley then to the guarded thread entering side of the said other pulley.

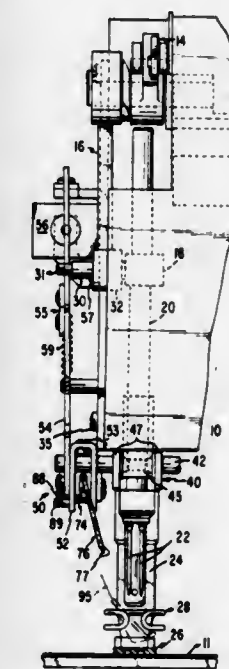
#### 4,422,397 NEEDLE THREAD WIPING DEVICE

Reinhold Papajewski, Stutensee-Friedrichsthal, and Lothar Reinfurth, Karlsruhe, both of Fed. Rep. of Germany, assignors to The Singer Company, Stamford, Conn.

Filed Sep. 3, 1981, Ser. No. 299,243  
Int. Cl.<sup>3</sup> D05B 65/06

U.S. Cl. 112-286

1 Claim



1. A needle thread wiping device adapted for use on a sewing machine having a frame, said frame including a work supporting bed having at least one orifice therein, at least one thread carrying needle supported by said frame for reciprocation in an endwise path through said at least one orifice, and a thread trimming mechanism associated with said sewing machine for severing sewing thread, said thread wiping device comprising in combination:

- a mounting bracket;
- means for supporting said mounting bracket on said sewing machine frame adjacent said endwise path of reciprocation of said thread carrying needle;
- a first and second substantially parallel shafts supported in said mounting bracket;
- a lever carried by said first shaft, a first sleeve pivotally carried by one end of said lever;
- means for selectively actuating said lever to rotate the same relative to said mounting bracket when said thread carrying needle is reciprocated upwardly;
- a link having one end carried by said second shaft, a second sleeve pivotally carried in the other end of said link;

g. a thread wiper having a hook on one end thereof;  
h. means for slidably supporting said thread wiper in said first and second sleeves;  
i. means for constraining three dimensional motion of said thread wiper on actuation of said actuating means, said constraining means further comprising a back plate having a curved slot with said second shaft extending therethrough and a pivotal connection between said back plate and said first sleeve, whereby said hook end of said thread wiper is influenced upon actuation of said actuating means to move substantially in a first plane at a shallow angle to said needle from an initial position outside of said endwise path of reciprocation of said thread carrying needle to a position substantially in said path immediately adjacent said orifice and later return to said initial position from said position substantially in said path upon deactuation of said actuating means, and a lug carried by said thread wiper having a portion thereof pivotally connected to said back plate whereby said hook end of said thread wiper is influenced by the latter part of said actuation of said actuating means to implement a motion in said hook end in a second plane substantially normal to said first plane from substantially in said path immediately adjacent said orifice transversely across said path of said at least one needle, and an immediate return therefrom upon deactuation of said actuating means.

#### 4,422,398 TOP FEED DEVICE FOR A SEWING MACHINE

Albert Dusch, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

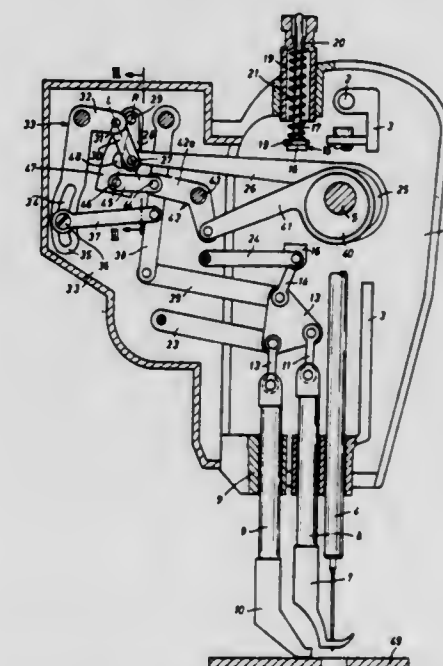
Filed May 29, 1981, Ser. No. 268,154

Claims priority, application European Pat. Off., Aug. 22, 1980, 80105004.8

U.S. Cl. 112-320

Int. Cl.<sup>3</sup> D05B 27/04

5 Claims

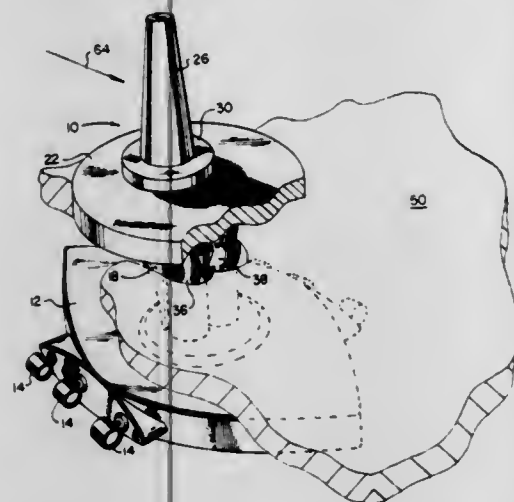


1. A transport device for a sewing machine having a housing, a feeder foot (7) and a fabric presser foot (10), drive means (5) for driving the feeder foot and the presser foot, transmission means operatively interconnecting the presser foot (10) and the feeder foot (7) to the drive means (5) for alternately reciprocating the feeder foot and the presser foot relative to each other in up and down motions directed perpendicular to a stitch plate (49) of the sewing machine, such that the speed of the up and down motions approach zero during a touchdown phase of the feeder foot and presser foot, the transmission means being of the type having an eccentric (25) connected to the drive means for oscillating in a selected frequency, a triangular lever (13) interconnecting the feeder foot and the presser foot, a coupling member (33) connected to the eccentric, and a linkage system



(37,38,39) having a link pivotally connected to the housing and interconnecting the coupling member (33) to the triangular lever (13), the improvement wherein the transmission means comprises a steering arm transmission (28,30) having a variable transmission ratio between an input (27) thereof and an output (31) thereof, said steering arm transmission interconnected between the eccentric (25) and the coupling member (33) and oscillating at the selected frequency of the eccentric, the improvement further comprising a linkage transmission (40,41,42,43,47; 101, 140,141,47) connected to the drive means (5) and said steering arm transmission for varying the transmission ratio of said steering arm transmission, said linkage transmission connected to said drive means for operating at twice the selected frequency of the steering arm transmission and eccentric.

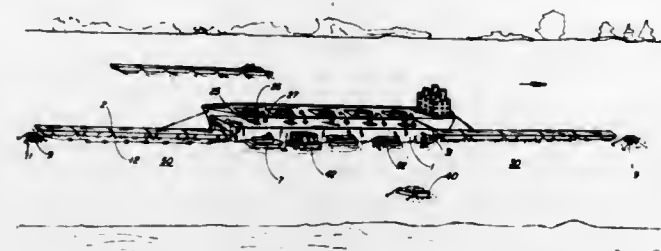
**4,422,399**  
**MEANS FOR INCREASING THE EFFICIENCY OF AN ICE DISAGGREGATION SYSTEM**  
 George W. Morgan, La Jolla, Calif., assignor to Suncor, Inc., Toronto, Canada  
 Filed Sep. 7, 1978, Ser. No. 940,245  
 Int. Cl.<sup>3</sup> B63B 35/08  
 U.S. Cl. 114—42 3 Claims



1. In an ice disaggregation system characterized by at least one rotating drum, which drum carries ice engaging teeth structure on the peripheral surface thereof, the improvement comprising:

- (A) a plurality of tooth supporting brackets distributed about and affixed to the peripheral surface of the drum, each of said brackets including an elongated tooth carrying beam portion disposed generally parallel to the drum peripheral surface and rigidly supported outwardly therefrom by a plurality of bracket legs;
- (B) a plurality of ice engaging teeth fixed to said bracket beam portion, each of said teeth having a sharp, ice engaging forward portion, said teeth being oriented such that the forward portions thereof generally face the direction of drum rotation; and
- (C) each of said teeth being further oriented such that said forward portion is disposed at an acute angle with respect to the drum axis, the upper edge of said forward portion extending radially outwardly further from the drum surface than the lower edge thereof.

**4,422,400**  
**MARINE SYSTEM FOR UNLOADING AND LOADING BULK PRODUCT**  
 Peter G. Burke, New Orleans, La., assignor to Gibeshemael Incorporation, New Orleans, La.  
 Filed Jun. 8, 1981, Ser. No. 271,503  
 Int. Cl.<sup>3</sup> B63B 25/06  
 U.S. Cl. 114—73 19 Claims

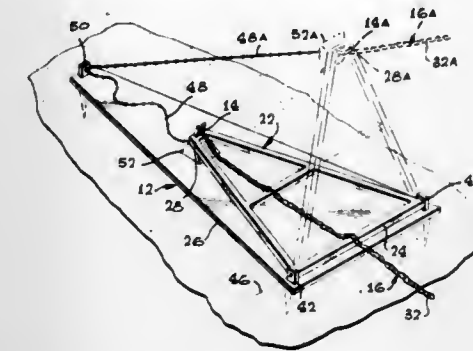


1. A marine system for transferring bulk product loads from and/or into barges and the like, comprising in combination:
  - (a) a floating transfer vessel having load transfer means for transferring a load between said transfer vessel and at least one barge and having an entry end and an exit end and the load transfer area there between;
  - (b) entry barge handling means for moving barges to said transfer vessel, including
    - a separate, entry, anchored floating structure substantially removed out away from said transfer vessel;
    - an extended, moveable, closed, endless, entry line extending from the entry end of said transfer vessel to a spaced entry point on said separate, entry floating structure;
    - temporary barge connection means carried by said entry line for temporarily connecting said entry line to a barge; and
    - entry drive means associated with said entry line for causing said entry line and its barge connection means to move from said spaced entry point inwardly toward said entry end of said transfer vessel moving the barge to said transfer vessel; and
  - (c) exit barge handling means located at the opposite end of said transfer vessel from said entry means for moving barges away from said transfer vessel, including
    - a separate, exit, anchored floating structure substantially removed out away from said transfer vessel;
    - an extended, moveable, closed, endless, exit line extending from the exit end of said transfer vessel to a spaced exit point on said separate, exit floating structure;
    - temporary barge connection means carried by said exit line for temporarily connecting said exit line to a barge; and
    - exit drive means associated with said exit line for causing said exit line and its barge connection means to move toward said spaced exit point outwardly away from said exit end of said transfer vessel moving the barge out away from said transfer vessel.

**4,422,401**  
**RAISED ANCHOR POINT CATENARY MOORING SYSTEM**  
 George M. Pomonik, Van Nuys, Calif., assignor to Amtel, Inc., Providence, R.I.  
 Filed Jul. 14, 1980, Ser. No. 168,050  
 Int. Cl.<sup>3</sup> B63B 21/24  
 U.S. Cl. 114—294 2 Claims

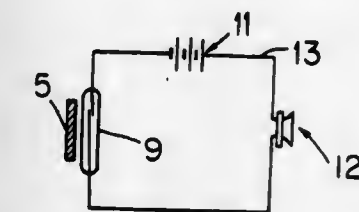
1. An offshore mooring system for use in a sea, comprising:
  - a member to be anchored having a portion substantially at the sea surface;
  - a plurality of chain devices extending in loose curves from said member portion to the sea bed;
  - a plurality of anchoring devices, each having a base mounted on the sea floor and a substantially rigid arm having an inner end pivotally mounted on the base about a largely

horizontal axis and an outer end connected to an end of one of said chain devices, said outer end of said arm lying on a side of said axis which is opposite said member; and



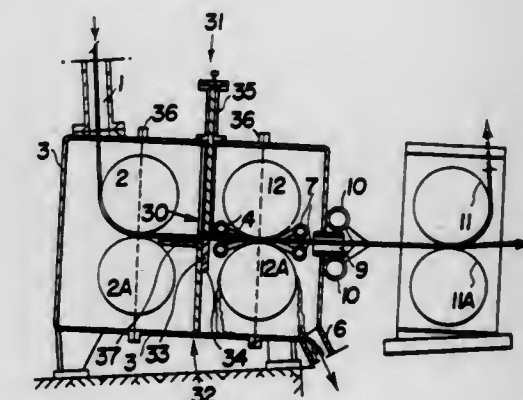
a limit line extending between locations on said base and said arm which are each spaced from the axis of pivoting of said arm on said base, to prevent pivoting of the arm by more than a limited angle from the horizontal.

**4,422,402**  
**APPARATUS FOR DETECTING THE REMAINING AMOUNT OF ROLLED PAPER**  
 Masato Ogihara, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan  
 Filed Feb. 20, 1981, Ser. No. 236,640  
 Claims priority, application Japan, Feb. 20, 1980, 55-21022[U]  
 Int. Cl.<sup>3</sup> G08B 7/06, 21/00  
 U.S. Cl. 111—67 A 9 Claims



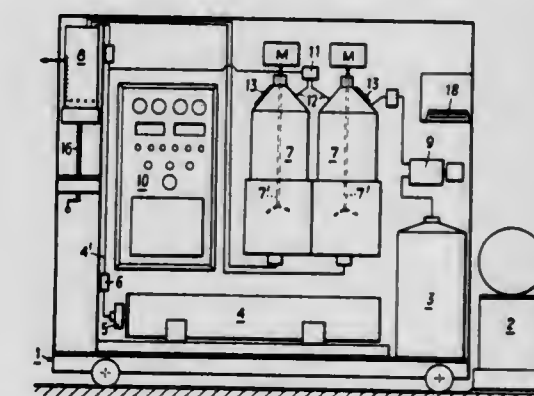
1. An apparatus for detecting the remaining amount of rolled paper, comprising:
  - a roll of paper, the diameter of which decreases as it is unrolled,
  - a swingable detection biased lever having a free end and a fixed end, the fixed end mounted on a support plate in said apparatus, said lever lying along the side of the roll of paper and said lever adapted to move in a plane parallel to the side of the roll of paper, and elongated contact means having a roller connected to said free end of said lever and urged into contact with the outer peripheral surface of said roll of paper,
  - a magnet piece attached to said free end of said detection lever, at least one magnetism sensor mounted on a support plate in said apparatus and disposed at such a position that the sensor is activated by said magnet piece when said swingable detection lever with said magnet piece comes to a predetermined position relative to said sensor as the diameter of said rolled paper decreases to a predetermined diameter, and
  - alarm indicating means activated in accordance with the activation of said magnetism sensor.

**4,422,403**  
**DIPLESS METALLIZING APPARATUS**  
 Theodore Bostroem, 470 Park Rd. Ext., Middlebury, Conn. 06762  
 Division of Ser. No. 145,302, Apr. 30, 1980, Pat. No. 4,357,838.  
 This application Apr. 7, 1982, Ser. No. 366,312  
 Int. Cl.<sup>3</sup> B05C 11/00  
 U.S. Cl. 118—63 11 Claims



1. Apparatus for providing a metallic article with a metal coating, said apparatus comprising:
  - (a) a coating chamber having an entrance opening for the metallic article to be coated, and an exit opening for the metal coated article,
  - (b) means within and enclosed by said chamber for applying a continuous stream of molten metal to the metallic article to be coated for a very short period of time so as to uniformly and evenly distribute the coating metal over the surface of the hot metallic article so as to coat the same,
  - (c) means downstream of said molten metal applying means for subjecting the coated metallic article to a hot gas blast comprising steam or other gases which would otherwise oxidize any aluminum contained in the molten coating metal except for the rapidity of the coating step, so as to remove substantially completely excess coating metal from the coated article, and
  - (d) means exterior to the exit opening of said coating chamber for rapidly cooling the metal coated article, prior to further handling.

**4,422,404**  
**APPARATUS FOR COATING OF GLASS**  
 Siegfried Harcuba, Innsbruck, Austria, assignor to Glasfabrik-en-Ausruestergesellschaft m.b.H., Innsbruck, Austria  
 Filed Jan. 18, 1982, Ser. No. 339,946  
 Claims priority, application Austria, Jan. 21, 1981, A 229/81  
 Int. Cl.<sup>3</sup> B05B 1/14  
 U.S. Cl. 118—315 20 Claims



1. An apparatus for applying to a glass object a coating of metal chlorides which are dissolved in an organic acid, comprising a hood having an opening therein, said glass object being disposed in the region of said opening, at least one thermoshield supported in the region of said opening in said hood



and having means for heating said glass object, a nozzle bar movably supported within said hood, a plurality of nozzles supported on said nozzle bar, first means for dissolving said metal chlorides in said organic acid in an environment free of oxygen to produce a coating fluid, and second means for supplying said coating fluid to said nozzles on said nozzle bar free of exposure to oxygen, said coating fluid being sprayed onto said glass object by said nozzles.

4,422,405

**COLOR ELECTROSTATOGRAPHIC APPARATUS**

Nobuo Kasahara, Tosio Nakahara, and Hidetoshi Yano, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 8, 1978, Ser. No. 958,872

Claims priority, application Japan, Nov. 25, 1977, 52-141173

Int. Cl.<sup>3</sup> G03G 15/09, 15/00

U.S. Cl. 118—658

9 Claims

1. An electrostatographic apparatus including a rotary photoconductive member and a rotary magnetic brush developing means operatively disposed closely adjacent to the photoconductive member for applying toner thereto, characterized by comprising:

a plurality of applicator means which are fixed in position and selectively actuatable for applying toners of different respective colors to the developing means; and  
actuator means for selectively actuating the applicator means; each applicator means comprising container means for containing the toner and magnetic brush means for applying the toner from the container means to the developing means; each applicator means comprising removal means disposed downstream of the photoconductive member and upstream of the magnetic brush means in a direction of rotation of the developing means for removing toner from the developing means; each removal means being normally maintained inoperative and being actuated for operation by the actuator means together with the respective magnetic brush means.

4,422,406

**APPARATUS FOR MANUFACTURING METAL LAYERS AND GLOW POLYMER LAYERS WHICH ARE SUPERIMPOSED AND ARRANGED LATERALLY OFFSET RELATIVE TO ONE ANOTHER**

Reinhard Behn, and Kurt Kaufman, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

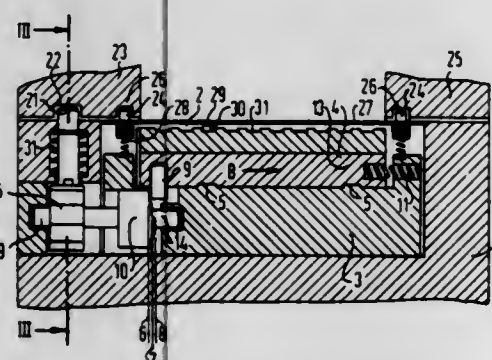
PCT No. PCT/DE80/00115, § 371 Date Jul. 7, 1981, § 102(e) Date Jul. 7, 1981, PCT Pub. No. WO82/00542, PCT Pub. Date Feb. 18, 1982

PCT Filed Aug. 4, 1980, Ser. No. 279,998

Int. Cl.<sup>3</sup> C23C 13/08

U.S. Cl. 118—719

11 Claims



1. In apparatus for manufacturing metal layers and glow polymer layers which are superposed on and arranged laterally offset of one another on a substrate, in which a rotatable cylinder and lock jaws form air locks between first and second vacuum chambers which respectively contain a glow polymer layer deposition structure and a metal layer deposition struc-

ture, in which a plurality of cavities are provided about the periphery of the cylinder for supporting respective substrates and carrying the same through the vacuum chambers, and in which each cavity has a displaceable apertured diaphragm at the surface of the cylinder, as a mask for the selective application of the glow polymer and metal layers, the improvement in combination therewith comprising:

for each cavity

a support in the cavity for supporting a substrate;

support mounting means in the cavity mounting said support for movement in a direction which includes a direction component which is parallel to the axis of rotation of the cylinder;

indexing means including an axially movable pin biased outwardly and mounted in and extending outwardly of the cylinder, and an indexing drive coupled between said pin and said support and operable to move said support on said support mounting means to a respective predetermined position upon each inward movement of said pin; and

for all of the cavities

pin control means mounted adjacent and stationary with respect to the cylinder and including camming means engaging the pin and defining and effecting inward and outward movements of said pin at predetermined rotational positions of the cylinder.

4,422,407

**APPARATUS FOR CHEMICALLY ACTIVATED DEPOSITION IN A PLASMA**

Jean-Jacques Bessot, Arpajon, and Bernard Bourdon, Gometz le Chatel, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

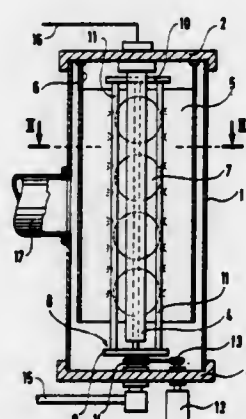
Filed Sep. 16, 1981, Ser. No. 302,936

Claims priority, application France, Sep. 17, 1980, 80 19983

Int. Cl.<sup>3</sup> C23C 13/08

U.S. Cl. 118—723

2 Claims



1. An apparatus for chemically activated deposition in a plasma, said apparatus comprising: a chamber in which a vacuum is maintained, said chamber having a longitudinal axis of symmetry and being closed by means of first and second removable end plates; a substrate support disposed about said axis within said chamber; a reactive gas distribution manifold; and means for setting up and maintaining a plasma inside said chamber, the improvement wherein: said substrate support is of polygonal cross-section, constituted by rectangular longitudinally extending facets, and wherein said manifold comprises two circular end portions interconnected by longitudinally extending pipes, means for rotating said manifold at uniform speed about the axis of the chamber and inside said substrate support, and wherein said pipes are provided with gas outlet orifices on the sides remote from the axis of rotation and facing said substrates borne by said longitudinally extending facets.

4,422,408

**SHIELDING DEVICE FOR THE TEMPERATURE AND POLLUTION CONTROL OF WATER IN A FARMING ENCLOSURE FOR FISH AND OTHER AQUATIC ORGANISMS**

Henn Pohlhausen, Friedrichstr. 56, D-2110 Buchholz in der Nordheide, Fed. Rep. of Germany

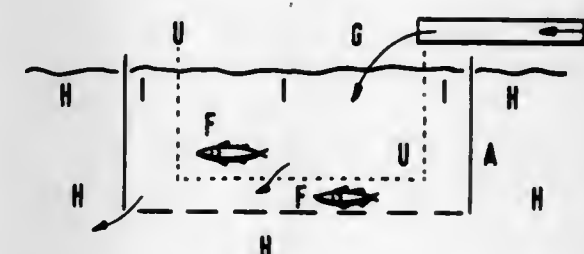
Filed Feb. 10, 1981, Ser. No. 233,098

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005150

Int. Cl.<sup>3</sup> A01K 63/00

U.S. Cl. 119—3

10 Claims



10. A fish farming device comprising a warm water shield enclosure for forming a warmer epilimnion in a surrounding body of cooler water comprising a peripherally closed water impermeable vertical single wall structure extending above the surface of said surrounding body of water and sufficiently below said surface to enclose the warmer water having lower unit weight than the surrounding water and provided with an anchoring means to maintain said enclosure in a relatively static position, said wall defining an enclosure open only to the atmosphere at its top and open to said body of surrounding water only at its bottom and laterally completely closed with respect to said surrounding body of water along its sides and at its top whereby the warmer water having a lower unit weight is enclosed within said shield and is prevented from flowing off laterally, and means for supplying water warmer than said surrounding body of water to the interior of said enclosure thereby maintaining an artificial warmer epilimnion within said enclosure.

4,422,409

**AUTOMATIC ANIMAL FEEDING APPARATUS**

Ralph Walker, 6340 Glenhills Way, Sacramento, Calif. 95824, and David Bories, Fair Oaks, Calif., assignors to Ralph T. Walker, Sacramento, Calif.

Filed Dec. 14, 1981, Ser. No. 330,444

Int. Cl.<sup>3</sup> A01K 5/02

U.S. Cl. 119—51.11

10 Claims

1. Apparatus for providing food and water to an animal comprising:

a housing;

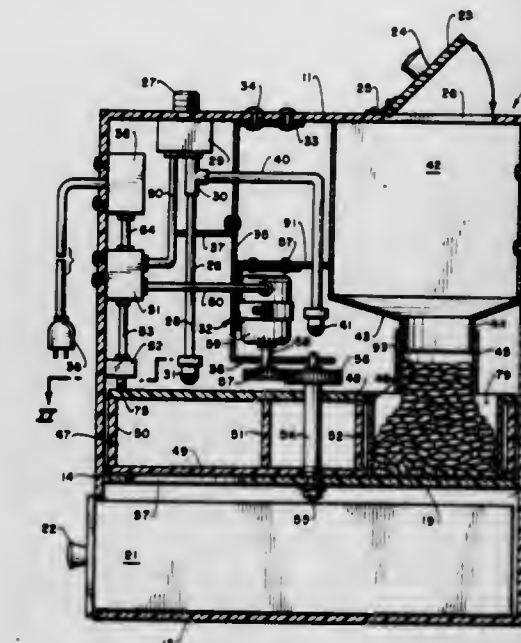
a partition wall dividing the interior of the housing into an upper water and food chamber and a lower enclosed accessible waste chamber;

a rotatable carousel having spaced top and bottom walls disposed above said partition separating the upper and lower chambers;

a water inlet opening into the interior of the upper chamber; a food storage bin mounted in said upper chamber, said bin communicating at its lower end with an opening in said top wall of said carousel, said opening in said top wall of said carousel communicating with a food ring, adapted to receive food from said bin, disposed between the top and bottom walls of said carousel; and

an opening in said partition wall remote from said lower end of said bin communicating with the interior of said waste chamber whereby waste remaining in said food ring can move by gravity from said food ring to said waste cham-

ber upon rotation of said carousel, said carousel having an animal feed position intermediate of said lower end of said



bin and said opening in said partition wall wherein food is exposed to said animal.

4,422,410

**DOMESTIC COMBUSTION APPLIANCES**

John M. Lake, Woodmanecote, and Robert C. Payne, Bishop Cleeve Nr. Cheltenham, both of England, assignors to Coal Industry (Patents) Limited, London, England

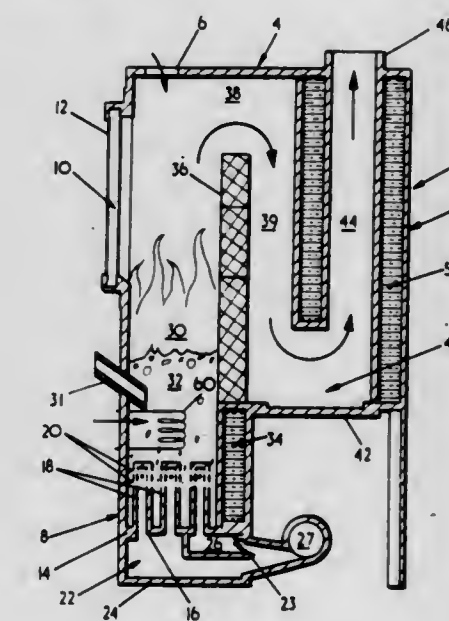
Continuation of Ser. No. 249,960, Apr. 1, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,198

Claims priority, application United Kingdom, Apr. 22, 1980, 8013281

Int. Cl.<sup>3</sup> F22B 1/02, 31/04

U.S. Cl. 122—4 D

2 Claims



1. A fluidized bed domestic combustion appliance comprising an upstanding body, an air permeable support horizontally within the body defining a plenum chamber below the support and a compartmented combustion zone above the support; said support having a plurality of apertures with standpipes located in the apertures and perforations in the standpipes leading toward said combustion zone; said combustion zone having a fluidized bed of particulate material immediately above said support and standpipe, an electric heater centrally positioned and immersed in a front portion of said fluidized bed; a primary boiler located adjacent a rear portion of said fluidized bed;



means for introducing air into the combustion zone above the support;  
 flue passages downstream of the combustion zone comprising a generally vertical downwardly extending open passage connected to the top of the combustion zone, a particulate matter drop-out zone at the base of said vertical passage, a further flue opening outwardly therefrom, and a secondary boiler in one of the walls of said flue passages; said plenum chamber having fan means for inducing an air flow through the air permeable support, closure means for blocking off air flow to said rear portion of the fluidized bed, means to simultaneously actuate the electric heater and to close the closure means so that during start-up when the electric heater is bringing the front portion of the fluidized bed up to operating temperature, the rear portion of the fluidized bed can be kept at a lower temperature to avoid heat loss to the primary boiler.

4,422,411

## CONVECTIVE HEATER

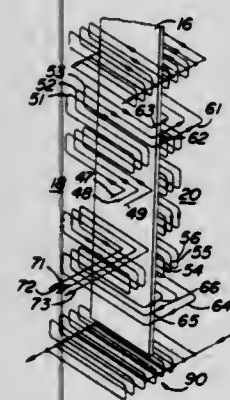
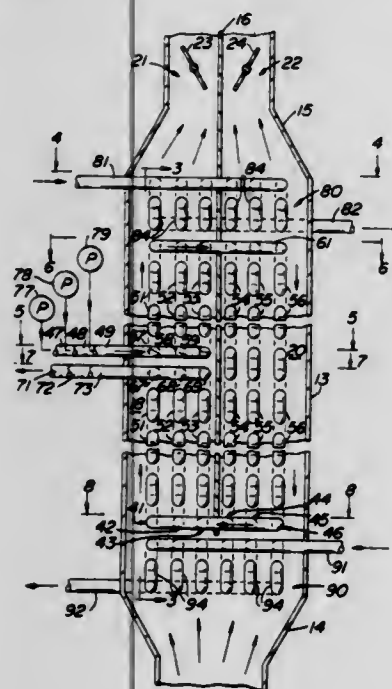
Robert M. Thorogood, Macungie, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed May 29, 1981, Ser. No. 268,450

Int. Cl.<sup>3</sup> F22D 1/00

U.S. Cl. 122-7 R

1 Claim



1. A convective heater for heating fluids such as a slurry or the like comprising:  
 means defining a heating chamber having an inlet at one end and an outlet at its other end,  
 means dividing said chamber into two heating gas flow paths whereby heating gases passing from said inlet to said outlet are divided into two heating gas streams,  
 and conduit means for the flow of the fluid to be heated through said heating chamber in heat exchange relation-

ship with the heating gases passing from said inlet to said outlet,  
 said conduit means comprises three parallel mixed flow tube circuits arranged to provide a mixed flow tube circuit in which the fluid to be heated enters one of said heating gas flow paths at a location between said inlet and outlet to flow in a co-current direction with said heating gases through said one path to a location near said outlet whereat said tube circuit transfers to said other heating gas path to then flow in a counter-current direction relative to said heating gas through said other path to a location near said inlet whereat said tube circuit transfers back to said one path to flow in a co-current direction to said entry location whereat said tube circuit leaves said one path,

wherein each of said tube circuits comprises tubes arranged in a serpentine-like arrangement comprising return bends located externally of said heating chamber, and passing back and forth transversely through said heating chamber as the fluid to be heated flows in said co-current and counter-current flow paths, and

wherein said tube circuits comprise three stacks of said transverse tubes extending along each of said heating gas flow paths and arranged in a generally parallel relation to one another to provide an inner tube stack, an intermediate tube stack and an outer tube stack, successive return bends for one of said tube circuits extending between the transverse tubes located in said outer and inner tube stacks in a pass, successive return bends for another of said tube circuits extending between the transverse tubes of said inner and intermediate tube stacks and successive return bends for the other of said tube circuits extending between the transverse tubes of said intermediate and outer tube stacks.

4,422,412

## DEVICE FOR CONVERTING ALCOHOLS TO ETHERS

John H. R. Norton, Johannesburg, South Africa, assignor to AECI Limited, Johannesburg, South Africa

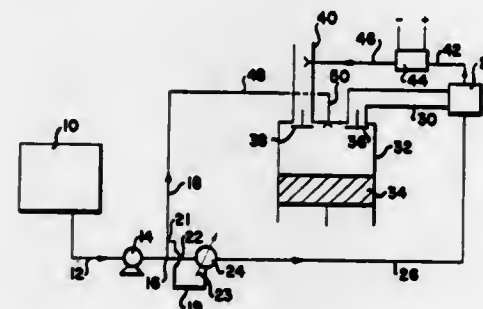
Continuation of Ser. No. 214,794, Dec. 9, 1980, abandoned. This application Nov. 16, 1982, Ser. No. 442,001

Claims priority, application South Africa, Dec. 27, 1979, 79/7031

Int. Cl.<sup>3</sup> F02M 27/02

U.S. Cl. 123-3

2 Claims



1. A compression ignition engine capable of running on a fuel of methanol and dimethyl ether, said engine comprising a compression ignition engine having at least one cylinder, a heat exchanger mounted by mounting means on the compression ignition engine, said heat exchanger being adapted to heat methanol passing therethrough to a temperature in the range of 80° to 400° C., a conversion chamber containing a catalyst for converting methanol to dimethyl ether at a temperature in the range of 80° to 400° C., also mounted by mounting means on the compression ignition engine, a supply tank for methanol, a first pipeline to lead a stream of methanol from the supply tank to the cylinder, a second pipeline to lead a stream of the methanol from the supply tank to the heat exchanger, a pipe for the methanol vapour leading from the heat exchanger to the con-

version chamber, and a pipe for the dimethyl ether leading from the conversion chamber to the cylinder.

2. A method of running a compression ignition engine on methanol and dimethyl ether, which comprises supplying a first part of methanol fuel from a supply tank containing the methanol fuel through a first pipe to a cylinder of the engine, and supplying a second part of the methanol from the supply tank through a second pipe to a heat exchanger where it is heated to a temperature in the range of 80° to 400° C., supplying this second part of the methanol at a temperature in this range from the heat exchanger to a catalytic conversion chamber containing a catalyst capable of converting the methanol to dimethyl ether at a temperature in the range of 80° to 400° C. and leading the dimethyl ether formed directly to the cylinder.

4,422,413

## APPARATUS FOR AND METHOD OF PRECISELY UPGRADING PUMP FUEL IN A MOTOR VEHICLE

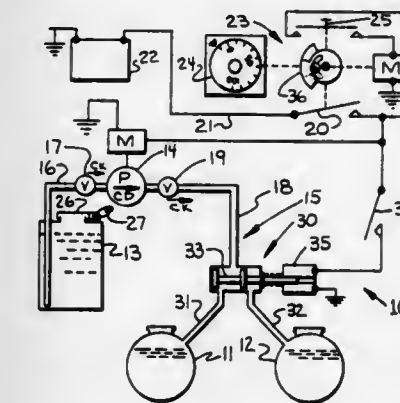
Jeffrey W. Pederson, Thief River Falls, Minn., assignor to Met-Con Manufacturing, Olathe, Kans.

Filed Aug. 10, 1981, Ser. No. 291,417

Int. Cl.<sup>3</sup> F02B 47/00; F02M 43/00; F02D 19/00

U.S. Cl. 123-25 J

22 Claims



1. An on-board motor vehicle fuel treatment system for a motor vehicle having a primary fuel tank, comprising:

- (a) a discrete reservoir for liquid fuel supplement;
- (b) an electrically powerable pump for pumping liquid supplement at a constant volumetric amount per unit of time from said reservoir to said tank;
- (c) a fuel supplement transfer line having a suction line fluidly connecting said reservoir to an inlet of said pump, and a delivery line connecting an outlet of said pump to said tank;
- (d) a normally open pump control switch in a power lead between a source of electromotive power and said pump; and
- (e) a timer operatively connected to said switch, said timer being operative to maintain said switch closed and to effect operation of said pump for a duration of time, said timer having
  - (1) an adjustable timer control having means for setting a duration of time based upon volumetric units of fuel, said control being adjustably settable on the basis of the volumetric units of untreated fuel in said tank, and
  - (2) means for initiating operation of said timer.

4,422,414

## PISTON AND CYLINDER ARRANGEMENT INCLUDING MEANS TO VARY THE COMPRESSION RATIO

Frank Moeller, Caterham, England, assignor to John Douglas Rees, Orpington, England

Filed Jul. 9, 1981, Ser. No. 281,625

Claims priority, application United Kingdom, Jul. 18, 1980, 8023616

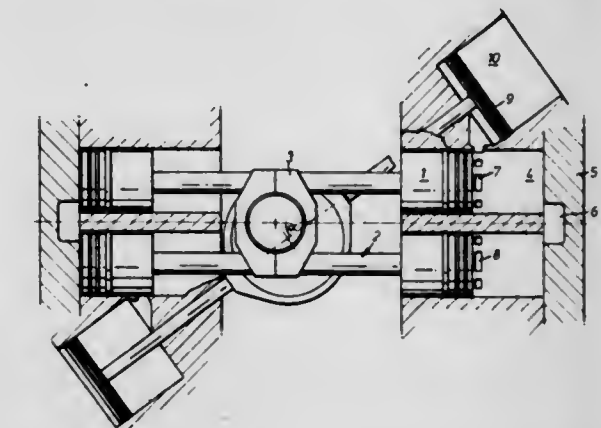
Int. Cl.<sup>3</sup> F02B 75/04

U.S. Cl. 123-48 B

4 Claims

1. An internal combustion engine, comprising a first pair of working piston (1) and cylinder (4) assemblies disposed adja-

cent each other with their longitudinal axes parallel, a common combustion chamber (6) communicating with the cylinders of the pair of piston and cylinder assemblies, a big end bearing housing (3) to which each piston is rigidly connected, and a counter rotating crank drive having an inner crank (12), an eccentric (12a) being carried on the inner crank and being arranged to drive the pistons, the eccentric being rotatable within said big end bearing housing, and further comprising connecting means (2) connecting at least one piston of the pair of piston and cylinder assemblies to said bearing housing, said connecting means extending axially of said piston, said connecting means comprising a rigid tube (16) connected to one of the piston and the housing, and a rigid rod (17) connected to the other of the piston and the housing, the rod extending coaxially within the tube, interengaging means provided internally of the tube and externally of the rod and arranged to cause relative longitudinal movement of the rod and the tube upon relative rotation thereof, and means for causing relative rotation of the rod and the tube to selectively adjust the position of the piston within its cylinder and thereby vary the compression ratio of the pair of piston and cylinder assemblies, said means for causing relative rotation of said rod and said



tube comprising longitudinally extending grooves (24) on the external surface of said tube and a worm spindle (18) engaged with said grooves, wherein a second pair of working piston and cylinder assemblies is disposed opposite to said first pair, and wherein one piston of each pair is connected to said bearing housing by respective connecting means and the other piston of each pair is connected to said bearing housing by a rigid tube (15) fixed to said piston and the housing and extending axially of said piston, an anti-fatigue bolt (19) extending coaxially within said tube over the whole length thereof, said anti-fatigue bolt being prestressed to keep the tube under compression, and further comprising a respective scavenging piston (9) and cylinder assembly (10) associated with the common combustion chamber of each pair of working piston and cylinder assemblies, each said scavenging piston and cylinder assembly being arranged adjacent the working piston and cylinder assembly of the respective pair provided with inlet ports (7), and wherein the longitudinal axes of said scavenging piston and cylinder assemblies are aligned, the longitudinal axis of each scavenging assembly being at an angle between 20° and 50° relative to the longitudinal axis of the associated pair of working piston and cylinder assemblies.

4,422,415

## INTAKE SYSTEM OF ENGINES

Noritaka Matsuo, Koichiro Takeuchi, both of Iwata, and Tokuji Muramatsu, Hamakita, all of Japan, assignors to Yamaha Motor Co., Ltd., Japan

Filed Jun. 26, 1981, Ser. No. 277,631

Claims priority, application Japan, Jun. 28, 1980, 55-88067

Int. Cl.<sup>3</sup> F02M 35/00

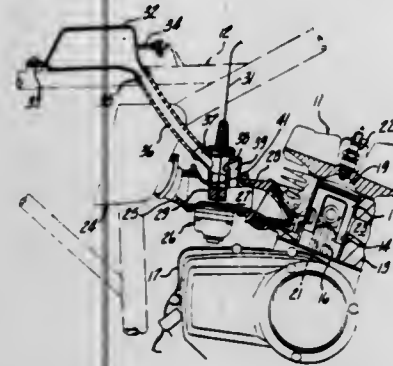
U.S. Cl. 123-52 M

4 Claims

1. An induction system for delivering intake charge to a variable volume chamber of an internal combustion engine



having an induction passage for supplying the total of the intake charge to said chamber, a throttle valve for controlling the flow through said induction passage, a plenum chamber, and means communicating said plenum chamber only with said induction passage between said throttle valve and said chamber, said communicating means and said plenum chamber providing for flow of a portion of said intake charge from said induction passage into said plenum chamber during a portion of the engine operating cycle and providing flow from said



plenum chamber to said induction passage of at least a part of said portion of said intake charge during at least a part of the induction cycle of said engine for supplementing the flow in said induction passage, and means for controlling the communication of said plenum chamber with said induction passage in response to a running condition of the engine comprising a control valve means operatively connected with said throttle valve and movable from an opened position when said throttle valve is in its idle position to a closed position when said throttle valve is in its fully opened position.

4,422,416

# INTAKE DUCT FITTED WITH NON-RETURN VALVE MEANS

Luigi Bernardoni, Tradate, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

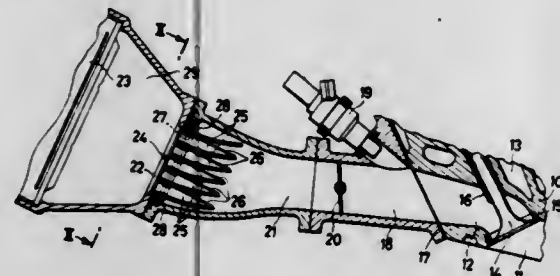
Filed Sep. 30, 1981, Ser. No. 307,098

Claims priority, application Italy, Oct. 17, 1980, 25427 A/80

Int. Cl.<sup>3</sup> F02B 77/00

U.S. Cl. 123—52 MF

2 Claims



1. An intake duct for feeding a mixture which comprises one of air and air-fuel from outside said intake duct to at least one cylinder of a four-stroke internal combustion engine, provided with at least one intake valve, characterised by being fitted with non-return valve means disposed in series with said at least one intake valve, said non-return valve means being arranged to allow mixture to flow in a direction to said at least one cylinder, being arranged to prevent backward flow of the mixture returned by said at least one cylinder, from said intake duct to the outside, said non return valve means being formed from a plurality of elastically flexible blades partly disposed side-by-side and partly superposed, and being connected to a support frame formed from a plurality of substantially parallel channels extending towards said at least one cylinder and being partly disposed side-by-side and partly superposed and disposed in the flow direction of the mixture feeding the engine, said blades being fixed to said frame so that they are also disposed in said flow direction in such a manner so as to close the relative channels when at rest.

4,422,417

# PULLBACK STARTER FOR INTERNAL COMBUSTION ENGINES

Alfred Obermayer, Lambach, Austria, assignor to Bombardier-Rotax Gesellschaft m.b.H., Gusskirchen, Austria

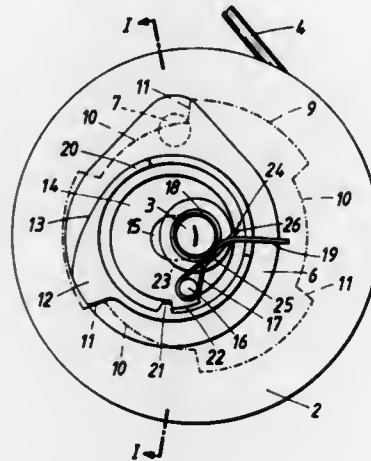
Filed Feb. 3, 1982, Ser. No. 345,235

Claims priority, application Austria, Feb. 27, 1981, 910/81

Int. Cl.<sup>3</sup> F02N 3/02

U.S. Cl. 123—185 BA

2 Claims



1. In a pullback starter for an internal combustion engine having a drive shaft carrying a driven coupling element, which starter comprises

- a housing,
  - an axle disposed in, and fixed to, said housing,
  - a rope pulley rotatably mounted on said axle,
  - a rope wound on said pulley and adapted to be pulled from said pulley to rotate the same on said axle in a predetermined sense,
  - a pullback spring opposing a rotation of said pulley in said predetermined sense,
  - a driving coupling element mounted on said pulley for inward and outward pivotal movements on an axis which is parallel to and spaced from the axis of said axle, said driving coupling element being adapted to constitute an engageable and disengageable coupling element of a clutch comprising said driven coupling element,
  - a coil spring surrounding said axle and tending to embrace the same in frictional contact therewith so as to be braked against rotation on said axle, which spring is provided at opposite ends with first and second legs protruding from said axle,
  - a locking member rotatably mounted in said driving coupling element for rotation relative thereto between locking and unlocking positions, and engaged by said first leg,
  - a first stop carried by said driving coupling element,
  - a second stop carried by said locking member and so arranged that, when the latter is in its unlocking position, said second stop engages the first stop carried by said driving coupling element,
  - a third stop carried by said locking member and so arranged that, when the latter is in its locking position, it prevents pivotal movement of said driving coupling element, and
  - a further stop carried by said driving coupling element and adapted to engage said second leg in a sense tending to untwist said spring and to define said locking position,
- the improvement of a safety stop carried by said first leg and adapted to engage said second leg and to act on the latter in a sense tending to untwist said spring.

4,422,418

# EMERGENCY AIR SHUTDOWN SYSTEM FOR A DIESEL ENGINE

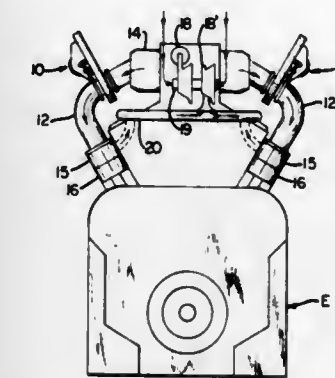
Russell J. Dorn, Aurora, Colo., assignor to Condor Engineering & Manufacturing, Inc., Henderson, Colo.

Filed Aug. 20, 1981, Ser. No. 294,773

Int. Cl.<sup>3</sup> F02B 77/08

U.S. Cl. 123—198 D

13 Claims



1. An emergency air shutdown system for a diesel engine wherein said engine has an air intake manifold and a plurality of discharge tubes for delivery of air from an air inlet into said manifold, said system comprising:

- a valve member for each discharge tube;
- means mounting each said valve member for movement perpendicular to the flow of air through said associated discharge tube between an open position, externally of said associated discharge tube and outside the path of air flow therethrough, and a closed position extending across said tube to block the flow of air therethrough;
- locking means normally retaining each said valve member in said open position; and
- activating means for each said valve member operative to advance said valve member from its normally open position to said closed position.

4,422,419

# ROTARY INTERNAL COMBUSTION ENGINE

Soei Umeda, 10-14, Mitsuyaminami 3-chome, Yodogawa-ku, Osaka-shi, Japan

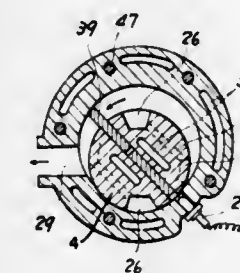
Filed Jul. 29, 1980, Ser. No. 173,494

Claims priority, application Japan, Oct. 15, 1979, 54-133343

Int. Cl.<sup>3</sup> F02B 53/08

U.S. Cl. 123—235

3 Claims



1. A prime mover comprising:

- a rotor having a compressor rotor part and a prime mover rotor part and a common shaft on which said rotor parts are mounted, the center of said rotor having a vane groove extending radially therethrough;
- a vane movably mounted in said vane groove and constituted by two vane parts opposed to each other at the center of the vane in the radial direction thereof;
- a compressor casing in which said rotor is rotatably mounted, said compressor casing having a lower inner wall part with a cross-sectional shape of part of a circle and with which said compressor rotor part is coaxially rotatable in close contact therewith, and an upper inner

wall part with a cross-sectional shape of part of a shape which is approximately elliptical and the center of which is offset from the center of the circular cross-sectional shape in a direction away from said lower inner wall part, said vane having a diametrical dimension equal to the dimension across the elliptical cross-sectional shape through the center of the circular cross-sectional shape and perpendicular to the direction of the offset, said approximately elliptical cross-sectional shape having the diametrical dimensions through the center of the circular cross-sectional shape substantially equal to the diametrical dimension of said vane, and said upper inner wall part being at least the part of the entire inner wall which is on the side of center of the circular cross-sectional shape in the direction of offset of the center of the elliptical shape; said compressor casing having a gas inlet opening through the upper inner wall part thereof;

a prime mover casing axially adjacent said compressor casing and having lower and upper inner wall parts similar in shape and in corresponding positions to the inner wall parts of said compressor casing, said prime mover rotor being coaxially rotatable in close contact with the lower circular cross-section shaped inner wall part of said prime mover casing;

ignition means in said prime mover casing directed into the space within said upper inner wall part thereof;

said prime mover casing having an exhaust port opening out of the upper inner wall part thereof;

a plate spring between said vane parts and urging said vane parts radially outwardly away from each other for improving the gas tightness between said vane parts and the inner walls of said casings;

means in the casing engaging said vane for limiting the radially outward movement of said vane; and

said rotors having two passages therein and extending between said compressor casing and said prime mover casing for conveying combustion gas from said compressor casing to said prime mover casing, there being one passage on each diametrically opposite side of said vane and being parallel with said vane groove and opening out of substantially diametrically opposite parts of the peripheries of said rotors, at least one end of said passage means being closed when the part of the periphery of said rotor from which it opens rotates in said lower parts of said casings and being opened when said part of the periphery of said rotor rotates in said upper parts of said casings.

4,422,420

# METHOD AND APPARATUS FOR FUEL CONTROL IN FUEL INJECTED INTERNAL COMBUSTION ENGINES

Joseph C. Croma, Northville, and Charles M. McQuillan, Milford, both of Mich., assignors to TRW Inc., Cleveland, Ohio

Filed Sep. 24, 1981, Ser. No. 305,110

Int. Cl.<sup>3</sup> F02D 33/00; F02M 37/04

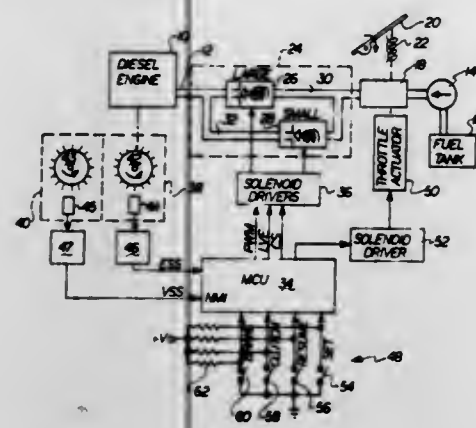
U.S. Cl. 123—352

26 Claims

1. A method of controlling fuel flow from a fuel source to the fuel rail of a fuel injected, internal combustion engine comprising the steps of providing plural fuel flow paths connected in parallel between said source and said fuel rail, providing a control signal in accordance with which fuel flow is to



be controlled, controllably pulsing fuel flow through a first of said paths in accordance with said control signal, and provid-



ing fuel flow through a second of said paths when a characteristic of said control signal goes beyond a predetermined limit.

4,422,421

### COMBUSTION KNOCK PREVENTING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Mitsuhiko Ezoe, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

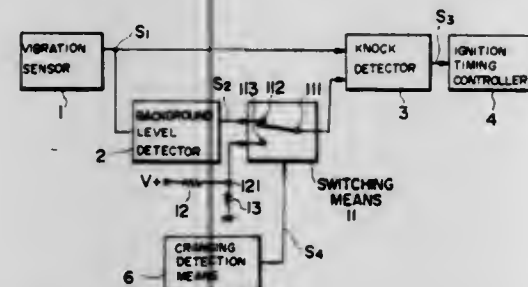
Filed Nov. 28, 1980, Ser. No. 211,194

Claims priority, application Japan, Nov. 30, 1979, 54-165646[U]; Jun. 6, 1980, 55-77982[U]

Int. Cl.<sup>3</sup> F02P 5/04

U.S. Cl. 123-424

5 Claims



1. A combustion knock preventing apparatus for an internal combustion engine, comprising:

an ignition system for the internal combustion engine;  
a cranking operation detecting means for generating an output signal upon detecting the cranking operation of the internal combustion engine;

a vibration sensor means for sensing the vibration of the engine to generate an output signal indicative of the sensed vibration;

a background level detecting means for generating an output signal indicative of the background vibration of the internal combustion engine;

means for generating a constant signal which is higher than said output signal of said background level detecting means;

a knock detecting means having a first input connected to said vibration sensor means for receiving said output signal of said vibration sensor means and a second input receiving a reference signal, said knock detecting means comparing said output signal of said vibration sensor means with said reference signal supplied to said input signal to generate a knock detection signal when said output signal of said vibration sensor means is higher than said reference signal supplied to said input signal;

means responsive to said output signal of said cranking operation detecting means for supplying said output signal of said background level detector means to said second input of said knock detecting means as said reference signal in response to the absence of said output signal of said cranking operation detecting means and supplying

said constant signal to said second input of said knock detecting means as said reference signal in response to the presence of said output signal of said cranking operation detecting means; and

means operatively connected with said ignition system for retarding the ignition timing in response to said knock detection signal.

4,422,422

### COMBINED CLOSED LOOP AND ANTICIPATING KNOCK LIMITING SPARK TIMING SYSTEM

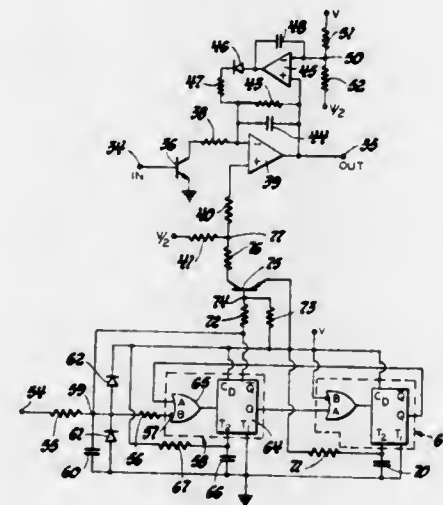
Kenneth D. Mowery, Noblesville, and L. Joseph Pechous, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1981, Ser. No. 326,848

Int. Cl.<sup>3</sup> F02P 5/04

U.S. Cl. 123-425

4 Claims



1. A knock limiting spark timing system for an internal combustion engine subject to knock-induced vibrations and having means effective to generate spark events with a predetermined timing relative to crankshaft rotational position and further having means effective to selectively retard spark timing from the predetermined spark timing by a retard angle determined by a retard voltage, the system comprising in combination:

means effective to sense the knock-induced vibrations and generate a knock signal therefrom comprising voltage pulses indicative of knock intensity;

integrator means effective to generate the retard voltage from said knock signal, the integrator means having an integrating input adapted to receive the knock signal and a reference input normally provided with a constant predetermined reference voltage;

means responsive to a detected engine knock anticipating event to generate a step change, in the retard direction, to the voltage provided to the reference input of the integrator, whereby a similar step change in the retard direction is produced in the retard voltage and thus in the engine spark timing, whereby open and closed loop knock control signals are combined in an additive manner to form a single retard voltage.

4,422,423

### JET CONTROL TYPE CARBURETOR

Katsuhiko Sugiyama, Aichi; Katsuyuki Ohsawa, Nagoya; Kenji Fujikake, Nagoya, and Yoshinori Idota, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenyusho, Aichi, Japan

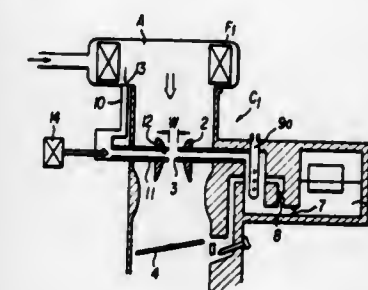
Filed Apr. 16, 1980, Ser. No. 140,955

Claims priority, application Japan, Apr. 24, 1979, 54-50569; Apr. 28, 1979, 54-53247; Apr. 28, 1979, 54-53248; Sep. 10, 1979, 54-115986; Nov. 10, 1979, 54-145694; Dec. 29, 1979, 54-173567; Dec. 29, 1979, 54-173568

Int. Cl.<sup>3</sup> F02B 33/00; F02M 7/00

U.S. Cl. 123-438

50 Claims



1. A jet control type carburetor comprising an intake pipe having an intake passage formed in an inner wall thereof, said intake passage allowing an intake air to flow therethrough;  
a venturi provided in said intake pipe, for increasing flow velocity of said intake air in said intake passage to reduce the pressure thereof;

a fuel nozzle opened into said intake passage and connected to a fuel supply source through a fuel passage for supplying the fuel into said intake passage from said fuel nozzle in order to introduce the mixture of air and fuel into said intake passage;

a throttle valve provided downstream of said venturi, for controlling the flow rate of said mixture of intake air and fuel;

a control fluid nozzle opened into said intake passage at a point upstream from said throttle valve and including the position of said throttle valve, said control fluid nozzle being in coaxial opposition to said fuel nozzle, said control fluid nozzle being connected to a fluid supply source through a control fluid passage for directly jetting the flow of said control fluid to the fuel spurted from said fuel nozzle to afford a predetermined velocity component of said control fluid having a directional sense contrary to that of the spurted fuel thereby to cause said control fluid to impinge upon said fuel spurted from said fuel nozzle and to restrain the fuel flow rate from said fuel nozzle; and a throttle means provided upstream of said control fluid nozzle in said control fluid passage, for controlling the flow rate of said control fluid in accordance with a driving condition of an engine;

whereby the fuel flow rate and the mixing condition of the fuel and the air are controlled over a wide range of the driving conditions of said engine with high stability and response by the predetermined velocity component of the control fluid so that the exhaust gas purification and the fuel consumption are improved by controlling accurately the air-fuel ratio of the intake mixture.

4,422,424

### ELECTRONICALLY CONTROLLED FUEL INJECTION PUMP

Douglas A. Luscomb, Mt. Upton, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 23, 1981, Ser. No. 276,608

Int. Cl.<sup>3</sup> F02M 51/00

U.S. Cl. 123-447

25 Claims

1. A fuel injection pump (100) for supplying pressurized fuel to an engine, characterized by:

a housing assembly (38, 45, 46, 47, 48, 49) provided with an

internal bore (17) defining a pressure chamber (44) having an inlet/outlet port (12) for receiving and discharging fuel and a metering chamber (16) having an inlet (53) for receiving a metered quantity of fuel and an outlet (26) for discharging pressurized fuel;

a plunger (2) connectibly driven by the engine for reciprocation in the pressure chamber;

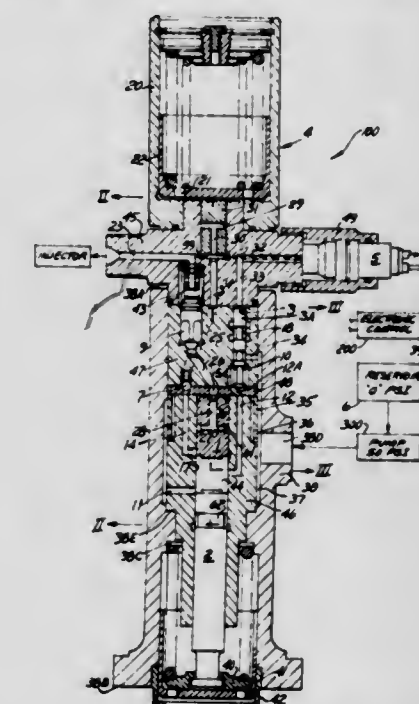
a floating piston (1) movably disposed within said bore in spaced relation to the plunger;

a spool valve chamber (18) located within said housing assembly and having a first port (12A) communicating with the pressure chamber port (12), a second port (56) communicating with the metering chamber inlet (53) and a drain outlet;

a spool member (3A) movable within the spool valve chamber (18) between seated and unseated positions;

an accumulator (4) pressurized by reciprocation of the plunger (2) to provide high pressure fuel to the pump, the accumulator providing fuel to the spool valve chamber and to the metering chamber and having a recess (59) for receiving a sufficient amount of pressurized fuel;

a pilot valve (5) adapted to be energized and de-energized to selectively establish first and second states of flow for communicating fuel between the accumulator (4) and the



spool valve chamber (18), the energized state causing the spool member to be seated and the de-energized state causing the spool member to be unseated;

a normally closed delivery valve (9) operable by a predetermined pressure to open and communicate the metered quantity of fuel in the metering chamber (16) through outlet (26) to the engine, this communication of the metered quantity of fuel representing an injection phase of the pump operation;

means for terminating (13, 27, 28) the injection phase as a result of piston (1) being displaced upwardly in the bore (17);

such that when the pilot valve (5) is energized, the spool member (3A) is seated and fuel communicates through the spool chamber into the metering chamber to displace piston (1) downwardly, during which time metering chamber (16) is filled with the metered quantity of fuel, whereupon the pilot valve is de-energized and the spool member is unseated, the plunger rises and pressurizes fuel in the pressure chamber (44) to the predetermined pressure, whereby the piston is displaced upwardly and the metered quantity of fuel is pressurized to the predetermined pressure to open the delivery valve and is discharged through the delivery valve to the engine.

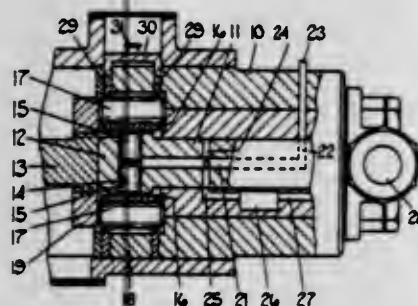


**4,422,425**  
**FUEL INJECTION PUMP**

**John R. Jefferson, Rainham, England, assignor to Lucas Industries Limited, Birmingham, England**  
Continuation of Ser. No. 93,084, Oct. 2, 1980, abandoned. This application Mar. 14, 1983, Ser. No. 473,265  
Claims priority, application United Kingdom, Oct. 20, 1979, 7936480

U.S. Cl. 123—450 Int. Cl.<sup>3</sup> F02B 23/10

U.S. Cl. 123-450



1. A liquid fuel injection pump for supplying fuel to a multi-cylinder internal combustion engine and of the kind comprising a rotary distributor member housed in a body and driven in use in timed relationship with an associated engine, a transverse bore formed in the distributor member and a plunger in said bore, a delivery passage communicating with the bore and arranged to register in turn with outlets in the body, as the distributor member rotates and during successive inward movements of the plunger, a cam ring surrounding the distributor member and having inwardly extending cam lobes for imparting said inward movements to the plunger, fuel supply means for supplying fuel to the bore during at least part of the time when the plunger is allowed to move outwardly by the cam lobes, said fuel supply means including an inlet port in the body to which fuel is supplied from a low pressure source, and an inlet passage in the distributor member for registration with said inlet port, flow control means for controlling the amount of fuel supplied through said port, control means for varying the maximum amount of fuel supplied to the engine automatically in accordance with engine speed during engine operation, said control means including stop means for limiting the outward movement of the plunger, said stop means comprising a ring mounted within the body of the pump and defining a stop surface which is engaged by a part associated with said plunger to limit the outward movement of the plunger, as the distributor member rotates, said stop surface being curved outwardly with respect to the plunger axis of rotation so that the distance of said surface from the axis of rotation of the plunger increases along the arcuate length of the surface, said stop surface including a first curved portion and a second curved portion which has a radius of curvature greater than the radius of curvature of said first curved portion, the contour of the second curved portion of the stop surface being such that as the speed of rotation of the distributor member increases the plunger can move off of said stop surface to no longer follow a path completely defined by said surface so that the extent of outward movement of the plunger is reduced as compared with the situation at lower speeds where the plunger remains in contact with said second curved portion to have the path of the plunger controlled entirely by the stop surface, whereby the maximum amount of fuel supplied to the engine is adjusted automatically in accordance with plunger angular speed with respect to said stop ring.

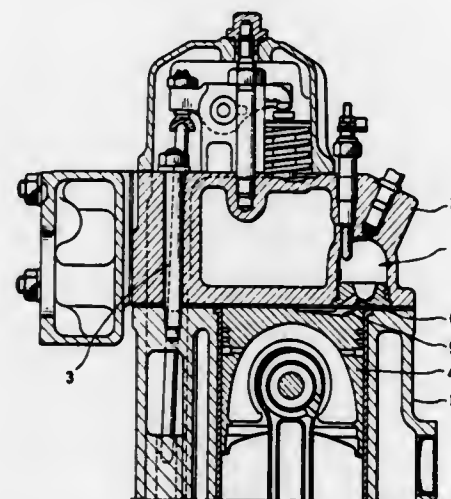
**4,422,426**  
**ANTECHAMBER SYSTEM DIESEL ENGINE**

**Takanori Tsugekawa; Toshio Banba, and Masakuni Matsui, all of  
Osaka, Japan, assignors to Yanmar Diesel Engine Co., Ltd.,  
Osaka, Japan**  
Division of Ser. No. 156,114, Jun. 3, 1980, Pat. No. 4,323,039.  
This application Dec. 23, 1981, Ser. No. 333,792  
Claims priority, application Japan, Jun. 5, 1979, 54-76055

Claims priority, application Japan, Jun. 5, 1979, 54-76055

2 Claims U.S. Cl. 123—470

### 1 Claim



1. In a diesel engine having a fuel injection nozzle and an insertion hole, for mounting said fuel injection nozzle therein, said insertion hole having a first portion, a second portion with a diameter less than the diameter of said first portion, and a seat portion therebetween, a first heat insulating material member disposed on said seat portion in the first portion of said insertion hole, a second heat insulating material member separately formed from said first heat insulating material member and disposed in said second portion of said insertion hole to surround a portion of said fuel injection nozzle and to contact the inner surface of said insertion hole, and a deformable support means positioned entirely within the insertion hole between said first heat insulating material member and a step portion of said fuel injection nozzle.

**4,422,427**  
**FUEL MANAGEMENT SYSTEM FOR AN**  
**AUTONOMOUS MISSILE**

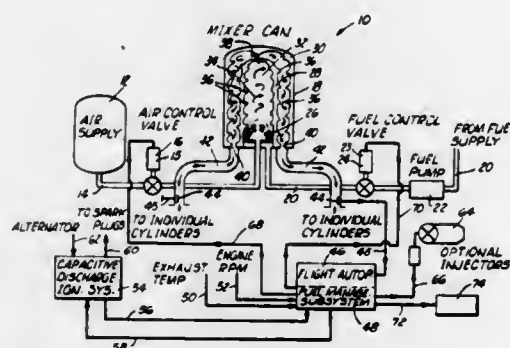
**George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.**

**Filed Jan. 28, 1982, Ser. No. 343,557**

Int. Cl.<sup>3</sup> F02M 31/00, 29/06

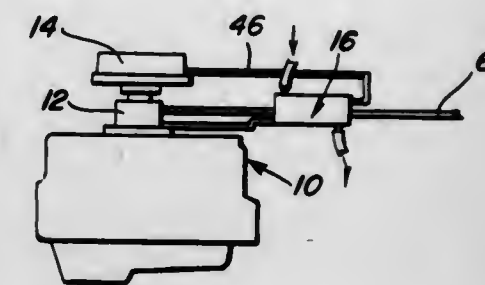
U.S. Cl. 123-478

### 5 Claims



1. A fuel management system for an autonomous missile or the like, the missile having a flight autopilot microprocessor, the system delivering a turbulent air fuel mixture to the cylinders of an internal combustion engine, the system comprising:  
an air supply with an air supply line;  
an air control valve connected to the air supply line for controlling the flow of air;

a fuel supply with fuel supply line and fuel pump;  
a fuel control valve connected to the fuel line for controlling the flow of fuel;  
an enclosed air fuel mixer can having an inner container, an outer container and an atomizing orifice disposed at the bottom of the inner container, the atomizing orifice connected to the air and fuel supply lines for receiving and atomizing the air and fuel therein and discharging the mixture out the top thereof and into the inside of the inner container, the mixture discharged out the top of the inner container and downwardly between the outside of the inner container and the inside of the outer container and through discharge openings in the bottom of the outer container; and  
manifolds connected to the discharge opening for delivering the air fuel mixture to the cylinders of the internal combustion engine.



tions of said passage with said first chamber, said second chamber including manifold vacuum air inlet and outlet means opening thereinto and said third chamber including liquid engine coolant inlet and outlet means opening thereinto.

**4,422,428**  
**FUEL INJECTION PUMP FOR INTERNAL**  
**COMBUSTION ENGINES**

**Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to  
Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Jun. 7, 1979, Ser. No. 46,285**

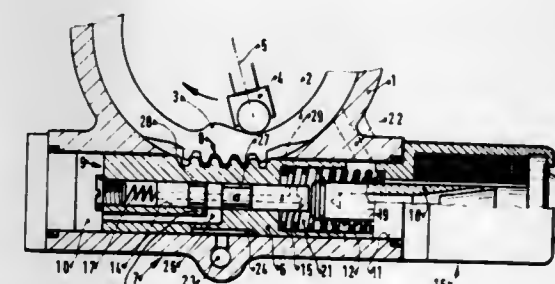
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978. 2839014

U.S. Cl. 123-502

Int. Cl.<sup>3</sup> F02M 59/20

U.S. Cl. 123-502

### 5 Claims



1. A fuel injection pump for internal combustion engines provided with a housing, a pressure operated adjusting piston correlated with a pressure chamber in said housing, a remotely positioned axially disposed piston restoring spring arranged to cooperate with said piston, a control plunger disposed coaxially with said adjusting piston, first means on said control plunger arranged to cooperate with second means on said adjusting piston and thereby adapted to control fluid flow into and out of said pressure chamber, whereby the control plunger is displaceable relative to the adjusting piston against the force of a control plunger restoring spring supported axially within said adjusting piston so that said control plunger is equalized in pressure via a longitudinal bore coaxial with said control plunger, further wherein said control plunger is adjustable by means of an electromagnet and a core relative thereto which directly engages one end of the control plunger via the force of a core spring which urges said core away from said electromagnet toward said control plunger.

**4,422,429**  
**FUEL HEATER**

**Morgan P. Reed, 700 South Eastern, Rayne, La. 70578**

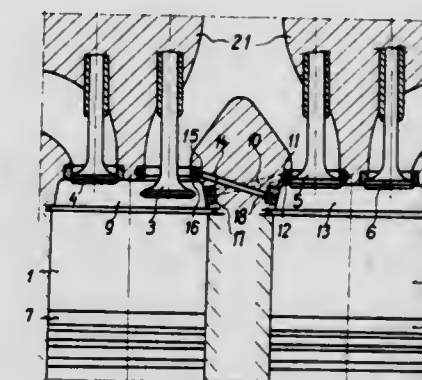
**Filed May 17, 1982, Ser. No. 379,008**

Int. Cl.<sup>3</sup> F02M 31/00, 27/00

U.S. Cl. 123-557

### 8 Claims

1. In an internal combustion engine including a fuel supply line, liquid coolant flow passages, and a manifold vacuum source, wherein the improvement comprises: a fuel heater for use in heating liquid fuel, said heater including an elongated hollow body defining a first central passage extending therethrough and first inner, second intermediate and third outer chambers disposed about said passage, first chamber and second chamber, respectively, with heater body wall portions of



1. A system for the creation of turbulence and gasification of the air-fuel mixture in a spark-ignition four-stroke internal combustion engine with an even number of cylinders, in which cylinders co-operating with each other constitute pairs of a synchronous motion of pistons, whereof when in one a working stroke is performed, then in the other one a suction stroke is performed, whereby said cylinders are connected with each other so that the working space of the first cylinder is connected by means of an annular passage surrounding the seat of the suction valve of the other cylinder and vice versa, whereby the annular passages surrounding the seats of suction valves, made in the material of a valve and/or a head, are connected with exhaust ducts widening in the direction of their outlets situated in faces of the seats of the suction valves, characterized in that conduits (10, 14) connecting combustion chambers (9, 13) with annular passages (11, 15) surrounding seats (12, 16) of suction valves (3, 5), are made in the material of a head (21) or are in a form of pipes, whereby their inlets situated in walls of the combustion chambers (9, 13) are provided with inserts (17) with a throttle nozzle (18), situated preferably as close as possible to walls of the combustion chambers (9, 13).



4,422,431

**EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE**

Kichihiko Dozono, Yokosuka, and Yoji Hasegawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

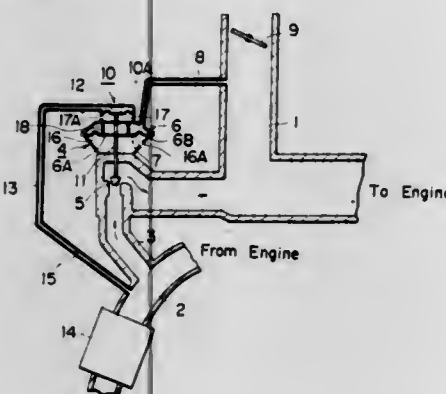
Filed Jan. 29, 1982, Ser. No. 343,852

Claims priority, application Japan, Feb. 8, 1981, 56-22659

Int. Cl.<sup>3</sup> F02M 25/06

U.S. Cl. 123-568

5 Claims



1. In an internal combustion engine including an intake passage provided with a throttle valve, and an exhaust gas passage provided with a particle trap for catching particles entrained by exhaust gas discharged from said internal combustion engine, an exhaust gas recirculation system comprising: an exhaust gas recirculation passage connected between said intake passage at a position downstream of said throttle valve and said exhaust gas passage at a position upstream of said particle trap so as to permit recirculation of the exhaust gas to said intake passage therethrough; a control valve means provided in said exhaust gas recirculation passage for controlling the recirculation of the exhaust gas to said intake passage through said exhaust gas recirculation passage; and a valve actuator means operatively coupled for controlling said control valve means, said valve actuator means being responsive to a vacuum pressure prevailing in said intake passage at a region downstream of said throttle valve and upstream of the position where said exhaust gas recirculation passage is connected to said intake passage and also responsive to a pressure prevailing in said exhaust gas passage at a region upstream of said particle trap, thereby causing said control valve means to be actuated to control the recirculation of the exhaust gas substantially in dependence on said intake passage vacuum pressure, while at the same time ensuring the the recirculation of the exhaust gas controlled by said control valve means is substantially insusceptible to the pressure of the exhaust gas in said exhaust gas passage being increased beyond a predetermined level as a result of said particle trap being clogged.

4,422,432

**VARIATION OF FUEL VAPORIZER FOR INTERNAL COMBUSTION ENGINE**

Kenneth L. Knox, Sr., 1796 Hillboro Ave., Reno, Nev. 89512  
Filed Oct. 23, 1980, Ser. No. 199,713

The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

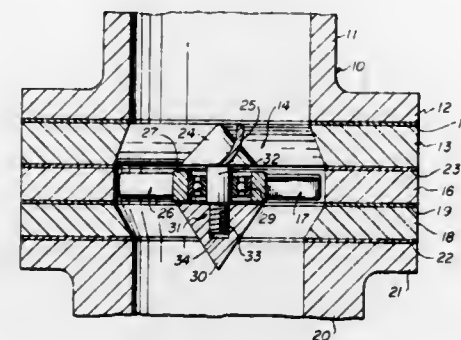
Int. Cl.<sup>3</sup> F02M 29/00

U.S. Cl. 123-592

11 Claims

1. In a variation of a fuel vaporizer for internal combustion engines, including a carburetor and an intake manifold, inlet guide vane assembly means carried in a discrete housing member and disposed below said carburetor and above said intake manifold and defined by an opening within said discrete housing member, plural stationary spaced vanes extending across said opening and obliquely angled relative to the direction of flow of fuel and air passing from the carburetor to the intake manifold supported by said housing member, turbine means

disposed between said guide vane assembly means and said intake manifold wherein said turbine means includes an impeller embodying a hub, an internal bearing in said hub and a discrete turbine housing surrounding and supporting said impeller oriented in serial registry with said housing member and intake manifold, said inlet guide vane assembly means changes



the flow direction of air and fuel before it impinges upon said turbine means to provide better atomization of fuel and a portion where said turbine housing communicates with said stationary vane housing defining a transition pressure area where air/fuel proceeds from a high pressure area to a low pressure area in said turbine housing for improved atomization by flash misting.

4,422,433

**PROJECTILE LOADER AND DETENT ASSEMBLY FOR GUNS**

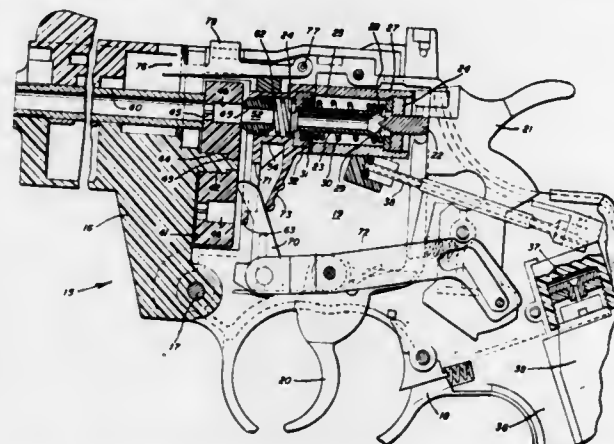
Keith Milliman, Fairport, N.Y., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed May 24, 1982, Ser. No. 381,150

Int. Cl.<sup>3</sup> F41B 11/06

U.S. Cl. 124-74

11 Claims



1. A gas-powered gun having a barrel and means for supplying pressurized gas and a projectile loader assembly therefor, the loader assembly comprising a loader having a plurality of projectile ports, the loader being movably mounted in the gun to permit the projectile ports to be aligned with the barrel, a detent holder connected to the gas-supplying means, a detent mounted in the detent holder in alignment with the barrel, the detent having an end portion which is engageable with the projectile ports of the loader, and means for urging the detent against the loader whereby the detent provides a retaining force on the loader when a projectile port is aligned with the barrel, the detent being provided with a gas passage there-through whereby pressurized gas can flow from the detent holder to the projectile port when the gun is fired.

4,422,434

**SOLAR ENERGY COLLECTION APPARATUS**

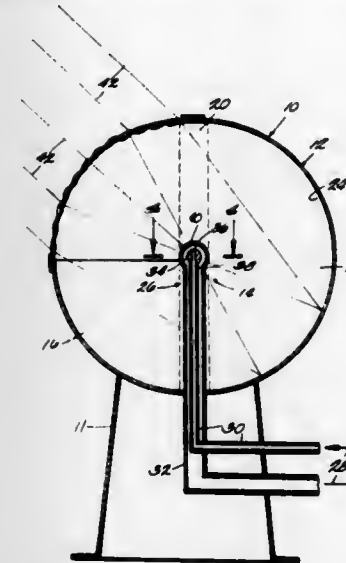
Robert G. Statz, and William W. Belson, both of Milwaukee, Wis., assignors to Capitol Stampings Corp., Milwaukee, Wis.

Filed May 6, 1982, Ser. No. 375,461

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-438

8 Claims



1. An apparatus for collecting solar energy comprising: an energy receiving means; a circulating means connected to said energy receiving means for circulating a heat absorbing fluid through said receiving means; and a hollow, generally spherical means with said energy receiving means positioned substantially at the center thereof, said hollow, generally spherical means including a lease means forming a portion of said spherical means and located in the upper portion thereof, said lenses means positioned to direct and concentrate sun rays onto said energy receiving means and onto the inner surface of said spherical means, said inner surface of said spherical means upon which sun rays are directed by said lenses means including a reflective material to thereby reflect said sun rays impinging upon said inner surface back to said energy receiving means.

4,422,435

**PORTABLE CHARCOAL IGNITERS OR IGNITION SYSTEMS AND APPARATUS RELATING THERETO**

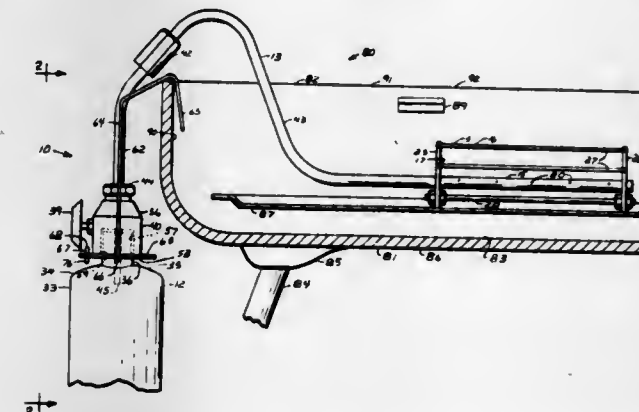
William D. Spell, P.O. Box 1734, Eustis, Fla. 32726

Filed Apr. 24, 1981, Ser. No. 257,487

Int. Cl.<sup>3</sup> F24B 3/00

U.S. Cl. 126-25 B

2 Claims



1. In a portable charcoal briquette ignition system having a pressurized gaseous fuel container, a burner with a plurality of gas discharge orifices, and conduit means interconnecting the burner and gaseous fuel container for delivering the gaseous fuel to said burner, the improvement wherein said burner includes means forming said plurality of gas discharge orifices, and a metal cage that is fixed to the orifice forming means and

thereabout defines a zone for the combustion of gaseous fuel discharged from the orifices, said cage is adapted and arranged to rest on an underlying support surface and to support the briquettes in a pile of charcoal briquettes heaped about the cage spacedly apart from said discharge orifices, said conduit means and orifice forming means provides an air tight passageway between said fuel container and said orifices whereby the admixture of air with gaseous fuel burned at said burner transpires in said combustion zone, said orifice forming means is an elongated, linearly extending metal tube section, said cage comprises elongated, linearly extending metal elements that are laterally offset from and fixed in parallel with said tube section, said conduit means has a valve component that is secured to said container and manipulatable to control the flow of gaseous fuel into said air tight passageway, and wherein said improvement further comprises a hanger for suspending the container from the side wall of a brazier, said gaseous fuel container having a shoulder forming end portion, and a neck piece extending upwardly from said shoulder, said valve component being secured to said neck piece and having an outer casing with a socket in which the neck piece is received, and an annular lower edge that is spaced apart from the shoulder and surrounds the neck piece at the mouth of the socket, said hanger having a flat U-shaped member which is adapted and arranged to straddle the neck piece and underlie the annular lower edge between the outer casing and the shoulder, thereby to support the container through the valve component secured to the neck piece thereof, and means engagable with the side wall of a brazier and connected to said member for suspending said member and the container supported thereby from said side wall.

4,422,436

**JACKETED WOOD STOVE**

Joseph G. Chamberlain, 12350 SW. 124th, Tigard, Ore. 97223

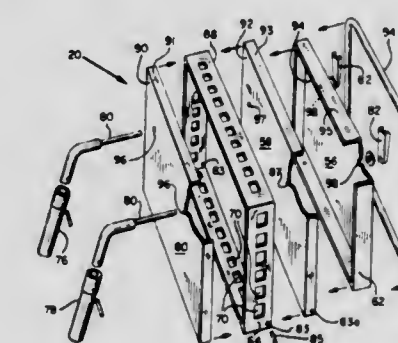
Continuation of Ser. No. 131,214, Mar. 17, 1980, abandoned.

This application Mar. 22, 1982, Ser. No. 360,425

Int. Cl.<sup>3</sup> F24C 1/14

U.S. Cl. 126-61

4 Claims



1. In a wood stove having a firebox which includes a frontal access opening and a door adapted to close said frontal access opening, a door comprising: inner and outer walls spaced apart to define a door airspace; and a peripheral wall interconnecting said inner and outer walls thereof in spaced-apart parallel relationship to define said door airspace; said peripheral wall having upper and lower air openings for admitting ambient air to flow vertically through said door airspace to internally convectively cool said outer wall; said inner wall of said door including a double-layered portion spaced inwardly from said peripheral wall surrounded by perimeter sealing means for sealing said inner wall against said frontal access opening of the stove, said double-layered portion protruding oppositely of said outer wall so as to fit within said opening, said double layers of said inner wall being spaced apart to define a second airspace.



4,422,437

## CATALYTIC FIREBOX

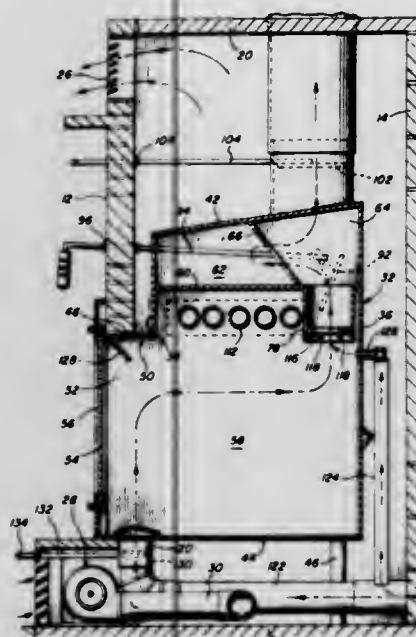
Dareld A. Hirschey, 121 4th Ave., SE., Glenwood, Minn. 56334

Filed Apr. 11, 1983, Ser. No. 483,539

Int. Cl.<sup>3</sup> F24C 1/14

U.S. Cl. 126-77

12 Claims



1. A catalytic firebox including a housing defining a closed lower combustion chamber, a closed upper afterburn chamber disposed above said combustion chamber with one marginal portion of said combustion chamber projecting horizontally outwardly beyond the corresponding marginal portion of said afterburn chamber and a combined flue gas and bypass chamber disposed above said one marginal portion of said combustion chamber and horizontally registered with said afterburn chamber, means dividing said combined chamber into central and remote portions spaced along said one marginal portion, a pair of first port means communicating said remote portions of said combined flue gas and bypass chamber with corresponding remote upper portions of said combustion chamber, a pair of second port means communicating said remote portions of said combined flue gas and bypass chamber with corresponding remote portions of said afterburn chamber, third port means communicating a central portion of said afterburn chamber with said central portion of said combined flue gas and bypass chamber, fourth port means communicating said central portion of said combined flue gas and bypass chamber with a central upper portion of said one marginal portion of said combustion chamber, and catalytic combustor means disposed in said first port means, damper means operatively associated with said fourth port means for variably opening and closing the latter, flue gas outlet means opening outwardly of said central portion, combustion air inlet means opening into said combustion chamber, and supplemental combustion air inlet means opening into said combustion chamber closely adjacent said combustor means.

4,422,438

## PREFABRICATED FIREPLACE AND THE INSTALLATION THEREOF

Ray J. Scholz, and William C. Southern, both of Los Gatos, Calif., assignors to Sierra Precast, Inc., San Jose, Calif.

Continuation of Ser. No. 877,088, Feb. 13, 1978, Pat. No. 4,384,565. This application Mar. 7, 1983, Ser. No. 472,741

The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> F24B 1/18; E04G 2/00

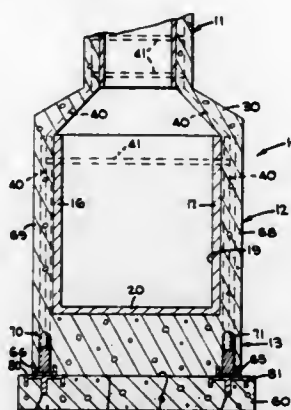
U.S. Cl. 126-120

8 Claims

1. A method of installing a precast, cementitious, prefabricated fireplace comprising the steps of:

(a) placing a precast, cementitious, prefabricated fireplace

with a weld plate fixed at the lower surface of a cementitious base thereof onto a cast, cementitious fireplace foundation with a weld plate fixed at the upper surface thereof;



(b) welding said plates to one another.

4,422,439

## FIREPLACE ADAPTERS

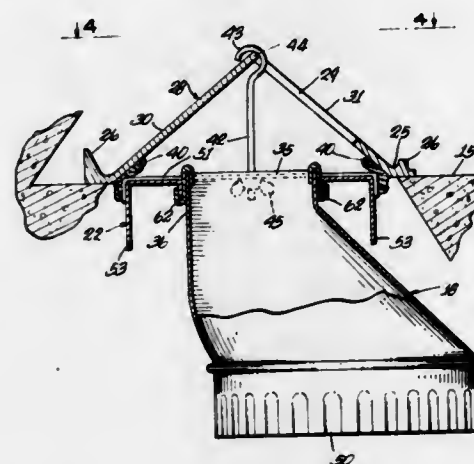
Richard L. Hunt, Warren, Ohio, assignor to David C. Frazier, Southington, Ohio

Filed Nov. 6, 1980, Ser. No. 204,471

Int. Cl.<sup>3</sup> F24B 7/00

U.S. Cl. 126-123

8 Claims



1. An adapter for use in connecting the combustion outlet of a stove to the chimney flue of a fireplace, said flue including a metal damper frame having a lower peripheral portion defining a mouth opening into said fireplace and an upper peripheral portion defining an opening to a chimney flue, said lower portion being connected to walls defining said fireplace to span said flue for passage of products of combustion therethrough, said adapter comprising:

a metal body having a planar portion underlying said damper frame lower portion and having an upper surface adapted to engage an undersurface of said damper frame at the periphery thereof surrounding said mouth, said planar portion of said adapter having an opening in line and communicating with said mouth,

a tubular metal boot adapted to have one end connected to said stove combustion outlet to receive products of combustion therefrom, said boot having its other end adapted for connection to the planar portion of said adapter in a manner to limit passage of products of combustion from said stove through said boot and adapter opening and through said damper frame mouth to and through said chimney flue, and tension means connected between said adapter body and said damper frame upper portion, said tension means extending through said chimney flue opening thereof for engagement there at and through said damper frame lower mouth opening, and operable to draw said adapter body upwardly to

press the upper surface of said adapter planar portion against the undersurface of said damper frame portion to restrict escape of combustion products through the engaging surfaces of said adapter and said damper frame, said tension means being free of any components extending downwardly any substantial distance from said adapter body, thereby to provide unobstructed access to said boot and to a said stove associated with the fireplace.

4,422,440

## AUTOMATIC DRAFT CONTROLLER

Robert J. Russell, 1332 Lymric Way, Bakersfield, Calif. 93309

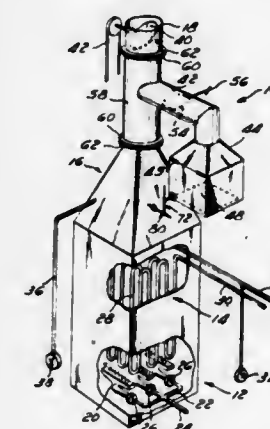
Division of Ser. No. 124,089, Feb. 25, 1980, Pat. No. 4,341,344.

This application Jan. 29, 1982, Ser. No. 343,778

Int. Cl.<sup>3</sup> F23N 3/00

U.S. Cl. 126-292

4 Claims



1. A method for draft control in a furnace having air regulators on its burners and a draft control plate mounted so as to be in communication with its flue, comprising the steps of:

- initially setting said plate in a closed position to permit the purging of said furnace;
- adjusting the air regulator to be approximately half open;
- initially setting said plate partially open to permit it to automatically open or close in response to changes in draft velocity due to changes in ambient and/or operating conditions;
- starting the furnace and monitoring the efficiency of its combustion;
- adjusting the position of said plate so that efficient operating conditions are achieved in said furnace while at the same time said air regulators are approximately half open; and
- adjusting the air regulators to maintain said efficient operating conditions.

4,422,441

## DISPOSABLE STACKABLE SPLATTER SHIELD AND FRAME THEREFOR

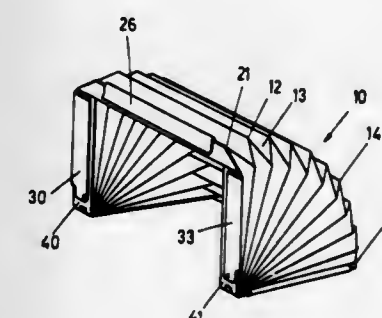
Erich G. Schoepe, P.O. Box 842 Station 'A', Scarborough, Ontario, Canada

Filed Jun. 22, 1981, Ser. No. 275,821

Int. Cl.<sup>3</sup> F24C 15/20

U.S. Cl. 126-299 C

1 Claim



1. In a splatter or cooking-shield assembly for positioning

around and over a source of heat such as an electric cooking element, and for partially enclosing a vessel placed on said element, comprising:

a semi-permanent disposable, collapseable shield of metallic foil formed into pleated walls and presenting, when collapsed, an accordin-shaped approximately U-shaped or half circular body capable of being stacked and packaged in multiples, and when opened presenting an open-fronted enclosure of approximately quadri-cylindrical or quadri-spherical configuration, said walls creating a free standing shield;

a frame for said shield comprising two essentially similar and approximately U-shaped or half circular shaped supporting elements, having free ends hingeably connected so as to maintain said elements in a closed or collapsed position in which said elements lie flat and interfacing or an open position at right angles to each other; and clip means for attaching said shield to said frame.

4,422,442

## WARMING JUG

Franz Gutmann, Rebstein, and Peter Sieber, Widnau, both of Switzerland, assignors to Platson AG Kunststoffwerke Hans Frei &amp; Sohne, Widnau, Switzerland

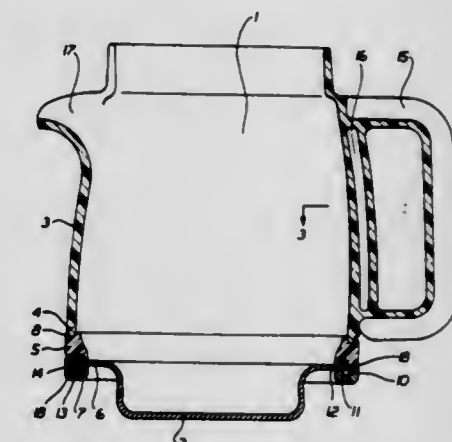
Filed Jun. 22, 1981, Ser. No. 275,495

Claims priority, application Switzerland, Oct. 28, 1980, 8014/80

Int. Cl.<sup>3</sup> A47J 27/00

U.S. Cl. 126-390

6 Claims



1. A warming jug adapted to be placed on a warming plate, said jug comprising a synthetic main body defining at least partially an interior cavity in said warming jug, said main body having a main portion and a lower end portion, a metal bottom forming the bottom of said cavity, a synthetic intermediate ring member located between said main body and said metal bottom and connected with said lower end portion of said main body, a synthetic closure ring member connected with said synthetic intermediate ring member, said metal bottom having a central portion located below said closure ring member, and said synthetic intermediate ring member and closure ring member having opposed faces clampingly engaging opposite surfaces of the outer portion of said metal bottom therebetween which outer portion is located at the perimeter of said metal bottom.

4,422,443

## SOLAR COLLECTOR

John E. Arendt, Rte. #1 Box 126, Chaffee, Mo. 63740

Filed May 5, 1981, Ser. No. 260,713

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126-418

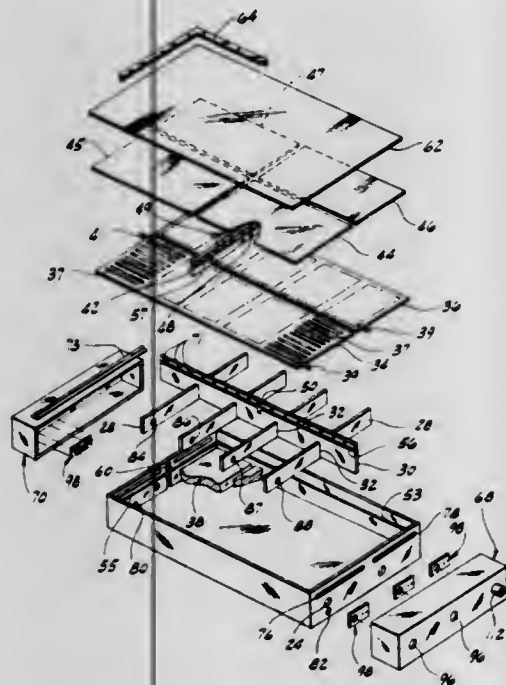
30 Claims

1. A solar collector device comprising an elongated housing structure having a bottom wall, opposed side walls, and first and second end walls, a first glazing member mounted closing the top portion of said housing structure, a second glazing



member disposed inwardly of the first glazing member forming an air space therebetween, an absorber member disposed in the housing structure between the second glazing member and the bottom wall, first and second end closure members attached respectively to said first and second end walls, each of said end closure members including means forming an enclosed space adjacent the respective end wall, means associated with the respective end walls communicating the air space between the glazing members with the enclosed spaces formed by the end closure members, and means on each of said end closure members for controllably communicating the enclosed spaces formed by the end closure members to atmosphere to limit the maximum temperature that can occur in the space between the glazing members, said first and second end closure members being movable between a first position wherein said end closure members lie adjacent to the respective end walls and a second position providing access to the respective end walls.

22. A solar collector device comprising an elongated hous-



ing structure having a bottom wall, opposed side walls, and first and second end walls, a first glazing member mounted closing the top portion of said housing structure, a second glazing member disposed inwardly of the first glazing member forming an air space therebetween, an absorber member disposed in the housing structure between the second glazing member and the bottom wall, first and second end closure members attached respectively to said first and second end walls, each of said end closure members including means forming an enclosed space adjacent the respective end wall, means associated with the respective end walls communicating the air space between the glazing members with the enclosed spaces formed by the end closure members, and means on each of said end closure members for controllably communicating the enclosed spaces formed by the end closure members to atmosphere to limit the maximum temperature that can occur in the space between the glazing members, said solar collector including heat absorbing means positioned in at least one of said end closure members to heat the space enclosed thereby.

4,422,444

**SOLAR ENERGY CONTROL SYSTEM AND METHOD**  
William Webb, Jr., 272 A S. Monaco Pkwy., Denver, Colo. 80224

Filed Mar. 26, 1981, Ser. No. 247,661

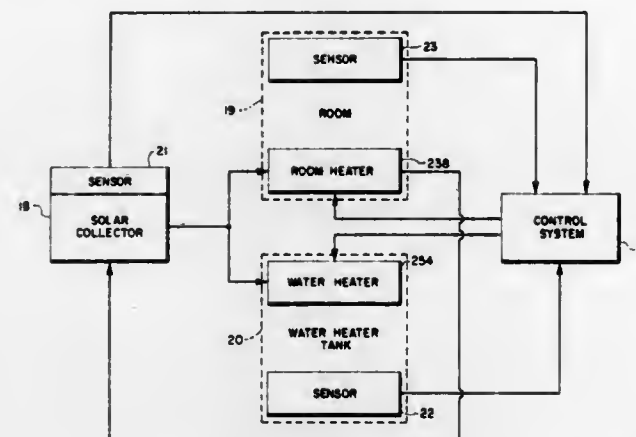
Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—422

28 Claims

1. A solar energy control system, comprising:  
first means adapted to provide an indication of availability of heat derived from a solar collector;  
second means adapted to provide separate indications of

heat needs at each of a plurality of defined areas, said defined areas including a room and a water heater; and processing means for receiving said indications from said first and second means and responsive thereto providing control outputs for enabling application of heat, when indicated to be available from solar energy, to said defined areas indicating heat needs, said processing means including determining means for causing heat to be applied at



any given time to that one of said defined areas that enhances the efficiency of said solar collector and for controlling the application of heat to said defined areas needing heat consistent with heat availability so that water in said water heater is caused to be heated prior to heating of air in said room when said water is sensed to be colder than said air and sufficient heat is available at said solar collector to heat said water.

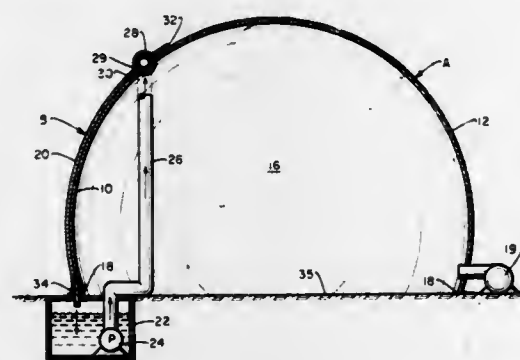
4,422,445

**INFLATION SUPPORTED SOLAR COLLECTOR**  
Ronald L. Pelley, 760 E. Telegraph Rd., Fillmore, Calif. 93015  
Continuation of Ser. No. 154,808, May 30, 1980, abandoned.  
This application Feb. 8, 1982, Ser. No. 346,519

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—426

1 Claim



1. A solar energy collecting apparatus comprising:  
a thin, flexible walled housing;  
an air blower connected to said housing, said air blower to inflate said housing forming a rigid walled structure, with said housing located on a supportive surface said housing forming a totally enclosed chamber, said rigid walled structure having an interior surface and an exterior surface, said interior surface defining the extremity of said totally enclosed chamber;  
a strip of sheet material mounted on a portion of said exterior surface of said rigid walled structure, a narrow chamber being formed between said strip and said exterior surface, said strip having a top edge and a bottom edge, said top edge located a substantial distance from said supportive surface;  
a liquid inlet pipe mounted within said narrow chamber, said liquid inlet pipe located at said top edge;

a reservoir, said reservoir to contain a liquid; means connecting said liquid inlet pipe to said reservoir; and a discharge opening attached to said bottom edge connecting with said narrow chamber, said liquid to be conducted through said inlet pipe into said narrow chamber and through said discharge opening into said reservoir.

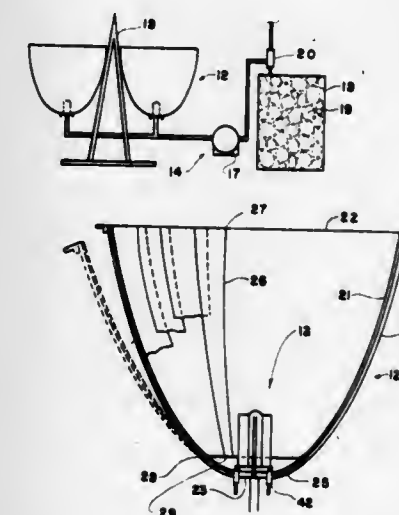
4,422,446

**SOLAR FURNACE APPARATUS**  
Benjamin W. Strickland, P.O. Box 30, Joliet, Mont. 59041  
Continuation-in-part of Ser. No. 64,493, Aug. 7, 1979, Pat. No. 4,291,678. This application Sep. 28, 1981, Ser. No. 306,168  
The portion of the term of this patent subsequent to Sep. 29, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> F24J 3/02

U.S. Cl. 126—438

9 Claims



1. A solar furnace apparatus including a reflector portion, a collector portion and a fluid transfer portion; said reflector portion including a generally dish-shaped reflective member, said reflective member having a conic section configuration with a large open face and a highly reflective internal surface, said reflective member including a fixed base section concentric with the axis of said reflective member, a plurality of movable curved segments extending from said fixed base section to the free edge of said open face of said reflective member, the end of each segment adjacent to said fixed base section being pivotally connected thereto; said collector portion being disposed along the axis and the focal point of said reflective member, said collector portion including a chamber formed of a plurality of concave longitudinal conductive metal sections joined at their edges, the cross section of said longitudinal sections forming a generally star-shaped configuration, said concave longitudinal sections being disposed substantially parallel to the longitudinal axis of said reflective member, end sections affixed to the free edges of said concave longitudinal sections and therewith forming an enclosed chamber, a central conduit means extending from one of said end sections to a point adjacent the other end section but spaced therefrom, a plurality of discrete longitudinal baffle means disposed within said chamber around said central conduit means, inlet and outlet means communicating with said chamber, mounting means for the securing of said collector portion adjacent the apex of said reflective member; said fluid transfer portion including conduit means connected to said inlet and outlet means of said collector portion and means associated with said conduit means for circulating fluid to heat storage or heat dissipating means.

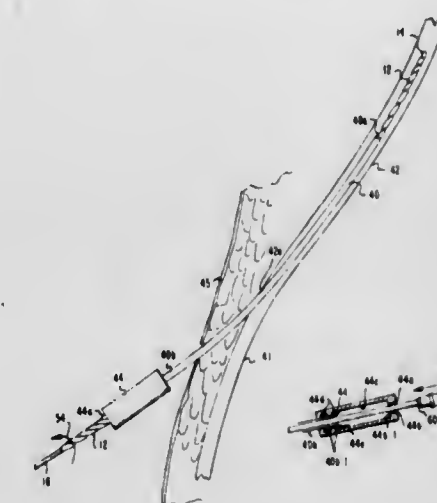
4,422,447

**PERCUTANEOUS BALLOON**

Peter Schliff, Rte. 7, Cookeville, Tenn. 38501  
Filed Apr. 13, 1981, Ser. No. 253,680  
Int. Cl.<sup>3</sup> A61B 19/00; A61M 25/00

U.S. Cl. 128—1 D

2 Claims



1. An intra-aortic balloon assembly comprising:  
an elongated intra-aortic balloon means having a distal end and a proximal end;  
said distal end terminating in a tip;  
coupling means being joined to said proximal end for introducing pulsatile pressure through said coupling means to said balloon means for selective inflation and deflation of said balloon means;  
elongated catheter means extending between said coupling means and said intra-aortic balloon means;  
catheter adapter means slidably mounted on said catheter means for providing a slidable liquid-tight seal between said catheter adapter means and said catheter means;  
an elongated percutaneous sheath having a first end for insertion into a vessel and having a second end for receiving an intra-aortic balloon;  
a percutaneous sheath collar secured to said second end; said percutaneous sheath collar having a hollow interior, a first end of said percutaneous sheath collar being joined to said percutaneous sheath and a second end thereof being provided with resilient locking means;  
said catheter adapter means being slidable through said second end past said locking means and into the hollow interior of said percutaneous sheath collar whereby said adapter means is fully enclosed by said percutaneous sheath collar and said locking means retains said catheter adapter means within said percutaneous sheath collar and whereby said percutaneous sheath collar and said catheter adapter means cooperate to provide a second liquid-tight seal between said sheath and said adapter means.

4,422,448

**MASSAGING APPARATUS**

Haruo Sugai; Takafumi Hamabe; Yukio Yamamura; Shinpei Otuka, and Hiroshi Moriwaki, all of Hikone, Japan, assigns to Matsushita Electric Works, Ltd., Osaka, Japan  
Filed Dec. 22, 1981, Ser. No. 333,566

Claims priority, application Japan, Aug. 20, 1981, 56-130628  
Int. Cl.<sup>3</sup> A61H 7/00

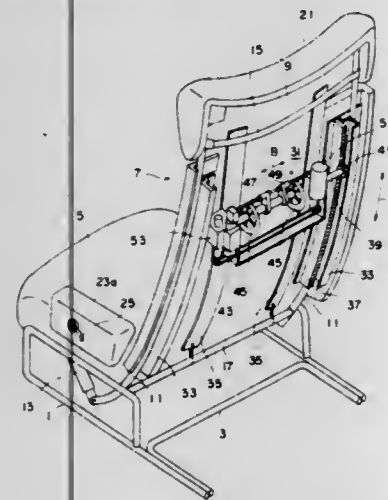
U.S. Cl. 128—44

21 Claims

1. A massaging apparatus comprising:  
a main shaft being capable of forward and reverse rotation, a pair of massaging wheels spaced a certain distance apart and attached to said main shaft,  
a position changing means for shifting said massaging wheels in a direction crossing the axis of said main shaft so as to change the position of the massaging wheels,



a spacing changing means for moving said massaging wheels axially of said main shaft to change the spacing thereof, message mode designating means for designating a mode of massage by said pair of massaging wheels, said message mode being determined by such elements as at least the position, spacing and direction of rotation of said massaging wheels, position detecting means for detecting the position of said massaging wheels, spacing detecting means for detecting the spacing of said massaging wheels, control means for controlling said position changing means and said spacing changing means in connection with said



message mode designating means, said position detecting means and said spacing detecting means to adapt said massaging wheels to the selected massage mode, preparation completion detecting means for detecting the completion of preparatory operation when the position and spacing of said massaging wheels are adapted to a selected massage mode by said control means, rotary drive means for driving said main shaft for rotation, and rotative direction control means for controlling said rotary drive means in connection with said preparation completion detecting means to rotate said main shaft in a direction suited for a selected massage mode.

#### 4,422,449 MASSAGING APPARATUS

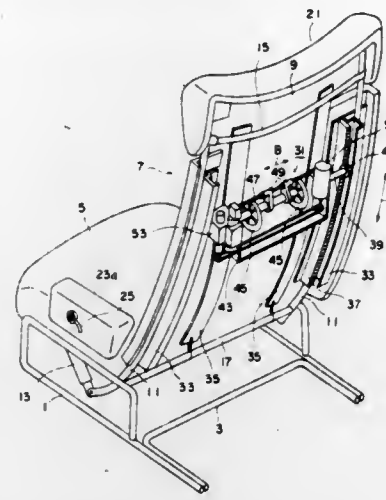
Takafumi Hamabe, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan  
Filed Dec. 22, 1981, Ser. No. 333,635  
Claims priority, application Japan, Dec. 29, 1980, 55-188536  
Int. Cl.<sup>3</sup> A61H 7/00

U.S. Cl. 128-44

2 Claims

1. A massaging apparatus comprising:  
a main shaft,  
a pair of massaging wheels spaced a certain distance apart and attached to said main shaft,  
a position changing means for shifting said massaging wheels in a direction crossing the axis of said main shaft so as to change the position of the massaging wheels,  
a spacing changing means for moving said massaging wheels axially of said main shaft to change the spacing thereof, message mode designating means for designating a mode of massage by said pair of massaging wheels, said message mode being determined by such elements as at least said position and spacing of said massaging wheels, position detecting means for detecting the position of said massaging wheels, spacing detecting means for detecting the spacing of said massaging wheels, and control means for controlling said position changing means

and said spacing changing means in connection with said message mode designating means, said position detecting

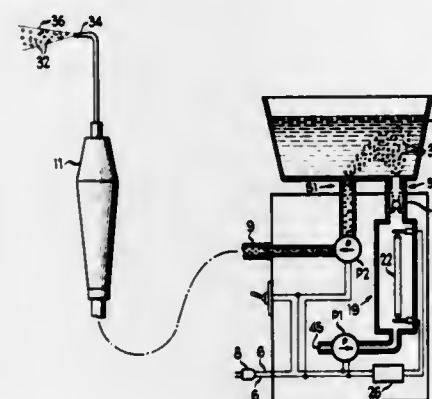


means and said spacing detecting means to adapt said massaging wheels to the selected massage mode.

4,422,450  
ACTINIC OZONE PERIODONTAL IRRIGATING APPARATUS AND METHOD  
Robert K. Rusteberg, Barrington Hills, Ill., assignor to Panlomatic Company, Elk Grove Village, Ill.  
Filed Jul. 28, 1982, Ser. No. 402,792  
Int. Cl.<sup>3</sup> A61H 7/00

U.S. Cl. 128-62 A

14 Claims



10. A method for treatment of periodontal infections, said method comprising the steps of:  
preparing a dispersal of bubbles of actinic ozone in a quantity of liquid, said actinic ozone being of the variety produced by irradiation of air by radiation having a substantial energy content at wavelengths in the vicinity of 145 nanometers; and,  
dispensing said dispersal and liquid under pressure directly to the periodontal region to be treated.

4,422,451  
SPINAL COMPRESSION AND DISTRACTION INSTRUMENTATION  
Ali Kalamchi, 1313 Delaware Ave., Wilmington, Del. 19806  
Filed Mar. 22, 1982, Ser. No. 360,470  
Int. Cl.<sup>3</sup> A61F 5/00; A61B 17/00

U.S. Cl. 128-69

15 Claims

1. A hook for spinal compression and distraction instrumentation comprising a main body section having a pair of opposite side surfaces, opposite top and bottom surfaces, and opposite front and rear surfaces, hook means connected to and extending from the front surface of the main body section, a longitudinal passageway completely extending through the main body section from the top surface thereof to the bottom surface thereof, the longitudinal passageway including front and rear

portions, and a slotted opening in one of the side surfaces extending from the top surface of the main body section to the bottom surface thereof, the slotted opening communicating

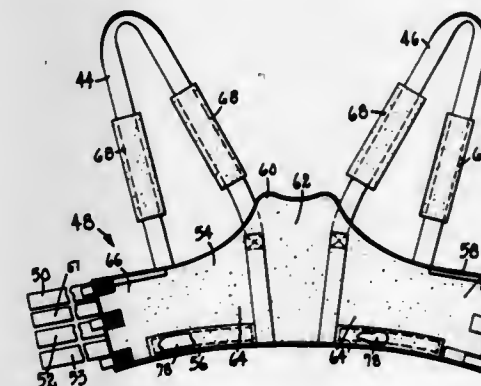


with the front portion of the longitudinal passageway and positioned closer to the hook means than the rear portion of the longitudinal passageway.

4,422,452  
GRAVITY TRACTION VEST  
Charles V. Burton, Excelsior, Minn., assignor to Abbott-Northwestern Hospital, Inc., Minneapolis, Minn.  
Filed Sep. 8, 1981, Ser. No. 299,679  
Int. Cl.<sup>3</sup> A61H 1/02

U.S. Cl. 128-75

6 Claims



1. A gravity traction vest for secure attachment to a patient, the patient having a torso with a rib cage having a plurality of ribs including a lowest rib, said vest adapted to be secured to the patient and attached to a support structure whereby the patient is suspended from the support structure with the head of the patient in an upward direction, said vest comprising:  
(a) a torso surrounding member having upper and lower edges and inner and outer surfaces for encircling the torso and rib cage of the patient;  
(b) support means cooperatively connected to said member and adapted to be attached to the support structure for suspending said member from the support structure and applying a uniform force on said member in said upward direction;  
(c) attachment means for securing said member to the patient; and  
(d) a flexible cushion insert means extending along at least a portion of said lower edge of said inner surface of said member and protruding inwardly toward the patient for engagement below the lowest rib, wherein when said vest

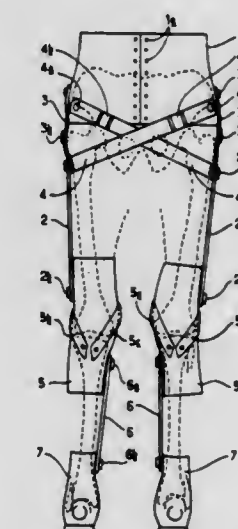
is attached about the patient's rib cage, substantially said entire insert means is positioned below the lowest rib and said insert means is urged inwardly toward the patient to a position wherein said insert means will restrain movement of said member caused by said force applied by said support means.

6. A method of suspending a patient being treated by gravity lumbar reduction therapy, said method including the steps of encircling the rib cage and a portion of the torso therebelow of the patient, with a vest having a cushion insert extending inwardly toward the patient from a lower edge of the vest and having a cincture over the insert and positioning the vest along the patient's torso so that substantially the entire insert is disposed immediately below the lowermost rib of the patient and engages a bottom surface of the rib, securing the vest about the rib cage by tightening the cincture over the insert, suspending the patient from a support structure with the head of the patient in an upward direction by suspending the vest from the support structure wherein upward movement of the vest relative to the torso of the patient is restrained by said insert.

4,422,453  
EXTERNAL APPARATUS FOR VERTICAL STANCE AND WALKING FOR THOSE WITH HANDICAPPED MOTOR SYSTEMS OF THE LOWER LIMBS  
Guy J. Salort, 219, rue Raymond Losserand, 75014 Paris, France  
Filed May 26, 1982, Ser. No. 382,250  
Claims priority, application European Pat. Off., Jun. 15, 1981, 8140049; France, Jun. 1, 1981, 81 10764  
Int. Cl.<sup>3</sup> A61F 5/00

U.S. Cl. 128-80 G

14 Claims



1. External apparatus for the vertical stance and walking for a person with handicap of the motor system of one or two lower limbs, comprising, in combination:

- a single piece corset disposed at the height of the pelvic girdle of the wearer;
- parallel to the side of the femur of the wearer and over its length, an outer femoral lever comprising a strip of flexible metal capable of absorbing and restoring the flexural and torsional stresses;
- at knee level of the wearer, a knee piece capable of maintaining the relative movements between the thigh and the leg in slight flexion and slight valgus position, within the strict limits of the physiological articular play;
- parallel to the antero-internal side of the tibia of the wearer and over its whole length, an antero-inner lever comprising a strip of flexible metal capable of absorbing and restoring the flexural and torsional stresses;
- a first elastic strap connecting the upper end of the outer femoral lever, substantially as an extension of the outer femoral lever, to the said corset in the vicinity of the iliac crest of the wearer;
- a second elastic strap extending transversely whilst sloping slightly upwardly connecting the outer femoral lever



to the corset towards or in the direction of the iliac spines of the wearer, the second elastic strap thus substantially crossing the pubic symphysis of the wearer;

(g) means connecting the lower end of the femoral lever to the knee piece;

(h) means connecting the upper end of the tibial lever to the knee piece; and

(i) means limiting the articular play of the tibio-tarsal articulation of the wearer, and connected to the lower end of the tibial lever.

4,422,454

**EMERGENCY EXTRICATION APPLIANCE**

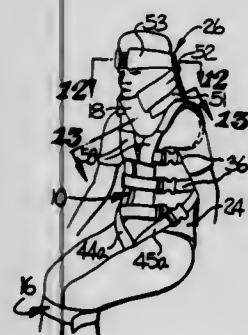
Paul R. English, Charlotte, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Filed Jun. 7, 1982, Ser. No. 385,501

Int. Cl.<sup>3</sup> A61G 1/00

U.S. Cl. 128—134

25 Claims



1. An emergency extrication appliance for the extraction of an injured person from an automobile or other confined location and where injury to the spine is suspected, and with the appliance being characterized by the ability of closely conform to the contour of the person during its application, and once applied, by the ability to effectively immobilize the full length of the spine and the head, and comprising,

a cervical collar adapted to encircle a wearer's neck to substantially immobilize the head and neck,

a relatively thin, generally flexible body support comprising a lower body portion adapted to overlie the lower back of the wearer, and a head support portion having a length and width sufficient to overlie the back of the neck and at least a portion of the head of the wearer,

an elongate semi-rigid reinforcing means mounted to said body support and extending medially along a lengthwise direction over at least a substantial portion of the length of said lower body portion and head support portion, to thereby overlie the spine of the wearer,

chest strap means mounted to said body support for encircling the wearer's chest and releasably securing the lower body portion to the back of the wearer, and

neck strap means for releasably interconnecting said head support portion of said body support and said cervical collar, and so as to substantially preclude relative movement therebetween upon being interconnected, whereby in its operative position on the wearer, the appliance acts to rigidify substantially the entire length of the spine and the head of the wearer.

4,422,455

**RESTRAINING DEVICE**

Alan J. Olsen, Cordova, Tenn., assignor to Danek Medical, Inc., Cordova, Tenn.

Filed Aug. 4, 1981, Ser. No. 289,971

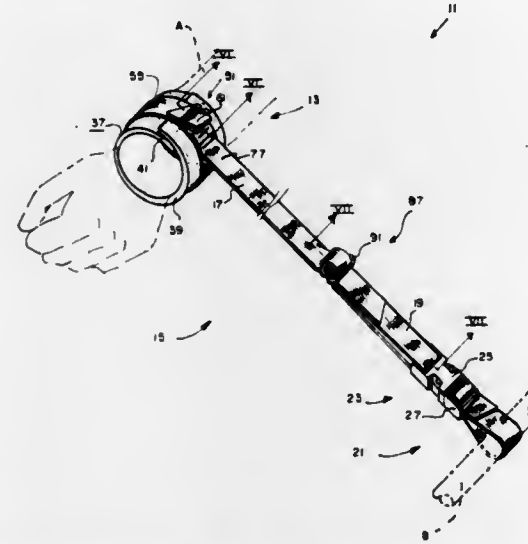
Int. Cl.<sup>3</sup> A61F 13/00

U.S. Cl. 128—134

14 Claims

1. A device for restraining a patient to a certain rigid structure, said device comprising adjustable cuff means for bindable placement about an extremity of the patient, elongated strap means having a proximal end affixed to said cuff means and a

distal end remotely situated therefrom, anchorable means for fixable attachment to said distal end of said strap means and to said certain rigid structure which may be inaccessible to the patient, and quick release means including separable cooperating receptacle and clasp members—one of which being affixed to said distal end of said elongated strap means with the other of said members being affixed to said anchorable means—for effectively facilitating expeditious release of said anchorable means from said distal end of said strap means to allow release of the patient when desired and for subsequently returning him to the original restraint condition with minimum effort, said



proximal end of said strap means being affixed to said cuff means, said adjustable cuff means includes first adjustable bindable means for facilitating an initial stabilizing condition of said cuff means about the extremity of the patient and second adjustable bindable means operable in conjunction with said first adjustable bindable means for subsequently facilitating optimum constraint of said cuff means about the extremity of the patient whereby said cuff means is prevented from tightening about the patient's extremity in the event the patient attempts to pull said distal end of said strap means from said anchorable means.

4,422,456

**NASAL CANNULA STRUCTURE**

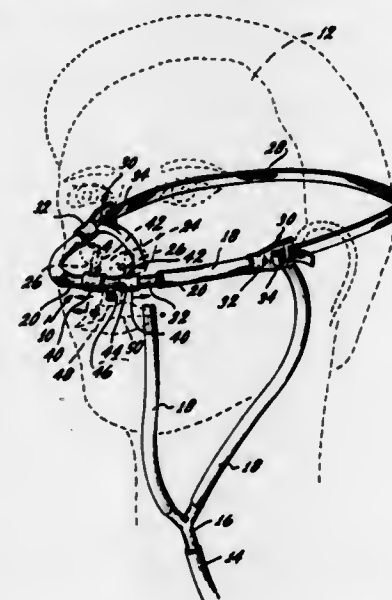
Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

Filed Sep. 8, 1981, Ser. No. 299,873

Int. Cl.<sup>3</sup> A61M 15/08

U.S. Cl. 128—207.18

7 Claims



1. A nasal cannula structure utilizing an elongated tubular conduit in which the improvement comprises:

support means for supporting said conduit so that a portion of said conduit extends beneath and adjacent to the nostrils of the nose of a user,

two separate, spaced holes located in said portion of said conduit said holes being separated from one another by an amount approximately corresponding to the spacing between the nostrils of the nose of a user,

two separate sleeves located around said portion of said conduit, each of said sleeves covering one of said holes, a tube capable of fitting into a nostril of a user attached to each of said sleeves so as to extend outwardly from its, said sleeves each including means communicating with said tube so as to establish flow communication between said sleeve and said tube,

said sleeves fitting closely against the exterior of said conduit so as to prevent gas leakage between the exterior of said conduit and the interiors of said sleeves,

said sleeves also fitting against the exterior of said conduit in such a manner as to permit the relative locations of said sleeves with respect to said conduit to be adjusted so that said tubes fit within the nostrils of the nose of the user when said tubes are in communication with said holes.

4,422,457

**SAFETY DEVICE FOR MEDICAL TREATMENT SYSTEM**

Shinichiro Hattori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

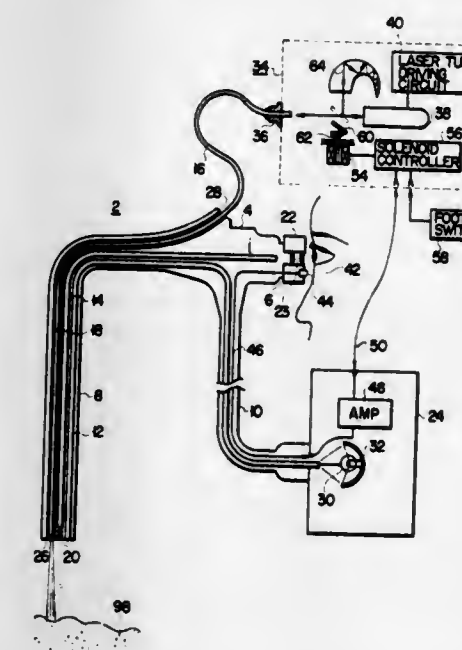
Filed Jul. 1, 1981, Ser. No. 279,327

Claims priority, application Japan, Jul. 14, 1980, 55-95872

Int. Cl.<sup>3</sup> A61B 17/36, 1/06

U.S. Cl. 128—303.1

11 Claims





4,422,459

**ELECTROCARDIOGRAPHIC MEANS AND METHOD FOR DETECTING POTENTIAL VENTRICULAR TACHYCARDIA**

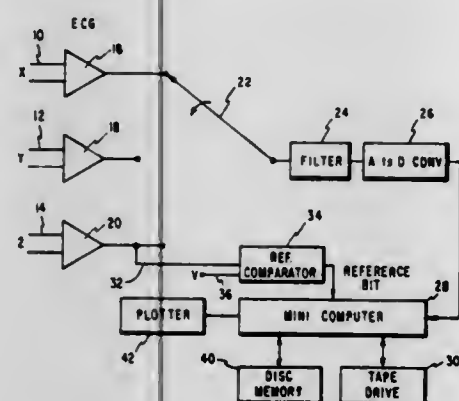
Michael B. Simson, Cherry Hill, N.J., assignor to University Patents, Inc., Norwalk, Conn.

Continuation of Ser. No. 208,219, Nov. 18, 1980, abandoned.

This application Mar. 1, 1982, Ser. No. 353,538

Int. Cl.<sup>3</sup> A61B 5/04

U.S. Cl. 128—702



1. A method for analyzing electrocardiograph signals to determine the presence or absence of a predetermined level of high frequency energy in the late QRS signal, comprising the steps of:

- converting a series of QRS signals to time segments, each segment having a digital value equivalent to the analog value of said signals at said time;
- applying a portion of said time segments in reverse time order to high pass filter means;
- determining an arithmetic value of the amplitude of the output of said filter; and
- comparing said value with said predetermined level.

4,422,460

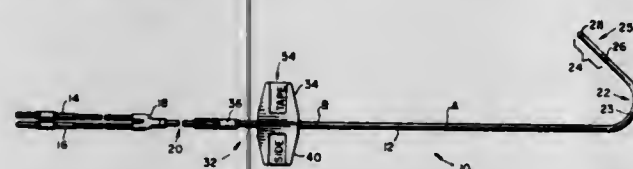
**POSITIONABLE LOCATING AND ORIENTING WING FOR A PACING LEAD**

Peter J. Pohndorf, Miami Shores, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Apr. 8, 1982, Ser. No. 366,816

Int. Cl.<sup>3</sup> A61N 1/04

U.S. Cl. 128—786



1. In a pacing lead assembly comprising a flexible pacing lead including at least one insulated conductor having a proximal end and a distal end, means at the proximal end for electrically connecting the insulated conductor to a pulse generator, a flexible bent or curved configuration in an outer end portion of the lead adjacent the distal end of the lead and an electrode assembly including at least one electrode mounted at the distal end of the pacing lead, the at least one electrode being connected to the conductor, the improvement comprising a positionable, locating, orienting and stabilizing device mounted on the pacing lead and having a passageway through which the pacing lead is received such that said device can be rotated on the pacing lead and cooperating locking means fixed on the lead and adapted to mate and lock with said device in a predetermined position of said device, whereby said device when locked in place in said predetermined position on the lead, has a predetermined orientation relative to the bent or curved configuration in the outer end portion of the pacing lead and whereby said device in its unlocked position can be rotated to a non-obtrusive position relative to the outer end portion of the

pacing lead, said device being generally flat and planar in shape and said unobtrusive position being a position where the plane of said flat planar device is generally coplanar with the plane of the bent or curved configuration in the outer end portion of the pacing lead, whereby the pacing lead assembly can be packaged in a flat or flush position on a substrate.

4,422,461

**ELECTRODE**

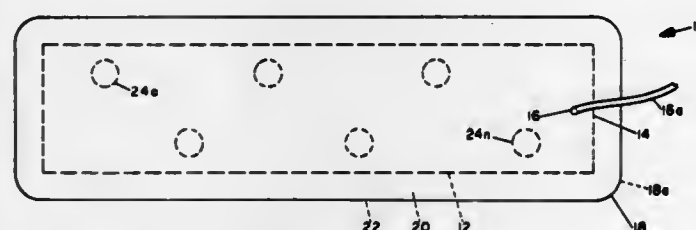
George Glumac, RR 2, Box 252G, Conifer, Colo. 80433

Filed Aug. 12, 1981, Ser. No. 292,218

Int. Cl.<sup>3</sup> A61N 1/04

U.S. Cl. 128—798

18 Claims



1. Electrode comprising:

- a. a layer of high-impedance carbon-loaded polycarbonate film material of a thickness of 0.1-5 mils;
- b. a metalized layer of low-impedance metallic foil material vapor deposited over said film material in a like geometrical configuration as said film material;
- c. a layer of plastic covering material with adhesive securing means disposed on a side of said foil material opposite said film material, said plastic covering material slightly larger than said film material and said foil material, and said securing means joining said film material, said foil material, and said plastic covering material together;
- d. a conductive medium layer disposed on a side of said film material opposite said foil material and substantially covering said film material; and
- e. snap means for electrically connecting to said electrode in electrical and mechanical connection to said foil material whereby said electrode maintains maximum flexibility and minimum profile over skin of an individual.

4,422,462

**DRIVE MECHANISM FOR ROTARY CLEANING DEVICE**

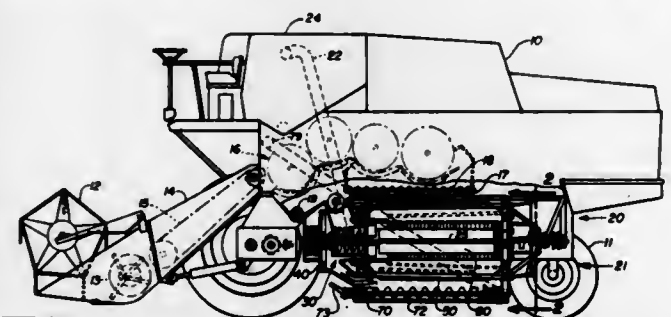
Frans J. G. C. Decoene, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 17, 1982, Ser. No. 408,981

Int. Cl.<sup>3</sup> A01F 12/00

U.S. Cl. 130—27 AA

20 Claims



1. In a rotary cleaning mechanism for cleaning threshold grain in a combine harvester, said cleaning mechanism having a frame; a cleaning cylinder rotatably mounted on said frame about an axis of rotation extending in a fore-and-aft direction; a rotatable infeed mechanism mounted on said frame forwardly of said cleaning cylinder; a fan rotatably supported by said frame proximate to said cleaning cylinder; and drive means for rotatably powering said cleaning cylinder, said infeed mechanism and said fan, said drive means being operatively connected to a drive transfer means for transferring rotational

power from a prime mover, an improved drive means comprising:

- a composite drive shaft defining said axis of rotation, said cleaning cylinder, said infeed mechanism and said fan being rotatable about said axis of rotation, said composite drive shaft including a first shaft member rotatably supported by said frame and having a tubular portion forming the inwardmost end thereof and a second shaft member rotatably supported by said frame and rotatably received within said tubular portion of said first shaft member;
- a first pulley connected to said first shaft member in operative communication with said drive transfer means to driveably rotate said first shaft member;
- a second pulley rotatably mounted on said first shaft member in operative communication with said drive transfer means for rotation independently of said first shaft member;
- a third pulley connected to said second shaft member in operative communication with said drive transfer means to driveably rotate said second shaft member; and
- a fourth pulley rotatably mounted on said second shaft member in operative communication with said drive transfer means for rotation independently of said second shaft member.

4,422,463

**ROTOR FOR AN AXIAL FLOW ROTARY SEPARATOR**

Neil L. West, Bettendorf, Iowa, assignor to Deere &amp; Company, Moline, Ill.

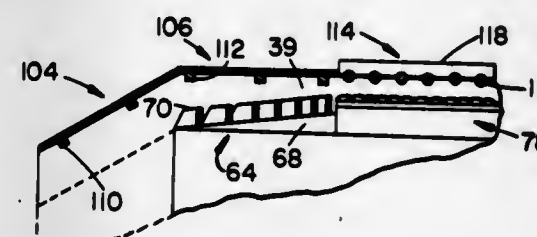
Division of Ser. No. 889,626, Mar. 24, 1978, Pat. No. 4,178,943.

This application Jul. 2, 1979, Ser. No. 53,665

Int. Cl.<sup>3</sup> A01F 12/22, 7/06

U.S. Cl. 130—27 HA

5 Claims



1. In an axial flow rotary separator for threshing and separating grain crop material and the like having a housing within which a rotor rotates and an axially extending annular space between rotor and housing in which through co-action between rotor and housing crop material is propelled spirally downstream while being threshed and separated, said separator having an upstream feed portion including a housing feed portion for receiving harvested crop material and conveying it downstream and a threshing portion including a housing threshing portion and a rotor threshing portion having a plurality of circumferentially spaced threshing bars, a separator transition portion extending between the separator feed and threshing portions for conveying crop material from the feed to the threshing portions comprising:

- a housing transition portion communicating with the housing feed portions and the housing threshing portions at its upstream and downstream ends respectively;
- a rotor transition portion rotatably mounted in the housing transition portion including an elongated ramp-style rasp bar substantially spanning the axial extent of the rotor transition portion and including a plurality of spaced side-by-side first raised rib-like elements, said bar being disposed so that radial clearance between the housing transition portion and the rib-like elements decreases progressively in a downstream direction; and
- means for propelling material downstream carried by the rotor transition portion, including an array of axially spaced material control elements substantially spanning the axial extent of the transition portion and, in large part, circumferentially spaced from the ramp-style rasp bar said

elements being disposed so that towards the upstream end of the transition portion the radial clearance between the elements and the housing is less than the corresponding clearance of the circumferentially corresponding elements of the ramp-style rasp bar.

4,422,464

**APPARATUS FOR THE FORMING OF HAIR**

Bertil Josefsson, Kageröd, Sweden, assignor to NPI New Products Investment AB, Askim, Sweden

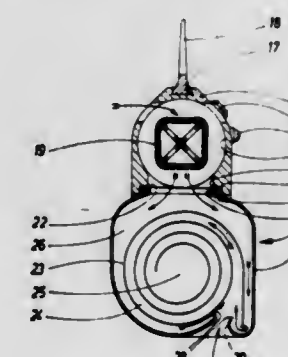
PCT No. PCT/SE80/00196, § 371 Date Mar. 27, 1981, § 102(e) Date Mar. 27, 1981, PCT Pub. No. WO81/00347, PCT Pub. Date Feb. 19, 1981

PCT Filed Jul. 30, 1980, Ser. No. 248,569

Claims priority, application Sweden, Jul. 30, 1979, 7906447 Int. Cl.<sup>3</sup> A45D 20/00

U.S. Cl. 132—9

5 Claims



1. Apparatus for forming hair, comprising: a hair forming tool provided with a casing having a first opening, at least one first duct in said casing and a first chamber communicating with said first duct, a suction device for creating an underpressure in said first duct and communicating with said first duct through said first chamber, said first opening serving for the introduction of a strand of hair into said first duct and into said first chamber, a second chamber surrounding said first chamber and forming part of at least one second duct communicating with ambient air, heating means in said second duct, said second duct having a second opening adjacent said first opening for passage of air from said heating means through said second duct into said first chamber, said second chamber via said second opening surrounding said first opening having a first connection with the first duct, and also having a second connection with the second duct for the supply of air, so that when there is an underpressure in said first duct, air rushes in via said first opening and via said first connection partly directly from the ambient air and partly from said second chamber and through said first duct to said first chamber, and timing means connected to said heating means for keeping the same in operation for a first predetermined period of time and for discontinuing operation for a second predetermined period of time, and also connected to said suction device for keeping the same in operation even when said heating means is inoperative.

4,422,465

**NAIL FILE AND METHOD FOR PRODUCING THE SAME**

Tomoyuki Haga, Tokyo, Japan, assignor to Shiseido Company, Ltd., Tokyo, Japan

Filed Oct. 17, 1980, Ser. No. 198,230

Int. Cl.<sup>3</sup> A45D 29/04

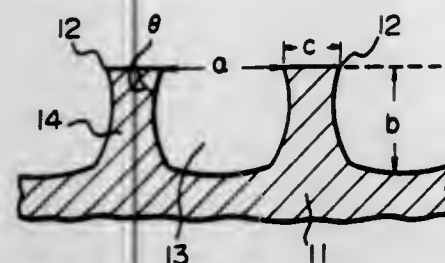
U.S. Cl. 132—76.4

2 Claims

1. A nail file having a number of file blades formed by a number of edge lines or concave portions, which are etched in the surface of flat metal plate, the arrangement of said concave portions being random or irregular, the diameter of said concave portions being within the range of 100 to 300 microns,



the depth  $b$  of said concave portions being within the range of 10 to 60 microns, the distance  $c$  between the adjacent edge



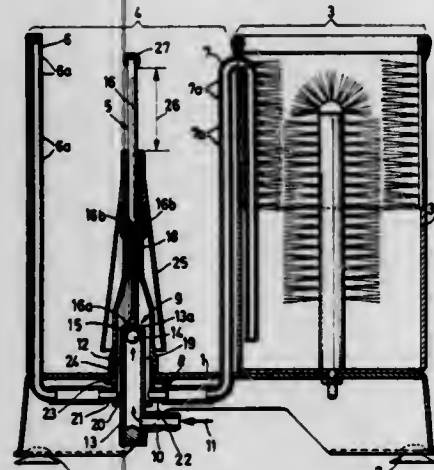
lines of said concave portions being within the range of 10 to 60 microns and the angle  $\theta$  of the blades being less than  $90^\circ$ .

#### 4,422,466 ARRANGEMENT FOR CLEANING CONTAINERS OF DIVERSE SHAPES

Klaus Schäfer, Wuppertal, Fed. Rep. of Germany, assignor to Schicker & Schäfer, Wuppertal, Fed. Rep. of Germany  
Filed Apr. 30, 1982, Ser. No. 374,608  
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131333

Int. Cl.<sup>3</sup> B08B 3/02, 9/08  
U.S. Cl. 134—55

14 Claims



1. An arrangement for cleaning containers, especially drinking utensils of diverse shapes, such as tumblers and stemware, comprising a support; means for spraying cleaning liquid on the internal surface of the respective container assuming a predetermined position relative to said support, including an elongated spraying assembly mounted on said support and having an internal distributing passage spaced in a predetermined direction from said support, and means for controlledly admitting the cleaning liquid at a predetermined pressure into said distributing passage, including a valve seat situated within said spraying assembly immediately upstream of said distributing passage, and a valve member movable toward and away from said valve seat; and means for directing a plurality of jets of the cleaning liquid against the external surface of the container assuming its predetermined relative position, including at least one tubular element extending substantially parallel to said direction at a transverse spacing from said spraying assembly and having a plurality of jet openings aimed toward said spraying assembly, and means for conducting a portion of the cleaning liquid from said distributing passage substantially oppositely to said direction to an upstream portion of said tubular element.

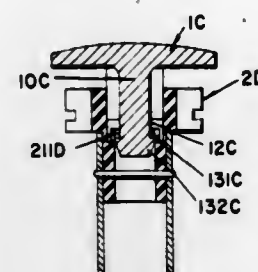
#### 4,422,467 COUPLING STRUCTURE OF THE UPPER NOTCH AND FERRULE ON AN UMBRELLA OR PARASOL

Tsun Z. Wu, No. 15, Lane 52, Ho-Ping West Rd., Section 3, Taipei, Taiwan

Filed Apr. 26, 1982, Ser. No. 371,828  
Int. Cl.<sup>3</sup> A45B 25/10

U.S. Cl. 135—36 TP

5 Claims



1. A coupling structure for connecting a ferrule to a notch member of an umbrella comprising:  
said notch member having an opening therein;  
a projection extending from said ferrule engaged in said opening;  
first means defining a stepped diameter area on one of said opening and projection; and  
second means defining a radially extending ring part on the other of said opening and projection engaged in said stepped diameter area;  
said notch member being made of flexible material and being integrally formed with said radially extending ring part;  
said projection including an upper portion having a diameter substantially corresponding to a diameter of said opening and a lower portion, said first means comprising a small diameter portion between said upper and lower portions of said projection;  
said opening of said notch member having a large diameter upper part for engagement with said upper part of said projection and a smaller diameter lower part for engagement with said lower part of said projection, said radially extending ring part having an axially extending portion extending upwardly from said small diameter portion of said opening with a space defined between a radially outer end of said radially extending ring part and an inner surface of said large diameter portion of said opening, whereby said projection of said ferrule can be inserted into said opening to resiliently move said radially extending ring part first outwardly then, with said ferrule coupled to said notch member, said radially extending ring part moves radially inwardly into said small diameter portion through the resiliency of said radially extending ring part.

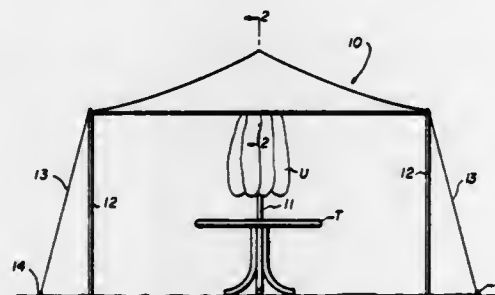
#### 4,422,468 CANOPY FOR USE WITH AN UMBRELLA

George W. Wilson, 5042 13th St., NE., Washington, D.C. 20017  
Filed Feb. 24, 1982, Ser. No. 351,903

Int. Cl.<sup>3</sup> E04F 10/00

U.S. Cl. 135—97

5 Claims



1. A canopy comprising in combination:

an umbrella having a lower support stand, a pole and an upper fabric covering,  
a tarp having a surface area substantially greater than the fabric covering,  
means connecting said tarp to the umbrella,  
and means holding said tarp along its edges in an elevated position,  
whereby said canopy serves as an adjunct to the umbrella, protecting a comparatively greater area from weather wherein said holding means comprises in combination, peripherally disposed grommets in said tarp, canopy poles with stepped down protrusions at an upper extremity to engage said grommets, and ropes with pegs extending from said protrusions to the ground to provide support for said tarp wherein said connecting means comprises a pole cap including a hollow, cylindrical upper collar with an inwardly extending, horizontal stop lip at an upper extremity and threads disposed on an inner sidewall thereof, a hollow, cylindrical lower collar with an outwardly extending horizontal lip at a lower extremity thereof and a bevelled surface opposing said lip further including threads on an outer sidewall thereof for threaded engagement with said upper collar with said tarp captured therebetween, said upper collar and said lower collar defining a central bore in said canopy to engage the pole of the umbrella.

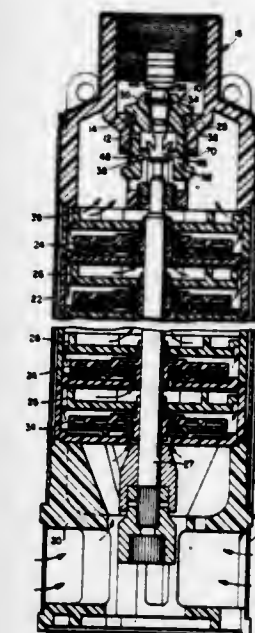
#### 4,422,469 SUBMERSIBLE PUMP CHECK VALVE

Nyle D. LaGrange, Bettendorf, and Elmer M. Deters, Muscatine, both of Iowa, assignors to The Marley/Wylain Company, Mission, Kans.

Filed Aug. 12, 1981, Ser. No. 292,049  
Int. Cl.<sup>3</sup> F16K 15/02

U.S. Cl. 137—315

8 Claims



1. A check valve comprising:  
a casing having walls defining a fluid passageway and a pair of openings respectively located on opposite ends of said passageway and in communication therewith;  
check valve means operably located in said passageway and shiftable between a flow and a non-flow position for permitting fluid flow in one direction through said passageway with said valve means in said flow position and for normally preventing fluid flow through said passageway in a second direction opposite said one direction with said valve means in said non-flow position, said valve means including  
a body member having structure defining a bore there-through;  
a plurality of elongated, yieldable, resilient legs having engagement means and coupled to said body, said legs being shiftable from a radially-outward position for preventing

removal of said check valve means from said passageway to a radially-inward position for permitting removal of said valve means from said passageway; and  
an elongated stem normally disposed through said body member bore and having locking means adjacent one end, said stem being axially shiftable for permitting said locking means to engage said legs into said radially-outward position and for permitting said locking means to disengage from said legs for allowing said legs to yield into said radially-inward position.

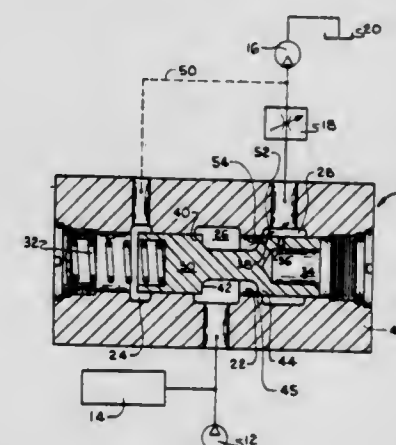
#### 4,422,470 FLOW LIMITING VALVE

Alan D. Jackson, and Dennis J. Stucky, both of Hutchinson, Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Jul. 1, 1982, Ser. No. 394,381  
Int. Cl.<sup>3</sup> F16K 17/34

U.S. Cl. 137—484.2

7 Claims



1. In a control valve having a valve spool which is positioned by varying axial forces thereon; the spool having alternately spaced grooves and lands, and a conventional valve body having a bore in which the spool is slidable from a closed position to at least one metering position providing restricted flow from a pressurized cavity in the body across a notch to an exhaust cavity in the body and at least one servo chamber acting on an end surface of the spool for positioning the spool, the improvement comprising:

a metering land on the valve spool;  
at least one metering notch positioned between the metering land and the valve bore;  
a vent passage means in the metering land connected to the servo chamber and positioned downstream of one of the metering notches and substantially axially aligned with said notch whereby the fluid jet exiting the notch has a tendency to pull fluid from the vent passage and decrease the pressure in the servo chamber whereby certain forces on the spool when in a fluid dynamic state can be cancelled so that the control valve will be unaffected by changing flows through the valve and varying pressure drops across the valve.

#### 4,422,471 FOUR BAR MANIFOLD

Ernest C. Faccini, Marbury, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1982, Ser. No. 381,829  
Int. Cl.<sup>3</sup> B63K 7/00

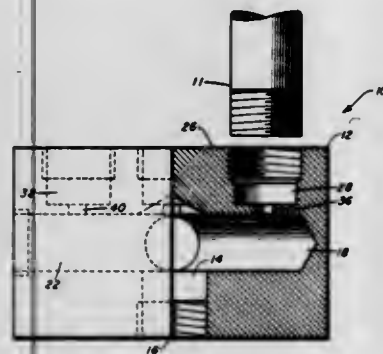
U.S. Cl. 137—561 A

2 Claims

1. A manifold for uniformly and equally distributing gas to each of a plurality of burn bar torches for burning holes in objects comprising:



a body member having at least one face, said body member further including;  
 a central plenum chamber having an inlet for receiving the gas,  
 a plurality of equally spaced radially extending cross passages, each of said passages having one end connected to said plenum chamber for carrying the gas out of said plenum chamber,  
 a plurality of orifices, each of said orifices having an inlet end connected to one of said respective cross passages and extending from said cross passage in perpendicular relation to said body face for receiving the flow of gas



from said cross passage, said orifices adapted to maintain sonic gas flow therethrough,  
 a plurality of outlet chambers, each of said outlet chambers having an inlet end connected in co-axial relationship to one of said respective orifices and extending perpendicularly to said face for receiving the flow of gas from said orifices and for distributing the gas to the burn bar torches, said outlet chambers adapted to receive the burn bar torches whereby,  
 the flow of gas is distributed uniformly and equally to each of the burn bar torches and the burn bar torches burn holes of equal size in the object.

4,422,472

## PUMP BASIN VALVE AND SLIP JOINT

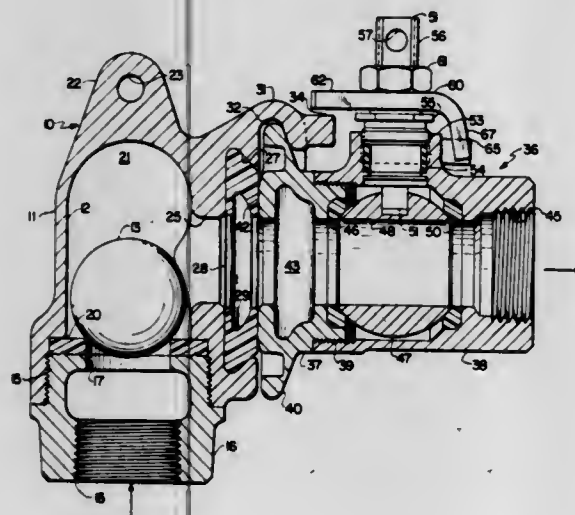
L. E. Klein, Mansfield, Ohio, assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Oct. 29, 1981, Ser. No. 316,148

Int. Cl.<sup>3</sup> F16L 37/00

U.S. Cl. 137—614.06

4 Claims



1. A valve and coupling apparatus for releasably interconnecting the outlet of pump and a conduit comprising  
 a first valve assembly comprising  
 a first housing;  
 means defining a passage through said first housing, at least one end of said passage terminating in an opening having a generally horizontal axis, the other end of said housing being connectable to the pump outlet,

a check valve in said housing, and  
 a generally U-shaped flange on said housing opening downwardly and partially encompassing said opening, said flange having a continuous recess extending along the inwardly facing surface thereof;  
 a second valve assembly comprising  
 means defining a flow path therethrough, at least one end of said flow path terminating in an opening having a generally horizontal axis and the other end thereof being connectable to the conduit,  
 a radially outwardly extending, generally circular flange surrounding said opening, said circular flange being flared and dimensioned to be received in said recess in said U-shaped flange downwardly over said circular flange, thereby coupling said first and second housings together with said  
 at least one openings aligned,  
 a valve element in said flow path, said valve element being rotatable through an angle of about 90° between positions in which said flow path is opened and closed,  
 a stem attached to and rotatable with said valve element and extending upwardly through said second housing, the exposed end thereof being connectable to a handle, and  
 a locking tab coupled to said stem and having an end portion extending radially away from said stem, said tab being oriented toward said first housing when said valve element is in the open position; and  
 said first housing further comprises  
 a projection fixedly attached to said first housing and extending toward said stem when said first and second housings are coupled together and protruding between said second housing and said tab when said valve element is in its open position, thereby preventing uncoupling of said housings until said valve element is rotated to its closed position.

4,422,473

## TANK BALL VALVE HAVING DEPENDENT SLEEVE AND HANDLE ATTACHED TO THE SLEEVE

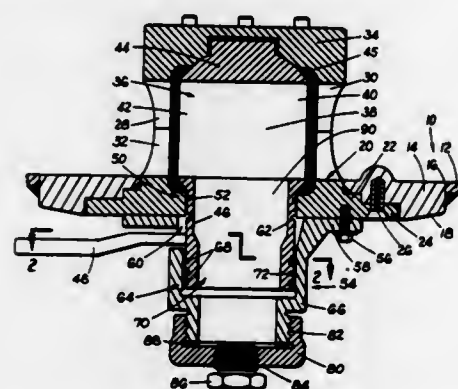
Richard B. Polley, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,364

Int. Cl.<sup>3</sup> F16K 51/00

U.S. Cl. 137—625.32

15 Claims



1. A ball valve assembly comprising: a ball valve housing adapted to be mounted within a tank inlet including a hollow body portion having at least one inlet port; a ball valve located within said housing and including a valve body portion which in one position is adapted to close said housing port; said ball valve including a ball valve port adapted to align with said housing port to allow lading to enter said ball valve; said ball valve further including a depending hollow sleeve extending below said tank; an outlet chamber provided around said sleeve; operating handle means connected to said sleeve below said tank to move said ball valve between open and closed position; said outlet chamber being connected to said ball valve housing with shearable fasteners which define a shear plane, and said sleeve including shear means aligned with said shear

able fasteners whereby upon hard impact said outlet chamber and a portion of said sleeve will shear off leaving said ball valve in place within said housing.

4,422,474

## ELECTRO-HYDRAULIC REMOTE VALVE

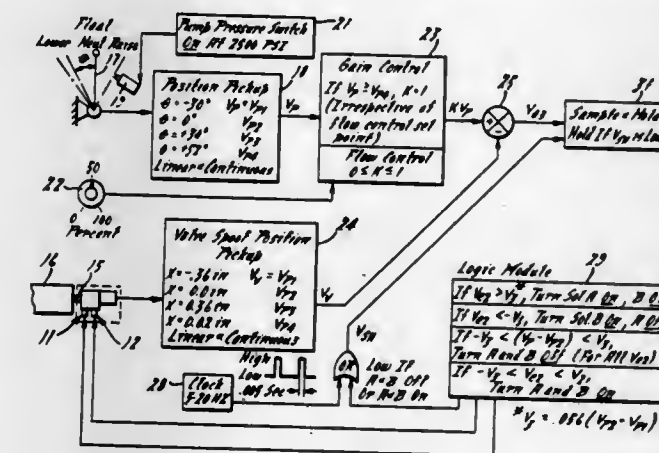
Habil S. Basrai, Port Huron, Mich., and Ganesh Rajagopal, Richardson, Tex., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 14, 1981, Ser. No. 301,789

Int. Cl.<sup>3</sup> F15B 13/043

U.S. Cl. 137—625.64

6 Claims



1. An electrical control system for a hydraulic power system that includes a source of pressurized fluid and a hydraulic remote valve means for directing the application of the pressurized fluid to move an implement in selective directions, the remote valve means including a linearly movable actuating portion;

the electrical control system comprising:  
 an electro-hydraulic actuator connected to the pressurized fluid source having an operating member coupled to the remote valve means actuating portion;  
 the actuator including a flow control valve connected to an adjustable flow rate control means for setting the flow rate of the pressurized fluid to the hydraulic remote valve;  
 a control handle having multi-detent positions;  
 and a feedback electronic control circuit that translates the position of the control handle into a position of the actuating portion of the hydraulic remote valve;  
 the feedback electronic control circuit including a control handle position transducer that produces a handle position indicating output signal;  
 a gain control circuit into which the output signal is fed to attenuate the same in proportion to the flow rate setting of the adjustable flow rate control means;  
 a position transducer means coupled to the operating member of the electro-hydraulic actuator for generating a signal sensing the actual position of the operating member;  
 a differential summing device having as its inputs the output signal of the gain control circuit and of the electro-hydraulic actuator operating member position sensing signal and as its output an error signal representing the difference between the actual and desired positions of the implement;  
 a sample-and-hold circuit having an input to receive the error signal;  
 and a clock logic means for transmitting the error signal at predetermined time intervals from the sample-and-hold circuit to the electro-hydraulic actuator to activate the latter to operate the hydraulic remote valve to cause the implement to move in raising or lowering direction or to hold the implement against movement.

1037 O.G.—53

4,422,475

## VARIABLE GAIN SERVO CONTROLLED DIRECTIONAL VALVE

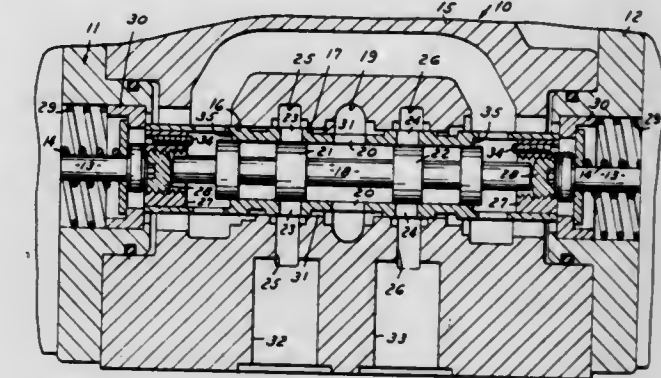
Ronald A. Aspinwall, Detroit, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed May 29, 1981, Ser. No. 268,489

Int. Cl.<sup>3</sup> F15B 13/044

U.S. Cl. 137—630.15

27 Claims



1. A variable gain servo controlled directional valve comprising  
 a valve body having an elongated bore,  
 a sleeve in said bore,  
 a spool mounted for reciprocating movement in said sleeve,  
 a force motor for positioning said spool in said sleeve,  
 said valve body having an inlet pressure port and outlet pressure ports,  
 said sleeve having passages permitting flow from said pressure ports to the interior of said sleeve,  
 said spool controlling the flow through the sleeve and movable from a null position to selective positions permitting fluid flow to said outlets of said body,  
 said sleeve including a bypass channel whereby upon shifting movement of said sleeve relative to said body, said bypass channel will permit fluid flow from said inlet port in said body to one of the outlet ports,  
 and means operable upon movement of said force motor to selectively control movement of said sleeve and said spool,  
 said last-mentioned means being operable upon shifting of said spool to initially permit flow under the control of said spool to one of said outlets in said body and upon continued movement of said spool to cause said sleeve to be moved axially so additional fluid will flow from said inlet port in said body to the selected outlet port of said body, and includes means for adjustably controlling the point in the axial movement of said spool when the axial movement of said sleeve is initiated.

4,422,476

## FLUIDIC CONTROL DEVICES

Alan Blanchard, Preston, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 10, 1983, Ser. No. 474,147

Claims priority, application United Kingdom, Mar. 16, 1982, 8207670

Int. Cl.<sup>3</sup> F15C 1/16

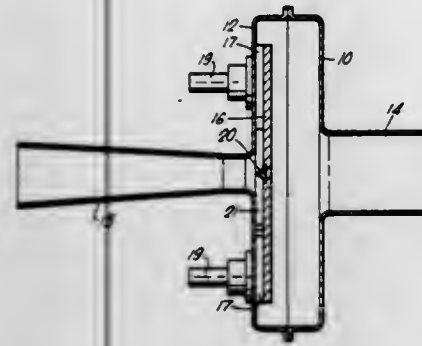
U.S. Cl. 137—810

5 Claims

1. A fluidic control device, in particular a vortex amplifier, comprising a casing, a supply fluid inlet communicating with the interior of the casing through a central opening in one end wall of the casing, a fluid outlet shaped as a diffuser communicating with the interior of the casing through a central opening in the opposite end wall of the casing, a plate within the casing and cooperating with the opposite end wall to form a vortex chamber, at least one further inlet for a control fluid in a wall of the casing, a spacer member defining a part of the periphery of the vortex chamber and disposed between the plate and the opposite end wall of the casing, a channel in the member com-



municating with the further inlet for directing control fluid into the vortex chamber, and in which characterised in that an



aperture is formed in the plate adjacent the channel in the member whereby to divert a portion of the control fluid to the side of the plate facing the supply fluid inlet.

4,422,477

**PRESSURE ENERGIZED PIPELINE PLUG**

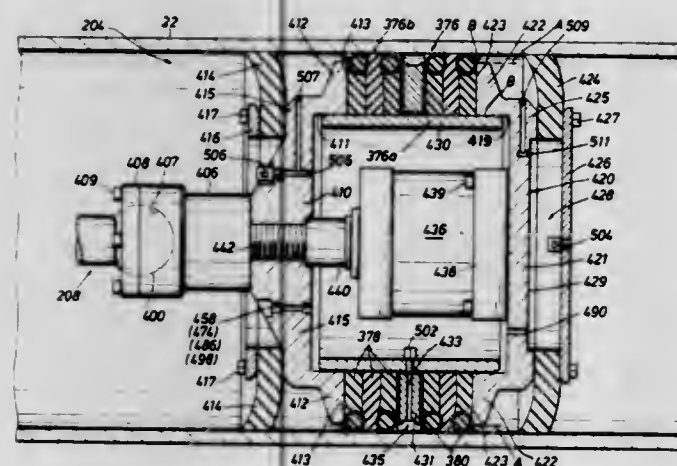
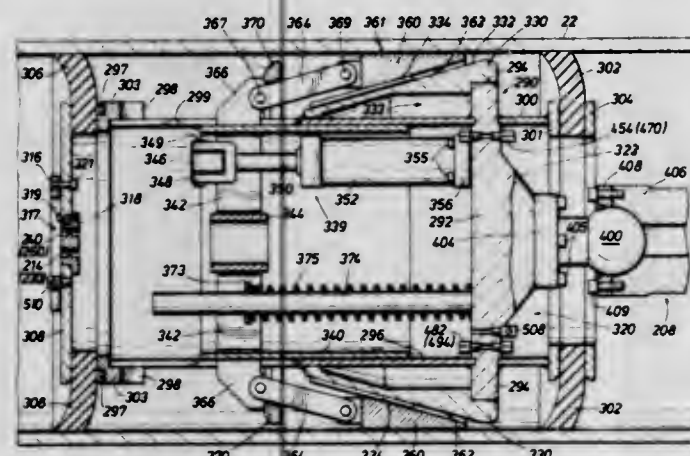
Robert H. Wittman; David E. Adkins, and Ronnie E. Haws, all of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Feb. 27, 1981, Ser. No. 238,713

Int. Cl.<sup>3</sup> F16L 55/10

U.S. Cl. 138—89

14 Claims



1. Apparatus for plugging the bore of a pipe at a selected location and withstanding a pressure differential thereacross that may equal or exceed the designed working fluid pressure of the pipe, comprising in combination:

cylindrical body means adapted for insertion into the pipe bore and for axial movement therein, said body means including a pressure head having a selected area; support means attached to and cooperating with said body

means for supporting said body means axially in the pipe during movement therein;

pipe gripping means carried by said body means for locking engagement with the inside surface of the pipe to anchor said body means in said pipe;

compression seal means having a selected annular area and carried by said body means for radially expanding in response to axial force applied thereto for sealingly engaging the inside surface of the pipe and converting said axial force into radial sealing pressure in a predetermined relationship;

an actuating sleeve adapted for limited axial sliding movement within said cylindrical body means; and

force applying means mounted within said body means for applying a predetermined axial force to said actuating sleeve to move said sleeve axially within said body means; said actuating sleeve cooperating with pipe gripping means for driving said pipe gripping means into locking engagement with the pipe in response to said axial force applied thereto by said force applying means.

4,422,478

**CLOSURE DEVICE**

Harry Pentney, Highworth, and Anthony R. L. Fitch, Swindon, both of United Kingdom, assignors to Raychem Limited, London, England

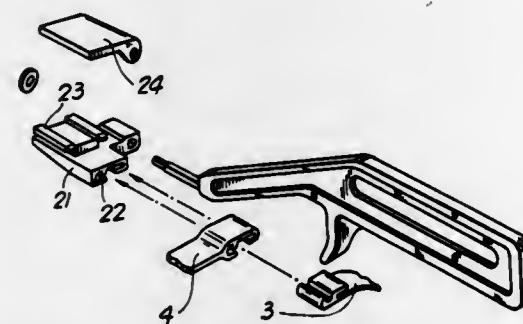
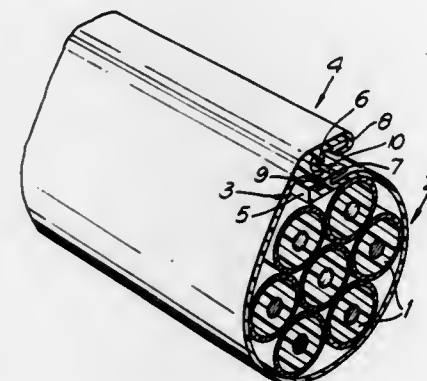
Filed Feb. 10, 1981, Ser. No. 233,119

Claims priority, application United Kingdom, Feb. 23, 1980, 8006212; Nov. 10, 1980, 8036170

Int. Cl.<sup>3</sup> F16L 11/12

U.S. Cl. 138—168

10 Claims



1. A wraparound device, comprising:

a cover having an underlying edge and an overlying edge, the edges being opposed, the underlying edge having a first edge portion and the overlying edge having a second edge portion, the edge portions being interlocked;

the first edge portion having a first ridge and said second edge portion having an opposed second ridge for engagement of the edge portions, the first and second ridge having a height which is approximately equal to one another;

the first edge portion having a protuberance extending along the first edge portion and spaced from the first ridge a distance greater than the width of the second ridge the protuberance defining a flange extending longitudinally

along the first edge portion and in a direction away from the second edge portion and substantially parallel to the cover defining a width, the width of the flange being at least twice the height of the ridges; the second edge portion having a longitudinally extending portion defining a flap and a further protuberance which abuts and underlines only the first ridge longitudinally along the first edge portion, the flap has a terminus defining a curved rim for gripping the flange; upon engagement of the edges, the flap overlies the flange with the curved rim gripping the underside of the flange at a distance from the first ridge at least twice the height of the ridges; and thereby, upon application of a tensile force tending to open the cover after engagement, the ridges absorb the majority of such a force, thereby reducing the opening force experienced by the flap against the flange and reducing the likelihood of the cover opening after engagement.

4,422,479

**LOOM CLOTH TAKE-UP AND METHOD**

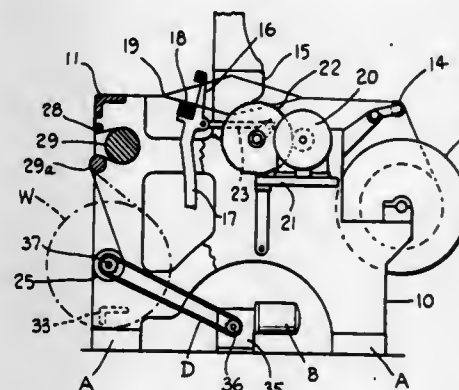
William J. Alexander, III, P.O. Box 848, Mauldin, S.C. 29662

Filed Aug. 6, 1981, Ser. No. 290,732

Int. Cl.<sup>3</sup> D03D 49/00, 49/20

U.S. Cl. 139—1 R

1 Claim



1. A method of enlarging the cloth take-up capacity of a loom having a center wind take-up roll carried by a front frame portion of the loom comprising the steps of: raising and supporting the loom in raised position; removing transverse obstructing loom members to permit increased size capacity for a wound roll of cloth accommodated by the raising of the loom; positioning the take-up roll on the loom between the side frame members so that a major portion of the take-up roll is carried within the side frame members; driving the take-up roll independently of other loom driving mechanism through a non-slip driver to center wind cloth produce by the loom; and controlling the driving of the take-up responsive to tension in the cloth by limiting current to a D.C. motor driving the take-up roll.

4,422,480

**LOOM-HEDDLE SELECTOR**

Werner Geirhos, Senden, and Josef Dietmayer, Bibertal, both of Fed. Rep. of Germany, assignors to Grosse Webereimaschinen GmbH, Neu-Ulm, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 153,821, May 27, 1980. This application Feb. 24, 1982, Ser. No. 351,994

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922318

Int. Cl.<sup>3</sup> D03C 1/00

U.S. Cl. 139—66 R

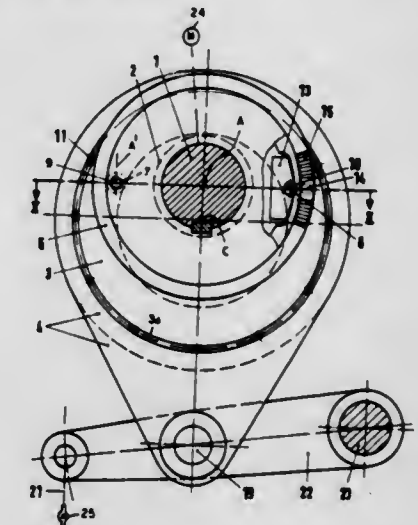
10 Claims

1. An apparatus for operating a loom heddle, said apparatus comprising: a drive shaft centered on and defining an axis; means for rotating said drive shaft about said axis; an eccentric carried on said drive shaft, rotatable relative

thereto about said axis, and formed with an axially extending guide;

crank means connecting said eccentric to said heddle for displacement of said heddle between end heddle positions as said eccentric rotates about said axis;

a drive disk rotationally fixed on said drive shaft adjacent said eccentric and formed with at least one recess axially alignable with said guide;



an entrainment bolt axially displaceable in said guide between an extended entrainment position projecting axially in one direction therefrom into said recess of said drive disk and thereby rotationally coupling said drive disk and eccentric together and a retracted position disengaged from said recess for relative rotation of said drive disk and eccentric; and means including a switch element operatively engageable with said bolt to displace same axially between said positions.

4,422,481

**ADJUSTABLE FASTENER FOR FASTENING PULLING CABLES ON THE SUSPENSION LEVERS OF TEXTILE DOBBIES OF THE NEGATIVE TYPE**

Joseph Palau, Duingt, France, assignor to S.A. Des Etablissements Staubli, Faverges, France

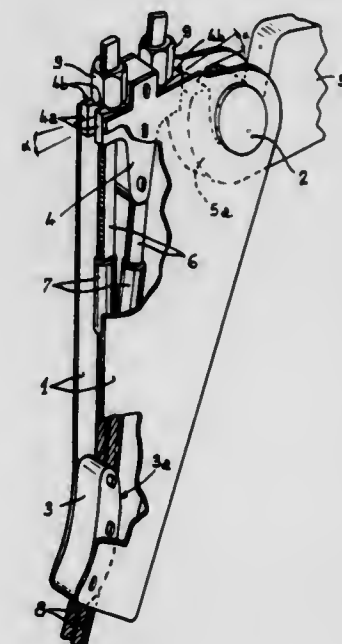
Filed Jan. 18, 1982, Ser. No. 340,178

Claims priority, application France, Jan. 30, 1981, 81 01980

Int. Cl.<sup>3</sup> D03C 13/00

U.S. Cl. 139—88

3 Claims



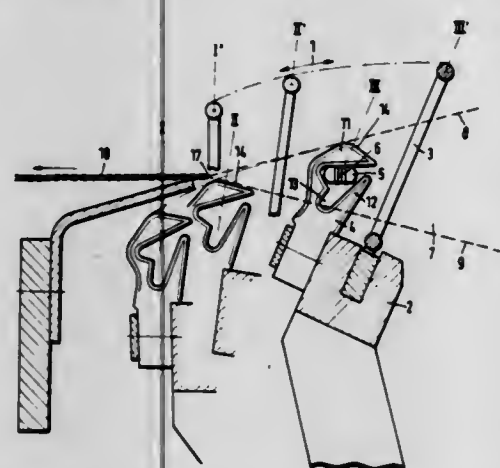
1. An adjustable fastener for fastening pulling cable means to



the suspension levers of textile bobbies of the negative type, wherein said fastener comprises two parallel side elements between which are mounted a transverse pin adapted to cooperate with the end of a suspension lever, a lower guide of curved section forming support for said cable means, and an upper stop comprising forked arm means oriented in the mean plane of the side elements so as to constitute a support for adjusting and locking nut means screwed on the upper ends of corresponding end piece means fixed to the cable means and passing through the said forked arm means.

**4,422,482**  
**GUIDE TOOTH FOR A WEAVING MACHINE**  
Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland  
Filed Nov. 18, 1981, Ser. No. 322,584  
Claims priority, application Switzerland, Dec. 2, 1980, 8886/80

Int. Cl.<sup>3</sup> D03D 49/60  
U.S. Cl. 139—188 R 5 Claims



1. In a weaving machine having means for forming a shed of air tangled warp threads between a low shed position and a high shed position,

a sley having a plurality of guide teeth for defining a weft path through said shed, each said tooth having a free upper leg with a straight outside edge for entering into said shed between two of the warp threads in said low shed position, said edge being parallel to the warp threads in said low shed position at a point adjacent said low shed position whereby upon entry into said shed the threads of said low shed position are not split by said teeth.

**4,422,483**  
**ANTISTATIC FABRIC AND GARMENT MADE THEREFROM**  
Howard M. Zins, Manchester, Mo., assignor to Angelica Corporation, St. Louis, Mo.  
Filed Jun. 3, 1981, Ser. No. 269,910  
Int. Cl.<sup>3</sup> D03D 15/00; A41B 0/00; B32B 9/00

U.S. Cl. 139—420 R 4 Claims

1. A woven fabric which substantially prevents the passage therethrough of hair and flaked-off particles of skin and which is readily laundered and which exhibits a charge decay of ninety percent from an applied voltage of five thousand volts within one-half of a second and which limits the average electrostatic charge that can be measured on said fabric to less than one hundred volts, even after many launderings, and hence is usable in making garments for "clean rooms" wherein static-sensitive devices are handled, and which comprises a first plurality of threads and a second plurality of threads, the threads of said first plurality of threads being essentially parallel to each other and extending in one direction, the threads of said second plurality of threads extending transversely of said one direction, one of said plurality of threads having the major portion thereof constituted by threads that are electrically resistive and having the minor portions thereof constituted by

threads that are electrically conductive, each of said electrically-resistive threads of said one plurality of threads comprising a multiplicity of non-textured, continuous, non-conductive filaments, each of said electrically-conductive threads of said one plurality of threads being a plural-ply thread, at least one ply of each of said electrically-conductive threads of said one plurality of threads being non-textured and continuous and having a denier of at least fifteen (15) and having conductive material at the surface thereof to render said one ply especially adapted to conduct static electricity, at least one other ply of each of said electrically-conductive threads of said one plurality of threads including non-textured, continuous non-conductive filaments to help make said electrically-conductive threads resistant to breaking, whereby said electrically-conductive threads can be woven into said fabric on commercial looms on a commercial scale and can remain substantially intact despite fifty commercial launderings, said conductive material at said surface of said one ply of each of said electrically-conductive

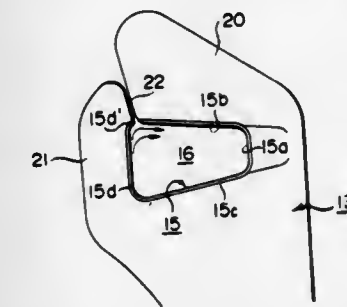


threads of said one plurality of threads providing an essentially-continuous and essentially-uninterrupted electrically-conductive path through the entire length thereof, said one ply of each of said electrically-conductive threads of said one plurality of threads being an identifiable ply of a diameter larger than each of said non-conductive filaments and that has the configuration of an open-type helix and that has a very substantial portion of the surface thereof exposed at the surface of said electrically-conductive thread, whereby the conductive surface of said one ply of each of said electrically-conductive threads of said one plurality of threads constitutes an exposed and visible part of the surface of said electrically-conductive thread, and whereby said conductive surfaces of said one ply coact to help provide said charge decay of ninety percent from an applied voltage of five thousand volts within one-half of a second and also to help limit the average electrostatic charge that can be measured on said fabric to less than one hundred volts.

**4,422,484**  
**WEFT GUIDE DEVICE IN A JET LOOM**  
Hiroshi Arakawa, Kariya, and Kinpei Mitsuya, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan  
Filed Nov. 24, 1981, Ser. No. 324,609  
Claims priority, application Japan, Nov. 28, 1980, 55-168652  
Int. Cl.<sup>3</sup> D03D 47/30

U.S. Cl. 139—435 3 Claims  
1. A weft guide device in a jet loom having a reed carrier for carrying a reed thereon, said device comprising an array of substantially vertically disposed and adjacently aligned weft

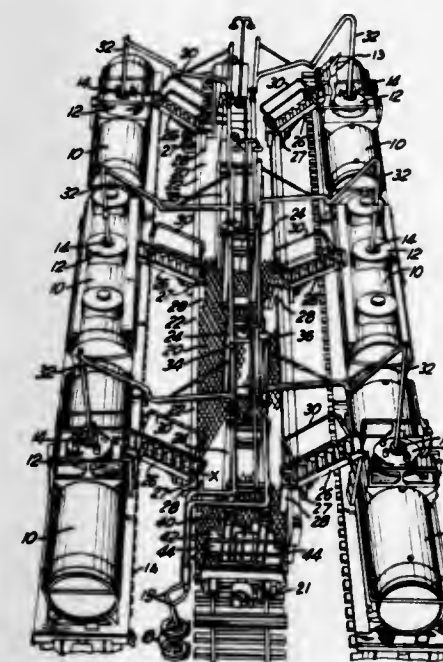
guide members mounted on said reed carrier along the reed, each of said weft guide members having substantially conjoining and straight upper wall, fore wall, lower wall and rear wall surfaces providing a generally quadrilateral-shaped weft guide opening which, together with said weft guide openings of said other aligned weft guide members, provides a weft guide path, said rear wall surface and said upper wall surface of each of said weft guide members being spaced apart to provide a relatively narrow weft thread opening therebetween to allow a weft thread to move therethrough out of said guide path in



preparation for the beating by said reed, and an air discharge member disposed substantially within said guide member array and laterally adjacent to one of said weft guide member rear wall surfaces to discharge air obliquely into said weft guide path and towards said fore wall surfaces, said rear wall surface of each said weft guide member being substantially vertical and having a curved upper portion adjacent to said weft thread opening to direct upwardly moving air currents along said rear wall surface across said weft thread openings and said upper wall surfaces of the weft guide members.

**4,422,485**  
**INTEGRATED MOBILE TANK-SERVICING SYSTEM**  
Ronald J. O'Shea; Joseph P. Balkey, both of Charleston; Andre Hooper, South Charleston, and Richard A. Kelly, III, St. Albans, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.  
Filed Sep. 30, 1981, Ser. No. 307,217  
Int. Cl.<sup>3</sup> B65B 3/04

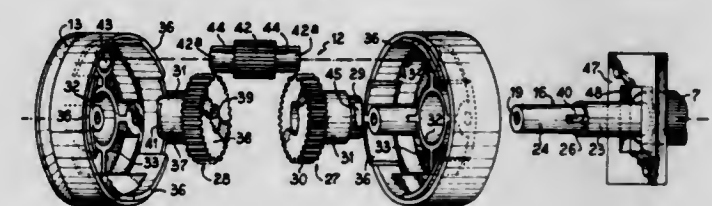
U.S. Cl. 141—98 19 Claims



1. A mobile system for effecting the transfer of a flowable medium with respect to at least one independent tank, said tank having an orifice for the flow of the flowable medium, comprising:  
(a) a mobile frame adapted to be moved adjacent to the tank;  
(b) at least one variable duct movably affixed at one end to the mobile frame and adapted for insertion into the orifice of the

tank, said variable duct being adapted to provide for the multidirectional movement of its other end with respect to the mobile frame; and  
(c) at least one variable walkway movably affixed at one end to the mobile frame, said variable walkway being independent of the variable duct and being adapted to provide for multidirectional movement of its other end with respect to the mobile frame, said other end being adapted to contact the tank to provide access thereto, whereby said mobile frame, variable duct, and variable walkway are adapted for independent movement to provide an integrated interaction with the tank for access between the tank and mobile frame and for the transfer of a flowable medium with respect to the tank.

**4,422,486**  
**TRIMMING MACHINE**  
Jean C. Maret, Paris, France, assignor to Aclers et Outillage Peugeot, Paris, France  
Filed Jan. 21, 1981, Ser. No. 227,120  
Claims priority, application France, Jan. 22, 1980, 80 01285  
Int. Cl.<sup>3</sup> B27C 1/00  
U.S. Cl. 144—117 R 5 Claims



1. A machine for trimming pieces of wood, such as a surfacing machine, planing machine or other machine, comprising a frame, a support carried by the frame on which support said pieces of wood are supported, a rotary tool adapted to machine at least one surface of said pieces of wood, two driving rollers for driving said pieces of wood in a given direction through the machine along said support, said rollers being provided respectively on an input side and an output side of the tool relative to said given direction and having shafts having axes parallel to the axis of rotation of the tool, and transmission means comprising a sun and planet train speed reducing mechanism connecting the rollers to the tool so that the rollers are rotatable by the tool, a first sun wheel of the sun and planet train being directly mounted on the shaft of a first of the driving rollers and being connected to rotate with said shaft of said first driving roller and a second sun wheel of the sun and planet train being a reaction sun wheel which is freely rotatably mounted on said shaft of said first driving roller, means for preventing the second sun wheel from rotating relative to said frame, means for mounting the shaft of said first roller on the frame so that the shaft is slidable relative to the frame in a plane containing the axis of the shaft of said first roller toward and away from said support, and elastically yieldable means for biasing said first driving roller toward said support.

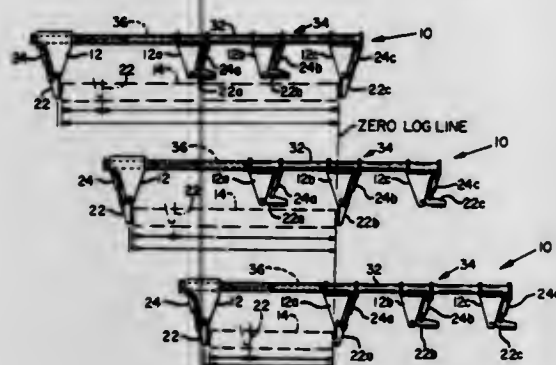
**4,422,487**  
**MULTI-DOG LOG CARRIAGE**  
Gerald D. McCurdy, Klamath Falls, Oreg., assignor to The Coe Manufacturing Company, Painesville, Ohio  
Filed Mar. 3, 1982, Ser. No. 354,238  
Int. Cl.<sup>3</sup> B27B 29/00, 29/08

U.S. Cl. 144—245 R 4 Claims  
1. An adjustable, end-dogging log carriage supportingly guided on a longitudinally-extending track for processing random-length logs comprising:  
(a) movable dog means movably supported on said track for supportingly engaging one end of a log;  
(b) a plurality of fixed dog means fixedly spaced relative to each other but movably supported on said track for selec-



tively supportingly engaging the other end of the log, with each one of said plurality of fixed dog means being longitudinally and fixedly spaced from each other one;

(c) independently-actuated dog operating means for selectively extending and retracting each one of said plurality of fixed dog means and said movable dog means;



(d) dog drive means associated with said movable dog means for displacing said movable dog means along said track with respect to said fixed dog means and clamping the log between said movable dog means and a selected one of said plurality of fixed dog means; and

(e) carriage means for moving said plurality of fixed dog means and said movable dog means in unison along said track.

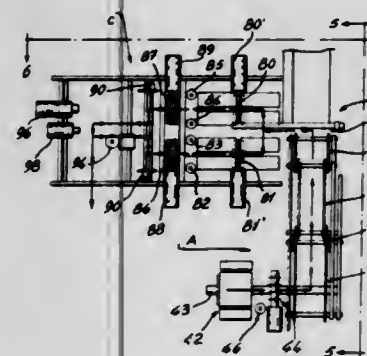
4,422,488

## MACHINE FOR PRODUCING DRAWER-SIDES

Paul H. Lacroix, Ste-Foy, and Ernest Lacasse, St-Romuald, both of Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Sep. 9, 1981, Ser. No. 300,481

Int. Cl.<sup>3</sup> B27M 3/18; B27C 9/04; B27F 1/02, 1/08  
U.S. Cl. 144—368 20 Claims



9. A machine for continuous production of pairs of drawer-sides from a panel of a thickness slightly greater than twice the thickness of one drawer-side, said machine comprising:

- first sawing means for cutting the panel to a predetermined drawer-side height;
- second sawing means adjacent said first sawing means for cutting off each panel to a predetermined drawer-side length;
- third sawing means adjacent said second sawing means for slitting each panel in two, through its thickness, in order to produce two boards of substantially equal dimensions;
- a smoothing table adjacent said third sawing means receiving the two boards laid flat and separated from one another, said table including means for planing the two surfaces, upper and lower, of each of the boards, and the two longitudinal edges thereof;
- means adjacent said smoothing table for subsequently moving the two boards towards each other;
- a machining table adjacent said moving means including horizontal and vertical dove-tailing heads for producing,

at one end of the two boards, a male dove-tail and, on the upper surfaces of said boards, a female dove-tail.

17. A method for continuous production of pairs of drawer-sides from a panel of a thickness slightly greater than twice the thickness of one drawer-side, consisting in: cutting the panels successively, by means of saws, to a predetermined drawer-side height; cutting the panels thus cut, by means of cut-off saws, to a predetermined drawer-side length; slitting the cut panels through their thickness in order to obtain two boards of substantially equal dimensions; laying the boards flat, separately, upon a smoothing table; planing separately the upper and lower surfaces, and the longitudinal edges, of the two boards and grooving the upper surfaces thereof in such a manner as to obtain a longitudinal groove in each board; bringing the two boards together; producing, in a single step and by means of a horizontal dove-tailing head, a male dove-tail at one end of the two adjacent boards and, by means of a vertical dove-tailing head, a female dove-tail in the upper surface of each board.

4,422,489

## COMBINATION NAIL HOLDER, NAIL SHIELD, AND NAIL FINISHING SET

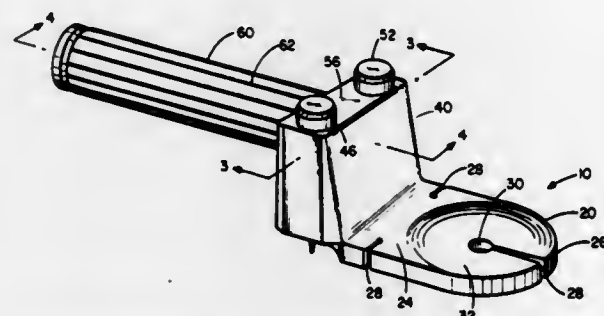
Gary Ross, 2811 Colorado Ave., #3, Santa Monica, Calif. 90404

Filed Oct. 22, 1982, Ser. No. 436,015

Int. Cl.<sup>3</sup> B25C 3/00

U.S. Cl. 145—46

8 Claims



1. A combination tool comprising:

- a gripping body member formed in a substantially U-shaped configuration with the curved portion of the U forming the forward edge of the tool;
- a multiplicity of very narrow V-shaped grooves, each of which extends inwardly from the outer edge of the gripping body member and each of which extends through the entire thickness of the gripping body member;
- the apex of one or more of said very narrow V-shaped grooves terminating in and extending into an opening within the interior of said gripping body member;
- each of said interior openings associated with a very narrow V-shaped groove also extending through the entire thickness of said gripping body member;
- a mid-body member located at the rear of said gripping body member and extending transversely from the upper surface of said gripping body member such that cavities are formed on either side of the rear portion of the gripping body member and beneath the mid-body member;
- a pair of substantially cylindrical openings extending through the entire height of said mid-body member;
- a pair of headed substantially cylindrical tapering shafts, one of which is received within each of said substantially cylindrical openings in said mid-body member such that the head of each shaft rests on the upper surface of said mid-body member and the tip of each shaft protrudes through the lower surface of said mid-body member and into the cavity on either side of the rear portion of said gripping body member and below said mid-body member; and
- a handle extending from the rear surface of said mid-body member;
- whereby each very narrow V-shaped groove can be used to hold a nail in any desired direction while it is hammered

into a surface of an object, the combination tool can act as a shield to protect the surface during the hammering process, and either of the substantially cylindrical tapering shafts can be used as a nail set to hammer the nail slightly below the surface of the object.

4,422,490

## VEHICLE ROAD WHEELS AND TIRES

Derek J. Power, Chiswick, England, assignor to Minlite Limited, Great Britain

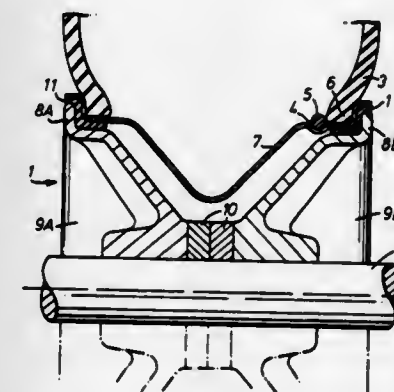
Filed Feb. 10, 1981, Ser. No. 233,090

Claims priority, application United Kingdom, Feb. 13, 1980, 8004732

Int. Cl.<sup>3</sup> B60C 5/16; B60B 3/08

U.S. Cl. 152—394

6 Claims



1. A vehicle road wheel and tire sealing assembly comprising:

- an annular integral tire sealing means for receiving both the inner and outer beads of a tire and for sealing the tire for inflation;
- a vehicle road wheel of split rim form having inboard and outboard rim parts releasably secured together to hold said sealing means in position around the rim parts, the sealing member being releasable from the rim parts by separating these parts; and
- means for transferring torque between said annular tire sealing means and said inboard and outboard rim parts consisting solely of resilient means, including inboard and outboard non-rigid torque transfer bands respectively fitted to the inboard and outboard rim parts and with which inboard and outboard areas of said annular sealing member are respectively engaged to provide a positive but resilient coupling between said wheel and said tire sealing means.

4,422,491

## COLLAPSIBLE AWNING FRAME

Joseph B. Cusick, III, P.O. Box 66, Peck, Kans. 67120

Filed Jul. 10, 1981, Ser. No. 282,008

Int. Cl.<sup>3</sup> E04F 10/04

U.S. Cl. 160—58 R

8 Claims

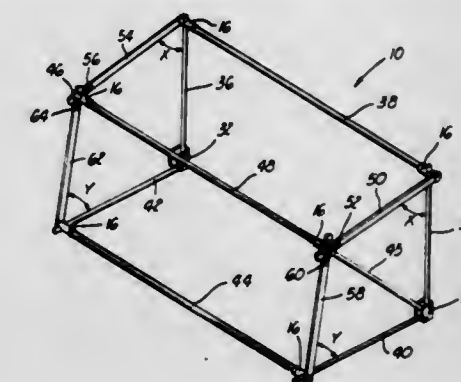
1. A collapsible awning frame for mounting in front of the opening of a window, door, or the like, the frame comprising:
  - a first hinge and a second hinge adapted for mounting on the opposite sides of the opening;
  - a first vertical rod having a lower end attached to the first hinge and extending upwardly therefrom;
  - a second vertical rod having a lower end attached to the second hinge and extending upwardly therefrom;
  - a horizontal upper tie rod having opposite ends attached to the upper ends of the first and second vertical rods;
  - a first fold rod having one end attached to the first hinge;
  - a second fold rod having one end attached to the second hinge;
  - a horizontal lower tie rod having opposite ends attached to the other ends of the first and second fold rods;
  - a first slide rod having one end attached to the first hinge;

a second slide rod having one end attached to the second hinge;

a horizontal extension tie rod having opposite ends attached to the other ends of the first and second slide rods;

a first upper slide arm having one end attached to the upper tie rod and the other end attached to the extension tie rod;

a second upper slide arm having one end attached to the



upper tie rod and the other end attached to the extension tie rod;

a first lower slide arm having one end attached to the extension tie rod and the other end attached to the lower tie rod; and

a second lower slide arm having one end attached to the extension tie rod and the other end attached to the lower tie rod.

4,422,492

## INSULATING SHADE DEVICE

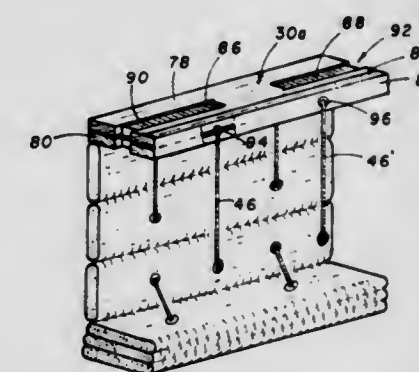
Billy M. Bledsoe, Rte. 2, Fulton Rd., Corryton, Tenn. 37721

Filed Aug. 4, 1980, Ser. No. 175,314

Int. Cl.<sup>3</sup> E06B 3/94; A47H 5/00

U.S. Cl. 160—84 R

4 Claims



1. An insulating shade device for increasing the thermal resistance and minimizing convective drafts at windows having a pane and a frame for supporting said pane, said frame including an upper cross member or lintel, a lower cross member or sill, and uprights, said device comprising:

- a shade having a multiplicity of insulating members, each of said members being proportioned for covering a section of said pane, said shade including means for joining said members such that the shade can be folded for storage and unfolded for creating an insulating cover over the window, said shade defining an upper end portion and a lower end portion;
- a support unit joining said upper end portion of said shade and suitable for attaching said shade proximate said upper lintel, said support unit including an upper cross member and a lower cross member, said cross members being pivotally connected along one edge of said unit, said support unit further including shade tension means for biasing said lower support member towards said upper support member, whereby said shade is placed under



tension and maintained in a substantially vertical plane upon securing the lower end portion of said shade to said window sill;  
means for drawing said shade to its folded position; and  
means for positioning the shade at any stage of deploying such that a preselected portion of the window can be covered.

4,422,493

# SUPPORT MEMBERS AND GEAR DRIVE FOR SHUTTER AND AWNING DEVICES

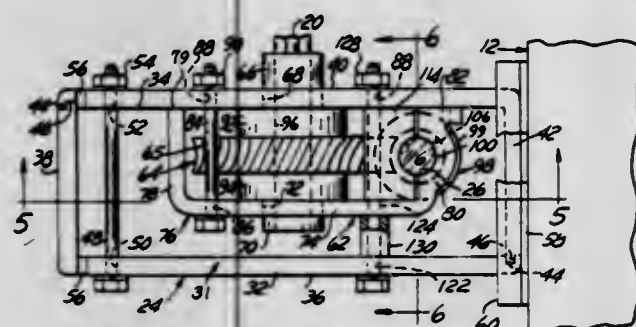
William F. Forquer, Venice, Fla., assignor to Security Shutter Corp., Venice, Fla.

Filed Dec. 16, 1981, Ser. No. 331,257

Int. Cl.<sup>3</sup> E06B 9/08

U.S. Cl. 160—133

10 Claims



1. In a protective shutter assembly for an opening in a wall or the like comprising an articulated curtain of a plurality of interlocked elongated rigid slats assembled hingedly relative to each other, a drive mechanism for raising and lowering said articulated curtain, said drive mechanism comprising a shaft having an axis of rotation disposed substantially parallel to the longitudinal axis of said slats, and support members for rotatably supporting said shaft at each end for winding said curtain about said shaft, the improvement comprising one of said support members being an open-ended enclosure having a pair of substantially parallel long sidewalls interconnected by a pair of substantially narrow sidewalls, support bracket means for supporting said enclosure from a wall with said relatively long sidewalls substantially perpendicular to the axis of said shaft, bearing means mounted on the end of said shaft and rotatably supported in a first aperture through one of said long sidewalls, a U-shaped saddle member having a second aperture providing a journal for a portion of said bearing means, a worm wheel mounted and coupled to said shaft within said U-shaped saddle member, a worm gear tangentially meshing with said worm wheel, said worm gear being mounted on and coupled to a drive shaft rotatably supported by said saddle member, wherein said saddle member has a partially cylindrical recess in supporting engagement with said drive shaft, and fastening means for attaching said U-shaped saddle to the inside surface of said long sidewall with said apertures substantially aligned.

4,422,494

# VIBRATORY FORMING OF SHAPED LEAD JOINTS

William J. Chaffin, Alexandria, and Ben C. Brown, Muncie, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 4, 1981, Ser. No. 259,975

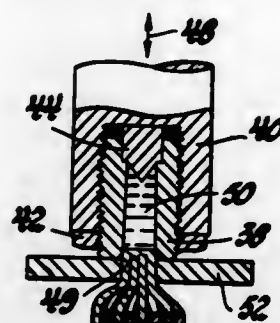
Int. Cl.<sup>3</sup> B22D 19/04; 23/06

U.S. Cl. 164—80

4 Claims

1. A process for forming a substantially metallurgically homogeneous shaped joint between discrete, solid lead parts comprising the steps of:  
gathering said parts together in contacting relationship to form a cluster;  
positioning a mold about said cluster, said mold having a cavity therein for receiving and molding said cluster into a desired shape conforming substantially to said cavity;  
subjecting said cluster to high frequency mechanical vibra-

tions of sufficient intensity to melt said parts and cause the melt so formed to assume said shape in said cavity;



4,422,495

# MOLD HANDLING SYSTEM

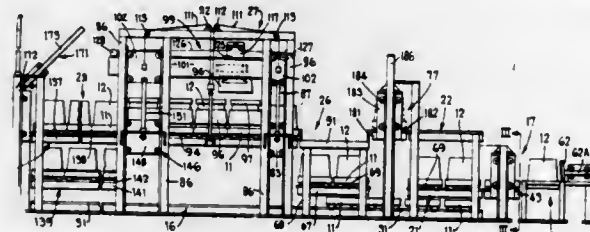
Adair B. Van Nette, III, Clinton Township, Seneca County, Ohio, assignor to Joseph B. Stinson Co., Fremont, Ohio

Filed Feb. 26, 1981, Ser. No. 238,342

Int. Cl.<sup>3</sup> B22D 5/02; 5/00; 47/02; 33/04

U.S. Cl. 164—324

12 Claims



1. An apparatus for handling molds supported on cars which have pairs of wheels for permitting rolling displacement of the cars, said apparatus comprising:

first elongated guide rail means for permitting empty mold cars to be rollingly moved therealong in a first direction from one end of said first rail means toward its other end, said first rail means extending approximately horizontally;  
second guide rail means positioned above and approximately vertically aligned with said first rail means for permitting mold-bearing cars to be rollingly moved therealong in a second direction which is opposite said first direction, said second rail means being horizontally elongated and having a first end thereof disposed substantially directly over said other end of said first rail means, and said second rail means having a second end thereof disposed substantially directly over said one end of said first rail means;

first elevator means positioned directly adjacent said other end of said first rail means for vertically lifting mold cars from said first rail means adjacent said other end to said second rail means adjacent said first end;  
means for positioning a preformed mold on each empty mold car when the latter is supported by said first elevator means;

said second rail means including a first horizontally-elongated rail section which extends from said first end through a selected distance to a first location for permitting mold-bearing cars to be rollingly supported thereon;  
horizontal pouring deck means positioned vertically above at least a portion of said first rail section so that the mold-bearing cars pass under said deck means as the cars move toward said first location, said deck means being positioned directly adjacent said first location and extending therefrom in a direction upstream of said first rail section;

second elevator means disposed at said first location for vertically raising the mold-bearing cars from said first rail

section into a raised position adjacent said deck means for permitting molten metal to be poured into the mold;  
said second rail means including a second horizontally-elongated rail section which extends from said first location downstream to a second location, said second rail section being vertically spaced upwardly relative to said first rail section so as to receive thereon the mold-bearing car when the second elevator means is in said raised position; pouring means positionable adjacent said second elevator means for pouring of the mold when the mold-bearing car is in said raised position at said first location;  
handling means for positioning a sleeve-like jacket on the mold prior to pouring of the mold when the mold-bearing car is in said raised position at said first location, and for removing the jacket from the mold after the mold-bearing car has been moved along said second rail section into said second location;

said handling means including elongated trolley rail means extending horizontally between said first and second locations and vertically above said second rail section, driving means for vertically raising and lowering the trolley rail means between upper and lower positions, a trolley rollingly supported on the trolley rail means and means to drive the trolley horizontally back-and-forth along the trolley rail means between said first and second locations, engaging means attached to the trolley to engage the mold jackets to raise and lower the mold jackets in response to the respective raising and lowering of the trolley rail means by said driving means, and said driving means and said means to drive the trolley being arranged downstream in said second direction of said pouring means;  
said second rail means including a third horizontally-elongated rail section which extends from said second location downstream to said second end, said third rail section permitting the mold-bearing cars to be rollingly moved therealong for permitting cooling of the molds;  
third elevator means located at the second end of said second rail means for vertically lowering the car from said second rail means downwardly for engagement with said first rail means adjacent said one end thereof; and  
means for removing the mold from the car prior to the car being returned to said first rail means.

4,422,496

# PROCESS FOR PREPARING OLIVINE SAND CORES AND MOLDS

Charles E. Seene, Brazil; John F. Kraemer, and Janis Ingebrigtsen, both of Terre Haute, all of Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 342,309, Jan. 25, 1982, Pat. No. 4,396,431.

This application Jan. 10, 1983, Ser. No. 456,951

Int. Cl.<sup>3</sup> B22C 1/18

U.S. Cl. 164—528

9 Claims

1. An improved process for preparing foundry cores and molds from a foundry aggregate and an inorganic cement binder therefor, comprising the steps of (a) mixing the aggregate with potassium olivine phosphate and as a hardener therefor water, aqueous sodium silicate, or aqueous phosphoric acid, (b) delivering the resulting mixture into a core box or mold box and (c) allowing to stand for a length of time sufficient for the binder to cure and form the core or mold.

4,422,497

# DEVICE OF CONTROLLING THE IDLING SPEED OF AN ENGINE

Norio Komoda, Aichi; Nobuyuki Kobayashi, Toyota; Hiroshi Itoh, Nagoya; Yozi Nishimura, Toyota, and Shigenobu Obara, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

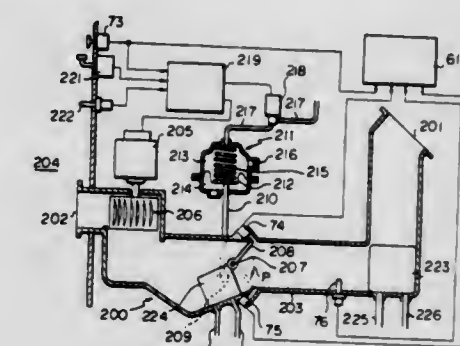
Filed Dec. 3, 1981, Ser. No. 327,115

Claims priority, application Japan, Jun. 5, 1981, 56-85628

Int. Cl.<sup>3</sup> B60H 3/04; F22B 21/04

U.S. Cl. 165—23

6 Claims



1. A device of controlling the idling speed of an engine of a vehicle having an air conditioning apparatus for cooling a driver's compartment, said engine comprising a main intake passage, a throttle valve arranged in the main intake passage, a bypass passage branched off from the main intake passage upstream of the throttle valve and connected to the main intake passage downstream of the throttle valve, a control valve arranged in the bypass passage, and a step motor actuating the control valve for controlling the amount of air flowing within the bypass passage, said air conditioning apparatus comprising an air duct which interconnects the driver's compartment to the exterior of the vehicle, a suction fan arranged in the air duct, an evaporator arranged in the air duct, a heat exchanger arranged in the air duct at a position located downstream of the evaporator, and an air mixture damper arranged in the air duct between the evaporator and the heat exchanger for controlling the amount of air directly flowing into the driver's compartment and for controlling the amount of air flowing into the driver's compartment via the heat exchanger, wherein said device comprises: first means for detecting the engine speed to produce a first signal indicating the engine speed; second means for detecting the operating condition of the engine to produce a second signal indicating that the engine is operating in an idling state; third means arranged in the air duct for producing a third signal indicating the temperature of air which has passed through the evaporator; fourth means cooperating with the air mixture damper for producing a fourth signal indicating that the entire air directly flows into the driver's compartment without passing through the heat exchanger, and; electronic control means in response to said first signal, said second signal, said third signal and said fourth signal for rotating the step motor in a rotating direction wherein the engine speed approaches a predetermined desired idling speed when the engine is operating in an idling state, said desired idling speed being increased when the temperature of air which has passed through the evaporator is higher than a predetermined temperature and when said fourth means produces said fourth signal.

4,422,498

# MACHINE TOOL COOLING SYSTEM

Po-Shiun Chen, Taichung Hsuan, Taiwan, assignor to YCI USA, Inc., Compton, Calif.

Filed Sep. 8, 1981, Ser. No. 299,834

Int. Cl.<sup>3</sup> F16H 7/02

U.S. Cl. 165—47

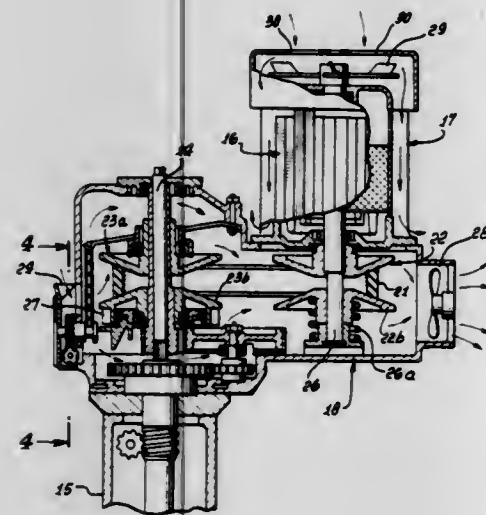
2 Claims

1. In a machine tool of the type including a vertical spindle coupled with a rotary tool and mounting a driven V-pulley, a



spindle drive motor including a drive shaft projecting parallel to said spindle and mounting a drive V-pulley aligned with said driven V-pulley, a drive belt trained over said pulleys and a housing housing said motor, shaft, spindle and V-pulleys, the improvement comprising:

- a first housing section housing said spindle drive motor and formed with a motor air cooling passage leading from a first inlet to define a downwardly directed heat exchange passage for directing air in heat exchange relationship with said motor and then terminating in a first outlet spaced downwardly from said first inlet;
- a second discrete housing section housing said V-pulleys and drive belt and forming a discrete horizontally elongated substantially straight passage leading from a second inlet disposed on one side of said driven pulley to a second outlet disposed on the side of said drive pulley opposite said one side to define a straight power transmission air cooling passage for directing air from said second inlet in direct heat exchange relationship with said driven pulley, drive belt, drive pulley and directly out said second outlet; impeller means in said first housing section and coupled with said motor drive shaft to draw cooling air in said first inlet



to flow in heat exchange relationship with said motor to be exhausted out said first outlet;

- a fan mounted on said second housing section for drawing air out said second outlet to create a negative pressure at said second outlet to positively draw cooling air in said second inlet to flow over said driven pulley, along the length of said drive belt, over said drive pulley to exhaust directly out said second outlet;
- a fan drive motor mounted on said second housing and coupled with said fan to drive said fan at a speed independent of said spindle drive motor speed; and
- control means connected with said fan drive motor for controlling said fan drive motor whereby operation of said spindle drive motor will draw ambient air in said first inlet to direct it downwardly through said motor and cooling passage, over said motor and out said first outlet and said fan drive motor may be operated independently of said spindle drive motor to draw air in said second inlet and longitudinally along said elongated straight passage over said drive pulley, over the length of said drive belt and over said drive pulley to then exhaust out said second outlet without passing through said first inlet, first passage and first outlet.

#### 4,422,499 MAKING OF STEAM GENERATOR WATER BOXES

Michel Batistoni, Dracy le Fort, France, assignor to Framatome, Courbevoie, France

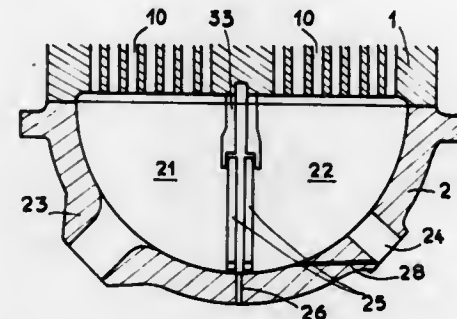
Filed Sep. 24, 1980, Ser. No. 190,391

Claims priority, application France, Oct. 8, 1979, 79 24986

Int. Cl.<sup>3</sup> F22B 1/134; F28F 9/22

U.S. Cl. 165—71

4 Claims



1. Water box for a steam generator having a bank of U-shaped tubes whose ends are fixed to a tube sheet, said water box comprising a substantially hemispherical base (2) applied to said tube sheet (1) and bounding a space divided into a supply chamber (21) and an evacuation chamber (22) by a semi-circular partition plate (3) which fits with clearance over its whole periphery into a circular groove and a diametrical groove (11) respectively provided in the inner walls of said hemispherical base (2) and said tube sheet (1), said hemispherical base (2) having at least one drain orifice (26) passing through it which opens at the lowest point of said circular groove for fitting said plate (3), said orifice (26) being capable of communicating with the two chambers (21, 22) of said water box.

#### 4,422,500

##### METAL HYDRIDE HEAT PUMP

Tomoyoshi Nishizaki, Suita; Minoru Miyamoto, Kusatsu; Kazuaki Miyamoto, Amagasaki; Ken Yoshida, Ibaraki; Katuhiko Yamaji, and Yasushi Nakata, both of Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

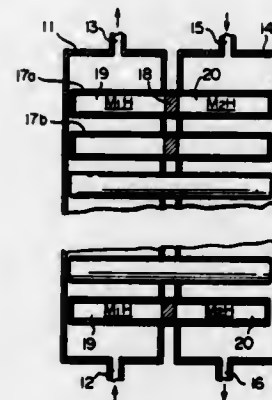
Filed Dec. 23, 1981, Ser. No. 333,680

Claims priority, application Japan, Dec. 29, 1980, 55-185356; May 18, 1981, 56-75559

Int. Cl.<sup>3</sup> F25D 15/00

U.S. Cl. 165—104.12

5 Claims



1. A metal hydride heat pump comprising a first and a second heat medium receptacle having heat media flowing therein and a plurality of closed vessels each containing a hydrogen gas atmosphere and divided into a first chamber having a first metal hydride filled therein and a second chamber having a second metal hydride filled therein, said first and second chambers of each closed vessel communicating with each other so that hydrogen gas passes from one chamber to the other but the metal hydrides do not, and a group of the first chambers of

the closed vessels being located within the first heat medium receptacle and a group of the second chambers of the closed vessels being located within the second heat medium receptacle, whereby heat exchange is carried out between the heat media in the first and second heat medium receptacles and the first and second metal hydrides through the external walls of the closed vessels,

wherein a heat medium flows in one direction in each of the first and second heat medium receptacles, and wherein the plurality of the closed vessels are sequentially arranged in each of the first and second heat medium receptacles such that with respect to the flow direction of the heat medium, a first chamber of a closed vessel located on the upstream side of the first heat medium receptacle communicates with a second chamber of a closed vessel located on the downstream side of the second heat medium receptacle, and a first chamber of the closed vessel located on the downstream side of the first heat medium receptacle communicates with a second chamber of the closed vessel located on the upstream side of the second heat medium receptacle.

#### 4,422,502 INTEGRATED WATER BOX AND EXPANSION CHAMBER DEVICE FOR A HEAT EXCHANGER SUCH AS THE RADIATOR IN THE COOLING CIRCUIT OF AN INTERNAL COMBUSTION ENGINE

Denis Villeval, Maurepas, France, assignor to Valeo, Paris, France

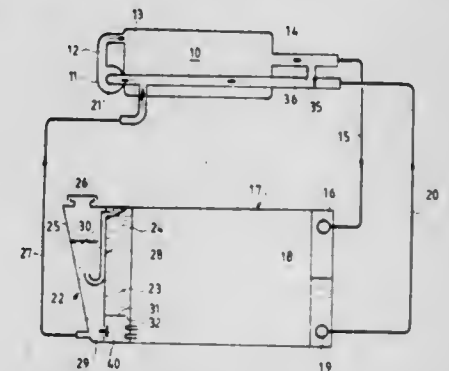
Filed Jul. 12, 1982, Ser. No. 397,216

Claims priority, application France, Jul. 16, 1981, 81 13891

Int. Cl.<sup>3</sup> F01P 11/02

U.S. Cl. 165—104.32

7 Claims



1. Integrated water box and expansion chamber device for a heat exchanger such as the radiator in the cooling circuit of an internal combustion engine, wherein the expansion chamber and the water box are interconnected by a degassing passage or duct and by a suction orifice, the expansion chamber also having a bottom end which is connected to a suction inlet of a pump for circulating liquid in said cooling circuit, one way valve means being provided to close said suction orifice to prevent liquid in the water box from flowing into the expansion chamber and to open said orifice to enable liquid to flow in the opposite direction.

#### 4,422,501

##### EXTERNAL ARTERY HEAT PIPE

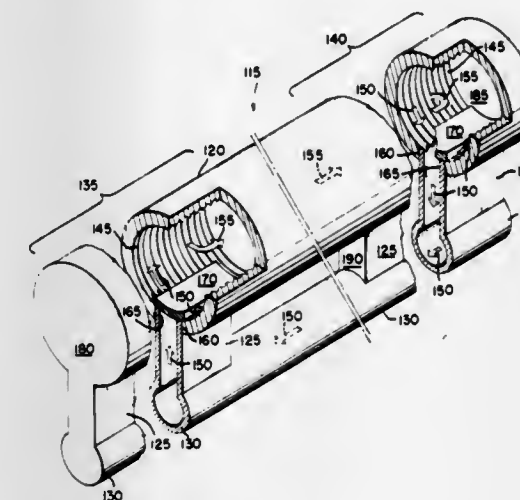
James L. Franklin, Kent; Roger L. Shannon, Federal Way, and Dale F. Watkins, Sumner, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 22, 1982, Ser. No. 341,949

Int. Cl.<sup>3</sup> F28D 15/00

U.S. Cl. 165—104.26

5 Claims



1. Heat transfer apparatus, comprising:
  - a closed chamber,
  - a working fluid disposed in said chamber,
  - a plurality of grooves distributed serially within said chamber for conducting said fluid,
  - an axial fluid channel extending along said chamber, each of said grooves terminating at said channel,
  - an elongated cap member traversing said channel and coacting with said grooves to form a plurality of fluid passageways,
  - a fluid-transporting conduit extending outwardly from said channel, and
  - a fluid-conducting tube extending proximate said chamber in fluid communication with said conduit.

#### 4,422,503

##### CONTROL LINE BLOW OUT PREVENTER

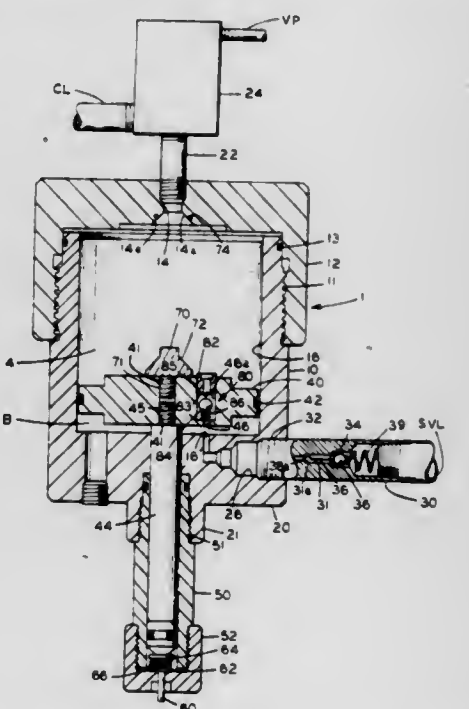
Kip B. Goans, Harvey, La., assignor to Baker Cac, Inc., Belle Chasse, La.

Filed Nov. 4, 1981, Ser. No. 318,290

Int. Cl.<sup>3</sup> E21B 33/06

U.S. Cl. 166—53

3 Claims



1. A blow out preventer for use in a control conduit for a downhole safety valve, said safety valve being manipulatable between open and closed positions upon variation of pressure within the control conduit; said blow out preventer compris-



ing: a housing defining a cylindrical fluid chamber adapted for interposition in the control conduit and having an axially spaced fluid inlet and a fluid outlet; a piston reciprocable inside said chamber between a first position adjacent said fluid inlet and a second position adjacent said fluid outlet; said piston having two opposed faces; first valve means on one said face of said piston for closing said fluid inlet only when said piston is in said first position; a fluid passage extending axially from said one face to the other through said piston; second valve means for metering fluid flow through said fluid passage in the direction toward said one piston face; a spring pressed ball check valve disposed in said fluid outlet and constructed to block fluid flow in the conduit from the safety valve in its closed position; and a fusible link normally holding said ball check valve in an open position, whereby the melting of said fusible link upon the occurrence of abnormal temperature permits said ball check valve to close said conduit and prevent fluid flow from the safety valve upwardly through the conduit.

4,422,504

## PROTECTIVE CLAMP ASSEMBLY

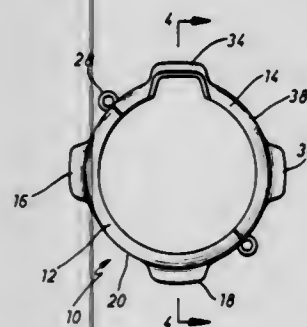
Boyd B. Moore, 427 Mignon, Houston, Tex. 77024

Filed Mar. 16, 1981, Ser. No. 244,233

Int. Cl.<sup>3</sup> F16L 3/22

U.S. Cl. 166—241

7 Claims



1. An assembly for establishing protective transition of conductor line about the spaced enlargements formed by threaded connections on a tubular member in a well comprising:

first and second generally semicylindrical body sections; hinge means along each side of each of said body sections for receiving a hinge pin to secure the assembly on the tubular member;

cooperating means on said body sections and the tubular member to interlock the assembly on the tubular member; stiffener portions extending radially outwardly of each of said body sections on each side of said hinge means to protect said hinge means against damage;

enclosure means, said enclosure means comprising an internal recess formed on at least one of said body sections by a longitudinal inwardly open channel which extends radially outward of the body section for receiving the conductor line therein to protect the conductor line against crushing as it transitions the spaced enlargements formed by the tubular member threaded connections; and

said channel having openings at each end for receiving the conductor line and said channel further including an inwardly curved portion adjacent at least one end thereof to direct the conductor line to close proximity with the tubular member adjacent at least one end of said channel.

4,422,505  
METHOD FOR GASIFYING SUBTERRANEAN COAL DEPOSITS

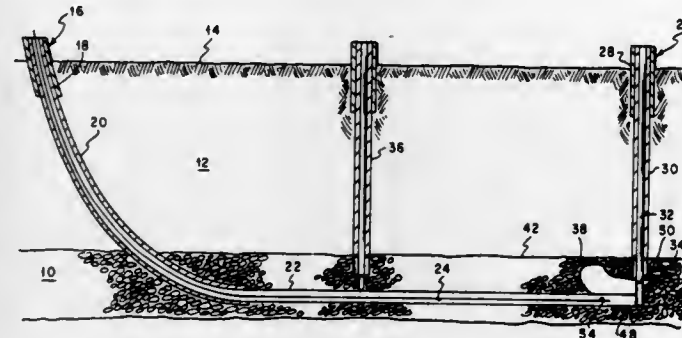
Kenneth L. Collins, Houston, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 7, 1982, Ser. No. 337,566

Int. Cl.<sup>3</sup> C10J 5/00; E21B 43/243; E21C 43/00

U.S. Cl. 166—256

10 Claims



1. A method for gasifying a subterranean coal deposit, said method consisting essentially of:

(a) positioning a cased injection well to extend from the surface into said subterranean coal deposit and substantially horizontally through a lower portion of said coal deposit, with at least a major portion of the casing in the horizontal portion of said cased injection well being perforated casing;

(b) positioning an injection tubing in said cased injection well for the injection of a free-oxygen containing gas into said coal deposit;

(c) positioning a production well to extend from the surface to said coal deposit with a lower end of said production well being located near and in fluid communication with a lower end of said cased injection well;

(d) igniting said coal deposit;

(e) gasifying a first portion of said coal deposit between said production well and a lower end of said injection tubing by injecting free-oxygen containing gas into said coal deposit through said injection tubing and recovering product gases through said production well; and

(f) gasifying a second portion of said coal deposit by withdrawing said injection tubing a selected distance and thereafter injecting free-oxygen containing gas into said second portion of said coal deposit and recovering product gases through said production well.

4,422,506

## LOW PRESSURE RESPONSIVE APR TESTER VALVE

Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 5, 1980, Ser. No. 204,100

Int. Cl.<sup>3</sup> E21B 34/10

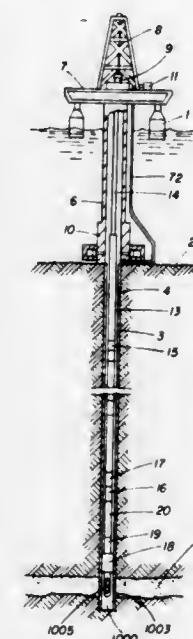
U.S. Cl. 166—324

10 Claims

1. A valve for use in a well testing string located in a wellbore and having a packer arranged for selectively sealing the wellbore isolating that portion of the wellbore above the packer from that portion of the wellbore below the packer to allow the production of fluids from that portion of the wellbore below the packer through said valve in the testing string as well as the introduction of fluids into that portion of the wellbore below the packer through said valve in the testing string, said valve being responsive to changes in the pressure of the fluid in the annulus between the wellbore and the well testing string in that portion of the wellbore above the packer when the packer sealingly engages the wellbore, said valve comprising:

valve section means having a valve means therein in a closed position to prevent the flow of fluid through the well testing string, the valve means being responsive to changes in the pressure of the fluid in the annulus to open

the valve means to allow the flow of fluid through the well testing string; power section means responsive to changes in the pressure of the fluid in the annulus, the power section means having first means therein adapted to move the valve means of the valve section means to the open position and having resilient means therein adapted to return the valve means of the valve section means to the closed position from the open position in response to a change in the pressure of the fluid in the annulus; and



isolation valve means for being continuously responsive substantially without interruption during such time as said valve is located in said wellbore to changes in the pressure of the fluid in the annulus to maintain the resilient means of the power section means at a level of force sufficient to close the valve means of the valve section means regardless of the hydrostatic pressure and temperature of the fluid in the annulus and the pressure and temperature of the fluid in said valve in the testing string.

4,422,507

## WELLHEAD APPARATUS

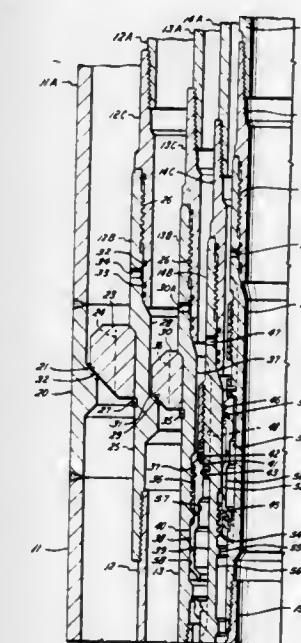
Larry E. Reimert, Houston, Tex., assignor to Dril-Quip, Inc., Houston, Tex.

Filed Sep. 8, 1981, Ser. No. 300,001

Int. Cl.<sup>3</sup> E21B 43/01

U.S. Cl. 166—348

12 Claims



1. Apparatus for use in suspending concentric strings of casing of an offshore well at the ocean floor, comprising an outer hanger having a bore therethrough and adapted to be

landed at the ocean floor, said outer hanger having at least three vertically spaced, upwardly facing seating surfaces which are parallel to one another and extend radially outwardly from the bore thereof, an inner hanger including a body having a bore therethrough and adapted to be lowered into the bore of the outer hanger, the outer side of the inner hanger body having a recess thereabout, and a ring received within the recess and having a plurality of vertically spaced, downwardly facing landing surfaces which are parallel to one another and the seating surfaces of the outer hanger, said ring being radially expandible, as the inner hanger body is lowered into the bore of the outer hanger to cause the landing surfaces thereof to move into supported positions on the seating surfaces of the outer hanger, means for supporting the inner hanger body on the ring when the ring is so supported from the outer hanger, and means on each of the outer and inner hanger bodies from which a casing string may be suspended for lowering within a bore drilled into the ocean floor to which an upper continuation of the casing string may be connected for extension back to water surface.

4,422,508

## METHODS FOR PULLING SUCKER ROD STRINGS

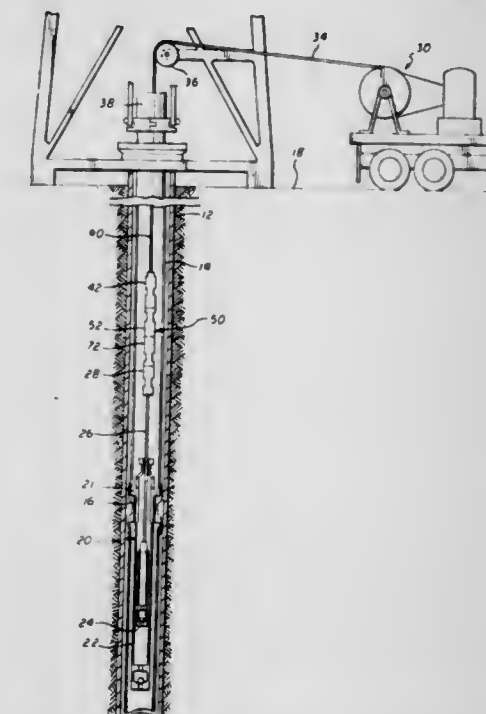
Woodrow T. Rutledge, Jr.; Russel P. Rutledge, and John E. Freeman, Jr., all of Big Spring, Tex., assignors to Fiberflex Products, Inc., Big Spring, Tex.

Filed Aug. 27, 1981, Ser. No. 296,633

Int. Cl.<sup>3</sup> E21B 17/06, 19/16

U.S. Cl. 166—376

2 Claims



1. A method of enabling the combination of steel suckers rods and fiberglass sucker rods to be joined together to form a sucker rod string which are connected to a downhole reciprocating pump to be pulled from a tubing string of a well comprising the steps of:

(a) installing a separable connector having at least one shear pin therein between the sucker rod string and the downhole reciprocating pump, such separable connector being joined only by said shear pin;

(b) applying a tension force to the sucker rod string, wherein said tension force is significantly greater than the tension force required for normal operation of the downhole reciprocating pump, and then shearing the pin of the separable connector, whereby the sucker rod string is disconnected from the downhole reciprocating pump; and

(c) pulling the sucker rod string from the tubing without the downhole reciprocating pump being attached thereto, thereby preventing the downhole reciprocating pump



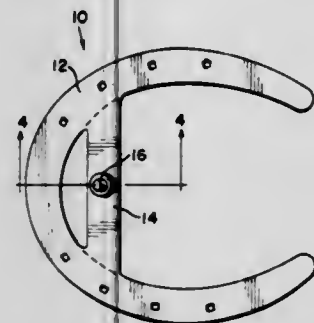
from stripping accumulated scale, paraffin, and other precipitate from the interior surface of the tubing string and thereby eliminating the necessity of rotating the sucker rod string to free the downhole reciprocating pump from an engagement with the accumulated scale, paraffin, and other precipitate which otherwise prevents the continued removal of the downhole reciprocating pump from the tubing.

4,422,509

**PROSTHETIC HORSESHOE**

Roger W. Mercer, II, 623 W. Church Rd., Sterling, Va. 22170  
Filed May 7, 1982, Ser. No. 375,960  
Int. Cl.<sup>3</sup> A01L 1/00, 7/00

U.S. Cl. 168—4



1. For use in the treatment of a horse having laminitis, a prosthetic horseshoe comprising:

- (a) a horseshoe having the general shape of a hoof and adapted for fastening to a hoof of said horse, said horseshoe having a lateral bar, the ends of which are integral with the sides of said horseshoe; and,
- (b) biasing means supported by the lateral bar of said horseshoe and adapted for rotating the out of position coffin bone to its normal position in the foot of said horse, said biasing means being an upwardly protruding screw adjustably supported by the lateral bar of said horseshoe, the longitudinal axis of said screw being at an angle less than 90 degrees with the upper face on said horseshoe.

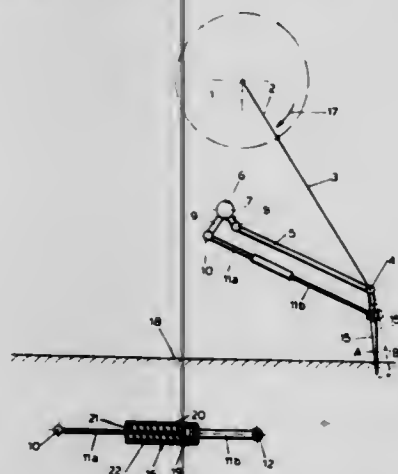
4,422,510

**APPARATUS FOR THE PROVISION OF VERTICAL DRAIN CHANNELS IN GRASS, FIELDS, MEADOWS ETC.**

Arie-Jan de Ridder, Soesterberg, Netherlands, assignor to Redexim Holding S.A., Bulle, Switzerland  
Filed Mar. 6, 1981, Ser. No. 241,211  
Claims priority, application Netherlands, Mar. 10, 1980, 8001412

Int. Cl.<sup>3</sup> A01B 45/02

U.S. Cl. 172—21



1. Apparatus for providing substantially vertical drain channels in the ground such as in an open field, turf, meadow or the like, comprising a frame adapted to move along the ground

having a rotary shaft journaled therein and one or more sets of pins adapted to penetrate the ground, at least one set of pins being connected to a lever system driven by said rotary shaft for reciprocal vertical movement, said lever system comprising a pair substantially parallel spaced rods connected at one end pivotally to the associated pins one below the other and at their other ends pivotally to said frame offset from each other, said lower one of said rods having resilient means for extending its length when said pins are placed under a load and for automatically resuming its normal length when said load is removed.

4,422,511

**HYDRAULIC RESET FOR TILLAGE AND SEEDING EQUIPMENT**

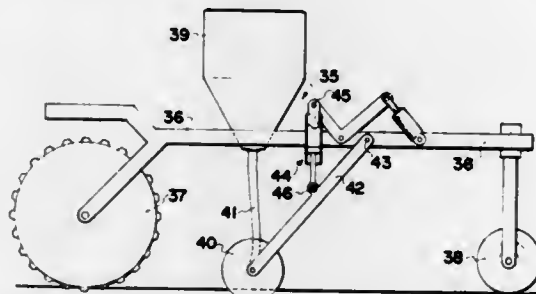
Erhard Poggemiller, Box 128, Luseland, Saskatchewan, Canada S0L 2A0, and Ralph Sweet, Box 3, Forgan, Saskatchewan, Canada S0L 1G0

Continuation-in-part of Ser. No. 25,399, Mar. 30, 1979, Pat. No. 4,353,423, which is a continuation-in-part of Ser. No. 835,049, Sep. 21, 1977, abandoned. This application Jun. 23, 1982, Ser. No. 391,457

Int. Cl.<sup>3</sup> A01B 61/04, 63/32

U.S. Cl. 172—260.5

28 Claims



1. In an agricultural implement which includes a frame, and a ground engaging tool assembly pivotally supported upon said frame, an hydraulic system including a variable displacement pump, a high pressure line extending from said pump, a main hydraulic ram operatively connected to said high pressure line and to said ground engaging tool assembly for controlling and presetting the depth of penetration of said ground engaging tool assembly; the improvement comprising in combination a resetting ram assembly for said ground engaging tool assembly, operatively extending between said ground engaging tool assembly and said frames, means operatively connecting said resetting ram assembly to the hydraulic system and means to adjust the hydraulic pressure within said resetting ram assembly below pump pressure whereby said resetting ram assembly is normally fully at one end of the stroke thereof until a predetermined pressure upon said ground engaging tool assembly is exceeded, said last mentioned means comprising a pressure reducing valve assembly operatively connected between said high pressure line and said resetting ram assembly to control and sense the pressure downstream of said valve assembly, said ground engaging tool assembly including at least one coulter assembly mounted for pivotal action to said frame, said resetting ram assembly being operatively connected between said main hydraulic ram and said coulter assembly.

4,422,512

**NARROW-BASE TERRACING PLOW**

Emory R. Hodgson, Jr., Yazoo City, Miss., and Darryl C. Rester, Baton Rouge, La., assignors to Dynamics Corporation of America, Greenwich, Conn.

Filed Jun. 1, 1981, Ser. No. 269,521

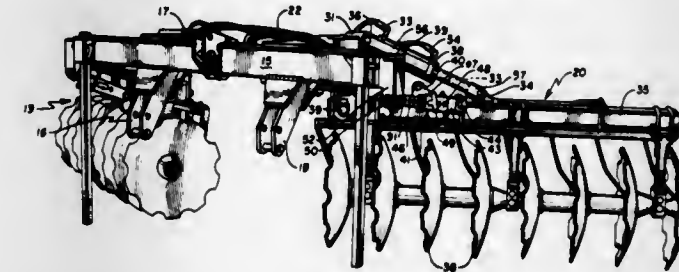
Int. Cl.<sup>3</sup> E02F 5/22

U.S. Cl. 172—454

17 Claims

1. A narrow-base terracing plow comprising:  
(a) a frame constructed and arranged to be connected to and supported by a tractor to extend transversely thereof;  
(b) a harrow gang having inner and outer end portions and

being mounted on said frame adjacent its inner end portion for pivotal movement relative to said frame about a generally horizontal axis extending transversely of said frame and extending laterally outwardly from said axis;  
(c) controllable hydraulic power means pivotally mounted on said frame and extending between and being pivotally connected to said harrow gang at a point located outwardly of said axis;  
(d) said power means being constructed and arranged to controllably move said harrow gang relative to the



ground and said frame between lowered operative and elevated non-ground-engaging positions; and  
(e) said power means also being constructed and arranged to force and hold said harrow gang while operative in an off-horizontal position with its outer end portion substantially depressed relative to said axis and to its said inner end portion, and to elevate said harrow gang to its elevated non-ground-engaging position above said frame independently of any other such harrow gangs which may be carried by said frame with its outer end portion substantially elevated relative to its said inner end portion.

4,422,513

**GAS HYDRATES DRILLING PROCEDURE**

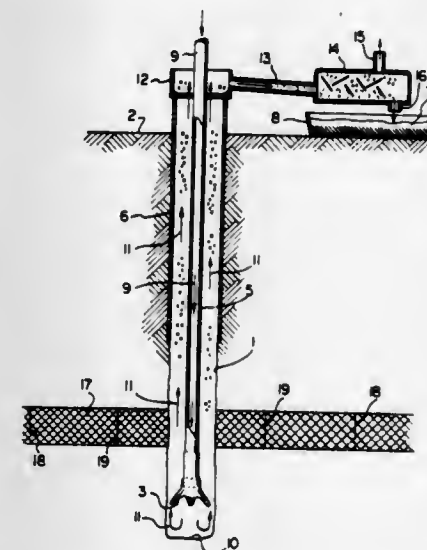
Lindsay J. Franklin, Box 7, Site 26, R.R. #2, Calgary, Alberta, Canada T2P 2G5

Filed Jul. 6, 1981, Ser. No. 280,346

Int. Cl.<sup>3</sup> E21B 21/00, 21/06

U.S. Cl. 175—17

4 Claims



1. A method of drilling in a hydrate-containing stratum comprising the steps of:  
(a) forming a wellbore by drilling into the hydrate-containing stratum;  
(b) continuously feeding a drilling mud into said wellbore;  
(c) maintaining the density of said mud at a level sufficiently low to promote the melting of hydrates; and  
(d) continuously discharging the mud/gas mixture thus produced from the wellbore as quickly as the mixture is produced.

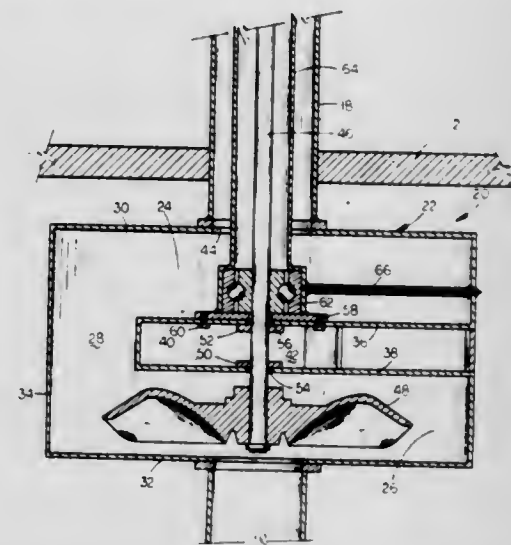
4,422,514

**PUMP FOR A REVERSE CIRCULATION ROTARY DRILLING RIG**

Wayne A. Grosch, R.R. #2, Osceola, Nebr. 68651  
Filed Sep. 28, 1981, Ser. No. 305,915  
Int. Cl.<sup>3</sup> E21B 21/00

U.S. Cl. 175—213

4 Claims



1. A pump for a reverse circulation drilling rig, including a hollow Kelly bar having upper and lower ends, a generally cylindrical-shaped housing having upper and lower ends, said housing having a central discharge opening formed in its upper end which communicates with the lower end of the Kelly bar, means securing the upper end of said housing to said Kelly bar, said housing having a central inlet opening formed in its lower end for receiving the drilling fluid being circulated, said housing defining spaced-apart first and second compartment areas, said housing having a fluid passageway at one side thereof which extends between said first and second compartment areas, a shaft rotatably mounted and extending downwardly through the Kelly bar, through said first compartment area and into said second compartment area, a pump impeller means on said shaft in said second compartment area for pumping fluid inwardly through said inlet opening, outwardly from said second compartment area, through said fluid passageway and said first compartment area and upwardly through said Kelly bar, a bearing means operatively secured to said housing in said first compartment area embracing said shaft, a pipe means extending downwardly through the Kelly bar positioned around said shaft for preventing fluid from coming into contact with said shaft, the lower end of said pipe means enclosing said bearing means in said first compartment area for preventing fluid in said first compartment area from coming into contact with said bearing means, and means extending from said housing for connection to drilling pipe.

4,422,515

**MOTORIZED WHEEL CHAIR**

John H. Loveless, Westminster, Md., assignor to Government of the U.S. as represented by Admin. of Veterans Affairs, Washington, D.C.

Filed Jul. 29, 1981, Ser. No. 288,197

Int. Cl.<sup>3</sup> B62D 11/04

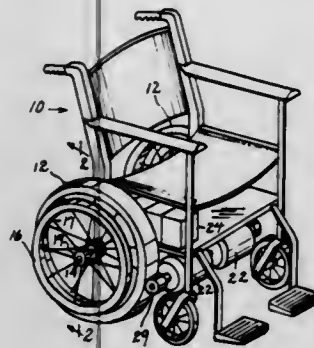
U.S. Cl. 180—6.5

10 Claims

1. In a motorized wheelchair for providing transportation for human passengers, said chair including ground-engaging



drive wheels and respective independent electric motors drivingly coupled to the drive wheels, the improvement comprising hand rim means freely journaled on said wheel chair, transducer means comprising means for generating electrical



signals responsive to the rotational velocity of said hand rim means relative to said wheel chair, and velocity controller means, connected to and energizing said motor, for controlling the speed of the motors responsive to and in accordance with said electrical signals.

4,422,516

**AXLE HOUSING LEAK OIL DISCHARGING DEVICE**  
Tadao Yamaura, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

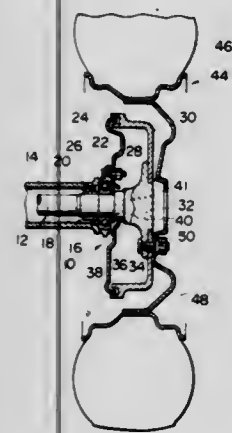
Filed Dec. 19, 1980, Ser. No. 218,332

Claims priority, application Japan, Dec. 20, 1979, 54-166214

Int. Cl.<sup>3</sup> B60B 35/12

U.S. Cl. 180—70 R

5 Claims



1. A device in combination with a wheel axle shaft and housing, comprising:  
a wheel bearing positioned between the housing and the axle shaft;

an annular spacer mounted on the axle shaft at a location interposed between and in contact with said bearing and an enlarged diameter section of the axle shaft, said enlarged diameter section extending into a brake drum of a frictional braking device for frictionally braking a wheel;  
a plate member secured to a flange section of the axle housing and having a central opening through which the enlarged diameter section of the axle shaft passes to enter the brake drum, said plate member forming part of said braking device;

a first annular flange formed as an integral part of said annular spacer and extending radially therefrom in a manner to collect oil that seeps through the wheel bearing and to splash the collected oil radially outwardly therefrom by the centrifugal force generated by the rotation of the axle shaft; and

means radially spaced from and surrounding said annular flange to collect the splashed oil and to guide the same to the exterior of said housing.

4,422,517  
**BAG-POSITIONED HINGED SEALS FOR AIR CUSHION VEHICLES**

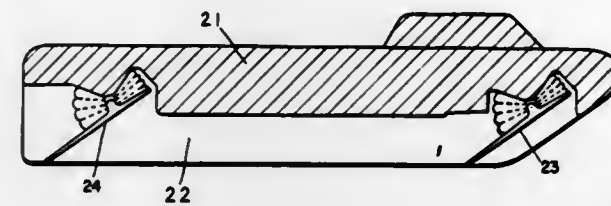
Peter G. Hammerschlag, 220 - 111th Ave. SE., Bellevue, Wash. 98004

Filed May 4, 1977, Ser. No. 793,845

Int. Cl.<sup>3</sup> B60V 1/04, 1/16

U.S. Cl. 180—127

3 Claims



1. In a water-traversable vehicle of the type having a hull with depending sidewalls and flexible bow and stern seals to confine a vehiclesupporting fluid cushion, at least one of said flexible seals comprising a flexible seal member positioned between said sidewalls in lateral contacting relation therewith and having upper and lower end portions, fulcrum means mounted by the hull and connected to the seal member intermediate said upper and lower end portions for accommodating pivotal displacement of the seal member about a fulcrum axis in response to cushion pressure exerted thereon, and inflatable positioning support means having separate portions engageable with the seal member adjacent the upper and lower end portions respectively on opposite sides of the fulcrum axis for balancing said cushion pressure applied and wherein said flexible seal member includes a plurality of laterally spaced stiffening rods to which the fulcrum means is connected, and flexible membrane panels supported between said stiffening rods.

4,422,518

**VEHICLE SPEED CONTROL**

William A. Treadwell, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

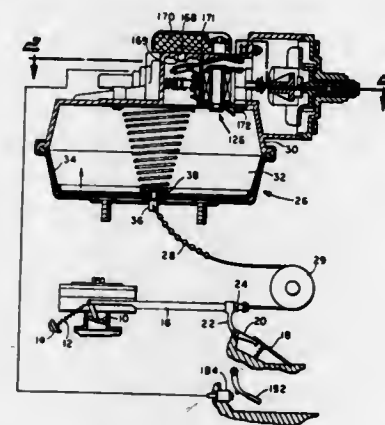
Division of Ser. No. 50,237, Jun. 20, 1979, Pat. No. 4,346,775.

This application Jun. 18, 1982, Ser. No. 389,655

Int. Cl.<sup>3</sup> B60K 31/00

U.S. Cl. 180—175

2 Claims



1. A pneumatically operated servoactuator for controlling a vehicle throttle to regulate the vehicle speed about a selected set speed, said servoactuator comprising:

- (a) a housing means defining a fluid pressure chamber including means defining a fluid pressure source port adapted for connection to a source of fluid pressure and a fluid sink port adapted for connection to the atmosphere;
- (b) actuator means movably responsive to the pressures in said chamber and including an output member adapted for connection to the vehicle throttle;
- (c) valve means including a member movable with respect to said source and sink port for controlling fluid pressure in said chamber, said valve means being selectively responsive to a vehicle speed sensor;

- (d) circuit means defining a stationary electrical contact;
- (e) dump valve means including:
  - (i) an auxiliary dump port in said chamber;
  - (ii) an elongated valve member of ferromagnetic material mounted intermediate its ends for pivotal movement with respect to said housing means, said member having a dump poppet disposed on one side of the pivotal mount for valving said dump port and a movable electrical contact means disposed on the opposite side of said pivotal mount;
  - (iii) means biasing said dump valve member in a direction to move said dump poppet to a position opening said dump port;
  - (iv) electromagnetic means operable upon actuation to magnetically attract said valve member and cause pivotal movement thereof in a direction closing said dump port with said poppet wherein said movement of said valve member causes closing of said movable electrical contact with respect to said stationary contact; wherein said circuit means employs plural paths electrically common through said pivotal mount and pole frame and through said biasing means.

4,422,520

**TRANSMISSION APPARATUS FOR FOUR-WHEEL DRIVE MOTOR VEHICLE**

Masayuki Kodama, Hachioji, and Sadao Makishima, Akigawa, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

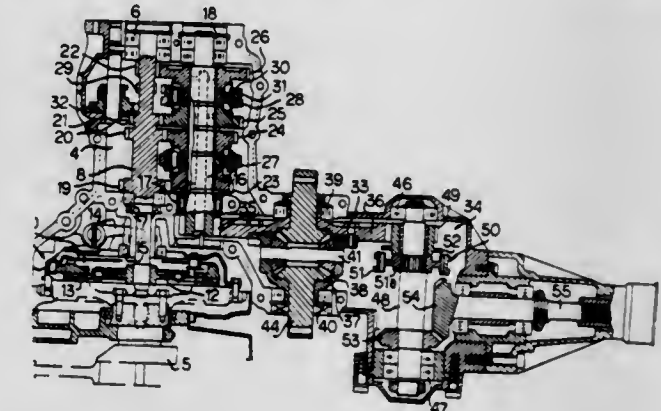
Filed Nov. 28, 1980, Ser. No. 210,873

Claims priority, application Japan, Nov. 29, 1979, 54-154624

Int. Cl.<sup>3</sup> B60K 17/34

U.S. Cl. 180—247

12 Claims



1. In a transmission apparatus for a motor vehicle having an internal combustion engine disposed in said motor vehicle transversely relative to a longitudinal direction of said motor vehicle and a transmission disposed transversely relative to said longitudinal direction of said motor vehicle, said transmission being operatively connected to the crankshaft of said engine through a clutch, a differential including a final reduction gear engaged with an output gear of said transmission and a differential case secured to a side of said final reduction gear, said differential case being disposed at a substantially central region of said motor vehicle, and first transverse, wheel axles operatively connected to the differential case for being driven via the differential, the improvement comprising,

said transmission being so arranged that said output gear is positioned at a substantially central region of said motor vehicle for engaging with said final reduction gear, a propeller shaft operatively drivingly connected to other transverse, wheel axles, said propeller shaft is oriented about a longitudinal center line of said motor vehicle, transfer means for operatively transferring torque from said final reduction gear to said propeller shaft, said transfer means including a supporting shaft and a gear mounted on said supporting shaft and engaged with said final reduction gear, a transfer clutch means mounted on said supporting shaft for coupling said gear with said supporting shaft, said supporting shaft being transversely disposed relative to said longitudinal direction of said motor vehicle, a first bevel gear secured on said supporting shaft, and means comprising a second bevel gear engaged with said first bevel gear for operatively driving said propeller shaft and further for driving said other transverse, wheel axles for a four-wheel drive.

4,422,521

**SAFE REMOTE-CONTROL DOOR OPENING-AND-CLOSING DEVICE FOR AN AUTOMOTIVE VEHICLE**

Haruo Mochida, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 22, 1982, Ser. No. 350,876

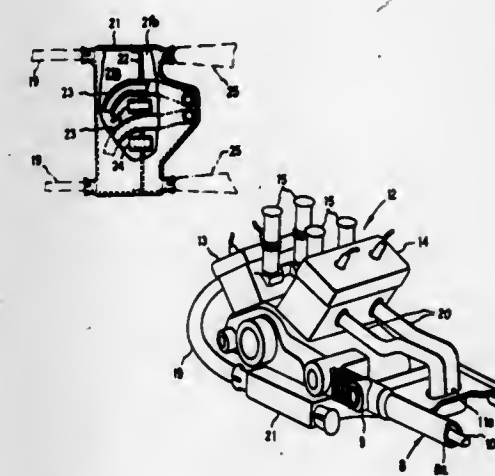
Claims priority, application Japan, May 20, 1981, 56-74880

Int. Cl.<sup>3</sup> B60R 21/00; B60J 5/00

U.S. Cl. 180—271

10 Claims

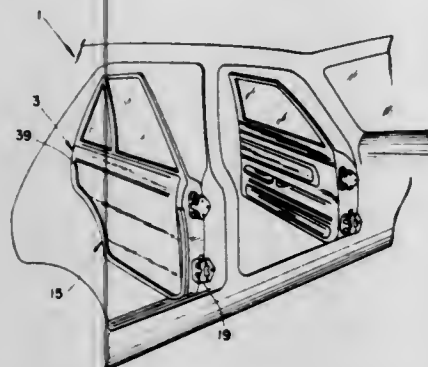
1. A safe remote-control door opening-and-closing device for an automotive vehicle for opening and closing a vehicle door from a remote position while protecting passengers from injury, which comprises:



1. An engine exhaust system for a motorcycle of the type having a frame, a front and rear wheel mounted to said frame, a V type engine with at least two cylinders arranged to form a "V", and arranged forwardly and rearwardly relative to one another, said exhaust system comprising: a muffler mounted to said frame underneath said engine, said muffler having an expansion chamber, a forward exhaust pipe extending from the forwardmost cylinder forwardly and downwardly to discharge into said expansion chamber, a rearward exhaust pipe extending from the rearwardmost cylinder downwardly to discharge into said expansion chamber, and a tailpipe having a volume and a dimension of length, exhausting from said muffler, said forward exhaust pipe and tailpipe, where they respectively enter and leave said muffler, being substantially coaxial, said rearward exhaust pipe passing downwardly rearwardly of said engine and forwardly of said rear wheel.



- (a) a door open-and-close mechanism linked to the vehicle door for opening and closing the vehicle door;  
 (b) a driving device linked to said door open-and-close mechanism, said driving device being adapted to drive said door open-and-close mechanism in a first normal direction and a second reverse direction;  
 (c) a door open switch connected in series with said driving device for operating said driving device in the first normal direction;

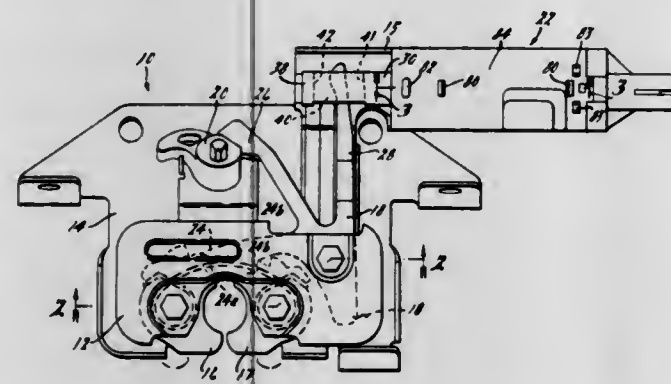


- (d) a door close switch connected in series with said driving device for operating said driving device in the second reverse direction; and  
 (e) an abnormal sitting position detection switch for detecting that one of the passengers is in an abnormal sitting position and for preventing said driving device from driving said door open-and-close mechanism in the first normal direction in response to said door open switch and in the second reverse direction in response to said door close switch when a passenger is detected to be in an abnormal sitting position.

**4,422,522**  
**INERTIAL LOCK FOR VEHICLE DOOR LATCH**  
 Michael Slavin, Troy, and Frank J. Sherosky, Mt. Clemens, both of Mich., assignors to Lectron Products, Inc., Rochester, Mich.

Filed Jan. 21, 1982, Ser. No. 341,532  
 Int. Cl.<sup>3</sup> E65B 65/16  
 U.S. Cl. 180—281

12 Claims



5. A locking mechanism for a vehicle door latch comprising electrical actuation means for releasing said door latch comprising a solenoid mechanism including a bobbin and a plunger movably disposed within said bobbin along an axis of movement, means for temporarily disabling said electrical actuation means by locking said plunger within said bobbin, said disabling means being engageable with said plunger to prevent latch releasing movement thereof in said bobbin in response to inertial forces having a component of force along the axis of movement of said plunger resulting from rapid changes in the direction of movement of the vehicle and being more rapidly responsive to said inertial forces than said plunger, whereby said plunger is locked by said

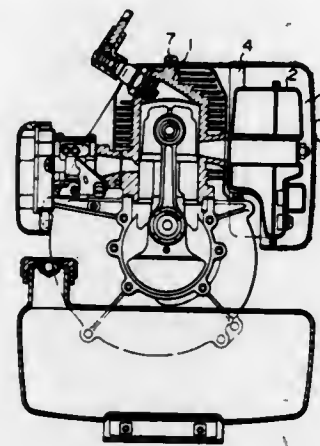
disabling means before said plunger has time to release said latch.

**4,422,523**  
**EXHAUST MUFFLER COVER**  
 Michiyasu Kuwano, Fushu, Japan, assignor to Kloritz Corporation, Japan

Filed Dec. 9, 1981, Ser. No. 329,088  
 Int. Cl.<sup>3</sup> F01N 7/00

U.S. Cl. 181—211

1 Claim



1. A cover for an exhaust muffler for an internal combustion engine comprising an exhaust muffler cover member of a thin material and disposed to substantially surround the exhaust muffler of the engine with a suitable gap therebetween; said cover member having an outer exposed piled buffering layer consisting of short and soft fibers of an epoxy resin like material having poor heat conductivity, with said fibers being attached perpendicularly to the outer surface of said cover member; and an attaching member fixed to an inner peripheral end of said cover member and adapted for attaching said cover member to the body of the engine, said attaching member also being a stiffening or reinforcement member.

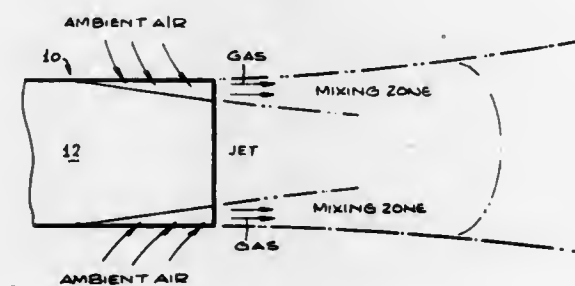
**4,422,524**  
**VARIABLE SHAPE, FLUID FLOW NOZZLE FOR SOUND SUPPRESSION**

Melvin N. Osborn, Los Angeles, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Mar. 22, 1982, Ser. No. 360,294  
 Int. Cl.<sup>3</sup> F02K 1/12

U.S. Cl. 181—215

3 Claims



1. A variable shape and area fluid flow nozzle for aircraft jet engines, said nozzle having a longitudinal axis and being adapted for use as a sound-suppression and cruise nozzle, comprising:  
 a plurality of longitudinally extending peripherally spaced web elements, each of said web elements comprising an inner wall, two side walls, and an outer wall, said walls defining a passage for a portion of the gas jet emanating from said engine, and said outer wall defining a portion of the outer periphery of said nozzle;

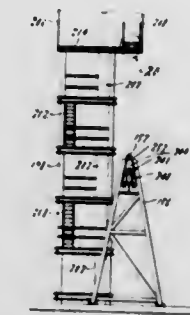
**4,422,526**  
**ACCESS TOWER FOR MANUFACTURE OF TUNNEL TUBES**

Robert A. Kaucic, Newark, Del., assignor to AMCA International Corporation, Hanover, N.H.

Filed Apr. 23, 1981, Ser. No. 256,709  
 Int. Cl.<sup>3</sup> E04G 1/15, 1/36

U.S. Cl. 182—36

2 Claims

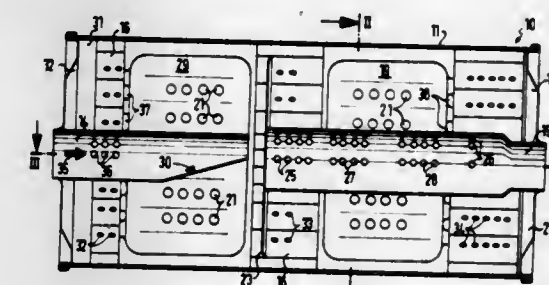


- a plurality of flaps individually and alternately interposed between pairs of said web elements and longitudinally extending from an upstream end of said nozzle to the downstream exit end of said nozzle, each of said flaps comprising a longitudinally extending gas guide vane defining the remaining portions of the outer periphery of said nozzle, each of said flaps further comprising a pair of side wall fins attached at the downstream end of and generally transverse to opposite edges of said vanes, said vanes and said fins being movable between and forming a seal with said web side walls; and means for providing movement of said flaps from a sound-suppression/nozzle closed mode wherein said nozzle periphery is characterized by a fluted downstream cross-section and said vanes, fins and side walls provide passages for ambient air to mix into said jet immediately downstream of said nozzle exit, and a cruise/nozzle open position wherein said web outer walls and said vanes form an enlarged area-circular nozzle exit for said engine jet.

**4,422,525**  
**MUFFLER**  
 Walter Seeger, Gaggenau, Fed. Rep. of Germany, assignor to Roth-Technik GmbH, Gaggenau, Fed. Rep. of Germany  
 Filed May 15, 1981, Ser. No. 263,995  
 Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020492

Int. Cl.<sup>3</sup> F01N 1/08  
 U.S. Cl. 181—255

18 Claims



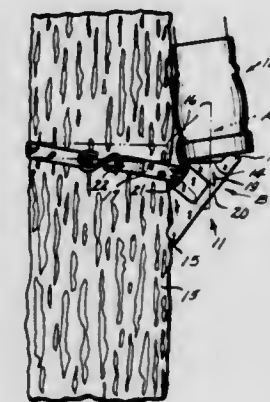
1. Muffler for muffling sound of combustion engines with a housing which is subdivided into at least two successive reflection chambers, an exhaust gas inlet entering a first one of said reflection chambers, intermediate channels for communication between the reflection chambers, an exhaust gas outlet pipe terminating in the last one of said successive reflection chambers, an inner side of said housing having at least one metal sheet accommodated to the curvature of said housing and having a plurality of corrugations, each corrugation and said inner side of said housing forming an intermediate channel, said exhaust gas inlet and outlet pipes having openings with regions surrounded by a respective reflection chamber, each reflection chamber forming a closed chamber and abutting the inner side of the corrugated metal sheet and forming a plurality of mutually separated guide channels, each intermediate channel having a cross-section which is smaller than the cross-section of said gas inlet pipe, the sum of cross-sectional areas of all intermediate channels being greater than the cross-sectional area of said inlet pipe, so that flow through the intermediate channels from input side to output side has substantially low flow resistance to reduce power losses and increase damping of high-frequency noise components, exhaust gas condensate forming in the muffler being transported out of the housing by the exhaust gas after a substantially short operating time.

**4,422,527**  
**TREE STEPS**  
 William E. Schultz, Okemos, and Jeffrey S. Vogl, Lansing, both of Mich., assignors to Vogl-Schultz, Incorporated, Okemos, Mich.

Filed Sep. 29, 1982, Ser. No. 428,195  
 Int. Cl.<sup>3</sup> A63B 29/04

U.S. Cl. 182—92

8 Claims



1. A tree step unit comprising:  
 an integrally formed pyramidal nesting shell housing having a truncated platform and pair of openings therethrough substantially at the truncation and including a pair of spaced-apart feet having rounded exteriors on each end of a substantially rectangular base with two sides converging toward said platform and connected integrally to said feet; and  
 a belt through said openings, said belt being adjustable and lockable to hold said housing against a vertical surface and present one of said sides in a substantially horizontal load support position.



4,422,528

**AERIAL BASKET STRUCTURE FOR LINEMEN AND METHOD FOR UTILIZING SAME**

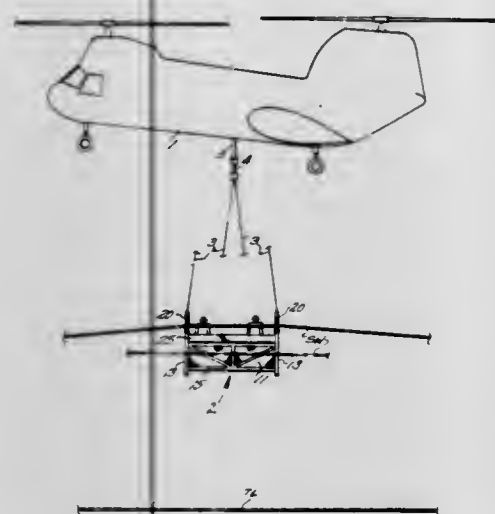
Donald D. Patterson, Lake Oswego, Oreg., assignor to Columbia Helicopters, Inc., Portland, Oreg.

Filed Apr. 13, 1981, Ser. No. 253,901

Int. Cl.<sup>3</sup> E04G 3/10

U.S. Cl. 182—145

2 Claims



1. An aerial basket structure for linemen and adapted for both transport of the linemen and for temporary engagement with a substantially horizontally suspended wire while the structure is slung below a helicopter, said basket structure comprising, an enclosure within which workers are carried and including upright members to which sling lines depending from the helicopter may be attached, a pair of inclined appendages on at least one side of the enclosure extending outwardly therefrom so as to engage the suspended wire during elevation of the enclosure by the helicopter to thereby engage the enclosure with the suspended wire to enable servicing of the latter by the linemen, said upright members each including a line attachment lug with each lug adapted to receive the lower end of a sling line in a manner to facilitate uninterrupted passage of the basket structure upwardly past the suspended wire prior to engagement of the suspended wire with the appendages.

4,422,529

**METHOD AND APPARATUS FOR LUBRICATING STEEL CABLE**

Steinar Johansen, Eiken, Norway, assignor to Masto Wireservice A/S, Kristiansand S, Norway

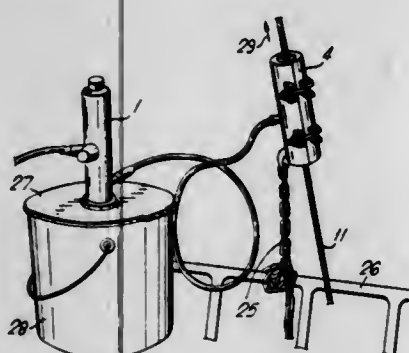
Filed Mar. 27, 1981, Ser. No. 248,297

Claims priority, application Norway, Oct. 6, 1980, 802958

Int. Cl.<sup>3</sup> F16N 7/00

U.S. Cl. 184—15 R

3 Claims



1. A method of lubricating steel cables with the aid of a lubricating device including a lubricating chamber and a pair of opposed axially aligned resilient sleeve-shaped gaskets comprising the steps of supplying a liquid lubricant to said lubricant chamber from a pump at a high delivery pressure of at least 20

bar and drawing a steel cable through said lubricating chamber between said gaskets at a rate of passage selected to permit the lubricant to penetrate the cable and substantially fill the hollow spaces in the cable entering the chamber without buildup of pressure in the chamber materially above the delivery pressure thereby to avoid leakage of lubricant through said gaskets and around the cable.

4,422,530

**PENDULUM STRUCTURE**

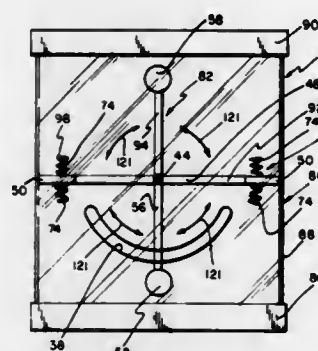
Cleo E. Denton, 1026 S. Richmond, Wichita, Kans. 67213

Filed May 8, 1981, Ser. No. 261,962

Int. Cl.<sup>3</sup> F03G 3/06

U.S. Cl. 185—29

3 Claims



1. A pendulum structure, comprising:  
(a) a housing assembly;  
(b) a pendulum assembly having a pendulum member pivotally connected to said housing assembly for swinging movement therein;  
(c) an actuator assembly connected to said housing assembly having a bias member engagable with said pendulum member to impart energy thereto to aid in said swinging movement;  
(d) said pendulum member being a dual pendulum member includes a main body having a head member secured to outer ends thereof;  
(e) said main body pivotally connected to said housing assembly at a central portion thereof;  
(f) said actuator assembly having a plurality of bias members engagable with respective ones of said head members; and  
(g) said head members concurrently engagable with respective ones of said bias members at the same time to receive from and impart energy to said head members.

4,422,531

**TRACTION MACHINE FOR AN ELEVATOR**

Sadayuki Ohtomi; Yasutaka Hirano; Iturou Tangiku, and Tamaiti Kondou, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

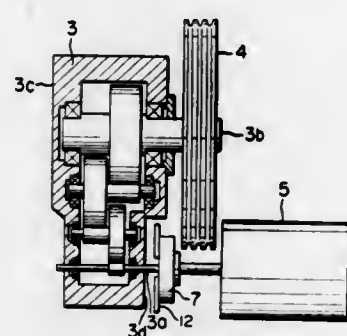
Filed May 1, 1981, Ser. No. 259,609

Claims priority, application Japan, Jun. 2, 1980, 55-76504

Int. Cl.<sup>3</sup> B66B 11/04

U.S. Cl. 187—20

6 Claims



3. A traction machine for an elevator, said traction machine comprising:

4,422,533

**SEALING MEANS FOR HYDRAULIC BRAKE ACTUATORS**

Anthony G. Price, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

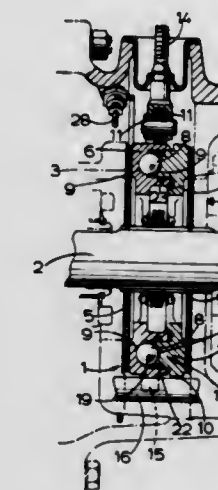
Filed Jul. 10, 1981, Ser. No. 282,080

Claims priority, application United Kingdom, Jul. 10, 1980, 8022677

Int. Cl.<sup>3</sup> F16D 55/20; F16J 15/32

U.S. Cl. 188—71.4

3 Claims



a reduction gear mechanism including a main housing having therein parallel axis gears, an input shaft and an output shaft extending parallel to said input shaft;  
a traction sheave connected to said output shaft;  
a brake drum secured as a shaft coupling to said input shaft at the side of said main housing on which said traction sheave is disposed;  
an electric motor having a shaft, said electric motor being disposed such that a peripheral portion of the shaft side end surface of said electric motor confronts a peripheral portion of one side surface of said traction sheave; and  
said shaft of said electric motor being connected to said input shaft through a plate-like connector means secured to a projecting end of said shaft of said electric motor and to said brake drum, the distance from a longer side of said plate-like connector means, elongated in a direction orthogonal to the longitudinal direction of said shaft of said electric motor, to the center of said shaft of said electric motor being selected to be less than the distance from the peripheral surface of said traction sheave to said center of said shaft of said electric motor.

4,422,532

**HAND BRAKE MECHANISM INCLUDING FORCE DIVIDING ASSEMBLY**

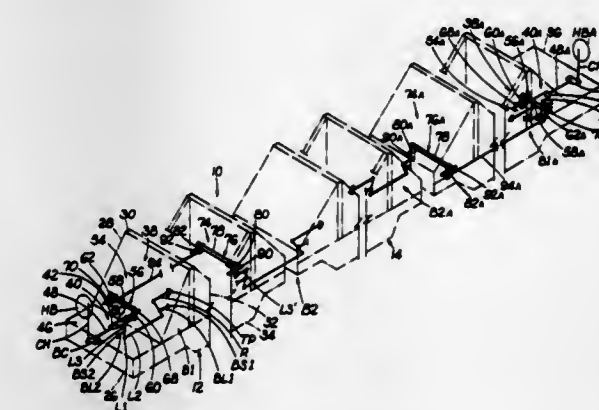
Eugene J. Cordani, Florissant; James C. Hammonds, St. Charles, and Frederick E. Vorwerk, St. Peters, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,599

Int. Cl.<sup>3</sup> B61H 13/00

U.S. Cl. 188—47

24 Claims



1. Mechanism for applying a brake force to a first set of brakes acting on a first set of wheels at a first end of a railway car and to a second set of brakes acting on a second set of wheels at the other end of the car; the first set of brakes being located on the opposite side of the car from the second set of brakes, and the brake force being produced by a manually operable hand wheel, the mechanism comprising: force splitting means interconnected with the hand brake for transmitting the brake force produced by operation of the hand brake to the first set of brakes; first torque means interconnected with the force splitting means for transferring the brake force produced by operation of the hand brake to the opposite end of the car; and second torque means interconnected with the first torque means for transferring the brake force transversely across the car to the second set of brakes whereby the first and second sets of brakes are applied to their respective sets of wheels to prevent movement of the car.

1. An hydraulic brake actuator comprising a brake housing having end faces, a rotatable shaft extending through said housing, brake discs rotatable with said shaft for engagement with said end faces, and a pair of pressure plates which are adapted for relative axial and angular movement to urge said brake discs into engagement with said end faces of said brake housing, an annular piston member provided in one of said plates, an annular cylinder member provided in an adjacent face of the other of said plates and having a bore surrounding an axis in which said piston is adapted to work, means defining a first seal-receiving groove in the outer surface of said piston, a first annular seal located in said first groove for engagement with the outer face of said cylinder, a second means defining a second seal-receiving groove in the inner face of said cylinder, a second annular seal located in said second groove for sealing engagement with the inner face of said piston, and a high pressure space defined in said cylinder between a wall defining a closure for the inner end thereof and the inner end of said piston, wherein each said seal in an unstressed condition is substantially of triangular outline having three main faces, and each said seal-receiving groove is defined between first and second end walls with which two of said main faces of said seal are in full facial contact, said end walls being relatively inclined, at least said second end wall also being inclined with respect to said axis of said cylinder, and the relative lengths of said faces and said end walls being so chosen that a sealing region of said seal defined by and between the third remaining one of said faces and the one of said two faces which in contact with said first end wall is in sealing engagement with the said other member, and a space is defined between said second end wall and the said third face to accommodate any deformation of the material of said seal which is otherwise confined between said walls of the groove and the said other member, the space being disposed at ends of said seals which are adjacent to said high pressure space whereby to enhance said facial contact of said faces of said seal and said end walls.

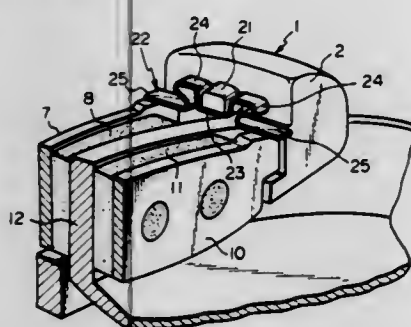


# 4,422,534 DISC BRAKE

Harumi Oshima, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan  
Continuation of Ser. No. 207,432, Nov. 17, 1980, abandoned.  
This application Jan. 10, 1983, Ser. No. 456,726  
Claims priority, application Japan, Nov. 20, 1979, 54-160716[U]; Nov. 20, 1979, 54-160718[U]  
Int. Cl.<sup>3</sup> F16D 55/224

U.S. Cl. 188—73.38

22 Claims



1. In a disc brake of the kind including a stationary member securable to a non-rotatable part of a vehicle and having first and second arms spaced along and extending across the circumference of a disc which is rotatable about an axis of rotation, a caliper slidably supported on the stationary member, a pair of friction pads slidably supported on opposing walls of the respective first and second arms, a brake actuator provided on one side of the disc for pressing one of the pair of friction pads against the one side of the disc and slidably displacing the caliper on the stationary member, thereby pressing the other one of the pair of friction pads against the other side of the disc, the improvement comprising:

the opposing walls of the first and second arms having outwardly facing shoulders for supporting circumferentially opposite ends of the pair of friction pads, the opposing wall of the first arm and the opposing wall of the second arm respectively having first and second projections opposing and extending toward each other located radially outward of the circumference of the disc;

first and second pad springs respectively integrally formed by bending separate elongated members in corresponding planes and respectively having first and second generally U-shaped central portions in said planes; each of said first and second pad springs having first and second pressing portions extending in a corresponding one of said planes continuously in directions parallel the axis of rotation of the disc from opposing sides of said first and second central portions so as to press the pair of friction pads radially inwardly toward the axis of rotation of the disc and against said shoulders, and having first and second resilient portions bent in the corresponding one of said planes respectively joining said first and second pressing portions; said first and second central portions each including spaced generally radially extending first and second side walls having radially outward ends and radially inward ends formed in the corresponding one of said planes and a base portion having a radially outward facing surface, formed in the corresponding one of the planes connecting said radially inward ends; said first and second resilient portions of said first and second pad springs being joined to said first and second central portions at said outward ends; said first and second projections extending between said first and second side walls of said first and second central portions on said radially outward surface of said base portion so that said first and second central portions of said first and second pad springs are respectively retained by said first and second projections at least in the direction radially outwardly away from the axis of rotation of the disc.

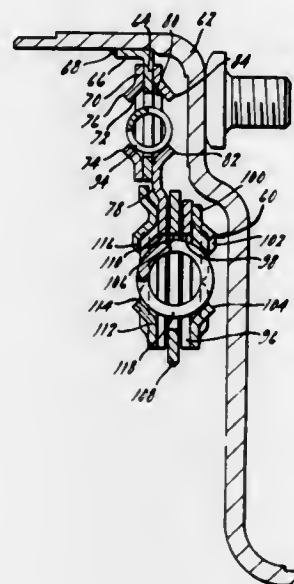
# 4,422,535

## COMPOUND DAMPER ASSEMBLY FOR AN AUTOMATIC TRANSMISSION

Ching-Chung Ling, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.  
Filed May 20, 1981, Ser. No. 265,496  
Int. Cl.<sup>3</sup> F16D 3/66

U.S. Cl. 192—3.28

10 Claims



1. In a hydrokinetic torque converter transmission adapted to deliver driving torque from an internal combustion engine to a drive shaft including a hydrokinetic torque converter having an impeller connected to said engine, a multiple ratio gear system having an output gear element connected to said drive shaft, said converter having a turbine connected to torque input elements of said gear system, and a mechanical torque delivery path in parallel relationship with respect to said hydrokinetic converter for establishing a mechanical torque flow path that is independent of the hydrokinetic torque flow path of the hydrokinetic converter;

said torque flow path comprising a damper assembly having a first damper plate connected to said impeller, a torque delivery shaft connected to an input element of said gear system, a torque output plate in said damper assembly, an intermediate damper plate in said damper assembly located between said first and second damper plates;

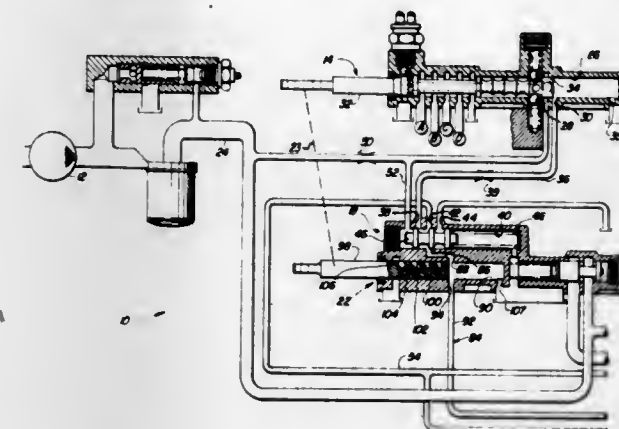
a first set of damper springs in said damper assembly establishing a yieldable spring connection between said first damper plate and said intermediate damper plate, and second and third sets of damper springs arranged in parallel disposition one with respect to the other and establishing a yieldable spring connection between said intermediate damper plate and said output damper plate, said first spring set being arranged in series disposition with respect to one of the other two sets of springs whereby said damper assembly is characterized by three characteristic operating stages including a first stage in which one set of springs of said other set acts in series relationship with said first set to establish a relatively low spring rate, a second characteristic operating stage wherein said one set of said other sets of springs establishes a spring damping force and a third characteristic operating stage wherein said second and third sets of springs act in parallel relationship in unison with the first series of springs inactive thereby establishing a final damper spring rate of high magnitude.

# 4,422,536 TRANSMISSION CONTROL SYSTEM WITH IMPROVED MODULATION RATE REGULATING VALVE

Lawrence A. Shatuck, White Heath, Ill., assignor to Deere & Company, Moline, Ill.  
Filed May 8, 1981, Ser. No. 261,844  
Int. Cl.<sup>3</sup> B60K 41/00

U.S. Cl. 192—3.57

5 Claims



1. A hydraulic transmission control system for selectively actuating at least one of a plurality of speed friction devices and for selectively actuating one of a plurality of direction-friction devices, comprising: a fluid source; a speed-selector valve connected for communicating the source to one of the speed friction devices; a direction-selector valve connected for communicating the source to one of the direction-friction devices; a hydraulically responsive pressure-modulating valve connected in fluid communication with the direction-selector valve for modulating the fluid communicated to the direction-selector valve from the source; said modulating valve including a valve element and a pressure-regulating spring biasing the valve element in a first direction and a piston engaged with the spring and shiftable in the first direction for increasing the resistance of the pressure-regulating spring to movement of the valve element in a second direction opposite to the first direction; a source of increasing fluid pressure directed along a fluid path leading to the piston for shifting the latter in the first direction; and an orifice-selector valve located in the fluid path and connected to the speed-selector valve for being operated concurrently with the latter for disposing a different orifice of a selected size in the fluid path for each speed position of the speed-selector valve to thereby regulate the rate that the source of increasing fluid pressure is communicated to the piston and thus, to thereby control the rate of movement of the piston in the first direction and hence, the rate of increase in the pressure of the fluid controlled by the modulating valve.

# 4,422,537

## ONE PIECE SHEET METAL CAGE

Joachim Ritter, and Ernst Neuwirth, both of Herzogenaurach, Fed. Rep. of Germany, assignors to INA Walzlagler Schaeffler KG, Fed. Rep. of Germany  
Filed Jun. 19, 1981, Ser. No. 275,289  
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023687

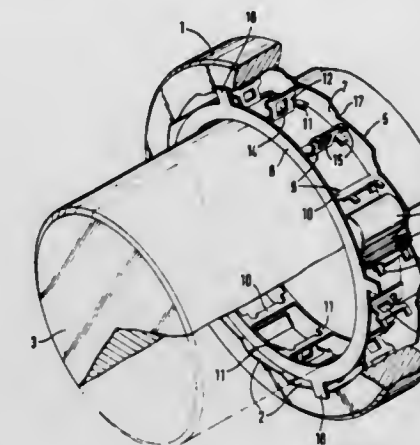
Int. Cl.<sup>3</sup> F16D 41/06

U.S. Cl. 192—45

5 Claims

1. A one-piece sheet metal cage for an overrunning roller clutch wherein the cam rollers roll between a smooth inner races and an outer race provided with camming surfaces comprising a U-shaped sheet metal element provided in its longitudinal section with radial ends of different height, the higher end engaging the camming surfaces in a locking manner with a corresponding outer profile and the cage is provided with folding springs on radially directed segments on the cross-bars forming the cage pockets which cause the cam rollers to bear against an inner and outer retaining element of an adjacent cross-bar, each said cross-bar comprising a short segment extending in the circumferential direction at the bottom of the U-profile which forms the inner retaining elements at its axial

ends adjoining the end flanges connecting the cross-bars and a flap between the inner retaining elements bent radially outward to which is secured a folding spring engaging an opening of the flap with an elastic projection, said flap being provided at its two axial ends with bent outer retaining lugs.



ward to which is secured a folding spring engaging an opening of the flap with an elastic projection, said flap being provided at its two axial ends with bent outer retaining lugs.

# 4,422,538

## FRICITION CLUTCH, ESPECIALLY FOR MOTOR VEHICLES

Klaus-Dieter Krumm, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

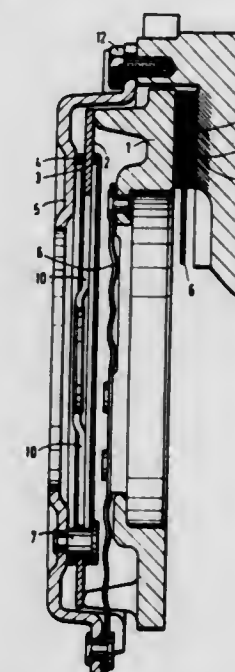
Filed Oct. 18, 1979, Ser. No. 86,138

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1978, 2845855

Int. Cl.<sup>3</sup> F16D 13/70

U.S. Cl. 192—70.14

12 Claims



1. In a friction clutch, the combination of a first component including a pressure plate; a second component at one side of said first component; a friction disc between said components; and means for biasing said first component toward said friction disc, said first component consisting of finely striped pearlitic cast iron containing less than 5 percent free ferrite and lamellar graphite finer than 3 in size according to VDG specification P441, at least one of said components containing between 0.16 and 0.3 percent by weight of titanium.



4,422,539

## CLUTCH DISK

Karl-Heinz Werner, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

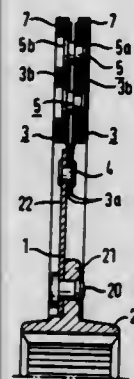
Filed Dec. 5, 1980, Ser. No. 213,626

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951573

Int. Cl.<sup>3</sup> F16D 13/69

U.S. Cl. 192—107 C

6 Claims



1. In a clutch disk, particularly for a motor vehicle clutch, comprising:

(a) a carrier disk having an axis, a circumferentially extending radially outer edge, and a peripheral zone spaced radially outwardly from and extending around said axis with said peripheral zone located adjacent to said outer edge of said carrier disk;

(b) a plurality of pairs of leaf spring elements, said pairs being distributed in the circumferential direction along and fixed to said peripheral zone and extending radially outwardly therefrom;

(aa) said leaf spring elements of each said pair of leaf spring elements comprising a radially inner fixing portion, a radially outer lining carrying portion and a neck portion connecting said fixing portion and said carrying portion;

(bb) said fixing portions of said leaf spring elements of each said pair of leaf spring elements having an assembled condition and a disassembled condition and in the assembled condition said leaf spring element of each said pair resting against each other in the axial direction and being commonly fixed to said peripheral zone;

(cc) the lining carrying portion (3b) of said leaf spring elements (3) of each said pair of leaf spring elements having an uneven configuration as compared with a plane normal to said axis such that only first partial areas of said lining carrying portions abut each other whereas second partial areas of said lining carrying portions are spaced from each other in the axial direction when in the unloaded condition;

(c) friction linings (7) fixed to oppositely directed front faces of said lining carrying portions of the leaf spring elements of each said pair of leaf spring elements within said second partial areas;

the improvement which consists in that in the disassembled condition the lining carrying portion and the fixing portion of said leaf spring elements of each said pair of leaf spring elements are inclined with respect to each other—as seen in a section plane containing said axis of the disk, said inclination being substantially overcome in the assembled condition so as to elastically press said lining carrying portions of the leaf spring elements of respective pairs of leaf spring elements against each other in said first partial areas, pulling members are provided between said lining carrying portions of the leaf spring elements of each said pair of leaf spring elements in said second partial areas, said pulling members being under pulling tension, said pulling tension generating an additional pressure between said lining carrying portions of the leaf spring

elements of respective pairs of leaf spring elements in said first partial areas, said pulling members are formed as rivets fixing said friction linings to said lining carrying portions, one first pulling member fixes by a first end thereof a first friction lining to the lining carrying portion of a first leaf spring element of each said pair of leaf spring elements, a second end of said first pulling member engaging the lining carrying portion of a second leaf spring element of each said pair of leaf spring elements at the outer front face of said second leaf spring element remote from said first leaf spring element and being axially movable with respect to the lining carrying portion of said second leaf spring element, and wherein at least one second pulling member fixes by a first end thereof a second friction lining carrying portion of said second leaf spring element of each said pair of leaf spring elements, the second end of said second pulling member engaging the lining carrying portion of said first leaf spring element of each said pair of leaf spring elements on the outer front face of said first leaf spring element remote from said second leaf spring element and being axially movable with respect to the lining carrying portion of said first leaf spring element, each said lining carrying portion of said leaf spring elements of each said pair of leaf spring elements comprise—when regarded in radial direction with respect to said axis, a centrally arranged said first partial area, and laterally arranged second partial areas on both circumferentially spaced sides of said central first partial area, and laterally arranged said first partial areas on the sides of said lateral second partial areas spaced circumferentially remote from said central first partial area, said lateral second partial areas being substantially arc-shaped, each said lining carrying portion is symmetrical relative to said centrally arranged first partial area thereof.

4,422,540

## CLUTCH/BRAKE UNIT WITH MODULAR HEAT EXCHANGER

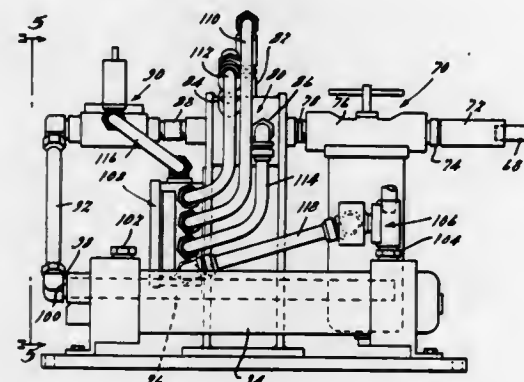
Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Filed Mar. 27, 1981, Ser. No. 248,304

Int. Cl.<sup>3</sup> F16D 13/72

U.S. Cl. 192—113 B

8 Claims



1. A heat exchange apparatus for use with an oil-cooled clutch/brake unit or the like, comprising cooling fluid; means for exchanging heat to said cooling fluid from oil from said unit passing through said apparatus; inlet and outlet conduit means to said heat exchanging means for said cooling fluid; means for sensing the temperature of oil entering said apparatus; and means for controlling the flow of said cooling fluid, including means for controlling the flow of said cooling fluid in response to the temperature of the oil sensed by said sensing means.

4,422,541

## APPARATUS FOR CONVEYING INSULATING GLASS PANES

Peter Lisec, Bahnhofstrasse 34, Amstetten-Hausmening, Austria

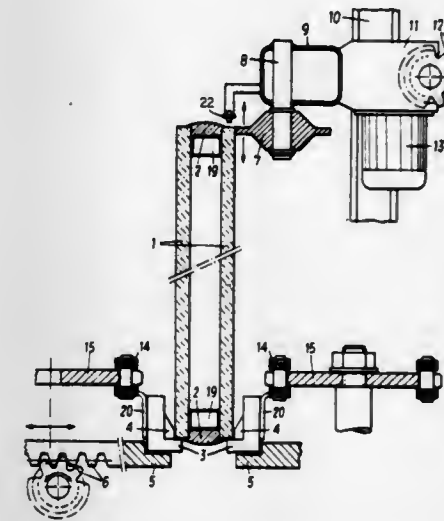
Filed Jul. 9, 1981, Ser. No. 281,706

Claims priority, application Austria, Sep. 22, 1980, 4725/80

Int. Cl.<sup>3</sup> B65G 15/14

U.S. Cl. 198—627

9 Claims



1. In apparatus for conveying insulating glass panes comprising each two spaced apart individual glass panes, which define grooves at the edges of said insulating glass panes, which grooves are filled with a sticky sealing compound, said apparatus being operable to convey said insulating glass panes with an inclination from the vertical along a predetermined path so that each of said individual glass panes has a lower edge face, an upper edge face, an outside surface, and an outer upper edge between said upper edge face and said outside surface, the improvement residing in that

a plurality of pairs of mutually opposite rigid supports disposed on opposite sides of said path are provided and are spaced apart along said path and movable along the same, drive means for moving said pairs of supports in unison along said path are provided,

the supports of each of said pairs are adapted to engage the lower edge faces of respective individual glass panes of each of said insulating glass panes only in an outer portion of said lower edge faces,

backing means disposed on one side of said path and spaced above said supports and adapted to engage one of said individual glass panes of each of said insulating glass panes on its outside surface,

two parallel guide rails which are spaced below said rigid supports and engage the latter from below, said drive means comprising two parallel endless conveyor elements disposed on opposite sides of said path, the supports disposed on each side of said path being secured to the adjacent said conveyor element,

the supports of each of said pairs carrying respective pressure contact jaws having substantially vertical pressure contact surfaces facing each other and adapted to resiliently engage respective individual glass panes of each of said insulating glass panes on said outside surfaces close to said lower edge face, and means to cause said pressure contact jaws to apply pressure resiliently to said outside surfaces, said pressure contact jaws cooperating resiliently with said rigid supports to maintain said lower edge faces of said panes on said rigid supports with said rigid supports out of contact with said sticky sealing compound.

4,422,542

## SCRAPER-CHAIN CONVEYORS

Helmut Temme, Waltrop, and Erwin Beckmann, Kamen-Methler, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen, Lunen, Fed. Rep. of Germany

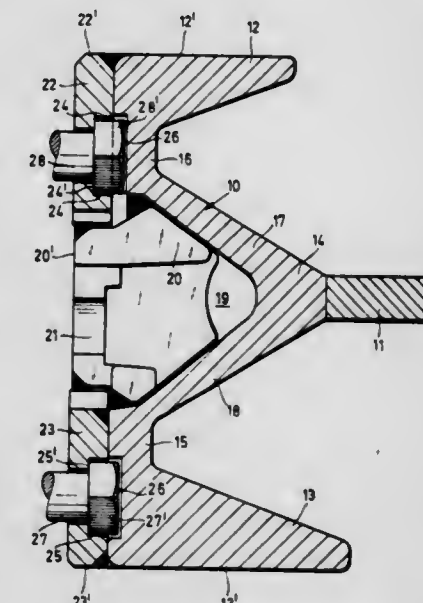
Continuation of Ser. No. 152,682, May 23, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,315

Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921412

Int. Cl.<sup>3</sup> B65G 19/28

U.S. Cl. 198—735

10 Claims



1. A conveyor channel section or pan comprising side walls, each with a generally sigma-shaped profile adjoined by a floor plate, each side wall having a central V-shaped groove in its exterior and upper and lower upstanding web portions adjacent said groove, reinforcement bars extending longitudinally of the pans, said bars being welded alongside the exteriors of the web portions of at least one of the side walls, apertures in the bars from which extend the shanks of bolts used to secure attachments to the pan, the inner faces of said bars having relieved portions along the margins of said apertures, and recesses in the exterior faces of the web portions of said at least one side wall behind the apertures, said recesses cooperating with said relieved portions to jointly define pockets in which the heads of said bolts are removably retained.

4,422,543

## UNIVERSAL CONVEYOR

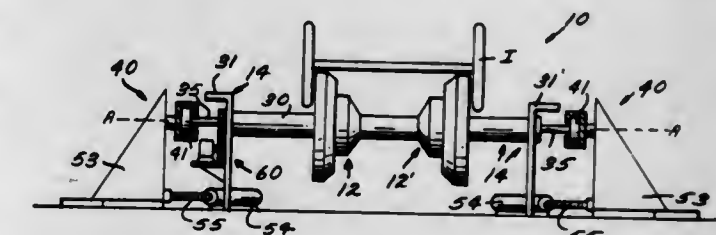
James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Jan. 3, 1979, Ser. No. 910

Int. Cl.<sup>3</sup> B65G 13/00

U.S. Cl. 198—782

18 Claims

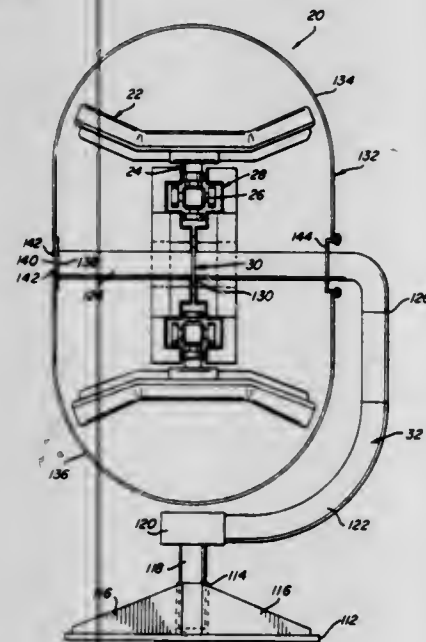


1. A conveyor roller comprising a generally tubular body member of hard rubber, including means defining an axial bore extending through the body member; a radially outermost generally axially extending peripheral surface; a generally radially extending first end surface; a generally radially extending second surface; a radially innermost generally axially extending peripheral surface; and a radially slanting outer surface; said radially outermost generally axially extending peripheral surface extending between said first surface and said second surface.



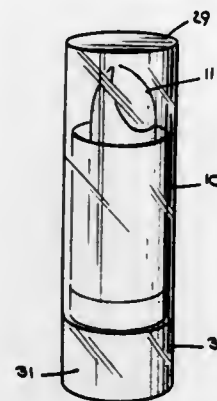
radially slanting surface, and said second surface extending between said radially slanting surface and said radially innermost generally axially extending peripheral surface; key means formed on the interior of said axial bore, and including a metal sleeve, said metal sleeve having an axially extending abutment surface formed on the opposite side of said radially slanting outer surface as said radially outermost generally axially extending surface.

**4,422,544**  
**CONVEYOR SYSTEM WITH BI-PLANAR CHAIN**  
Robert L. Alldredge, 130 Pearl St., Denver, Colo. 80203  
Filed May 18, 1981, Ser. No. 264,632  
Int. Cl.<sup>3</sup> B65G 15/60  
U.S. Cl. 198—838



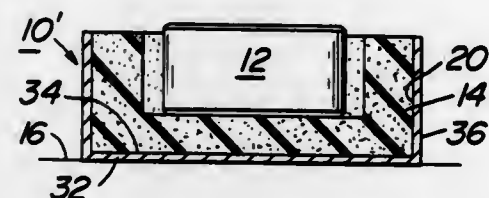
6. An improved conveyor system of the type employing and endless conveyor belt capable of following a path having vertical and horizontal curves along the course of travel while supporting a load from below the load, the conveyor system including a track arranged for establishing a selected course of longitudinal travel for the belt, a belt moving means having (1) a pulling chain adapted to be moved along the course of travel defined by said track, and (2) belt carriage means joined to the pulling chain at selected intervals and extending from the chain to the belt for supporting the belt from below the belt, wherein the improvement comprises: a support leg structure having
- (a) a base capable of supporting the conveyor against an underlying surface;
  - (b) a conveyor support bar having a free end and an opposite end attached to said base, the bar extending transversely to the longitudinal course of the conveyor and carrying said track;
  - (c) means intermediate the base and support bar for selectively adjusting the vertical height of the support bar relative to the base;
  - (d) means intermediate the base and support bar for selectively adjusting the horizontal position of the support bar relative to the base; and
  - (e) means intermediate the base and support bar for selectively adjusting the relative angle of rotation between the support bar and base.

**4,422,545**  
**COSMETIC DISPLAYER AND DISPENSER**  
Shlomo J. Kadoory, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.  
Filed May 17, 1982, Ser. No. 379,248  
Int. Cl.<sup>3</sup> A45D 40/06; B65D 51/28, 65/16  
U.S. Cl. 206—45.34



1. A cosmetic displayer and dispenser having a holder assembly adapted to hold a first cosmetic, a cover and a base, the improvement comprising, said base being constructed of transparent material and fillable with cosmetic.

**4,422,546**  
**SOAP DISH**  
Betty Charity, 8036 Lincoln Dr., Jessup, Md. 20794  
Filed Aug. 10, 1982, Ser. No. 406,903  
Int. Cl.<sup>3</sup> A47K 5/08, 7/02; A47L 13/46; B43L 21/00  
U.S. Cl. 206—77.1

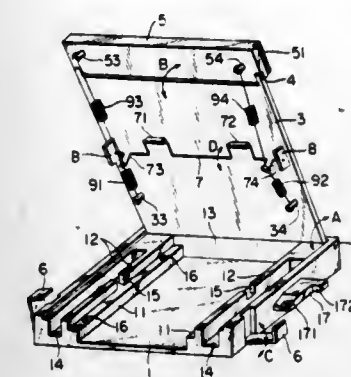


1. A soap dish for releasably holding a bar of soap comprising a soap retaining member adapted to releasably contain a bar of soap therein, said soap retaining member being formed of an aqueous absorbing composition which may be compressively deformed subsequent to said aqueous absorption for removal of liquid contained therein, said soap retaining member including a lower surface having a liquid impervious layer formed thereon, said liquid impervious layer being resilient.

**4,422,547**  
**CONTAINER FOR HOLDING SUBSTRATE**  
Nobutoshi Abe, Kawasaki; Yukio Kakizaki, Yokohama, and Jiro Kobayashi, Yamato, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan  
Filed Nov. 29, 1982, Ser. No. 445,030  
Int. Cl.<sup>3</sup> B65D 85/30, 81/02; H01N 13/54  
U.S. Cl. 206—328

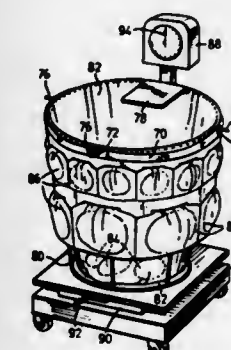
1. A container for containing therein a planar substrate, said container comprising:
- (a) housing means provided with an opening which said substrate can pass through in the direction substantially parallel to the plane of said substrate, and with an inner space for receiving said substrate;
  - (b) door means attached to said housing means for closing said opening, said door means being movable to open said opening; and
  - (c) fixing means for fixing said substrate received in said inner space to said housing means, said fixing means including a contact member movable within said inner space of housing means, and means for moving said contact member and

operable in link with the motion of said door means in such manner that when said opening is closed by said door means,



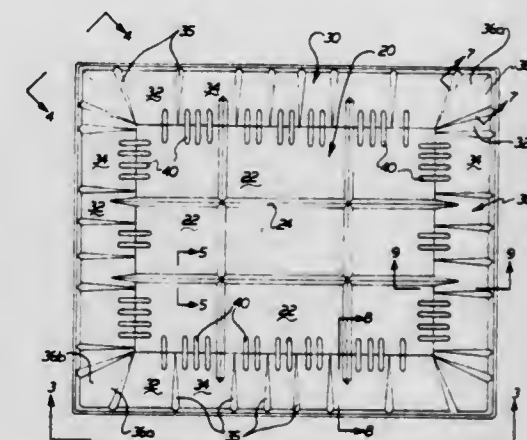
said contact member is brought into contact with said substrate and when said opening is opened, said contact member is retracted from said substrate.

**4,422,548**  
**SURGICAL SPONGE COUNTER AND BLOOD LOSS DETERMINATION SYSTEM**  
Barbara E. Cheesman, Cornwall, and Raza Ali Khan, Oakville, both of Canada, assignors to Ritmed Limited  
Filed Jan. 18, 1982, Ser. No. 340,261  
Int. Cl.<sup>3</sup> A61B 19/00; A61F 13/00; B65D 30/22, 85/00; G01G 19/00  
U.S. Cl. 206—370



1. A system for collecting, containing, counting, weighing and disposing of soiled sponges from surgical procedures, comprising:
- means for suspending and retaining a disposable receptacle into which said soiled sponges may be placed directly from the field of operation;
  - a strip of thermoplastic material having a plurality of pouches formed therein, each pouch having front and rear walls and having a top, a bottom and a pair of opposed sides; the front and rear walls of each pouch being securely sealed one to the other at the bottom and at least one side thereof, and having a substantially horizontal opening between said front and rear walls at its top side; said plurality of pouches being contiguous one to another at at least one adjoining pair of sides, or at a respective top and bottom of adjoining pouches;
  - and means for suspending said strip of thermoplastic material from its top edge; and means for weighing at least said receptacle, said strip of thermoplastic material, said suspending means and any soiled surgical sponges contained in said pouches.

**4,422,549**  
**APPARATUS FOR STABILIZING LAYERS OF NEWSPAPERS ON A MOVABLE PALLET**  
James S. Werkheiser, Nazareth, Pa., assignor to Harris Graphics Corporation, Melbourne, Fla.  
Filed Mar. 23, 1981, Ser. No. 246,731  
Int. Cl.<sup>3</sup> B65D 19/24  
U.S. Cl. 206—386



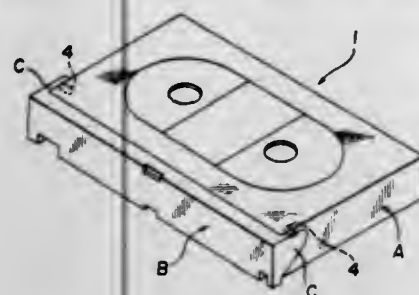
1. A separator sheet for disposition between horizontally oriented layers of newspaper bundles on a movable pallet, said separator sheet having a central portion and an outer portion circumscribing the central portion, the outer portion including first inclined walls extending upwardly from the central portion at acute angles thereto and for bearing against the bottom surfaces of the outer bundles of the layer of newspaper bundles above the separator sheet to support said outer bundles of said layer of newspaper bundles and for exerting forces against the outer bundles of the layer for resisting horizontal movement of the newspaper bundles above the separator sheet, the outer portion of said separator sheet further including second inclined walls extending downwardly from the central portion at an acute angle thereto and which bear against the top surfaces of the outer bundles of the layer of newspaper bundles below the separator sheet for exerting forces against the outer bundles of the layer of newspaper bundles below the separator sheet, said central portion being disposed generally in a central reference plane, said first inclined walls being disposed in planes extending upwardly from the central reference plane at acute angles thereto, said second inclined walls being disposed in planes extending downwardly from the central reference plane at acute angles thereto, said first and second inclined walls being alternately disposed about the central portion of the separator sheet with adjacent first and second inclined walls extending in opposite directions from said central reference plane, and said outer portion further including side walls extending through the central reference plane and interconnecting adjacent first and second inclined walls.

**4,422,550**  
**STRUCTURE OF PIVOTAL-SHAFT RECEIVING HOLE OF THIN-WALLED MOLDING PRODUCT**  
Masatoshi Okamura, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan  
Filed Jul. 2, 1981, Ser. No. 279,798  
Claims priority, application Japan, Aug. 4, 1980, 55-109777  
Int. Cl.<sup>3</sup> B65D 85/672

1. A pivotal shaft receiving member, comprising:
- a one piece molded product including a portion having a first thickness;
  - a boss formed on one surface of said portion of said product;
  - a bore for a pivotal shaft, said bore having walls defined by



said portion and said boss, the depth of said bore being greater than said first thickness; and a pivotal shaft positionable in said bore, said pivotal shaft



having a length greater than said first thickness and less than said depth of said bore, wherein said molded product comprises a magnetic tape cassette and wherein said shaft is fixed to a cover for said cassette.

4,422,551

**BLISTER PACKAGE DISPENSER**

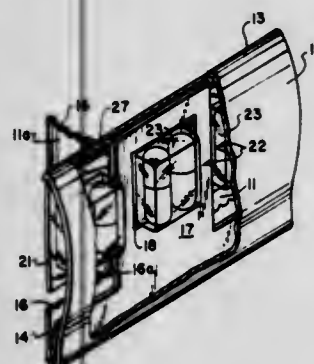
Thomas D. Pawlowski, Neenah, Wis., assignor to James River-Dixie/Northern, Inc., Norwalk, Conn.

Filed Dec. 2, 1981, Ser. No. 326,756

Int. Cl.<sup>3</sup> B65D 75/00

U.S. Cl. 206—461

10 Claims



1. An improved dispensing package structure for a strip of severable blister package units, comprising:

a generally flattened end-accessible sleeve of flexible and resilient material;

a planar panel of like flexible and resilient material retained along a first edge thereof within said sleeve and having a free edge opposite said first edge free to move within said sleeve, said planar panel being in substantially coplanar relation with a confronting inner surface portion of the flattened sleeve, said panel having a window portion, the strip of severable blister package units being inserted within said sleeve through an end thereof between said planar panel and said confronting inner surface portion by deflecting said planar panel away from said inner surface portion and inserting said strip until the blister portion of at least one of said units aligns to project through said window, whereby the resilient planar panel resumes its undeflected planar shape for releasably retaining the strip within the sleeve by the interaction of said window and said aligned blister portion of said package units.

4,422,552

**CARD FOR MOUNTING BAGS AND THE LIKE**

Charles E. Palmer, Somers, and William A. Gelinas, Enfield, both of Conn., assignors to Palmer Systems, Inc., Somers, Conn.

Filed Jun. 7, 1982, Ser. No. 385,881

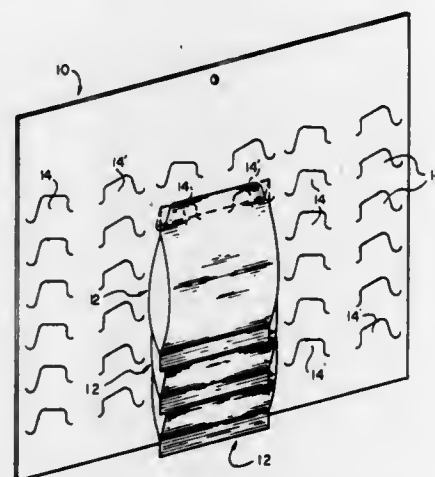
Int. Cl.<sup>3</sup> G09F 1/02; B65D 73/00

U.S. Cl. 206—466

15 Claims

1. In a card for disengageably mounting a product-containing bag having a reversely-foldable, generally rectangular outer flange thereon, the improvement comprising: a coacting

pair of locking tabs formed in said card by substantially identical mirror-image cut scores, each tab of said pair being hingedly connected to the remainder of said card along a lower portion thereof, and being defined by inner, upper and outer edge portions, said inner edge portion extending upwardly from the inner end of the hinge to said upper edge portion, and said outer edge portion extending downwardly and outwardly from said upper edge portion toward the outer end of said



hinge, said outer edge portions of said tabs being spaced from one another a distance substantially equal to or less than the width of the bag flange, so that said tabs can be displaced forwardly from the plane of said card to receive the folded flange of a bag thereover with its outer end portions extending therebeyond, and can thereafter be forced back through said plane, with the bag carried thereon, to cooperatively engage the outer flange portions behind said card to securely mount the bag.

4,422,553

**TABLET SPLITTING DEVICE**

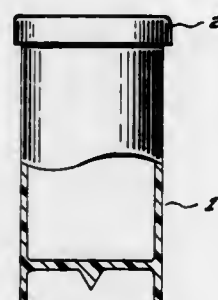
Harold L. Hoeks, 3295 West River Rd., N.W., Grand Rapids, Mich. 49503, and Donald D. Robinson, 1950 Hall St., S.E., Grand Rapids, Mich. 49506

Filed Sep. 17, 1982, Ser. No. 419,441

Int. Cl.<sup>3</sup> B26F 3/00; B65D 85/56

U.S. Cl. 206—528

11 Claims



1. A tablet splitting pharmaceutical container comprised of a main body of the container and a removable cap of the container used for the storage of pharmaceutical tablets, wherein the improvement comprises an incorporation of a tablet splitting device into the physical configuration of the container whose elements constitute: a physical cutting edge used to split whole tablets into portions; and, physical cavities adjacent to the cutting edge used to capture the split tablet portions with the container-device.

4,422,554

**MECHANIZED RETRIEVABLE HORIZONTAL STORAGE RACK**

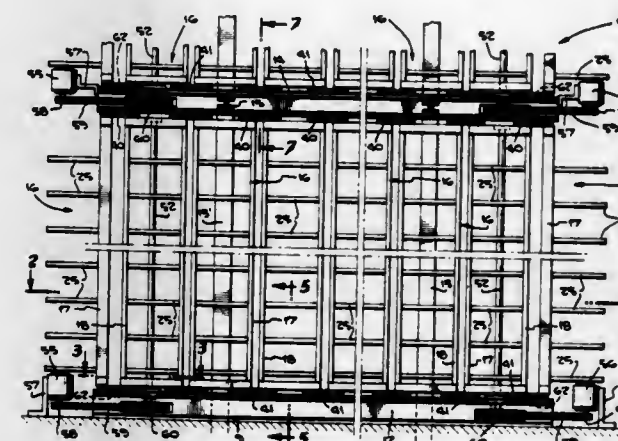
Robert D. Lichti, 3318 Warwood Rd., Lakewood, Calif. 90712

Filed Jul. 1, 1981, Ser. No. 279,432

Int. Cl.<sup>3</sup> A47F 3/08

U.S. Cl. 211—1.5

23 Claims



1. A mechanized rack assembly comprising a horizontally elongated stationary frame, a storage train comprising a multiple number of vertically elongated traveling frames including link means for movably linking said traveling frames together in the form of an endless chain of such traveling frames, said stationary frame including a horizontally extending support for traveling frames of said chain extending along sides and around ends of the stationary frame, and a rolling support on each traveling frame adapted to ride on said horizontally extending support, a motor having an operating drive connection with said chain, each traveling frame comprising a stack of storage stations of selected horizontal breadth and depth comprising a multiple number of vertically spaced outwardly open trays for reception thereon of storage items, said operating drive connection and said chain being adapted to be halted with a selected one of said stacks and its trays in a delivery position at one end of the stationary frame with trays open outwardly for removal and loading of storage items, the horizontal distance between stacks in back to back relationship on opposite sides of said endless chain of traveling frames being less than the horizontal depth of said stacks.

4,422,555

**RACKING**

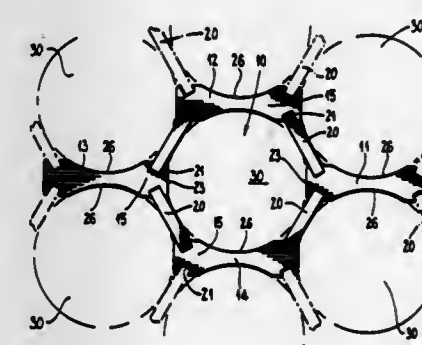
Keith R. Jacobs, Ferny Creek, Australia, assignor to Linton James Kirk, Ascendale, Australia

Filed Jun. 25, 1981, Ser. No. 277,342

Int. Cl.<sup>3</sup> A47F 7/28

U.S. Cl. 211—74

11 Claims



1. A modular rack for storing wine bottles comprising a honeycomb of elongate cellular enclosures each arranged to accommodate a wine bottle, the honeycomb being defined by elongate support members each of which includes an upper elongate surface and a lower elongate surface, each longitudinal edge of at least one end of the support member having formed therein a pair of obliquely extending slots, the slots

opening adjacent or on the edge of said respective upper and lower surfaces, the elongate support members being joined together by struts which extend between two adjacent support members and have ends that locate within the slots of adjacent support members so that the struts are inclined to the plane of the support members.

4,422,556

**RECEPTACLES FOR OVERHEAD STORAGE SYSTEMS**

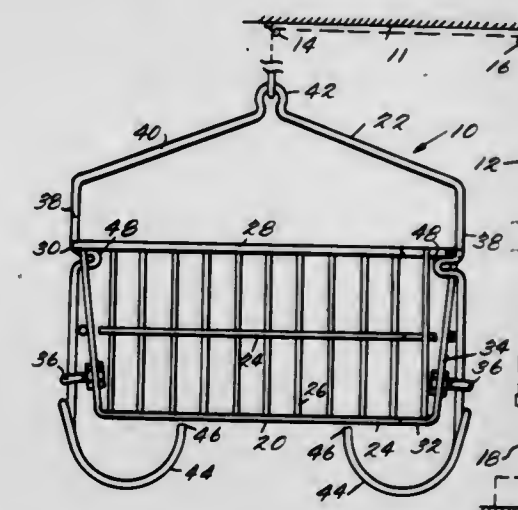
Junius T. Moore, Charleston, W. Va., assignor to The Moore Company, Inc., Charleston, W. Va.

Filed Feb. 2, 1981, Ser. No. 230,643

Int. Cl.<sup>3</sup> A47F 7/00

U.S. Cl. 211—119

7 Claims



1. An improved receptacle for storing articles and hanging clothing, the receptacle being used in a changeroom system having means for moving the receptacle between a lowered position of accessibility and an elevated position of inaccessibility, said receptacle comprising:

a basket member for storing articles;

a bail-like handle member of substantially inverted U-shaped configuration for attachment to said means for moving the receptacle, said bail-like handle member having a pair of parallel arms extending downwardly on opposite sides of said basket member and each of said arms carrying at its lower end at least one inwardly turned U-shaped clothes supporting hook member having a free end extending upwardly beneath and towards said basket member, said basket member being movable relative to said bail-like handle member between a lower position and an upper position;

eye bolts carried by said basket member on opposite sides thereof for receiving said parallel arms therethrough to guide the same when said bail-like handle member is moved relative to said basket member; and

basket support means positioned on said parallel arms and spaced upwardly of said U-shaped clothes carrying hooks for directly receiving a load from said basket member and transferring it directly to said parallel arms when said basket member is in the lower position relative to said bail-like handle member whereby the free ends of said hook members extending beneath said basket member are load free.



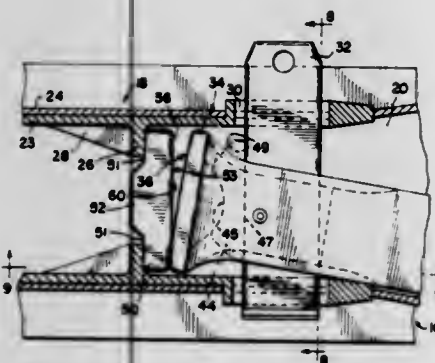
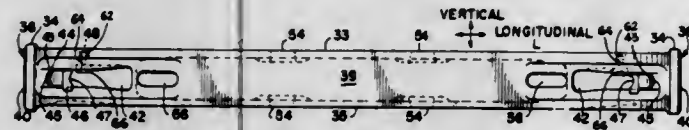
4,422,557

**ALIGNING DRAWBAR**

Russell G. Altherr, Munster, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.  
Continuation of Ser. No. 202,561, Oct. 31, 1980, abandoned.  
This application Sep. 13, 1982, Ser. No. 417,459  
Int. Cl.<sup>3</sup> B61G 9/20

U.S. Cl. 213—62 R

2 Claims



1. A drawbar arrangement for connecting the adjacent ends of two adjacent railway vehicles each having a drawbar pocket and stop means disposed within said drawbar pocket, a buffing block disposed in each of said pockets and engageable with said stop means upon buff impact of said vehicles, said buffing blocks each having a planar buffing surface surrounded by a convex surface, and an elongated drawbar having opposite ends extending into respective ones of said drawbar pockets, key means connecting said opposite ends of said drawbar in said drawbar pockets, said drawbar ends each having a partially spherical surface and a concentric planar surface normal to the longitudinal axis of said drawbar, said spherical surface having a radius of curvature greater than one-half the length of said drawbar and the center of curvature thereof disposed on the longitudinal axis of said drawbar whereby when said railway vehicles are in buff condition and longitudinally axially aligned said drawbar planar surface and said buffing block planar surface are in substantially face to face engagement with said buffing block abutting said stop means so that said buffing forces are transmitted longitudinally through said drawbar and said railway cars, and when said railway cars are in buff condition and out of longitudinal axial alignment said drawbar spherical surface and said buffing block convex surface are in engagement with said buffing block abutting said stop means so as to impose said buff forces on said drawbar ends on opposite sides of said longitudinal axis of said drawbar to cause said drawbar to become aligned with the longitudinal axes of said vehicles and simultaneously to exert opposing forces on said adjacent vehicles to cause the railway vehicles to become longitudinally aligned.

4,422,558

**CONTAINER FOR FREIGHT TRANSPORT**

Gerhard Mittelmann, Oehningen; Klaus P. Brodbeck, Singen, and Gerd Bretschneider, Hiltzingen, all of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

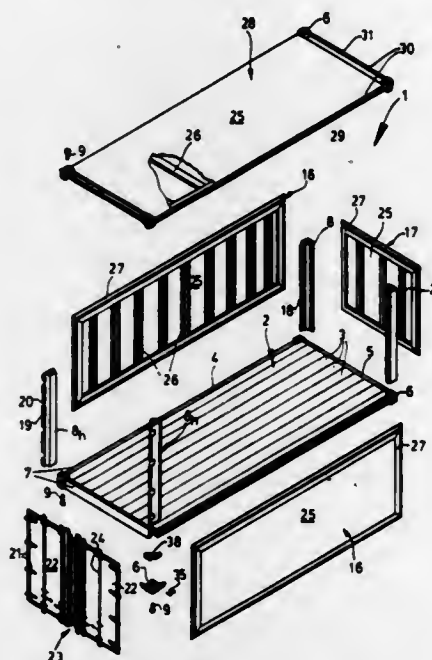
Filed Jun. 22, 1981, Ser. No. 275,802

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024707

Int. Cl.<sup>3</sup> B65D 8/10, 6/36

U.S. Cl. 220—1.5

10 Claims



1. A container for transporting goods, said container having a floor, a plurality of sidewalls, a roof and at least one door, the improvement which comprises: a plurality of posts extending between said floor and said roof, said plurality of posts each being provided with means for attaching said plurality of sidewalls to said plurality of posts; attachment means associated with said plurality of posts and said floor and said roof for releasably securing said plurality of posts to said floor and said roof wherein said floor and said roof are surrounded by a profiled frame, the corners of which are formed by said attachment means, said attachment means comprises a cube-shaped piece having on each of two vertical surfaces which are perpendicular to each other at least one tongue-like projecting flange and, on another surface perpendicular to said two vertical surfaces, step-like projections; and wherein said plurality of posts each comprises a hollow section adapted to mate with said step-like projections on said attachment means wherein the interior of each hollow section is subdivided by walls into a plurality of chambers, the cross section of each chamber corresponding to the cross section of a step-like projection on said attachment means so as to clamp said hollow section to said attachment means.

4,422,559

**MOLDED CONTAINER WITH SNAP-ON CLOSURE**

H. Richard Landis, Oak Lawn, Ill., assignor to Landis Plastics Inc., Chicago Ridge, Ill.

Filed Dec. 14, 1981, Ser. No. 330,710

Int. Cl.<sup>3</sup> B65D 41/16, 41/18

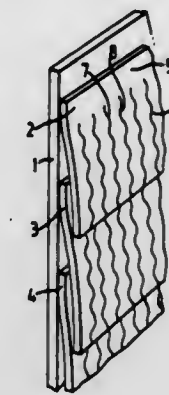
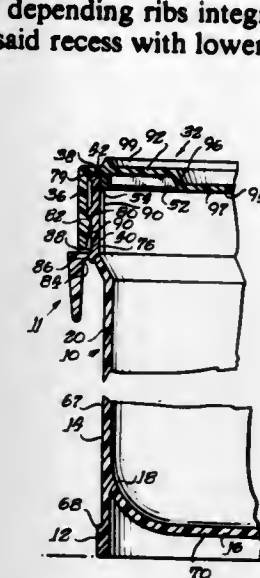
U.S. Cl. 220—306

8 Claims

4. A molded plastic closure for a container having a circular opening and a circular interlocking bead means, said closure comprising a circular top wall, an outer annular skirt depending from said top wall, a circular bead on said outer annular skirt facing radially inwardly to interlock with said circular bead means on the container when the closure is pressed downwardly on the container; an inner annular skirt depending from said top wall concentric with said outer skirt providing a channel between said skirts for receiving the upper rim of the

container; stacking ring means on said upper circular wall of said closure; an annular recess located in said top wall adjacent said inner skirt and extending radially inward; a plurality of depending ribs integral with said closure and located in said recess with lower sides of the ribs extend-

ends remote from the spine, the strands being in the form of flat elongate fronds having edges which include back and forth



bends presenting peaks and valleys, the spines being disposed in parallel rows with the strands of one spine overlapping the spine of the next adjacent row.

4,422,562

**GROUND CONTROL SYSTEM**

James L. Rawson, Oelwein, Iowa, assignor to Rawson Control Systems, Inc., Oelwein, Iowa

Filed May 21, 1981, Ser. No. 266,083

Int. Cl.<sup>3</sup> A01C 15/18

U.S. Cl. 222—55

2 Claims

ing closely adjacent a plane defined by the lower edge of said inner skirt so that the ribs will slide across the container rim to allow the rim to move into said channel and assist in snap fitting the closure onto a container with an interlocking of said closure bead and said container bead means with a downward force applied to the closure.

4,422,560

**FRYPAN LID**

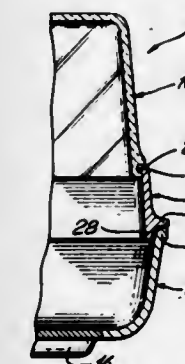
Harry Solomon, Ville St. Laurent, Canada, assignor to Toastess Inc., Pointe Claire, Canada

Filed Aug. 20, 1982, Ser. No. 409,825

Int. Cl.<sup>3</sup> B65D 51/00

U.S. Cl. 220—377

10 Claims



1. A lid for a frying pan, comprising an upper transparent plastic cover and a lower heat resistant plastic collar fixedly connected to said transparent cover and adapted to fit on a rim of said frying pan, said collar acting as a heat insulating body between said cover and said frying pan whereby to prevent heat generated by said frying pan during use from adversely affecting said cover.

4,422,561

**FUEL TANK COMPONENT**

Ronald L. Grosvenor, Wolverhampton, and Michael Fox, Wheaton Aston, both of England, assignors to IMI Marston Limited, Wolverhampton, England

Filed May 18, 1981, Ser. No. 264,692

Int. Cl.<sup>3</sup> B65D 25/16

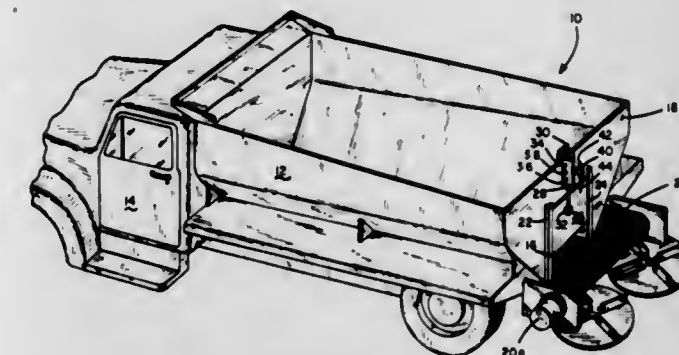
U.S. Cl. 220—461

7 Claims

1. In a fuel tank adapted to self-seal in the event of penetration, a tangling wall formed of a plurality of strips of material secured to the interior of the tank wall, some of the strips being cut so as to provide a plurality of strands having one end joined to a spine of the strip transverse to the strands and having free

1. Application rate control system for controlling opening of metering feedgate of a spreader with respect to vehicle travel speed and conveyor speed, said system comprising:

- means for sensing travel speed of a vehicle, said means comprises a sensor connected to a gear train of said vehicle, means for ratioing said vehicle speed and connected to said travel speed sensing means, and means for incrementally selecting constants of swath width and application rate means for operationally amplifying a generated vehicle speed signal and connected to said ratio means;
- means for sensing speed of a conveyor, said means comprises a sensor connected to a drive gear of said conveyor, means for ratioing width of said conveyor and connected to said conveyor speed sensing means, and means for incrementally selecting constant of density of material, means for operationally amplifying a generated conveyor speed signal and connected to said ratio means;
- means for ratio selecting and connected to said constant selecting means;
- means for differential amplifying output signals of said ratio selecting means and said constant selecting means;
- means for sensing and controlling position of said metering feedgate comprising a double acting hydraulic servo control cylinder and a variable potentiometer for outputting a position control signal, said sensing and controlling means connected between said differential amplifier means and said ratio selecting means; and,
- means for pulse modulating an output signal from said differential amplifier means to said double acting servo control hydraulic cylinder whereby said sensing and controlling





position means generates a closed loop feedback signal thereby providing for control of said metering feedgate with respect to said travel speed and said conveyor speed and said pulse modulation means controls positioning of said metering feedgate.

4,422,563

## NESTABLE POURING SPOUT ASSEMBLIES

Pierre Babiol, Villefranche sur Saone, France, assignor to Societe Nouvelle de Bouchons Plastiques, Anse, France

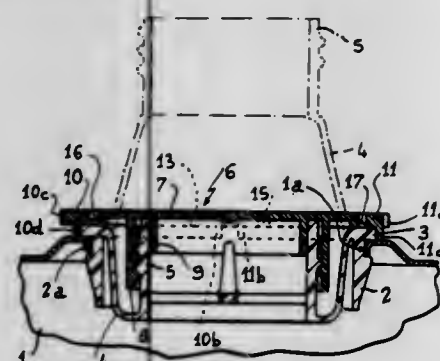
Filed Jul. 13, 1981, Ser. No. 282,624

Claims priority, application France, Jul. 23, 1980, 80 16401

Int. Cl.<sup>3</sup> B65D 25/44, 47/36

U.S. Cl. 222—153

3 Claims



1. A retractable pouring spout assembly for attaching to a container having an opening extending through one of its surfaces, the assembly comprising:

- a collar shaped to be inserted into said opening and be fixed to the container and having an upper periphery, the collar having a flexible tubular sleeve joined thereto and moveable between an upstanding extended position exposing an upper portion of the sleeve for pouring and a retracted position wherein said upper portion is nested within the collar and the container, said upper portion of the sleeve being threaded, and the upper periphery of the collar comprising annular flange means surrounding the collar and overlying the surface of the container;
- a closure cap having a threaded portion adapted to screw onto said upper threaded portion of the sleeve and having a head portion overlying and closing the sleeve, and the head portion having an outer periphery comprising annular half-rings overlying the annular flange means of the collar and having downwardly extending annular rib means surrounding said annular flange means and abutting the surface of the container, the half-rings being integrally connected to the head portion of the cap by multiple frangible bridges, whereby the half-rings can be disengaged from the upper periphery of the collar when the bridges are ruptured; and
- means for preventing unscrewing of the closure cap when the sleeve is nested in the container comprising, mutually interfering protrusions and notches oppositely carried by said annular means of the collar and of the closure cap.

4,422,564

## NEEDLE THREADING DEVICE

Herbert G. Koenig, and Margaret E. Koenig, both of 807 Grossman Ave., Rhinelander, Wis. 54501

Filed Oct. 20, 1980, Ser. No. 198,305

Int. Cl.<sup>3</sup> D05B 87/00

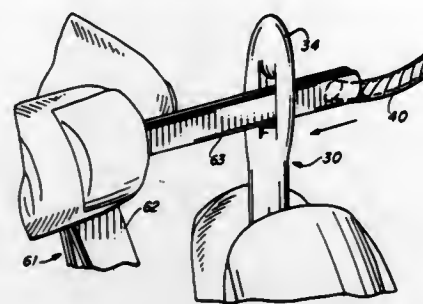
U.S. Cl. 223—99

3 Claims

1. A needle threading apparatus for inserting a thread in the eye of a needle, said apparatus comprising:

- a pair of substantially planar blades of substantially rigid material each having a distal end and a proximal end and being joined at their opposite proximal ends; and
- said blades defining a space therebetween for reception of a section of thread and being substantially equal in

length and being in a normally open position, said blades having a width and thickness so that at least the distal ends of the said blades are adapted to be inserted through the



eye of a needle whereby thread can be inserted between the blades and the blades pinched together and the yarn drawn through the eye of the needle.

4,422,565

## STRIP MATERIAL TRANSPORTING APPARATUS

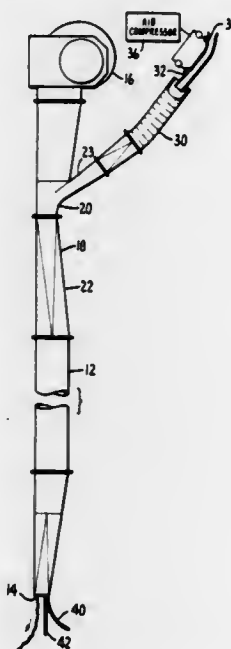
Imants Reba, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Dec. 7, 1981, Ser. No. 328,355

Int. Cl.<sup>3</sup> B65H 17/32

U.S. Cl. 226—97

9 Claims



1. Apparatus for transporting strip materials from a first location to a second location comprising, in combination:

- a first conduit defining an interior leading to said second location;
- a venturi device including a venturi throat and venturi diffuser disposed along said first conduit and in communication with the interior thereof;
- means for generating fluid flow in said first conduit interior and through said venturi throat and diffuser;
- a second conduit leading from said first location to the vicinity of said venturi throat; and
- auxiliary fluid flow generating means for entraining said strip material at said first location and transporting said strip material through said second conduit to said venturi throat.

4,422,566

## ARRANGEMENT FOR GUIDING PRINT WEBS ON CYLINDERS OF ROTARY PRINTING MACHINES

Klaus Goerner, Manfred Dietze, and Rainer Birkner, all of Leipzig, German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

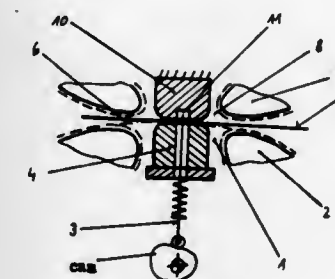
Filed May 13, 1981, Ser. No. 263,466

Claims priority, application German Democratic Rep., May 13, 1980, 221059

Int. Cl.<sup>3</sup> B65H 17/20

U.S. Cl. 226—191

15 Claims



14. An arrangement for guiding and holding a print web moving between cylinders of a rotary printing machine, the cylinders having outer surfaces rolling over one another, the arrangement comprising passage means including at least one passage provided in at least one of the cylinders and being open at the outer surface of the latter; means for preventing slippage of the web between the cylinders and including at least one element which is located in said one passage and extends at least to the outer surface of the one cylinder so as to cooperate with the print web, said element of said slippage preventing means being formed as a needle controllable in a rhythmic manner and arranged to start functioning at a predetermined starting point; and means for controlling said needle in a rhythmic manner, said controlling means being arranged to control said starting point in a rhythmic manner.

4,422,567

## MEDICAL SUTURING DEVICE

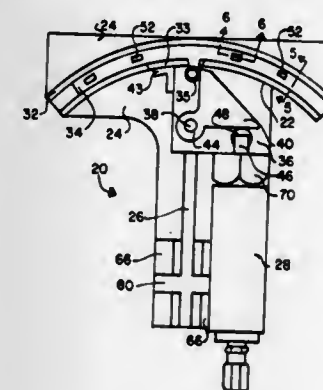
Taylor H. Haynes, Medical Plaza Central #1, Salt Lake City, Utah 84112

Filed Nov. 17, 1981, Ser. No. 322,351

Int. Cl.<sup>3</sup> A61B 17/04

U.S. Cl. 227—19

13 Claims



1. A medical suturing device comprising:

- a base,
- a head removably attached to said base, said base having a portion opposite said head,
- said head including a body member, a rocker plate, a rocker arm rotatably attached to said rocker plate and a wedge, said rocker plate being attached to said body member, said body member including a first means for receiving staples and a second means for receiving said wedge such that said wedge is slidably located in said second means,

said wedge having a portion which abuts the rocker arm, said head also including a third means for attaching to a power mechanism, said third means including a member which abuts said rocker arm and has an in and an extended position, and, a staple driver which extends between said wedge and said staples, wherein when said power mechanism is activated, said member moves from the in to the extended position, rotating said rocker arm which in turn slides said wedge within said first means and drives said staples through a work-piece.

4,422,568

## METHOD OF MAKING CONSTANT BONDING WIRE TAIL LENGTHS

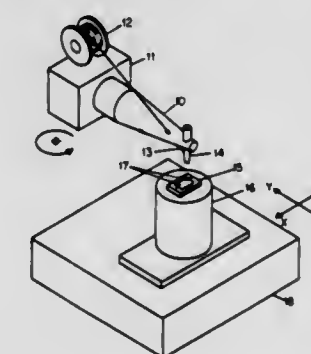
Richard J. Elles, Philadelphia; Razon Ely, Hatboro, and Dan Vilenski, Horsham, all of Pa., assignors to Kulicke and Soffa Industries, Inc., Horsham, Pa.

Filed Jan. 12, 1981, Ser. No. 224,099

Int. Cl.<sup>3</sup> B23K 1/06

U.S. Cl. 228—111

8 Claims



1. The method of forming an exact predetermined shape and length of fine wire under the face of a bonding wedge after making a second wire bond with an automatic wedge bonding machine of the type having a bonding wedge and a non-articulating wire clamp comprising the steps of:

- making a second wire bond at a second bonding point on a semiconductor device to connect the second of two bonding points with a length of fine wire,
- providing an open wire clamp adjacent the rear of said bonding wedge,
- raising said bonding wedge relative to said second bonding point substantially vertically a small predetermined distance to pay out wire below said bonding wedge without permanently deforming the wire,
- moving said bonding wedge laterally relative to said second bonding point to pay out an exact predetermined straight axial length of fine wire under the center of the working face of said bonding wedge without permanently deforming the wire,
- ceasing movement of said bonding wedge relative to said second bonding point long enough to stop movement of said bonding wedge and damp out harmful vibrations,
- closing said wire clamp on said fine wire to fix the length of fine wire extended under the face of said bonding wedge,
- moving said bonding wedge relative to said second bonding point in a predetermined inclined angle direction aligned with the axial direction of said fine wire which maintains said fixed length of straight fine wire under the face of said bonding wedge while simultaneously moving said bonding wedge substantially vertically relative to said second bonding point, thereby
- breaking said straight fine wire at a point adjacent said second wire bond, and
- leaving a predetermined length of said straight fine wire inclined under the working face of said bonding wedge which is formed at a predetermined angle between the working face of said bonding wedge.



4,422,569

## FORMING METAL ARTICLES

Dennis J. Payne; Martin H. Mansbridge; John Norton, and Sidney J. Swadling, all of Milton, England, assignors to British Aerospace Public Limited Company, London, England

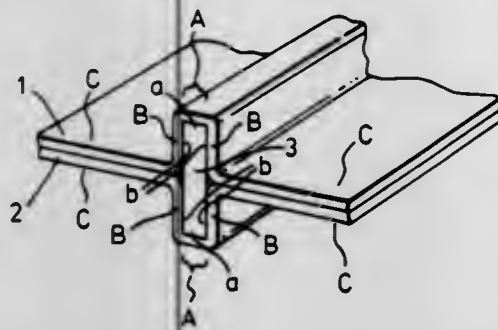
Filed Feb. 13, 1981, Ser. No. 234,265

Claims priority, application United Kingdom, Feb. 15, 1980, 8005255

Int. Cl.<sup>3</sup> B23K 31/00

U.S. Cl. 228—173 C

7 Claims



1. A method of forming a stiffened metal panel including a web region and a flange region to stiffen the panel, which method includes the step of:

- placing two sheet members of a superplastically deformable material in opposed, spaced-apart relationship to either side of a reinforcing structure;
- heating the two sheet members to a temperature range within which superplastic deformation can take place;
- urging respective first regions of the two sheet members against respective opposed regions of the reinforced structure;
- superplastically deforming, by gaseous pressure, the remaining portions of the sheet members so that they bulge towards each other;
- continuing said superplastic deformation of the sheet members until respective second regions of each, adjacent the respective first regions, are urged against the reinforcing structure and respective third regions of which adjacent the respective second regions are urged, solely by gaseous pressure to meet each other in a common substantially planar region lying intermediate said opposed regions of the reinforcing structure; and
- bonding the third regions of one sheet member to those of the other to form said web region, and the reinforcing structure, together with respective first and second regions of the sheet members defining said flange region.

4,422,570

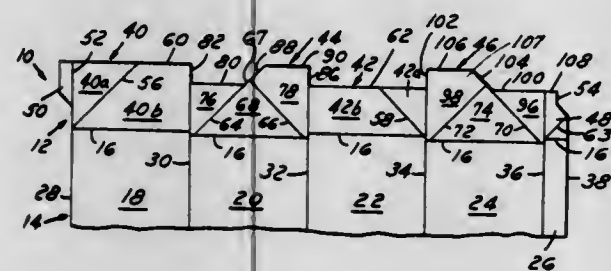
FLAT TOP END CLOSURE FOR LIQUID CONTAINERS  
Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 24, 1982, Ser. No. 411,739

Int. Cl.<sup>3</sup> B65D 5/74

U.S. Cl. 229—17 R

6 Claims



1. A flat top end closure for a liquid carrying, paperboard container having a tubular body, said flat top end closure comprising two oppositely disposed fold-in panels, one of which serves as a pouring spout, and two oppositely disposed outer closure panels, said fold-in panels each including a sub-

stantially triangular panel portion defined by converging diagonal score lines and being integrally connected to said tubular body, and a pair of fold-back panels integrally connected to and folded between said substantially triangular panel portion and the respective adjacent outer closure panels, said two oppositely disposed outer closure panels including one shorter and one longer panel, with the edge portion of said longer panel overlapping said shorter panel, a lift tab formed on a side edge of said longer panel for lifting the portion of said longer panel which overlies said pouring spout and the one fold-back panel adjacent thereto, and a lift tab formed on the other of said fold-back panels for first lifting said other fold-back panel and the portion of said shorter closure panel which overlies said other fold-back panel and then opening the full infolded panel into a pouring spout.

4,422,571

## PROPORTIONAL MOTOR DRIVE CONTROL

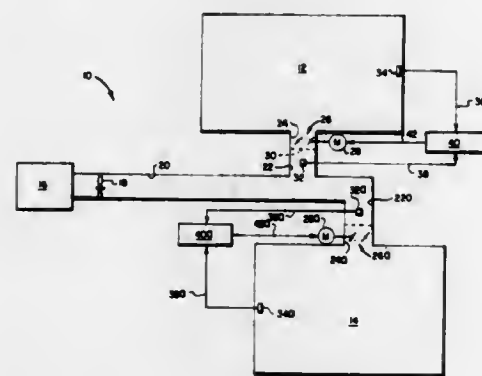
William W. Bowman, Dallas, Tex., assignor to Hoffman Controls Corp., Dallas, Tex.

Filed May 22, 1981, Ser. No. 266,461

Int. Cl.<sup>3</sup> F24F 7/00; F25D 17/04

U.S. Cl. 236—49

7 Claims



1. In a method for providing a drive control signal to a damper motor for opening and closing a damper in a system for supplying conditioned air to a room through a duct, the improvement comprising:

- comparing an electrical signal proportional to the temperature in the said room with an electrical signal proportional to the velocity of air flow through said duct, and
- driving said damper motor to operate said damper in a direction determined by the greater of said temperature signal or the said velocity signal.

4,422,572

## ENGINE COOLING WATER CIRCULATION SYSTEM

Yukio Sakurai, Atsugi; Masao Okajima, Yamato, and Arifumi Inoue, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 4, 1981, Ser. No. 327,489

Claims priority, application Japan, Dec. 22, 1980, 55-184600[U]

Int. Cl.<sup>3</sup> B60H 1/02

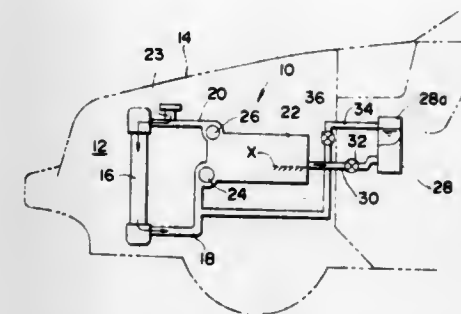
U.S. Cl. 237—12.3 B

9 Claims

1. An engine cooling water circulation system for an engine having a water jacket therein, comprising:

- a radiator having a water inlet thereon;
- a first hose for feeding cooled water from the radiator to the engine water jacket;
- a second hose for feeding heated water from the engine water jacket to said radiator;
- a heater core of a passenger room heater;
- a third hose leading from the engine water jacket to a lower portion of said heater core for feeding the heated water from said engine water jacket to said heater core;
- a fourth hose leading from an upper portion of said heater core to said first hose for feeding the cooled water from

said heater core to said first hose, said lower portion being positioned at a lower level than said upper portion; and valve means disposed in said fourth hose at a portion near said upper portion of said heater core, said valve means being capable of providing a communication between said interior of said heater core and the open air under a certain condition, said valve means comprising a two-way valve which has



first and second conditions, said first condition being a condition wherein the communication between the heater core and said first hose is established while blocking the communication between the interior of said heater core and the open air, and said second condition being a condition wherein the communication between the interior of said heater core and the open air is established while blocking the communication between the heater core and said first hose.

4,422,573

## HEATING SYSTEM

Frederick R. Morgan, Marlow, England, assignor to Radiant Tube Systems Limited, London, England

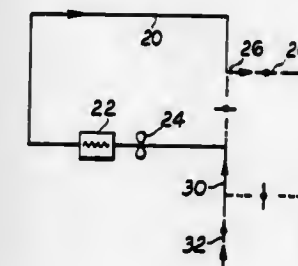
Filed Dec. 18, 1981, Ser. No. 332,014

Claims priority, application United Kingdom, Nov. 5, 1981, 8133360

Int. Cl.<sup>3</sup> F24H 3/00

U.S. Cl. 237—70

4 Claims



1. A space heating system comprising an endless loop of duct suspended high in the said space, said duct having an exposed lower surface arranged to radiate heat when said duct is heated, having an upper surface insulated against heat loss and having lateral surfaces provided with convection spoilers to minimize heat transfer by currents of ambient air flowing past said surfaces, a fan in said loop for moving gases in and along said loop, and an auxiliary heater which is arranged to heat gases flowing in said loop and is located adjacent to the downstream side of the fan, wherein the improvement comprises

- a branch duct having its one end connected to a source of process gas combustion products and its other end connected to said loop adjacent to the upstream side of the fan,
- a dampered fresh air inlet connected to said branch duct for diluting the process gas to limit its temperature,
- a damper in said branch duct, between said air inlet and the source of process gas, which can be closed to permit said loop to be purged with air,
- a dampered outlet connected to said loop at a point remote from the downstream side of the fan, and
- a damper in said loop between said outlet and said branch duct to control recirculation.

- a dampered outlet connected to said loop at a point remote from the downstream side of the fan, and
- a damper in said loop between said outlet and said branch duct to control recirculation.

4,422,574

## SPRAY ENROBER NOZZLE CONSTRUCTION WITH REMOVABLE AND INTERCHANGEABLE COMPONENTS

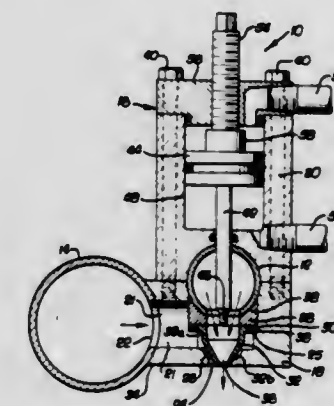
James Mancuso, Jr., Huntington Beach, Calif., assignor to Par-Way Manufacturing Co., Costa Mesa, Calif.

Filed Jan. 25, 1982, Ser. No. 342,118

Int. Cl.<sup>3</sup> B05B 15/02

U.S. Cl. 239—118

1 Claim

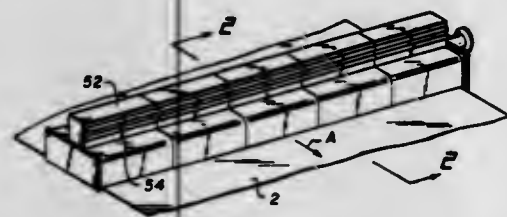


1. In an enrober for applying an ingredient spray to food products, an ingredient spray apparatus comprising:

- a spray air tube for carrying spray air to assist in the spray of a food ingredient;
- a first housing section defining a round outer orifice, a shoulder at least partially surrounding said outer orifice and an air conduit connecting said spray air tube to said outer orifice;
- a plurality of separately formed interchangeable nozzle pieces each having a ring-shaped portion adapted to be seated on said shoulder and an inner orifice defining a portion that is at least partially conical depending from said ring-shaped portion and adapted to be disposed within said outer orifice;
- a second housing section removably secured to said first housing section;
- an ingredient tube for carrying said food ingredient, said ingredient tube extending between said first and second housing sections and defining an ingredient opening that communicates through an installed one of each nozzle pieces with said inner orifice thereof;
- a connection piece disposed between said nozzle piece and said ingredient tube;
- a sealing member disposed between said installed nozzle piece and said connection piece;
- a plurality of interchangeable cleanout plungers, each corresponding to one of said nozzle pieces and adapted to extend through said ingredient tube in alignment with said inner orifice;
- pneumatic means disposed within said second housing section for causing periodic reciprocation of said plunger; and
- means for adjusting the home position of said plunger with reference to said inner orifice.

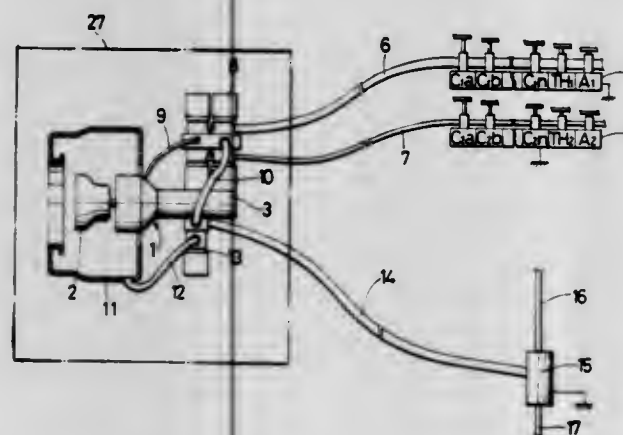


**4,422,575**  
**STEAM DISTRIBUTOR WITH PLUG VALVE**  
 Norman F. Dove, 1493 Crown St., North Vancouver, British Columbia, Canada V7J 1G4  
 Filed Aug. 17, 1981, Ser. No. 293,113  
 Int. Cl.<sup>3</sup> A62C 37/20  
 U.S. Cl. 239—562 10 Claims



1. A steam distributor to apply steam to a paper sheet moving beneath it, the distributor comprising:  
 a steam supply header;  
 a chamber to receive steam from the header;  
 outlets in the chamber whereby steam is passed to the paper sheet;  
 first pipes communicating the header with the chamber;  
 an outlet for each first pipe in the chamber;  
 an inlet for each first pipe to allow steam into the pipe from the header;  
 a valve member extending to an open end of each first pipe and co-operating with the open end to control the flow of steam through the open end;  
 means to reciprocate the valve member towards and away from the open end of the pipe;  
 first locating means locating the valve member in the distributor; and  
 second locating means locating each first pipe relative to the first locating means to maintain the pipe in constant alignment with the valve member.

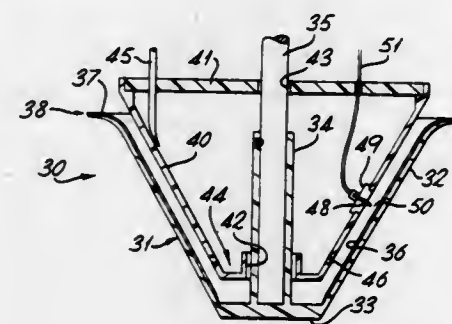
**4,422,576**  
**ELECTROSTATIC COATING MACHINE AND METHOD OF CHANGING COLOR OF PAINTS THEREBY**  
 Eiji Saito, Kamakura; Shoji Aizawa; Michio Mitsui, both of Yokohama; Tomohiko Miyata, Tokyo, and Masayuki Kuroda, Kawasaki, all of Japan, assignors to Ransburg Japan, Ltd., Tokyo, Japan  
 Filed Jul. 24, 1981, Ser. No. 287,818  
 Claims priority, application Japan, Aug. 4, 1980, 55-106955  
 Int. Cl.<sup>3</sup> B05B 5/04  
 U.S. Cl. 239—693 2 Claims



1. An electrostatic coating machine comprises:  
 a coating machine main body having a rotary atomizing head which is applied with a high voltage and a cleaning shroud reciprocatingly provided to move between a position surrounding said rotary atomizing head and retracted therefrom;  
 first and second color change valve mechanisms respec-

tively being adapted to feed a plurality of paints and cleaning fluids to said rotary atomizing head;  
 first and second paint feed pipes, each having one end connected with said first and second color change valve mechanisms respectively;  
 a first change-over valve being connected with the other ends of said first and said second paint feed pipes and provided at a position close to said rotary atomizing head;  
 a third paint feed pipe connected between said first change-over valve and said rotary atomizing head to allow supplying paint and cleaning fluid selectively from either of said first paint feed pipe and said second paint feed pipe with said rotary atomizing head by way of said first change-over valve;  
 a first drain pipe being connected to said first change over valve in such a manner as to drain paint and cleaning fluid selectively from one of said first paint feed pipe and said second paint feed pipe;  
 a second drain pipe connected to said cleaning shroud for draining cleaning fluid flowing out of said cleaning shroud;  
 a third drain pipe communicating with said first drain pipe;  
 a second change-over valve provided between said second drain pipe and said third drain pipe, and adapted to selectively bring said second drain pipe into communication with said third drain pipe;  
 a discharge suction communicating with said third drain pipe for forcibly discharging fluid from said third drain pipe; and  
 wherein said cleaning shroud, said first change-over valve and second change-over valve are disposed in a high voltage section at the same potential as said rotary atomizing head when a high voltage is applied to said rotary atomizing head, and wherein each of said first and second color change valve mechanisms and said discharge section are disposed on the side of the ground.

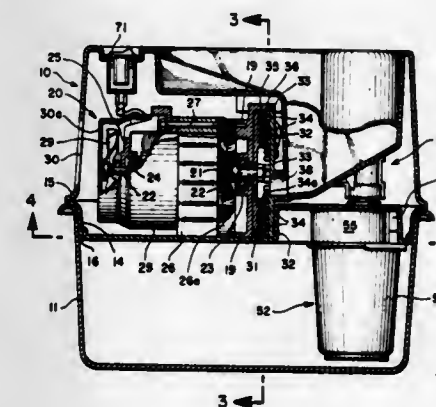
**4,422,577**  
**ELECTROSTATIC SPRAYING**  
 Arthur J. Arnold, Harpenden, and Barry J. Rye, Luton, both of England, assignors to National Research Development Corporation, London, England  
 Filed Jul. 30, 1981, Ser. No. 288,372  
 Claims priority, application United Kingdom, Aug. 6, 1980, 8025570  
 Int. Cl.<sup>3</sup> B05B 5/04  
 U.S. Cl. 239—703 13 Claims



1. Apparatus for the electrostatic spraying of liquid comprising a high capacity nozzle having: inlet means for admitting a supply of liquid; a rotatable member having an internal liquid distribution surface disposed in use about a substantially vertical axis to receive the liquid at a first level such that on rotation the liquid is centrifugally atomised from a circumferential edge of the member at a second level higher than the first level, at least a part of the distribution surface between the first and second levels being conductive and the conductive surface being substantially electrically isolated from metallic electrical connection; and electrode means so spaced within the rotatable member that conduction occurs in an air path between the electrode means and the conductive surface such that the

conductive surface is maintained substantially at the electrode potential, the conductive surface being of such extent relative to the position of the electrode means that the electrode means is substantially shielded from any direct leakage path to an external surface at earth potential and the flow of liquid over the conductive surface being effective to charge the liquid before atomisation.

**4,422,578**  
**ROTARY GRAIN MILL HAVING MEANS FOR CONTROLLING AIR AND GRAIN FLOW THERE THROUGH, AND METHOD**  
 Leon R. Scott, Sandy, Utah, assignor to Stratford Squire International, Salt Lake City, Utah  
 Filed Sep. 4, 1981, Ser. No. 299,499  
 Int. Cl.<sup>3</sup> B02C 7/11  
 U.S. Cl. 241—6 8 Claims

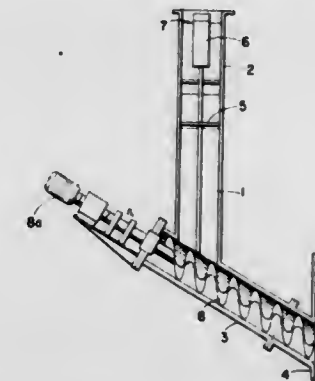


1. A rotary mill for milling particulate grain material, comprising a housing; a first disc having radially spaced concentric rows of teeth extending therefrom, said disc being mounted for rotation in said housing; a second disc having radially spaced concentric rows of teeth extending therefrom and mounted in the housing in spaced, confronting axial alignment with the first disc so that the rows of teeth on the first and second disc overlap forming alternating rows of radially spaced, interposed teeth; means for rotating the first disc relative to the second; inlet means for supplying grain and air to the area between the discs inwardly of the innermost row of teeth; outlet means for air and material that has passed radially through the interposed rows of teeth; means in substantially air-tight communication with the outlet means for collecting the milled grain material from the outlet; and air valve means in communication with the collecting means for controlling the amount of air flow from and through the collecting means, which, in turn, controls the air flow through the mill.

**4,422,579**  
**FEEDING DEVICE FOR A JET MILL**  
 Jouko Niemi, 33960 Pirkkala 6, Pirkkala, Finland  
 Filed Nov. 23, 1981, Ser. No. 324,085  
 Claims priority, application Finland, Nov. 25, 1980, 803663  
 Int. Cl.<sup>3</sup> B02C 19/06  
 U.S. Cl. 241—39 9 Claims

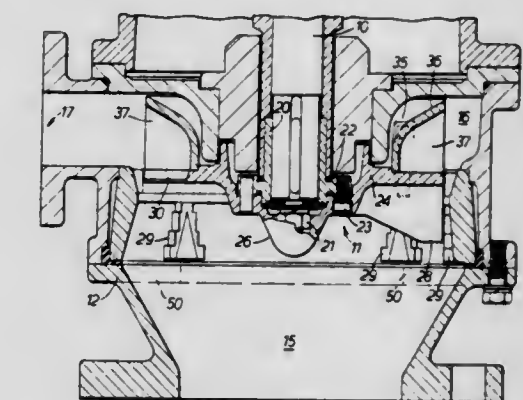
1. A combined jet mill and device for feeding particulate material thereto and simultaneously disintegrating any clogged material, comprising:  
 a jet mill having an inlet for receiving particulate material;  
 a substantially vertical plug pipe having an upper inlet opening and a lower outlet opening;  
 a feed funnel for receiving particulate material connected to said inlet opening of said plug pipe;  
 at least one plunger means arranged for operation in said feed funnel and cooperable with at least one wall of said funnel to force particulate material from said funnel into said plug pipe to form a plug of material in said plug pipe; said at least one plunger means comprising a cylinder connected to said feed funnel and a plunger piston movably

mounted to said cylinder and in said feed funnel toward said inlet opening of said plug pipe;  
 an additional pipe connected to said outlet opening of said plug pipe and having an end connected to said inlet of said jet mill, for receiving compressed particulate material in the form of the plug from said pipe; and



a screw feeder rotatably mounted in said additional pipe for conveying and disintegrating the material from said plug pipe to said jet mill;  
 whereby the plug of particulate material formed in said plug pipe by said at least one plunger means forms a gas-tight plug against admission of gas from said jet mill into said funnel.

**4,422,580**  
**MACERATOR PUMPING IMPELLER**  
 Nigel R. C. Shepherd, Ross-on-Wye, and Graham M. Preece, Checkley, both of England, assignors to The Haigh Engineering Co. Ltd., United Kingdom  
 Filed Jun. 9, 1981, Ser. No. 272,023  
 Claims priority, application United Kingdom, Jun. 11, 1980, 8019074  
 Int. Cl.<sup>3</sup> B02C 23/36  
 U.S. Cl. 241—46.11 5 Claims



1. A macerator including a casing, a shaft mounted in said casing, an impeller mounted on the shaft and having at least one slot passing axially therethrough, said impeller having on its upstream side upstanding fins and on its downstream side an outwardly flared annular member on which is mounted a number of external radial vanes, said casing and said impeller defining a discharge chamber about said outwardly flared annular member, said discharge chamber being sized with respect to said annular member such that rotation of said annular member therein creates a pumping effect on effluent in said discharge chamber and on effluent upstream of said impeller adequate to draw further effluent through said at least one slot.

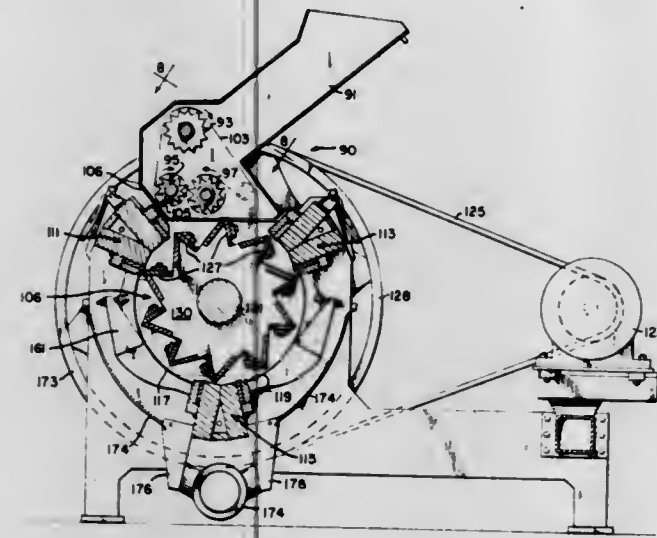


**4,422,581**  
**APPARATUS FOR RECOVERING RUBBER FROM RUBBER TIRES**  
 Milton R. Chryst, 7025-125th Ave. SE., Snohomish, Wash. 98290

Filed Jan. 15, 1981, Ser. No. 225,434  
 Int. Cl.<sup>3</sup> B02C 18/06

U.S. Cl. 241—66

43 Claims



1. An apparatus for granulating rubber, comprising: means for feeding rubber-containing material, such as tires, into the apparatus; cutting chamber means which includes at least three stationary cutting blade stations located around the inner circumference of the cutting chamber means, wherein a first stationary cutting blade station is located substantially at the bottom center of the cutting chamber means, and wherein the second and third stationary cutting blade stations are located in the upper half portion of the circumference of the cutting chamber means, on opposite sides thereof, each of said stationary cutting blade stations including at least one stationary cutting blade, the cutting chamber means further including at least one set of rotary cutting blades, mounted so as to rotate within the cutting chamber means, the rotary cutting blades passing the stationary cutting blades in a cutting relationship thereto, wherein the relative spacing of the stationary cutting blade stations and the rotary cutting blades in the one set thereof is such that only one rotary cutting blade is contacting a stationary cutting blade in a cutting relationship at any one time, so as to significantly reduce the vibration of the apparatus in operation, which in turn increases the durability of and extends the life of the apparatus, said cutting chamber means further including screen means which extend between said first cutting blade station and the second and third cutting blade stations, respectively, said screen means permitting granules of desired size to fall therethrough; and means for rotating the rotary cutting blades within the cutting chamber means.

**4,422,582**  
**FOOD PROCESSING MACHINE**  
 Carl R. Roeger, Troy; William D. Miller, Bradford, and Charles R. Goodin, Troy, all of Ohio, assignors to Hobart Corporation, Troy, Ohio

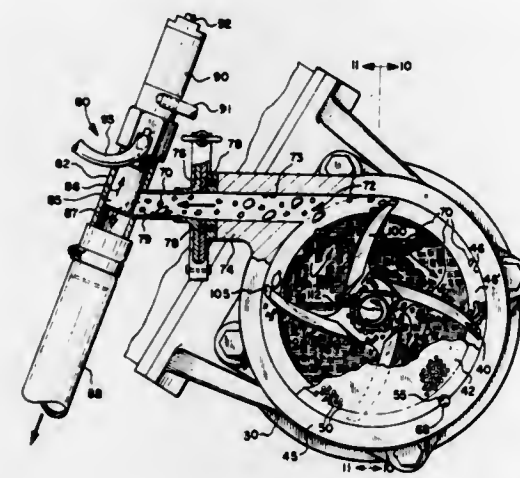
Filed Oct. 22, 1981, Ser. No. 313,532  
 Int. Cl.<sup>3</sup> B02C 18/36

U.S. Cl. 241—82.5

2 Claims

1. In a meat grinder having bone chip removal and including a cylinder, a grinding plate at a discharge end of said cylinder, a screw rotatably mounted therein for conveying a meat product to said grinding plate, and a knife mounted on the end of said screw at the grinding plate for cutting the meat product, the improvement comprising the combination of:

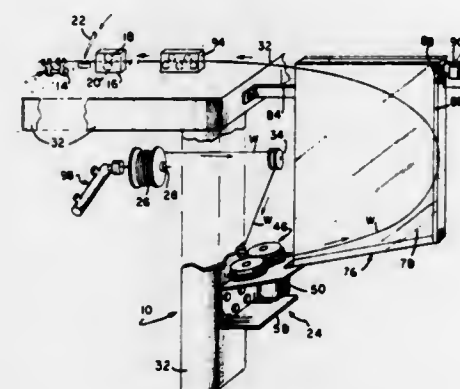
means in said cylinder immediately axially inwardly of said grinding plate defining a bone chip discharge outlet, said grinding plate having a pattern of extrusion holes therethrough, which pattern terminates radially inwardly of the plate periphery to form an outer solid annular perimeter, a knife having an integral central hub and blades with tips thereof extending radially beyond said hole pattern and sweeping in close proximity to the inside surface of said cylinder, said blades being of substantially uniform depth in an axial direction throughout their lengths, each blade having a forward surface generally normal to a radial plane therethrough, said forward surface being



formed with a curvature in the radial direction which recedes from the hub opposite to the direction of rotation of the knife so that bone chip fragments encountering said forward surfaces are provided with an outward force component tending to move said chips toward the tips of said blades, said blades effectively sealing off arcuate segments of space between adjacent blades and thereby providing a series of spaces for entrapment of said bone chips for purging through said discharge outlet, a conduit leading from said discharge outlet, and valve means in said conduit for opening said conduit to discharge into a region of low pressure whereby accumulated meat product rich with bone chips or the like is removed from said perimeter region.

**4,422,583**  
**WIRE FEEDER**  
 Richard B. Maxner, and Vitaly Bandura, both of Danvers, Mass., assignors to USM Corporation, Farmington, Conn.  
 Filed Dec. 14, 1981, Ser. No. 330,265  
 Int. Cl.<sup>3</sup> B65H 59/00, 59/04, 51/20, 59/38  
 U.S. Cl. 242—45

3 Claims



1. A wire feeder for removing wire from a reel of wire and feeding the wire to a wire length cutting station at a constant feed pressure so that a consistent length of wire can be cut from the reel including:

a. feed means for removing the wire from the reel and a

spring biased idler pulley positioned between the reel and the feed means to maintain the wire between the reel and feed means under constant tension;

b. said feed means comprising a pair of rollers for frictionally engaging the wire and drawing the wire from the reel, a motor for driving at least one of said rollers, said rollers having inter-engaging gear teeth so that rotation of one roller by the motor causes an opposite rotation of the other roller so that the rollers can draw the wire off the reel;

c. a guide housing adjacent said feed means to receive the wire from the said feed means to contain the wire in a predetermined configuration;

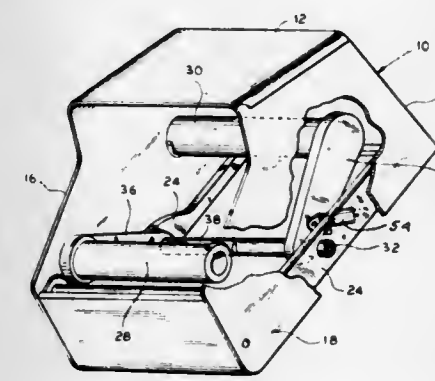
d. said guide housing comprising opposed spaced side wall members which receive the wire and an end wall against which the wire comes in contact;

e. said end wall being pivotally mounted to said side wall members and having means controlling a limit switch which controls the operation of the roller motor so that as wire is fed into the guide housing and contacts the end wall, the limit switch will be energized to shut off the roller motor so that additional wire will not be fed into the guide housing;

f. means to draw the wire out of the guide housing and cut the wire to a desired length at the length cutting station so that as wire is removed from the guide housing, the wire will no longer contact the end wall so that the limit switch can again be operated to energize the roller motor causing the rollers to withdraw more wire from the reel into the guide housing so a consistent length of wire is present in the guide housing under a constant feed pressure which is isolated from the reel.

**4,422,584**  
**TOILET PAPER DISPENSER WITH SWINGING MANDRELS**  
 Merwin J. Dashnier, James A. Diring, and Donald G. Krueger, all of Green Bay, Wis., assignors to Wisconsin Tissue Mills, Inc., Menasha, Wis.  
 Filed Oct. 9, 1981, Ser. No. 309,946  
 Int. Cl.<sup>3</sup> B65H 19/04  
 U.S. Cl. 242—55.3

4 Claims



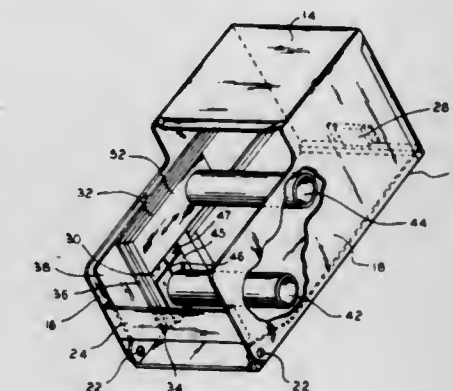
1. In a toilet paper dispenser having wall means defining a housing and a dispensing opening, the improvement comprising:

- (1) first and second mandrels;
- (2) support means for supporting the mandrels from a common pivot; and
- (3) engagement means on the support means to cause movement of the second mandrel from a storage position to a free swinging position so that the second mandrel can swing about the pivot by gravity to a lower dispensing position upon movement of the first mandrel from a dispensing position to an exhausted core storage position, the engagement means not being engaged when the second mandrel is in its free swinging position.

**4,422,585**  
**TOILET PAPER DISPENSER WITH SLIDING MANDRELS**

Arthur N. Schultz, James A. Diring, and Donald G. Krueger, all of Green Bay, Wis., assignors to Alwin Manufacturing Company, Inc., Green Bay, Wis.  
 Filed Sep. 21, 1981, Ser. No. 304,721  
 Int. Cl.<sup>3</sup> B65H 19/08, 49/00  
 U.S. Cl. 242—55.53

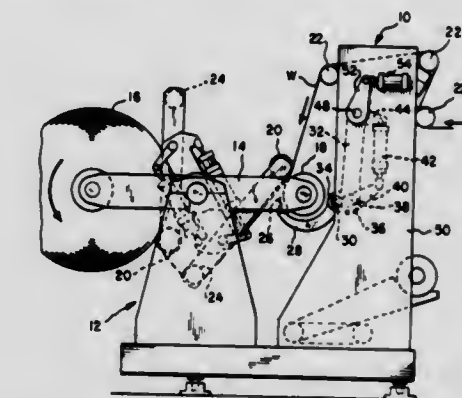
3 Claims



1. In a paper roll dispenser, including wall means defining an enclosure having an access opening for access to rolls of paper stored therein for dispensing therefrom, the improvement comprising first and second roll supporting mandrels, guide means on said wall means, said guide means including first and second intersecting track portions, slide block means integrally connected to said mandrels for supporting said mandrels in said guide means to afford first and second positions for each of said mandrels within said track portions with said slide block means for said first and second mandrels engaging and supporting said second mandrel in a first position in said track portions above said first mandrel a first position at said intersection of said first and second track portions and blocking downward movement of said second mandrel to said second position for dispensing when said mandrels are in said first position, and said first mandrel is in said first position for dispensing.

**4,422,586**  
**METHOD AND APPARATUS FOR ROLL CHANGING**  
 Richard S. Tetro, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio  
 Filed Nov. 27, 1981, Ser. No. 325,445  
 Int. Cl.<sup>3</sup> B65H 19/26, 19/28  
 U.S. Cl. 242—56 R

12 Claims



1. A method of severing a web being wound on a winding machine, including the steps of:

- applying an adhesive strip on the outer surface and extending along the length of a new core upon which web is to be wound;
- positioning the new core adjacent but out of engagement with a free running span of the web and rotating said core;
- positioning a cutting blade in stationary location adjacent



said core and adjacent to but out of engagement with said web downstream of said core; and urging said web into engagement with said rotating core so that said adhesive strip will engage the surface of said web across its width and adhere thereto and cause said web to engage said blade so as to be severed thereby adjacent said adhesive strip while a leading edge of severed web remains adhered to said adhesive strip to cause said web to be wound on said core.

#### 4,422,587 MACHINE FOR SLITTING STRIPS OF SHEET MATERIAL

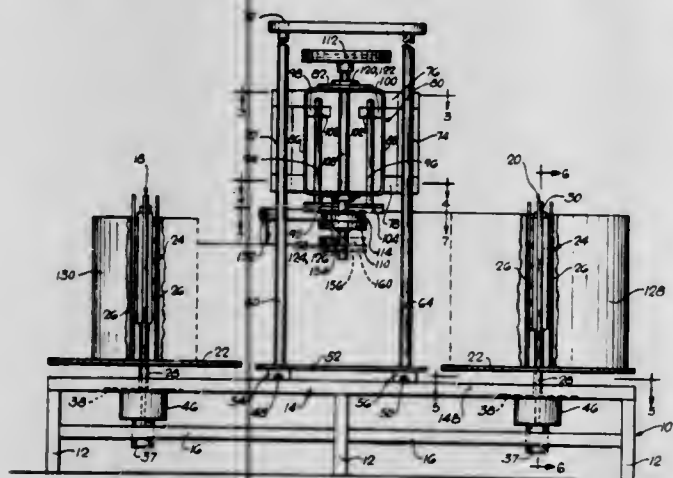
Theodore Primich, Merrillville, Ind., assignor to Gary Steel Products Corp., Gary, Ind.

Filed Dec. 19, 1980, Ser. No. 218,220

Int. Cl.<sup>3</sup> B65H 35/02

U.S. Cl. 242-56.2

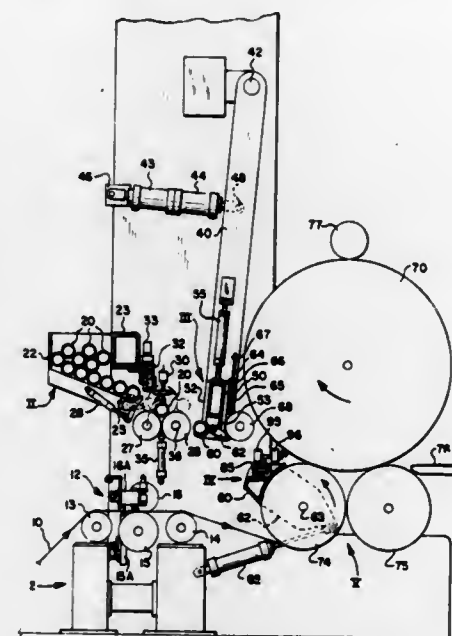
14 Claims



1. A device for slitting a narrow strip from a wider coil of elongated strip of sheet material comprising, in combination: a frame, a first mandrel and a second mandrel, said mandrels being adapted to receive the coil of sheet material, means for mounting the first mandrel and second mandrel at spaced locations along an axis on the frame, said first mandrel and second mandrel being rotatable with respect to the frame about parallel spaced axes, a carriage, means for mounting the carriages on the frame between the first mandrel and second mandrel for translation along an axis of elongation normal to the axis between the first mandrel and the second mandrel, a pair of shafts, means for mounting the shafts on the carriage for rotation about spaced parallel axes, said shafts being generally parallel to the axes of the first and second mandrel, a first circular knife mounted on one shaft of said pair for rotation about the center thereof in a plane normal to the one shaft and a second circular knife mounted on the other for rotation about the center thereof in a plane normal to said other shaft of said pairs, the perimeter of said knives being adjacent to each other to form a cutting interface, means for positioning said knives at a controlled position between the frame and the edge of the elongated strip opposite the frame, and means for translating the elongated strip from one mandrel to the other mandrel.

4,422,588  
**SLITTER-REWINDER SYSTEM**  
Heinz K. Nowisch, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio  
Filed Sep. 28, 1981, Ser. No. 305,821  
Int. Cl.<sup>3</sup> B65H 19/00, 35/02, 37/02; B32B 31/18  
U.S. Cl. 242-56.3

12 Claims



1. A slitter-rewinder system comprising: a slitter having knives movable into a plurality of preselected transverse positions, a core cutter section comprising means for supporting a core, core cutting means positioned adjacent said core support means and movable transversely into a plurality of preselected positions corresponding to the positions of said slitter knives and operable to cut a core thereon into a plurality of core sections corresponding in length and position to the corresponding transverse spacing and placement of said slitter knives, a pair of winder drums for receiving a slit web from said slitter for winding on a core, transporter means for carrying said core sections from said core support for placement in said winder drums, a combined web cutting and adhesive applying section, including a transverse support positioned adjacent said winder drums, a carriage mounted for movement transversely of said support, said carriage having cutter means for severing said web between said winder drums and a wound roll, said carriage further having adhesive applicator means thereon for applying an adhesive to the trailing end of the web from the roll so that the same may be secured to the roll and for applying adhesive to the lead end of the web for application to a core in winding position on said winder drums.

4,422,589  
**FRICTION TRANSMITTING APPARATUS**  
Hitoshi Okada, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,566

Claims priority, application Japan, Sep. 30, 1980, 55-138831

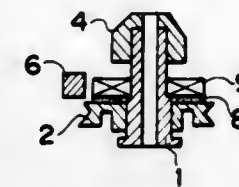
Int. Cl.<sup>3</sup> B65H 17/02; H02K 49/10

U.S. Cl. 242-68.1

1 Claim

1. A force transmitting apparatus for use in a magnetic recording/reproducing apparatus, which comprises: a rotatable reel shaft provided in the magnetic recording/reproducing apparatus, said reel shaft having a reel-driving hub mounted on one end thereof; an annular driving pulley coaxially mounted on said reel shaft for rotation with respect thereto, said driving pulley having a coaxial, annular, flat, axial end face facing toward said one end of said reel shaft; a coaxial, annular, magnetically attractable, flat disc affixed to said axial end face of

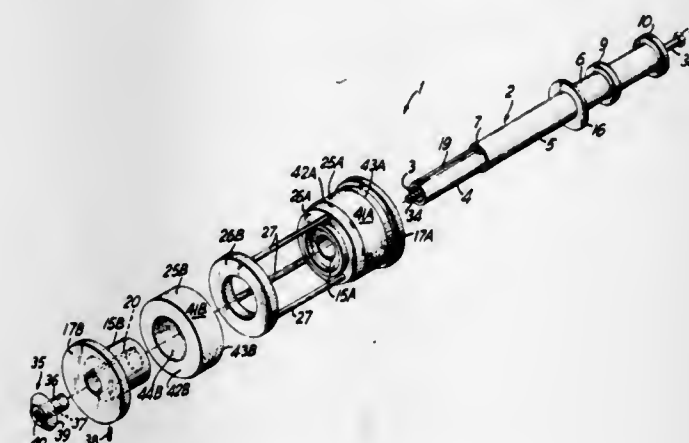
said driving pulley for rotation therewith; a coaxial, annular, flat magnet affixed to said reel shaft and located between said reel-driving hub and said pulley, said magnet being disposed in coaxial, opposed relationship to said disc so that said disc is attracted to said magnet whereby said driving pulley is mag-



netically held in driving engagement with said magnet and thereby with said reel shaft; and a detector for detecting rotation of said magnet, said detector being disposed between said reel-driving hub and said pulley at a location radially outwardly from the periphery of said magnet.

4,422,590  
**STUB SHAFT**  
James W. Rathbone, Waynesville, N.C., assignor to Champion International Corporation, Stamford, Conn.  
Filed Sep. 17, 1981, Ser. No. 302,980  
Int. Cl.<sup>3</sup> B23B 5/22, 31/40; B65H 75/18  
U.S. Cl. 242-68.3

3 Claims



1. A stub shaft assembly comprising: (a) a hollow shaft having a through bore; (b) a fixed chuck removably mounted on said shaft, said fixed chuck having an outer circumferential portion having a smooth surface and a radially outwardly extending flange disposed adjacent to said outer circumferential portion of said fixed chuck; (c) a first elastomeric gripping ring mounted on said outer circumferential portion of said fixed chuck; (d) a first pressure plate mounted on said outer circumferential portion of said fixed chuck whereby said first elastomeric gripping ring is sandwiched between said first pressure plate and said flange on said fixed chuck; (e) a sliding chuck removably slidably mounted on said hollow shaft, said sliding chuck having an outer circumferential portion having a smooth surface and a radially outwardly extending flange disposed adjacent to said outer circumferential portion of said sliding chuck; (f) a second elastomeric gripping ring mounted on said outer circumferential portion of said sliding chuck; (g) a second pressure plate mounted on said outer circumferential portion of said sliding chuck whereby said second elastomeric gripping ring is sandwiched between said second pressure plate and said flange on said sliding chuck; (h) means keying said sliding chuck to said hollow shaft to allow reciprocal sliding movement of said sliding chuck on said hollow shaft while preventing rotational movement of said sliding chuck on said hollow shaft; (i) a thrust member mounted in a bore in said sliding chuck, said thrust member having a threaded bore and having a

- thrust surface bearing against an end surface of said sliding chuck;
- (j) means keying said thrust member to said sliding chuck to prevent said thrust member from rotating within said sliding chuck bore;
- (k) a rod disposed in said through bore in said hollow shaft, said rod having a threaded end which threadedly engages said threaded bore in said thrust member, and said rod also having an opposite profiled end which enables rotation of said rod within said through bore of said hollow shaft;
- (l) force transmitting means extending between opposed surfaces of said first and second pressure plates; and
- (m) rotation of said rod in one direction being operable through said thrust member to move said sliding chuck toward said fixed chuck to cause said pressure plates to compress said elastomeric gripping rings axially by reason of said force transmitting means whereby the outer diameters of said gripping rings are expanded.

4,422,591  
**SHAFT HAVING MEANS FOR RETAINING THEREON A REEL, MATERIAL ROLL OR SIMILAR ARTICLE**  
Johannes D. van Maanen, Berkel en Rodenrijs, Netherlands, assignor to Teuopharm-Schiedam B.V., Schiedam, Netherlands

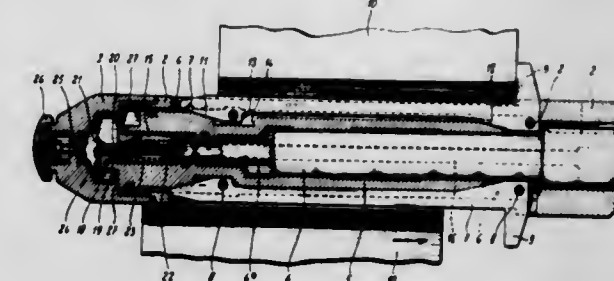
Filed Dec. 8, 1981, Ser. No. 328,515

Claims priority, application Netherlands, Jun. 11, 1981, 8102815

Int. Cl.<sup>3</sup> B65H 75/24

U.S. Cl. 242-72.1

12 Claims



1. Apparatus for detachably connecting a hollow reel, material roll or similar article on a shaft and to be slipped on the shaft from a free end thereof, said shaft having recesses, said apparatus comprising: a plurality of elongated pressure members located in said recesses and adapted to be displaced radially outwards by means of a pressurized fluid supplied through the shaft from a source of pressurized fluid until said pressure members engage the inside of the reel and also adapted to move radially inwards again for removing the reel from the shaft, each pressure member being mounted in its associated recess also for a slidable movement in axial direction between a first and a second position, and provided at the end remote from the free end of the shaft with a stop projecting radially outwards for shifting the pressure members into the second position by means of the reel slipped on the shaft and engaging the stops, actuating means mounted within the pressure members for axially reciprocating movement between a third and a fourth position, said actuating means being provided with wedge surface means cooperating with wedge surface means formed at said pressure members so that by a movement of the actuating means from said third position to said fourth position the pressure members are urged radially outwards, and means for returning the pressure members radially inwards by a movement of said actuating means to said third position, said actuating means having a stop surface bearing against a stop surface formed at the shaft in said third position of said actuating means, means acting as a spring being provided urging said actuating means to said third position, two spaces being defined in the shaft and communicating with each other through a relatively narrow channel, a first valve member closing said



channel in said third position of said actuating means and the first space communicating with the source of pressurized fluid so that in operation said first space is filled with said pressurized fluid, said second space being defined in part by a substantially transversely extending surface of said actuating means and being provided with a second, normally closed, valve member, said first valve member being coupled to said pressure member such that when said pressure members are moved to said second position the first valve member is opened, so that the pressurized fluid flows into said second space through said channel whereby said actuating means is urged to said fourth position by the fluid pressure acting on said transverse surface for displacing radially the pressure members by means of said wedge surface means by opening said second valve member the fluid pressure in the second space being relieved so that said actuating means is urged to said third position again by said means acting as a spring.

4,422,592

**BRAKE MECHANISM FOR SPOOL**

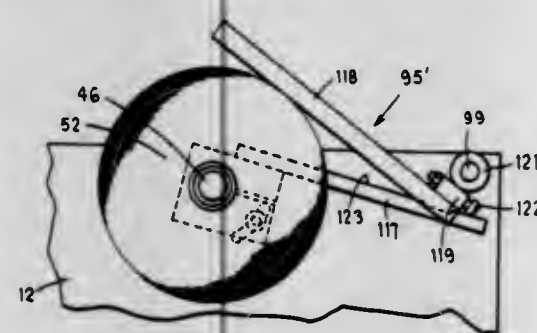
Jack G. Swope, St. Ignace, and Harry C. Weiss, Moran, both of Mich., assignors to Renco Incorporated, Homer, Mich.

Filed Jan. 11, 1982, Ser. No. 338,810

Int. Cl.<sup>3</sup> B65H 25/28, 25/22; B41J 33/52

U.S. Cl. 242-75.45

8 Claims



1. In an imprinting apparatus using a ribbon for permitting imprinting of data, said apparatus including a frame, spool-supporting shaft means rotatably supported on the frame and mounting thereon a spool of said ribbon, guide means for movably guiding the ribbon in a preselected path as the ribbon is withdrawn from the spool, imprint means associated with a selected part of the ribbon path, driving means disposed in driving engagement with said ribbon for effecting intermittent and unidirectional displacement of said ribbon along said path and withdrawal of said ribbon from said spool, and brake means associated with said spool for imposing a braking torque thereon for regulating the tension of the ribbon withdrawn therefrom and for preventing overrunning of the spool, said brake means including an elongated follower pivotally supported on said frame and having a part thereof urged into engagement with the outer diameter of the spool for sensing the diameter of said spool and for sensing any decrease in said diameter as the ribbon is withdrawn, said brake means also including a brake member associated with said spool for imposing a braking torque thereon, said brake member having an elongated brake actuating arm associated therewith and projecting therefrom for permitting the braking torque to be varied in response to movement of said actuating arm, and said follower having a cam associated therewith and disposed in contact with said brake actuating arm for transmitting the pivotal movement of said follower to said brake actuating arm so that the braking torque imposed by the brake member on the spool decreases in response to a decrease in the spool diameter, comprising the improvement wherein the brake means includes adjusting means mounted on said follower and including said cam for permitting the rate of brake torque change to be selectively adjusted per unit change in spool diameter without significantly changing or affecting the brake torque imposed on the spool when empty, said brake actuating arm extending approximately radially outwardly from the rotational axis of said spool and defining thereon a substantially

planar contact surface which is contacted by said cam, and said adjusting means including mounting means movably supporting said cam on said follower for permitting the initial position of said cam to be adjusted relative to said follower, said mounting means permitting said cam to be movably adjusted along a direction which extends substantially parallel to said contact surface when the follower is in engagement with an empty spool so that the adjustment does not significantly affect the position of said brake actuating arm.

4,422,593

**BELT CLAMPS FOR VEHICLE OCCUPANT RESTRAINT BELT SYSTEMS**

Juichiro Takada, 3-12-1 Shinmachi, Setagayaku, Tokyo, Japan

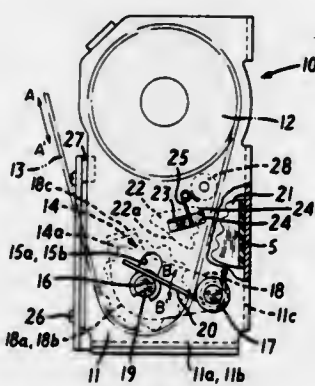
Filed May 24, 1982, Ser. No. 381,645

Claims priority, application Japan, May 29, 1981, 56-081116

Int. Cl.<sup>3</sup> A62B 35/02; B65H 75/48, 59/00

U.S. Cl. 242-107.2

10 Claims



1. A belt clamp for use in a vehicle safety belt system and having a frame, a fixed clamping jaw mounted on the frame adjacent the path of a belt of the system and a movable clamping jaw carried by the frame and engaged by the belt such that it is adapted to be moved in response to tension in the belt toward the fixed clamping jaw to press a segment of the belt against the fixed jaw and restrain the segment from movement, characterized in that at least one stop surface on the frame is engageable by the movable clamping jaw to limit the extent of its movement toward the fixed clamping jaw and in that there is at least one member interposed between the fixed clamping jaw and the frame that is adapted to deform in response to a predetermined tensile load on the belt and thereby allow the belt to slip through the clamping jaws and absorb the kinetic energy of an occupant who is thrust forward against the belt system.

4,422,594

**AUTOMATIC ROLL-UP DEVICE FOR A SAFETY BELT**

Wolf-Dieter Hölzl, Schwäbisch Gmünd, Fed. Rep. of Germany,

assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 320,870

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3043014

Int. Cl.<sup>3</sup> A62B 35/02; B65H 75/48

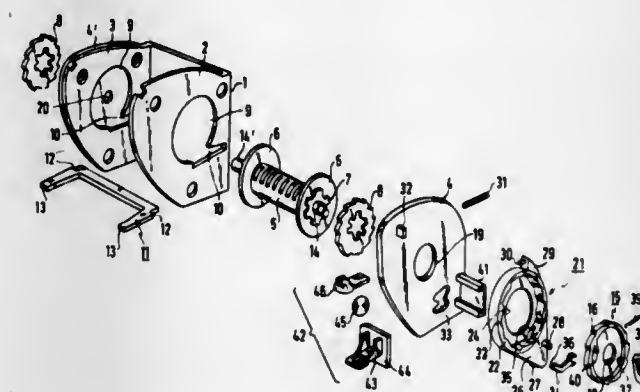
U.S. Cl. 242-107.4 A

9 Claims

1. Automatic wind-up roller for a safety belt of a vehicle with means to block a belt shaft on which the safety belt is wound in case of danger due to exceeding a predetermined acceleration or deceleration of the vehicle or due to exceeding a predetermined acceleration of belt pullout, comprising a housing, a belt shaft rotatably supported in the housing, a safety belt rolled around the belt shaft, a locking wheel with locking teeth fixed to the belt shaft and rotatable therewith, a locking detent adapted to engage the locking teeth of the locking wheel to block the belt shaft in case of danger but normally out of engagement with the locking teeth, a control

part rotatably supported on the belt shaft rotatable from a rest position to a locking position in which the control teeth of the locking wheel, a support member fixed to the belt shaft for moving the control part to its locking position, said support member having locking teeth, and an operating lever mounted on the control part and movable to engage the locking teeth of the support member,

(a) a vehicle-sensitive inertia sensor which activates said operating lever mounted on the control part to move to



engage the locking teeth of the support member when a predetermined acceleration or deceleration of the vehicle is exceeded, the support member through said engagement of the operating lever moving the control part to its locking position,

(b) a belt-sensitive inertia sensor attached to said support member which sensor engages the control part when the belt pullout exceeds a predetermined acceleration, the support member through said engagement of said sensor moving the control part to its locking position.

4,422,595

**STUD HOLDERS FOR REEL ASSEMBLY**

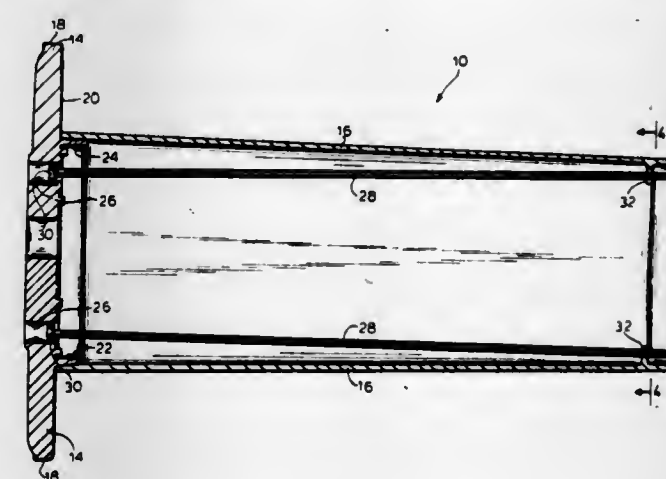
Alvin D. Thomas, Valatie, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Jan. 19, 1982, Ser. No. 340,737

Int. Cl.<sup>3</sup> B65H 75/14, 75/22

U.S. Cl. 242-116

5 Claims



1. A reel for wire or the like, comprising: a hollow elongated barrel having an interior area; a first and second flange disposed on respective ends of the barrel; a plurality of bolt means for maintaining the flanges on the ends of the barrel, said first flange having respective receptacles for a first end of the respective bolt means to be secured thereto, said second flange having respective receptacles for an opposite second end of the respective bolt means to be secured thereto, said bolt means being disposed in said respective receptacles and through said barrel securing said flanges to the barrel; and alignment means disposed on the interior area of the barrel

4,422,596

**DISPENSING REEL**

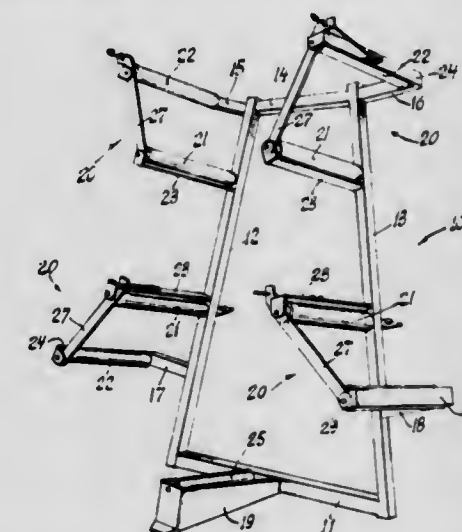
Thomas H. Cleavenger, Chicago, Ill., assignor to Cleavenger Associates Inc., Chicago, Ill.

Filed Sep. 27, 1982, Ser. No. 424,064

Int. Cl.<sup>3</sup> B65H 49/00

U.S. Cl. 242-129

6 Claims



1. A large capacity dispensing reel for coils of plastic pipe and tubes and the like comprising,

(a) a skeleton frame comprising a base and a pair of vertically extending converging trunk members,  
(b) a series of upwardly inclined limbs extending in opposite directions from said trunk members,  
(c) a plurality of open core coil retention units supported by said trunks and said limbs and extending to one side of said frame,  
(d) said retention units comprising open core coil supporting members,  
(e) a movable coil latch arm provided by each of said retention units for retaining a segment of the coil within each of said retention units, and  
(f) a releasable latch for locking said latch arms in position for retaining the open core coil within said retention units.

4,422,597

**CARRIER DEVICE FOR TWISTER OR BOBBIN TUBES**

Ulrich Lossa, Krefeld, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 320,855

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046449

Int. Cl.<sup>3</sup> B65H 49/00

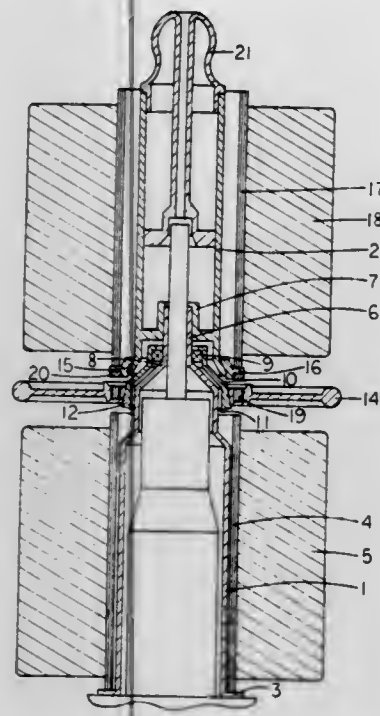
U.S. Cl. 242-130

10 Claims

1. A carrier device for at least two twister or bobbin tubes comprising: a substantially sleeve-shaped carrier member for carrying said tubes stacked axially one above the other, said carrier member having a central region, a first support surface on said central region, said central region having a circumference, the lower tube of said axially stacked tubes having an inner circumference such that the central region provided with a smaller circumference than the inner circumference of said lower twister tube enables the lower twister tube to be slipped



onto said carrier member in an axial condition without disassembling, and an annular pull-off aid having a continuous



circumferential thread engaging surface releasably supported on said first support surface.

4,422,598

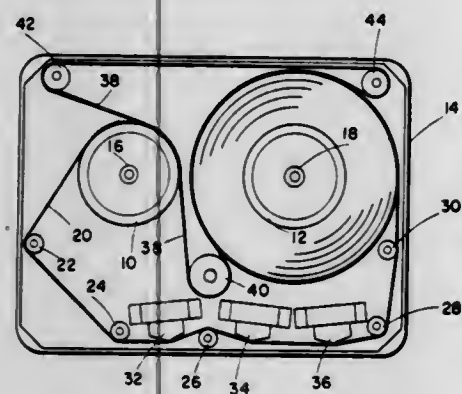
### EXTREME TEMPERATURE TAPE RECORDER DRIVE BELT

Johannes B. Groenewegen, Kirkland, and Stephen M. Meginiss, III, Seattle, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jun. 9, 1981, Ser. No. 271,764  
Int. Cl.<sup>3</sup> G03B 1/04; F16H 55/36

U.S. Cl. 242—192

2 Claims



1. A drive belt for abutting and driving magnetic tape and tape reels in a magnetic tape recorder comprising: a silicone rubber including a silicone polymer chain; and substituent groups on the polymer chain.

4,422,599

### MAGNETIC TAPE CASSETTE

Masatoshi Okamura, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan  
Filed Nov. 19, 1981, Ser. No. 323,080

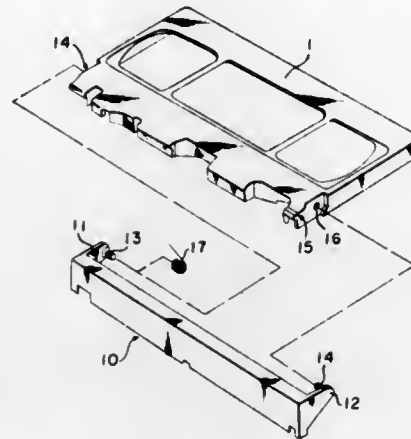
Claims priority, application Japan, Feb. 9, 1981, 56-16864[U]  
Int. Cl.<sup>3</sup> G03B 1/04; G11B 15/32, 23/04

U.S. Cl. 242—198

3 Claims

1. A magnetic tape cassette comprising:  
an upper half casing having first and second sides and a front defining a tape travel path;  
a hole in each of said sides;

a guard panel having two ends, each of said ends including a pin;  
a guide groove in each of said sides, each said guide groove defining an area including one of said holes and extending toward said front, the width of each said groove increas-



ing toward said front, wherein each said guide groove includes a chamfered edge,  
whereby each of said pins is guided into one of said holes so that said guard panel is pivotally supported on said half casing.

4,422,600

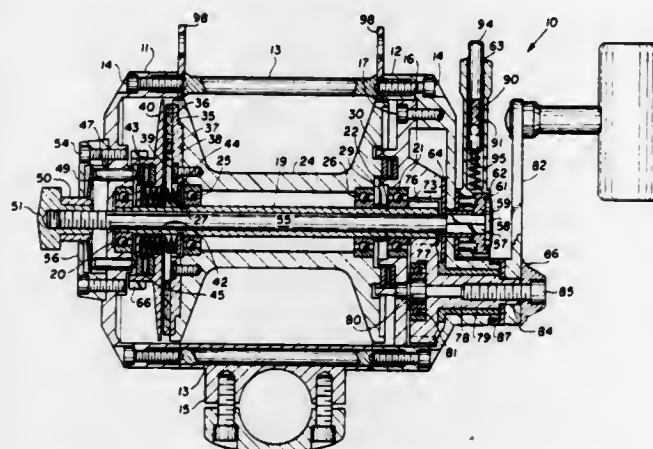
### FISHING REEL

Robert Preston, 3081 N.W. 47th Ter., Apt. #307, Lauderdale Lakes, Fla. 33331

Continuation-in-part of Ser. No. 265,683, May 20, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 423,703  
Int. Cl.<sup>3</sup> A01K 89/02

U.S. Cl. 242—217

4 Claims



4. In a fishing reel of the type comprising a body, a spool rotatably supported in said body, a spool-driving and braking device including a friction coupling, an actuating device for actuating said friction coupling, the improvement wherein said actuating device comprises:

- a pressure adjustment lever containing a cavity and a lever aperture, said pressure adjustment lever mounted exteriorly on said body for manual manipulation, said aperture intersecting said cavity,
- a pin containing a pin aperture, said pin positioned in said cavity,
- an arcuate strip, said arcuate strip affixed to said body in a spaced relationship and passing through said lever and pin apertures,
- a yieldable member positioned in said cavity and urging said pin against said arcuate strip,
- at least one projection formed on said arcuate strip and positioned in the path of contact traced out by said pin on said arcuate strip as said pressure adjustment lever is manipulated, said projection of a shape for stopping manipulation of said pin and pressure adjustment lever in at

least one direction and for permitting said pressure adjustment lever to pass beyond said stopping position by manual urging of said pin against said yieldable member and out of contact with said arcuate strip.

4,422,601

### SYSTEM FOR GUIDING A MISSILE BY MODULATED LIGHT BEAM

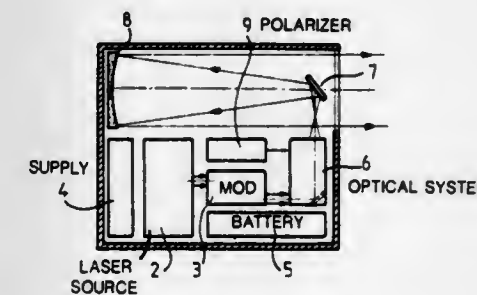
Jean C. Chavany, Chatenay-Malabry, and Wladimir Koreicho, Chilly-Mazarin, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Jan. 23, 1981, Ser. No. 227,603

Claims priority, application France, Jan. 29, 1980, 80 01841  
Int. Cl.<sup>3</sup> F41G 7/26

U.S. Cl. 244—3.13

7 Claims



1. In a system for guiding a missile in a direction of sight, comprising, at emission, a source of emission producing a light beam of which the axis defines the direction of sight and a device for modulating the beam emitted, and on the missile, at least one photo-detector and a processing circuit for determining, from the output signal from the detector, at least one coordinate of the missile with respect to the direction of sight, said coordinate being applied to the control surfaces of the missile in order to control the path of the missile on the direction of sight, characterized in that the modulation device comprises a sight in the form of a band comprising repetitive motifs, a movement of translation at constant speed being created between the beam and the sight, in a direction perpendicular to the axis of the beam, each motif comprising opaque and transparent parts, the opaque and/or transparent parts having a length (measured in the direction of displacement) which varies according to the height in question, and a time base is provided for determining the two coordinates of the missile, wherein the sight is a hollow drum rotated about its axis and a reflecting member is placed at the centre of the sight so as to reflect the beam arriving along the axis of the sight, in a radial direction with respect to the sight.

4,422,602

### TRIPOD TYPE LANDING GEAR

Andre Turiot, Morsang S/Orge, France, assignor to Messier-Hispano-Bugatti (S.A.), Montrouge, France

Filed Mar. 24, 1982, Ser. No. 361,218

Claims priority, application France, Mar. 27, 1981, 81 06155  
Int. Cl.<sup>3</sup> B64C 25/10

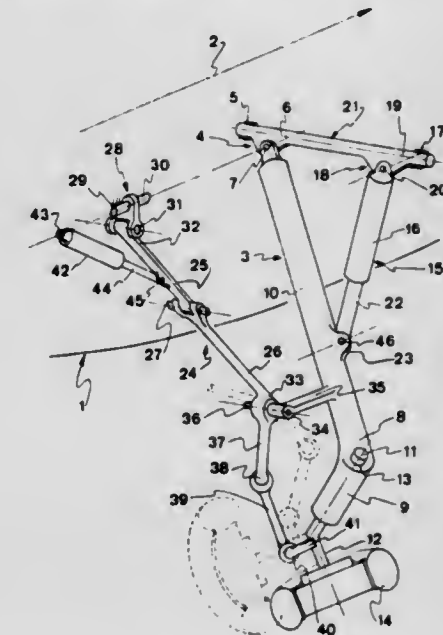
U.S. Cl. 244—102 R

7 Claims

1. Retractable landing gear of the tripod type for a rigid-frame aircraft, comprising:

- a leg capable of being connected on a first end at a first fixed point of the aircraft frame via a first cardan joint to first and second pins, including means for mounting said leg rotatably around the second pin, the other end of said leg supporting a pivoting pin on which can be mounted a rolling means,
- a shock absorber of which one end can be connected at a second fixed point of said frame via a second cardan joint to third and fourth pins including means for mounting said shock absorber rotatably around the fourth pin, the other end of said shock absorber being rotatably connected at a

point on said leg around a fifth pin, said point on said leg being located near the aforesaid pivoting pin,  
a strut of which one end is capable of being connected at a third fixed point of said frame via a third cardan joint to sixth and seventh pins including means for mounting said strut rotatably around the seventh pin, the other end of said strut being connected to said leg through an eighth pin substantially near said pivoting pin, said strut being made up of at least two levers pivoting in relation to each other around a ninth pin,



connection means between the end of said strut cooperating with the eighth pin and said pivoting pin supporting the rolling means, and

means for controlling the alignment of the two levers of said strut, with said first, third, seventh, eighth and ninth pins being parallel in one direction, and the second, fourth, fifth and sixth pins being parallel in a second direction with said two directions forming a non-zero angle between them.

4,422,603

### LANDING GEAR FOR AIRCRAFT

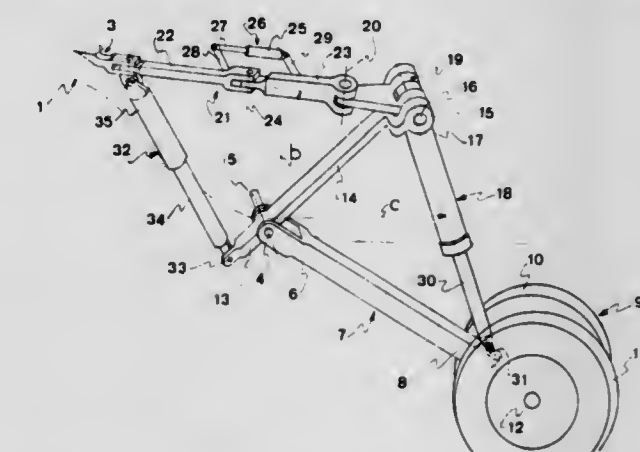
Andre Turiot, Morsang S/Orge, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France

Filed Mar. 2, 1982, Ser. No. 354,009

Claims priority, application France, Mar. 5, 1981, 81 04421  
Int. Cl.<sup>3</sup> B64C 25/14

U.S. Cl. 244—102 R

13 Claims



1. Retractable landing gear actuated between two positions, respectively the retracted and extended positions, for a rigid-frame aircraft, said landing gear comprising: a lever mounted rotatably on a first pin at a first attachment point incorporated



in the frame and forming a first pivot axis, a rocker beam mounted rotatably at one end on a second pin incorporated in said frame at said first attachment point, a "breaking" strut mounted rotatably at a first of its ends onto a second attachment point incorporated in said frame and including at least two alignable parts, connecting means for linking the other end of said strut to said lever at a second point thereof defining a second pivot axis, controllable means for "breaking" the alignment of said strut parts, a shock absorber connecting said second point of said lever to a second point of said rocker beam and means for applying a controllable pivoting force to said lever.

4,422,604

**FUSELAGE LANDING GEAR WITH TANDEM WHEELS**  
André Turiot, Morsang S/Orge, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France

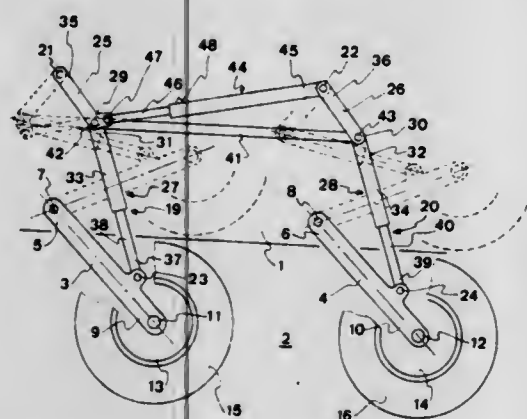
Filed Mar. 2, 1982, Ser. No. 354,010

Claims priority, application France, Mar. 5, 1981, 81 04420

Int. Cl.<sup>3</sup> B64C 25/14

U.S. Cl. 244—102 R

12 Claims



1. Landing gear of the so-called fuselage type with wheels mounted in tandem for an aircraft having a rigid structure, said landing gear comprising; at least two rocker beams, means for mounting one of the ends of said beams, respectively around two first and second pivot axes incorporated in the structure of the aircraft, means for supporting rolling means on the other ends of said rocker beams, first and second connection means connected between first and second points respectively on the two said rocker beams to third and fourth pivoting points incorporated in the structure of said aircraft, each of said first and second connection means comprising a lever and a shock absorber connected to each other on one of their ends by a pivoting point, the ends of the two levers rotating together with the third and fourth points respectively, the other ends of the shock absorber being respectively connected to the first and second points, a connecting rod of constant length linking the two levers, means for applying a force on at least one of the two said levers consisting of an actuating cylinder having a first end connected in rotation to a rigid point of the aircraft structure, means for applying the force of the second end of said actuating cylinder to at least one lever, said actuating cylinder taking on at least two positions determining two limit lengths, said two limit lengths corresponding respectively to retracted and extended positions of the landing gear, and wherein the first end of said actuating cylinder is fixed on one said third and fourth points incorporated in the rigid structure of the aircraft.

4,422,605

**REVERSER FOR JET ENGINE**

Etienne Fage, Jouy-en-Josas, France, assignor to Societe AS-TECH, Meudon la Foret, France

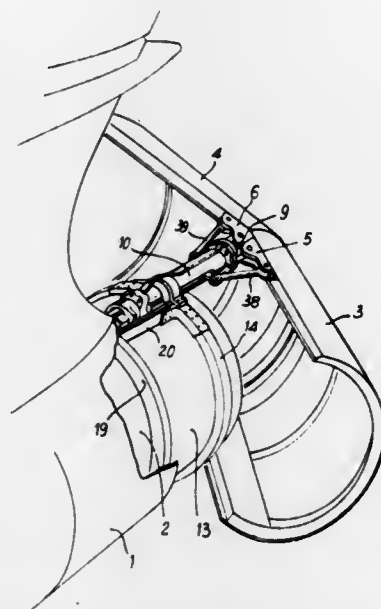
Filed Sep. 10, 1981, Ser. No. 300,989

Claims priority, application France, Nov. 27, 1980, 80 25168

Int. Cl.<sup>2</sup> B64D 33/04

U.S. Cl. 244—110 B

5 Claims



1. In a thrust reverser for a jet engine of an aircraft comprising at least one door mounted to pivot about an axis which is transverse and substantially diametrical with respect to the jet of said engine and which is located downstream of the exhaust nozzle thereof, said door being pivotable between a folded position in which it is clear of, said jet and an extended position in which it is arranged transversely with respect to said jet, and a control device for controlling the position of said door, said control device including at least one longitudinal jack and at least one connecting rod interconnecting said jack and said door,

the improvement comprising:

at least one locking device adapted to lock said door in folded position, said locking device being effective to unlock said door to permit passage from its folded position to its extended position only after said door has been brought into a super-retracted position with respect to said folded position, and

at least one stop means which allows said door to pass from said folded position to said super-retracted position only when the power output of said engine is lower than a predetermined threshold valve close to idling.

4,422,606

**AUTOMATIC LEADING EDGE SLAT FOR AIRCRAFT**

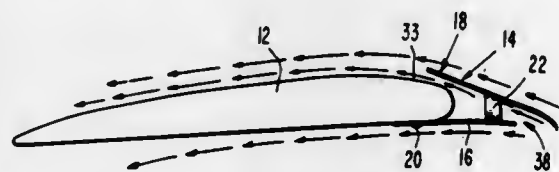
Ronald G. Munroe, P.O. Box 317, Georgetown, S.C. 29440

Filed Jun. 25, 1981, Ser. No. 277,353

Int. Cl.<sup>3</sup> B64C 13/16

U.S. Cl. 244—203

16 Claims



1. A leading edge slat assembly for an aircraft wing comprising:  
(a) a lower strip attachable to said wing in a position in which the lower strip projects forwardly from the leading edge of the wing;

(b) an upper strip overlying the lower strip in spaced relation thereto, said upper and lower strips having leading edge portions that are spaced apart forwardly of the leading edge of the aircraft wing to which the lower strip is attached, the upper strip having a trailing edge portion adapted to overlie the upper surface of the leading edge portion of the wing; and

(c) spring elements connecting the respective strips at spaced locations along the lengths thereof, said spring elements being tensioned to normally hold the rear edge portion of the upper strip in contact with the upper surface of the wing, while being adapted to resiliently yield in the presence of ram air directed through the space between the leading edges of the strips, for biasing of the upper strip away from the wing by the ram air to allow passage of the ram air along the top surface of the wing, the spring elements constituting the sole means connecting the strips, said leading edge portions of the strips being at all times vertically spaced apart throughout their lengths by the spring elements to define a continuously open space therebetween, the strips being relatively formed and located to require that the space open downwardly in generally level attitudes of the wing to prevent ram air from entering the space, and to open forwardly when the wing is inclined, to permit said entry.

4,422,607

**CLIMBING CHOCKS**

Mark Vallance, Crest Cottage, Great Hucklow, Tideswell, Derbyshire S17 8RF, England

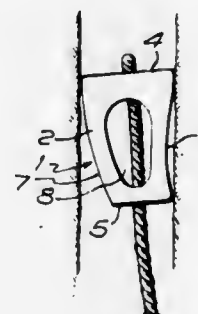
Filed Oct. 6, 1980, Ser. No. 193,912

Claims priority, application United Kingdom, Oct. 11, 1979, 7935322

Int. Cl.<sup>3</sup> F16M 13/00

U.S. Cl. 248—1

8 Claims



1. A climbing chock for positioning in a crack in a rock formation comprising a generally wedge shaped body including four side faces, two opposite side faces of which are respectively of concave and convex configuration, said body also being formed with longitudinal passageway means extending in the direction and within the confines of said side faces through which a line is passed, whereby the applied force along said line allows said concave and convex faces to move toward engagement with the sides of the crack while resisting pivoting action so as to tend to cause secure three point engagement of said chock.

4,422,608

**PANEL HANGER**

James W. Hogg, Nashville, Tenn., assignor to Anchor Wire Corporation of Tennessee, Goodlettsville, Tenn.

Filed May 29, 1981, Ser. No. 268,499

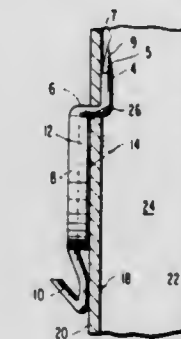
Int. Cl.<sup>3</sup> A47F 5/00

U.S. Cl. 248—205 A

12 Claims

1. In a hanger for suspending articles from a vertical panel having a front and rear surface, said device comprising a disc having a front and rear surface and a wire having an upwardly projecting needle point penetrator portion disposed in a plane parallel with the planes of said disc's front and rear surfaces to permit forcible insertion through said panel and by manipula-

tion to abut against the panel's rear surface thereof to prevent removal of the hanger, a foot portion projecting outwardly from the lower end of said penetrator portion and at a substantially right angle thereto to extend between the front and rear surfaces of said panel to provide support against vertical movement, that portion of said wire extending forwardly through said front surface of the panel when said penetrator portion



abuts against said rear surface being connected to said disc to press said disc against said front surface of the panel, said wire further depending downwardly from said foot portion to define a shank, said shank defining a hook at its lower end, said disc having a rear surface provided with an adhesive covering for adhesion to the front surface of said panel to prevent relative movement of said disc.

4,422,609

**CLAMP-MOUNT DEVICE**

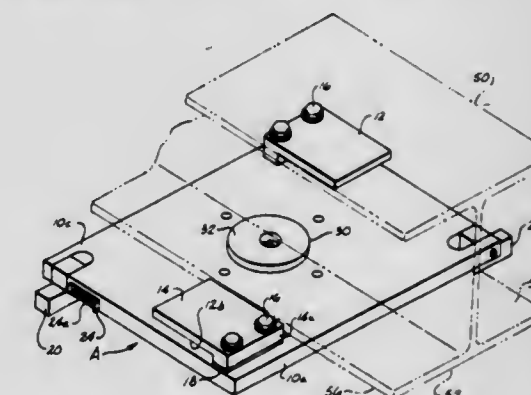
Keith H. Clark, Decatur, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 14, 1981, Ser. No. 293,414

Int. Cl.<sup>3</sup> A47B 96/06; E04G 3/00

U.S. Cl. 248—228

7 Claims



1. A clamp-mount device for mounting equipment to an associated I-beam and the like structural member of the type having oppositely extending flanges, said device comprising:  
a base;  
a pair of oppositely facing clamping members carried diagonally on said base clamping said flange therebetween and having flange receiving openings facing one another;  
lock means carried diagonally by said base opposite said clamping members locking said flanges in said clamping members;  
resilient hub means carried centrally of said base engaging and biasing a back side of said flanges maintaining same tightly clamped, said base turning about said hub means to receive said flanges within said clamping members; and means securing said equipment to said base.



4,422,610

## FLOWER POT HOLDER

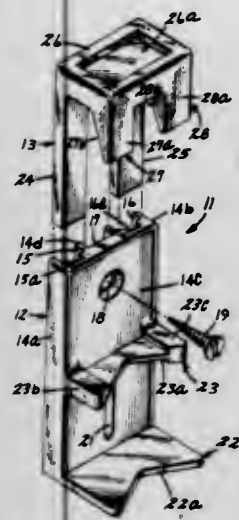
Vicki L. Hunt, Clearwater, Fla., assignor to Ron-Vik, Incorporated, Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,312

Int. Cl.<sup>3</sup> A47K 1/08

U.S. Cl. 248—311.2

17 Claims



1. A device for releasably mounting a flower pot having a frustoconical side wall and a stepped collar at the top of the side wall, the device comprising:

- (a) a base member capable of vertical orientation and defining front and back faces, the base member comprising
  - (i) first and second abutment means projecting laterally from said front face in vertical spaced relation;
  - (ii) the first abutment means being constructed and disposed to underlie and engageably support the bottom edge of said stepped collar;
  - (iii) the second abutment means being constructed and disposed to be engaged by and laterally support the frustoconical wall of the flower pot;
- (b) and clamping means associated with the base member, the clamping means being movably adjustable relative to the base member to define a retaining enclosure with said first abutment means;
- (c) and locking means for maintaining the clamping means and support means in a predetermined fixed relative position.

4,422,611

## LIFTABLE DRIVER'S SEAT FOR AUTOMOBILES

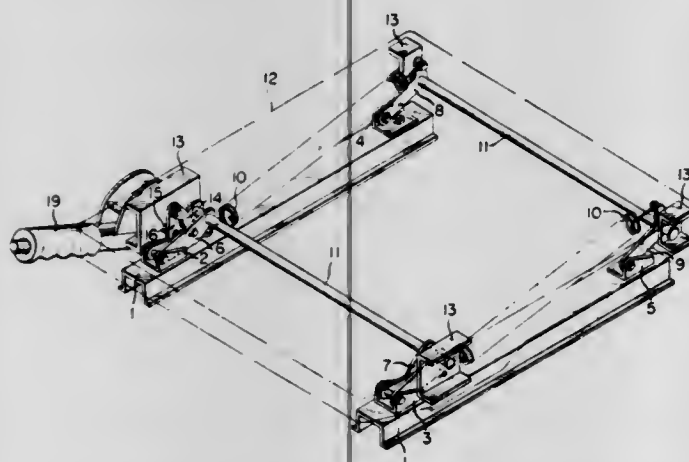
Minoru Kitsuda, 3-5, Nishi Yahata 1-chome, City of Hiratsuka, Kanagawa Prefecture, Japan

Filed Sep. 11, 1981, Ser. No. 301,388

Int. Cl.<sup>3</sup> E01B 7/00

U.S. Cl. 248—421

8 Claims



1. A liftable driver's seat for automobiles comprising a seat frame having substantially a rectangular shape in the plan

view, bearing block means disposed near the four corners of said seat frame so as to be rigidly secured thereto, link means pivotally connecting said bearing means to the floor of said automobile so as to be elongated in substantially the same direction, a main rotary shaft means rotatably supported by one of said bearing blocks, a pair of operating links pivotally connected together at one of their end portions, with the other end of one of said operating links being fixedly secured to said main rotary shaft, the other end of the other of said operating links being pivotally connected to one of said link means disposed near said bearing block which rotatably supports said main rotary shaft, and a manipulating lever means having generally a hollow cylindrical form and detachably secured to said main rotary shaft, said manipulating lever means is provided with a stopper means which is adapted to coact with a counter element secured to said bearing block which rotatively supports said rotary shaft such that said stopper means usually prevents said rotary shaft from being rotated in association with said counter element, but whereby, when said stopper means is separated from said counter element, said main rotary shaft is allowed to be rotated by said manipulating lever means.

4,422,612

## DEVICE FOR SUPPORTING A MOVEABLE SEAT, FOR EXAMPLE IN A MOTOR VEHICLE

Simon Frank, Watterdingen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

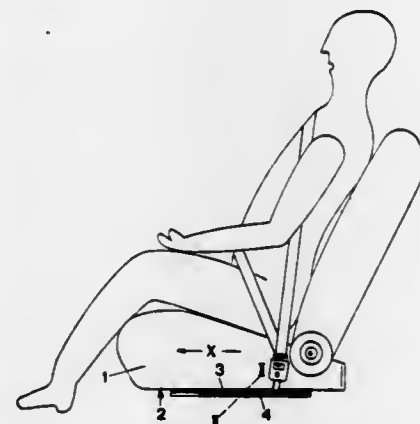
Filed May 28, 1982, Ser. No. 382,901

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122124

Int. Cl.<sup>3</sup> F16M 13/00

U.S. Cl. 248—430

6 Claims



1. A sliding rail arrangement for supporting a moveable seat in a motor vehicle comprising:

- a substantially U-shaped alignment rail secured to said motor vehicle wherein each leg of said substantially U-shaped alignment rail is provided with first and second spaced apart continuous flanges; and
- a substantially U-shaped sliding rail slidably received within said substantially U-shaped alignment rail wherein each leg of said U-shaped sliding rail is provided with third and fourth spaced apart continuous flanges extending toward and proximate to said first and said second continuous flanges respectively such that one of said first continuous flange and said third continuous flange is below the other so as to define a first pair of continuous flanges and one of said second continuous flange and said fourth continuous flange is below the other so as to define a second pair of continuous flanges wherein one of said first pair of continuous flanges and said second pair of continuous flanges define a bearing surface for receiving a bearing and the other of said first pair of continuous flanges and said second pair of continuous flanges abut each other when said sliding rail is overloaded.

4,422,613

## PICTURE FRAME EASELS

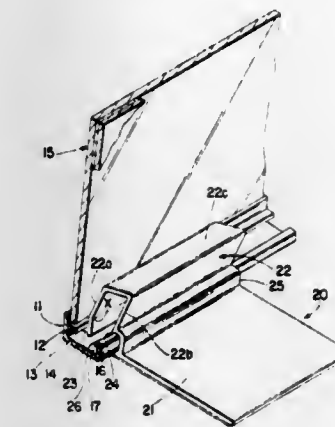
Nicholas K. Cray, Schiller Park, Ill.; Frederick L. Murrin, and Phillip E. Maupin, both of Greenville, Pa., assignors to R. D. Werner Co., Inc., Greenville, Pa.

Filed Jun. 18, 1982, Ser. No. 389,846

Int. Cl.<sup>3</sup> A47F 7/14

U.S. Cl. 248—473

9 Claims



1. An easel for detachably supporting and mounting a back-loading picture frame of channel shape having upstanding front and rear faces, said easel comprising a flat land member adapted to underlie said frame, a resilient yoke member secured to said land member and including a pair of spaced legs disposed in angled relation to said land member, said legs and said front and rear faces of the frame having means associated therewith adapted to contact the said legs whereby the legs are adapted to be lockingly retained in spring pressed relation against said front and rear faces and removable therefrom by exertion of pressure upon said legs.

4,422,614

## SUPPORT MEANS FOR A PLURALITY OF SOLAR PANELS

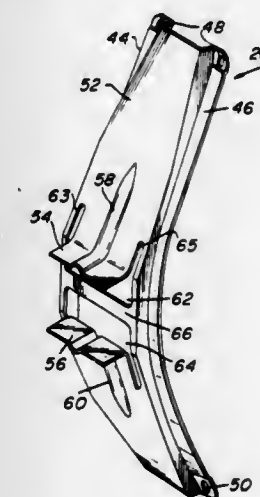
Gerard R. Santos, Levittown, Pa., assignor to The Budd Company, Troy, Mich.

Filed Aug. 27, 1981, Ser. No. 296,797

Int. Cl.<sup>3</sup> B60R 1/02

U.S. Cl. 248—475 R

3 Claims



1. Support means for holding a plurality of curved solar panels comprising:

- (a) a main metal tubular support structure extending along the length of the solar panels to be supported;
- (b) a plurality of support members for receiving said plurality of solar panels thereon connected to said main tubular support structure;
- (c) each of said support members comprising an elongated integral metal sheet curved to receive said solar panels on

one side and including projecting sections on the opposite side welded to said tubular support structure;

(c) each of said support members being adapted to receive and hold two adjacent solar panels and including longitudinally disposed edges including a plurality of apertures therein to permit fastening means to be connected therethrough to hold said solar panels;

(e) each of said support members further including a solid section between said protruding sections with each of said protruding sections including a centrally disposed indent portion to add strength thereto; and

(f) each of said support members still further including a pair of apertures at opposite ends thereof with said support members overlapping adjacent solar panels so that one aperture of each said pair is aligned with one solar panel.

4,422,615

## FLEXIBLE REFLECTOR ASSEMBLY FOR BICYCLES AND THE LIKE

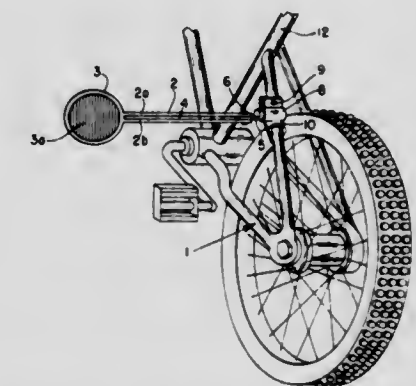
Henry E. McManus, Box 543, 60 Woodhaven Dr., Belchertown, Mass. 01007

Filed May 21, 1982, Ser. No. 380,331

Int. Cl.<sup>3</sup> B60R 1/06

U.S. Cl. 248—475 R

6 Claims



1. An attachment for a bicycle or the like comprising of an extension arm, said extension arm having two parallel members, a strut connecting the said parallel members, a reflector member at the end of said arm between the said parallel members, a fulcrum swivel mount assembly, means located at the opposite end of said arm from said reflector member for connection with said fulcrum swivel mount assembly, a fulcrum clamp, said fulcrum clamp adapted to be fastened to said fulcrum swivel mount assembly, a bicycle clamp being adapted to be fastened to a frame member of a bicycle, said fulcrum clamp being an integral part of the body of said bike clamp, a reflector adapted to be mounted on said reflector member whereby said extension arm may be rotated forward or backward on said fulcrum mount and whereby said extension arm may be rotated about its own axis 360°, said fulcrum swivel mount assembly comprises of a fulcrum cylinder, a tongue having flat upper and lower surfaces and extending outwardly from said fulcrum cylinder, pivot mounts protruding upwardly and downwardly from said upper and lower tongue surfaces, a fulcrum cutout in each segment of said parallel segments of said extension arm adapted to mount said pivot mounts therein, said fulcrum cylinder adapted to be inserted within said fulcrum cylinder and adapted to be inserted within said fulcrum clamp.



4,422,616

**SUPPORT ARM FOR FASTENING TO A WALL**  
 Rudolf Wilke, Arolsen, Horst Jäger, Edertal, and Winfried Scholl, Düsseldorf, all of Fed. Rep. of Germany, assignors to Rudolf Wilke, et al., Fed. Rep. of Germany  
 Filed Feb. 1, 1980, Ser. No. 117,721

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2905031

Int. Cl.<sup>3</sup> A47B 57/04, 96/14

U.S. Cl. 248—544

25 Claims



1. A support arm assembly for fastening to a wall, said assembly comprising a support arm, a pressure plate bearing on the wall, a securing screw having a threaded end passing substantially centrally through said pressure plate for engagement in said wall and a head end located outside said wall for carrying said support arm, flange means axially facing said pressure plate and being adapted to exert a bending moment on said securing screw, and at least three adjustment screws spaced around said securing screw and acting between said pressure plate and said flange means so that on rotation of each said adjustment screw the distance between said flange means and said pressure plate is varied at the location of that screw, thereby tilting the flange means relative to the wall and thus exerting said bending moment on said securing screw and deflecting the same to align said head end and said support arm relative to said wall.

4,422,617

**EDGE JOIST**

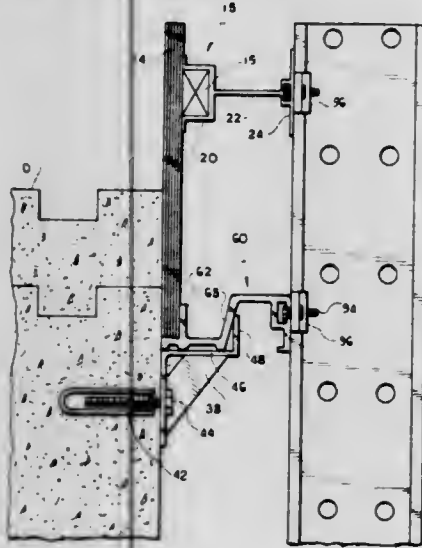
Anthony J. Gallis, Lake Hiawatha, N.J., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Jan. 15, 1982, Ser. No. 339,776

Int. Cl.<sup>3</sup> E04G 11/00

U.S. Cl. 249—19

12 Claims



1. An edge joist for use in a wallform system including at least one sheathing panel, joists extending in one direction along said panel for supporting the same, and strengthening walers extending in a generally perpendicular direction behind said joists for supporting the same to form a joist system, the edge joist comprising a metal S-beam and having an upright front flange engageable with a rear surface of said upright sheathing panel with a lower edge of the front flange to be disposed substantially at a straight edge of the panel, a rear flange generally parallel to said front flange, a protective toe

plate extending forward from the lower edge of the front flange, and a stepped angled web extending from adjacent said lower edge of said front flange to adjacent an upper edge of said rear flange.

4,422,618

**REMOTELY OPERATED VALVE**

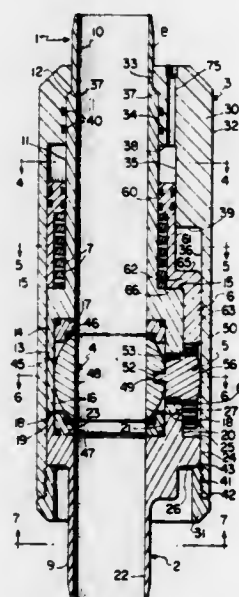
John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed Dec. 1, 1981, Ser. No. 326,331

Int. Cl.<sup>3</sup> F16K 31/12, 31/54

U.S. Cl. 251—58

13 Claims



1. In a remotely operable valve, the combination of
  - a first valve body member having
    - a first end portion dimensioned to be secured to an end of a first fluid-conducting member,
    - a through bore concentric with a first longitudinal axis, and
    - a second end portion which is hollow and has an inner wall concentric with the first axis,
  - the second end portion having an outer surface concentric with a second longitudinal axis spaced laterally from and parallel to the first axis,
  - the second end portion also including a lateral opening which is radial with respect to the first and second axes,
  - a portion of the first valve body member between the first and second end portions having a longitudinal outer surface which is cylindrical and extends parallel to the first axis;
  - a second valve body member having
    - a first end portion dimensioned to be secured to an end of a second fluid-conducting member,
    - a second end portion, and
    - a through bore,
  - the second body member being disposed with its second end portion opposed to the second end portion of the first body member and with its through bore concentric with the first longitudinal axis;
  - a housing surrounding the first and second body members and securing the body members together in end-to-end relation with the second end portions of the two body members defining a cavity with which the through bores and said lateral opening communicate, the housing having
    - a first inner surface portion which is spaced outwardly from the longitudinal outer surface of the first body member and extends parallel to the first axis, and
    - a second inner surface portion spaced outwardly from that portion of the outer surface of the second end portion of the first body member through which the lateral opening extends;
  - a rotary movable valve member disposed in the cavity and movable between a first position, in which the through

- bores of the first and second body members are in communication, and a second position, in which the movable valve member prevents flow between the through bores;
- an actuating member comprising
  - a pinion disposed within the space between the second inner surface portion of the housing and the outer surface of the second end portion of the first valve member, and
  - a shank journaled in the lateral opening in the second end portion of the first body member and connected to the movable valve member to rotate the same when the pinion is rotated;
- a combined piston and rack member comprising
  - an annular piston disposed between and slidably engaging said longitudinal outer surface of the first body member and the first inner wall portion of the housing, the annular piston coacting with the first body member and the housing to define an expansible chamber, and
  - a rack extending longitudinally within the space between the second end portion of the first body member and the second inner wall portion of the housing and operatively engaged with the pinion;
- the combined piston and rack member being yieldably biased longitudinally in one direction; and
- a flow conduit arranged to supply pressure fluid to the expansible chamber to drive the combined piston and rack member in the opposite direction.

4,422,619

**REMOTE VALVE OPERATING SYSTEM**

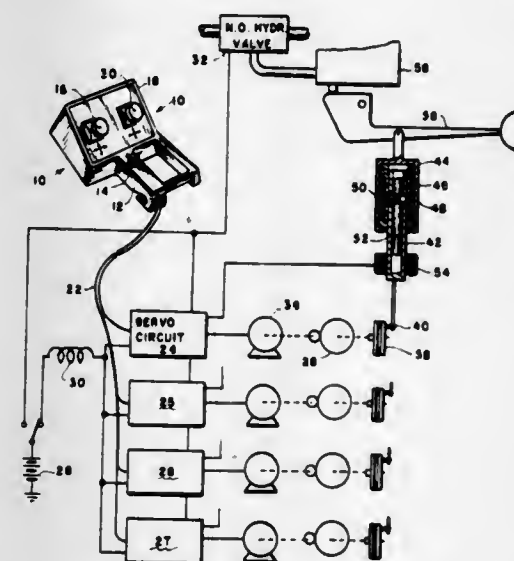
Edward E. Griffiths, 3200 Polaris St., No. 23, Las Vegas, Nev. 89102

Filed Jul. 21, 1981, Ser. No. 285,520

Int. Cl.<sup>3</sup> F16K 31/05

U.S. Cl. 251—130

8 Claims



1. A remote control system for remotely controlling the movement and position of a manually operable mechanism, said control system comprising:
  - a remote control unit including a manually operable dead-man switch and a manually adjustable remote control potentiometer for generating a control signal;
  - a drive motor;
  - a motor position sensing potentiometer coupled to said drive motor and positioned by the rotation of said drive motor for generating a position signal;
  - solenoid controlled interconnecting means coupled to the output of said drive motor and to the manually operable mechanism for positioning said manually operable mechanism in response to rotation of said drive motor;
  - a servo circuit coupled between said drive motor and said remote control unit and responsive to said control signal from said manually adjustable remote control potentiometer and said position signal from said motor position sensing potentiometer for rotating said motor to a position

where said position signal corresponds to said control signal;  
 a solenoid control circuitry controlled by said servo circuit for actuating said solenoid controlled interconnecting means during operation of the remote control system; and safety circuitry within said servo circuit for disabling said solenoid control circuitry and for returning said drive motor to a predetermined neutral position whenever said control signal exceeds predetermined upper and lower voltage limits.

4,422,620

**ADJUSTABLE FULCRUM HAMMER**

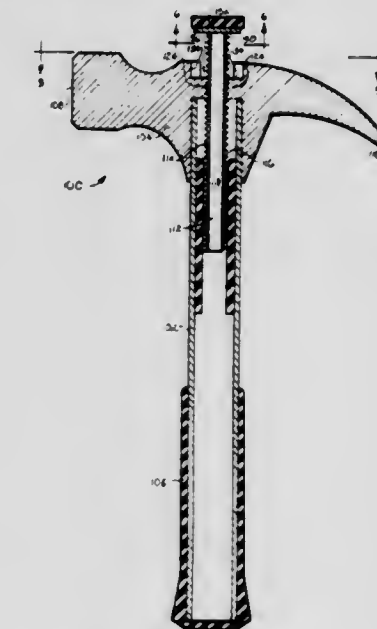
Jerold I. Nitzberg, 3029 Fleetwood Ave., Baltimore, Md. 21214

Continuation-in-part of Ser. No. 238,956, Feb. 27, 1981, abandoned. This application Apr. 5, 1982, Ser. No. 365,866

Int. Cl.<sup>3</sup> B25C 11/00

U.S. Cl. 254—26 E

6 Claims



1. An adjustable fulcrum hammer comprising in combination:
  - a handle having a grip at one end for manually grasping said handle and an interior cavity extending into said handle from the opposing end;
  - a claw hammer head having a striking surface and claw and rigidly fixed about said other end of said handle with said striking surface and said claw extending outwardly from said handle, said head having a bore extending there-through from the upper surface and axially communicating with said cavity;
  - an elongated fulcrum rod extending through said bore and into at least a portion of said cavity having a flange member rigidly fixed to one end thereof and being capable of turning movement between locked and unlocked positions; and
  - means for reciprocally adjusting the position of said rod between extended and retracted positions relative to said head and for locking said rod in predetermined positions, said adjusting and locking means including a pair of opposing first threaded portions associated with said bore and a pair of second opposing threaded portions associated with said rod, said rod further including a pair of opposing parallel planar surfaces extending along the length of said rod thereby defining together with said first threaded portions the perimeter of said rod, said bore further including means defining surfaces which together with said second threaded portions define an aperture with which said rod perimeter slidably cooperates in said unlocked position so as to permit reciprocal movement of said rod between said extended and retracted positions thereof, said first and second threaded portions matingly engaging one another so as to securely lock said rod rela-

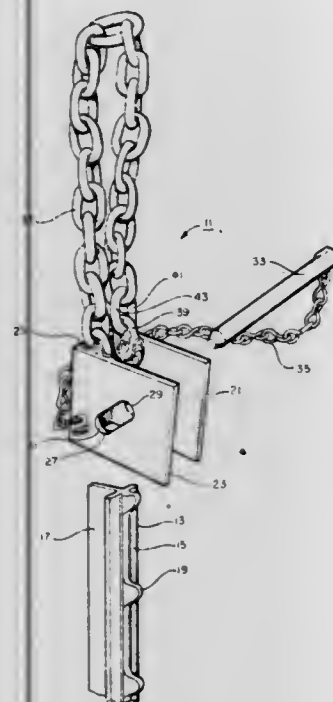


tive to said head when said rod is turned from said unlocked position to said locked position.

**4,422,621**  
**FENCE POST PULLER**  
Paul B. Ekern, P.O. Box 1830, Vernon, Tex. 76384  
Filed Feb. 11, 1982, Ser. No. 347,994  
Int. Cl.<sup>3</sup> E21B 19/00

U.S. Cl. 254—30

2 Claims



1. A device for use in pulling metal fence posts of the type having a flange and shank formed perpendicular to each other to define a T-shaped cross-section, and lugs spaced along the flange, comprising:

- a pair of side plates connected together by a cross-member at the rear and spaced for placement around a post with the shank between and parallel with the plates;
- locking means connecting the plates forward of the cross-member for engaging one of the lugs upon application of an upward force on the device; and
- a looped chain for receiving the upward force, the chain having a plurality of links, with one of the links on each end being rigidly mounted to and perpendicular with each plate on the inner side of each plate between the cross-member and the locking means, defining a space between them for receiving the shank.

**4,422,622**  
**PREFABRICATION FENCE PANEL CONSTRUCTION FOR DOG KENNELS AND THE LIKE**  
Stanley M. Broski, Jr., Kansas City, Mo., assignor to Merchants Metals, Inc., Forth Worth, Tex.  
Filed Dec. 21, 1981, Ser. No. 332,498  
Int. Cl.<sup>3</sup> E04H 17/16

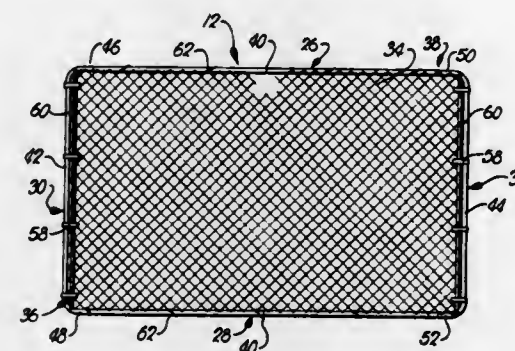
U.S. Cl. 256—25

1 Claim

1. An upright, free-standing enclosure, comprising:
- a plurality of fence panels, each including—
  - a top rail;
  - a bottom rail;
  - a pair of upright side rails each having an upper and a lower end;
  - the end margins of said top, bottom and side rails being integral with the major portion of the corresponding rails and configured for telescopic interfitted of the opposed ends of said top rail with the upper ends of the respective side rails, and for telescopic interfitted of the opposed end of said bottom rail with the lower ends of said respective side rails, to define an interconnected,

continuous panel perimeter having a desired length and height;

- a section of fencing fabric;
- means for securing said fabric section to said interconnected perimeter-defining rails, and for subjecting said telescopically interfitted rail ends to forces tending to pull said top, bottom and side rails together, whereby said panel construction is structurally self-sustaining;
- frame structure including telescopically interfitted, top, bottom and side rails presenting a continuous frame circumscribing and defining a gateway;



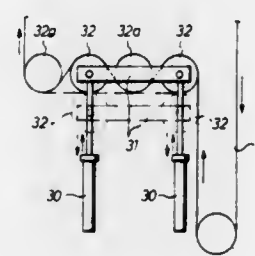
a gate configured to fit within said frame structure;

- hinge means securing said gate within said frame structure;
- and
- means rigidly interconnecting adjacent, upright side rails of said plurality of fence panels and said frame structure for presenting a free-standing enclosure free of permanently set posts or the like, including rigid connectors directly coupled to said adjacent side rails and spanning the distance therebetween.

**4,422,623**  
**APPARATUS FOR COOLING STEEL STRIPS TO EFFECT CONTINUOUS ANNEALING**  
Hiroshi Kuroda, Tokyo; Yoshikazu Fukuoka, Fukuyama; Hiroshi Naemura, Fukuyama, and Takayoshi Shihomura, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 160,077, Jun. 16, 1980, abandoned.  
This application May 26, 1982, Ser. No. 382,205  
Claims priority, application Japan, Jun. 28, 1979, 54-80808  
Int. Cl.<sup>3</sup> C21D 9/573

U.S. Cl. 266—109

8 Claims



1. In an apparatus for carrying out a continuous annealing treatment on a steel strip, a cooling unit for cooling a steel strip which has been heated to a temperature above a recrystallization point in the continuous annealing treatment, comprising:
- a cooling chamber (12) for receiving said heated steel strip;
  - a plurality of cooling rollers (32, 32a) in said cooling chamber and about which said steel strip is adapted to be passed so that said steel strip contacts said cooling rollers over a given contact area so as to be cooled thereby; and
  - elevating means (30) for selectively raising and lowering some of said plurality of cooling rollers with respect to remaining cooling rollers for selectively changing a contact angle and the contact area between said steel strip and said cooling rollers and for selectively releasing the

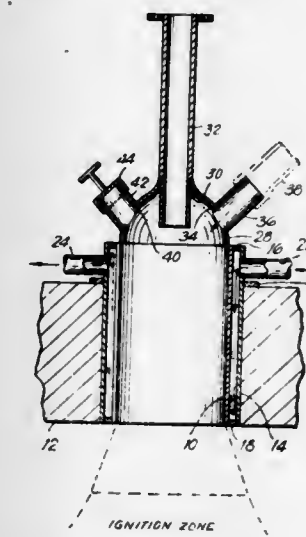
contact between said steel strip and said cooling rollers, to thereby vary the cooling rate of said steel strip;

- said cooling chamber further comprising means for water-quenching said steel strip when the contact between said steel strip and said rollers is released.

**4,422,624**  
**CONCENTRATE BURNER**  
H. E. Dunham; David Arana, both of Morenci, Ariz.; Terrell D. Jackson, Littleton, Colo.; Brent E. McEuen, Safford, and John A. Schneider, Morenci, both of Ariz., assignors to Phelps Dodge Corporation, New York, N.Y.  
Filed Aug. 27, 1981, Ser. No. 296,874  
Int. Cl.<sup>3</sup> F27D 3/10; F23D 11/36

U.S. Cl. 266—182

10 Claims



1. A sulfide concentrate burner particularly adapted for use in the flash smelting of sulfide concentrates in a reverberatory furnace comprising a cylindrical mixing chamber, a convexo-concave housing affixed to one end of said mixing chamber, an oxidizing gas feed pipe extending through said convexo-concave housing and into the central part of the concave portion thereof and aligned with the central axis of said mixing chamber, and at least one concentrate feed port located in said convexo-concave housing, said oxidizing gas feed pipe adapted to eject a jet of oxidizing gas into said mixing chamber and create a subatmospheric pressure within said convexo-concave housing whereby sulfide concentrate is aspirated from said concentrate feed port and mixed with said jet of oxidizing gas to produce at the end of said mixing chamber opposite said convexo-concave housing a jet comprising a mixture of oxidizing gas and sulfide concentrate.

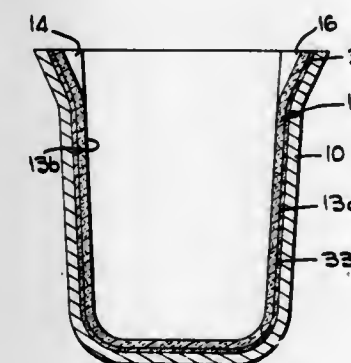
**4,422,625**  
**FOUNDRY POURING LADLE PROTECTIVE LINER**  
Carrol R. Thurn, Minnetonka, Minn., assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 23, 1982, Ser. No. 351,557

Int. Cl.<sup>3</sup> C21B 3/00

U.S. Cl. 266—281

15 Claims



1. A ladle assembly for receiving and transferring non-fer-

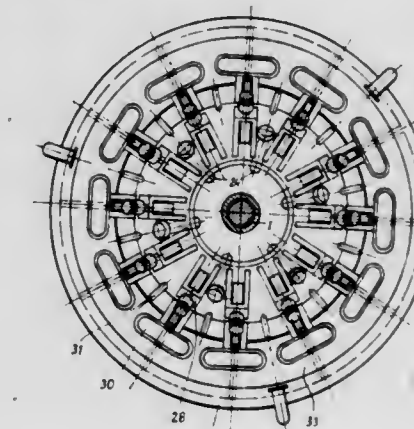
rous metal in a liquid state between a melting furnace and a mold, comprising

- a rigid external pouring ladle fabricated of a material having a melting point above the liquid metal temperature,
- a ladle liner of a material which burns at a temperature above the liquid metal temperature, said liner having an external surface generally similar in shape to and spaced from the internal surface of said external ladle,
- a particulate support mass disposed between said external and internal surfaces of said ladle liner and external ladle respectively, and
- a refractory cap overlying that portion of said particulate support mass which is exposed between the upper edges of said external ladle and said ladle liner.

**4,422,626**  
**APPARATUS FOR REPAIRING A REFRACTORY FURNACE LINING**  
Friedrich Baumgartner; Alfred Romar, and Albert Rigles, all of Veitsch, Austria, assignors to Veitscher Magnesitwerke-Aktiengesellschaft, Vienna, Austria  
Filed Nov. 1, 1982, Ser. No. 437,910  
Claims priority, application Austria, Nov. 13, 1981, 4918/81  
Int. Cl.<sup>3</sup> F27D 1/16

U.S. Cl. 266—281

10 Claims



1. In an apparatus for building up and repairing a portion of a refractory lining of an industrial furnace or hot-running vessel, which comprises

- (a) a vertically extending rotary shaft,
- (b) a horizontally extending centrifuging disc keyed to the shaft for rotation therewith, the disc being capable of being lowered into the furnace or vessel,
- (c) an inlet funnel surrounding the shaft above the disc for supplying a particulate refractory material thereto whereby the disc may be lowered into the furnace or vessel and rotated for centrifugally throwing the supplied refractory material against the portion of the refractory lining to be built up and repaired,
- (d) a conical element keyed to the shaft for rotation therewith and defining a conically outwardly tapering inlet conduit of annular cross section having an upper end in communication with the inlet funnel and a lower end above the disk, the inlet conduit having an inner wall and an outer wall, the combination of
- (e) a bell-shaped shutoff valve body surrounding the shaft and vertically adjustably mounted in the inlet funnel for regulating the communication between the inlet funnel and the upper inlet conduit end,
- (f) adjustable slide means at the lower inlet conduit end for regulating the flow of the material from the inlet conduit to the disc,
- (g) means for spraying water into the inlet conduit, the water spraying means including
- (1) a horizontal row of bolts extending from the outer wall into the inlet conduit and distributed over the periphery



- thereof, at least one of the bolts being hollow and having bores, and
- (2) a source of water connected to each hollow bolt for spraying the water through the bores,
- (h) wiper elements projecting into the inlet conduit from the inner and outer walls, and
- (i) means for delivering a gas under pressure into the inlet funnel in the range of the shutoff valve body, the means including
- (1) a circular chamber,
  - (2) a porous cover over the circular chamber and
  - (3) a source of gas under pressure connected to the circular chamber whereby the gas under pressure enters the inlet funnel in finely distributed form.

4,422,627

## ENDLESS SPRING, SUCH AS RINGSRING

Helmut Schmidt, Munich; Ulrich Ramm, Neubiberg, and Alexander Schroeder, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

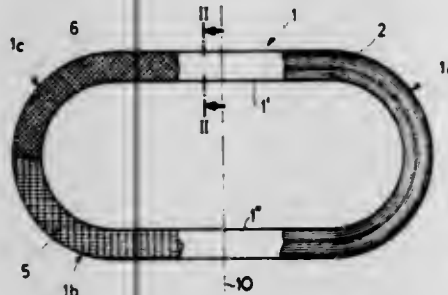
Filed Jun. 1, 1981, Ser. No. 268,726

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022418

Int. Cl.<sup>3</sup> F16F 1/36, 7/00; B32B 9/04

U.S. Cl. 267—148

13 Claims



1. An endless spring comprising substantially straight leg portions connected by curved end portions, said endless spring forming a frame having a frame plane for taking up loads extending in said frame plane in a main load application direction, comprising a spring body having a plurality of layers (2, 3, 4) made of fiber compound materials and extending in parallel to said frame plane, said layers comprising a first layer type (2) in which fiber bundles are wound so that all the fibers extend unidirectionally in said first layer type and a second layer type (3, 4), each said second layer type comprising at least two plies (5, 6) in which the fibers extend in cross-over relationship relative to each other, said first layer type and said second layer type being arranged in alternate succession relative to each other.

4,422,628

## CLAMPING APPARATUS

Shigeo Kasai, Sagami-hara, Japan, assignor to Amada Company, Limited, Japan

Filed Sep. 24, 1981, Ser. No. 305,336

Claims priority, application Japan, Sep. 24, 1980, 55-131485

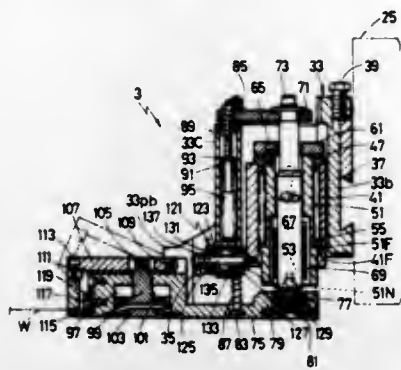
Int. Cl.<sup>3</sup> B23Q 1/04

U.S. Cl. 269—71

2 Claims

1. A workpiece clamping apparatus (3) for machine tools comprising:
  - a. a frame (33);
  - b. a rocking sleeve member (41), rockably fixed to the frame (33);
  - c. a cylindrical member (51), slidably inserted in the rocking sleeve member (41), so as to move therein;
  - d. a rod member (67), inserted in the cylindrical member (51), so as to project therefrom;

- e. a swinging holding member (75), rockably provided at one end of the rod member (67); and



- f. an upper clamping jaw means (111) and a lower clamping jaw means (115), both connected to the swinging holding member (75), for gripping an end of a workpiece (W).

4,422,629

## RANGE JAWS FOR MILLING MACHINE VISES

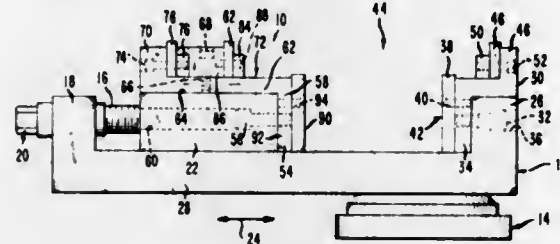
Alfred J. Carlson, 9926 W. 143rd Pl., Orland Park, Ill. 60462

Filed May 24, 1982, Ser. No. 381,192

Int. Cl.<sup>3</sup> B25B 1/24

U.S. Cl. 269—282

9 Claims



1. In the combination of a vise, the vise having a stationary end member, the moveable end member having a flat elongated upper surface, said flat elongated upper surface being substantially normal to a work piece clamping surface located on the moveable end member, said vise including a stationary flat surface extending between said stationary member and said moveable end member, the improvement comprising a first accessory member, a second accessory member, a third accessory member, the first accessory member having a Z-shaped cross-section, said Z-shaped cross-section of said first accessory member including removable joining means for joining said first Z-shaped cross-section accessory member to said moveable end member, said second accessory member having a second Z-shaped cross-section, said second Z-shaped cross-section of said second accessory member including means to removably join said second accessory member to said stationary end member, said first accessory member including a first leg portion and a second leg portion and a portion intermediate said first leg portion and said second leg portion, said second leg of said first accessory member having a free end, said free end of said second leg of said first accessory member being disposed in sliding touching engagement with said stationary flat surface, said second accessory member including a first leg portion and a second leg portion and a portion of said second accessory member intermediate said first leg portion and said second leg portion, said second leg portion of said second accessory member having a free end, said free end of said second leg portion of said second accessory member residing in touching engagement with said flat surface, said intermediate portion of said first accessory member including a pair of lateral surfaces, said pair of lateral surfaces being disposed in spaced apart parallel relationship, said pair of lateral surfaces extending intermediate said first leg portion and said second leg portion of said first accessory member, said third accessory member including means for removably securing said third

accessory member to said first accessory member, said third accessory member being provided having an outermost surface configured to rest upon one of said pair of lateral surfaces, said intermediate portion of said first accessory member having the other of said pair of lateral surfaces configured to reside upon said flat elongated upper surface of said moveable end member, said second accessory member having a supporting surface configured to reside upon a lateral surface of said stationary end member, a first supporting block, a first clamping plate member, means to removably secure said first clamping block and said first clamping plate to said first leg of said first accessory member, a second supporting block a second clamping plate, means to removably secure said second supporting block and second clamping plate to a leg of said second accessory member, a third supporting block, a third clamping plate, a third clamping member, means to removably secure said third supporting block and said third clamping plate to a surface of said third clamping member, a surface of said first supporting block and a surface of said first clamping plate being disposed at right angles to one another, a surface of said second supporting block and a surface of said second clamping plate being disposed at right angles to one another, a surface of said third supporting block and a surface of said third supporting clamping plate being disposed at right angles to one another, wherein said supporting surface of said first accessory member defines a plane, said surface of said first supporting block and said surface of said second supporting block and said surface of said third supporting block being disposed equidistant from said plane, wherein said third accessory member comprises one end and another end and at least one lateral surface, therebetween, a notch, said notch being located on said one end of said first accessory member, said notch being configured to accommodate said first supporting block residing therewithin when said at least one lateral surface of said third accessory member is disposed clampingly engaged to said supporting surface of said first accessory member.

means for securing said body to said shaft at a selected one of a plurality of positions therealong; the outer diameter of said first cylindrical portion being greater than the outer diameter of said second cylindrical portion.

4,422,631

## PAPER FEEDING DEVICE FOR RECORDING APPARATUS

Tsugio Sugizaki, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

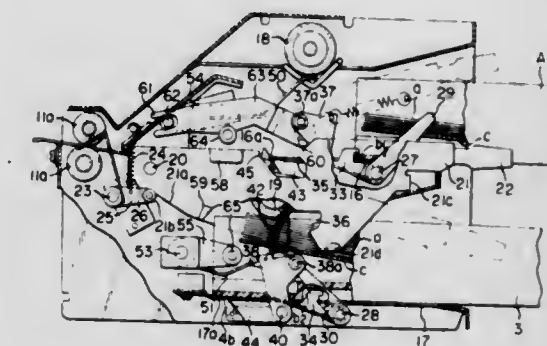
Filed May 20, 1981, Ser. No. 265,362

Claims priority, application Japan, May 28, 1980, 55-71012

Int. Cl.<sup>3</sup> B65H 5/26

U.S. Cl. 271—9

1 Claim



4,422,630  
BLADE HOLDER AND METHOD OF USING THE SAME

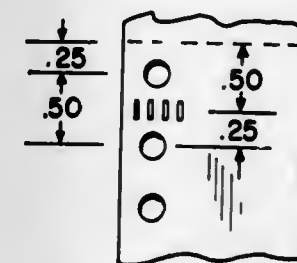
John L. Trentman, Tipp City, Ohio, assignor to Harris Corporation, Melbourne, Fla.

Filed May 14, 1982, Ser. No. 378,380

Int. Cl.<sup>3</sup> B42B 2/00

U.S. Cl. 270—53

4 Claims



1. A crimp blade holder for attachment to a shaft and for removably mounting a plurality of crimp blades, comprising: a body having first and second cylindrical portions, each of said portions having a periphery defining an outer diameter, said portions being joined together at an end face of each of said portions and disposed along a common axis; said body having a hole extending axially therethrough, said shaft being insertable through said hole; said first portion having a plurality of slots arranged about the periphery thereof in a first spaced relationship for removably inserting one of said crimp blades into each of said slots; said second portion having a plurality of slots arranged about the periphery thereof in a second spaced relationship for removably inserting one of said crimp blades into each of said slots; means for securing said crimp blades within each of said slots; and

1. A paper feeding device for recording apparatus comprising, a plurality of paper feeding racks for loading detachable cassettes loaded with paper, a paper feed roller for each rack a manual lever capable of taking a plurality of positions, each corresponding to one of said paper feeding racks and a neutral position, means urging the return of said lever from each of said plurality of positions back to said neutral position, a stopper for each rack prohibiting the loading of a cassette onto a corresponding paper feeding rack and removal of any already loaded cassette from said paper feeding rack whenever said manual lever is set to a position corresponding to said rack, a locking member for locking said manual lever when said manual lever is moved to one of said positions, a sensor for unlocking said locking member and for permitting return of said manual lever to said neutral position whenever a paper feeding rack is completely loaded with a cassette, and further means for permitting insertion of a cassette when said manual lever is set to one of said positions, and for urging the paper into contact with said paper feeder roller when said manual lever is returned back to its neutral position.

4,422,632

## TILTABLE TENNIS COURT

Pierre Trottet, Le Coulet 1165, Allamand, Switzerland

Filed May 26, 1982, Ser. No. 382,240

Claims priority, application Switzerland, Jun. 4, 1981, 3668/81

Int. Cl.<sup>3</sup> A63J 3/00

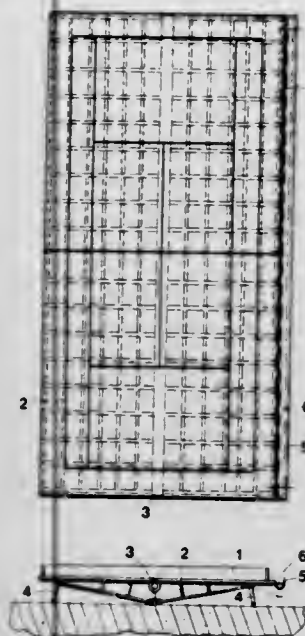
U.S. Cl. 272—3

3 Claims

1. A tennis court characterized in that it comprises a panel and a pivot on which said panel is mounted, said pivot oriented



along the longitudinal axis of said panel, a frame supporting said panel and engaging said pivot, and jacks at opposite sides



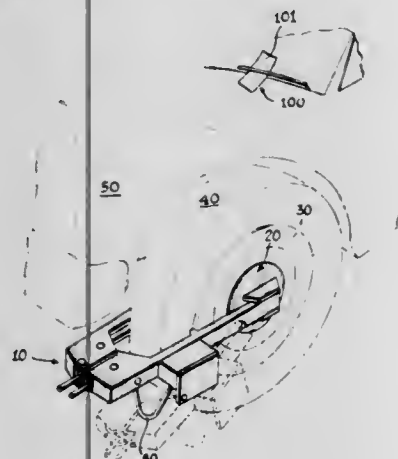
of said frame to adjust the lateral inclination of the panel- has been inserted.

**4,422,633**  
**SIMULATED WHEEL IMMOBILIZING APPARATUS**  
John J. Petrone, 110 Roberts La., Apt. 100, Alexandria, Va. 22314

Continuation-in-part of Ser. No. 129,552, Mar. 12, 1980, abandoned. This application Aug. 6, 1981, Ser. No. 290,441  
Int. Cl.<sup>3</sup> A63J 5/02

U.S. Cl. 272-8 N

6 Claims



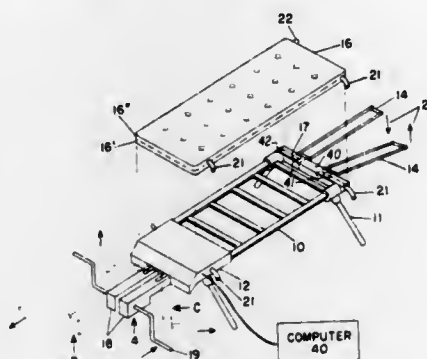
1. A novelty/advertising device for use in combination with the windshield and one wheel of a vehicle, wherein the device comprises:

a first flexible major component dimensioned to be disposed around, but spaced from, at least a portion of the said one wheel, and further having an exterior configuration which closely resembles a wheel immobilizing device, wherein the first major component comprises an enlarged portion dimensioned to overlie a portion of the hub of the said one wheel, and an elongated L-shaped arm projecting from the enlarged portion and extending beyond the radius and at least a portion of the width of the vehicle wheel, and at least one downwardly depending support element disposed on the said enlarged portion adjacent to, but spaced from, the hub whereby the first major component may be positioned adjacent to, but spaced from one wheel of a vehicle, to give the impression that a wheel immobilizing device has been physically attached to said one wheel, and a second flexible major component adapted to be placed on the windshield of a vehicle, wherein the second major

component is dimensioned and colored so as to resemble a traffic ticket commonly issued in a given geographical area, and has promotional material imprinted thereon, in lieu of the language found on a traffic summons.

**4,422,634**  
**SWIMMING SIMULATOR**  
Harry C. Hopkins, 15 Lafayette St., White Plains, N.Y. 10606  
Filed Jun. 8, 1981, Ser. No. 271,390  
Int. Cl.<sup>3</sup> A63B 69/10  
U.S. Cl. 272-71

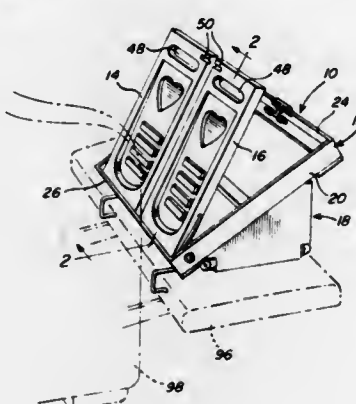
9 Claims



1. A swimming simulator for providing a user with the exercise typically produced by swimming, comprising:  
support frame having a longitudinal axis resting on a foundation and supporting the torso of the user in a horizontal position at a distance above the foundation;  
a pair of arm levers with a longitudinal axis and being extendable from a front part of said support frame, said arm levers including a pair of grip handles adapted to be seized by the user's hands and extending transversely from the longitudinal axis of said arm levers, said grip handles being movable along a circular path against a first predetermined resistance;  
a pair of leg levers extending from a rear part of said support frame in a position to contact the legs of the user, the end of each of said leg levers being movable in an arc about a rear pivot point at the other end, such movement being against a second predetermined resistance; and  
at least one air pump means connected by a mechanical coupling to at least one of said pair of grip handles and said pair of leg levers for operating said air pump means and providing at least one of said first and second predetermined resistances.

**4,422,635**  
**PORTABLE MULTIPLE USE EXERCISER**  
James V. Herod, P.O. Box 1317, Collegedale, Tenn. 37315, and Charles H. Neal, 2027 Jenkins Rd., Chattanooga, Tenn. 37421  
Filed Jan. 27, 1982, Ser. No. 344,203  
Int. Cl.<sup>3</sup> A63B 23/04; A61G 7/04  
U.S. Cl. 272-96

8 Claims

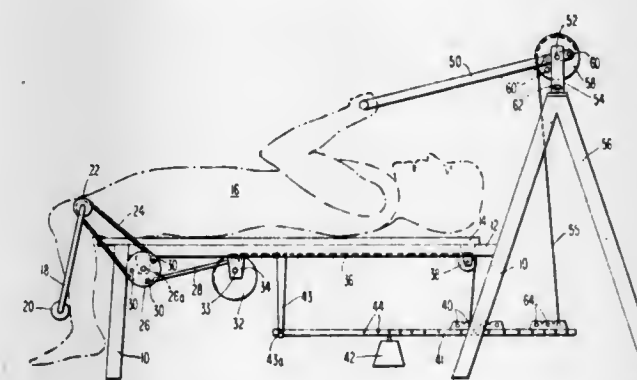


1. A portable multiple use exerciser including a base, a pair

of side-by-side levers pivotally supported at one pair of corresponding ends from said base for independent spring biased oscillation relative to said base between first positions generally paralleling said base and second positions angled relative to said base with the other ends of said levers inclined away from said base, said levers being adapted to be engaged by the feet, hands, knees or elbows of the user, a stand for said base, said base including opposite side marginal portions generally paralleling said levers when the latter are in the first positions thereof, said stand including a support panel having opposite side marginal portions, a pair of wings pivotally supported from said opposite side marginal portions of said panel for swinging movement relative thereto about an axis generally paralleling said side marginal portions and between collapsed positions generally paralleling and overlying one side of said panel and extended limit positions with said wings disposed at generally right angles relative to said panel and projecting outwardly of one side thereof, the free swinging edge portions of said wings being similarly inclined relative to said axes and including first fastening means supported therefrom, the undersurfaces of said opposite side marginal portions of said base including second fastening means supported therefrom with which said first fastening means are releasably engageable for supporting said base in an inclined position relative to a surface upon which said panel rests.

**4,422,636**  
**EXERCISE APPARATUS**  
Michael M. de Angeli, 12 Raymond Rd., Broomall, Pa. 19008  
Filed Jun. 18, 1980, Ser. No. 160,614  
Int. Cl.<sup>3</sup> A63B 21/06  
U.S. Cl. 272-117

5 Claims



1. Apparatus for the exercise of body members by the lifting of weight against the force of gravity, comprising:

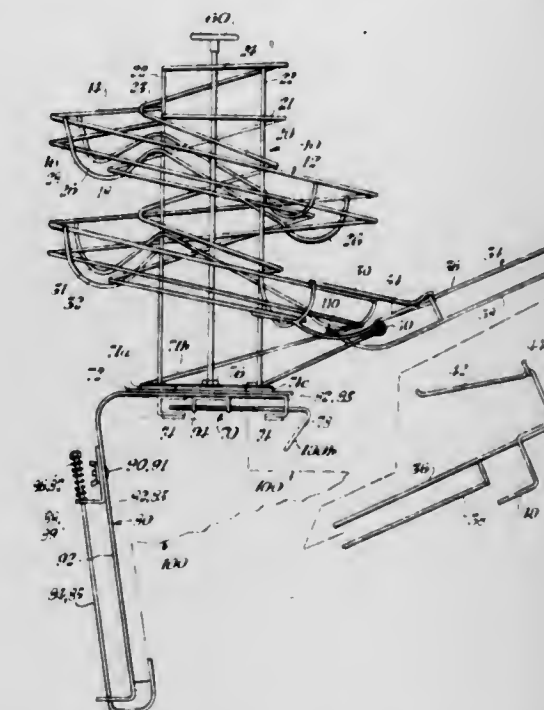
a frame;  
a bench mounted on said frame;  
a first rotatable arm, mounted for rotation on said frame at an end of said bench to exercise leg muscles;  
a second rotatable arm mounted on said frame for rotation for exercise of arm muscles; and  
a weight adapted to be elevated by rotation of either of said first or second arms;

wherein means are provided for operative connection of both said arms to said weight, said means for connection permitting variation of the position of said arms at which rotation thereof causes elevation of said weight to commence, and of the direction of rotation of said arms which elevates said weight, said weight being elevated from a rest position upon rotation of one of said arms, said means for connection permitting variation of said rest position with respect to the position of said arms at which rotation thereof causes elevation of said weight to commence, independent of the position of said arm at which maximum effort is exerted against the force of gravity.

**4,422,637**  
**POOL BALL HOLDER AND SPOTTING DEVICE**  
Edward A. Bush, 2407 Blossom Ct., Ft. Pierce, Fla. 33450  
Filed Feb. 8, 1982, Ser. No. 346,550  
Int. Cl.<sup>3</sup> A63D 15/00

U.S. Cl. 273-22

8 Claims



1. A device for storing and sequentially dispensing billiard or pool balls onto the playing surface of a billiard or pool table comprising:

a means for holding and storing the balls in a sequence selected by the player;  
a means for removably attaching said holding means onto the edge of the table;  
a means for placing one ball at a time onto the playing surface in a position selected by the player, said placing means having a proximal and a distal end;  
a means for rotating said placing means in arcuate fashion, said rotation means for increasing the range of available ball placement by the player;  
said attaching means interconnected between the lower end of said holding and storing means and said rotating means;  
a biasing means for holding said distal end of said placing means above the playing surface when not in use;  
said holding and storing means aided by gravity to deliver the balls to said placing means;  
said placing means pivotally connected to said holding and storing means at said proximal end of said placing means;  
said placing means pivotable about said pivot connection by the player by manual arcuate movement of said distal end of said placing means downwardly to the table surface;  
said ball placement determined by the position of said distal end selected by the player.

**4,422,638**  
**GOLF PUTTER**  
Richard B. C. Tucker, Baltimore, Md., assignor to Wm. T. Burnett & Co., Inc., Baltimore, Md.  
Filed Jan. 23, 1981, Ser. No. 227,636  
Int. Cl.<sup>3</sup> A63B 53/08

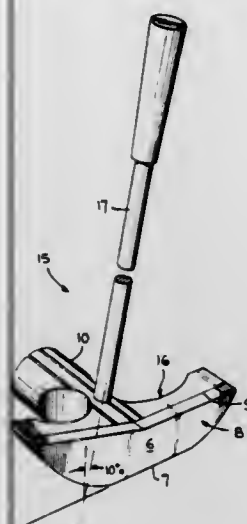
U.S. Cl. 273-78

11 Claims

1. A putter comprising a shaft and a head having a striking face at one end of said shaft, said head having an elastomer on at least the striking area of said face of said head, said elastomer having a hardness of at least 70 Durometer A and a hardness less than the hardness of a golf ball and a high resiliency with controlled dampening, said hardness permitting penetration of a golf ball into said elastomer when a ball is stroked with said face, and said resiliency and controlled dampening causing said



stroked ball to rebound from said face a distance at least as great as the distance of the rebound of said ball when said ball



is stroked with an equal force with a metal putter head of equal mass.

4,422,639

**ELECTRONIC FOOTBALL GAME**

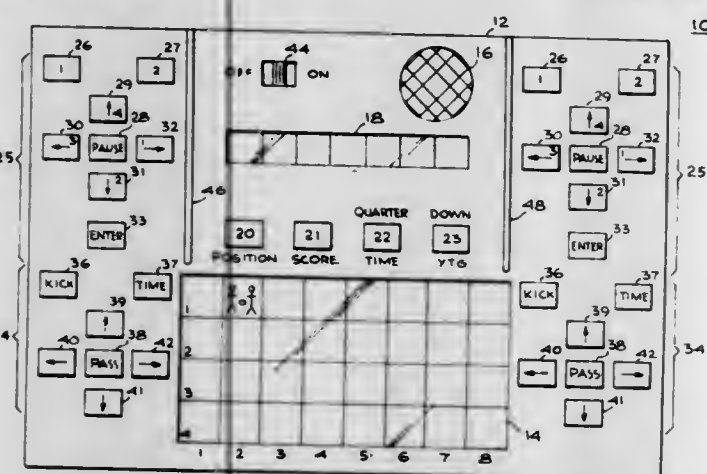
Robert M. Del Principe, Hawthorne, and Peter A. Oliphant, Van Nuys, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 10, 1980, Ser. No. 205,481

Int. Cl.<sup>3</sup> A63F 9/00

U.S. Cl. 273—94

12 Claims



1. An electronic football game comprising:  
a display in the form of a playing field having indicia representing a ball, a plurality of offensive players including a quarterback and at least two receivers any one of which may be a ball carrier and each capable of receiving the ball, running with the ball and passing the ball at any time during an individual play of the game, and a plurality of defensive players;  
run input means responsive to operator control for maneuvering the ball carrier about the field at any time during an individual play of the game;  
pass input means responsive to operator control for passing the ball from the ball carrier at any time during an individual play of the game and from any position on the playing field; and  
control means responsive to the run and pass input means for starting an individual play, for executing multiple run maneuvers and multiple pass maneuvers during an individual play of the game in response to the run input means and the pass input means, respectively, and for controlling the display indicia to indicate the positions and movement of the players and the ball, and including line means for determining a line of scrimmage on the field, means for determining the position of the ball carrier on the field, means for enabling the ball carrier to execute a forward pass, means for enabling the ball carrier to execute a lat-

eral or backward transfer of the ball, and means for preventing the ball carrier from executing a forward pass if the ball carrier has crossed the line of scrimmage.

4,422,640

**VIDEO GAME CONTROL UNIT AND LAP BOARD HOLDER THEREFOR**

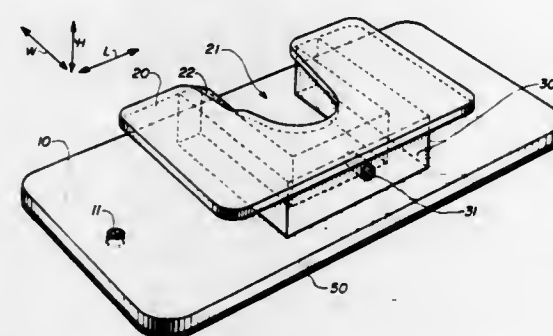
Michael J. Tamarkin, 1610 S. Queen St., York, Pa. 17403

Filed Jul. 6, 1982, Ser. No. 395,138

Int. Cl.<sup>3</sup> A63B 71/04

U.S. Cl. 273—148 R

6 Claims



1. A lap board holder for supporting a video game control unit of the type wherein a control rod extends generally perpendicularly from the top surface of a generally box-shaped housing which is up to about 6 inches long, up to about 6 inches wide and up to about 3 inches high, comprising:  
a rigid planar base having length at least sufficient to span and rest on the legs of a person operating the control unit while seated and width at least equal to the width of the housing;  
a rigid planar shelf having length exceeding the length of the control unit by an amount sufficient to provide support for at least one hand of a person operating the control unit and width at least equal to the width of the housing, the periphery of the shelf including a recess; and  
means joining the shelf to the base and positioning the shelf above the base in parallel spaced apart relationship such that the housing can be slid into position between the shelf and base and be held there by a tight fit with the control rod positioned in the recess in the shelf.

4,422,641

**SHIFTABLE BLOCK PUZZLE**

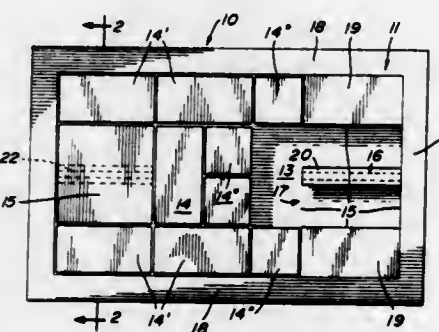
Pierre K. Collin, 1077 B St-Joseph Blvd., Charlesbourg West, Quebec, Canada G2K 1G3

Filed Mar. 18, 1982, Ser. No. 359,430

Int. Cl.<sup>3</sup> A63F 9/08

U.S. Cl. 273—153 S

11 Claims



1. A shiftable block puzzle comprising a board defining a bottom wall having a flat top surface, a plurality of blocks of different sizes confined for lateral movement on said flat surface, and a restricted area on said flat top surface for reception thereon of a single primary one of said blocks after shifting movements of secondary ones of said blocks to make way for displacement of said primary block from a predetermined starting position, said primary block having means to permit

same to be displaced onto said restricted area, said restricted area provided with a protruding element extending above said flat bottom wall and located to prevent said secondary blocks to enter said restricted area, said means to permit said primary block to be displaced into said restricted area being a slot in a lower surface thereof for reception therein of said protruding element to permit said primary block to be shifted into said restricted area.

4,422,642

**NOVELTY EDUCATIONAL PUZZLE APPARATUS**

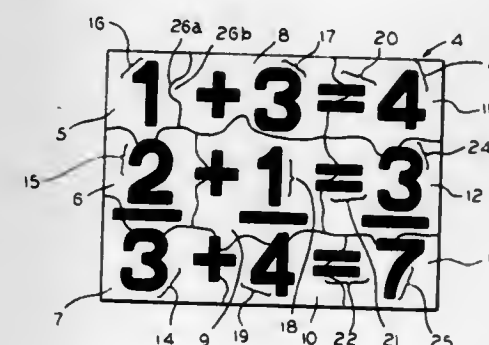
Leslie S. Fletcher, 4230 Yorkshire La., Northbrook, Ill. 60062

Filed Sep. 30, 1982, Ser. No. 429,327

Int. Cl.<sup>3</sup> A63F 9/10; G09B 1/36, 1/38

U.S. Cl. 273—157 R

9 Claims



1. A novelty educational puzzle for instructing users in multidirectional, mathematical, grammatical and color skills, said apparatus comprising:

a plurality of interlocking yet detachable puzzle piece means;  
indicia means comprising written information situated upon said plurality of interlocking puzzle piece means;  
said puzzle pieces being capable of interlocking with others of said plurality of puzzle pieces in both horizontal and vertical columns respectively;  
assembly restriction means operably associated with said puzzle piece means so as to allow assembly of said puzzle piece means in both the vertical and horizontal directions only when said indicia means is in proper sequence;  
said indicia means providing information in both the vertical and horizontal directions;  
said indicia means information comprising initial information, and resultant information proximate to two edges of said puzzle; and  
said indicia means, said interlocking puzzle piece means, and said assembly restriction means cooperating to provide a puzzle that is restrictive in formation to ensure correct assembly as to both intermediate information and end information in both the vertical and horizontal directions.

the user resting in substantially stable fashion at about the user's breastbone; and



(c) a straight rigid elongated member attached to and spaced forward from said another section angled in an upward direction, in a forward direction and in a side direction.

4,422,644

**BOARD GAME APPARATUS**

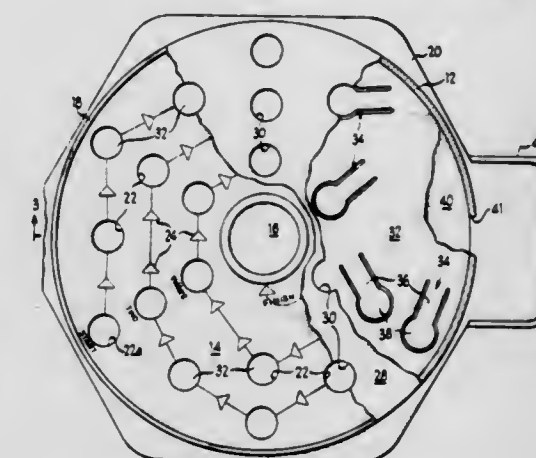
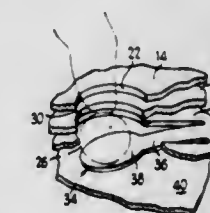
Edward T. Holahan, Chicago, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 5, 1981, Ser. No. 318,336

Int. Cl.<sup>3</sup> A63F 3/00

U.S. Cl. 273—249

14 Claims



13. A board game apparatus, comprising:

a housing;  
a playing surface defined on said housing, including a plurality of playing piece receiving apertures;  
at least two playing pieces sized to pass through said apertures;  
a playing piece support surface on said housing beneath said playing surface arranged to support said playing pieces in said apertures, said playing piece support surface being movable with respect to said playing surface;  
a plurality of deflectable elements arranged on said support surface and aligned beneath less than all of said apertures to allow a playing piece to be pushed through said support surface into the interior of said housing; and  
means for concealing the location of said deflectable elements when said playing surface is moved.

4,422,643

**GOLF SWING TRAINING DEVICE**

Emmet J. Cushing, 6115 Dupont Ave. South, Minneapolis, Minn. 55419

Filed May 3, 1982, Ser. No. 374,435

Int. Cl.<sup>3</sup> A63B 69/36

U.S. Cl. 273—183 B

7 Claims

1. A golf swing training device comprising:  
(a) a first section made of rigid material arched over the user's shoulder on each side of the neck and extending to rest against the user's back in substantially stable fashion below the shoulder level;  
(b) another section of rigid material continuing from the first section downward from the shoulder along the front of



4,422,645

**GAMEBOARD AND CARRYING CASE**

Charles R. Simons, 307 Kensington, Ferndale, Mich. 48220  
Continuation of Ser. No. 236,720, Feb. 23, 1981, Pat. No. 4,381,113, which is a continuation of Ser. No. 952,311, Oct. 18, 1978, Pat. No. 4,252,324, which is a continuation-in-part of Ser. No. 748,820, Dec. 9, 1976, abandoned, and Ser. No. 674,986, Apr. 8, 1976, abandoned. This application Oct. 5, 1981, Ser. No. 308,860

The portion of the term of this patent subsequent to Feb. 24, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> A63F 3/00

U.S. Cl. 273—286

5 Claims



1. In combination, a carrying case, a gameboard, a pair of die tossing cups, play pieces and a game pack for storing the play pieces,

said gameboard comprising a sheet of pliable material of uniform thickness having a first and a second pair of opposed right-angulantly arranged margin edges spaced from one another a first and a second predetermined distance respectively, and each edge being of said uniform thickness, said gameboard being rolled into a roll and defining a bore of generally circular cross section throughout its length, said length being of a length equal to said first predetermined distance;

said pair of die tossing cups comprising a first and second end cap, said first end cap and said second end cap each having an open end and including a closed circular end wall and a cylindrical axially extending side wall of circular cross section of a predetermined inner diameter substantially equal to the diameter of said gameboard when rolled and each of said end caps including said side walls and end walls being of a common predetermined outer diameter, and each of said end caps being positioned on the ends of said rolled gameboard with the end wall of each cap being in abutting engagement with one of the margins of said gameboard along said second pair of opposed edges and captivated within said end caps and within said axially extending side walls of said end caps, each of said end caps being of an axial length substantially less than one-half the distance between said second pair of opposed edges; and

said carrying case comprising a longitudinally-extending tubular container of circular cross-section of an inner diameter substantially equal to but slightly greater than the outer diameter of the cylindrical side walls and end walls of the end caps, said case having a closed end and an open end, and said gameboard and end caps being in said container, said container snugly jacketing said gameboard and end caps, said container being of an axial length substantially equal to but slightly greater than the first predetermined length of said gameboard and the thickness of the end walls of said first and second end caps and said container having an outer uniform diameter;

cap means for said open end of said tubular container, said cap means comprising a cup-shaped member of a diameter substantially equal to said outer diameter of said container and having an axially extending skirt sized to and snugly jacketing said container adjacent said open end and closing said open end of said container; and

said game pack comprising a pair of bags, each bag having an open end, a closed bottom and side walls of a maximum opening less than the interior of the rolled gameboard and received in the space within the rolled gameboard.

4,422,646  
**INFRARED TARGET FOR MILITARY APPLICATIONS AND ITS USE**

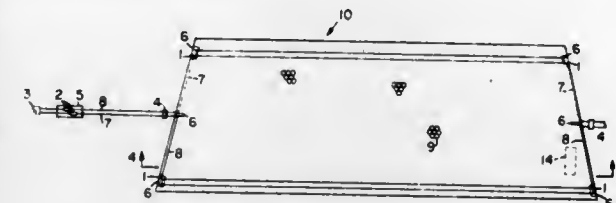
Stephen P. Rosa, Bethesda, Md., assignor to TVI Energy Corporation, Beltsville, Md.

Filed Sep. 18, 1981, Ser. No. 302,878

Int. Cl.<sup>3</sup> F41J 9/12

U.S. Cl. 273—348.1

14 Claims



12. An electrically operated military target module capable of emitting an infrared signal when an electric current from an electrical power source having two poles is passed therethrough comprising a unitary, composite laminate including:

- (A) electrically insulating top and bottom layers, each layer having inner and outer surfaces;
- (B) a substantially continuous, electrically conductive layer of substantially uniform thickness between said inner surfaces, wherein said electrically conductive layer is comprised of carbon;
- (C) at least two substantially parallel metallic busbars in contact with said electrically conductive layer, each of said busbars having two ends;
- (D) a first electrical connector means for connecting both ends of one of said busbars to one pole of an electrical power source;
- (E) a second electrical connector means for connecting both ends of another of said busbars to the other pole of the electrical power source;

wherein said top layer and said bottom layer have edges, which are sealed together to thereby form an enclosed laminate containing the electrically conductive layer; and said outer surface of said top layer is covered by a thermal insulating pad containing a multiplicity of discrete air-containing cells through which said infrared signal can pass.

4,422,647

**VOLLEYBALL OUT OF BOUNDS DETECTING AND INDICATING SYSTEM**

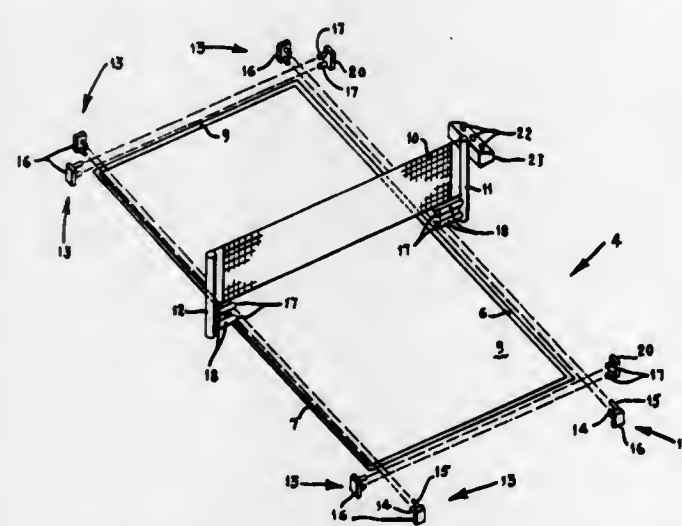
Wayne D. Wilson, 4934 Turquoise Cir., Colorado Springs, Colo. 80917, and James J. Joyce, 7630 Topin Rd., Colorado Springs, Colo. 80908

Filed Feb. 19, 1982, Ser. No. 350,529

Int. Cl.<sup>3</sup> A63B 71/06

U.S. Cl. 273—411

8 Claims



1. In combination with a volleyball court having a net and sideline and endline bounds defining a playing surface, a vol-

leyball out of bounds detecting and indicating system comprising

light beam generating means projecting light in the form of upper and lower juxtaposed light beams around the outer periphery of said playing surface said light beams being spaced apart a distance that prevents simultaneous interruption of both beams by a single volleyball, said light beams being positioned outside of and proximately spaced from said sideline and endline bounds with said lower beam being proximately spaced from said playing surface, detector means receiving said projected light and outputting signals in response thereto, and volleyball out of bounds indicating means receiving said detector means output signals and generating out of bounds indication signals exclusively in response to volleyball incurred light beam interruptions.

4,422,648

**CERAMIC FACED OUTER AIR SEAL FOR GAS TURBINE ENGINES**

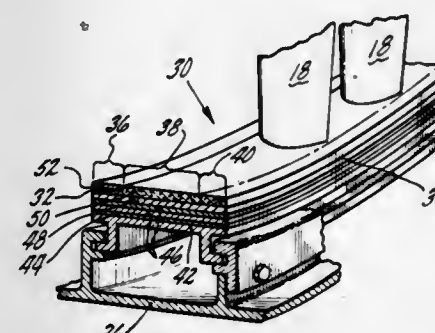
Harry E. Eaton, Woodstock, and Richard C. Novak, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 17, 1982, Ser. No. 389,304

Int. Cl.<sup>3</sup> F01D 11/08

U.S. Cl. 277—53

4 Claims



1. In an outer air seal of the type circumscribing the turbine rotor blades of a gas turbine engine and having a leading edge region forward of the blades, a midregion opposing the blades and a trailing edge region rearward of the blades, the improvement comprising:

an abradable ceramic coating having higher surface density at the leading edge region of the seal than at the midregion of the seal.

4,422,649

**STIRLING ENGINE PISTON RING**

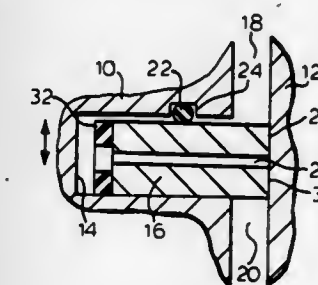
Roy B. Howarth, Clifton Park, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 2, 1982, Ser. No. 354,020

Int. Cl.<sup>3</sup> F16J 9/00

U.S. Cl. 277—75

6 Claims



1. In combination a piston, cylinder and sealing ring for use in providing a seal between the piston and the cylinder in which is contained a high pressure region on one side of the

ring and a low pressure region on the opposite side, said ring comprising:

an inner and outer surface, said outer surface having at least two sides, one of which is exposed to high pressure, the other side of which is exposed to low pressure;

a contact surface on said outer surface engageable with the cylinder;

means isolating said inner surface from the high pressure;

a leakage path between the high and low pressure coupled to means capable of communicating a mean pressure to the inner surface of the ring so as to balance pressure forces acting on the inner and outer surfaces; and

means biasing said contact surface into engagement with the cylinder to provide a seal therebetween.

4,422,650

**FLEXIBLE SEAL ASSEMBLY**

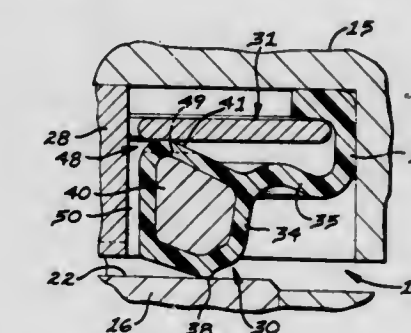
Harold L. Reinsma, Dunlap; Michael A. Roussin, and Albert L. Woody, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 22, 1982, Ser. No. 421,172

Int. Cl.<sup>3</sup> F16J 15/34

U.S. Cl. 277—88

21 Claims



1. In a face seal assembly (10) for a joint (12) having a first member (15) pivotable about an axis (20) relative to a second member (16), the first member (15) having an annular recess (23) disposed about said axis (20) and the second member (16) having a sealing surface (22) confronting said recess (23), said seal assembly (10) being disposed in said recess (23) and including an annular seal (30) of flexible, wear resistant material and a metallic load spring (31), said seal (30) having an axially movable sealing portion (34) with an annular seal lip (38), and said spring (31) being disposed behind said sealing portion (34) and exerting a force for urging and maintaining said seal lip (38) in sealing engagement against said sealing surface (22), the improvement comprising:

a rigid stiffener ring (40) molded into said sealing portion (34) of said seal (30), said stiffener ring (40) being of a construction and position within said sealing portion (34) sufficient for providing the sealing portion (34) with an intervening wall portion (41) separating the stiffener ring (40) from direct force transmitting contact with and from rubbing against the load spring (31) in response to axial movement of said sealing portion (34).

4,422,651

**CLOSURE FOR PIPES OR PRESSURE VESSELS AND A SEAL THEREFOR**

Douglas J. Platts, Worksop, England, assignor to General Desecaling Company Limited, Nottinghamshire, England  
Division of Ser. No. 841,894, Oct. 13, 1977, Pat. No. 4,140,240.  
This application Dec. 27, 1978, Ser. No. 974,036

Claims priority, application United Kingdom, Nov. 1, 1976, 45281/76

Int. Cl.<sup>3</sup> F16J 15/34

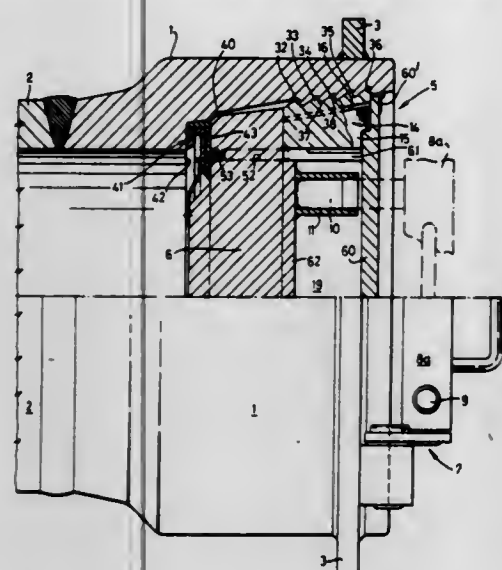
U.S. Cl. 277—206 R

1 Claim

1. A seal comprising a support of relatively rigid material having first and second flanges having remote surfaces adapted to engage respective opposed faces of elements between which



a seal is to be formed, the first flange having a greater surface area than the second flange and being less flexible than the second flange, said flanges extending in substantially parallel planes and said support defining an inwardly opening channel,



and a lining of relatively flexible material carried by the support and extending beyond the terminal edges of the flanges, portions of said lining extending beyond the terminal edges of said flanges including sealing surfaces coplanar with said remote surfaces of said flanges.

4,422,652

#### RELEASABLY RETAINING ARTICLES FOR ROTATION THEREOF

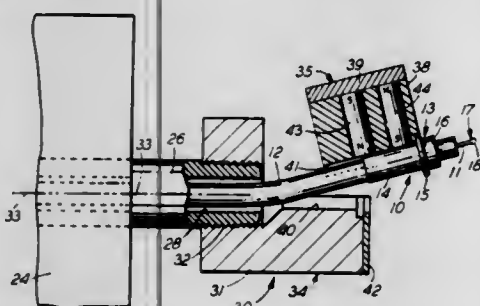
Alan K. Shapiro, Shillington, and Henry R. Siebach, Wyomissing Hills, both of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,059

Int. Cl.<sup>3</sup> B23B 31/00; B23Q 3/152

U.S. Cl. 279—1 M

10 Claims



1. Apparatus for releasably retaining an article for rotation thereof, comprising:

- a chuck body and means for rotating the same about a central axis thereof;
- a first jaw associated with the chuck body and disposed generally laterally of the central axis;
- a second jaw, complementary with and mountable to the first jaw, at least one of said jaws having seat means aligned generally parallel to said central axis to receive said article such that a generally longitudinal axis of the article is substantially coincident with the central axis of the chuck body; and
- magnetic means, associated with said jaws, for releasably mounting the second jaw to the first jaw, for releasably retaining therebetween an article for rotation about the central axis.

4,422,653

#### CHUCK FOR TUBULAR WORKPIECES

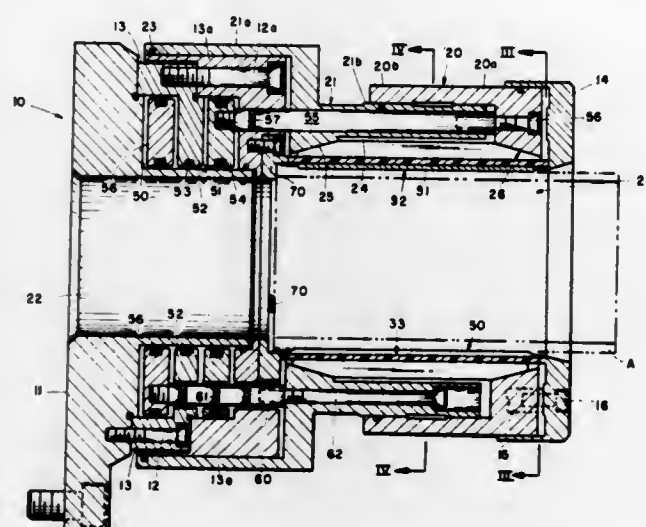
Charles Piotrowski, Suttons Bay, Mich., assignor to Sheffer Collet Company, Traverse City, Mich.

Filed Apr. 16, 1982, Ser. No. 369,246

Int. Cl.<sup>3</sup> B23B 31/20

U.S. Cl. 279—2 A

15 Claims



13. A chuck for gripping tubular workpieces the surface of which may be eccentric, a tubular workpiece clamp having an outer cylindrical sheath, an inner cylindrical sheath and a tubular sleeve seated between and firmly engaging both of said sheaths; said sleeve being of a resilient material having memory and capable of radial and circumferential migration; said sheaths each being segmented into elongated strips interconnected at an end of the sheath whereby said sheaths are capable of diametric expansion and contraction; movable jaw means for alternately compressing and releasing said clamp.

4,422,654

#### HOLLOW ROTARY CLAMPING APPARATUS

Kurt Grünig, Lengnau, Switzerland, assignor to Jos. Habegger, AG, Meisberg, Switzerland

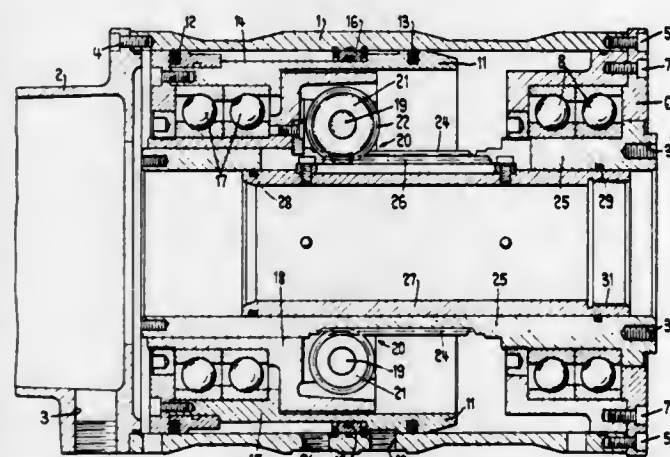
Filed Feb. 26, 1981, Ser. No. 238,343

Claims priority, application European Pat. Off., Mar. 28, 1980, 80810106.7

Int. Cl.<sup>3</sup> B23B 31/00

U.S. Cl. 279—4

12 Claims



1. In a hollow rotary clamping apparatus for use in a lathe, the clamping apparatus including a housing, a piston located coaxially within the housing, the piston having a configuration so as to be displaceable in a longitudinal direction with respect to the apparatus, means for supplying a pressure medium to the piston to displace the piston with respect to the apparatus, a rotary part disposed coaxially within the piston, the rotary part being displaceable with the piston and supported with respect to the piston by bearing means, and an actuating tube to which a collet, chuck or the like is connectable, the actuating tube

being displaceable as a result of movement of the rotary part; in which the improvement comprises:

a racked-bar differential drive mounted on the rotary part, the drive including axles symmetrically arranged on the rotary part, a respective first gearwheel and a respective second gearwheel mounted on each axle, the gearwheels each being rotatable but fixed to the axle on which the gearwheels are mounted so that relative rotation of the first gearwheel with respect to the second gearwheel is prevented, a guide tube located within the rotary part and surrounding said actuating tube, a first racked-bar disposed on the guide tube, the first gearwheel engaging the first racked bar, a slot in the guide tube, and a second racked-bar on the actuating tube, the second gearwheel extending through the slot and engaging the second racked-bar.

4,422,656

#### APPARATUS FOR MANUAL ROTATION OF MOTOR VEHICLE DRIVING WHEELS THROUGH PROPELLER SHAFT AND DIFFERENTIAL

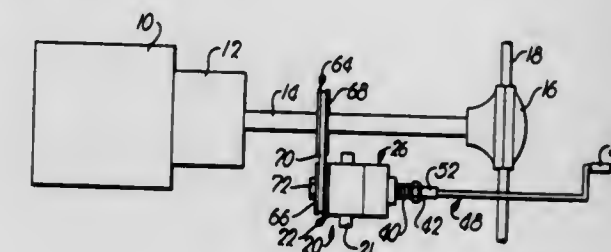
James H. Kaplan, Mission Hills, and Joel S. Lissauer, Overland Park, both of Kans., assignors to Harlan Material Handling Corporation, Kansas City, Kans.

Filed May 10, 1982, Ser. No. 376,539

Int. Cl.<sup>3</sup> B60K 9/00

U.S. Cl. 280—3

9 Claims



4,422,655

#### CHUCK WITH IMPROVED JAW ACTUATOR SUPPORT STRUCTURE

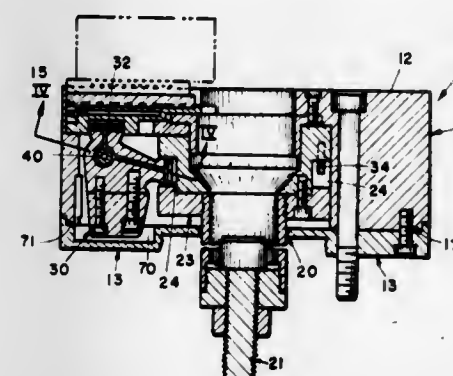
Carlson A. Waite, Bear Lake, Mich., assignor to Sheffer Collet Company, Traverse City, Mich.

Filed Aug. 24, 1981, Ser. No. 295,772

Int. Cl.<sup>3</sup> B23B 5/34; B25G 3/22

U.S. Cl. 279—118

1 Claim



1. In a chuck having a main body member, a plurality of radially extending slots therein opening through the front face thereof, a base for a jaw slidably seated in each of said slots, a plurality of L-shaped levers, each having one leg engaging one of said jaw bases, individual trunnion means mounting each lever; an actuator mounted concentrically of said body member for axial movement and engaging the other leg of each of said levers; each trunnion means having a pair of circumferentially spaced posts with one of said levers being seated between them; a pivot pin extending through each pair of said posts and said lever for supporting the lever for radial rocking movement, a central opening extending lengthwise through said pin and a circumferential channel in said lever surrounding said pin and lubricant conduit means communicating with both said opening and said channel, said chuck characterized in that secondary lubricant conduits extend lengthwise of both legs of each lever and discharge through the ends of each lever engaging said actuator and a jaw base; a lubricant receiving port communicating with one end of said opening in said pin; said main body member having a plurality of pockets, each housing one of said levers and trunnion means; a circumferential channel in the rear of said body adjacent the circumferential periphery thereof communicating with and providing the only interconnection between said pockets adjacent the outer radial periphery thereof whereby lubricant accumulating in said pockets may migrate between the pockets to automatically and uniformly distribute the lubricant between the pockets due to centrifugal forces incident to use of the chuck.

1. Apparatus for facilitating the hitching of a towable vehicle to a towing vehicle behind the latter upon manual rotation of the drive wheels of the towing vehicle through its propeller shaft and differential by a single operator standing on the ground behind the towing vehicle, said apparatus comprising: a support adapted for connection to the chassis of said vehicle;

an input spindle rotatably carried by said support; an output spindle rotatably carried by said support in axial alignment with the input spindle; means for transmitting power from said output spindle to said shaft, the input spindle being shiftable along its axis of rotation relative to the support toward and away from the output spindle; resilient means yieldably biasing the input spindle away from the output spindle; means for interconnecting the spindles when the input spindle is shifted toward the output spindle against the action of said resilient means whereby, upon rotation of the input spindle to rotate the output spindle, the shaft is rotated through said power transmitting means; and a manually operable crank extending rearwardly from said towing vehicle to a point accessible to said operator and having means of connection with the input spindle for rotating the latter, said interconnecting means being releasable to prevent rotation of the input shaft and crank while the propeller shaft is being rotated during normal operation of the towing vehicle.

4,422,657

#### CONNECTION BETWEEN TELESCOPIC SUSPENSION STRUTS FOR SNOWMOBILE SKIS AND STABILIZER MEMBER

Larry D. Swanson, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Oct. 6, 1980, Ser. No. 194,550

Int. Cl.<sup>3</sup> B62B 17/04

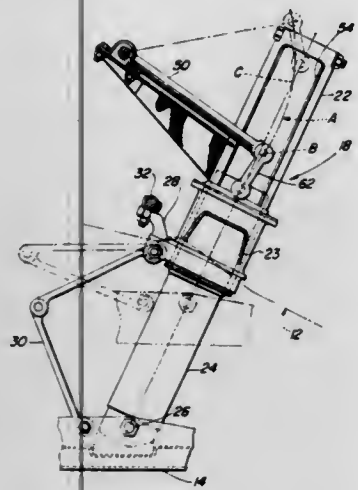
U.S. Cl. 280—21 R

2 Claims

1. In a snowmobile including a longitudinal main frame, right- and left-hand transversely spaced skis suspended from the forward end of the frame respectively by right- and left-hand telescopic struts which each include an outer upright tube fixed to the frame and an inner tube reciprocably and swivelly mounted in the outer tube, a stabilizer member including an intermediate transverse section rotatably mounted on the frame and having right- and left-hand leg sections at its opposite ends respectively connected to the respective inner tubes of the right- and left-hand telescopic struts, an improved connection between each of the inner tubes and the opposite



leg sections, comprising: a stud fixed to the upper end portion of each inner tube and projecting crosswise to the length thereof; said outer tubes being provided with rectangular openings extending lengthwise thereof and respectively having the studs received therein, the openings having respective



widths to provide clearance for permitting the inner tubes to swivel during steering and respective lengths for permitting the inner tubes to move between extended and retracted positions within the outer tubes; and a link connected between each stud and an end of a respective leg.

#### 4,422,658 WHEELED CARRIER

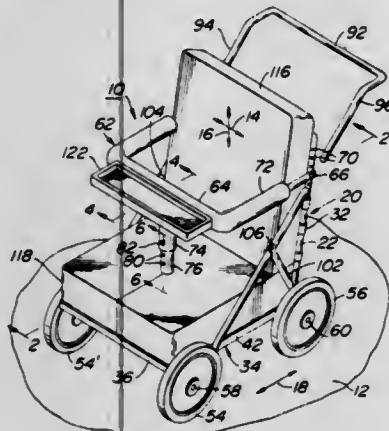
Steven F. Hilliard, Odenton, Md., assignor to Roger C. Lam, Columbia, Md., a part interest

Filed Sep. 28, 1981, Ser. No. 306,227

Int. Cl.<sup>3</sup> B62B 9/10

U.S. Cl. 280—47.4

13 Claims



1. A wheeled carrier comprising:
  - (a) a substantially planar back frame extending in a substantially vertical plane having a pair of transversely displaced back post members;
  - (b) a substantially planar base frame coupled to said back frame extending in a substantially horizontal plane;
  - (c) means for rotating said back frame to a positional location substantially coincident with said horizontal plane formed by said substantially planar base frame, said back frame transversely displaced back post members being pivotally secured to said base frame;
  - (d) a plurality of wheel members rotatably coupled to said base frame for rolling said wheeled carrier on a base surface; and,
  - (e) containment means being independently releasably coupled to each of said back and base frames for preventing a user from falling external said wheeled carrier, said containment means being (1) vertically adjustable with respect to said base and back frames, and (2) removable from each of said back and base frames, whereby said containment means maintains said back frame in said substantially

vertical plane when said containment means is coupled to said back frame.

#### 4,422,659 REAR FENDER STRUCTURE FOR MOTORCYCLES

Hideaki Nebu, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

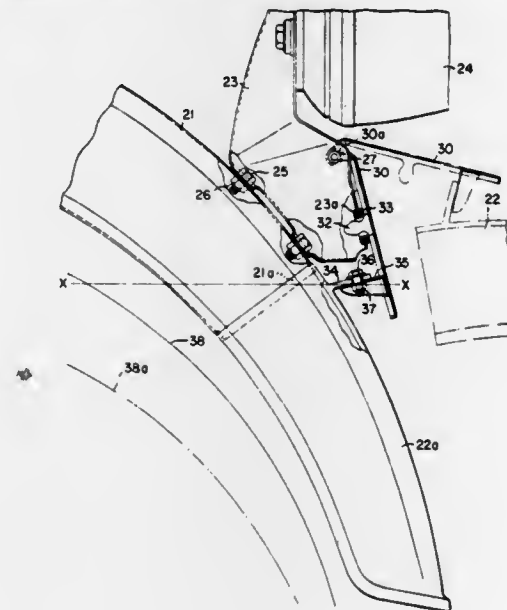
Filed Dec. 16, 1981, Ser. No. 331,264

Claims priority, application Japan, Dec. 29, 1980, 55-185423; Dec. 29, 1980, 55-187958[U]

Int. Cl.<sup>3</sup> B62B 9/16

U.S. Cl. 280—152.1

6 Claims



1. A rear fender structure for a motorcycle, comprising a fender body;
  - a hinged mount fixed to said fender body and extending rearwardly from said fender body to include a hinge displaced from said fender body and a hinged member;
  - a fender member fixed to said hinged member, said fender member forming a retractable extension of said fender body.

#### 4,422,660 REMOVABLE WHEEL ASSEMBLY FOR WHEELCHAIRS

William D. Costello, Ventura; Charles J. Helton, III, Camarillo, and Martin B. Frank, Los Angeles, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 24, 1982, Ser. No. 361,239

Int. Cl.<sup>3</sup> B62M 1/14

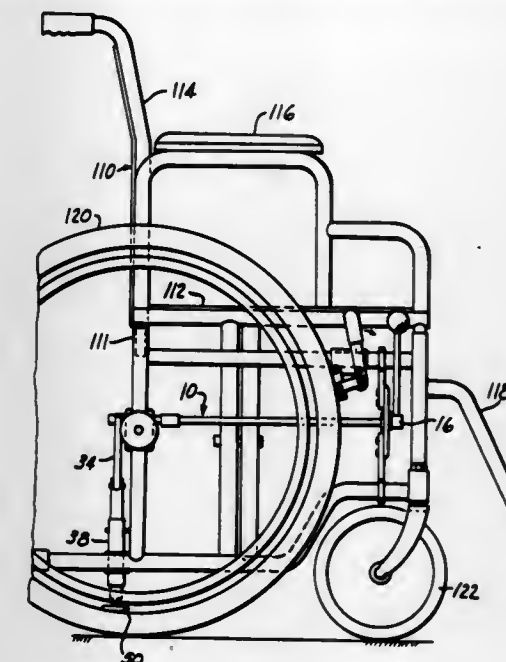
U.S. Cl. 280—242 WC

32 Claims

1. An assembly capable of mounting to a wheelchair in duplicate to provide removal of the drive wheels of the wheelchair, the assembly comprising:

- (a) a connector block mounted on a wheelchair frame, the connector block having a first orifice extending therethrough for receiving an axle of a drive wheel of the wheelchair and a second orifice extending therethrough and at least partially intersecting the first orifice;
- (b) an axle for a drive wheel having an annular groove at one end and extending into the first orifice of the connector block such that the annular groove aligns with the second orifice;
- (c) a rod rotatable about its longitudinal axis and extending through the second orifice of the connector block with at least a portion of the rod having a generally circular cross section and a slot therealong, which slot aligns with the first orifice of the connector block;
- (d) a first arm fastened to and extending radially from the rod and which moves with rotation of the rod;
- (e) a second arm pivotally linked to the first arm;
- (f) a leg pivotally linked to the second arm and slidably

mounted to the frame which cooperates with the rod, first arm and second arm to move between a surface-engaging position and surface-disengaging position upon rotation of the rod, such that the rod intersects the annular groove of



the axle when the leg is in the surface-disengaging position and the slot on the rod aligns with the first orifice and faces the annular groove of the axle when the leg is in the surface-engaging position.

#### 4,422,661 HEIGHT ADJUSTING SYSTEM FOR MOTORCYCLE

Sadao Kawamura, Iwata, Japan, assignor to Showa Manufacturing Co., Ltd., Tokyo, Japan

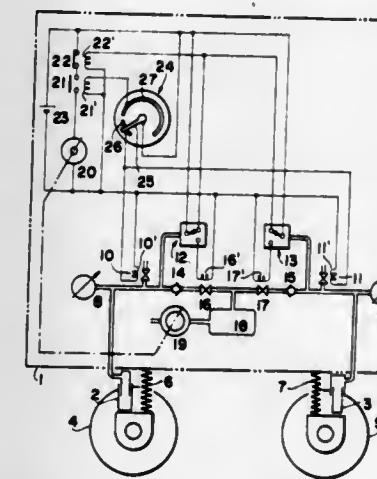
Filed Feb. 19, 1981, Ser. No. 235,919

Claims priority, application Japan, Apr. 10, 1980, 55-46190

Int. Cl.<sup>3</sup> B62K 21/02

U.S. Cl. 280—276

6 Claims



1. In a motorcycle including a front and rear wheel, a front and rear axle, a body supported on said axles, and a speedometer connected to at least one of said wheels, the improvement in providing a height adjusting system for said motorcycle comprising front and rear telescopic suspensions each including a pneumatic shock absorbing mechanism, one of said mechanisms being attached at one end to the rear axle of a motorcycle and the other end being attached to the motorcycle body, and the other of said mechanisms being attached at one end to the front axle of a motorcycle and the other end to the motorcycle body thereby supporting said motorcycle body away from the said axles, a high pressure gas source connected to the said two suspensions and gas flow control means for allowing gas under pressure to flow from the said gas source to the two suspensions when the running speed of the motorcycle is raised, thereby increasing the height of the motorcycle, said

gas flow control means including an air pump, a movable contact driven by the speedometer of the motorcycle, a first fixed contact engaged by the movable contact when the motorcycle is either stopped or running at a low speed, and a second fixed contact engaged by the movable contact when the motorcycle runs at a higher speed and operates said air pump supplying the high-pressure gas source.

#### 4,422,662 FRONT FORK CONSTRUCTION FOR MOTORCYCLE

Hidehiko Inoue, Ooi; Masao Nishikawa, Tokyo, and Nobuo Anno, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 59,286, Jul. 20, 1979, Pat. No. 4,278,266.

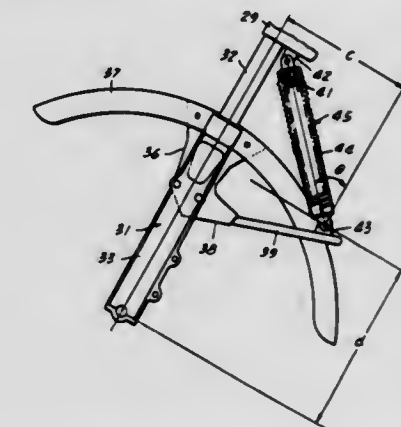
This application Feb. 18, 1981, Ser. No. 235,555

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B62K 25/08

U.S. Cl. 280—276

7 Claims



1. A front wheel suspension assembly for a motorcycle comprising in combination: parallel telescoping forks of the hydraulic type which straddle the front wheel and which are inclined downward in a forward direction, thereby producing a bending moment in said forks with the motorcycle supported in an upright position upon a horizontal surface, each fork comprising an upper tube telescopically mounted within a bottom tube and containing a body of oil, said tubes having continuous cylindrical surfaces in sliding contact and lubricated by said body of oil, a bridge fixed to the upper portions of said upper tubes, means mounting the front wheel for rotation on said bottom tubes, torque receiving means fixed to said bottom tubes, and means including resilient means extending between said bridge and said torque receiving means for applying a counter bending moment to said forks in opposition to the first said bending moment, thereby reducing sliding friction between said telescoping tubes.

#### 4,422,663 FOLDABLE AND PORTABLE VEHICLE

David T. Hon, Los Angeles, Calif., assignor to Hon Corporation, Los Angeles, Calif.

Division of Ser. No. 233,624, Feb. 12, 1981. This application Sep. 29, 1982, Ser. No. 427,431

Int. Cl.<sup>3</sup> B62K 15/00

U.S. Cl. 280—278

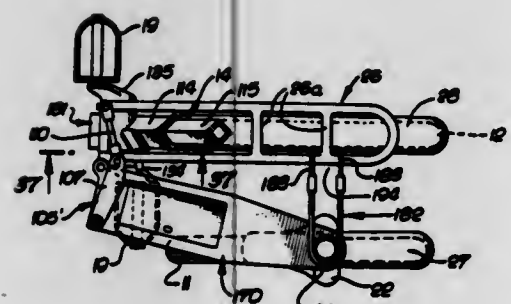
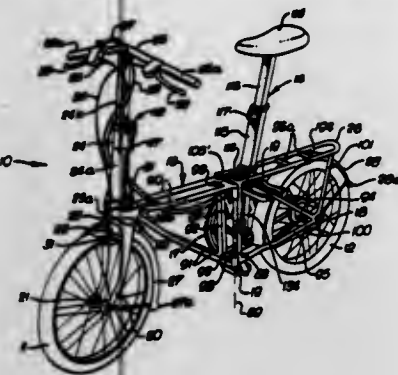
10 Claims

1. A foldable and portable bicycle and cart, comprising: front and rear frame sections disposed in end-to-end relation to form an elongated frame, said front frame section having a front wheel mounted at its front end and said rear frame section having a rear wheel mounted at its rear end; a foldable handlebar assembly on said front frame section above said front wheel;

a hinge joining said frame sections together for swinging from end-to-end relation into folded side-by-side relation with said sections in a preselected folded position and



holding said wheels in substantially parallel positions when said sections are in said preselected folded positions; and  
an auxiliary wheel assembly mounted on said frame adjacent



said hinge and including an auxiliary wheel normally stored in a raised storage position and selectively extendable beneath said frame to approximately the level of said front and rear wheels, thereby to convert said bicycle to a three-wheeled cart.

#### 4,422,664 BOAT TRAILER FENDER, LAMP AND LICENSE PLATE SUPPORT

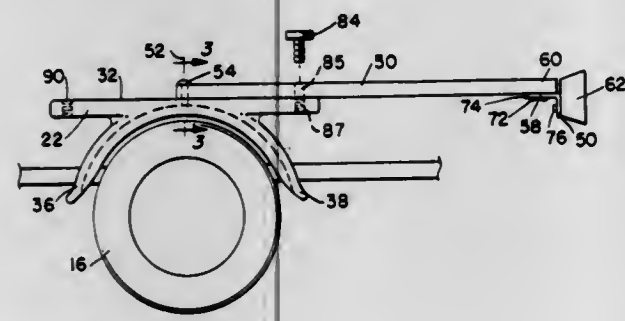
George A. Poveromo, Miami, Fla., assignor to Sebert E. Reese, II, Miami Lakes, Fla.

Filed Jun. 16, 1981, Ser. No. 273,565

Int. Cl.<sup>3</sup> B62D 3/10

U.S. Cl. 280-414.1

8 Claims



1. A fender, lamp and license plate support, for a boat trailer comprising:  
a semi-circular portion  
a horizontal base having ends  
a hollow bar having a lamp and license plate attached thereto;  
said semi-circular portion being integral with said horizontal base and depending therefrom; and  
said hollow bar pivotally attached to said base midway of said ends so that the lamp and license plate may be positioned behind the trailer during over-the-road travel and repositioned forward of the trailer during launching of a boat therefrom whereby the lamp will not contact the water during launching.

#### 4,422,665 BOAT TRANSPORTATION AND LAUNCHING MEANS

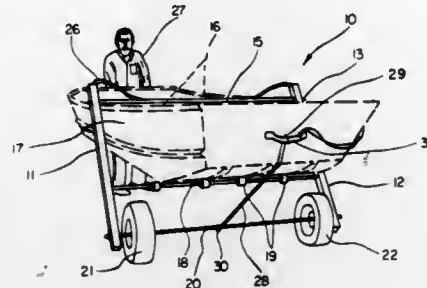
William M. Hinnant, Wendell, N.C. 27591

Filed Nov. 2, 1981, Ser. No. 317,285

Int. Cl.<sup>3</sup> B60P 3/10

U.S. Cl. 280-414.2

7 Claims



1. A boat type transportation, launching and recovery means for use in conjunction with boat type device having end portions, sides and a bottom comprising: a pair of upright means; means extending between said upright means for supportingly engaging said bottom of said boat type device; means extending between said upright means for engaging the upper edge of said sides of said boat type device; and wheel means rotatively mounted adjacent the lower portion of said upright means whereby an improved boat type transportation, launching and recovery means is provided.

#### 4,422,666 SUSPENSION MECHANISM FOR AUTOMOTIVE VEHICLES

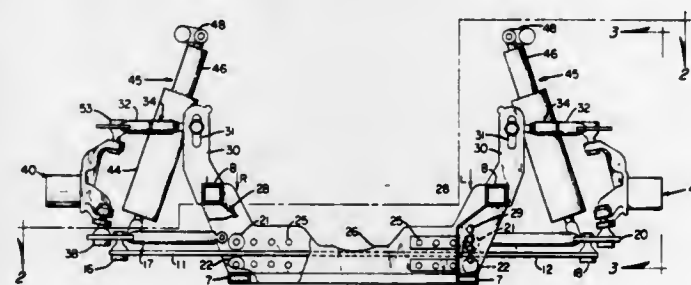
Rudy R. Proctor, Wheatridge, Colo., assignor to Spring Technology, Ltd.

Filed Aug. 5, 1981, Ser. No. 290,350

Int. Cl.<sup>3</sup> B60G 3/00

U.S. Cl. 280-694

16 Claims



1. In a vehicle suspension system wherein a chassis is supported by laterally spaced wheels, there being a pair of wheels located at opposite sides of the front and rear ends of said chassis, the improvement comprising:

at least one laterally extending cantilevered spring member extending from connection to one of said wheel, said spring member connected to traverse the substantial span between a pair of wheels at one of said front and rear ends, and the end of said spring member opposite said connected end bearing against said chassis, a second laterally extending, cantilevered spring member extending from connection to another of said pair of wheels opposite to said connected end of said one spring member, said second spring member dimensioned to traverse the substantial span between said pair of wheels in juxtaposed relation to said one laterally extending cantilevered spring member, said one spring member being bifurcated throughout its greater length to define spaced parallel spring portions, and said second spring member dimensioned to be of a width for extension between said spaced parallel spring portions; and  
support means disposed above and bearing against said spring members at intermediate points along the length of

said springs relatively near the connected end of each said spring member and away from the opposite end, said support means being secured to said chassis whereby an unbalanced, downwardly directed force imparted to said support means is operative to generate a downwardly directed bending moment about said connected end which is imparted through the opposite end of each said spring member to said chassis.

#### 4,422,667 SUSPENSION FOR A TRACTOR-SCRAPER

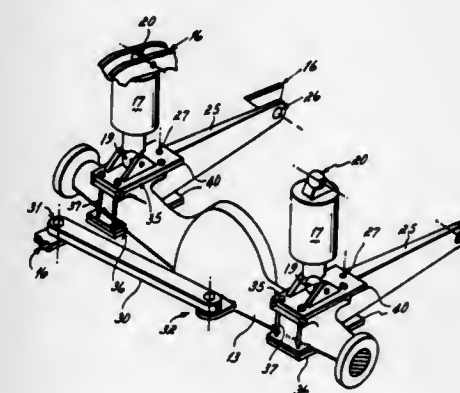
Gary D. Perry, Lubbock, Tex., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Dec. 30, 1981, Ser. No. 335,872

Int. Cl.<sup>3</sup> B60G 11/26

U.S. Cl. 280-705

4 Claims



1. In a scraper-tractor having an axle housing and a frame, a suspension for supporting said frame with respect to said housing comprising:

a pair of laterally spaced brackets projecting from said housing,  
a pair of laterally spaced generally horizontal longitudinally-extending arms,  
pins pivotally securing one of the ends of said arms with respect to said housing brackets,  
ball joints securing the other ends of said arms to said frame,  
a vertical hydraulic spring pivotally mounted between said housing and said frame,  
and a generally horizontal transverse track bar pivotally mounted at its ends between said frame and axle housing, respectively.

#### 4,422,668 PASSIVE SAFETY DEVICE

Albert Thill, Weyhausen, and Wolfgang Sukopp, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,630

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1981, 3105480

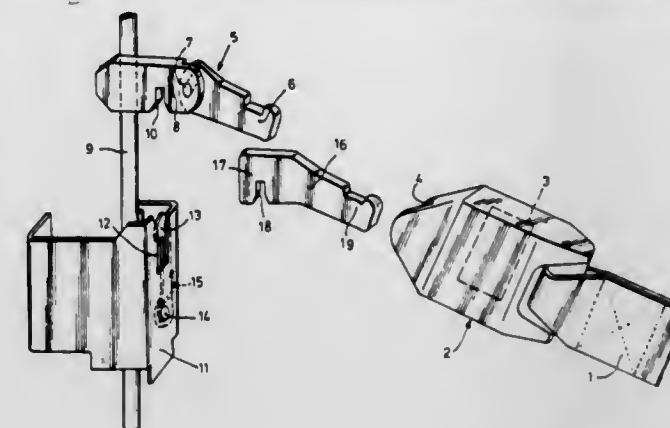
Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 280-804

2 Claims

1. A passive safety device for vehicles, for example passenger automobiles, has a safety belt with at least one upper end associated with the shoulder of a vehicle occupant, said upper end being connectable by means of a manually-operable belt lock to a shackle held on a slide which can be displaced by a guide means between a release position and a restraining position, when in the restraining position said slide can be locked in a receiving means fixed on the vehicle body by means of a spring-loaded locking latch, characterized in that there is pro-

vided a lock insertion shackle carried separately in the vehicle, one end of said lock insertion shackle being connectable with



#### 4,422,669 SEAT BELT TENSIONING DEVICE

Masakazu Chiba, Sasebo; Satoshi Kuwakado, Aichi; Toshihiro Takei, Kariya; Noboru Tsuge, Kariya, and Toshiaki Shimogawa, Aichi, all of Japan, assignors to Nippon Soken, Inc. and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

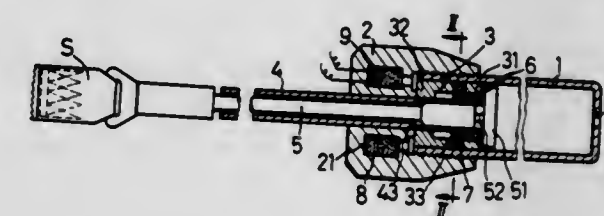
Filed Feb. 2, 1981, Ser. No. 230,711

Claims priority, application Japan, Feb. 4, 1980, 55-13302[U]

Int. Cl.<sup>3</sup> B60R 21/10

U.S. Cl. 280-806

7 Claims



1. A seat belt tensioning device for a vehicle comprising:  
a cylinder having a piston slidably disposed within said cylinder so as to move in only one direction;  
piston operating means for moving said piston in said one direction during an emergency to apply a tensioning force to the seat belt;

a plastically deformable metallic pipe, one end of which is disposed within said piston so as to move in said direction together with said piston;  
a metallic rod, one end of which is connected to a seat belt and the other end of which is disposed within said one end of said metallic pipe;

a seat belt tensioning force limiting member secured to the said other end of said metallic rod to connect said rod to said piston; said tensioning force limiting member being broken when the seat belt tensioning force of said piston reaches a predetermined value;  
locking means for locking said pipe and said piston in said cylinder when said seat belt tensioning force limiting member is broken;

said pipe being provided with an inner projecting portion which is engaged with said rod when tension load is applied to said seat belt so as to pull said metallic rod in the direction opposite to said one direction after said seat belt tensioning force limiting member is broken and said pipe is locked in said cylinder; and  
said projecting portion being plastically deformed by said rod when the tension load applied to said seat belt reaches the plastically deforming load of said pipe.



4,422,670

**COLOR DEVELOPING SHEET FOR PRESSURE-SENSITIVE RECORDING SHEET**

Akira Hasegawa; Ippai Shimizu, both of Tokyo; Kaneko Toshio, and Sumio Miyake, both of Iwaki, all of Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,840

Claims priority, application Japan, Feb. 12, 1981, 56-18102  
Int. Cl.<sup>3</sup> B41M 5/16, 5/22

U.S. Cl. 282—27.5

14 Claims

1. Color developing sheet for a pressure sensitive recording sheet having a color developing layer comprising an organic electron acceptive color developing agent, calcium carbonate and styrene-butadiene copolymer latex or carboxylated styrene-butadiene copolymer latex of an average particle size of less than  $0.08\mu$  and wherein the ratio of styrene to butadiene in the styrene-butadiene copolymer latex is from 40:60 to 70:30, said calcium carbonate being used in an amount of more than 30% by weight per total solid content of said color developing agent.

4,422,671

**COATING COMPOSITIONS FOR THE PRODUCTION OF A RECORDING MATERIAL**

Manuel Cespon, Vienna, Austria, assignor to Ciba-Geigy Corporation, Ardley, N.Y.

Division of Ser. No. 130,304, Mar. 14, 1980, Pat. No. 4,348,234.

This application Jun. 30, 1982, Ser. No. 393,896

Claims priority, application Austria, Mar. 20, 1979, 2073/79  
Int. Cl.<sup>3</sup> B41L 1/20

U.S. Cl. 282—27.5

6 Claims

1. A color-developing sheet for pressure-sensitive recording material, consisting of at least one substrate sensitized with a color-developing composition, containing a color developer consisting essentially of at least two water-soluble, inorganic, metal salts, including at least one nitrate with a molecular weight of 150 to 350 and at least one halide with a molecular weight of 120 to 280.

4,422,672

**INDEX SHEET**

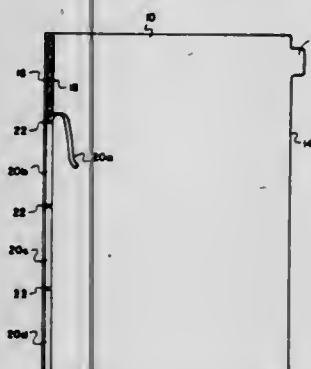
Kurt L. Levi, 80 Wingold Ave., Toronto, Ontario, Canada

Filed Aug. 31, 1981, Ser. No. 298,173

Int. Cl.<sup>3</sup> B42F 21/02; B42D 9/00, 13/00

U.S. Cl. 283—39

5 Claims



1. An index sheet for a bound volume, having pages of predetermined width and height, said index sheet comprising: a rectangular panel of flexible sheet material, having a predetermined width corresponding at least to the width of said pages of said volume; tab means on said panel on the right-hand edge thereof, and extending outwardly from said edge, and adapted to carry indexing indicia; a pressure sensitive adhesive strip on the left-hand edge of said panel, and, a plurality of removable cover strips covering said adhesive strip and arranged in end-to-end alignment in a single row whereby when one of said cover strips is removed, a portion of said adhesive strip is exposed, while the remain-

der of said cover strips remain in position covering the remainder of such adhesive strip in such row and said panel is inserted between the pages of said volume with said adhesive strip adjacent the left-hand edges of said pages, said exposed portion of said adhesive strip secures said panel in position with said tab means extending outwardly from the right-hand edge of said volume, exposing same to view, removal of one of said cover strips leaving the remainder thereof in such row undisturbed whereby said panel may be inserted into one said volume and used and may then be removed therefrom, and by removing a further one of said cover strips, said panel may then be inserted elsewhere.

4,422,673

**PIPE COUPLINGS**

John E. Blackford; John J. Kelly, both of Coventry, and Philip A. Baker, Solihull, all of England, assignors to Lucas Industries Limited, Birmingham, England

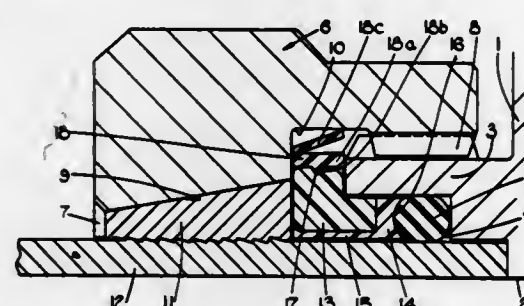
Filed Jun. 3, 1981, Ser. No. 269,408

Claims priority, application United Kingdom, Jun. 4, 1980, 8018262

Int. Cl.<sup>3</sup> F16L 55/00

U.S. Cl. 285—23

12 Claims



1. A pipe coupling comprising: body means including an externally screw-threaded sleeve, for receiving an end of a pipe and for receiving a sealing ring engageable between the body and the pipe; a nut having a bore therethrough for receiving the pipe, said nut including threaded means, at one end of said bore, for engaging said externally screw-threaded sleeve, said nut further including a tapered portion at an other end of said bore, said tapered portion tapering inwardly towards said other end of said bore, said nut further including a recess in an intermediate portion of said bore; pipe-gripping collet means, disposed in said nut, said collet means including a tapered external surface means for engaging said tapered portion of said bore, said tapered external surface means tapering inwardly towards said other end of said bore, said collet means further including an internal surface means for engaging an external surface of the pipe and gripping the pipe as a result of relative movement between said nut and said collet; a back-up member disposable into said intermediate portion of said bore; and on at least partly resiliently deformable retainer ring, said retainer ring including means for detachably engaging said back-up member, said retainer ring extending into said recess in said intermediate portion of said bore, whereby said collet means is retained against disengagement from said bore in one direction by mutual engagement of said tapered surfaces and in an opposite direction by engagement of said retainer ring with said nut and with said back-up member.

4,422,674

**TAMPER PROOF GAS METER**

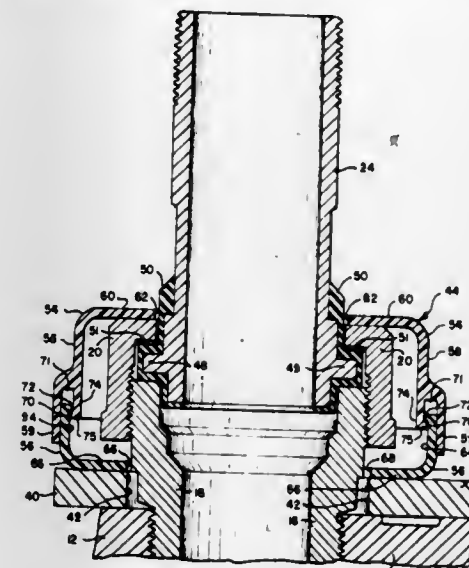
Richard L. Stenemagle, DuBois, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1980, Ser. No. 203,305

Int. Cl.<sup>3</sup> F16L 55/00

U.S. Cl. 285—30

9 Claims



1. An enclosure for loosely enclosing a gas meter swivel nut comprised of first and second cylindrical sleeve members of easily destructible material each having cylindrical side walls spaced from said nut and terminating in free ends, the free end of said second sleeve member being telescoped within the free end of said first sleeve member, cooperating locking means respectively within each of said sleeve members preventing disassembly of said sleeve members from each other whereby access to the interior of said enclosure can be achieved only by destruction thereof, said locking means being comprised of a resilient retainer secured within said first sleeve member having an abutment portion on the free edge thereof, abutment means on the interior of said second sleeve member which is engaged by the abutment portion of said retainer when said sleeve members are in assembled relationship thereby preventing disassembly of said sleeve members from one another.

4,422,675

**CO-AXIAL TUBE COUPLING**

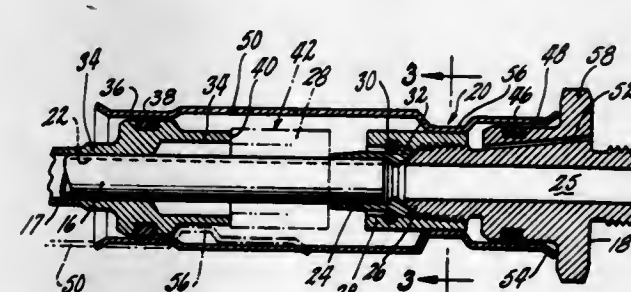
James R. Norris, Bolton, and Norman W. Narkon, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 29, 1981, Ser. No. 287,680

Int. Cl.<sup>3</sup> F16L 11/12

U.S. Cl. 285—45

7 Claims



1. A coupling for connecting tubing to a connector including a connector and a tubing, each having a passageway there-through, said connector having a generally circular elongated body having said passageway in axial alignment with said passageway in said tubing, said connector having a threaded end, a retractable nut adapted to threadably engage said threaded end, a ferrule member and means sealingly securing said ferrule member to the end of the tubing intended to be joined by said coupling, means on said nut cooperating with said ferrule to secure said ferrule in sealing engagement with

said connector, an adapter having a circular cross section axially spaced from said ferrule and means sealingly securing said adapter to said tubing and a first radial seal supported in a recess formed in the outer diameter of said adapter, a second radial seal axially disposed relative to said first radial seal and supported in a recess formed in the outer diameter of said circular elongated body of said connector, the diameter of said first radial seal being substantially equal to the diameter of said second radial seal, a retractable sleeve-like element having a generally hollow cylindrical body being dimensioned to engage each of said radial seals spanning said ferrule when deployed in its operating condition for capturing and containing any leakage from said passageways.

4,422,676

**MULTI-PASSAGE ROTOR COUPLING**

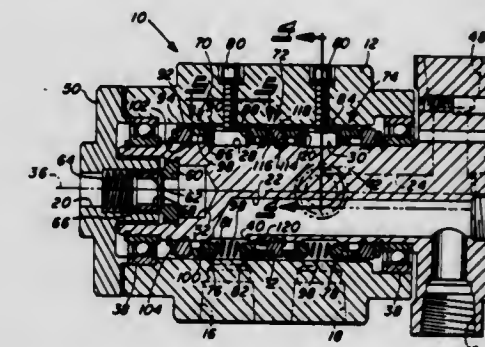
Mansur Sitabkhan, North Royalton, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 21, 1980, Ser. No. 209,241

Int. Cl.<sup>3</sup> F16L 39/04

U.S. Cl. 285—136

7 Claims

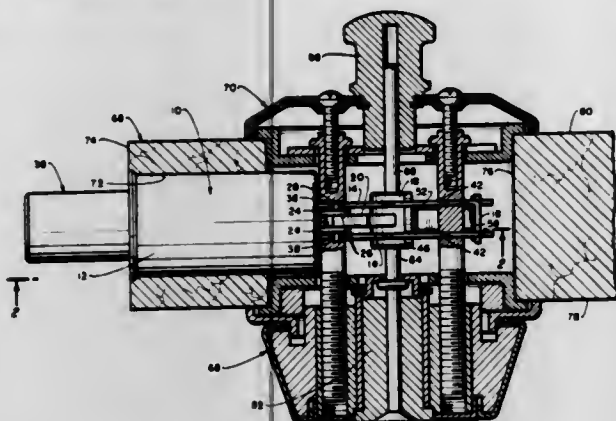


1. A multi-passage rotary coupling comprising a body having an internal cylindrical bore therein, a rotor member having a substantially cylindrical portion located within said cylindrical bore and rotatable relative to said body about an axis of rotation, bearing means interposed between said rotor member and said body located at each end of said bore for supporting said rotor member within said cylindrical bore for rotation relative thereto, three annular wear rings interposed between said bearing means and secured to said cylindrical portion of the rotor member for rotation therewith, one wear ring located adjacent each bearing and a third wear ring spaced axially between said bearings, each wear ring having a sealing face thereon disposed substantially perpendicular to said axis of rotation, a pair of anti-rotation member assemblies, one assembly located between each end wear ring and said central wear ring, said anti-rotation member assemblies each having a pair of axially spaced annular face sealing members, each of said sealing members having a face seal disposed substantially perpendicular to said axis of rotation, one face seal of each sealing member engaging a sealing face of said wear rings, an annular seal on each sealing member engaging the internal surface of said bore, means for preventing said assemblies from rotating relative to said body, said assemblies, wear rings and annular seals forming a pair of annular axially spaced passageways, openings through said body terminating with each annular passageway and, openings through said rotor terminating with each annular passageway thereby forming two fluid passages between the openings in said body and rotor.



**4,422,677**  
**LATCH BOLT HAVING CRANK CAMMING FOR POSITIVE BOLT POSITIONING**  
 Arnold C. Gater, Anaheim, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.  
 Filed Feb. 5, 1981, Ser. No. 232,986  
 Int. Cl.<sup>3</sup> E05C 1/06; E05B 65/06  
 U.S. Cl. 292—139

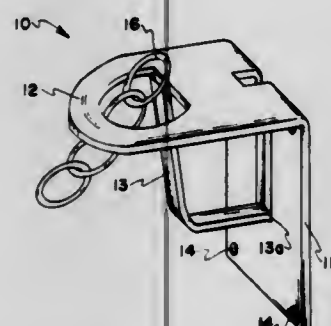
6 Claims



1. In a latch construction of the type having a crank hub rotatable in a frame about a transverse axis with a crank arm extending radially therefrom, a longitudinal driving lever with a rearward end pivotally connected to an end portion of the crank arm through a transverse driving pin, a forward end of the driving lever pivotally connected to a longitudinally reciprocal bolt, forward movement of the crank arm by rotation of the crank hub moving the bolt through the driving lever forwardly to an extended position in which the driving pin is simultaneously moved into a generally vertical bolt positioning slot in the frame, the driving pin and bolt positioning slot engagement resisting rearward movement of the bolt out of the extended position from an outside force against the bolt, rearward movement of the crank arm by rotation of the crank hub initially withdrawing the driving pin from the bolt positioning slot while moving the bolt to a retracted position; the improvements including: cam surface means on said rotatable crank hub and resilient means bearing thereagainst cooperably actionable as said bolt approaches and moves into said extended position for resiliently urging said driving pin through said crank hub and crank arm into and resiliently resisting removal from said frame bolt positioning slot; said resilient means including a generally U-shaped spring resiliently bearing between said cam surface means and said frame having a leg abutting said cam surface means and a leg abutting said frame.

**4,422,678**  
**LATCH**  
 Larry L. Tuckett, 1890 N. Fruitland Dr., and Ronald L. Kendall, 1734 N. Fruitland Dr., both of North Ogden, Utah 84404  
 Filed Feb. 17, 1981, Ser. No. 234,737  
 Int. Cl.<sup>3</sup> E05C 17/36  
 U.S. Cl. 292—264

1 Claim

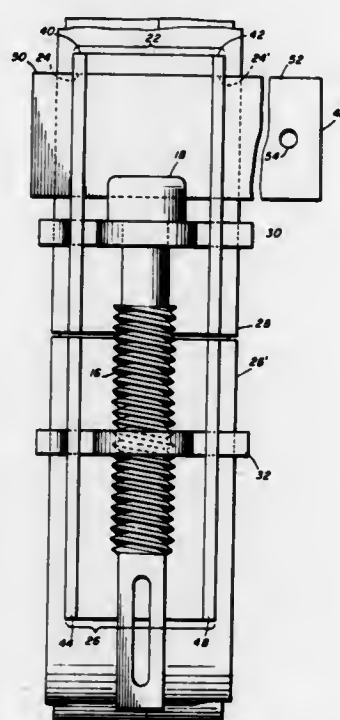


1. A latch device comprising a connector brace having one end forming an attachment

member and another end bent to extend normal to said attachment member and forming a rigid loop; a tongue member formed by bending a piece of said attachment member and the other end of said connector brace to extend from said attachment member and including a hook extending parallel to said attachment member and through a central portion of said loop.

**4,422,679**  
**TAMPER-PROOF FASTENER**  
 Robert A. Ruscitto, Braintree, Mass., assignor to Boston Edison Company, Boston, Mass.  
 Filed Mar. 25, 1982, Ser. No. 361,517  
 Int. Cl.<sup>3</sup> B05D 33/34  
 U.S. Cl. 292—307 R

9 Claims



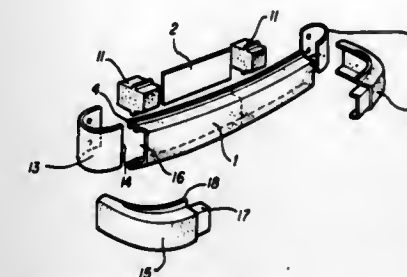
1. A tamper-proof device for protecting and fastening a sealing collar comprising a first bolt disposed proximate to a first wall provided with a transverse slot, the head of said first bolt being provided with a transverse slot aligned with the slot in said first wall; a hard metal tab adapted to transverse the slots in said first wall and the head of said first bolt, said tab having one end bent at a substantial angle and a hole adjacent to the other end; a second bolt passing through said hole; and means for preventing removal of said second bolt; whereby said tab prevents said first bolt from turning and said bent end and second bolt prevent removal of said tab.

**4,422,680**  
**ENERGY ABSORBING CURVED SECTIONS**  
 Marcel Goupy, Saint Cloud, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France  
 Filed Jun. 3, 1981, Ser. No. 270,015  
 Claims priority, application France, Jun. 3, 1980, 80 12270  
 Int. Cl.<sup>3</sup> B60R 19/02

9 Claims

1. A method of forming a composite vehicle bumper comprising: forming an elongated section which is curved along the elongate axis thereof, said section defining a frontal face as well as upper and lower borders extending perpendicular to said frontal face, providing said upper and lower borders with a first edge formed unitary with an edge of said frontal face which is transverse to said axis and a free edge which is opposite said first edge and which includes a raised portion, wherein said section is formed by pultrusion molding of glass strands impregnated with hardening synthetic resin, including the drawing of said impregnated

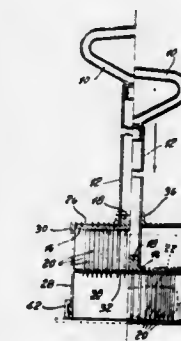
strands through a draw plate having a constant curve radius; and providing at least one closure plate having edges shaped to



mutually engage said free edge by connecting each said closure plate between said free edges at an axial portion of said section which is subject to maximum stress during use.

**4,422,681**  
**ANIMAL EXCREMENT PICKER**  
 Sylvain Laroche, 855 Choquette, Beloeil, Canada  
 Filed Jan. 22, 1982, Ser. No. 341,869  
 Claims priority, application Canada, Feb. 17, 1981, 371054  
 Int. Cl.<sup>3</sup> A01K 29/00  
 U.S. Cl. 294—1 BA

5 Claims



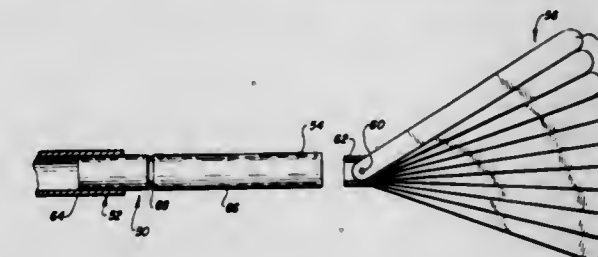
1. An animal excrement picker comprising: a handle having an elongated shank portion with a cross-section of a given shape; a plate secured to one end of said shank; a plurality of spikes mounted to said plate extending downwardly therefrom; a housing having a top wall and sidewall means extending peripherally and downwardly from said top wall to define therewith an enclosure with an open end; a perforated plate mounted within said housing and to said sidewall means, said perforated plate extending parallel to said top wall between said top wall and said open end and including a plurality of openings, each in axial alignment with a respective spike so as to allow passage of said spike therethrough; said top wall having a collar portion with an opening in the region of said handle, said opening having a shape corresponding to that of said shank portion and a dimension such as to cause frictional contact between said handle and said collar portion of said top wall to thereby prevent relative free movement therebetween and to hold said spikes in a lowermost position after an excrement has been spiked.

**4,422,682**  
**DEVICE FOR CHECKING AND RESETTNG SMOKE ALARMS**  
 Thomas P. O'Connell, 5710 S. Sawyer Ave., Chicago, Ill. 60629  
 Filed Nov. 13, 1981, Ser. No. 321,093  
 Int. Cl.<sup>3</sup> B25J 1/80

2 Claims

1. A device for checking and resetting a smoke alarm provided with an internal electrical source for sounding an alarm and adapted to be mounted on a ceiling or a wall, said smoke alarm being provided with test and reset button means, said device comprising an elongated member having one end pro-

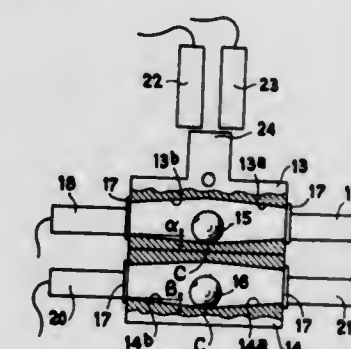
vided with testing means and the other end provided with smoke wafting means, whereby said testing means are adapted to engage said test and reset button means to activate or reset the smoke alarm, and said smoke wafting means is wafted across an activated smoke alarm to clear the smoke out of the interior of the smoke alarm before it can be deactivated by said testing means, wherein said elongated member comprises a tubular rod having a pair of sections, one section telescopically related with the other section, said smoke wafting means comprising a fan formed by a plurality of overlapping leaves, a housing for supporting said fan, and a pivot pin commonly connecting one set of ends of said leaves and securing same to



said housing, said housing being slidably receivable in the interior of one of said sections, and means for limiting the inward movement of said fan into said one section, whereby, for storing said device, the two sections are telescoped together, the fan leaves are collapsed and the fan and its housing are pushed into the confines of said one section, and wherein said testing means comprises a base attached to said one end of the elongated member, a pair of testing projections extending outwardly from the face of said base, one of said projections terminating in a button, another pair of projections extending out of a side wall of said base, one of said side wall projections terminating in a button, said smoke wafting means comprising a fan structure.

**4,422,683**  
**LEVEL DETECTOR AND ITS APPLICATION TO A GRABBING APPARATUS FOR CONTAINERS OR THE LIKE**  
 Henri Charonnat, Pont Saint Martin, France, assignor to Brissonneau et Lotz Marine, Carquefou-Nantes, France  
 Filed Jun. 8, 1981, Ser. No. 271,669  
 Claims priority, application France, Jun. 11, 1980, 80 12955  
 Int. Cl.<sup>3</sup> B66C 13/04  
 U.S. Cl. 294—86 LS

16 Claims



1. Level detecting apparatus for grabbing apparatus of the type comprising a frame suspended at a point from a manipulating engine, the frame being adapted for connection to a load to be hoisted, the load having an initial inclination, and means for displacing the point of suspension in a reference direction of the frame, the level detecting apparatus comprising a level detector adapted for connection to the frame so as to pivot in a vertical plane parallel to the reference direction and to provide an output signal when the level detector has a predetermined deviation from horizontal, actuating means for pivoting the level detector in said plane, first means responsive to said



output signal for controlling, upon the frame being connected to the load and prior to hoisting, the actuating means so as to pivot the level detector to a horizontal position and for thereafter inhibiting the operation of the actuating means so as to fix the relative position of the level detector with respect to the frame, and second means responsive to said output signal for controlling, upon hoisting of the load, the displacing means so as to position the point of suspension to one in which deviation from horizontal of the level detector is cancelled, and wherein said level detector comprises a tubular body having closed ends and a slightly concave roller track, a ball adapted to roll on the roller track toward one end or the other of the tubular body as a function of the inclination of the level detector with respect to horizontal, and detector means for detecting the presence of the ball at each of said closed ends and for emitting said output signal in response to said detecting.

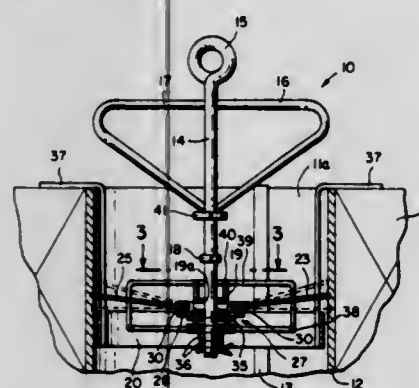
4,422,684

**APPARATUS FOR LIFTING REEL-LESS COILS OF WIRE**  
George E. Zitzman, 131 Tanners Pond Rd., Garden City, N.Y. 11530

Filed Sep. 22, 1981, Ser. No. 304,630  
Int. Cl.<sup>3</sup> B66C 1/54

U.S. Cl. 294-97

6 Claims



1. A lifting fixture for operation within cores comprising a central tension member adapted to be placed within the core and to be connected at its upper end to a carrier device; and a plurality of lifting bars coupled to the tension member for deflection about axes transverse to the axis of the tension member and extending radially outward to engage the inner wall of the core in an upwardly inclined position, whereby when the tension member is stressed for lifting the bars deflect to press their ends into the walls of the core, means to limit the downward deflection of the lifting bars comprising an annulus underlying the free ends of the bars and movable axially on the central tension member and stop means on the tension member to afford limited movement of the annulus axially of the tension member.

4,422,685

**MODULAR CHASSIS AND BODY FOR MOTOR VEHICLES**

Paul F. Bonfilio, 47-25 198th St., Auburndale, N.Y. 11358, and Richard Stobe, 2229 Marcel Dr., Orange Park, Fla. 32073  
Filed Jul. 6, 1981, Ser. No. 280,345

Int. Cl.<sup>3</sup> B62D 25/00

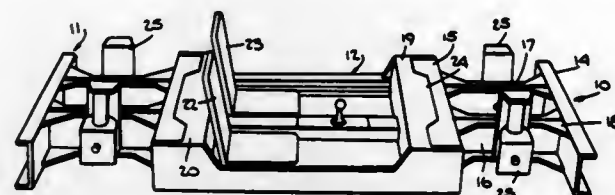
U.S. Cl. 296-197

9 Claims

1. In an automobile, a modular structure constituted by pre-formed components which when joined together define the basic chassis of a motor vehicle to which is attachable a body of a selected configuration to create an automobile of any desired style, the structure comprising:

A. a floor tray provided with end couplers and a floor extending therebetween on which seating is mountable;

- B. identical front and rear cradles, each of which is joined to a respective coupler to create a chassis; and



- C. a sectioned body having a capsule section defining a cockpit having door openings, said capsule section being secured to said floor tray to act as a truss for said chassis.

4,422,686

**VEHICLE ROOF STRUCTURE**

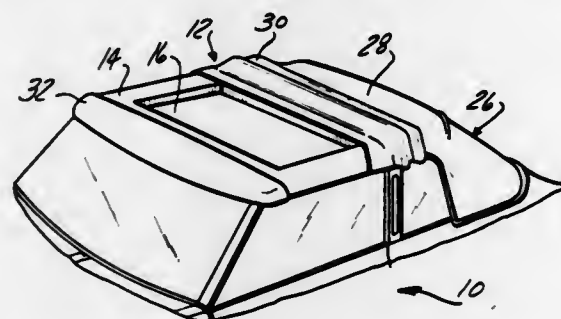
Ralph Droz, Westland, Mich., assignor to American Sunroof Corporation, Southgate, Mich.

Filed Dec. 7, 1981, Ser. No. 328,212

Int. Cl.<sup>3</sup> B60J 7/06

U.S. Cl. 296-219

5 Claims



1. A vehicle roof structure having an opening surrounded by a stationary roof structure adapted to be retractably closed by a folding roof cover comprising:

- a pre-formed cap mounted on a rear portion of the stationary roof structure of the vehicle;
- a decorative cover having a first portion fixedly secured to the pre-formed cap and a second portion extending flexibly forward therefrom;
- a frame mounted in the roof opening and secured to the stationary roof structure along the edges of the roof opening;
- guide track means formed along the longitudinal sides of the frame;
- pairs of first and second cross bows extending substantially perpendicular to the longitudinal axis of the frame, the pairs of first and second cross bows attached at spaced intervals along the flexible second portion of the cover; the first cross bow of each pair of cross bows having opposed ends riding in the guide track means for retractably and extensibly sliding the flexible cover over the roof opening;

- biasing means, extending between each of the first and second cross bows in each pair of cross bows, for maintaining a predetermined distance between the first and second cross bows;

- means, attached to the forward end of certain of the first cross bows of the pairs of cross bows for urging the second cross bows of the adjacent forwardmost pair of cross bows upward and thereover as the flexible portion of the cover is urged in a rearward direction uncovering the roof opening to create folds in the flexible portion of the cover; and

- means, attached to the forwardmost first cross bow, for latching the flexible portion of the cover in a fully closed position.

4,422,687

**SLIDING ROOF PANEL ASSEMBLY**

Milton C. Kaltz, Allen Park; Edward M. Chojnowski, Northville; David C. Garascia, Novi; Barney J. Bauer, Howell, and Richard D. George, Brownstown, all of Mich., assignors to American Sunroof Corporation, Southgate, Mich.

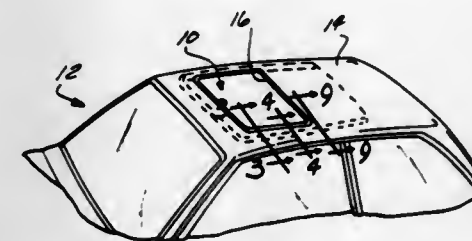
Division of Ser. No. 196,468, Oct. 14, 1980, Pat. No. 4,379,586.

This application Sep. 29, 1982, Ser. No. 427,429

Int. Cl.<sup>3</sup> B60J 7/10

U.S. Cl. 296-221

12 Claims



1. A modular sliding roof panel assembly adapted to be mounted to the stationary roof structure of a vehicle having an opening in the roof thereof which is opened and closed by the sliding roof panel, said assembly comprising:

- an integral housing adapted to be mounted to the interior of said stationary roof structure of said vehicle, said housing having an aperture therein aligned with said opening in said roof of said vehicle;
- a movable roof panel;
- guide rails mounted to said housing and extending in the sliding direction of said movable roof panel;
- front and rear guide shoes mounted to said movable roof panel and engaging said guide rails for controlling the movement of said movable roof panel between open and closed positions, said front guide shoes being pivotally mounted to said movable roof panel, said rear guide shoes having a first portion slidably engaging said guide rails and a second integral portion positioned over said guide rails and extending laterally outward therefrom;
- drive means operably connected to at least one of said front and rear guide shoes for moving said movable roof panel between open and closed positions;
- guide blocks mounted to said movable roof panel and having a cam track formed therein, said guide blocks being positioned laterally outward from said guide rails and cam follower means pivotally mounted to said second portion of said rear guide shoes and engageable with said guide blocks for selectively raising the rear edge of said movable roof panel above said stationary roof structure of said vehicle and for lowering said rear edge of said movable roof panel below said stationary roof structure such that said movable roof panel can slide beneath said stationary roof opening.

4,422,688

**LATCHING DEVICE FOR A DETACHABLY ATTACHABLE ROOF PANEL IN A VEHICLE**

Michitada Kameoka, Musashino, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,635

Claims priority, application Japan, Sep. 9, 1980, 55-128202[U]; Sep. 9, 1980, 55-128203[U]; Sep. 9, 1980, 55-128205[U]

Int. Cl.<sup>3</sup> B60J 7/18

U.S. Cl. 296-224

5 Claims

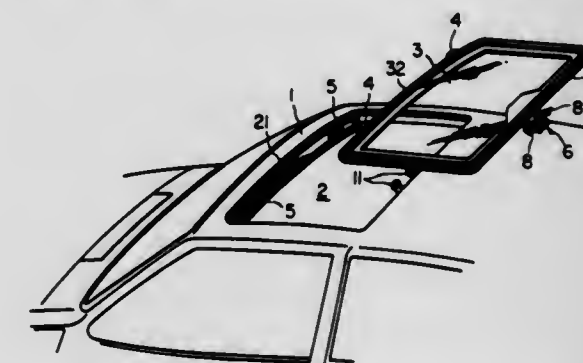
1. In a latching device for a detachably attachable type roof panel in a vehicle, comprising:

- (a) a roof of the vehicle having an opening formed in one part thereof, said opening having an inner peripheral brim;
- (b) a roof panel of a size to be snugly fitted in said opening of said roof in a detachably attachable manner;
- (c) a detachably attachable hinge member provided on the

front edge of said roof panel and which is engaged with the inner peripheral brim of said roof opening;

- (d) a toggle latch provided on the rear edge of said roof panel to be also engaged with said inner peripheral brim of said roof opening, said toggle latch having link members; and

- (e) a pivotal shaft for connecting one of said link members of said toggle latch and said roof being inserted and withdrawn by the expanding and contracting operations of a connecting shaft for the link members through said link



members, and said pivotal shaft being maintained in its fitted state by a spring provided on the connecting shaft, the improvement comprising:

- a locking mechanism which positively prevents contraction to a release position of said expanding and contracting connecting shaft in one position of said locking mechanism and means for permitting moving said locking mechanism to a position at which it does not prevent contraction of said connecting shaft when said roof panel is to be removed from said roof opening, said locking mechanism being provided on said toggle latch.

4,422,689

**LOCKING DEVICE FOR DETACHABLE PANEL OF VEHICLE ROOFS**

Junji Yamamoto, Nagoya; Noboru Kanou, and Masayuki Usami, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

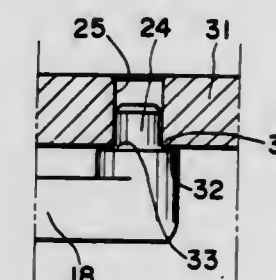
Filed Jan. 13, 1981, Ser. No. 224,844

Claims priority, application Japan, Jan. 19, 1980, 55-4953

Int. Cl.<sup>3</sup> B60J 7/08

U.S. Cl. 296-224

4 Claims



1. A locking device for a panel adapted to be detachably fitted in an opening of a vehicle roof, the panel being hinged at a front edge thereof to the vehicle roof, comprising:

- (a) a lever pivotally mounted on the detachable panel near a rear edge of said panel;
- (b) a stationary body securely fixed to the underside of the vehicle roof and having a pair of parallel, spaced-apart arms, each arm having an opening, said openings generally facing one another; and
- (c) a link mechanism having a bracket securely fixed to said lever and having a pair of links, each link having one of its ends pivoted to said bracket and having a seating face at



its other end and a pivot pin projecting from said seating face and adapted to be pivotally and releasably mounted in said opening in one of said arms, said links being resiliently biased in opposite directions such that said pivot pins are resiliently biased away from one another, each of said pivot pins being tapered from the portion thereof adjoining said seating face to its tip, and at least a portion of the interior surface of each of said openings being arcuate, when viewed in longitudinal cross section, for permitting linear engagement of each of said pins with said interior surface of an individual one of said openings, whereby said links are adapted to be resiliently mounted on said stationary body in a substantially rattle-free manner.

4,422,690

## SEAT POSITION CONTROL MECHANISM

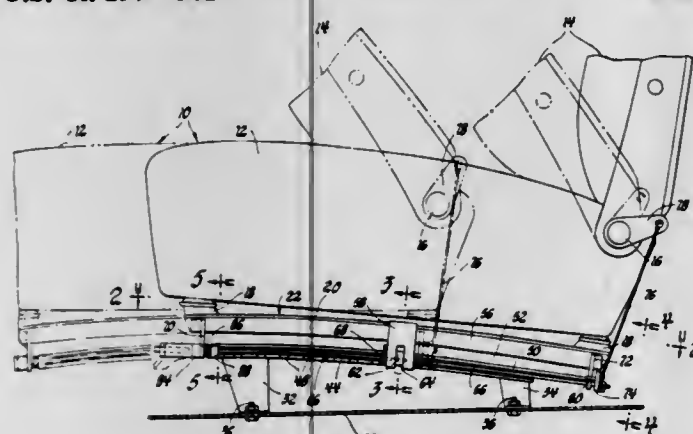
Leonard F. Kopich, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 22, 1981, Ser. No. 275,833

Int. Cl.<sup>3</sup> B60H 1/04

U.S. Cl. 297—341

4 Claims



1. In a vehicle seat including a seat cushion, a seat back supported thereon for movement between an upright position and a tilted position, and a pair of track members for mounting the seat on a vehicle for relative longitudinal movement to a plurality of adjusted positions and an easy enter position, a seat position control mechanism comprising, in combination, a plurality of longitudinally spaced first locating means on one of the track members, a second locating means on the other track member, locator means movably mounted on the other track member for movement therewith and movement relative thereto, means biasing the locator means to a normal position in engagement with a first locating means and the second locating means to lock the track members in an adjusted position, operable means for moving the locator means to a seat adjustment position out of engagement with one of the first locating means while remaining in engagement with the second locating means to unlock the track members and permit movement of the track members to another adjusted position, and means alternately responsive to movement of the seat back to tilted position or actuation of the operable means for moving the locator means out of engagement with the second locating means while remaining in engagement with a first locating means to unlock the track members and permit the track members to move from an initial starting position to the terminal position, movement of the seat back to upright position or de-actuation of the operable means permitting movement of the track members from the terminal position to the initial starting position and re-engagement of the locator means with the second locating means under the action of the pawl biasing means to again lock the track members in the initial starting position.

4,422,691

## PASSENGER SEAT

Ignaz Vogel, Kleinsteinbacher Str. 44, Karlsruhe 41, Fed. Rep. of Germany 7500.

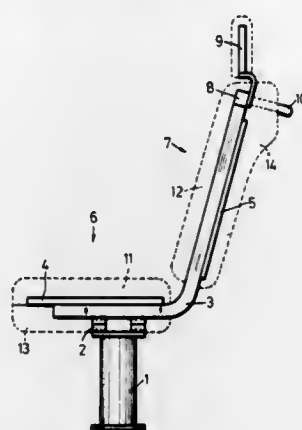
Filed Jun. 17, 1981, Ser. No. 274,491

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022640

Int. Cl.<sup>3</sup> A47C 4/02

U.S. Cl. 297—440

4 Claims



1. A passenger seating arrangement for installation in vehicles such as buses, railroad cars, boats and airplanes, said seating arrangement comprising: a support frame consisting of support legs with at least two seat support beams mounted on, and interconnecting, said legs, at least one seat mounted on said support frame, said seat including two support tubes mounted on said support beams, a seating plate mounted on top of said support tubes and a backrest plate mounted behind said support tubes, the seating and backrest plates being interconnected by said support tubes, said support tubes having open upper ends, upholstery members mounted on top of the seating and the front of the backrest plates and cover parts mounted on the rear of said backrest plate, a bridging tube inserted into the open ends of said support tubes, said bridging tube carrying a headrest, and a handle integral with said bridging tube and projecting rearwardly therefrom beyond the cover parts of said backrest plate.

4,422,692

## SIMULATED WIRE WHEEL TRIM FOR AUTOMOBILE WHEELS

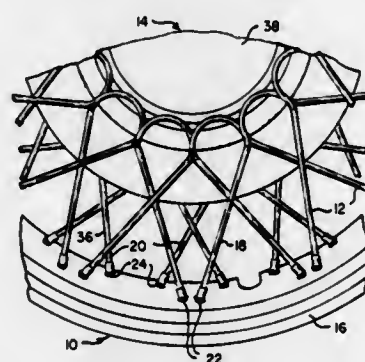
Don W. McClure, Sterling Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 26, 1981, Ser. No. 267,166

Int. Cl.<sup>3</sup> B60B 7/00

U.S. Cl. 301—37 SS

9 Claims



1. A simulated wire wheel cover comprising: a circular rim member; a spoke array composed of a plurality of interconnected spoke members welded to one another at the point where end spoke member comes in contact with the adjacent spoke member in said array; the radially outer end of said spoke array capable of engaging and positioning said circular rim member, said rim member provided with holes to receive

the radially outer end of said spoke members; a center hub member fastened to and supported by the central portion of said spoke array; and wheel retention means attached to said rim member.

4,422,693

## VEHICLE BRAKING SYSTEMS

Glyn Phillip R. Farr, Leek Wooton, England, assignor to Lucas Industries Limited, Birmingham, England

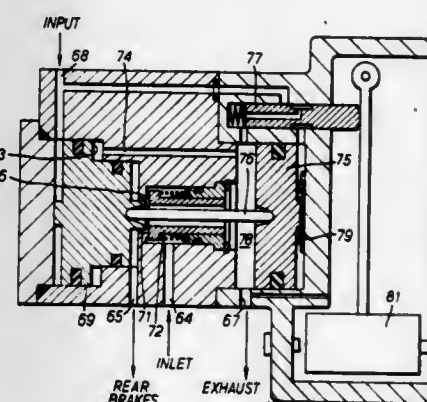
Continuation-in-part of Ser. No. 148,670, May 12, 1980, abandoned. This application Aug. 17, 1982, Ser. No. 408,854

Claims priority, application United Kingdom, May 10, 1979, 7916298

Int. Cl.<sup>3</sup> B60T 8/16, 8/26

U.S. Cl. 303—24 A

4 Claims



1. A pressure regulating device for a vehicle braking system in which a continuous supply of brake actuating fluid is available from a power source, the device comprising: an inlet for receiving brake actuating fluid from said power source; an outlet for connection to a rear brake of the vehicle; sensing means for sensing deceleration of the vehicle; valve means for connecting the outlet to the inlet in order to supply fluid from the inlet to the outlet to increase the pressure supplied to the rear brake and for connecting the outlet to exhaust in order to reduce the pressure supplied to the rear brakes; and control means for controlling operation of said valve means, said control means being responsive to a control pressure selected by the driver of the vehicle, to rear brake pressure of the vehicle, and to said sensing means, and being operative at any particular control pressure to operate the valve means to maintain the relationship:

$$AP_1 - BP_2 + C = Df$$

where:

$P_1$  is the control pressure;

$P_2$  is the rear brake pressure;

$f$  is the sensed deceleration;

A, B, and D are constants with A being greater than B; and C is an optional constant.

4,422,694

## BRAKING PRESSURE CONTROL UNIT FOR A HYDRAULIC BRAKE SYSTEM

Bernad Schopper, and Volker Berisch, both of Hattersheim, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 244,999, Mar. 18, 1981, abandoned.

This application Jan. 4, 1983, Ser. No. 455,448

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016207

Int. Cl.<sup>3</sup> B60T 11/32

U.S. Cl. 303—84 A

34 Claims

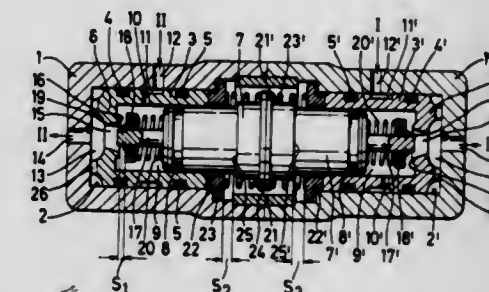
1. A braking pressure control unit for a hydraulic brake system having brakes at the wheels of one axle connected to two different brake circuits comprising:

a casing having an intermediate piston disposed therein coaxial of a longitudinal axis, said piston being movable

from its rest position in both directions relative to said casing;

two differential pistons disposed coaxial of said axis in tandem relationship in said casing and slidable in said casing against a preloading force in opposite directions, said two differential pistons being preloaded and bearing against one another by means of a common spring device;

a valve device having a valve seat and a valve closure member associated with each of said differential pistons and said intermediate piston, each of said valve devices having one of said valve seat and said valve closure member



coupled to a different one of said differential pistons and the other of said valve seat and said valve closure member coupled to an adjacent end of said intermediate piston, each of said valve devices connecting a pressure inlet chamber of an associated one of said brake circuits to a pressure outlet chamber of said associated one of said brake circuits; and

means associated with each of said differential pistons and said intermediate piston, which upon failure of one of said brake circuits, ensures that said valve device of the intact brake circuit is in its open position.

4,422,695

## ANTI-SKID BRAKING SYSTEM FOR VEHICLES

Glyn Phillip R. Farr, Wootton, England, assignor to Lucas Industries Limited, Birmingham, England

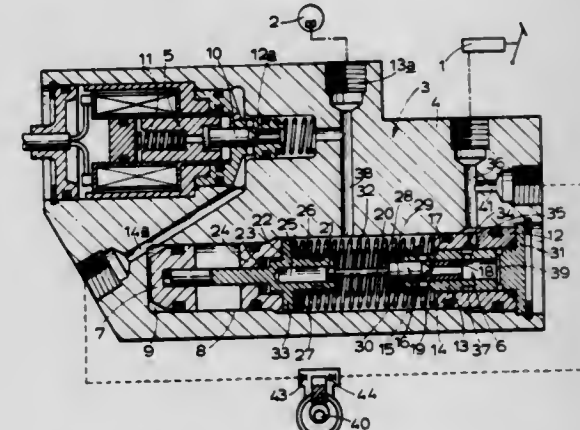
Filed Jan. 7, 1982, Ser. No. 337,760

Claims priority, application United Kingdom, Jan. 14, 1981, 8101108; May 12, 1981, 8114404; May 12, 1981, 8114405; May 21, 1981, 8115716; Sep. 11, 1981, 8127546

Int. Cl.<sup>3</sup> B60T 8/02

U.S. Cl. 303—115

6 Claims



1. An anti-skid hydraulic braking system for vehicles comprising a wheel, a brake for braking said wheel, a source of brake-applying pressure for applying said brake, means for sensing skid conditions at said wheel at a skid point during braking and for producing a skid signal at said skid point, and a modulator responsive to said skid signal to relieve said brake-applying pressure by displacing fluid from said brake, said modulator including a brake-reapplication restrictor which is operative to control the rate at which said brake-applying pressure from said source can be re-applied to said brake at the cessation of said skid signal, wherein a valve assembly is incor-



porated to by-pass said reapplication restrictor, said valve assembly comprising first and second valve members which are relatively movable between a spaced inoperative position in which unrestricted communication is provided between said source and said brake and an operative position in which said valve members are urged into engagement to render said restrictor operative, means for urging said first valve member into engagement with said second valve member in response to said skid signal, and means for urging said second valve member into engagement with said first valve member in response to any difference in fluid pressure acting across restrictor.

4,422,696

**TRACK STRUCTURE FOR A TRACKED VEHICLE**

Horst Selt, Steinbach, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

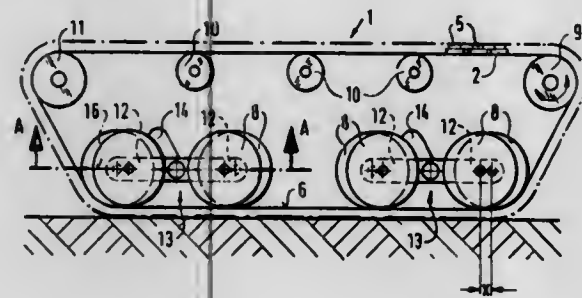
Filed Oct. 24, 1980, Ser. No. 200,381

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1979, 2943066

Int. Cl.<sup>3</sup> B62D 55/14

U.S. Cl. 305—28

5 Claims



1. In a track-laying military vehicle, the improvement which comprises track assembly having:  
an endless track composed of a multiplicity of tread links spaced apart by linear gaps extending the width of the track and means pivotally connecting said links together only at the end of said gaps whereby said gaps each have a width  $x$  between respective tread links; and  
roller means supporting said track with a lower ground-engaging stretch and an upper return stretch, said roller means including an arm connected to said vehicle, and a pair of running wheels journaled on said arm and bearing upon running surfaces of said tread links at least in the region of said lower stretch, said wheels being journaled on said arm with an interaxial spacing  $X$  wherein  $1x \leq X \leq 1.5x$ , the axes of said wheels being fixed on the respective arm and lying in a plane parallel to the plane of said running surfaces of said lower stretch.

4,422,697

**ROTARY ROLLER BEARING CONNECTION WITH A FREE CENTER**

Georg Gugel, Nuremberg, and Theodor Kaiser, Hochstadt, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,240

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034008

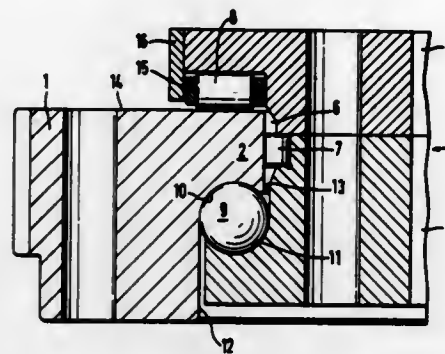
Int. Cl.<sup>3</sup> F16C 19/49

U.S. Cl. 308—175

7 Claims

1. A ring-rolling bearing connection with a free center comprising two concentric races, one race having a circular slot open towards the other race, the other race having a circular protrusion engaging the said slot with spacing on all sides, and cylindrical rollers being provided between the outer surface of the protrusion, on the one hand, and the corresponding surface in the slot, on the other hand, to absorb radial forces, and one row each of rolling elements between the corresponding faces of the protrusion, on the one hand, and corresponding

faces of the slot, on the other hand, to absorb axial forces, of which at least the row transmitting the main axial load consists of cylindrical rollers, characterized in that, in the area of a retaining row of rolling elements facing the rolling elements and absorbing only the lifting tilting moment, both on the



protrusion's adjacent radial surface its axially facing retaining row, and at the slot portion opposite the said retaining row there are provided sections of circular arc form whose radii correspond at least to the radius of the rolling elements disposed in the retaining row.

4,422,698

**BEARING ASSEMBLY**

Akio Aoki, and Kenichi Uchida, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 976,643, Dec. 20, 1978, abandoned.

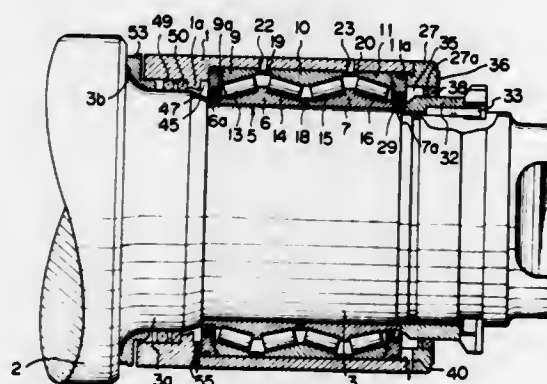
This application Nov. 6, 1980, Ser. No. 204,546

Claims priority, application Japan, Dec. 24, 1977, 52-155993; Aug. 2, 1978, 53-93663

Int. Cl.<sup>3</sup> F16C 1/24, 33/78

U.S. Cl. 308—187.1

11 Claims



1. In rolling mill apparatus of the type having a bearing assembly supporting a rotatable roll neck of a mill roll for rotation about an axis on a fixed chock, the bearing assembly including an outer race, an inner race, and rolling elements therebetween, and the bearing assembly including seal means between the inner and outer races for sealing the rolling elements in a region between the inner and outer races, the improvement comprising chamber means disposed adjacent to and axially outward of said seal means, means for restricting entry of contaminants to said chamber means from the exterior of said assembly, and discharge means positioned axially outward of said seal means for discharging from said chamber means contaminants which enter said chamber means through said restricting means, said discharge means comprising a discharge opening formed through said chock for draining contaminants from said chamber means along a path separated from the entry of said contaminants into said chamber means.

4,422,699

**ELECTRICAL CONNECTOR DEVICE IN A VEHICULAR STEERING SYSTEM**

Yoshimi Sakurai, Tanashi; Yutaka Shinoda, and Hideo Nagata, both of Hiratsuka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha & Furukawa Electric Co., Ltd., Tokyo, Japan

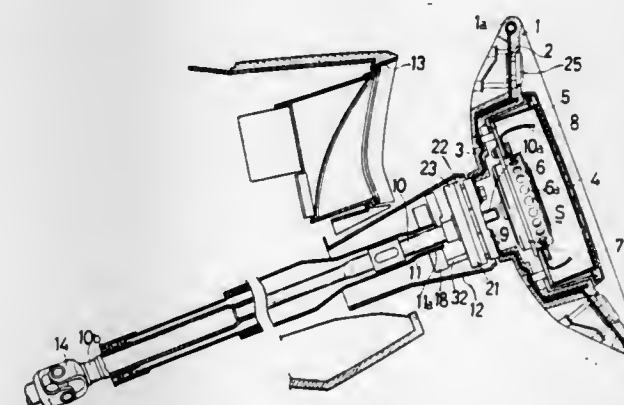
Filed Oct. 7, 1981, Ser. No. 309,441

Claims priority, application Japan, Oct. 7, 1980, 55-140241; Oct. 7, 1980, 55-140242; Oct. 7, 1980, 55-140244

Int. Cl.<sup>3</sup> H01R 39/32

U.S. Cl. 339—3 S

4 Claims



1. An electrical connector device in combination with a steering system having a rotatable member including a steering wheel and a steering shaft, and a fixed member including a steering column, said connector device comprising:  
a movable casing supported on said rotatable member for rotation therewith said disposed around said steering shaft, said movable casing having a first terminal;  
a stationary casing fixedly supported on said fixed member and disposed around said steering shaft, said stationary casing having a second terminal;  
at least one chamber defined between said movable and stationary casings;  
an electrical conductor coiled in a plurality of convolutions in said chamber around said steering shaft and connected at one end thereof to said first terminal and at the other end thereof to said second terminal; and  
said movable casing being axially immovable with respect to said stationary casing and axially movable with respect to said rotatable member.

4,422,700

**GROUNDING MULTI-PIN CONNECTOR FOR SHIELDED FLAT CABLE**

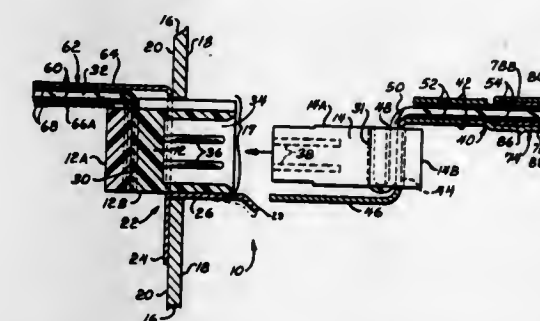
Horst M. Krenz, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Jan. 6, 1982, Ser. No. 337,360

Int. Cl.<sup>3</sup> H01R 4/66

U.S. Cl. 339—14 R

14 Claims



1. A grounded multi-pin connector mounted in an aperture in a grounded panel and electrically coupling first and second segments of a multi-conductor, flat cable enclosed in a conduc-

tive shield wherein said second segment is enclosed in an insulative sheath, said connector comprising:

a first housing connected to said first cable segment, said first housing including a recessed portion wherein are located a plurality of conductive pins in a fixed planar array;  
a second housing with a slot therein and having a plurality of conductive receptacles connected to said second cable segment and arranged in a fixed planar array such that when said second housing is inserted in the recessed portion of said first housing, electrical connection between said first and second cable segments is established;  
first conductive means having first, second and third sections;  
means for mounting said first conductive means between said first housing and said panel such that the first section of said first conductive means is electrically grounded, the second section thereof extends through said aperture adjacent said first housing, and said third section engages the conductive shield of the first segment of said flat cable thereby grounding said conductive shield; and  
second conductive means having a bent portion positioned in the slot of said second housing and adapted to securely engage said insulative sheath and electrically communicate with the conductive shield of said second segment, a section of said second conductive means extending in a generally parallel direction to said second housing and in close proximity thereto for contacting the second section of said first conductive means when said first and second housings are mated thereby grounding the conductive shield of the second segment of said flat cable.

4,422,701

**ELECTRICAL RECEPTACLES**

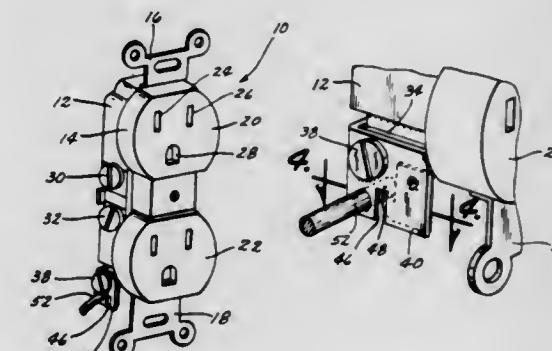
Raymond G. Anderson, 206 N. Sharmin St., Ankeny, Iowa 50021

Continuation of Ser. No. 157,562, Jun. 9, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,650

Int. Cl.<sup>3</sup> H01R 3/04

U.S. Cl. 339—14 R

5 Claims



1. An outlet plug receptacle comprising:  
an insulated housing having wall portions forming a chamber for holding power terminals and a ground terminal therein;  
an electrical cover means for said housing having at least one plug receiver,  
at least one plug mounting strap positioned between said housing and said cover to fix said receptacle to an outlet box,  
at least two power wire terminals mounted within said housing chamber,  
a ground terminal having a threaded aperture in said mounting strap and a mated threaded screw for securing a ground wire by turning said screw down upon said ground wire, and  
a quick wiring, stab-in, ground terminal arranged to receive a ground wire and grip the same, said ground terminal being formed at least in part as an integral portion of said plug mounting strap and being removably secured to said mounting strap by said ground terminal screw.



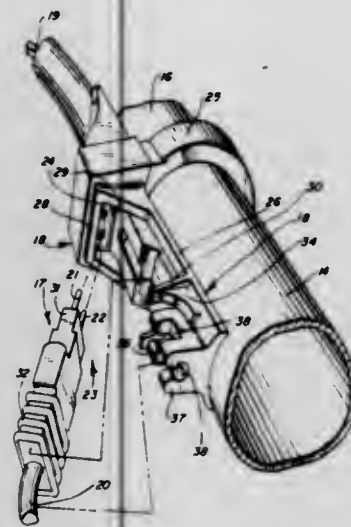
4,422,702

**VACUUM CLEANER ELECTRICAL CONNECTOR**  
Erwin E. Nordeen, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 24, 1981, Ser. No. 306,283  
Int. Cl.<sup>3</sup> H01R 4/64

U.S. Cl. 339—15

10 Claims



1. In a vacuum cleaner structure having a tubular air conducting wand provided at one end with connecting means for removable connection to a suction hose end having an electrical connection mounted thereto, the improvement comprising: a plug housing provided on said one end of the wand; and electrical conducting means including a plug and conductor cord means for providing an electrical supply extension from said hose electrical connection, said plug housing defining a base portion carried by said one end of the wand, a guide portion having a through opening aligned with said electrical connection on said hose end as an incident of mechanical connection of said one end of the wand to said suction hose end, a rigid plug stop shoulder on said hose spaced from said guide portion a preselected distance for effectively preventing movement of the plug outwardly from the guide portion through opening when the plug is in an installed disposition with one end of the plug received in said guide portion opening and the other end of the plug juxtaposed inwardly of said stop shoulder, and retaining means on said base outwardly of said stop shoulder for releasably retaining said conducting means from movement away from said base, said guide portion of the plug housing defining an inclined guide surface spaced from said base portion outwardly adjacent and extending toward said through opening and facing toward said plug stop shoulder and conducting means retaining means for slidably guiding said one end of the plug into said opening and said other end of the plug extending angularly outwardly away from the base adjacent said plug stop shoulder and conducting means retaining means, thereby permitting said other end of the plug to be moved inwardly toward the base to said installed disposition.

4,422,703

**ELECTRICAL CONNECTOR FOR USE WITH MULTI-PIN ARRAYS**

Gordon D. Christensen, San Jose, and Charles J. Donaher, Los Altos Hills, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 15, 1981, Ser. No. 302,445  
Int. Cl.<sup>3</sup> H01R 13/629

U.S. Cl. 339—74 R

14 Claims

1. An electrical connector for interconnecting a plurality of terminal pins in predetermined array to companion apparatus, comprising:

- (a) a housing;
- (b) a plurality of contacts supported by said housing in said array and extending in a common direction, each such

contact having a first terminal for connection to said companion apparatus and a second terminal adapted for receiving one such terminal pin and having facing elements self-biased into preselected attitude; and

(c) a plate member defining apertures in registry with and for receipt of said second terminals, said plate member being supported for movement in said housing in said common direction between a first position wherein said

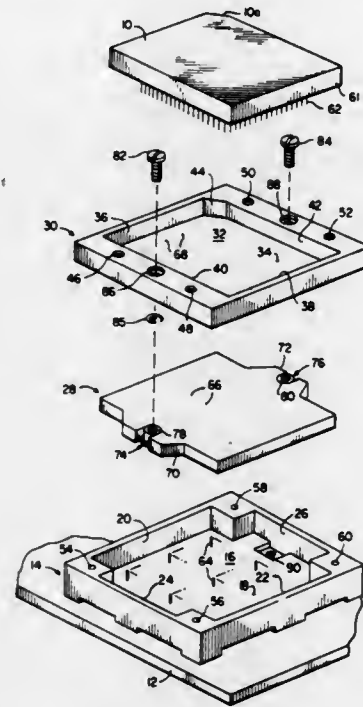


plate member engages said facing elements of all such second terminals to oppose such self-bias thereof and displace said facing elements from said preselected attitude whereby said pins may be readily received in said second terminals, and a second position wherein said plate member does not oppose said second terminal self-bias whereby said facing elements may exert full force of said self-bias upon pins therebetween.

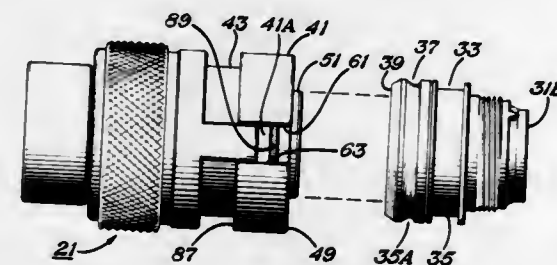
4,422,704  
LATCH

Robert A. Williams, 2721 White Settlement, Fort Worth, Tex. 76107

Filed Jan. 5, 1982, Ser. No. 337,156  
Int. Cl.<sup>3</sup> H01R 13/629

U.S. Cl. 339—91 R

7 Claims



1. A latch, comprising:

a body having a forward end with space surrounded by a wall for receiving, in a latching position, one end of a member having an outer annular groove at said one end, in said latching position, said outer annular groove of said member being located within said space at said forward end of said body,

an inner annular groove formed in the inner portion of said wall at said forward end of said body at a position such that said inner annular groove of said body is in the same plane as said outer annular groove of said member when

said one end of said member is located within said space at said forward end of said body in said latching position, the outer portion of said wall at said forward end of said body having at least one axially extending groove formed therein which intersects said inner annular groove forming an opening which exposes said inner annular groove through said axially extending groove,

annular coiled spring means located in said inner annular groove,

a sleeve carried by said body for axial sliding movement between forward and rearward positions,

an arm extending from the forward end of said sleeve for sliding movement in said axially extending groove as said sleeve is moved axially between said forward and rearward positions,

in said rearward position of said sleeve, said arm allowing the said annular coiled spring means to extend partially through said opening allowing said one end of said member to be located within said space at said forward end of said body in said latching position,

in said forward position of said sleeve, said arm forcing the portion of said annular coiled spring at said opening inward into space at said forward end of said body and into said outer annular groove of said member when said one end of said member is located within said space at said forward end of said body in said latching position to latch said body and said member together.

4,422,705

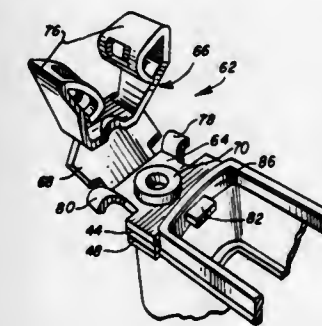
**CABLE STRAIN RELIEF FOR AN ELECTRICAL CONNECTOR**

Alan H. Kasper, Cicero, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 10, 1981, Ser. No. 291,352  
Int. Cl.<sup>3</sup> H01R 13/58

U.S. Cl. 339—103 M

11 Claims



1. A strain relief system for an electrical connector having housing means including a mounting flange, comprising: a cable clamp mounted on said flange for restraining movement of a cable connected to said connector; said cable clamp being configured such that tension applied to said cable tends to bend said flange; and said cable clamp including means engaging said housing means for resisting bending of said flange.

4,422,706

**ELECTRICAL CONNECTOR PLUG WITH RECEPTACLE ASSEMBLY**

Don E. Neuhauser, Point Pleasant, W. Va., assignor to Power Distribution Products, Inc., Point Pleasant, W. Va.

Filed Jun. 8, 1981, Ser. No. 271,385  
Int. Cl.<sup>3</sup> H01R 13/58

U.S. Cl. 339—107

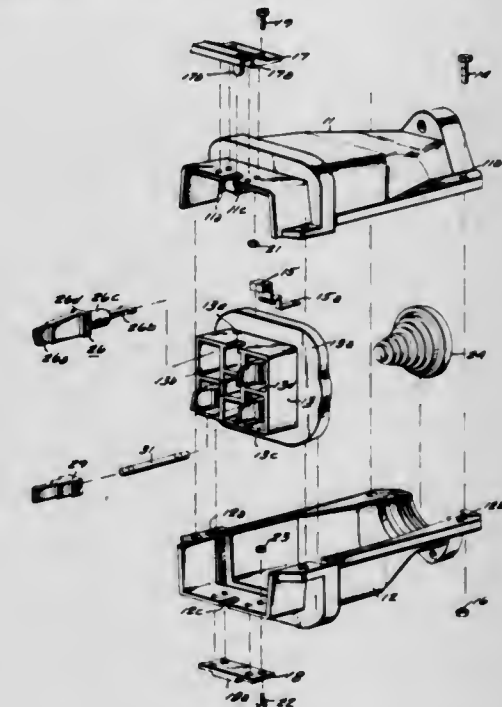
8 Claims

1. In combination, an electrical connector pair comprising a male plug and a female receptacle adapted for engagement to complete an electrical circuit comprising

a male plug housing, and a female receptacle housing;

two identical one-piece insulators, each having a plurality of contact compartments, means securing a first one of said insulators in said male plug housing, and means securing a second one of said insulators in said female receptacle

housing; top and bottom determining members for mounting on said male plug housing for defining a top and bottom of said male plug housing, said female receptacle housing including a top determining member and said insulators having a keyway in their top portion which cooperates with said top determining members of said male and female housings to insure correct assembly of said insulators therein,



4,422,707

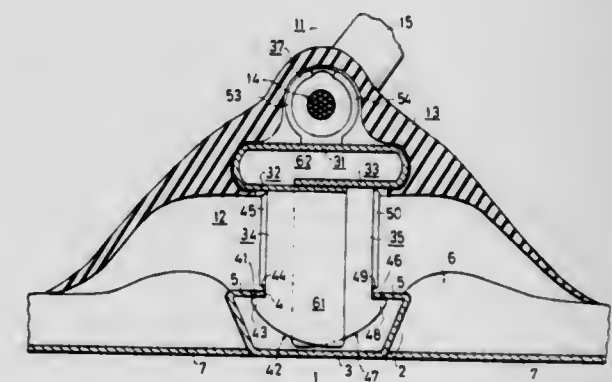
CRT ANODE CAP

Kazuo Wada; Toshita Chihara, both of Yokohama; Tetsuya Saito, and Mitsuo Suzuki, both of Tokyo, all of Japan, assignors to Taisho Denki Kogyo Kabushiki Kaisha and Sony Corporation, both of Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,869  
Claims priority, application Japan, Aug. 29, 1980, 55-122477  
Int. Cl.<sup>3</sup> H01R 4/48

U.S. Cl. 339—143 R

3 Claims



1. A CRT anode cap which is provided with an insulated high-tension lead, an anode structure electrically connected with the free end of the insulated high-tension lead for engagement with a CRT anode button, and an insulating cap provided



at one end portion of the insulated high-tension lead for housing the anode structure, wherein the anode structure has a first conductive plate member, second and third conductive plate members extending from left and right free end portions of the first conductive plate member and folded back to the right and the left, respectively, to underlie the first conductive plate member in opposing relation thereto, fourth and fifth conductive plate members extending downwardly from the rear free end portions of the second and third conductive plate members, respectively, and sixth and seventh conductive plate members extending from the front and rear free end portions of the first conductive plate member, respectively; wherein the fourth conductive plate member has, in its lower left portion, a first anode button engaging piece provided with a first stepped portion extending outwardly to the left and a first slope extending down therefrom to the right, and a first flange receiving facet extending upwardly from the first stepped portion; wherein the fifth conductive plate member has, in its lower right portion, a second anode button engaging piece provided with a second stepped portion extending outwardly to the right and a second slope extending down therefrom to the left, and a second flange receiving facet extending upwardly from the second stepped portion; wherein the fourth and fifth conductive plate members constitute an engaging portion for engagement with the CRT anode button; wherein the first, second and third conductive plate members constitute a radioactive rays shielding portion for shielding radioactive rays emanating from the side of the CRT anode button; wherein the sixth conductive plate member is electrically connected with the insulated high-tension lead; and wherein the seventh conductive plate member holds the insulated high-tension lead.

4,422,708

## SUPPORT DEVICE FOR INTEGRATED CIRCUIT

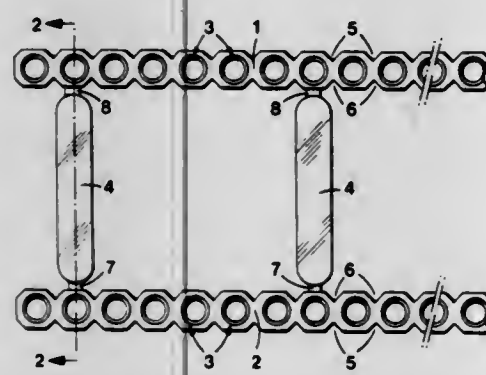
Jean Birnholz, Monthey, Switzerland, assignor to Ultra-precision, S.A., Monthey, Switzerland

Filed Apr. 6, 1981, Ser. No. 251,203

Claims priority, application Switzerland, Jun. 13, 1980, 4575/80

Int. Cl.<sup>3</sup> H01R 13/514

U.S. Cl. 339—176 MP

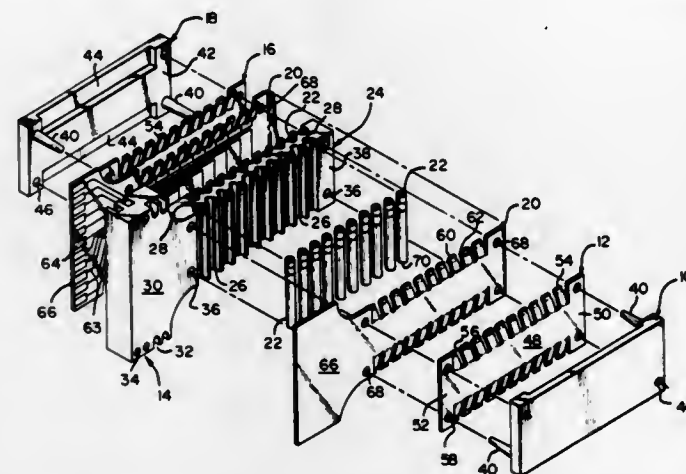


1. A support device for an integrated circuit in the form of a block having rows of pins along opposing edges thereof for engagement with corresponding sockets carried by a support device, said support device being adapted to be mounted on a circuit board and comprises a unitary structure having two elongated parallel portions formed of insulating material each provided with socket receiving holes spaced to cooperate with the spacing of the pins of the integrated circuit block and a plurality of transverse bridges of insulating material rigidly connecting said two parallel portions to provide a perfect register of the centers of the two series of holes with the pins of the integrated circuit so that the two series of sockets carried by said socket receiving holes will precisely register with the pins of the integrated circuit on the support device.

4,422,709  
MULTIPLE TRANSDUCER CONNECTOR  
Dana Croci, and David A. Kaplan, both of Harrisburg, Pa.,  
assignors to AMP Incorporated, Harrisburg, Pa.  
Filed Sep. 28, 1981, Ser. No. 306,039  
Int. Cl.<sup>3</sup> H01R 23/66

U.S. Cl. 339—176 MF

2 Claims



1. An electrical connector for terminating a plurality of cylindrical-shaped electrical devices having electrical contact surfaces at each end to a circuit film having conductive traces extending from an enlarged end outwardly to tabs spaced along and projecting from each longitudinal side of an elongated portion, said connector comprising:

- a housing of insulating material having an elongated block with a plurality of spaced-apart cavities extending transversely across the block and further having at one end of the block means to receive the enlarged end of the circuit film;
- a spring element of resilient material having a web with spring fingers projecting from each longitudinal side thereof in the same spaced-apart pattern as the tabs on the circuit film and the cavities in the elongated block, said fingers being preloaded by being bent out of the plane of the web, said element

being attachable to the elongated block with the fingers in registration with the cavities so that upon placing electrical devices in the cavities and the elongated portion of the circuit film between the block and the spring element, the spring fingers thereon bias the circuit film tabs against the electrical contact surfaces at each end of the electrical devices to establish electrical contact therebetween.

4,422,710  
REPAIRABLE BACKSHELL ADAPTER FOR  
ELECTRICAL CONNECTOR

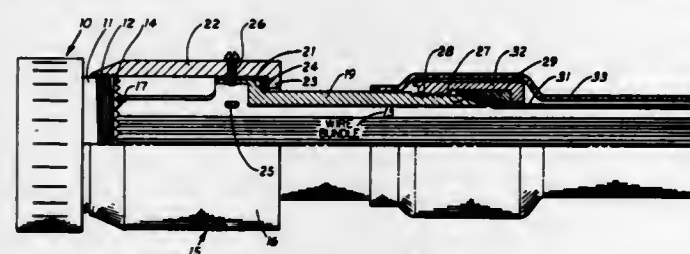
Brian J. Perona, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 21, 1981, Ser. No. 333,157

Int. Cl.<sup>3</sup> H01R 17/18

U.S. Cl. 339—177 R

2 Claims



1. An electrical cable assembly comprising:  
an electrical connector having a backshell provided with a threaded section and a plurality of aft extending teeth thereon;

a plurality of wires extending aft from said connector through said backshell;  
a terminator surrounding a portion of said wires and having at least one segment of teeth engageable with a portion of said backshell teeth, said terminator having a tapered surface on its aft end and a threaded section adjacent said tapered surface;  
a barrel threadably engageable with said threaded section on said backshell for biasing said segment of teeth on said terminator with said teeth on said backshell;  
means for locking said barrel to said terminator;  
a clamping sleeve adjacent said tapered surface on said terminator;  
a shielded cable surrounding a portion of said wires and having one end positioned between said tapered surface and having one end positioned between said tapered surface and said clamping sleeve; and  
a locking nut engageable with said threaded section adjacent said tapered surface for biasing said clamping sleeve to wedge said shielded cable between said tapered surface on said terminator and said clamping sleeve.

4,422,711

## ACTIVE PIN CONTACT

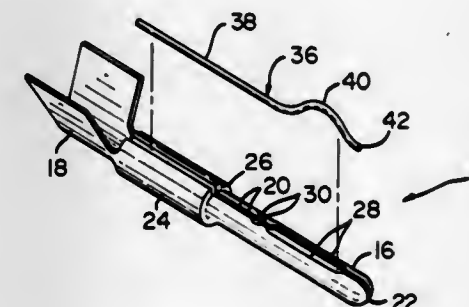
James P. Wolowicz, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 21, 1981, Ser. No. 333,231

Int. Cl.<sup>3</sup> H01R 11/22

U.S. Cl. 339—252 R

7 Claims



1. An active electrical pin contact including a hollow pin contact section and a conductor-connecting section for electrical connection with an electrical conductor, a spring member secured in said pin contact section, characterized in that said hollow pin contact section being partly formed with a rounded nose portion and with edges to be abutted including opposed recessed areas therealong to form a longitudinal slot being spaced a predetermined distance from each other forming a longitudinal gap therealong;  
said spring member having a linear section, a bowed section and a short front section which has a curved configuration reverse to that of said bowed section;  
said spring member being inserted into said hollow pin contact section through said longitudinal gap with said linear section extending along an inside surface of said hollow pin contact section, said bowed section having a contact-engaging section extending above an outside surface of said hollow pin contact section within the opposed recessed areas and said curved front section extending along said inside surface spaced from an inside curved surface of the partly-formed nose portion;  
said hollow pin contact section being formed into its final configuration with said edges in abutment thereby permitting at least said curved front section to move along said inside surface when an inward force is exerted onto said contact-engaging section.

4,422,712

## HOUSED CONTACT ARRANGEMENT FOR A TUBULAR LAMP

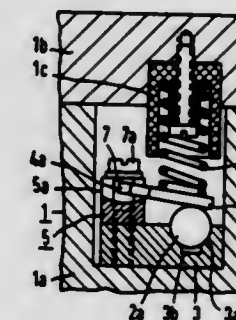
Günther Koszytorz, Penzberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany  
Filed Oct. 16, 1981, Ser. No. 312,156

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040538

Int. Cl.<sup>3</sup> H01R 13/187

U.S. Cl. 339—255 R

4 Claims



1. A contact arrangement of the type which provides electrical communication with a lamp contact terminal of a tubular lamp which is arranged in a housing, the lamp contact terminal having a selectable one of spherical and cylindrical configurations, the arrangement comprising:

contact means having a substantially semicylindrical recess for engaging the lamp contact terminal;  
support block means electrically coupled with said contact means and arranged beside said substantially semicylindrical recess of said contact means, said support block means having a recess therein extending transverse to said substantially semicylindrical recess of said contact means;  
pressure plate means having a first portion retained in contact with said recess in said support block means, and a second portion for contacting the lamp contact terminal;  
cover means for closing the housing; and  
resilient spring means mechanically connected to said cover means for applying a force between said cover means and said pressure plate means upon closure of said cover means.

4,422,713

## METHOD FOR MAKING HIGH EFFICIENCY HOLOGRAMS

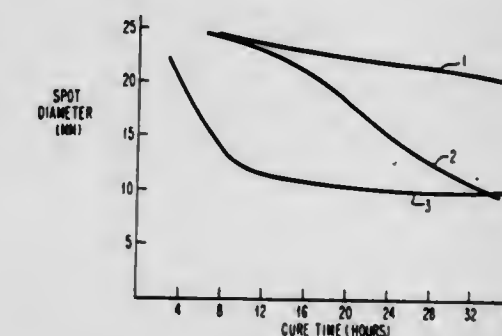
Barbara D. Grant, San Jose; Magdalena M. Hilden, Felton; Carol R. Jones, and Glenn T. Sincerbox, both of San Jose, all of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,284

Int. Cl.<sup>3</sup> G03H 1/18; G03C 5/22

U.S. Cl. 350—3.61

11 Claims



1. In a process for making high efficiency holograms from dichromated gelatin (DCG), the improved method comprising the steps of:



curing the DCG for a specified time under specified temperature and humidity conditions;  
placing a dye spot on the cured DCG material;  
measuring the extent of diffusion of the dye spot after a predetermined time;  
repeating the method until dye spot diffusion of a predetermined size occurs; and  
using the material at that cure state to make holograms.

4,422,714

**ELLIPSOIDAL OPTICAL COUPLING DEVICE**

Pierre Benoit, Cortailod; Jean-Paul Pellaux, Neuchatel; Gilbert Widmer, Le Landeron, all of Switzerland; Betty Kerlennovich, Bahia Blanca, Argentina, and Andre Coche, Strasbourg, France, assignors to Cables Cortailod S.A., Switzerland  
PCT No. PCT/CH80/00103, § 371 Date Mar. 17, 1981, § 102(e) Date Mar. 17, 1981

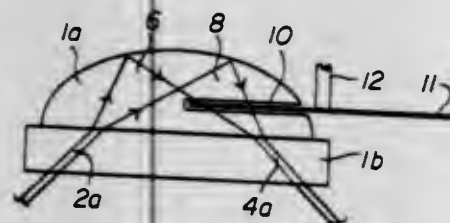
PCT Filed Sep. 12, 1980, Ser. No. 245,647

Claims priority, application Switzerland, Sep. 14, 1979, 8328/79; Jun. 16, 1980, 4606/80

Int. Cl.<sup>3</sup> G02B 5/172

U.S. Cl. 350—96.15

22 Claims



1. An optical coupling device for at least two light conductors, comprising a solid body at least a part of which consists of a half-ellipsoid of revolution made of a material transparent at least in the wavelength range of the light transmitted by these light conductors, the outer surface of said half-ellipsoid being placed in an ambient medium, means for positioning the end of one of said light conductors at one of the foci of said half-ellipsoid, second means for positioning the end of a second light conductor at the other focus of said half-ellipsoid, said positioning means orienting the optical axes of the two conductors whose ends have been placed at the foci of the half-ellipsoid in such a way that a divergent light beam emitted by one of these conductors is transformed, after having undergone a total reflection inside said half-ellipsoid, at the interface between said half-ellipsoid and said ambient medium into a beam converging on the end of the other conductor, said half-ellipsoid including a slot formed therein to permit the interposition along the path of said convergent beam of beam modifying means operative to modify a light beam transmitted through said half-ellipsoid.

4,422,715

**FIBER OPTIC CONNECTOR HAVING FIBER CUTTING MEANS**

Russell H. Williams, Harriburg, Pa.; Peter Garner, Flemington, and K. Scott Gordon, Sergeantsville, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Jun. 22, 1981, Ser. No. 276,055

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.20

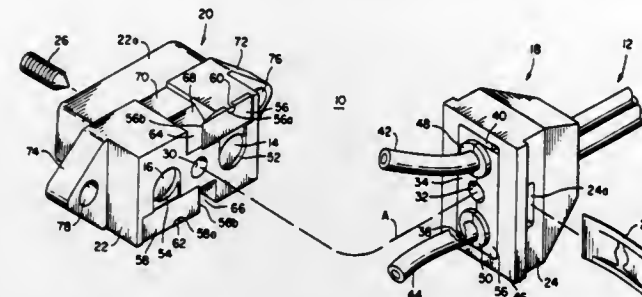
33 Claims

13. A fiber optic connector for termination with a termination device, comprising in combination:

- (a) first housing means including separation means thereon;  
(b) second housing means for retentively engaging said fiber; and

(c) means coupling said first and said second housing means for movement relative to each other to effect separation of

a portion of said fiber during such relative movement of said first and second housing means, a retentively engaged



portion of said separated fiber defining an end face for termination with a termination device.

4,422,716

**OPTICAL FIBER CONNECTOR**

Yoshitaka Morimoto; Tomiji Shiga, and Akio Ushirogawa, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

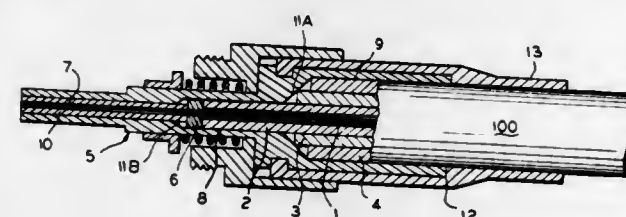
Filed Oct. 31, 1980, Ser. No. 202,631

Claims priority, application Japan, Nov. 21, 1979, 54-151174

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.21

6 Claims



1. An optical fiber cable termination assembly for an optical fiber cable comprising:

an optical fiber cable including at least one optical fiber for transmitting a light beam and a protective tubular member for protecting said optical fiber while enabling said optical fiber to move freely and axially therein, a forward part of said optical fiber protruding from the end of said protective tubular member;

a sleeve member abutting against the end of said protective tubular member for fixing a portion of said forward part of said optical fiber therein so that said forward part of said optical fiber does not move into or out of said protective tubular member, an inner diameter of said sleeve member being dimensioned to be substantially equal to the corresponding dimension of said optical fiber;

a glass tube for tightly retaining the remainder of said forward end of said optical fiber; and

termination means having a first bore for receiving said glass tube, a second bore for receiving said sleeve member and a third bore for receiving a protective jacket for said optical fiber including said protective tubular member.

4,422,717

**COUPLING ARRANGEMENT FOR OPTICAL WAVEGUIDES**

Bernhard Schmidt, Neunkirchen, Fed. Rep. of Germany, assignor to Felten & Guillaume Carlswerk Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 280,508

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 3025888

Int. Cl.<sup>3</sup> G02B 7/26

U.S. Cl. 350—96.21

7 Claims

6. An arrangement for coupling optical fiber ends mounted in respective connectors, comprising an elongated hollow housing; clamping means in said housing including a prismatic

first clamping member extending over the entire length of said housing and having a longitudinally extending V-shaped groove, and a pair of identical second clamping members each extending over a part of the length of said first clamping member in registry with said groove to bound therewith a confining space for receiving the respective connector-mounted optical fiber end; a plurality of pressing bodies received between said housing and said second clamping members; means for urging said pressing bodies against said second clamping members with an adjustable force to thereby clamp the respective optical fiber ends received in the respective confining spaces between the respective second clamping members and said first

formed in the center of the assembly so the low-loss optical fiber is protected from a high hydrostatic water pressure.

4,422,719

**OPTICAL DISTRIBUTION SYSTEM INCLUDING LIGHT GUIDE**

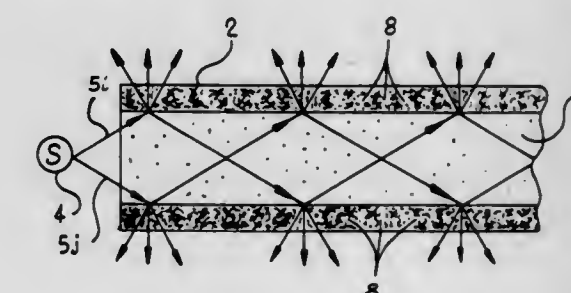
Donald E. Orcutt, Succasunna, N.J., assignor to Space-Lyte International, Inc., Newark, N.J.

Filed May 7, 1981, Ser. No. 261,688

Int. Cl.<sup>3</sup> G02B 5/14

U.S. Cl. 350—96.30

48 Claims



1. An optical distribution system comprising in combination: a source of light; means to apply light derived from said source to an area requiring illumination; said means comprising a flexible light guide coupled in light-transmitting relation to said source, said light guide comprising a flexible core of light transmitting material; and a sleeve of transparent or translucent material tightly surrounding said core in unbonded relationship thereto and in a manner to substantially eliminate air from the interface between said core and said sleeve, said sleeve and said core being constructed and arranged to laterally diffuse, disperse or refract through the sidewall of said sleeve a substantial component of the light traversing said core longitudinally.

4,422,718

**SUBMARINE OPTICAL FIBER CABLE**

Yukio Nakagome; Kitsutaro Amano, both of Yokohama; Tai-chiro Nakai, Fujisawa; Yasuhiko Niino, Yokohama; Yoshihiro Ejiri, Tokyo; Hitoshi Yamamoto, Kawasaki, and Yoshihiko Yamazaki, Kashiwa, all of Japan, assignors to Kokusai Den-shin Denwa Kabushiki Kaisha, Tokyo, Japan

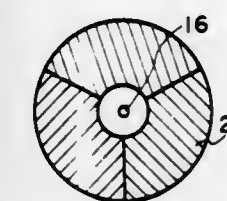
Continuation of Ser. No. 20,872, Mar. 15, 1979, abandoned. This application Nov. 3, 1981, Ser. No. 317,842

Claims priority, application Japan, Mar. 31, 1978, 53-36580; Mar. 31, 1978, 53-36581

Int. Cl.<sup>3</sup> G02B 5/14

U.S. Cl. 350—96.23

8 Claims



1. A submarine optical fiber cable using a low-loss optical fiber as a transmission medium comprising a cylindrical pressure-resisting metal layer consisting of an assembly of only three longitudinally extending nonstranded pressure-resisting segments, each of said segments being fan-shaped in cross section and all equal in cross section with entirely flat contact surfaces along which the segments make contact longitudinally and solid throughout, said segments converging toward a center and defining one cylindrical optical fiber housing space centrally of the assembly, and at least one low-loss optical fiber extending longitudinally in the optical fiber housing space

4,422,720

**STEREOSCOPIC VIEWING AND PROJECTION SYSTEM**

David M. Sheiman, 1401 Alvarado Ter., Los Angeles, Calif. 90006, and Elliot A. Rudell, 2422 Curtis Ave., Redondo Beach, Calif. 90278

Continuation-in-part of Ser. No. 920,280, Jun. 29, 1978, Pat. No. 4,235,515, which is a continuation-in-part of Ser. No. 632,224, Nov. 17, 1975, abandoned. This application Oct. 9, 1980, Ser. No. 195,680

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> G02B 27/14, 27/24

U.S. Cl. 350—138

31 Claims



1. A stereoscopic viewing system comprising:  
(a) a thin plate prism with a plano face and an opposite face bearing a plurality of parallel, spaced-apart, straight-line, V-grooves defining a plurality of straight, spaced-apart, triangular prisms that provide a viewing face;



- (b) a mirror to one side of and parallel to said thin plate prism;
- (c) a first imaging surface behind said thin plate prism, at an occluded angle of 1 degree to 15 degrees relative to said prism;
- (d) a second imaging surface in the reflected line of sight from said mirror, at an occluded angle of 40 to 60 degrees with said mirror; and
- (e) first and second stereoscopic images displayed, respectively, on said first and second imaging surfaces.

4,422,721

## OPTICAL ARTICLE HAVING A CONDUCTIVE ANTI-REFLECTION COATING

Robert E. Hahn; Thomas R. Jones, both of Santa Rosa, and Peter H. Berning, Sebastopol, all of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Aug. 9, 1982, Ser. No. 406,302

Int. Cl.<sup>3</sup> G02B 1/10

U.S. Cl. 350—164

9 Claims



1. In an optical article, a substrate having first and second surfaces and a conductive antireflection coating disposed on the first surface, said conductive antireflection coating having at least one layer of a low index material carried by said first surface and a thin transparent conducting layer of the material having a high index of refraction carried by said layer of low index material and providing an exposed surface to which a direct electrical contact can be made, said thin transparent conducting layer having an optical thickness ranging from 1.0 to 30.0 nanometers and wherein said layer of low index material has its design thickness reduced to compensate for the thickness of the thin transparent conducting layer whereby the provision of the thin transparent conducting layer whereby the optical performance of the coating over that which could be obtained without the use of the thin transparent conducting layer.

4,422,722

## COLOR SEPARATION OPTICAL SYSTEM FOR COLOR TELEVISION CAMERA

Takeshi Higuchi; Kazuo Yeshikawa, both of Ohmiya, and Hideo Buto, Okegawa, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

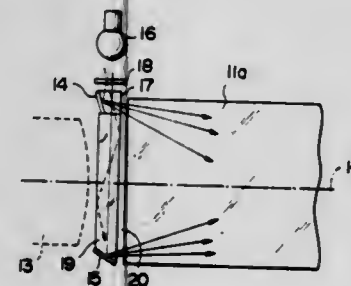
Filed Feb. 2, 1981, Ser. No. 230,605

Claims priority, application Japan, Feb. 22, 1980, 55-21216

Int. Cl.<sup>3</sup> G02B 27/10; H04N 9/09

U.S. Cl. 350—173

6 Claims



1. A color separation optical system for a color television camera disposed between a taking lens of a television camera and a plurality of image pick up elements for color components consisting of a number of prism blocks wherein the improvement comprises a plane parallel plate located with an air gap in front of an entrance face of a prism block of the color separation system, and bias light reflecting surfaces provided at a periphery of said plane parallel plate for reflecting bias light toward said entrance face of the prism block, said bias light reflecting surfaces being toric surfaces.

tion system, and bias light reflecting surfaces provided at a periphery of said plane parallel plate for reflecting bias light toward said entrance face of the prism block, said bias light reflecting surfaces being toric surfaces.

4,422,723

## ADJUSTABLE REFLECTOR WITH IMPERFORATE REFLECTIVE MEMBRANE

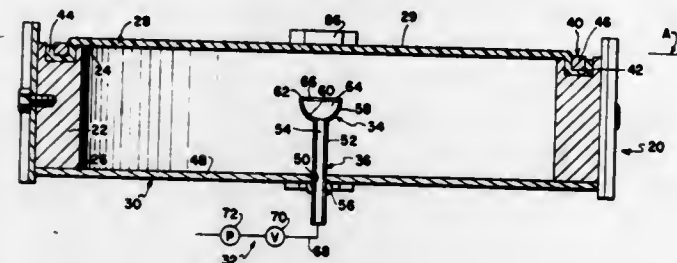
Carl L. Williams, Jr.; Robert S. Black, and Larry R. Payne, all of Abilene, Tex., assignors to LaJet Energy Company, Abilene, Tex.

Filed Aug. 11, 1981, Ser. No. 291,911

Int. Cl.<sup>3</sup> G02B 5/10

U.S. Cl. 350—295

26 Claims



1. A reflector comprising:  
a hollow housing having top and bottom openings;  
a flexible, elastic imperforate reflective membrane, coupled over said top opening in a gas-tight manner;  
base means for covering said bottom opening in a gas-tight manner;  
evacuation means, coupled to said housing, for creating a partial vacuum in said housing tending to deflect said membrane below a reference plane and into said housing;  
control means for regulating evacuation of said housing by said evacuation means; and  
adjustment means, coupled to said base means, for supporting and adjustably positioning said control means in said housing at a location corresponding to a predetermined deflection of said membrane below said reference plane.

4,422,724

## REAR VIEW MIRROR ARRANGEMENT TO BE MOUNTED ON A VEHICLE DOOR

Hidehiro Otsuka, Tokyo; Takaaki Oda; Fumiyoshi Sato, both of Machida, and Masaaki Kikuta, Sayama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

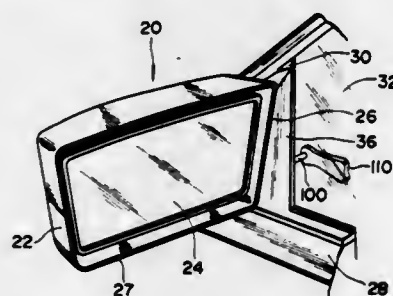
Continuation of Ser. No. 240,196, Mar. 3, 1981, abandoned. This application Apr. 14, 1983, Ser. No. 483,848

Claims priority, application Japan, Mar. 5, 1980, 55-26730

Int. Cl.<sup>3</sup> G02B 7/18; B60R 1/06

U.S. Cl. 350—307

16 Claims



1. A rear view mirror arrangement for an automotive vehicle, which is mounted on the vehicle side door, comprising:  
a reflecting mirror;  
a mirror housing having a first pivot means for pivotably supporting said mirror; and  
a mirror angle adjustment lever having an operating handle at the inner end thereof, said handle being positioned inside of the vehicle passenger compartment, said lever

having an outer end cooperatively and releasably connected to said mirror, and said lever having a second pivot means provided at the intermediate portion of said adjustment lever for permitting said adjustment lever to move in any direction; and  
a spring provided between said mirror housing and the vehicle side door for elastically urging said mirror housing against the vehicle side door in order to retain said mirror housing in the laterally protruded position.

4,422,725

## METHOD OF OPTIMALLY OPERATING A GRAPHITE FIBER REINFORCED GLASS MATRIX COMPOSITE OPTICAL ARTICLE

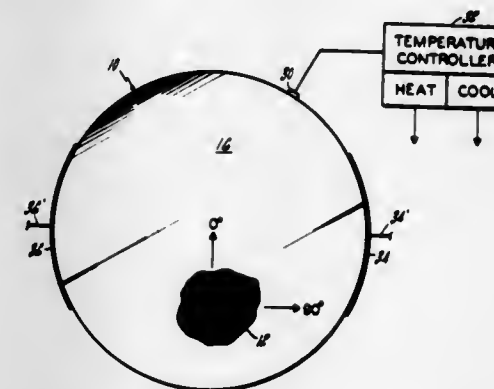
Karl M. Prew, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 16, 1981, Ser. No. 243,689

Int. Cl.<sup>3</sup> G02B 5/08

U.S. Cl. 350—310

13 Claims



1. For a laser mirror comprising principally a graphite fiber reinforced-glass matrix composite, the thermal strain for said composite over a wide temperature range being a non-linear function of temperature, said function exhibiting a region of minimum absolute slope, the method of minimizing changes in the size of said mirror comprising the step of:  
maintaining the temperature of said mirror within a limited range in said wide temperature range, said limited range being substantially at said region of minimum slope of said thermal strain function for said composite.

4,422,726

## METHOD OF MAKING AN ELECTRO-OPTICAL DISPLAY

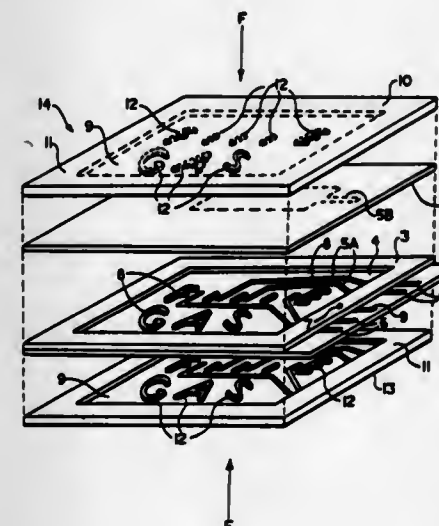
Steven D. Harris, Uniontown, and Joseph I. Wolfe, Stow, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 14, 1981, Ser. No. 311,692

Int. Cl.<sup>3</sup> G02F 1/133

U.S. Cl. 350—331 R

9 Claims



1. A method of making an electro-optical display having

improved optical uniformity, said display comprising a pair of plates of which at least one plate is transparent, said plates bonded together by means of a seal made from an hermetic sealant composition that encloses a cavity between the plates that contains an electro-optical material whose ability to convey information to a viewer of the display is dependent upon whether the electro-optical material is in an electrically energized or an electrically unenergized state imparted thereto by means of an electrically conductive coating in the form of at least one discrete image disposed on side of the plates facing towards the electro-optical material, said method including the steps of:

- (a) providing at least one pressure plate in addition to said pair of plates having at least one raised portion on the surface thereof, said raised portion dimensionally adapted to align with and press uniformly substantially only upon the seal when the pressure plate is positioned and pressed against the side of the optical display plate facing away from the cavity so as to minimize or eliminate refraction patterns that might have otherwise arisen in the electro-optical material in the absence of the uniform pressure provided by the raised portion;
- (b) positioning the pressure plate of step (a) on the side of the optical display plate facing away from the cavity; and
- (c) pressing the pressure plate of step (b) against the display plate so as to urge both of the display plates together.

4,422,727

## LACQUER, WITH INORGANIC FILLER, COATING DISPLAY-ELEMENT'S POLARIZER

Holm Baeger, Bad Soden, and Hans Wedel, Mühlthal, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Fed. Rep. of Germany

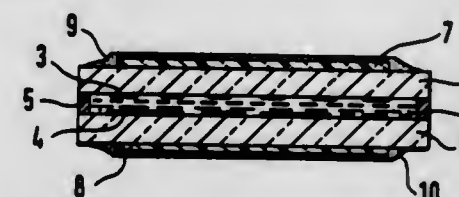
Filed Oct. 16, 1980, Ser. No. 197,687

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944325

Int. Cl.<sup>3</sup> G02F 1/133

U.S. Cl. 350—334

2 Claims



1. A passive electro-optical indicating element for displaying information such as alphabetical and numerical characters, comprising:

- a front transparent electrode support;
- a back transparent electrode support, which together with said front transparent electrode support defines a cavity;
- a liquid crystal substance enclosed in said cavity formed by said front and back transparent electrode supports;
- a polarizer arranged on the surface of each said front and back transparent electrode supports opposite said liquid crystal substance;
- a thin coating of a transparent curable lacquer applied to the outside surface of the polarizer arranged on said front electrode support, said coating of a transparent curable lacquer including an inorganic filler of silicon dioxide suspended therein in an amount between 2 and 10 percent by weight of the prepared lacquer.



# 4,422,728 LIQUID CRYSTAL MOUNTING AND CONNECTION SCHEME

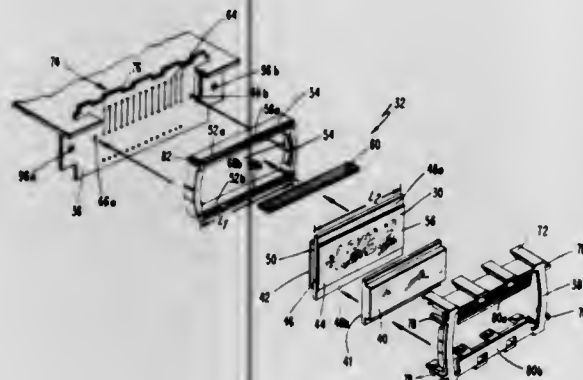
Joseph Andreaggi, Short Hills, N.J., assignor to Sangamo Weston, Inc., Atlanta, Ga.

Filed Jan. 30, 1981, Ser. No. 230,409

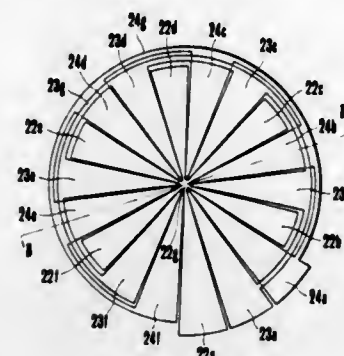
Int. Cl.<sup>3</sup> G02F 1/133

U.S. Cl. 350—334

7 Claims



said first transparent plate and arranged in concentric relation to each other, and  
a second set of transparent electrodes positioned on said second transparent plate and arranged in radial relation to



each other and having respective areas, each area of second set of transparent electrodes being set in such a manner that the amount of light passing the diaphragm aperture vary in accordance with the variation of an intermediate step in APEX system.

4,422,730

# LIQUID CRYSTAL DISPLAY DEVICE AND THE MANUFACTURING METHOD THEREOF

Shuichi Kozaki, Nara; Fumiaki Funada, Yamatokoriyama; Shigehiro Minezaki, Ikoma, and Hisashi Ueda, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

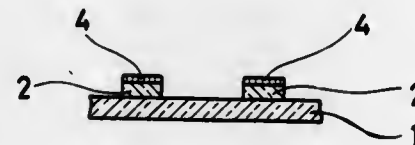
Filed Oct. 16, 1980, Ser. No. 197,575

Claims priority, application Japan, Oct. 18, 1979, 54-134806; Feb. 27, 1980, 55-24403; Feb. 28, 1980, 55-24842

Int. Cl.<sup>3</sup> G02F 1/133

U.S. Cl. 350—339 R

11 Claims



1. A method for making a liquid crystal display device comprising the steps of:  
providing a pair of substrates;  
forming a first patterned layer on a part of one of the substrates;  
forming a second layer on the remaining part of one of the substrates, the thickness of the second layer being substantially identical to that of the first patterned layer to provide a uniform layer in thickness;  
forming an additional layer on the uniform layer; and disposing a liquid crystal layer between the pair of substrates.

4,422,731

# DISPLAY UNIT WITH HALF-STUD, SPACER, CONNECTION LAYER AND METHOD OF MANUFACTURING

Jean-Paul Drognet, Courbevoie, and Michel Vernay, Paris, both of France, assignors to Societe Industrielle des Nouvelles Techniques Radioelectriques Societe Anonyme dite, Asnieres, France

Filed May 6, 1981, Ser. No. 261,083

Claims priority, application France, May 8, 1980, 80 10274

Int. Cl.<sup>3</sup> G02F 1/13

U.S. Cl. 350—344

7 Claims

5. A method of manufacturing a two-dimensional display unit said method including the following steps:

# 4,422,729 ELECTRO-OPTICAL DIAPHRAGM WITH RADIAL ELECTRODES

Ryoichi Suzuki, Kawasaki, and Takashi Uchiyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1980, Ser. No. 165,149

Claims priority, application Japan, Jul. 4, 1979, 54-84848  
The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> G02F 1/13, 1/133, 1/03; G03B 9/08

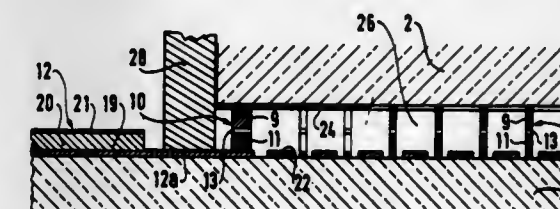
U.S. Cl. 350—336

2 Claims

2. In a solid state diaphragm device for use in a photographic camera having an electro-optical element and a matrix drive system for controlling the selection of light transmitting areas of said electro-optical element to vary the size of the diaphragm aperture, the improvement comprising:

first and second transparent plates sandwiching said electro-optical element;  
a first set of transparent annular electrodes positioned on

depositing electrodes on a transparent front plate and on a back plate;  
fixing said plates face to face so as to leave a constant microscopic gap between their facing "inside" surfaces;  
depositing a sealing strip which joins said plates together along the edge of an inner zone to form a sealed chamber between said plates, said inner zone containing said electrodes;  
filling said chamber with a fluid having an optical characteristic which is electrically controllable; and  
connecting said electrodes to control circuits which are suitable for supplying display signals to control said optical characteristic; the improvement wherein said step



during which said plates are fixed face to face itself includes the following steps:  
depositing adhesive metal half studs on each of the inner surfaces in such a way that each half stud deposited on one of said plates is in register with a half stud deposited on the other of said plates, at least some of said studs being spacer studs spaced out in said inner zone;  
depositing a connection layer on the tops of the half studs of at least one of said plates;  
installing said plates with contact between the tops of the half studs which face each other; and  
forming connections between the half studs in contact via said connection layer so as to form studs which joins said plates together.

4,422,732

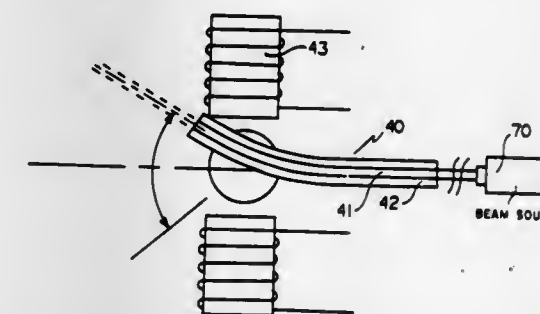
# BEAM ADDRESSED ELECTROOPTIC DISPLAY SYSTEM

Richard J. Ditzik, 9838C Appletree Dr., San Diego, Calif. 92124  
Filed Jun. 8, 1981, Ser. No. 271,692

Int. Cl.<sup>3</sup> G02F 1/03

U.S. Cl. 350—356

7 Claims



1. A method for manufacturing large area electrooptic displays which comprises:

(a) placing a glass or transparent substrate on a work surface,  
(b) fixing spacers around the margins of the substrate,  
(c) fixing a first thin membrane to the spacers such that the first membrane is in spaced relationship to the substrate,  
(d) injecting an electrooptic material in a space between the first membrane and the substrate,  
(e) applying optically clear adhesive to an open surface of the first membrane,  
(f) laying a second thin membrane upon the adhesived surface of the first membrane,  
(g) from a suitable height above the second membrane, directing a low power laser beam normal to the work surface through an optical diffuser, through a conven-

tional beam-splitter, and on to an exposed surface of the second membrane,  
(h) while the adhesive is curing, observing any Fezeau fringes and applying pressure normal to the exposed surface of the second membrane until said fringes disappear,  
(i) after the adhesive has set, fixing a protective transparent substrate in spaced relation to the second membrane.

4,422,733

# CLADDED SPHERICAL LENS HAVING UNEVEN REFRACTIVE INDEX

Keisuke Kikuchi, Ibaragi; Takitaro Morikawa, Sayama; Junichi Shimada, Ibaragi, and Kenjiro Sakurai, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

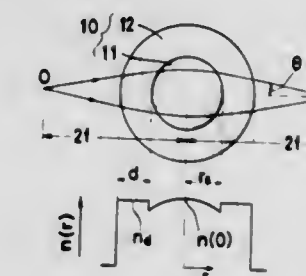
Filed Mar. 18, 1981, Ser. No. 244,915

Claims priority, application Japan, Mar. 31, 1980, 55-42348; Aug. 27, 1980, 55-118126; Sep. 4, 1980, 55-122666

Int. Cl.<sup>3</sup> G02B 9/02

U.S. Cl. 350—413

5 Claims



1. A cladded lens having an uneven refractive index, comprising:

(a) a core having a radius ( $r_0$ ) and a refractive index ( $n(r)$ ) continuously graded in proportion to the distance ( $r$ ) from the center thereof according to the formula:

$$n^2(r) = n^2(0) [1 + G_2(r/r_0)^2 + G_4(r/r_0)^4]$$

where  $n(0)$  is the refractive index at the center of the core, and  $G_2$  and  $G_4$  the secondary- and fourth-order coefficients representing the distribution of the graded refractive index of the core; and

(b) a cladding covering at least a portion of the outer periphery of said core and having a thickness and a refractive index which are determined in accordance with the refractive index at the center of said core, whereby the aberration can be reduced below the diffraction limit of light.

4,422,734

# PHOTOGRAPHIC LENS SYSTEM HAVING AN AUXILIARY LENS

Kazuo Tanaka, Tokyo, and Keiji Ikemori, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha

Filed Dec. 24, 1980, Ser. No. 219,977

Claims priority, application Japan, Dec. 28, 1979, 54-171341

Int. Cl.<sup>3</sup> G02B 9/62, 9/64, 15/10

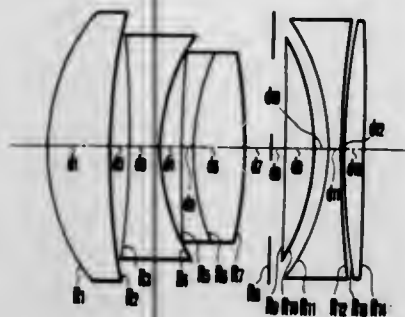
U.S. Cl. 350—422

8 Claims

1. A photographic lens system comprising:  
a principal lens having an optical axis; and  
an auxiliary lens to be mounted at the image side of the principal lens in such a manner that the optical axis coincide with each other, said lens being capable of being dismounted, having a negative refractive power and consisting of the first positive lens, the second negative lens



and the third positive lens in sequence from the object side; and wherein the compound refractive power of the



second negative lens and the third positive lens is negative.

#### 4,422,735 FUNDUS CAMERA

Tsutomu Shimizu, Hanno; Koji Inaba, and Naomiki Araki, both of Hachioji, all of Japan, assignors to Olympus Optical Company, Ltd., Japan

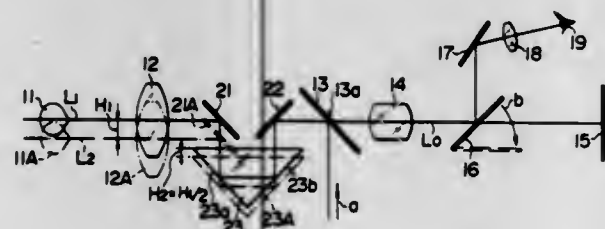
Filed Jan. 29, 1981, Ser. No. 229,463

Claims priority, application Japan, Apr. 22, 1980, 55-52385

Int. Cl.<sup>3</sup> A61B 3/14

U.S. Cl. 351-206

8 Claims



#### 1. A fundus camera, comprising:

- an objective lens having a principal optical axis; said objective lens being disposed to be movable in a plane which is perpendicular to said principal optical axis thereof to align said principal optical axis thereof with a visual axis of an eye being examined;
- a first reflecting surface disposed on the principal optical axis of said objective lens for movement simultaneously with and in the same direction as and through the same distance as said objective lens;
- a second reflecting surface disposed for movement simultaneously with and in the same direction as and through one-half the distance travelled by said objective lens; said first reflecting surface reflecting light passing through said objective lens to said second reflecting surface;
- a third reflecting surface disposed for simultaneous movement with, and in the same direction as, said second reflecting surface and moving the same distance as said second reflecting surface, said second reflecting surface reflecting light reflected by said first reflecting surface to said third reflecting surface;
- a stationary fourth reflecting surface; said third reflecting surface reflecting light that has been reflected by said second reflecting surface to said fourth reflecting surface; and
- an apertured reflecting mirror disposed for reflecting illuminating light in a direction which will cause said illuminating light to be reflected by said fourth, third, second and first reflecting surfaces and through said objective lens to illuminate the fundus oculi of an eye being examined and which will also permit light reflected off the fundus oculi of the eye, and then passing through said objective lens and reflected off said first through fourth reflective surfaces, to pass through the aperture of said reflecting mirror so as to permit observation or photographing of the

illuminated fundus oculi through said objective lens and through said aperture of said apertured mirror.

#### 4,422,736 EYE FUNDUS CAMERA HAVING RING SLIT MASK IN ILLUMINATING SYSTEM

Kazuo Nunokawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

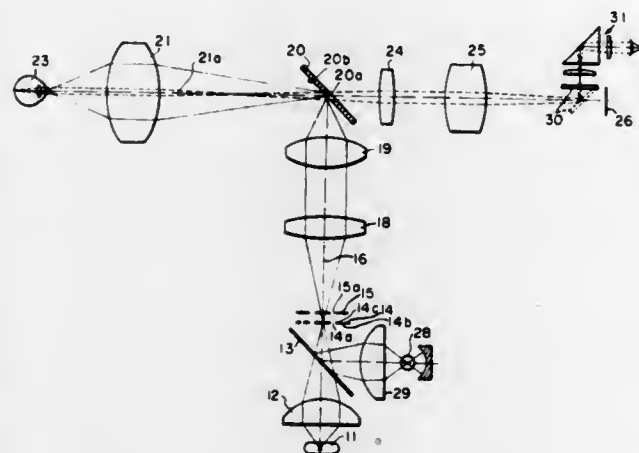
Filed Mar. 18, 1981, Ser. No. 245,149

Claims priority, application Japan, Mar. 21, 1980, 55-36769

Int. Cl.<sup>3</sup> A61B 3/14, 3/10; G03B 7/00

U.S. Cl. 351-207

4 Claims



1. An eye fundus camera comprising objective lens means adapted to be placed opposite to a patient's eye with a distance between the objective lens means and the patient's eye, an illumination optical system for projecting an illumination light beam through said objective lens means, and an observing optical system for directing a light beam reflected from said patient's eye through said objective lens means to an image plane, said illuminating system including a first ring-shaped aperture located substantially in conjugate with the cornea of the patient's eye and a second ring-shaped aperture located substantially in conjugate with the iris of the eye, said first ring-shaped aperture having a ring-shaped dimming band therein.

#### 4,422,737 DEVICE FOR OBTAINING TOPOGRAPHIC PICTURE OF SURFACE OF ROTATING OBJECT

Dmitry D. Gribov, ulitsa Chusovskaya, 11, korpus 6, kv. 35, Moscow; Vladimir P. Kulesh, ulitsa Stroitel'naya, 6, kv. 29, Zhukovskiy, Moskovskaya oblast; Apollinary K. Martynov, 3 Frunzenskaya ulitsa, 3, kv. 40, Moscow; Anatoly A. Orlov, ulitsa Naberezhnaya Tsialkovskogo, 22, kv. 82, Zhukovskiy, Moskovskaya oblast; Alexandr I. Sidorov, poselok Tomilino, ulitsa Gogolya, 24, kv. 73, Moskovskaya oblast, Ljuberetskiy rayon; Sergei D. Fonov, poselok Zarya, 180, kv. 52, Moskovskaya oblast, Balashikhinskiy rayon, and Arkady V. Stepanov, ulitsa Serova, 18, kv. 22, Zhukovskiy, Moskovskaya oblast, all of U.S.S.R.

Filed Dec. 14, 1981, Ser. No. 330,702

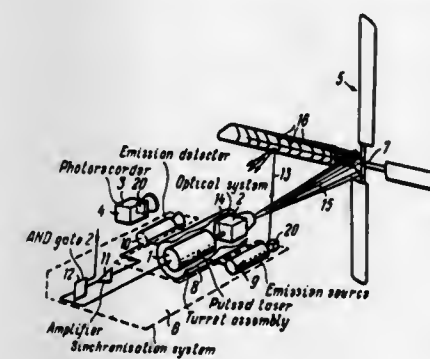
Int. Cl.<sup>3</sup> G03B 19/18, 21/32

U.S. Cl. 352-39

14 Claims

1. A device for obtaining a topographic picture of the surface of a rotating object, comprising:
  - a turret assembly whose axis of rotation coincides with the axis of rotation of said rotating object;
  - a pulsed laser installed on said turret assembly coaxially with its axis of rotation;
  - an optical system forming a set of light planes from a light beam coming from said pulsed laser;
  - a reflector arranged on the axis of rotation of said rotating object and directing said light planes at the surface of the rotation object;
  - a photorecorder installed on said turret assembly and having its

- recording plane optically mated with said rotating object, said photorecorder being used to record intersection of said light planes with the rotating object;
- a system designed to synchronize an instant at which said pulsed laser emits as said rotating object passes preset points on its path, including:
  - an emission source installed on said rotating turret, the emission source being directed at a present point along the path of the rotating object, and
  - a detector receiving radiation from said source, recording it as said rotating object passes present points along its path and furnishing a signal enabling synchronous emission of said pulsed laser; and
- a unit controlling position of said turret assembly, including:



- a sensor indicating present position of said turret assembly, and
- a sensor indicating the preset position of said turret assembly; and
- a circuit designed to compare the present position of the turret assembly with the preset position thereof, said comparison circuit having three inputs and an output, said first input being connected to said sensor indicating the present position of the turret assembly, the second input being connected to said sensor indicating the preset position of said turret assembly, while the third input is connected to said emission detector, the output of said comparison circuit being connected to said pulsed laser to enable its operation at the instant as signal is applied from said emission detector.

#### 4,422,738 HAND-HELD MAP VIEWER AND NAVIGATIONAL AID

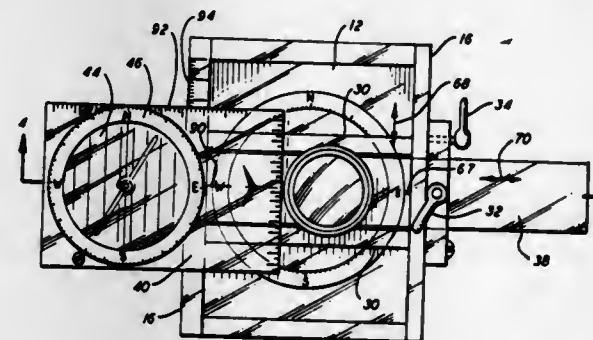
Daniel W. Steele, 2 Sherwood Cir., Clay, N.Y. 13041

Continuation-in-part of Ser. No. 41,648, May 23, 1979, abandoned. This application Jan. 28, 1981, Ser. No. 229,232

Int. Cl.<sup>3</sup> G03B 21/00

U.S. Cl. 353-11

19 Claims



1. A self-contained map viewer and navigational aid unit comprising:
  - (a) a base member having a circular opening therein;
  - (b) a map holder with a map supported therein;
  - (c) means for releasably attaching said map holder to said base for rotation about a predetermined axis with said map positioned within said opening;

- (d) viewing means through which a portion of said map is visible;
- (e) movable means upon which said viewing means is carried, said movable means being mounted for movement relative to said base linearly in any direction in a plane adjacent and parallel to said map to selectively change said visible portion; and
- (f) means selectively movable into and out of contact with a portion of said map holder to make a visible trace thereon when in contact therewith in response to relative movement of said viewing means and said map holder.

#### 4,422,739 AUTO FOCUS CAMERA

Sakuji Watanabe, Warabi; Akira Ogasawara, Yokohama; Nobuhiko Terui, Tokyo; Kunihisa Hoshino, Kawasaki, and Ken Utagawa, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

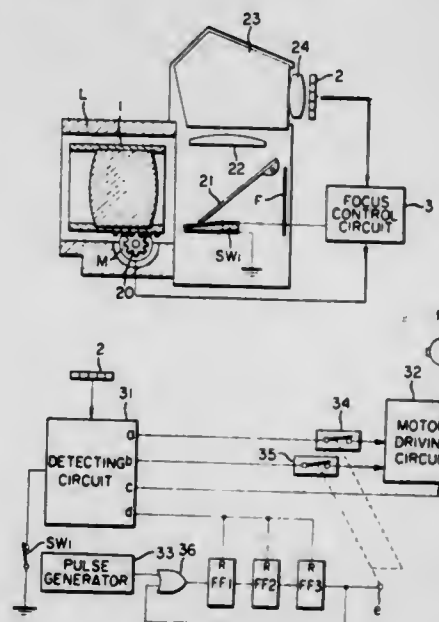
Filed Aug. 25, 1981, Ser. No. 296,143

Claims priority, application Japan, Aug. 30, 1980, 55-120217

Int. Cl.<sup>3</sup> G03B 13/20, 7/08

U.S. Cl. 354-404

5 Claims



1. In a single lens reflex camera which comprises a movable reflecting mirror disposed across a phototaking optical path, the mirror being retracted from the phototaking optical path prior to exposure to the film; automatic focusing means having detecting means detecting the focusing state of a phototaking lens from the output of a light receiving means disposed on a substantial focusing plane of a light beam passed through the movable reflecting mirror and generating selectively an in-focus signal and an out-of-focus signal, and driving means which displaces the phototaking lens in response to the out-of-focus signal and stops displacing the phototaking lens in response to the in-focus signal; and first disabling means for disabling the automatic focusing means in response to retraction of the movable mirror from the phototaking optical path, the improvement comprising:

- second disabling means for disabling the driving means during generation of the in-focus signal in response thereto to thereby restrain movement of the phototaking lens, the second disabling means including timer means which starts counting when generation of the in-focus signal has stopped and counts a predetermined time interval at least until completion of disabling of the automatic focus means by the first disabling means, the second disabling means maintaining the disabled condition of the driving means until the timer completes counting.



# **4,422,740** **LENS ASSEMBLY PROVIDED WITH AN AUTOMATIC FOCUSING DEVICE**

Tohru Kawai, Kawasaki, both of Japan, and Akiyasu Sumi, Yokohama, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

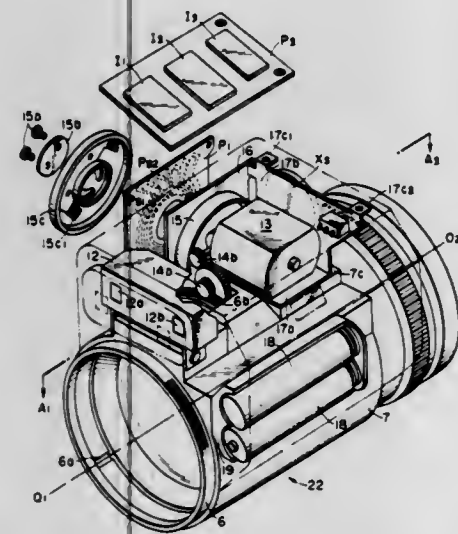
Filed Jul. 5, 1981, Ser. No. 280,549

Claims priority, application Japan, Jul. 7, 1980, 55/92883; Jul. 9, 1980, 55/96744[U]; Jul. 9, 1980, 55/96745[U]; Jul. 9, 1980, 55/96746[U]; Aug. 7, 1980, 55/111984[U]; Jan. 9, 1981, 56/1495[U]

Int. Cl.<sup>3</sup> G03B 3/10

U.S. Cl. 354—25

2 Claims



1. An interchangeable lens assembly provided with an automatic focusing device, comprising:

- a phototaking lens system for imaging an object;
- a first fixed barrel for holding said phototaking lens system for movement in a direction along its optical axis;
- a second fixed barrel;
- an automatic focusing device including a distance detector mounted on said second fixed barrel for detecting the object distance and for producing a drive force for automatically moving said phototaking lens system to an in-focus position, wherein when said lens assembly is mounted to a camera body said distance detector is disposed on the upper half of said lens body and is inclined with respect to the base of the camera body;
- a focus adjusting member for moving said phototaking lens system, said focus adjusting member and said automatic focusing device being connected to each other through an aperture formed in a portion of said second fixed barrel, said phototaking lens system being moved in accordance with the drive force from said automatic focusing device; and
- cover means for covering at least a portion of said automatic focusing device, said second fixed barrel covering the portion of said lens assembly which is not covered by said cover means.

## **4,422,741**

### **DISTANCE DETECTING DEVICE AND A FOCUS CONTROL SYSTEM UTILIZING THE SAME**

Makoto Masunaga; Takao Kinoshita, both of Tokyo; Toshio Sakane; Tokunichi Tsunekawa, both of Yokohama; Kazuya Hosoe, Machida; Takashi Amikura, Tokyo, and Isao Horigaya, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 121,690, Feb. 15, 1980, Pat. No. 4,329,033. This application Jan. 29, 1982, Ser. No. 343,987

Claims priority, application Japan, Feb. 28, 1979, 54-22906

Int. Cl.<sup>3</sup> G03B 3/10; G01C 3/08

U.S. Cl. 354—403

15 Claims

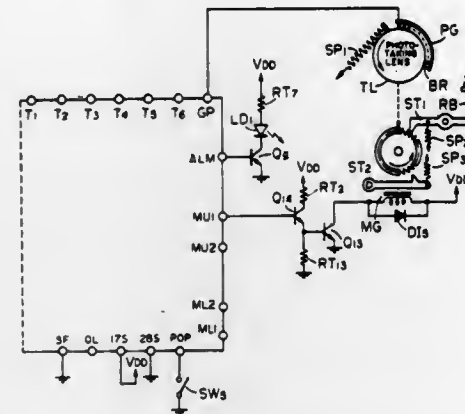
14. A system for automatically focusing an objective lens means (e.g., TL in FIG. 37) on an object, comprising:

- means (e.g., RB, ST1, SP1 in FIG. 37) for moving said

lens means from a predetermined position on an optical axis thereof along the axis;

(B) means (e.g., PG, BR in FIGS. 37 and 38) for producing electrical pulses in association with the movement of said lens means;

(C) means (e.g., digital circuit system shown in FIGS. 9A to 9D) for detecting distance to said object and for control-



ling the stop position of said lens means on the basis of distance data and said electrical pulses produced from said pulse producing means; and

(D) means (e.g., 70 in FIG. 9C) responsive to a first electrical pulse produced from said pulse producing means to change operation mode of said distance detection and stop position control means from distance detection operation to stop position control operation.

## **4,422,742**

### **PHOTOGRAPHING MODE SWITCHING DEVICE FOR A CAMERA**

Fujio Enomoto, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

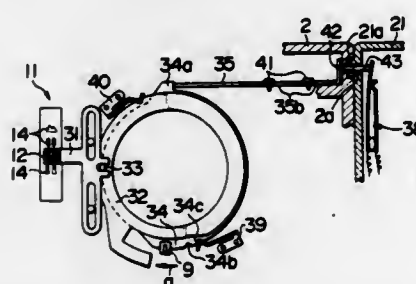
Filed May 7, 1982, Ser. No. 375,740

Claims priority, application Japan, Jul. 27, 1981, 56-112015[U]

Int. Cl.<sup>3</sup> G03B 7/083, 15/05

U.S. Cl. 354—413

8 Claims



1. A photographing mode switching device for use in a camera of the type which is adapted to cooperate with an electronic flash which may be detachably mounted thereon to permit a selective switching between an EE photographing mode under natural light and a flash photographing mode; the device comprising:

- a mode switching member which normally establishes an EE photographing mode in the camera and which switches the operating mode of the camera to a flash photographing mode in response to an external operation;
- a position detecting member for detecting the displacement of the mode switching member to a position in which it establishes the flash photographing mode;
- a mounting detecting member for detecting the fact that an electronic flash has been mounted on the camera; and
- an electrical shutter control circuit for presetting an exposure period to be used during a flash photography

only when said both detecting members have detected the position and the mounting, respectively.

## **4,422,743**

### **EXPOSURE SYSTEM FOR A CAMERA**

Tatsuro Izumi; Nobuyuki Taniguchi, both of Sakai; Toshiaki Matsumoto, Izumisano; Masatake Niwa, Sakai; Tokuji Ishida, Daito, and Masatoshi Itoh, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

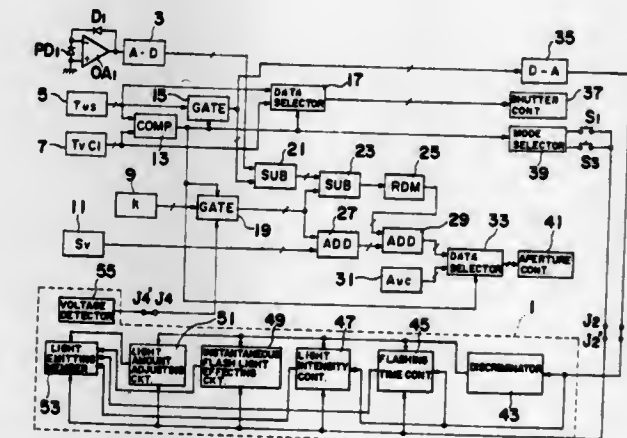
Filed Mar. 19, 1981, Ser. No. 245,688

Claims priority, application Japan, Mar. 19, 1980, 55-35540

Int. Cl.<sup>3</sup> G03B 15/05

U.S. Cl. 354—415

33 Claims



18. A photographic system for flash photography with a camera comprising:

- means for projecting an artificial flash light durable with a controllable intensity for a period of time, so as to illuminate an object to be photographed upon real exposure;
- means for receiving light reflected from said object through-out said period of time; and
- means for controlling the intensity of said projected artificial light in response to said receiving means.

## **4,422,744**

### **APPARATUS FOR SIGNAL TRANSMISSION AND RECEPTION BETWEEN CAMERA AND ATTACHMENT**

Osamu Maeda, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

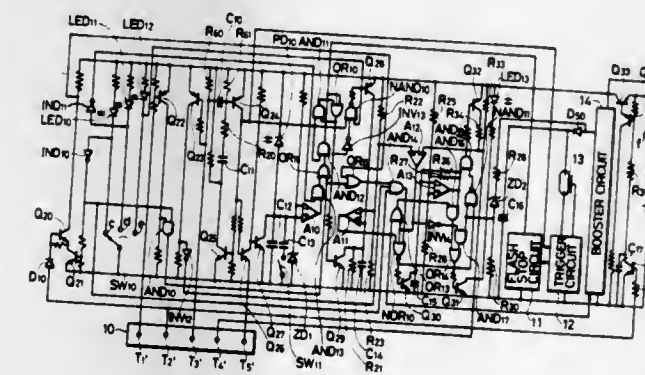
Filed Mar. 16, 1982, Ser. No. 358,838

Claims priority, application Japan, Mar. 23, 1981, 56-40504

Int. Cl.<sup>3</sup> G03B 15/05, 17/00; G08B 1/08; G08C 19/00

U.S. Cl. 354—413

19 Claims



1. An attachment unit attachable to a camera unit including a camera unit terminal, current signal generating means for generating a signal in a form of current and a voltage detection circuit, said attachment unit comprising:

- an attachment unit terminal adapted for connection to said camera unit terminal,
- voltage signal generating means for generating on said attachment unit terminal a signal in a form of voltage, which is in turn detected by said voltage detection circuit, even

when said current signal generating means is generating the current signal, and  
a current detection circuit for detecting said current signal on said attachment unit terminal.

## **4,422,745**

### **CAMERA SYSTEM**

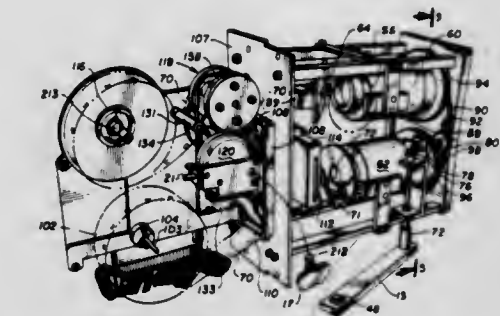
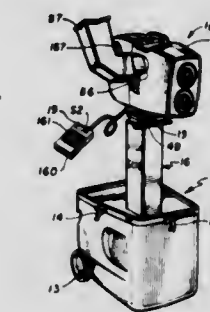
Talmadge W. Hopson, Bloomington, Minn., assignor to National School Studios, Inc., Minneapolis, Minn.

Filed Jul. 31, 1981, Ser. No. 288,815

Int. Cl.<sup>3</sup> G03B 17/24

U.S. Cl. 354—105

20 Claims



1. A camera system comprising:

- a camera body;
- a film supply cartridge loaded with a supply of film and mounted within said camera body;
- a film take-up cartridge mounted within said camera body constructed and arranged for receiving film from said film supply cartridge;
- lens means mounted on said camera body for projecting an image from outside of said camera body on an exposure location within said camera body;
- lens adjusting means for adjusting the magnification of said lens means;
- shutter means mounted within said camera body constructed and arranged to permit said lens means to project an image on said exposure location only when said shutter means is opened;
- film drive means for moving film from said film supply cartridge through said exposure location to said film take-up cartridge;
- actuator means; and
- control means for coordinating operation of said film drive means and said shutter means to sequentially expose said film on a frame-by-frame basis in response to said actuator means and for verifying that unexposed film is in said exposure location prior to opening said shutter means.



4,422,746

## AUTO FOCUS CAMERA

Hiroshi Meguro, Kawasaki, and Nobuo Okabe, Narita Higashi, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

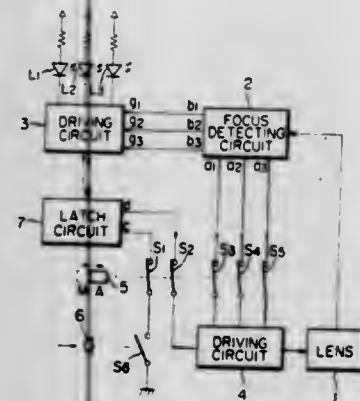
Filed Sep. 4, 1981, Ser. No. 299,788

Claims priority, application Japan, Sep. 11, 1980, 55-129675[U]

Int. Cl.<sup>3</sup> G03B 13/18

U.S. Cl. 354—195.12

6 Claims



1. A photographic camera comprising:

- a phototaking lens having a focusing lens system controlled to focus on a focal plane an image of an object to be photographed;
- means for detecting the focusing state of said image on said focal plane and producing a detecting signal representing the focusing state;
- means for displaying the focusing state in response to the detecting signal;
- first operating means provided in said phototaking lens and manually operable to control the focusing lens system;
- second operating means having electric driving means responding to the detecting signal and electrically operable to control said focusing lens;
- first restraining means operable to disable response of the display means and the electric driving means to said detecting signal; and
- second restraining means operable to disable response of the electric driving means to said detecting means, the second restraining means having means for disabling operation of the first restraining means during operation of the second restraining means.

4,422,747

EXPOSURE TIME CONTROL DEVICE FOR CAMERA

Masanori Uchidoi, Yokohama, and Kazunobu Urushihara, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 144,981, Apr. 30, 1980, Pat. No. 4,349,263. This application Dec. 16, 1981, Ser. No. 331,198

Claims priority, application Japan, May 8, 1979, 54-56538

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

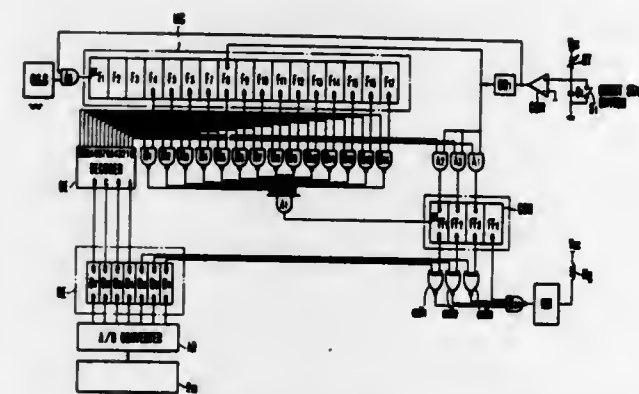
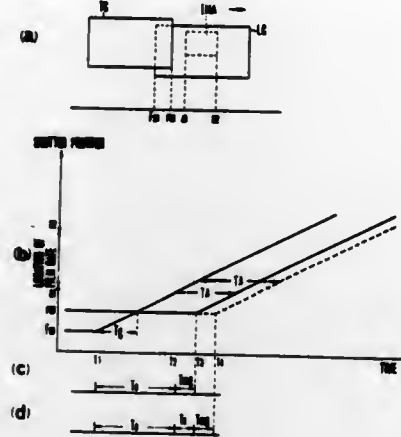
Int. Cl.<sup>3</sup> G03B 9/62

U.S. Cl. 354—458

9 Claims

1. An electrical exposure time control device for a camera having a slit shutter controlled by an electromagnet, comprising:
- (a) first timing means for forming a given time interval equal to a desired exposure time but forming an exposure time in the shutter different from the desired exposure time;
- (b) second timing means for forming a compensation time interval;
- (c) means for maintaining the opening of said shutter for a total time equal to the sum of the given time interval and the compensation time interval so that the shutter is opened for the desired exposure time; and

- (d) control means for shortening the given time interval formed by the first timing means by a predetermined time



interval so that the given time interval formed is shorter than the desired exposure time.

4,422,748

APPARATUS FOR TRANSPORTING AND PROCESSING PHOTOGRAPHIC MATERIALS OR THE LIKE

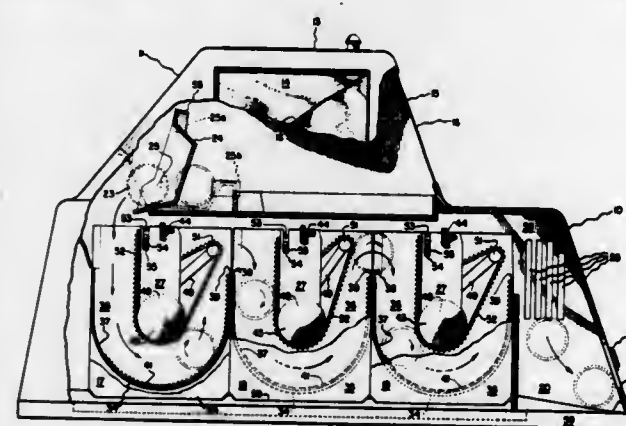
Montague Everett, Greenwich, Conn., and Joseph Charipar, Thousand Oaks, Calif., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,548

Int. Cl.<sup>3</sup> G03D 3/08

U.S. Cl. 354—316

40 Claims



1. Apparatus for ejecting a small-diameter cylindrical object from a larger-diameter, substantially semicylindrical, horizontal open-topped trough having a horizontal lip, the axis of the object being approximately parallel to the lip, comprising:
- toothed belt means for pressing the object against an inner surface of the trough and rotating the object about its axis and
- means which constrain the object to roll, without slipping along the inner surface of the trough.

4,422,749

DEVELOPING APPARATUS

Osamu Hoshino, Tokyo; Michio Ito, Hachioji, and Akihiko Takeuchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

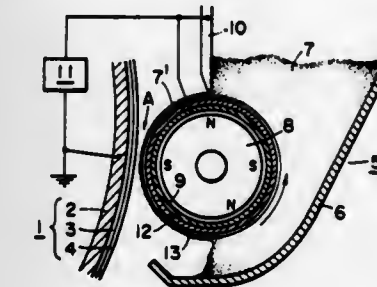
Filed Oct. 2, 1981, Ser. No. 308,083

Claims priority, application Japan, Oct. 11, 1980, 55-142205; Oct. 11, 1980, 55-142206

Int. Cl.<sup>3</sup> G03G 15/09

U.S. Cl. 355—3 DD

28 Claims



1. A developing apparatus for supplying developer to an electrostatic latent image on an electrostatic latent image bearing member for developing the latent image, comprising:
- developer conveying means with developer on a surface thereof for conveying the developer to a developing region, said developer conveying means including a high resistance layer on a developer conveying surface thereof and a medium resistance layer formed thereover and having a volume resistivity of  $10^8$  to  $10^{12}$   $\Omega$ cm;
- means for supplying the developer to said developer conveying means; and
- means for applying a developing bias voltage to said developer conveying means.

4,422,750

DEVELOPER REPLENISHING DEVICE

Shun Kawata, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

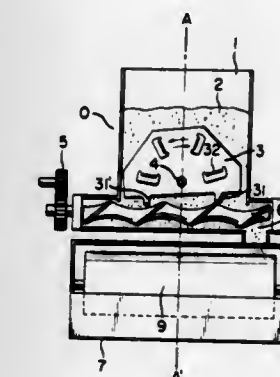
Filed Mar. 8, 1982, Ser. No. 355,463

Claims priority, application Japan, Mar. 25, 1981, 56-42455[U]

Int. Cl.<sup>3</sup> G03G 15/08

U.S. Cl. 355—3 DD

7 Claims



1. In an image recording apparatus of the type in which means are provided to feed toner from a hopper to an image developing unit, the improvement comprising a plate pivotally mounted within said hopper, and means actuated by said feeding means for oscillating said plate, whereby the oscillating of said plate breaks up clumps of toner which may form within said hopper and caking of the toner is prevented.

4,422,751

ORIGINAL FEED CONTROL UNIT

Yutaka Komiya, and Koichi Takada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

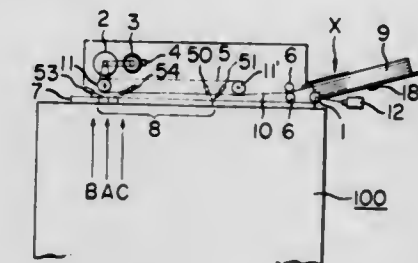
Filed Apr. 8, 1982, Ser. No. 366,576

Claims priority, application Japan, Apr. 15, 1981, 56/55524; Apr. 16, 1981, 56/56214; Apr. 20, 1981, 56/58586

Int. Cl.<sup>3</sup> G03G 15/00

U.S. Cl. 355—14 SH

11 Claims



1. An original feed control unit comprising:
- conveying means for conveying an original to an exposure station of an image forming apparatus;
- input means for entering a desired width of a margin to be formed on a recording material, the width variable; and
- control means for controlling a stop position of said original conveyed by said conveying means in accordance with an image forming mode of said image forming apparatus to provide the width of the margin entered from said input means.

4,422,752

METHOD OF AND AN APPARATUS FOR CLASSIFYING COLOR FILMS

Siegfried Thurm, Volswinkel, and Konrad Bunge, Cologne, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

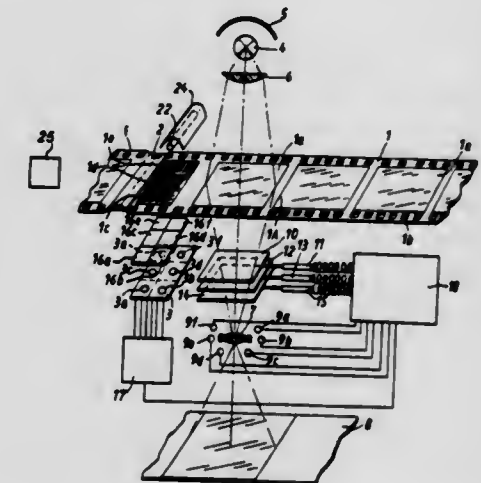
Filed Mar. 10, 1980, Ser. No. 129,108

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909336

Int. Cl.<sup>3</sup> G03B 27/52

U.S. Cl. 355—41

19 Claims



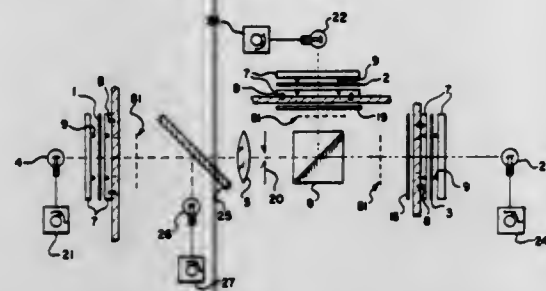
1. A method of classifying a color film, particularly for use in adjusting the exposure of said film during the production of copies therefrom, comprising the steps of providing a marking of predetermined color composition on an unexposed zone of said film by exposing said zone to radiation prior to development and subsequently developing the latter; determining the spectral transmissivity of said marking; and comparing said transmissivity with reference transmissivities.



# 4,422,753 MULTICHANNEL MASKING CAMERA AND PROJECTOR

Paul L. Pryor, 10 Lonsdale Ave., Dayton, Ohio 45419  
Filed Nov. 25, 1981, Ser. No. 324,999  
Int. Cl.<sup>3</sup> G03B 27/52, 27/70  
U.S. Cl. 355—43

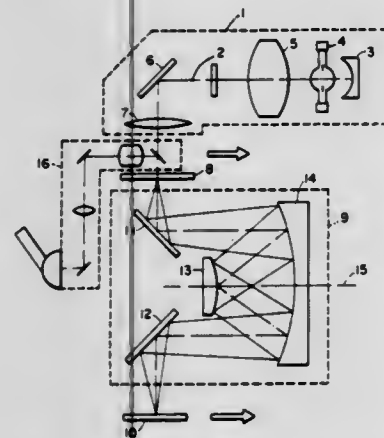
3 Claims



1. A camera-projector comprising: means for producing multiple images of an original scene; means for recording at least one of the images produced; means for insuring that the produced and recorded images are in register one with the other and the original scene; means for illuminating the recorded images for projection in register back through the camera onto the original scene; means for controlling the optical properties of the projected images; said recording means including film holding means for holding film in a precise position; and positioning means for positioning shields on opposite sides of said film holding means.

4,422,754  
PROJECTION-PRINTING APPARATUS  
Junji Isohata, Tokyo, and Hironori Yamamoto, Chigasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Jan. 20, 1982, Ser. No. 340,843  
Claims priority, application Japan, Aug. 8, 1981, 56-124212  
Int. Cl.<sup>3</sup> G03B 27/52, 27/70  
U.S. Cl. 355—43

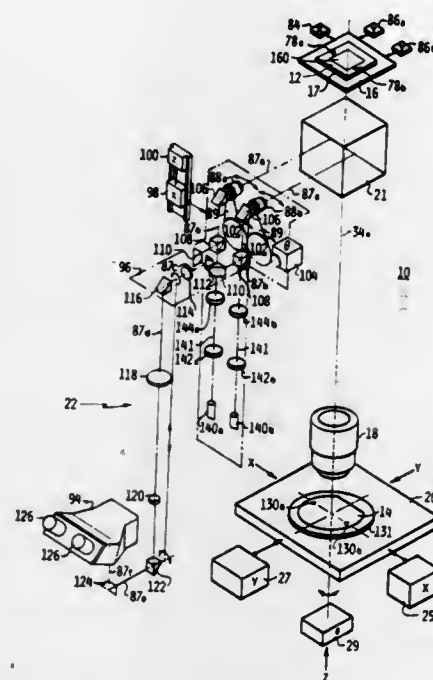
2 Claims



1. A projection-printing apparatus for printing the image of a mask on a wafer, said apparatus comprising:  
an imaging optical system for projecting the image of the mask upon the wafer;  
means for moving at least one of the mask and the wafer relative to said imaging optical system in a plane perpendicular to the optical axis of said imaging optical system, said moving means including a guide member, a sliding member for carrying at least one of the mask and the wafer and being movable relative to said guide member, and at least one floating element provided on said sliding member for floatingly mounting said sliding member on said guide member for said relative movement;  
means for detecting irregularities in said guide member; and  
means for individually controlling the floating forces of each said floating element to compensate for irregularities in said guide member detected by said detecting means.

4,422,755  
FRONTAL ILLUMINATION SYSTEM FOR SEMICONDUCTIVE WAFERS  
Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.  
Continuation of Ser. No. 113,375, Jan. 18, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,147  
Int. Cl.<sup>3</sup> G03B 27/52, 27/70  
U.S. Cl. 355—43

19 Claims



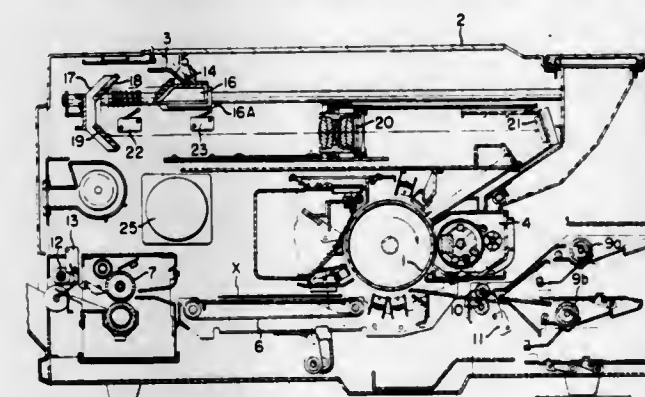
1. An optical system for illuminating a workpiece on which a pattern of a masking element is to be photometrically printed and for viewing an image of the illuminated workpiece, said system comprising:  
a first holder for holding the workpiece;  
a second holder for holding the masking element;  
refractive imaging means, disposed between the first and second holders, for projecting an image of the pattern of the masking element onto the workpiece and for projecting an image of an illuminated portion of the workpiece towards the second holder;  
first optical means, disposed between the refractive imaging means and the second holder, for providing a viewing port to facilitate viewing of the image of the illuminated portion of the workpiece;  
an objective lens unit including at least one objective lens, disposed adjacent to the viewing port, for viewing at least a portion of the image of the illuminated portion of the workpiece;  
light source means for providing a beam of illuminating light; and  
second optical means, disposed between the light source means and the objective lens and operable with the objective lens, for projecting an image of the light source means to an entrance pupil of the refractive imaging means without passing through the masking element.

4,422,756  
COPYING MACHINE  
Shunichi Abe, and Mitsuo Akiyama, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan  
Filed Jul. 23, 1981, Ser. No. 286,196  
Claims priority, application Japan, Aug. 20, 1980, 55-113479  
Int. Cl.<sup>3</sup> G03B 27/34  
U.S. Cl. 355—57

6 Claims

1. In a variable magnification copying machine which includes means for operator selection of a predetermined magnification ratio, a path along which copy sheets for receiving and retaining a predeterminedly magnified copy of the original are operatively transported, and bidirectionally movable means

for scanning an original to be copied and movable between an initial position and a limit position,  
forward clutch means engageable with said scanning means to cause movement of the scanning means in a first direction from its initial position for scanning of the original to be copied;  
return clutch means engageable with said scanning means to cause movement thereof in a second direction opposite said first direction of scanning means movement to return the scanning means to its initial position;  
means in the sheet path for detecting the trailing edge of a sheet transported along the path, said detecting means being connected to said forward clutch means to disengage the same from said scanning means, and being further connected to said return clutch means to engage the same with said scanning means, both upon detection of the trailing edge of a sheet transported along the path; and  
means connected to the operator selection means and presettable in accordance with the predetermined magnification ratio for causing disengagement of said forward clutch



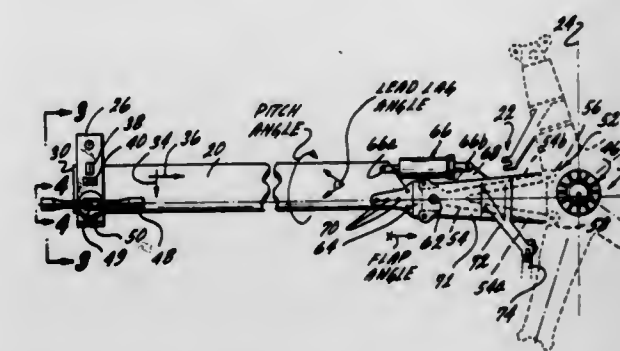
means from the scanning means when the scanning means in moving in said first direction reaches a position of maximum forward travel preset in accordance with the predetermined magnification ratio selected by an operator;  
such that when a copy sheet larger than that normally utilized for receiving a copy of the original at an operator selected magnification ratio is transported along the sheet path, forward movement of the scanning means in said first direction from its initial position is stopped by said presettable means prior to detection of the trailing edge of the sheet to thereby facilitate production of a copy of an original on a sheet larger than necessary to accommodate the copy, said presettable means causing forward movement of the scanning means to stop at a particular preset position dependent upon the magnification ratio selected by an operator, and return movement of the scanning means in said second direction being thereafter initiated by engagement of said reverse clutch means upon subsequent detection of the trailing edge of the copy sheet.

4,422,757  
APPARATUS AND METHOD FOR OPTICAL PHASING OF HELICOPTER MAIN ROTOR BLADES  
Michael S. Munski, Carlsbad, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.  
Filed Aug. 13, 1981, Ser. No. 292,699  
Int. Cl.<sup>3</sup> G01B 11/26  
U.S. Cl. 356—138

21 Claims

1. An apparatus for adjusting lead-lag angles of a plurality of blades of a helicopter rotor system having a rotor blade, hinge pin and rotor hub comprising:  
a fitted frame member coupled to the tip of said rotor blade; frame alignment means coupled to said frame member for spatially positioning said tip of said blade with respect to said rotor hub in a predetermined relation;  
a first target arranged and configured to be disposed on said hinge pin;

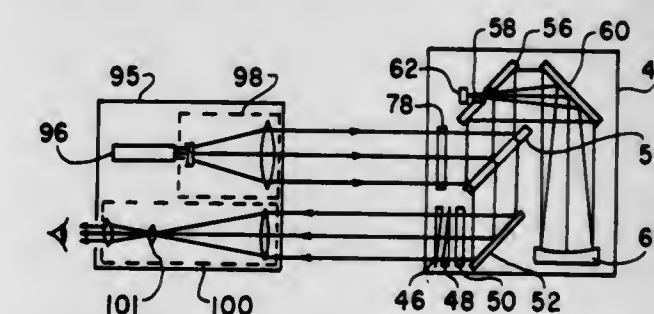
a second target arranged and configured to be disposed on said rotor hub; and  
optical alignment means coupled to said frame for aligning said



tip of said rotor blade, said first target and said second target along a predetermined line, whereby appropriate lead-lag angles of said rotor blade may be quickly and accurately achieved by a static test.

4,422,758  
BORESIGHTING OF AIRBORNE LASER DESIGNATION SYSTEMS  
Thomas E. Godfrey, Orange, and Lovere A. Moesser, Diamond Bar, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.  
Filed Jul. 24, 1981, Ser. No. 286,415  
Int. Cl.<sup>3</sup> G01B 11/26; G01C 1/00  
U.S. Cl. 356—152

2 Claims



1. In the apparatus for boresighting laser designator/ranger devices wherein radiation from a phosphorescent refractory target is collimated and projected by boresight optics for precision alignment of the laser designator device, the improvement eliminating long-term boresighting errors due to changes in mechanical and electrical boresight components comprising:  
a boresight module having  
a germanium laser IR window,  
a visual alignment window,  
optical paths leading from each window for focusing and aligning,  
an internal refractory target capable of generating visible radiation in response to laser energy;  
a plurality of adjustable prism wedge windows for aligning the boresight module optical paths to said visible radiation;  
a collimator unit containing  
a glass reticle capable of being removed,  
a fold mirror,  
a parabolic mirror, and  
an autocollimating mirror,  
each adapted to direct light in a path from the fold mirror, to the parabolic mirror, to the autocollimating mirror and back, and the glass reticle adapted to produce both a visual image and a reflected image;  
means positioning said glass reticle in the collimator infinity focal plane by coincident focusing of these two images;



means for securing a phosphorescent ceramic target in said focal plane within the collimator in lieu of the glass reticle; means within the collimator for exciting said ceramic target to phosphorescence;

an alignment fixture containing a laser beam source and a visual alignment telescope, capable of being set parallel to each other;

means for selecting the autocollimating mirror of the collimator unit with said alignment fixture;

means for focusing the alignment fixture on the collimator phosphorescent ceramic target and for concomitantly aligning the lines of sight of the visual alignment telescope thereon to obtain parallelism between the laser beam and the alignment telescope lines of sight within alignment fixture;

means in front of the parallelized alignment fixture for replacing the collimator with the boresight;

means for axially adjusting the target and for rotating the prism optical wedges within the boresight to align all optical systems of the boresight directly to the alignment fixture laser beam; and

means for locking the optical wedges to set the focus and alignment of the boresight module so that the module is ready for boresighting the laser designator/ranger device.

4,422,759

## PHOTOGRAPHIC ACCESSORY

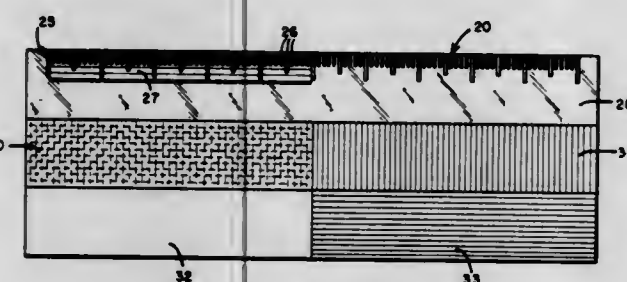
Daniel G. Holman, 12743 Radisson Rd. NE., Blaine, Minn. 55434, and Robert A. Ersek, 2300 Cypress Point West, Austin, Tex. 78746

Filed May 4, 1981, Ser. No. 260,078

Int. Cl.<sup>3</sup> G01J 1/02

U.S. Cl. 356—243

3 Claims



1. A photographic accessory for scientific and medical use comprising, in combination:

a sheet of flexible, colorless, translucent material having a front surface with a dull finish and at least one linear edge having a scale of photographically perceptible graduations along said edge;

a pressure-sensitive adhesive on the rear surface of said sheet;

a plurality of opaque patches of primary Printing Manufacturing Standards colors on the front surface of said sheet;

so that when said sheet is adhered to a body surface at an area to be treated and photographed, observation of the patches in the resultant photograph enables determination of the color of the area, regardless of color deviations introduced by photographic processes.

4,422,760

## OPTICAL ANALYZING INSTRUMENT HAVING VIBRATING TROUGH

Donald R. Webster, Laurel, Md., assignor to Pacific Scientific Instruments Company, Anaheim, Calif.

Filed Feb. 20, 1981, Ser. No. 236,580

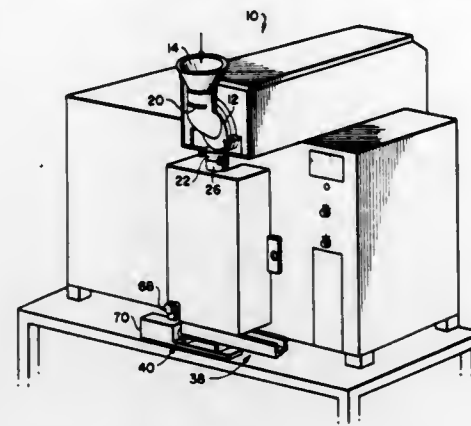
Int. Cl.<sup>3</sup> G01N 21/01, 21/55

U.S. Cl. 356—244

7 Claims

1. An analyzing instrument for analyzing samples of particulate material comprising a chute for receiving the samples of particulate material, the chute having a window therein, means positioned at the bottom of the chute for supporting a column of particulate material in the chute, for vibrating the column of

particulate material to maintain the material in a freely flowing condition and for removing the particulate material from the



chute, and measuring means for making optical measurements on the sample in the chute through said window as the particulate material moves past the window.

4,422,761

## PHOTO-ELECTRIC PARTICLE SENSING SYSTEM

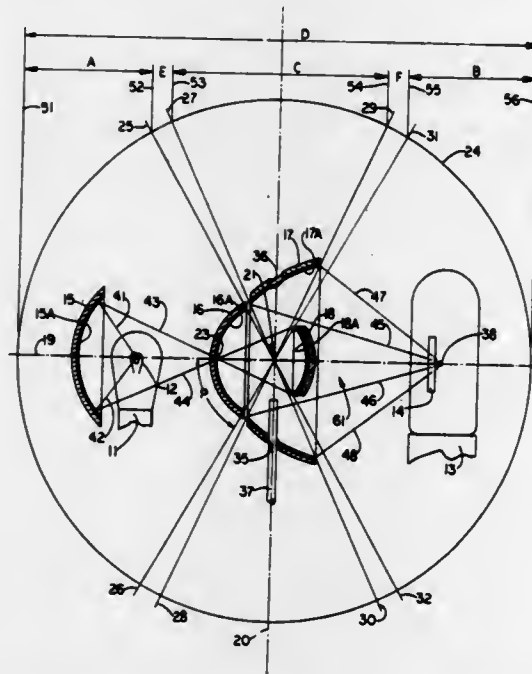
Joseph C. Frommer, 1525 Teakwood Ave., Cincinnati, Ohio 45224

Filed Sep. 28, 1981, Ser. No. 305,974

Int. Cl.<sup>3</sup> G01N 21/47

U.S. Cl. 356—338

19 Claims



11. In a photoelectric system for sensing light deflected from its direction of propagation by microscopic or sub-microscopic particles in a fluid comprising means for sending the fluid along a predetermined fluid path, a light source, a non-transparent surface having a transparent opening therein between the light source and a zone of the fluid path, a photosensor having a light sensitive surface, a first reflecting surface so designed and arranged that it reflects rays reaching it from the said light source toward the transparent opening in the non-transparent surface, a second light reflecting surface so designed and arranged that it reflects light reaching it from the said transparent opening toward the said zone of the said fluid path, and a third light reflecting surface so designed and arranged that it reflects light reaching it from the said zone of the said fluid path toward the said light sensitive surface, the said third reflecting surface being of annular shape so that rays reflected by it from said zone toward the said light sensitive surface surround a space not traversed by these rays, and the said

second reflecting surface being arranged inside this space not traversed by these rays.

4,422,762

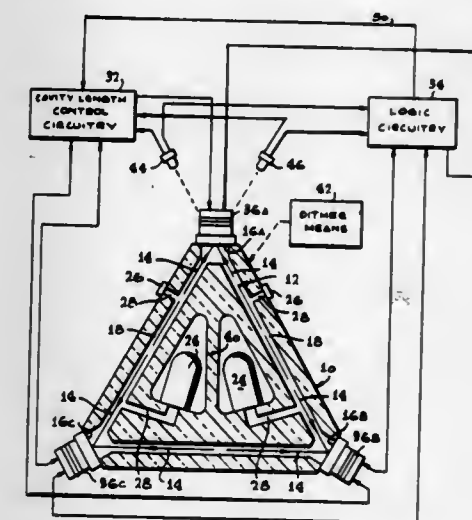
## RING LASER

Thomas J. Hutchings, Thousand Oaks, and Gary D. Babcock, Mission Viejo, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 91,019, Nov. 5, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,722 Int. Cl.<sup>3</sup> G01C 19/64

U.S. Cl. 356—350

25 Claims



1. In combination:

a ring laser, including a plurality of corner mirrors defining a ring laser path, transducers to control the inward and outward position of said mirrors, apparatus for detecting the AC amplitudes of the envelopes of two frequency modulated laser traveling waves counterpropagating along said laser path, apparatus for differentially dithering the laser path length, servo means for controlling the position of at least one said transducer and mirror to control and tune the length of the path of said laser;

apparatus connected to said detecting apparatus for producing two signals which are measures of the AC amplitudes of the envelopes of said counterpropagating waves;

summing means connected to receive said AC amplitude signals and to produce a sum signal which is a measure of the sum of said AC amplitude signals; and

means for servoing the position of at least one of said transducers and mirrors to minimize said sum signal.

4,422,763

## AUTOMATIC PHOTOMASK ALIGNMENT SYSTEM FOR PROJECTION PRINTING

Hans P. Kleinknecht, Bergdietikon, Switzerland, assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 967,785, Dec. 8, 1978, abandoned. This application May 27, 1982, Ser. No. 382,424 Int. Cl.<sup>3</sup> G01B 11/26, 9/02

U.S. Cl. 356—356

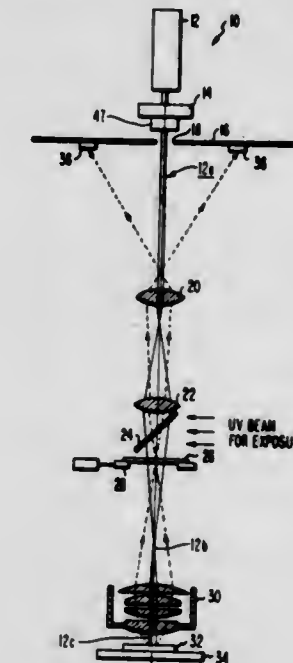
12 Claims

1. An automatic projection printing apparatus for aligning a photomask with a semiconductor wafer comprising:

- a semiconductor wafer having a plurality of diffraction patterns formed thereon;
- a monochromatic light source adapted to have a beam directed onto a selected one of said diffraction patterns;
- a key on said photomask, said key being adapted to block portions of said selected one of said diffraction patterns from said beam of said monochromatic light source;
- at least four photosensitive elements adapted to receive light from said monochromatic light source after said beam has been reflected from said selected one of said diffraction patterns;
- step and repeat stage means for mounting said semicon-

ductor wafer such that said semiconductor wafer can be moved in discrete steps from one position to another, each of said positions containing one of said diffraction patterns;

- mounting means for mounting said photomask whereby light from said monochromatic light source can be directed onto said key on said photomask and thereafter directed onto said selected one of said diffraction patterns formed on said semiconductor wafer;
- feedback means including said photosensitive elements and said mounting means for aligning said photomask to a selected portion of said substrate by relative linear and rotational movement between said photomask and said



substrate in response to the intensities of light detected by said photosensitive elements; and

- optical means comprising a pair of focusing lenses positioned between said source and said photomask for illuminating said key and focusing the portion of said beam not blocked by said key to a location above said wafer, said optical means further comprising a projection lens positioned between said focus location and said wafer for projecting said beam from said focused location to the surface of said wafer;
- said optical means and said feedback means being arranged to focus reflected and diffracted beams from said diffraction pattern on said photosensitive elements when said photomask is in alignment with said wafer.

4,422,764

## INTERFEROMETER APPARATUS FOR MICROTOPOGRAPHY

Jay M. Eastman, Pittsford, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed Dec. 12, 1980, Ser. No. 215,785

Int. Cl.<sup>3</sup> G01B 11/02

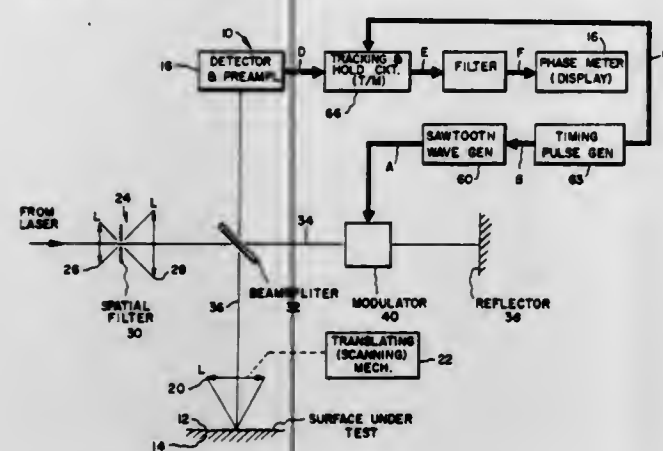
U.S. Cl. 356—357

18 Claims

1. Interferometer apparatus for measuring the microtopography of the surface of an object which comprises light reflector means, means for dividing a first beam of incident monochromatic light into second and third beams directed towards said surface and said reflector means and for recombining said second and third beams upon reflection therefrom to interfere with each other, means between said dividing means and said surface for focusing said second beam into a spot on said surface, means for moving said focusing means to scan said spot along said surface while said spot is maintained within the

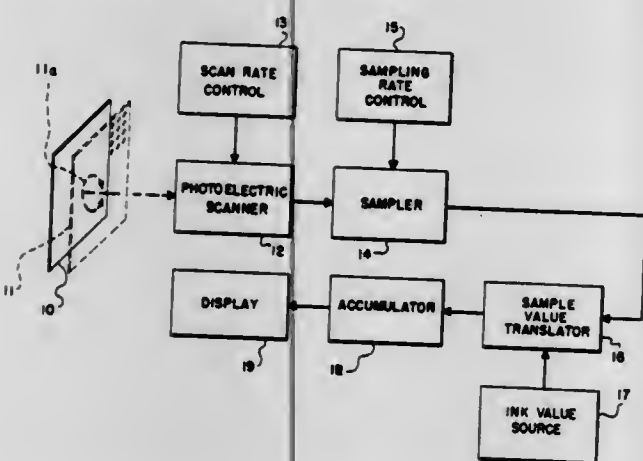


depth of focus of said focusing means, means for phase modulating said third beam, and means for detecting the phase dif-



ference between said recombined second and third beams to provide a measure of the microtopography of said surface.

**4,422,765**  
**OFF-SET PRINTING INK CONSUMPTION PREDICTION**  
Ernst R. Hoffman, P.O. Box E, Atglen, Pa. 19310  
Filed Aug. 20, 1980, Ser. No. 179,767  
Int. Cl.<sup>3</sup> G01N 21/17, 21/84  
U.S. Cl. 356-432



1. In the method of predicting the printing ink consumption of an off-set image, which method includes the steps of photo-electrically scanning the screened image from which the off-set image is to be produced along a linear scanning path, periodically sampling the resulting electrical signal, utilizing the signal samples to produce signal values representing the corresponding ink consumption requirements, and totaling and displaying the so-produced values, the improvement which comprises

analyzing the screened image to determine the scanning and sampling rates which will produce samples reliably corresponding to the density of the image dots, and performing the scanning and sampling at the rates so determined,

the analyzing comprising overlaying the screened image consecutively with glass screens having different line numbers, pivoting each screen back and forth to create moire patterns through interaction between the screen and the image; and determining the least conspicuous moire pattern so produced.

**4,422,766**  
**METHOD OF AND DEVICE FOR REDUCING APPARATUS RESPONSE TIME DURING THE TESTING FOR MOISTURE CONTENT IN MOVING SPACED PLASTIC SHEETS**

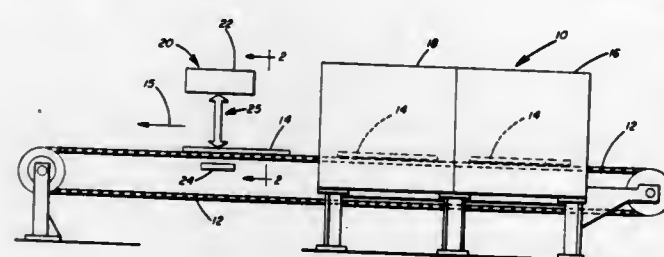
Edward M. Skukalek, Ford City, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 27, 1981, Ser. No. 286,448

Int. Cl.<sup>3</sup> G01N 21/47

U.S. Cl. 356-445

12 Claims



1. A method of reducing response time from a non-testing period to a testing period of a testing circuit in a device for measuring moisture content in plastic sheets wherein, during the testing period, energy beams are directed toward a sheet, reflected from the sheet in response to the directed energy beams, and the reflected energy beams are detected to provide a reading corresponding to the moisture content of the sheet, comprising the step of:

reflecting the directed energy beams from a specular surface during the non-testing period to provide the testing circuit with energy for producing a reading substantially within the range of anticipated moisture content readings of the sheet.

**4,422,767**  
**COMBINATION MOUNTING RING AND CATCH BASIN FOR CONCRETE TRUCKS**

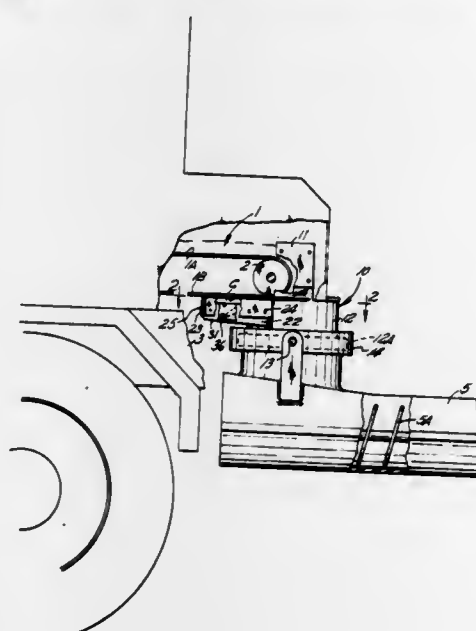
James E. Yelton, 640 Kingswood, Eugene, Oreg. 97405

Filed Jan. 25, 1981, Ser. No. 277,397

Int. Cl.<sup>3</sup> B28C 7/06, 7/12; B65G 45/00

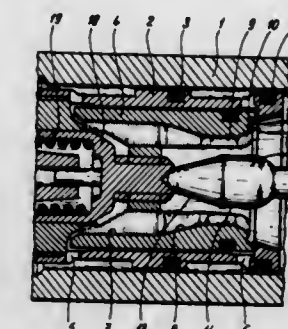
U.S. Cl. 366-40

4 Claims



1. A mounting ring assembly for attachment to a truck chassis and which rotatably supports one end of a delivery trough by which truck transported materials are mixed and discharged, a conveyor belt also supported by the truck chassis for the delivery of the materials to said delivery trough, said mounting ring assembly comprising, a ring structure through which materials are discharged and on which is rotatably mounted one end of the delivery

trough permitting movement of the latter about a vertical axis, a catch basin carried by said ring structure and including a bottom wall, side walls and a front wall, means in place on the catch basin and contactable with the lower run of the conveyor belt, nozzles carried by the catch basin for directing a water spray upwardly against the belt lower run, said catch basin bottom wall in subjacent spaced relationship with a segment of the belt lower run and in discharge relationship with the ring structure whereby the nozzle spray and belt purged particles gravitate from the catch basin through the ring structure and into the delivery trough, and positionable means in place on the catch basin and contactable with the lower run of the conveyor belt, said positionable means normally located transversely below the belt run and swingable therefrom to an open position permitting access to the catch basin for periodic cleaning of same.



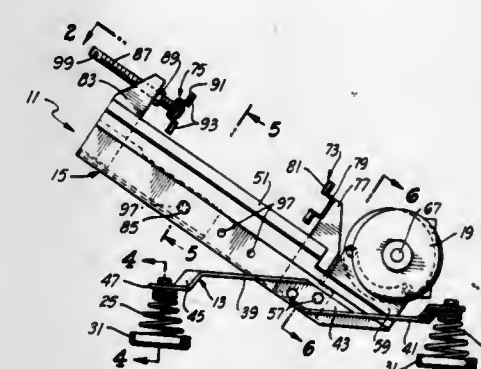
**4,422,768**  
**PAINT CAN SHAKER**  
Donald F. Solomon, Costa Mesa, Calif., assignor to Roy Brodsky, Santa Monica, Calif.

Filed Mar. 22, 1982, Ser. No. 360,350

Int. Cl.<sup>3</sup> B01F 11/00

U.S. Cl. 366-110

10 Claims



1. A shaker for a container comprising: a container carrier including a generally channel-shaped section having spaced legs joined by a web and diverging wing members extending outwardly from the legs, respectively, of the channel-shaped section to define surfaces for at least assisting in supporting the container; means for mounting the carrier including resilient means for enabling the carrier to undergo vibratory motion; means for retaining the container on the carrier including first and second jaws for gripping the container therebetween, at least one of the jaws being partly received in and mounted on said channel-shaped section for movement longitudinally of the channel-shaped section and being fixable in position along said channel-shaped section; a motor; means for mounting the motor on the channel-shaped section; and means driven by the motor for imparting vibratory motion to the carrier.

**4,422,769**  
**MIXING APPARATUS FOR TWO FLOWING LIQUIDS**  
Arnoldus G. Holthuisen, Venlo, Netherlands, assignor to Metaalwarenfabriek Venlo B.V., Venlo, Netherlands  
Filed Mar. 15, 1982, Ser. No. 358,188

Claims priority, application Netherlands, Mar. 16, 1981, 8101268

Int. Cl.<sup>3</sup> B01F 15/02

U.S. Cl. 366-178

6 Claims

1. A mixing apparatus for two flowing liquids, said apparatus having a first annular inlet for a first liquid and a separate,

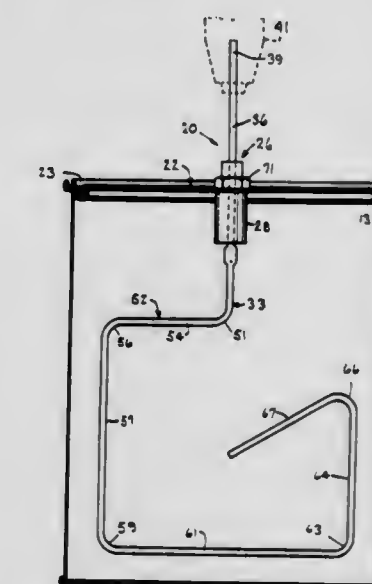
spaced apart second annular inlet for a second liquid, and also having an outlet for the two liquids after mixing, an external and internal guide for the first liquid in the direction towards the second inlet and the outlet, each of said internal and exter-

nal guides having an essentially cylindrical portion immediately in front of said second inlet, said external guide being a sleeve body with an essentially cylindrical end portion and having an end face located at said second inlet, and an annular vortex chamber at said second annular inlet in said end face.

**4,422,770**  
**PAINT STIRRER**  
Harry F. Geible, 6975 Wil-O-Paw Rd., Coloma, Mich. 49038  
Filed Jan. 20, 1982, Ser. No. 340,688  
Int. Cl.<sup>3</sup> B01F 7/32

U.S. Cl. 366-248

5 Claims



1. An electric drill powered paint stirrer for stirring paint in a conventional paint marketing can of the kind normally closed for sale by a full closing marketing lid, comprising in combination:

a second full closing lid, similar to and substitutable on said can for said marketing lid but having a central opening; a bushing element having one reduced diameter, externally threaded end extending from a shoulder, the bushing element having a central through bore, said central opening of the second lid being of diameter to snugly receive said threaded end therethrough but not said shoulder, said bushing element being elongate with length substantially exceeding diameter, substantially more than half of the length of said bushing element extending downward beneath the second lid and into the can, with only a minor portion of the bushing extending above the lid, a nut threadable on said threaded end of said bushing element to clamp said second lid against the said shoulder, a stirring rod having an upstanding shank extending upward through said bushing element and shaped for chucking in the chuck of a conventional electric drill, said rod having



upper and lower widened portions closely flanking the upper and lower ends of the bushing element for axially locating said shank in said bushing element, said rod having a bottom portion depending from said shank and sized to lie close to the can peripheral wall and bottom for stirring paint in the can, said bottom portion of said rod below said lower widened portion extending down in a continuation of the shank, said continuation being of length small compared to the can diameter, then in an upper radial segment extends radially to near one side of the can, then in a depending segment extends down to near the can bottom, then in a lower diametral segment extends diametrically across the central portion of the can and then in an upstanding segment extends upward near the opposite side of the can to a point spaced below the level of the upper radial segment, and then in a free end segment extends angularly downward toward the center of the can, the upstanding segment extending up for approximately two-thirds the height of the depending segment, the free end segment angling downward therefrom at about 30° from the horizontal and terminating at a point substantially on the axis of the shank and at a height approximately one-third of the way up the depending segment from the lower diametral segment, so that the angled free end segment is spaced vertically a substantial distance from both the upper and lower segments of said rod and radially a substantial distance from the depending segment.

4,422,771

## DOWNFLOW MIXER

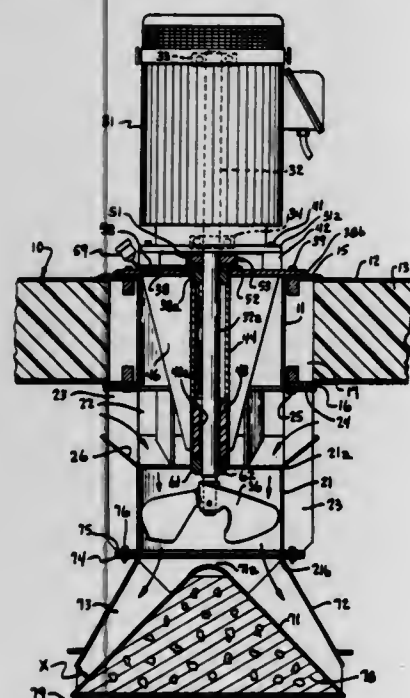
Jack R. Earhart, Rockton; Freddie J. Langdon, Rockford, and John K. Johnson, Stillman Valley, all of Ill., assignors to Aqua-Aerobic Systems, Inc., Rockford, Ill.

Filed Oct. 19, 1981, Ser. No. 312,656

Int. Cl.<sup>3</sup> B01F 7/22

U.S. Cl. 366—251

22 Claims



1. A downflow mixer for mixing materials in an open surface body of liquid comprising, means for supporting the mixer in an open surface body of liquid, an annular upper casing on the support means defining an upright passage extending from a level above the surface of the body of liquid to a level substantially below the surface of the body of liquid, an upright annular pump casing open at its upper and lower ends, means mounting the annular pump casing on the upper casing with the upper end of the pump casing spaced below the lower end of the upper casing to provide a liquid intake below the upper casing, an electric drive motor, motor mounting means mounting the motor on the upper casing to extend upwardly therefrom, the motor having an elongated one-piece motor shaft

with one portion in the motor rotatably supported in upper and lower bearing means in the motor and an extended shaft portion extending downwardly through the upright passage and into the pump casing, an axial flow propeller mounted on the lower end of the extended shaft portion in the pump casing for pumping liquid downwardly therethrough, said motor bearing means being constructed and arranged to carry the entire radial and axial loading on said motor shaft including the end thrust on the shaft produced by said propeller, shaft stabilizer means rigid with said motor mounting means and defining a rigid shaft enclosure surrounding said extended shaft portion and extending downwardly through said upright passage, anti-deflection bearing means on the lower end portion of said shaft stabilizer means dimensioned to normally have a running clearance with said extended shaft portion for limiting deflection of the lower end of said extended shaft portion, wall means extending between the shaft stabilizer means and the upper casing across said upright passage for preventing passage of atmospheric air through the upright passage to the propeller, and mechanical shaft seal means between the shaft stabilizer means and the extended shaft portion at a location above the anti-deflection bearing means for preventing the flow of atmospheric air through said shaft enclosure to the anti-deflection bearing means and propeller.

4,422,772

## MIXING APPARATUS

Rolf Baumgartner, Oftringen, Switzerland, assignor to Rolf Baumgartner AG, Switzerland

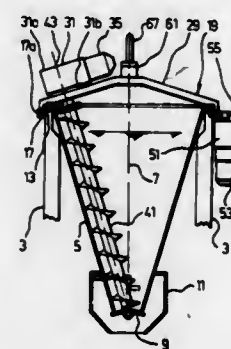
Continuation-in-part of Ser. No. 103,495, Dec. 14, 1979, abandoned. This application Aug. 7, 1981, Ser. No. 290,868

Claims priority, application Switzerland, Dec. 22, 1978, 13070/78

Int. Cl.<sup>3</sup> B01F 7/14

U.S. Cl. 366—287

15 Claims



1. A worm mixer comprising a substantially conically shaped vessel with a vertical axis defining a chamber for the mixing of materials, a cover mounted on said vessel allowing rotation of said cover and said vessel relative to each other about the vertical axis of said vessel, an elongated worm mounted to said cover at an off center location and extending within said chamber, drive means connected to said worm above said cover for rotating said worm about its axis, said worm having an upper end extending through a leadthrough of said cover sealing means sealing said leadthrough of said cover to said worm, and at least one bearing for rotatably journaling said worm about its axis near an upper end of said worm and outside of said chamber, said bearing being mounted on the outside of said sealing means, said drive means being arranged and connected with said worm on the outside of said sealing means with respect to said chamber, the interior of said vessel being free of any gear motor and bearing serving to drive and journal said worm, said worm being journaled at its upper end exclusively outside said chamber.

4,422,773

## APPARATUS AND METHOD FOR THE NON-INVASIVE MIXING OF A FLOWING FLUID STREAM

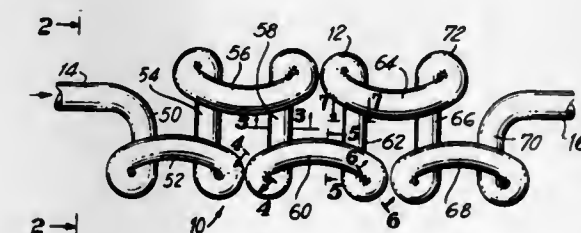
Michael M. Cassaday, Peekskill, and John L. Smith, New City, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Aug. 4, 1980, Ser. No. 175,222

Int. Cl.<sup>3</sup> B01F 5/00

U.S. Cl. 366—341

18 Claims



1. A method for the rapid and thorough, non-invasive mixing of two or more components in a fluid stream which is flowing in a single conduit comprising a single inlet and a single outlet which are connected by a single, undivided, unobstructed flow path that is closed to other flow paths, which method comprises the steps of:

establishing a first secondary flow pattern in said fluid stream flowing in a first portion of said conduit; and, thereafter,

establishing a second secondary flow pattern in said fluid stream flowing in a second portion of said conduit which is in close proximity to said first portion prior to the substantial dissipation of said first secondary flow pattern; and

destroying said first secondary flow pattern in said fluid stream flowing in said second portion of said conduit which is in close proximity to said first portion by establishing said second secondary flow pattern therein.

6. In apparatus for the rapid and thorough, non-invasive mixing of two or more components in a fluid stream which is flowing in a single conduit comprising a single inlet and a single outlet which are connected by a single, undivided, unobstructed flow path that is closed to other flow paths, the improvements comprising:

means along a first portion of said conduit to establish a first secondary flow pattern in said fluid stream flowing in said conduit; and

means along a second portion of said conduit positioned in close proximity and relative to said first means so as to establish a second secondary flow pattern in said fluid stream flowing in said conduit prior to the substantial dissipation of said first secondary flow pattern which is effective to destroy said first secondary flow pattern.

4,422,774

## METAL FINISHING BARREL APPARATUS

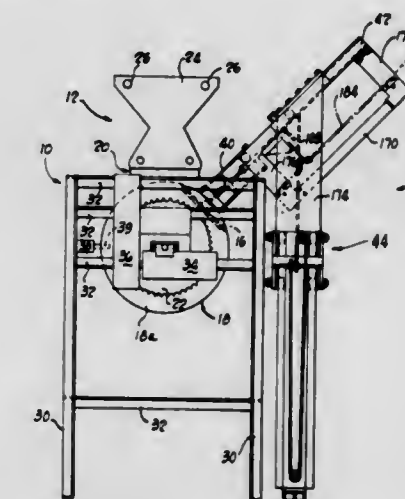
Frank Little, Au Gres, Mich., assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed Mar. 20, 1981, Ser. No. 246,010

Int. Cl.<sup>3</sup> B01F 9/02, 15/02

U.S. Cl. 366—347

17 Claims



1. A door handling apparatus for removing an access door from a metal finishing barrel or the like, comprising:

(a) means for supporting a barrel in a predetermined aligned position with a portion of said door handling apparatus;

(b) an assembly supported for reciprocating motion towards and away from said barrel supporting means;

(c) means for driving said assembly between a first position wherein said assembly is located adjacent to said barrel and a second position, spaced from said first position;

(d) a pair of rotatable spindles, carried by said assembly engageable with locking structure on a barrel access door, said spindles rotatable between locked and unlocked positions;

(e) a latching mechanism carried by said assembly and engageable with an actuating member forming part of a barrel latching means and operative to move said latching means between latched and unlatched positions;

(f) said assembly including means for maintaining engagement between said assembly and said access door to effect separation of said door from said barrel as said assembly moves to its second position.

4,422,775

## DEVICE FOR CONTROLLING THE FUNCTIONS OF A WATCH AND FOR DISPLAYING THE STATE OF AT LEAST ONE OF THE CONTROLLED FUNCTIONS

Marcel Thoenig, Granges, Switzerland, assignor to ETA SA, Fabriques d'Ebauches, Granges, Switzerland

Filed Sep. 22, 1982, Ser. No. 421,544

Claims priority, application Switzerland, Sep. 23, 1981, 6129/81

Int. Cl.<sup>3</sup> G04B 23/02, 27/02

U.S. Cl. 368—74

6 Claims

1. A device for controlling the functions of an analogue watch provided with a frame and performing a plurality of functions, at least one of which can adopt a plurality of states and for displaying the state of at least one of said controlled functions, comprising:

a stem able to take a plurality of axial positions with respect to said frame;

a member pivotally mounted on said frame and driven by said stem;

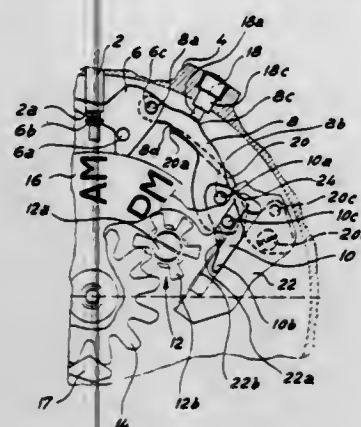
a movable indicator for displaying the states of the controlled function which is visible from outside the watch;

transmission means for driving said indicator;

a mechanism cooperating with said pivotally mounted member to be brought into different positions by said member



and comprising an operative end for cooperating with said transmission means; and  
a push button having an inoperative position and an operative position, said push button in the operative position



cooperating with said mechanism for said operative end to produce a movement of said transmission means when said stem is in a predetermined position, and for the said operative end to not act on said transmission means when said stem is in the other position or positions.

4,422,776

#### DEVICE FOR CORRECTION OF TIME DATE DISPLAYED BY AN ELECTRONIC WATCH

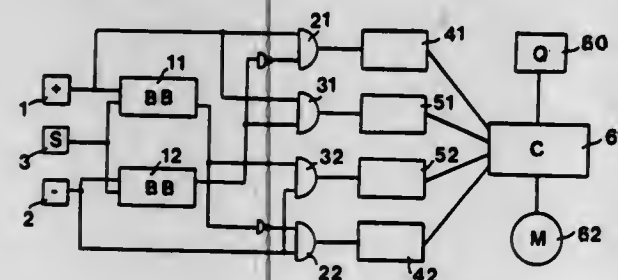
Aurele Maire, La Chaux-de-Fonds, and Norbert Perucchi, St-Blaise, both of Switzerland, assignors to Compagnie des Montres Longines, Franchillon S.A., St-Imier, Switzerland  
Filed Feb. 1, 1982, Ser. No. 344,646

Claims priority, application Switzerland, Feb. 23, 1981, 1173/81

Int. Cl.<sup>3</sup> G04B 27/02

U.S. Cl. 368—185

5 Claims



1. A device for correction of data displayed by an electronic watch by means of a crown capable of being rotated in both directions, said device comprising first means of correction for making a first type of correction of the data displayed, the direction of the correction being determined by the direction of rotation of the crown, further comprising,  
second means of correction for making, in the same position of the crown, a second type of correction of the data displayed; and  
means for detecting a reversal of direction of rotation of the crown after a correction of said first type, and for controlling, in response to that detection, the disconnection of the first means of correction and the connection of the second.

#### 4,422,777 TIME CORRECTING DEVICE FOR TIME SIGNALLING TIMEPIECE

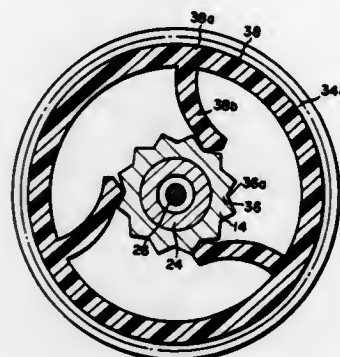
Norihiko Nakamura, Saitama, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1982, Ser. No. 388,692

Claims priority, application Japan, Jun. 16, 1981, 56-88332[U]  
Int. Cl.<sup>3</sup> G04B 17/12

U.S. Cl. 368—185

5 Claims



1. A time correcting device for a time signalling timepiece comprising:  
a time striking control construction having an hour wheel pipe;  
an hour wheel inserted into said hour wheel pipe with clearance; and  
a click means coupled between said hour wheel pipe and said hour wheel, said click means comprising:  
a click wheel having click teeth corresponding to each of the hour from one o'clock through twelve o'clock; and  
a click apparatus having at least one nail portion facing to said click wheel and said nail portion being engagable with said click teeth;  
whereby the click action between said click wheel and said click apparatus enables the intermittent rotation between said hour wheel pipe and said hour wheel so that the direct time correction can be performed.

4,422,778

#### METHOD FOR MEASURING ASPHALT PAVEMENT TEMPERATURE AND DEVICE FOR IMPLEMENTATION OF THE SAME

Alexandr A. Shestopalov, prospekt Smirnova, 20, korpus 1, kv. 30; Ernst I. Denikin, Grazhdansky prospekt, 13, korpus 1, kv. 190; Nikolai Y. Kharkhuta, prospekt Smirnova, 37, korpus 1, kv. 20, all of, Leningrad; Alexandr A. Vasiliev, Volzhsky bulvar, 40, kv. 36, Moscow, and Vyacheslav I. Okunev, ulitsa Schepkina, 12, kv. 47, Rybinsk, all of U.S.S.R.

Filed Dec. 5, 1980, Ser. No. 213,616

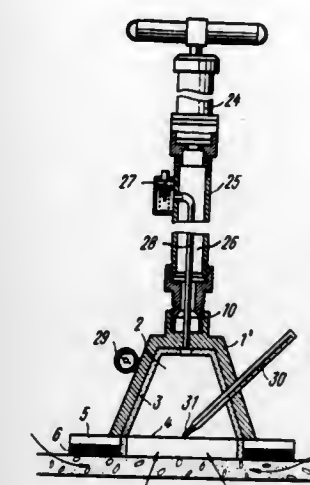
Int. Cl.<sup>3</sup> G01K 13/02; G01N 25/72

U.S. Cl. 374—135

4 Claims

1. A method of determining the temperature internally of a porous, aggregate material in a pavement of a road comprising, confining a given area of a surface of an asphalt road pavement while still in a heated state after paving of the road and comprising an aggregate material which is porous and isolating said area from the ambient atmosphere and simultaneously defining over said area of the surface an enclosed volume of space thermally isolated from the ambient atmosphere, applying a vacuum to said space for drawing into said enclosed volume of space from internally of the pavement aggregate material gases entrained in pores of the porous aggregate material, and sensing the temperature of the gases drawn into said volume of

space with a temperature sensor within said enclosed space, while still in a heated state after paving of the paving of the



road and thereby to ascertain the temperature of the asphalt pavement.

4,422,779

#### HYDRAULIC BEARING SUPPORT

Arno Hamaekers, Hemsbach; Gerd-Heinz Ticks, Waldmichelbach, and Hans-Joachim Rudolf, Rastede, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

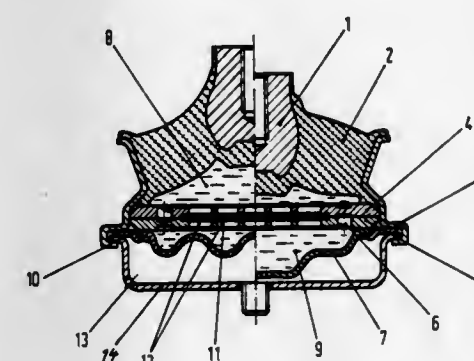
Filed Apr. 24, 1981, Ser. No. 257,170

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019377

Int. Cl.<sup>3</sup> F16C 27/00

U.S. Cl. 384—99

10 Claims



1. A working chamber, expansion chamber hydraulic bearing support which comprises: a conical element of elastic material having a bearing base top and a concave bottom in an annular housing, a diaphragm centered between two stop plates mated to the inside circumference of the housing bottom, a flexible bellows forming the expansion chamber mounted on the bottom of the housing, and a nozzle rigidly associated with the inside circumference of the housing bottom or with the stop plates, the nozzle connecting the working and expansion chambers, the ratio of the length to diameter of the nozzle being in the range of 4:1 to 80:1 and the ratio of the volume of the working chamber to the volume of the nozzle being in the range of from 4:1 to 200:1.

4,422,780

#### TRANSVERSELY RESTRAINED, LONGITUDINALLY FLEXIBLE MOUNT FOR A BEARING FOR A SPINDLE

George L. Glaesser, 4258 Mentone Ave., Culver City, Calif. 90230

Filed Jan. 12, 1982, Ser. No. 339,719

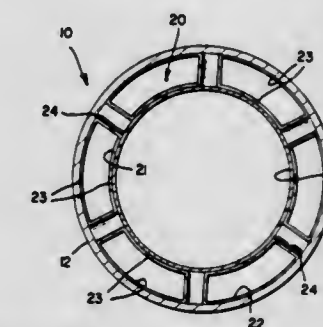
Int. Cl.<sup>3</sup> F16C 27/00

U.S. Cl. 384—215

1 Claim

1. A radially restrained, longitudinally flexible mount for use

in mounting a bearing for a rotating shaft in a frame, said radially restrained, longitudinally flexible mount comprising:  
a. an inner ring which is mechanically coupled to the bearing;  
b. an outer ring which is disposed concentrically to said inner ring and which is mechanically coupled to the frame;  
c. a frame member which has an inner cylindrical band which is mechanically coupled to said inner ring and an outer cylindrical band which is mechanically coupled to said outer ring;  
d. a first flexible coupling member which longitudinally



flexibly couples said inner cylindrical band to said outer cylindrical band whereby said inner ring can bidirectionally move longitudinally along the axis of the shaft;  
e. a second flexible coupling member which longitudinally flexibly couples said inner cylindrical band to said outer cylindrical band whereby said inner ring can bidirectionally move longitudinally along the axis of the shaft; and  
f. a plurality of spokes which provide lateral rigidity between said inner cylindrical band and said outer cylindrical band so that said inner cylindrical band and said outer cylindrical band are concentric with each other and the axis of the shaft.

4,422,781

#### PRINTING APPARATUS AND METHOD WITH VARIABLE VELOCITY ON-THE-FLY PRINTING

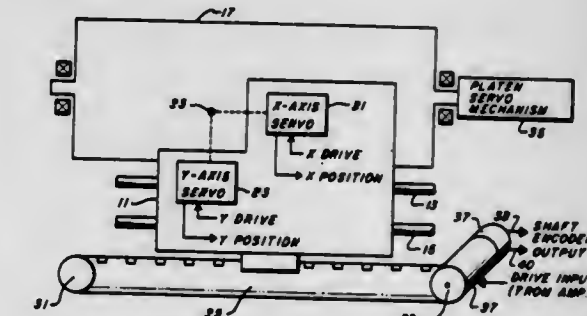
Stephen C. Armfield, Londonderry, and Christopher W. Brock, Bow, both of N.H., assignors to Centronics Data Computer Corp., Hudson, N.H.

Filed Mar. 1, 1982, Ser. No. 353,649

Int. Cl.<sup>3</sup> B41J 3/04

U.S. Cl. 400—18

15 Claims

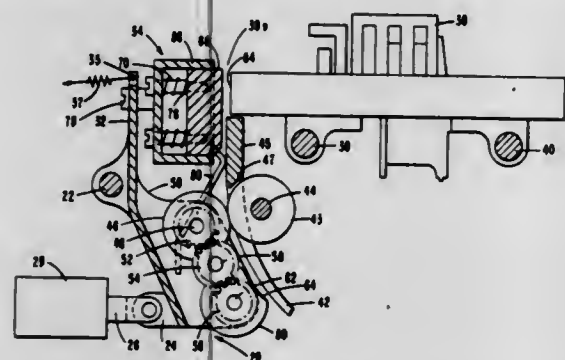


1. In a calligraphic printing apparatus having a moving carriage carrying a movable stylus mechanism, a carriage control element, and means responsive to the carriage control element for moving said carriage along a printing path, said printing path being divisible into a plurality of distance-velocity increments, wherein as said carriage moves along said printing path a plurality of symbols are written by said movable stylus, the improvement wherein said carriage control element comprises means for determining, for each distance-velocity increment along said printing path, a maximum carriage velocity,



said maximum carriage velocity being dependent on the complexity of said symbol, and means responsive to said maximum carriage velocities for determining, for each distance-velocity increment along said printing path, an optimum change in carriage velocity, whereby said carriage can traverse said printing path at a velocity which varies as a function of the complexities of the particular characters being written by said stylus thereby to provide adequate time over which each character can be written from said moving carriage.

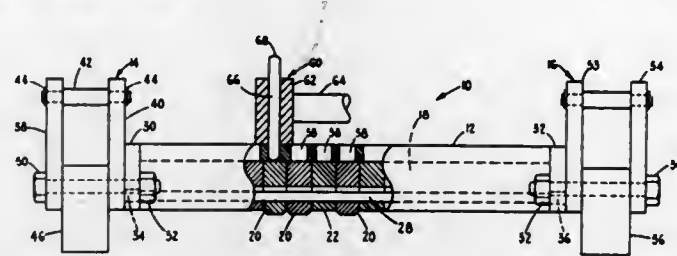
**4,422,782**  
**RECORD MEMBER FEED AND SUPPORT MECHANISM**  
Raymond L. Lawter, Zanerville; David C. Wills, and Narinder Singh, both of Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio  
Filed Jun. 28, 1982, Ser. No. 392,449  
Int. Cl.<sup>3</sup> B41J 11/20  
U.S. Cl. 400—56



1. A mechanism for feeding and supporting a record member with respect to a printing position for receiving printed indicia along a line thereof comprising:

- a chute member for guiding a record member disposed therein along a predetermined path, said chute member having an end portion positioned adjacent the printing position;
- a first driven roller and a drive roller disposed on opposite sides of said chute member;
- an elongated support member rotatably mounted substantially midway between its ends and extending along said chute member, said support member rotatably supporting said first driven roller at a point on one side of the rotatable mounting of said support member;
- a platen member mounted on said support member on the opposite side of said rotatable mounting from said first driven roller and positioned adjacent said end portion of the chute member;
- first actuating means engaging said support member adjacent said platen for rotating said support member to a first position enabling said first driven roller to engage said drive roller to feed a record member to a printing position adjacent said platen member;
- and second actuating means engaging said support member adjacent said first driven roller and operated for rotating said support member to a second position removing the first driven roller from engaging with said drive roller and moving said platen member into engagement with the record member.

**4,422,783**  
**STAMPING APPARATUS HAVING MAGNETIC SUPPORTING MEANS**  
LeRoy E. Houk, Ellwood, Pa., assignor to The Babcock & Wilcox Company, New Orleans, La.  
Continuation of Ser. No. 217,307, Dec. 17, 1980, abandoned.  
This application Jan. 17, 1983, Ser. No. 458,681  
Int. Cl.<sup>3</sup> B41J 1/16  
U.S. Cl. 400—128



1. Apparatus for holding a plurality of stamp members for individually stamping identifying characters of a permanent nature into a tubular metal surface, comprising an elongated frame substantially rectangular in cross-section and having a channel formed in the underside thereof for receiving said stamp members, each of said stamp members comprising a substantially rectangular member having an imprinting character formed on an end face thereof and a transverse groove formed across a side face thereof, and means extending through said groove for retaining said one or more stamp members within said channel while allowing individual movement of each stamp member to stamp the tubular metal surface; said frame having a plurality of holes formed therein opposite said channel and aligned therewith; first and second support assemblies attached to said first and second plates respectively, a first pair of permanent magnets attached to said first support assembly, and a second pair of permanent magnets attached to said second support assembly; each of said support assemblies comprises a pair of spaced-apart, inverted, substantially U-shaped members attached to one of said plates, each of said permanent magnets being received between said U-shaped members and attached thereto adjacent the free ends of the legs thereof; each of said magnets is a horseshoe magnet attached to said U-shaped members by means permitting pivotal adjustment of said permanent magnets to allow said permanent magnets to define spaced leg members supporting said frame in a predetermined position on the tubular metal surface and substantially conforming to the shape of said tubular metal surface.

**4,422,784**  
**SOLENOID-TYPE HAMMER ASSEMBLY FOR IMPACT PRINTER**

Aram S. Arzoumanian, Encino; Heinz W. Hieber, Valencia; Howard H. Nojiri, Agoura, and Jimmie L. Hart, South Lake Tahoe, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

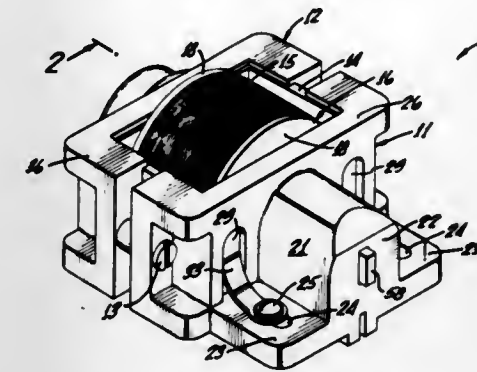
Filed Apr. 8, 1982, Ser. No. 366,524  
Int. Cl.<sup>3</sup> B41J 9/133

U.S. Cl. 400—144.2

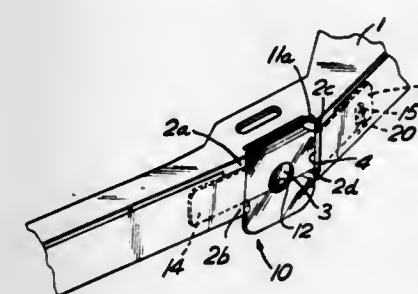
1. In a hammer assembly for a high speed impact printer of the type comprising a solenoid including a coil and an axially-apertured pole piece, said pole piece having a conically-shaped recessed surface, an axially movable armature within said solenoid, said armature having a tapered conical leading surface facing and substantially parallel to said recessed surface of said pole piece, and hammer means, one end of said hammer means being rigidly connected to said armature, to form a unitized armature/hammer element for striking a print element in said printer, said hammer means extending through said aperture in said pole piece, the improvement wherein the larger diameter end of said recessed surface of said pole piece has a chamfer which faces said leading surface of said armature

5 Claims

and is tapered at an acute angle relative to the axis of said pole piece which is greater than the angle of taper of said recessed

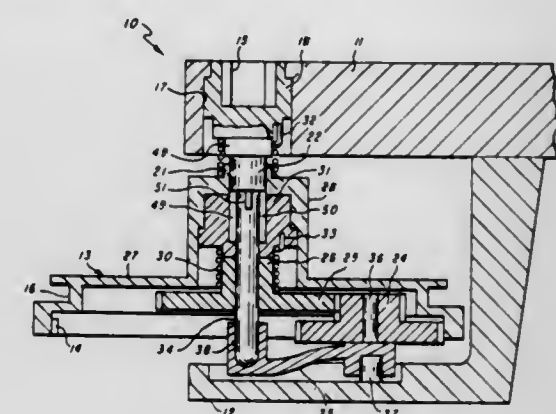


**4,422,785**  
**RIBBON CARTRIDGE CONSTRUCTION**  
Sydney Shore, 38-04 48 St., Long Island City, N.Y. 11004  
Filed May 26, 1982, Ser. No. 382,548  
Int. Cl.<sup>3</sup> B41J 35/26, 35/28  
U.S. Cl. 400—208



1. In a ribbon cartridge construction having a housing including means forming a ribbon access window at the outer perimeter thereof for exposing a run of ribbon for printing on an oppositely facing surface, a ribbon inlet aperture and a ribbon outlet aperture on either side of the window for the passage of ribbon into and out of the housing and means disposed adjacent said window for shielding all but a predetermined portion of the exposed ribbon from an oppositely facing surface, the improvement wherein: the shielding means comprises a resiliently flexible planar shield including a shielding portion configured to cover the exposed run of ribbon and having a printing aperture corresponding in size to said predetermined portion of the exposed ribbon and first and second elongated mounting arms extending outwardly from the shielding portion in opposite directions and configured to be slidably received in the ribbon inlet and outlet apertures to dispose the shield in an operative position wherein the printing aperture is aligned with the predetermined portion of the exposed ribbon upon the full insertion of both arms; the ribbon inlet and outlet apertures have a width sufficient to receive the mounting arms outwardly of a ribbon passing therethrough; and the cartridge construction further comprises one-way locking means disposed on the first arm and adjacent the corresponding one ribbon aperture for permitting the sliding insertion of said first arm into the one ribbon aperture and for preventing subsequent removal thereof; wherein the one-way locking means comprises a hole in said first arm, guide means disposed adjacent said one ribbon aperture and forming a guide path receptive of said first arm upon insertion in the one ribbon aperture and a first locking projection in the guide path and engageable with said hole.

**4,422,786**  
**BIDIRECTIONAL MOTION TO UNIDIRECTIONAL MOTION TRANSLATOR**  
Paul J. Piptone, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Filed Nov. 3, 1980, Ser. No. 202,995  
Int. Cl.<sup>3</sup> B41J 33/14, 33/04  
U.S. Cl. 400—229



1. A bidirectional motion to unidirectional motion translator in combination with an impact printer of the type utilizing a printhead and a platen, having a unidirectional print ribbon mechanism, wherein the translator is activated by the left to right and right to left motions of the printhead relative to the platen, the unidirectional output of the translator activating the print ribbon mechanism, comprising:

- (a) a drive cable connected to opposite sides of the frame of the printer;
- (b) rotationally mounted housing means, having an axial bore therethrough, and having a flange around which the driven cable is wound, relative in one direction or the opposite direction depending upon the relative direction of motion between the printhead and the platen and the resultant winding and unwinding of the drive cable;
- (c) a driven shaft rotatably mounted within the bore of the housing means;
- (d) upper clutch means positioned at the upper end of the driven shaft and adapted to selectively engage the driven shaft and the housing means, operable to turn the driven shaft in a fixed direction when the housing means rotates in the one direction, and to cause the driven shaft to slip when the housing means rotates in the opposite direction;
- (e) rotational engaging means, rotated by the housing means in a direction opposite to that of the housing means; and
- (f) lower clutch means positioned at the lower end of the driven shaft and adapted to selectively engage the driven shaft and the rotational engaging means, operable to turn the driven shaft in the opposite direction when the housing means rotates in the opposite direction causing the engaging means to rotate in the one direction, and operable to cause the driven shaft to slip when the housing means rotates in the one direction causing the engaging means to rotate in the opposite direction, whereby the driven shaft rotates in the fixed direction when the housing means is rotated in either the one or the opposite direction.

**4,422,787**  
**TEAR BAR FOR A PRINTER**  
George L. Guthrie, 2938 E. 62nd St., Indianapolis, Ind. 46220  
Filed May 10, 1982, Ser. No. 376,719  
Int. Cl.<sup>3</sup> B41J 15/00

U.S. Cl. 400—621

3. A tear bar for a printer including a hood covering the printer mechanism, the hood defining an opening through which paper fed through the printer exits, and support means comprising a paper bail mounting bar disposed generally at the ends of the opening adjacent the paper edges, the printer including a paper bail, the tear bar including a tearing edge

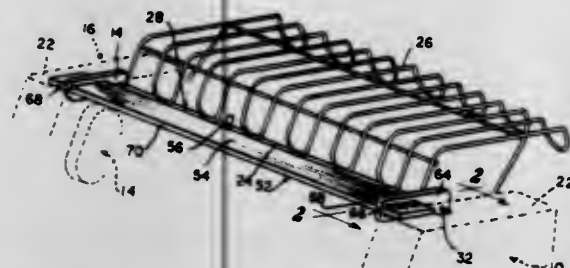
5 Claims

8 Claims

4 Claims



adjacent the surface of the paper as the paper is fed through the opening, the tearing edge extending generally across the opening and beyond the edges of the paper fed therethrough, the tear bar further including a pair of ears on the tear bar for selectively engaging the support means, the ears being secured to the tearing edge such that engaging the support means with the ears mounts the tear bar from the support means for movement between use and non-use positions, the ears positioned on the tear bar beyond the edges of the paper fed therebetween, each of the ears defining an opening for receiving a respective end of the paper bail mounting bar to mount the tear bar from



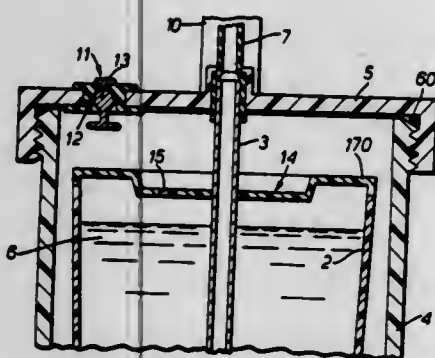
the paper bail mounting bar, the paper bail mounting bar including stops formed by the connection of the paper bail to the paper bail mounting bar, the ears being incapable of being advanced beyond the stops to permit sliding engagement of the ears on the paper bail mounting bar, and one of the ears including means defining a groove between its perimeter and the means defining an opening in said one of the ears, the groove providing additional clearance for the entry of the paper bail mounting bar into the opening associated with the groove, the tear bar in its use position presenting the tearing edge in operative position to permit a user to tear the paper as it exits from the printer.

#### 4,422,788 APPARATUS FOR FEEDING A LIQUID TO AN APPLICATOR

John D. Braithwaite, Maidenhead; Derrick O. King, Old Windsor, and Sidney J. Williams, Virginia Water, all of England, assignors to Black & Decker Inc., Newark, Del.  
Continuation of Ser. No. 194,452, filed as PCT GB 79/00131, Aug. 3, 1979, published as WO 80/00315, Mar. 6, 1980, & 102(e) date Apr. 9, 1980. This application Mar. 16, 1982, Ser. No. 358,821  
Claims priority, application United Kingdom, Aug. 9, 1978, 32726/78

Int. Cl.<sup>3</sup> A43K 5/02  
U.S. Cl. 401—188 R

36 Claims



1. A portable apparatus for feeding paint under pressure to an applicator, comprising:  
an outer vessel;  
a paint container received, in use, within the interior of the vessel with part of the interior of the vessel remaining for occupancy by gas;  
said container having a lid fitted thereto and extending over the top thereof;  
a pressurizing assembly supported by the vessel, and including a housing having a capsule of pressurized gas therein

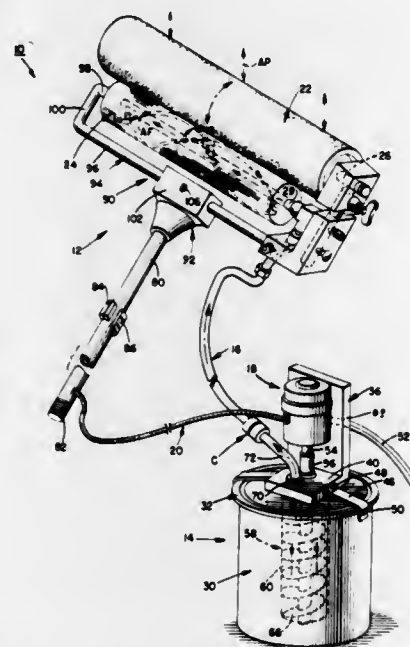
and further having pressure reducing means therein, the pressure reducing means having a high pressure side and a low pressure side;  
a first fluid path extending from the high pressure side of the pressure reducing means and communicating with the outlet of the pressurized gas capsule;  
a second fluid path extending from the low pressure side of the pressure reducing means through the vessel and into the container whereby the interior of the container can be pressurized;  
a feed conduit connected, in use, to the applicator, said feed conduit extending into the vessel from the exterior thereof and extending into the interior of said container for transferring paint therefrom to the applicator;  
said lid having a hole therein and said feed conduit extending through said hole and being removable and insertable therethrough as a close fit therein; and  
restricted transfer means, associated with the paint container and communicating with said part of the interior of the vessel and the interior of the paint container, for allowing flow of gas between said part of the interior of the vessel and the interior of the paint container to equalize the pressures therein, but for preventing passage of paint therethrough, except at a very slow rate, from said container into said part of the interior of the vessel;  
the combination of the paint container having said lid, said feed conduit having said close fit with respect to said hole in said lid, and the functioning of said restricted transfer means substantially preventing paint from contaminating the interior of said outer vessel, even if during use the vessel is inadvertently knocked over.

4,422,789  
FLUID APPLICATOR WITH FEEDER ROLLER  
Joseph C. Charney, 7915 N. Fairfield Rd., Milwaukee, Wis. 53217; Phillip M. Goodman, 9018 N. 70 St., Milwaukee, Wis. 53223, and Robert H. Morgan, 3745 S. 76th, Milwaukee, Wis. 53220

Continuation of Ser. No. 193,001, Oct. 2, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,545  
Int. Cl.<sup>3</sup> B43M 11/02

U.S. Cl. 401—218

12 Claims



1. A fluid applicator for applying fluid, such as paint or the like, to a surface, comprising:  
a source of fluid;  
a pump fluidly connected to said source of fluid;  
a frame having a fluid passage therein fluidly connected to said pump;  
a fluid applicator roller rotatably mounted on said frame;  
a fluid dispersing roller rotatably mounted on said frame to contact said fluid applicator roller, said fluid dispersing roller including a central fluid passage defined to extend

axially of said fluid dispersing roller and to be in fluid communication with said frame fluid passage to receive fluid therefrom, a plurality of fluid transfer passages extending radially of said fluid dispersing roller and being in fluid communication with said central fluid passage, and a pair of helical fluid troughs defined in the outer surface of said fluid dispersing roller to be in fluid communication with said transfer passages to receive fluid therefrom, said helical troughs each intersecting each fluid transfer passage and each having a width dimension which decreases to a minimum adjacent a transfer passage, each of said helical fluid troughs including a ridge within each trough to establish capillary action, said pump pressurizing fluid in said helical ridged troughs; and  
control means on said frame for controlling said pump.

4,422,790  
CONNECTING MEANS FOR FILTER CARTRIDGES  
Hans Gebert, Hellbronn; Manfred Löffelhardt, Obersulm, and Gerhard Obernosterer, Öhringen-Ohrnberg, all of Fed. Rep. of Germany, assignors to Knecht Filterwerke GmbH, Stuttgart, Fed. Rep. of Germany  
Filed Mar. 25, 1982, Ser. No. 361,881  
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113640

Int. Cl.<sup>3</sup> F16B 1/00

U.S. Cl. 403—11

3 Claims

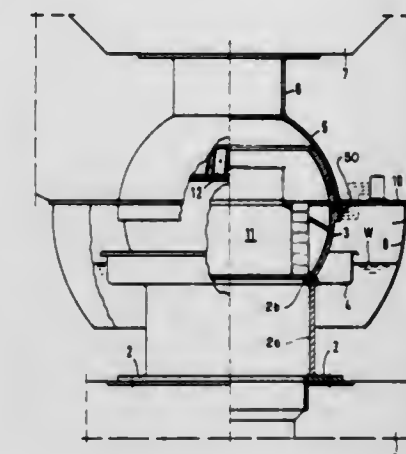


1. Means for connecting at least two filter elements, which are axially arranged in series and are designed as filter cartridges, of a fluid filter, more especially a lubricating-oil filter for internal-combustion engines, characterized in that the connecting means is designed as a joint for tilting the filter cartridges relative to each other during the installation and removal thereof, said connecting means being in the form of a clip hinge made of a plastics-material injection moulding provided with an integrally formed film hinge, said clip hinge engaging with its free ends in the inner ports in the respective end discs of the filter elements, said clip hinge having free ends comprising detents which engage over the end discs of the filter elements, and having two other ends which in the installed position are in operative engagement with each other and comprise conically extending ring sections, which correspond to each other.

4,422,791  
UNIVERSAL JOINT CONSTRUCTION FOR USE IN ANCHORING A SURFACE PLATFORM TO A SEA BED  
Helmut Lausberg, Oberhausen, and Karl-Werner Pommerening, Dortmund, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg Nürnberg Aktiengesellschaft, Fed. Rep. of Germany  
Filed Apr. 7, 1982, Ser. No. 366,207  
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1981, 3116626

Int. Cl.<sup>3</sup> F16C 11/00  
U.S. Cl. 403—39

26 Claims



1. A universal joint for use in anchoring sea platforms to a sea bed which is adapted to be disposed adjacent the sea bed, comprising an outer top ball cup having a bottom opening with an edge around the opening, an inner bottom ball cup disposed within said outer top ball cup and enclosing the bottom thereof and having an exterior in slidable engagement with an interior of said outer top ball cup, a bell forming an enclosed pressure space between the exterior of said top ball cup and said inner bottom ball cup, a ring seal bearing defined between said inner bottom ball cup and said outer top ball cup adjacent the edge of said outer top ball cup, said inner bottom ball cup exterior between said ball cups having a plurality of shoes thereon bearing in sliding engagement against the interior of said outer top ball cup and each comprising a support plate having a substantially closed contour area defined by an enclosing border thereabout, each supporting plate secured to said inner bottom ball cup, a sliding layer within said contour area secured to said supporting plate and slidable on the interior of said outer top ball cup, and a border seal extending around the periphery of each of said supporting plates.

4,422,792  
GUSSET METAL LEDGER HANGER  
Tyrell T. Gillb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.  
Filed Aug. 16, 1982, Ser. No. 408,242  
Int. Cl.<sup>3</sup> F16B 5/00

U.S. Cl. 403—232.1

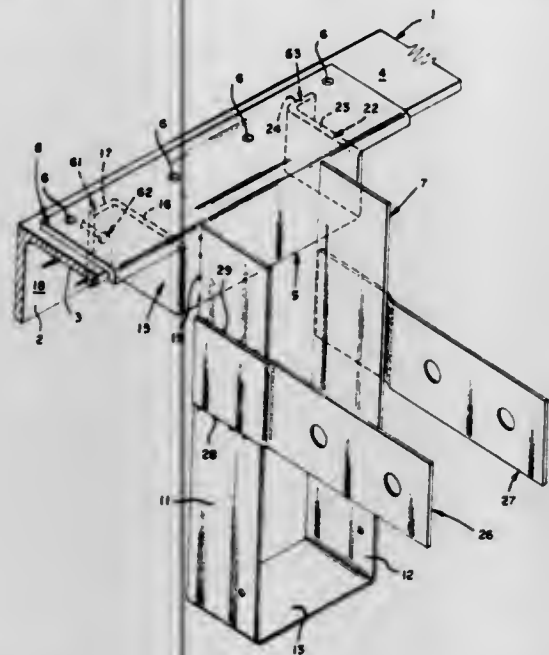
6 Claims

1. In combination a gusset metal ledger hanger for attachment to a metal ledger 1 wherein the metal ledger includes a lower leg 2 attached to the face of a wall and an outstanding leg 3 having an upper face 4 and a lower face 5, said ledger hanger including; a top flange 8 adapted for connection to said upper face 4 of said outstanding ledger leg 3, a depending flange 9 attached to said top flange 8 extending downwardly therefrom, first and second stirrup members 11 and 12 attached to said depending flange 9 extending downwardly therefrom and adapted for holding a structural beam member, a first gusset member 15 operatively and rigidly connected to said top flange 8 having a top edge 16 in registration with said lower face 5 of said outstanding leg 3 of said ledger and having a side face 17 in close fitting relation to said outward face 18 of said lower leg 2 of said metal hanger 1, and said gusset member



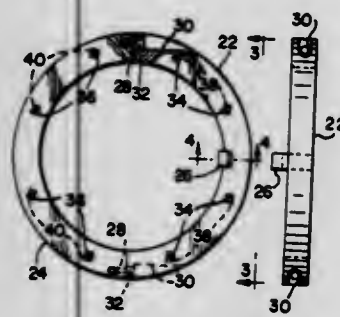
is an integral part of said depending flange 9; said improvement comprising:

- a. a first gusset foot 61 attached to said first gusset member 15



- at a right angle thereto and positioned in face to face contact with said ledger lower leg 2; and  
b. fastening means 62 adapted for permanently attaching said first gusset foot 61 to said ledger lower leg 2.

**4,422,793**  
**SPLIT COLLAR SPACER RING ASSEMBLY**  
George E. Mandich, 6201 Johnson St., Merrillville, Ind. 46410  
Filed Jun. 29, 1981, Ser. No. 278,645  
Int. Cl.<sup>3</sup> B25G 3/00; F16B 9/00; F16L 41/00  
U.S. Cl. 403—261 7 Claims



1. A split collar spacer ring means adapted to hold an elongated shaft means having a longitudinal groove and a circumferential side wall within a space defined by a sleeve means having an end wall, said side wall having an annular collar groove with a bottom end wall substantially parallel to the longitudinal axis of said elongated shaft means which comprises: first collar means removably placed in a portion of said annular collar groove, said first collar means including first and second ends and a projection placed into said groove; second collar means removably placed in a further portion of said annular collar groove, said second collar means including first and second ends, said first and second collar means being removably joined together so that said first ends and said second ends of said first and second collar means abut each other, respectively, to surround and be affixed to said shaft means; a plurality of fastener means each including an elongated bolt removably secured to said joined first and second collar means and being situated in a direction substantially normal to the central axis of said joined first and second collar means; spacer means between said joined first and second collar means and said end wall abutting at least a portion of said end wall; and a plurality of both first and second bolt means, secured in a corresponding plurality of holes in said

first and second collar means, respectively, and contacting said spacer means.

**4,422,794**  
**COUPLING FOR EARTH BORING UNITS**  
Arthur D. Deken, Perry, Okla., assignor to The Charles Machine Works, Inc., Perry, Okla.  
Filed Jul. 21, 1981, Ser. No. 285,501  
Int. Cl.<sup>3</sup> B25G 3/18; F16B 21/00; F16D 1/00  
U.S. Cl. 403—330 4 Claims



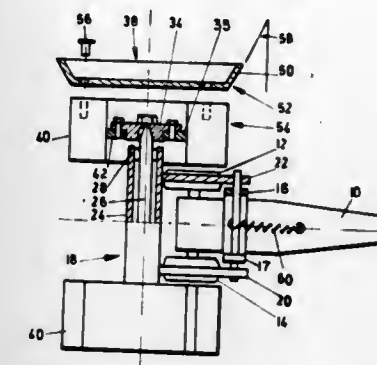
1. A coupling for coaxially joining pipe or rod sections in load transmitting relation to be employed with an earth boring drive unit comprising:

- a first elongated member having a generally annular wall with the inner surface of said wall defining an axially opening cavity of polygonal cross-sectional throughout at least a portion of the length of said cavity, said wall being formed with a recess opening into such cavity;  
a second member having an exterior surface formed with a pocket opening outwardly thereof, said second member further having an elongate segment telescopically engageable within said cavity, said segment being provided with an exterior cross-section configured to drivingly mate with said polygonal cross-section of the cavity to transmit torque between said members;  
each of said members providing means remote from the telescopically interengageable portions thereof to affix the member to a pipe or rod section;  
a mounting pin carried by said second member and extending transversely within said pocket;  
a load transmitting latch in said pocket having an enlarged transverse bore loosely enclosing said pin for said latch to be capable of limited movement normal to the axis of said pin and pivot on said pin from within said pocket outwardly beyond said exterior surface of said second member;  
biasing means urging said latch outwardly to engage within said recess of said first member when said members are interengaged in load transmitting relation;  
abutment means in said first member cavity with which said second member engages when said elongate segment is telescoped into said cavity to transmit axially compressive loads through said members;  
said recess providing an abutment wall against which said latch engages to lock said members against axial separation upon tension being applied to said members; and  
said pocket providing a stop wall to limit movement of said latch within said pocket, said latch transmitting axial tension loads applied to said coupling by simultaneous engagement of said latch with both said abutment wall and said stop wall, said latch bore being out of contact with said mounting pin when said simultaneous engagement occurs and said latch transmits said tension loads.

**4,422,795**  
**COMPACTOR**  
Aubrey R. Berrange, 011 Nahoon, Leicester Rd., Bedfordview, Johannesburg, Transvaal, South Africa  
Filed Apr. 8, 1980, Ser. No. 138,378  
Claims priority, application South Africa, Apr. 9, 1979, 79/1666; Jun. 12, 1979, 79/6616  
Int. Cl.<sup>3</sup> E01C 19/26  
U.S. Cl. 404—124 14 Claims

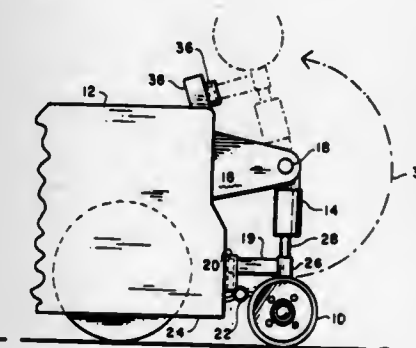
1. A compactor which comprises a chassis adapted to be

drawn by tractive means, two laterally separated impact rollers of substantially identical non-circular profile, stub axle means operatively related to the chassis and supporting each impact roller for rotation, and torsion means connecting the impact



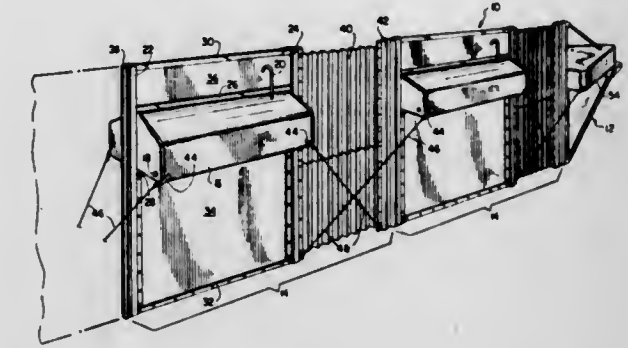
- rollers to each other to constrain the impact rollers to rotate substantially in synchronism with each other, but torsionally permitting a degree of out-of-synchronism movement in response to torsional forces.

**4,422,796**  
**HYDRAULICALLY ADJUSTABLE PAVEMENT ROLLER**  
Boyd D. Tavernier, P.O. Box 11915, Reno, Nev. 89510  
Continuation of Ser. No. 120,640, Feb. 11, 1980, abandoned.  
This application Jun. 29, 1981, Ser. No. 278,324  
Int. Cl.<sup>3</sup> E01C 19/26  
U.S. Cl. 404—128 6 Claims



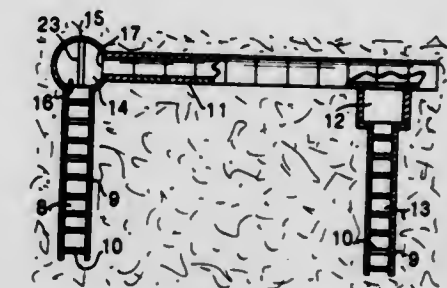
1. An auxiliary roller accessory system for a vehicle for rolling a surface outside of the normal rolling track of said vehicle, said roller accessory system comprising:  
a support structure rigidly mountable to the rear body of the vehicle, said support structure including a support bracket extending outwardly from said vehicle;  
a hydraulically operable cylinder pivotally connected to the end of said bracket distal of said vehicle, said cylinder having a movable piston;  
a roller having an axle coupled to said piston, said roller being movable in a vertical direction upon hydraulic actuation of said piston;  
a slidable bracket having a first end connected to said roller axle and a second end having a connected cross member; and  
socket means coupled to said vehicle and positioned to loosely engage the cross member on said slidable bracket for maintaining both the rolling alignment of said roller and the substantially vertical alignment of said hydraulic cylinder.

**4,422,797**  
**FIRE RESISTANT OIL SPILL CONTROL BOOM**  
Ian R. McAllister, Ian A. Buist, and William M. Pistrzrak, all of P.O. Box 200, Calgary, Alberta, Canada T2P 2H8  
Filed Feb. 16, 1982, Ser. No. 348,877  
Int. Cl.<sup>3</sup> E02B 15/04  
U.S. Cl. 405—70 15 Claims



1. A fire resistant spillage containment boom, said boom including a plurality of units capable of being connected together, each of said units comprising a float member, a first panel member extending vertically above said float member, a second panel member extending vertically below said float member, first and second frame members secured to opposite ends of said float member, each of said frame members extending above and below said float member and secured to said first and second panel members, said first frame member including a first channel shaped connecting element, a corrugated panel having vertically disposed corrugations and being substantially coextensive with and secured to said second frame member along a first longitudinal edge thereof, a second channel shaped connecting element attached to the second longitudinal edge of said corrugated panel, shock absorbing means for controlling the flexing of said corrugated panel, a connecting member for connecting the first connecting element of one of said units to the second connecting element of the adjacent unit in said boom, said float member, said panel members, said corrugated panel, said connecting elements, and said connecting member each being formed of a metal capable of withstanding the temperature of a petroleum fire.

**4,422,798**  
**PROCESS FOR CONSTRUCTION OF AN UNDERGROUND STRUCTURE AND THE STRUCTURE THUS OBTAINED**  
Jacques Bonvoisin, Beaufoy, Belgium, assignor to Compagnie Internationale des Pieux Armes Frankignoul, Liege, Belgium  
Filed May 6, 1981, Ser. No. 260,995  
Claims priority, application Belgium, May 8, 1980, 0/200526  
Int. Cl.<sup>3</sup> E21D 9/04  
U.S. Cl. 405—132 8 Claims



1. Process for the construction of an underground structure, particularly a tunnel, of the type comprising:  
the construction of a first longitudinal underground passage;  
the construction of a first lateral wall, preferably of concrete, in a vertical direction and defining a first lateral side of said structure, this wall being obtained by filling a trench dug from said first passage;



driving a series of first mechanically resistant pipes into the soil from said passage, preferably horizontally and perpendicular to the plane of said trench, said pipes being intended to form the roof of said structure;  
 construction before or after the said driving, of a second underground passage parallel to the first and adjacent to said first pipes;  
 construction, in an analogous manner to the first, of a second lateral wall, in a vertical direction and defining another lateral side of said structure;  
 covering with concrete of said passages and said pipes;  
 said process being characterized in that it consists of constructing at least one of said passages by means of a series of second mechanically resistant pipes, driven into the soil; then digging said trenches from first openings provided on the lower side of said second pipes and in driving said first pipes from second openings provided on a lateral side of said second pipes.

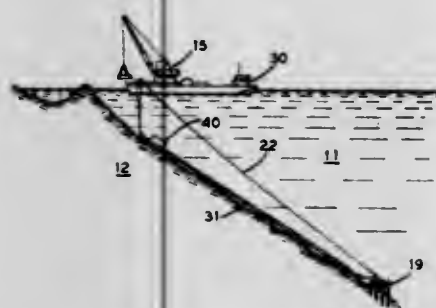
#### 4,422,799 METHOD FOR INSTALLING SUBMARINE PIPELINES USING A MARINE RAILWAY SYSTEM

William L. Green, New Orleans; Dennis E. Calkins, Metairie; Gary E. Harrison, Marrero, all of La., and Jesse R. Wilkins, Picayune, Miss., assignors to McDermott Incorporated, New Orleans, La.

Filed Jun. 1, 1981, Ser. No. 268,557  
 Int. Cl.<sup>3</sup> F16L 1/00

U.S. Cl. 405—158

11 Claims



1. A method of installing a submarine cold water conduit on the bottom of a body of water to an underwater land formation having an upslope and downslope area comprising the steps of:
  - (a) attaching a railway leader to a track pulldown cable, the railway leader including a sheave through which is reeved a conduit pulldown cable,
  - (b) rigidly fastening the railway leader and successive railway track sections to each other to construct a marine railway track means while simultaneously threading each track section with the conduit pulldown cable and pulling the track pulldown cable to control descent of the railway track sections,
  - (c) lowering the track means onto the bottom,
  - (d) securing the track means to the bottom,
  - (e) releasably attaching the reeved conduit pulldown cable to a first section of the cold water conduit and pulling the first cold water conduit section into position on the track means using the reeved conduit pulldown cable,
  - (f) securing the first cold water conduit section to the track means and repositioning the conduit pulldown cable for attaching to another section of the cold water conduit, and
  - (g) repeating steps (e) and (f) for each successive cold water conduit section until all conduit sections are in place.

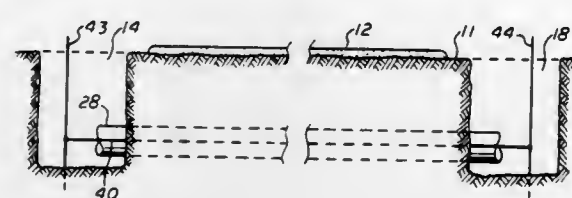
#### 4,422,800 METHOD OF INSTALLING AN UNDERGROUND CONDUIT

Robert O. Parish, assignor to Doc's Road Boring, Inc., Houston, Tex.

Filed Nov. 21, 1980, Ser. No. 208,981  
 Int. Cl.<sup>3</sup> E21C 9/00, 23/00

U.S. Cl. 405—184

3 Claims



1. A method of facilitating the future installation of a proposed conduit in the earth below a grade parallel to and spaced apart from an adjacent conduit, which comprises the steps of:
  - digging a first pit into said earth adjacent said grade, said first pit being located on the vertical plane that intersects the course of said adjacent conduit and having a depth at least as deep as the depth of said adjacent conduit below said grade;
  - and digging a second pit into said earth adjacent said grade, said second pit being spaced apart from said first pit and being located on said vertical plane and having a depth at least as deep as the depth of said adjacent conduit below said grade;
  - forming a pilot hole in the earth extending between said first and second pits parallel to and spaced apart from said course to be traveled by said proposed conduit;
  - reaming said pilot hole to form said enlarged hole having a diameter sufficient to accommodate said adjacent conduit;
  - attaching an end of a cable to said adjacent conduit, said end being attached radially outwardly from said adjacent conduit;
  - and running said adjacent conduit through the earth between said first and second pits along a course parallel to the course of said proposed conduit, thereby pulling said cable through the earth adjacent thereto;
  - fixing one end of said cable to a first stake;
  - fixing the other end of said cable to a second stake;
  - filling said first pit with earth of the level of said grade with said first stake exposed;
  - and filling said second pit with earth up to the level of said grade with the second stake exposed.

#### 4,422,801 BUOYANCY SYSTEM FOR LARGE SCALE UNDERWATER RISERS

Neville E. Hale, Mississauga, Canada, and Kenneth Gardner, Santa Barbara, Calif., assignors to Fathom Oceanology Limited, Mississauga, Canada

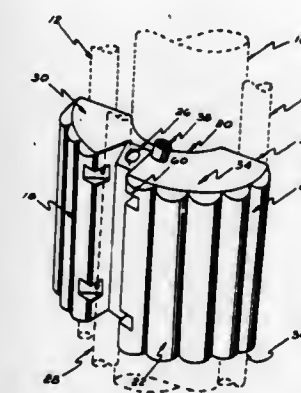
Filed Sep. 11, 1980, Ser. No. 186,506  
 Claims priority, application Canada, Sep. 28, 1979, 336655  
 Int. Cl.<sup>3</sup> E21B 7/12

U.S. Cl. 405—195

14 Claims

1. A canister for use in association with a plurality of similar canisters, superimposed one on another, for providing buoyancy control of large scale underwater risers, comprising:
  - a floodable, hollow structure with a curved, vertical rear wall having a contour approximating in curvature the outer diameter of a riser section with which said canister is to be employed; a curved vertical front wall extending arcuately substantially in parallel with said rear wall; vertical side walls; and top-forming and bottom-forming walls;
  - internal conduit means for providing air communication between superimposed canisters;
  - an air inlet in the bottom wall comprising a tube extending partially into the interior of said canister and connected to

a source of compressed air supplied thereto from below said canister;  
 a water outlet in said bottom wall permitting displacement of water from the interior of said canister upon the injection of compressed air at a pressure sufficient enough to expel water therefrom; and,



a port in said conduit means to permit air communication to said conduit and thence through said conduit to the canister next above so as to supply compressed air to said air inlet in said next above canister, whereby said internal conduit comprises the source of compressed air for said next above canister.

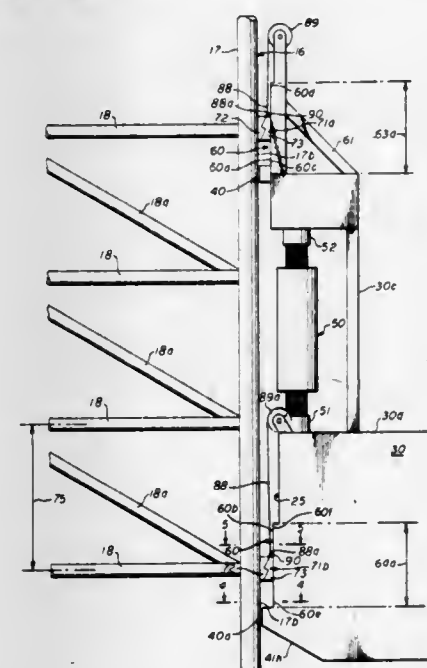
#### 4,422,802 LEG LOAD DISTRIBUTION AND LOCKING ARRANGEMENT FOR JACK-UP TYPE MOBILE OFFSHORE PLATFORM

Kenneth P. Choate, Houston, Tex., assignor to Robin Shipyard (PTE.) Ltd., Singapore, Singapore

Filed Apr. 7, 1981, Ser. No. 251,775  
 Int. Cl.<sup>3</sup> E02B 17/00

U.S. Cl. 405—198

24 Claims



1. In a jack-up type mobile offshore structure wherein a hull provides a working area platform with openings therethrough for receiving vertically extending legs and wherein a cooperating jacking arrangement between the hull and legs enables the legs to be lowered onto a subsea surface so that the hull may then be moved on the legs to an elevated position above the water for conducting drilling or other operations, the invention comprising means to secure the structure and legs together, said means including:
  - a. a plurality of vertically extending guide means carried by the hull and spaced about each of the legs;

- b. a first pair of wedges forming first wedge means movable vertically in said guide means;
- c. a second pair of wedges forming second wedge means spaced vertically in said guide means relative to said first wedge means, said second wedge means movable vertically in said guide means;
- d. means interconnecting said pair of wedges which forms said first and second wedge means whereby at least one of the wedges of each of said first and second wedge means may be moved to engage a leg and thereby secure the legs to the structure; and
- e. means to raise and lower said wedge means in said guide means.

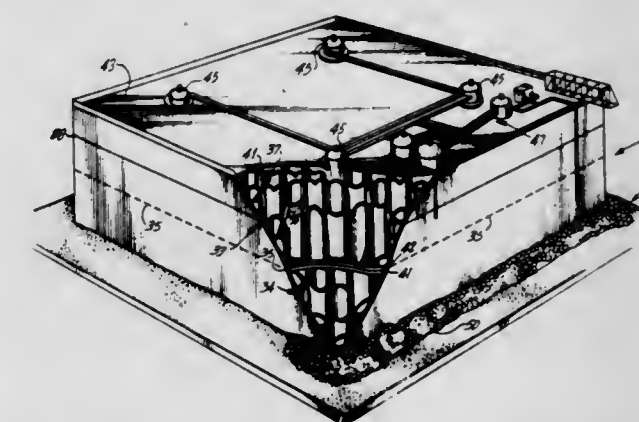
#### 4,422,803 STACKED CONCRETE MARINE STRUCTURE

Sherman B. Wetmore, Westminster, Calif., assignor to Global Marin, Inc., Los Angeles, Calif.

Filed Nov. 30, 1981, Ser. No. 325,778  
 Int. Cl.<sup>3</sup> E02R 17/00

U.S. Cl. 405—204

13 Claims



1. A concrete offshore structure located in water of selected depth and extending from a surface defining the bottom of the water body to above the water surface and comprising at least two similar prefabricated concrete modular subassemblies interconnected in a vertical arrangement in such manner to define a horizontal interface between each such pair of subassemblies, vertical guide tubes cooperatively disposed in each of said subassemblies, said guide tubes adapted to at least partially register with one another when said subassemblies are vertically arranged, a shear pin adapted to be received by said cooperating guide tubes to prevent relative movement between said subassemblies, said shear pin having a leading edge to positively align said cooperating guide tubes and thereby said subassemblies when received into said guide tubes, and cement between each such pair at each interface for securing the members of each pair together.

#### 4,422,804 GRAVITY BASE OF OFFSHORE PRODUCTION PLATFORM WITH ICE-PENETRATING PERIPHERAL NOSE SECTIONS

Ben C. Gerwick, Jr., Oakland, Calif.; Edward B. Price, Dallas, and Thomas P. Taylor, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,372  
 Int. Cl.<sup>3</sup> E02B 17/00

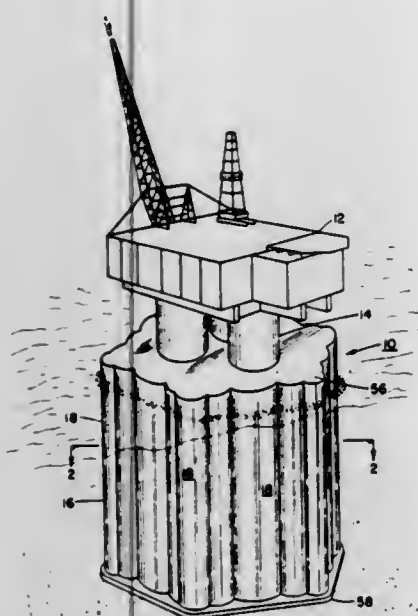
U.S. Cl. 405—210

13 Claims

1. A gravity base offshore production platform structure including an above-water platform section and a support section extending from the marine floor to said platform section, said support section comprising:
  - at least one shaft extending from the marine floor to said platform section;
  - an array of vertically extending oil storage compartments; and
  - an array of vertically extending ballast compartments about



said oil storage compartments and said at least one shaft, said array of ballast compartments forming protruding scallop-like or starpoint portions about the periphery of



said support section for absorbing maximum anticipated iceberg thrust forces and punching shear, whereby local punching failures as a result of iceberg impact are confined to said scallop-like or starpoint portions.

4,422,805

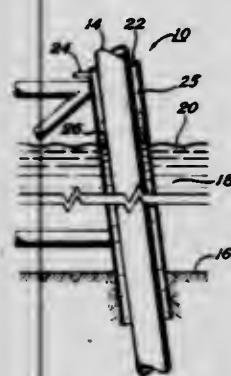
**METHOD OF GROUTING OFFSHORE STRUCTURES**  
Ronald E. Sweatman, Fountain Valley, Calif., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 221,946, Dec. 31, 1980, abandoned.  
This application Jun. 20, 1983, Ser. No. 504,241

Int. Cl.<sup>3</sup> E02B 17/00; E02D 5/34

U.S. Cl. 405-225

3 Claims



1. A method of grouting an offshore structure having a vertically extending outer jacket and a pile mounted inside of and spaced from said jacket to form a space therebetween comprising:

- closing the top of said space;
- forcing a generally water-immiscible, quick setting, initially fluid material into said space to displace water downwardly out of said space, the density of said material being less than that of the water it displaces by at least 0.1 pounds per gallon;
- forcing a low density aerated cement slurry into said space on top of said material thereby positioning said material proximate the bottom of said space, the density of said aerated slurry being less than that of said material by at least 0.1 pounds per gallon;
- allowing said material to set;
- pumping a conventional unaerated cement slurry into said

space under pressure, thereby collapsing said aerated cement slurry; and allowing the collapsed cement slurry to set.

4,422,806

**SLIDING TENSION LEG TOWER**

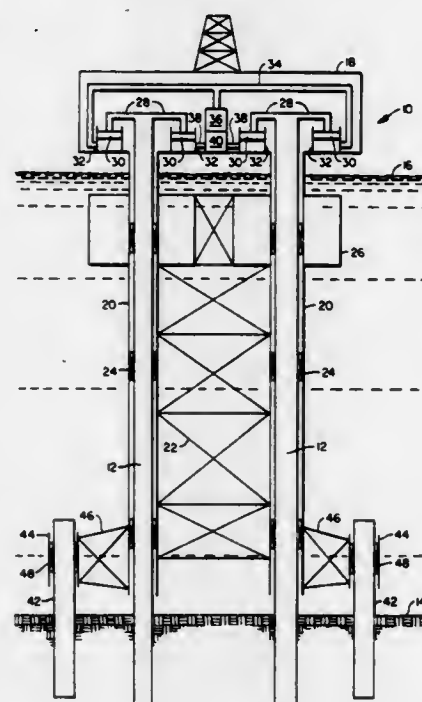
Barry J. Abbott, Concord, and William H. Silcox, San Francisco, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 17, 1981, Ser. No. 235,194

Int. Cl.<sup>3</sup> E02B 17/00

U.S. Cl. 405-227

7 Claims



1. An offshore drilling and producing structure, which comprises:

- a rigid platform including equipment associated therewith;
- a plurality of open-ended sleeves affixed to the platform and extending downwardly therefrom for a substantial distance below the water surface, in a substantially vertical orientation;
- an equal plurality of axial piles secured to the sea floor which extend upwardly into said open-ended sleeves to at least a position near the surface of the water;
- buoyant means affixed to said sleeves below the water line for providing an upward buoyant force in excess of the weight of said platform including equipment associated therewith and said sleeves;
- means for counterbalancing the excess buoyant force from the plurality of axial piles said means permitting simultaneous vertical movement of each of said sleeves with respect to each of said piles to permit a desired degree of compliancy of rotation about the sea floor.

4,422,807

**MINE ROOF SUPPORTS**

Michael Dettmers, Kamen; Walter Weirich, Dortmund, and Bernd Peters, Dülmen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen, Lunen, Fed. Rep. of Germany

Continuation of Ser. No. 216,200, Dec. 15, 1980, abandoned.

This application Dec. 20, 1982, Ser. No. 451,447

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1980, 3000237

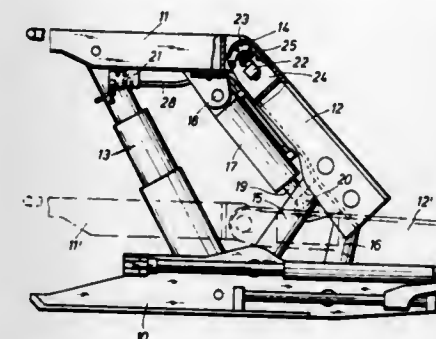
Int. Cl.<sup>3</sup> E21D 15/44

U.S. Cl. 405-296

13 Claims

- 1. In a mine roof support with a roof-engageable structure, the goaf shield pivotably connected to said roof-engageable structure and hydraulic props operable to raise and lower said roof-engageable structure, a hydraulic valve device and means

for operating said device to prevent operation of the props whenever the roof-engageable structure and the goaf shield reach a pre-determined relative angular disposition, the improvement comprising: the valve device and the operating means are mounted separately from said hydraulic props and directly to the roof-engageable structure and the goaf-shield in



a protected position which is in the region of the axis of pivotal connection between the roof-engageable structure and the goaf-shield and which allows the valve device and the operating means to move angularly in relation to one another in correspondence with a change in the angular disposition of the roof-engageable structure and the goaf-shield.

4,422,808

**HYDRAULICALLY-OPERATED DEVICES**

Stephen P. Cook, Walton, England, assignor to Dowty Mining Equipment Limited, United Kingdom

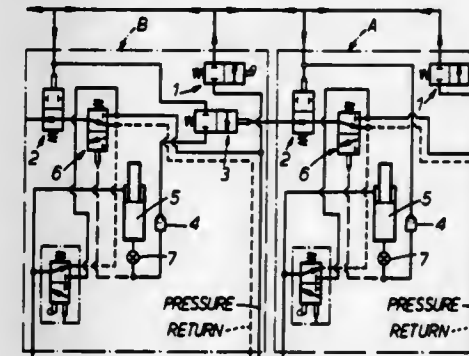
Filed Jul. 7, 1982, Ser. No. 395,973

Claims priority, application United Kingdom, Jul. 16, 1981, 8121999

Int. Cl.<sup>3</sup> E21D 23/16

U.S. Cl. 405-302

3 Claims



3. An assembly of mine-roof supports of which (i) each has hydraulically-operated means, the assembly of hydraulically-operated means, in use, being operated one after the other in a predetermined sequence,

(ii) each of some at least has a control member actuatable to cause operation of the hydraulically-operated means of other mine-roof supports, and

(iii) each, other than that having the first hydraulically-operated means to be operated in the predetermined sequence, has associated with it hydraulic control means

(a) normally to prevent operation of a hydraulically-operated means in response to actuation of a control member, but

(b) operable, in response both to the completion of operation of the next-before hydraulically-operated means in sequence and to the de-actuation of the control member which caused operation of that next-before means, to permit operation of the next-to-operate hydraulically-operated means in the sequence when a control member is next actuated, and

(c) comprising a first pressure-operated hydraulic control valve and two further serially-connected pressure-

operated hydraulic control valves, one of the two being responsive to the completion of operation of the next-before hydraulic means in the sequence to permit the flow of fluid to the second of the two, and the second being responsive to the deactuation of the control member which caused operation of the next-before hydraulic means in the sequence to permit the flow of said fluid to the first pressure-operated hydraulic control valve.

4,422,809

**COAL PUMP**

John H. Bonin, Sunnyvale; John W. Meyer, Palo Alto, and Arnold D. Daniel, Jr., Alameda County Fairgrounds, all of Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

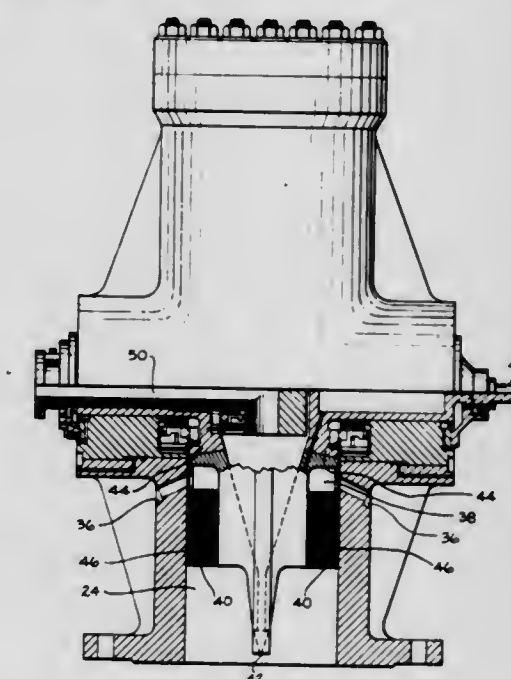
Continuation of Ser. No. 036, 843, May 7, 1979, abandoned.

This application Jun. 15, 1981, Ser. No. 273,606

Int. Cl.<sup>3</sup> B65G 53/40

U.S. Cl. 406-98

8 Claims



1. Apparatus for feeding pulverized material from a supply source to a high pressure accumulator, comprising:

- (a) a high pressure housing,
- (b) feed means for supplying pulverized material,
- (c) extruder means disposed in the housing and connected to the feed means for receiving the pulverized material and discharging it at high pressure within the housing,
- (d) said extruder means having a central rotating hub and a plurality of radially extending sprues each terminating with a discharge outlet which rotate therewith,
- (e) all of the sprues disposed within a common rotating plane perpendicular to the rotating hub, and
- (f) gas pressurizing means disposed within the housing on said rotating hub adjacent the sprues for directing high pressure gas parallel to and adjacent the plane in which the sprues are disposed.

4,422,810

**APPARATUS FOR TRANSPORTING PNEUMATICALLY SUSPENDED PARTICULATES FROM A SOURCE TO A PLURALITY OF RECEIVERS**

Douglas J. Boring, Franklin, Pa., assignor to Conair, Inc., Franklin, Pa.

Filed Dec. 20, 1978, Ser. No. 971,344

Int. Cl.<sup>3</sup> B65G 53/26, 53/52

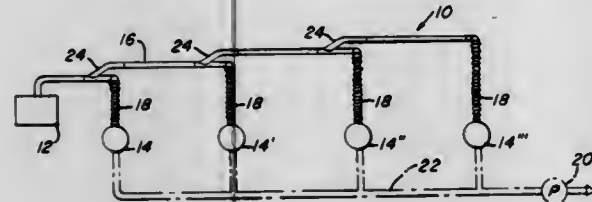
U.S. Cl. 406-156

8 Claims

- 1. A vacuum conveying system for transporting pneumatically suspended particulates from an upstream particulate source to a plurality of downstream particulate receiving means comprising: a continuous primary material transport conduit having a plurality of elongated generally horizontally



extending conduit portions with each downstream extent of said conduit portions being spaced below the adjacent upstream extent of the downstream adjacent one of said conduit portions; said primary material transporting conduit having adjacent ones of said conduit portions connected by transition conduit portions, respectively, a plurality of particulate receiving means, branch conduits communicating between said particulate receiving means and said conduit portions downstream of the upstream section of said transition conduit portions, respectively; vacuum producing means for obtaining a vacuum



in a selected one of said particulate receiving means whereby pneumatically suspended particulate from such a source are transportable by suction to said selected one of said particulate receiving means; and each of said transition portions extending at an upward acute angle with respect to the central axis of the downstream conduit portion of said conduit portions connected thereby to inhibit the flow of particulate there-through when said vacuum producing means discontinues the vacuum to said selected one of said particulate receiving means.

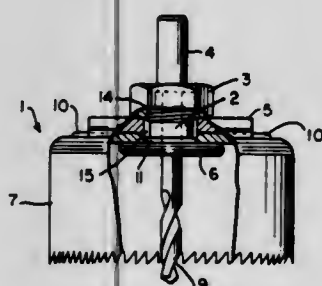
#### 4,422,811 HOLE SAW

Bruce Ellison, Leeds, and James A. DeCarteret, Bernardston, both of Mass., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 16, 1981, Ser. No. 225,849  
Int. Cl.<sup>3</sup> B23B 51/04

U.S. Cl. 408—204

2 Claims



#### 1. A hole saw comprising:

- a mandrel;
- a hole saw blade disposed on said mandrel for rotation with said mandrel about the mandrel axis;
- a drive washer disposed on said mandrel for rotation with said mandrel about the mandrel axis;
- a mandrel nut disposed on said mandrel to secure said hole saw blade and said drive washer to said mandrel;
- said hole saw blade and said drive washer are provided with cooperation drive means for driving said hole saw blade;
- said mandrel is provided with a backing land at its one end and a drive shank at its other end;
- said hole saw blade abuts said backing land;
- said drive washer abuts said hole saw blade;
- said mandrel nut abuts said drive washer;
- said mandrel nut is secured to said mandrel by means of a left hand thread; and
- said cooperating drive means are elongated radially extending ribs on one of said hole saw blade and said drive washer and coacting elongated radially extending depressions on the other of said hole saw blade and said drive washer said hole saw blade and said drive washer which

serving to drive said hole saw blade and further serving as stiffening means for said hole saw blade.

#### 4,422,812 ROTATABLE SHELL CUTTER

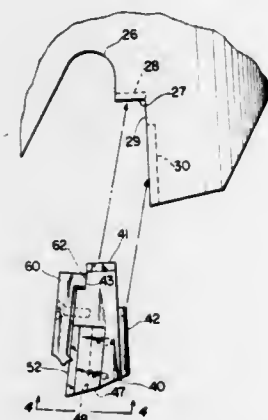
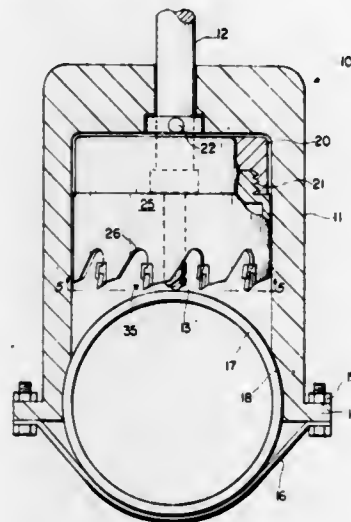
Kevin D. Linville, 6257 Sturm Rd., Huntington, W. Va. 25705

Filed Nov. 25, 1981, Ser. No. 324,993

Int. Cl.<sup>3</sup> B23B 27/10

U.S. Cl. 408—204

12 Claims



1. A rotatable shell cutter of the type intended for cutting an opening into the curved side surface of an elongated pipe, generally transverse to the direction of elongation of the pipe, comprising:

- a cylindrical member having an operative end, at least three cutting assemblies arranged in a circle at the operative end of the cylindrical member, to cut into the side of the pipe as the cylindrical member is advanced parallel to its axis,
- a rotatable drill bit located along the axis of the cylindrical member and rotatable therewith to drill a hole into the side of the pipe as the cutting assemblies of the cylindrical member are cutting an opening into the side of the pipe,
- a circumferentially extending recess formed into the operative end of the cylindrical member adjacent each cutting assembly, the side of each recess, on the trailing side thereof, taken in the direction of rotation, having first locating means therein, which first locating means is longer in the axial direction of the cylindrical member than in the circumferential direction thereof,
- a seat operatively mounted so as to be supported by said first locating means, said seat being elongated in a direction parallel to the axis of the cylindrical member, such that a major portion of the rear of the seat, taken in the direction of travel of the cylindrical member, is supported by the axially extending part of said first locating means, said seat being removably mounted relative to said cylindrical member,
- a cutting insert being elongated and having a cutting edge at the end thereof extending axially out from said operative

end of the cylindrical member, the elongated trailing side of the cutting insert resting against the seat, second locating means on the insert and seat for locating the cutting insert against and relative to the seat, and a clamp having first means removably connected relative to the cylindrical member, said connection being beyond the ends of the seat and cutting insert, which ends are remote from the cutting edge of the latter, and said clamp having second means engaging the cutting insert to positively and removably position the cutting insert relative to the seat and the cylindrical member, and to secure the cutting insert and seat relative to the cylindrical member.

#### 4,422,813 WALL EXPANSION DEVICE WITH ANCHORING SOCKET

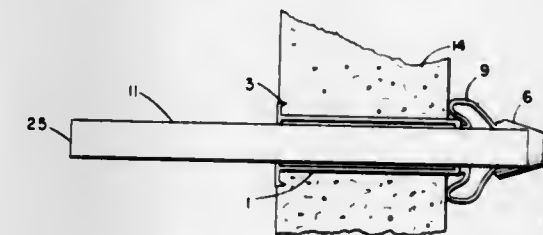
Sheldon Greenbaum, 11651 Stoneview Sq., Reston, Va. 22091

Filed Mar. 5, 1981, Ser. No. 240,625

Int. Cl.<sup>3</sup> F16B 13/06

U.S. Cl. 411—38

4 Claims



1. A device for securing an object to a hollow wall surface comprising a first hollow tube member having wall-engaging means at one end, a second hollow tube member having a plurality of longitudinally extending slots spaced about its outer surface, means for removably fastening the other end of said first member to one end of said second member in longitudinal alignment of said members for insertion into an opening through said wall surface, the interior surface of said other end of said second member being provided with threads for receiving a threaded portion of a fastening member extending longitudinally through said joined hollow members, a portion of said second tube member adjacent said threaded end tapering inwardly toward said threaded end, said second member being adapted to collapse radially outwardly along said slots and into contact with the adjacent wall surface as a fastening member is threaded through said threaded end of said second member, said second member being capable of being unfastened from said first member by means extending through said longitudinally aligned hollow members and engaging the inner wall surface of said tapered portion with a force sufficient to unfasten said second member from said first member and cause said second hollow member to fall within said hollow wall.

#### 4,422,814 GROUND LEVEL DUMP UNIT

Ernest D. Borders, Statesville, N.C., assignor to Applied Products, Inc., Statesville, N.C.

Filed Jun. 2, 1981, Ser. No. 269,467

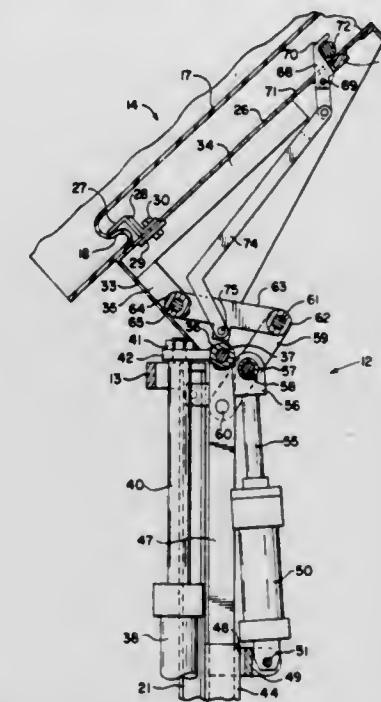
Int. Cl.<sup>3</sup> B65G 65/30

U.S. Cl. 414—303

6 Claims

1. A dumping unit for lifting and dumping a waste receptacle into a compactor, comprising a frame mounted on the compactor, laterally spaced vertical slide bars slidably mounted on said frame, a fluid cylinder on said frame for raising said slide bars, a face plate assembly pivoted on the upper ends of said slide bars and having a support saddle at its upper end, a second fluid cylinder mounted on the lower ends of said slide bars, linkage means connecting said face plate and said second cylinder to rotate said face plate and invert a receptacle supported on said saddle to dumping position, a hook lever pivoted on

said face plate assembly and adapted to engage an abutment on said receptacle to lock it in inverted dumping position, and a bell crank link connecting said hook lever to said linkage



means to move the hook lever into engagement with said abutment as the face plate assembly is rotated to invert the receptacle.

#### 4,422,815 MACHINE TOOL SUPPORT AND DISCHARGE APPARATUS

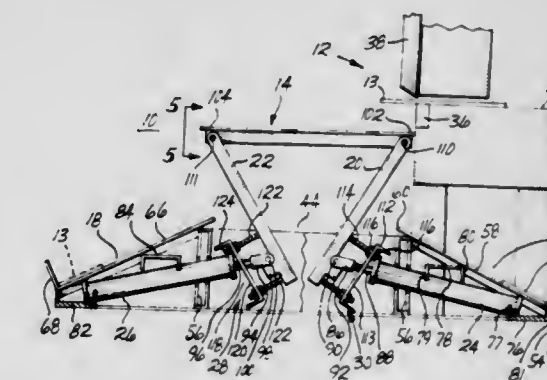
Bernard Danhof, Bellevue, Wash., assignor to Western Automation Corporation, Redmond, Wash.

Filed Jan. 4, 1982, Ser. No. 336,635

Int. Cl.<sup>3</sup> B65H 35/00

U.S. Cl. 414—222

58 Claims



47. A double tilting support and discharge apparatus, comprising:

- (a) a table portion;
- (b) first support leg means having an upper end portion pivotally connected to said table portion at a first pivot axis;
- (c) second support leg means having an upper end portion pivotally connected to said table portion at a second pivot axis spaced from said first pivot axis;
- (d) first actuator means pivotally supporting the lower end portion of said first leg means, said first actuator means pivoting said table portion about said second axis by shifting said first actuator means between a retracted position and an extended position; and
- (e) second actuator means pivotally supporting the lower end portion of said second leg means, said second actuator means pivoting said table portion about said first pivot axis



by shifting said second actuator means between a retracted position and an extended position.

4,422,816

## SHIFTABLE ARTICLE STORAGE DEVICE

Han-Ichiro Naito, Akiyama; Tsuneo Yamaguchi, Tokyo, and Kiyoshi Harashima, Ome, all of Japan, assignors to Elecompack Company Ltd., Tokyo, Japan

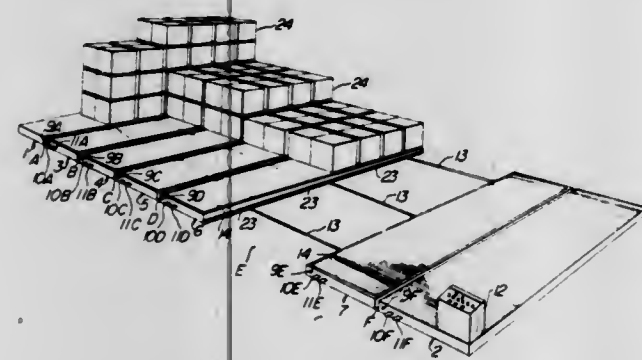
Filed Mar. 16, 1971, Ser. No. 124,726

Claims priority, application Japan, Mar. 17, 1970, 45-22501; Jun. 14, 1970, 45-61662; Jun. 29, 1970, 45-56748; Dec. 28, 1970, 45-125408

Int. Cl.<sup>3</sup> A47B 53/00

U.S. Cl. 414—331

7 Claims



1. In a shiftable storage means including a plurality of movable stacks, supporting means for each of said stacks, including a reversible electric motor and two relay means for each of said stacks for controlling the direction of the motors and stacks, and a plurality of safety switches secured to the sides of each movable stack for cutting off the current to the motors when the stacks move too close to each other; the improvement which comprises: a normally open pair of relay contacts mounted on one of said relay means for completing a bypass circuit around a safety switch on an adjacent stack for permitting both stacks to be moved in a desired direction to open a space between stacks.

4,422,817

## LOAD MANIPULATING APPARATUS

Frank Little, Au Gres, Mich., assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed May 29, 1981, Ser. No. 268,622

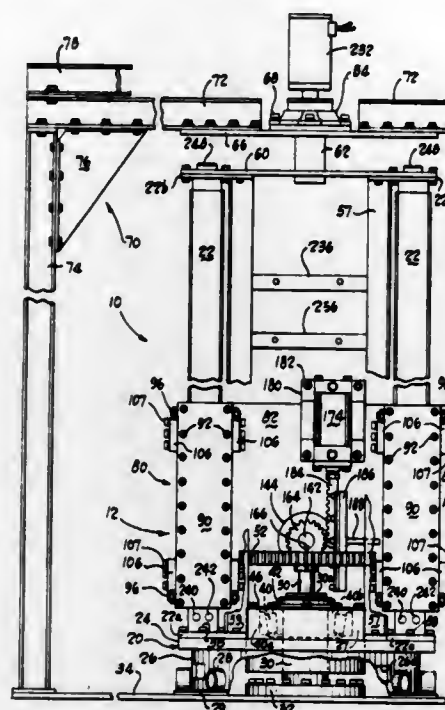
Int. Cl.<sup>3</sup> B65G 65/23

U.S. Cl. 414—421

12 Claims

1. A load manipulating apparatus comprising:
  - (a) a turnplate assembly rollingly engaging a base means and supported for rotation about an upstanding shaft by a bearing means;
  - (b) a pair of columns attached to and extending upwardly from said turnplate assembly;
  - (c) turnplate drive means carried by said turnplate assembly, engaging said shaft for effecting rotation of said turnplate assembly, said turnplate drive means rotating with said turnplate assembly;
  - (d) an elevator guided for vertical, reciprocating movement along said columns;
  - (e) elevator drive means coactable with drive structure formed on said columns for effecting movement in said elevator;
  - (f) an operating arm attached to said elevator for engaging a load, including means for releasably engaging a parts receptacle, said parts receptacle comprising a hopper including a pair of spaced, apertured ears engageable by

fluid pressure actuated pins carried by said operating arm; and,



(g) arm tilt means for pivoting said arm about a horizontal axis.

4,422,818

## SCRAPPER TYPE VEHICLE

Lloyd A. Molby, P.O. Box 7788, Longview, Tex. 75602

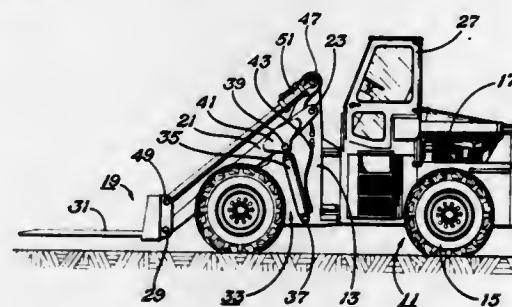
Continuation of Ser. No. 162,376, Jun. 23, 1980, abandoned.

This application Aug. 16, 1982, Ser. No. 408,684

Int. Cl.<sup>3</sup> B66F 9/00

U.S. Cl. 414—712

3 Claims



1. In a scrapper type vehicle for handling junk cars and the like and having a frame mounted on wheels and having a prime mover powering the vehicle, the improvement comprising:

- a. a pair of main beams attached at respective inner end portions to a pair of respective first points on said frame for pivotal movement about a first transverse, horizontal axis thereat;
- b. a lifting fork means pivotally attached to said main beams at their respective outer ends at a pair of respective second points and having lift prongs adapted to penetrate laterally through said junk cars to lift said junk cars and to load said junk cars onto a transport vehicle;
- c. elevating means connected with said main beams and said frame for elevating said outer ends of said main beams and said lift prongs with any junk car thereon; and
- d. lift fork tilting means attached to said frame at a pair of respective third points for pivotal movement about a second transverse, horizontal axis thereat; said lift fork tilting means being pivotally attached to said lift fork means at a pair of respective fourth points; said lift fork tilting means including extensible and retractable means that can be locked into a given length for fixing an angle of tilt to said lift fork means, that said lift fork tilting means can be locked into a parallelogram linkage with said main beams with said lifting fork means at neutral tilt and that

said lift fork tilting means can be varied into trapezoidal configurations with said main beams at other angles of tilt of said lifting fork means when positioned either upward or downward from the neutral tilt; said pair of first and third points being disposed vertically with respect to each other and at the same angle and in the same respective direction that said pairs of said second and fourth points are disposed with respect to each other when said lift fork prongs are substantially horizontal in said neutral tilt such that said lift fork means can be moved from ground level to maximum height with the neutral tilt maintained by only raising said outer ends of said main beams because of said parallelogram linkage at said neutral tilt.

4,422,819

## FOLD-AWAY FORK LIFT FOR LOADERS

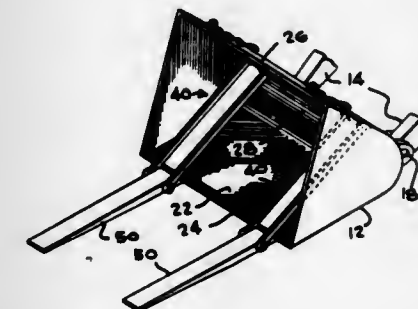
William H. Guest, Torrington, Conn., assignor to Guest Industries, Inc., Torrington, Conn.

Filed Apr. 21, 1981, Ser. No. 256,245

Int. Cl.<sup>3</sup> E02F 3/70

U.S. Cl. 414—724

33 Claims



14. In combination with a front end bucket having a bottom plate with a lip, an upper inclined plate and adjoining plate means between the said plates, a fork lift attachment comprising:

- a tine, and
- means comprising a support arm for mounting said tine for movement between a first, use position wherein said tine extends forwardly of the front lip of the bucket and a second, storage position in which said tine extends along the underside of said upper plate.

4,422,820

## SPOILER FOR FLUID TURBINE DIFFUSER

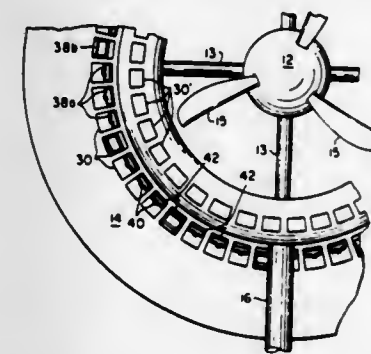
Jerome Kirsch, Dix Hills, and Edward Markow, Oakdale, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,622

Int. Cl.<sup>3</sup> F03D 7/04

U.S. Cl. 415—4

11 Claims



1. A fluid-energy device having a passively limited power output, said device comprising:

- a duct with an inlet, an outlet of greater cross sectional area than the inlet, and at least one slot for conducting external

fluid to a boundary layer along an inner surface of the duct between the inlet and the outlet;

a rotatable turbine mounted within the duct between the outlet and the inlet; and

at least one tab mounted to the duct so as to have a preload position in which fluid flow through the slot is relatively unimpeded and an attenuating position in which the slot is at least partially blocked, said tab having a lifting surface arranged such that fluid flow through the slot causes a decrease in pressure against the lifting surface.

4,422,821

## FLUID PROCESSING DEVICE

Stanley Smith, Wotton-under-Edge, England, assignor to Rolls Royce Limited, London, England

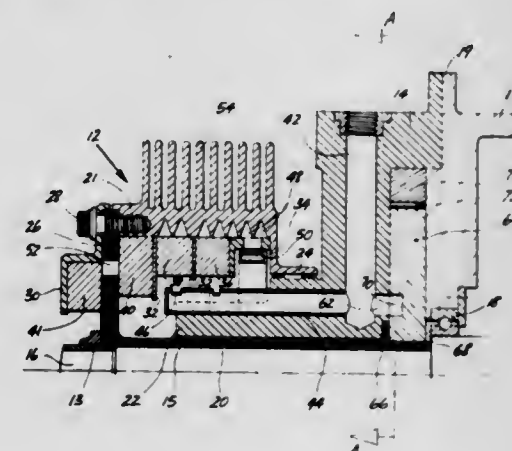
Filed Dec. 22, 1980, Ser. No. 218,704

Claims priority, application United Kingdom, Dec. 21, 1979, 7944038

Int. Cl.<sup>3</sup> F04D 11/00

U.S. Cl. 415—89

4 Claims



1. A separator for a fluid mixture which contains both a liquid and a gas, comprising:

- a body having a static part and a rotatable part and drive means for causing rotation of the rotatable part thereof;
- at least three axially separated annular compartments within the rotatable part of the body, a first and a second one of said compartments each having one inlet and separate liquid and gas outlets therefrom, and each containing a rigid fluid-permeable material connected for rotation with the body and disposed between the inlet and one of said outlets, the third of which has one inlet and one outlet and contains a static scoop; and,
- means for directing fluid mixture to be separated into the inlet of the first compartment at a radially inner part thereof,

the arrangement being such that the mixture flows into the fluid-permeable material in the first compartment, the liquid flowing radially outwardly under centrifugal action through the material to the liquid outlet at a first radius through which it passes into the third compartment to be picked up and delivered from the device by the scoop the entry to which is disposed at a second radius less than the first radius, the gas leaving the material at a third radius less than the second radius, and passing to the inlet of the second compartment which is disposed at a radially outer part thereof at a radius less than the second radius, the gas passing radially inwardly through the fluid-permeable material in the compartment to a clean gas outlet while any liquid carried in the fluid-permeable material by the gas is centrifuged to a liquid outlet in the radially outer part of the compartment which also communicates with the inlet of the third compartment.



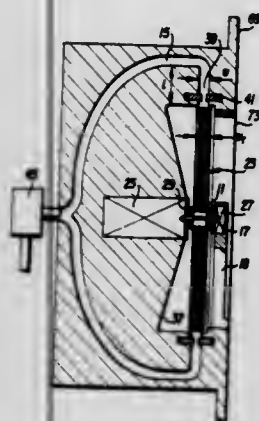
**4,422,822**  
**ROTATING FIBER ARRAY MOLECULAR DRIVER AND**  
**MOLECULAR MOMENTUM TRANSFER DEVICE**  
**CONSTRUCTED THEREWITH**

Norman Milleron, 1854 San Juan, Berkeley, Calif. 94707  
 Filed Aug. 11, 1980, Ser. No. 176,971

Int. Cl.<sup>3</sup> F01D 1/34

U.S. Cl. 415—90

20 Claims



1. A molecular vacuum pump for evacuating gaseous molecules from a chamber containing said molecules comprising:
  - a housing;
  - a first rotor mounted in said housing and including a first central hub and a plurality of fibers attached to and about the outer circumference of said hub, said fibers at the point of attachment to said hub being normal to said outer circumference and extending in a radial direction from an axis of said hub;
  - a molecule inlet provided in said housing and connecting with said chamber for establishing a path for molecules to flow from said chamber into said rotor;
  - means for rotating said rotor about its axis at a predetermined speed sufficient to axially extend and straighten said fibers and provide the ends of said fibers with a tip speed which equals or exceeds the average velocity of gaseous fluid molecules entering said rotor such that molecules struck by the sides of the ends of said fibers are propelled from a point radially outward of the hub where they are struck in a direction defined by a distribution function which peaks in a direction normal to the sides of said fibers and in the direction of fiber rotation;
  - an annular molecule exit path provided in said housing and surrounding said first rotor, said annular molecule exit comprising at least one exit slot spaced from the ends of the rotating fibers extending radially and annularly about the axis of said hub and receiving molecules struck by said rotor fibers;
  - a molecule discharge path connected to said annular molecule exit path; and
  - means for magnetically suspending said rotor when said rotor is rotating at said predetermined speed.

**4,422,823**  
**TURBODRILL**  
 Rolan A. Ioannesian, naberezhnaya Tarasa Shevchenko, 1/2, kv. 19, and Jury R. Ioannesian, Matveevskaya ulitsa, 18, korpus 2, kv. 63, both of Moscow, U.S.S.R.

Continuation of Ser. No. 855,544, Nov. 29, 1977, abandoned.  
 This application Jun. 29, 1981, Ser. No. 278,395

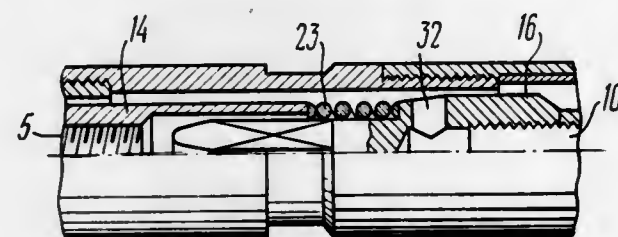
Int. Cl.<sup>3</sup> F01D 15/06

U.S. Cl. 415—199.5

17 Claims

1. A turbodrill comprising:
  - a casing;
  - a multistage turbine in said casing having a plurality of stators and a plurality of rotors, said stators being mounted to and rigidly fixed to said casing;
  - a sectional shaft composed of a plurality of releasably con-

nected neighboring shafts, each said connected shaft having a separate one of said rotors mounted thereto; first ball bearing means for each said neighboring shaft comprising ball bearings disposed between said casing and each said neighboring shaft separately to said casing; connecting means operating to releasably connect said releasably connected shafts serially to one another and being operable to permit relative displacement therebetween at the releasable connection, said connecting means comprising slide couplings formed by a female and a male half-couplings, said half-couplings have a cross-section to compensate for misalignment of neighboring shafts;



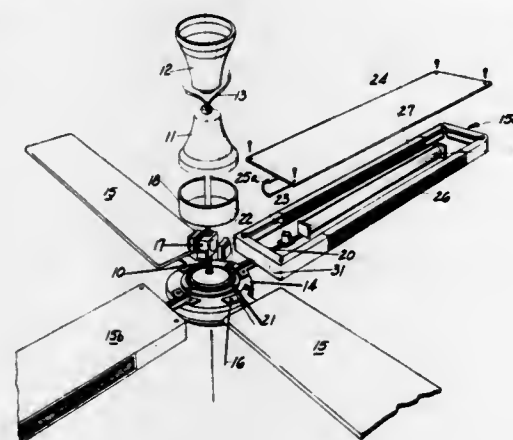
- a spindle assembly mounted to one end of said sectional shaft and including a spindle shaft operable to rotatably drive a drilling bit;
- hydraulic damping means forming part of said slide couplings operably disposed between said sectional shaft and said spindle shaft and including an interstice in said female half-coupling, said interstice communicating with the space between the casing of the turbodrill and the shaft thereof and a sealing element placed in the male half-coupling; and
- second ball bearing means disposed between said casing and said spindle assembly, and rotatably mounting said spindle assembly in said casing.

**4,422,824**  
**GERMICIDAL CEILING FAN BLADE**  
 Charles A. Eisenhardt, Jr., 1051 Sugar Sands Blvd., Riviera Beach, Fla. 33404

Filed Mar. 29, 1982, Ser. No. 363,260  
 Int. Cl.<sup>3</sup> F04D 29/70

U.S. Cl. 416—5

16 Claims



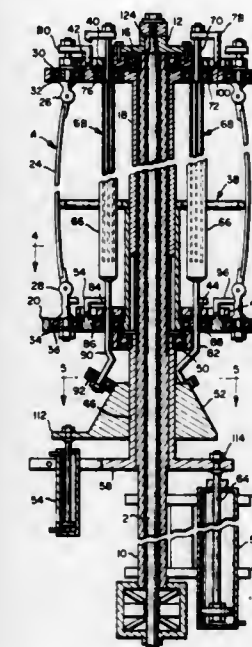
1. A fan blade comprising: a hollow housing having leading and trailing edges through which air may pass; a germicidal light located within said housing; and means to insure that said light will burn as the fan blade rotates.

**4,422,825**  
**CONTROLLED WIND MOTOR**  
 Fred A. Boswell, Box 440, Ft. Valley Rte., Strasburg, Va. 22657  
 Continuation-in-part of Ser. No. 131,666, Apr. 29, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,627

Int. Cl.<sup>3</sup> F03D 7/06

U.S. Cl. 416—132 B

7 Claims



1. A mechanical sail including:
  - (a) a mast including a rotatably drive shaft and a nonrotatable sleeve surrounding said drive shaft;
  - (b) a top vane mount and a bottom vane mount rotatably connected to said mast;
  - (c) said mounts spaced from each other on said mast;
  - (d) a series of rotatable vanes spaced from and surrounding said mast and supported by and between said mounts;
  - (e) means extending between said mounts and connected to said vanes for controlling the rotation of said vanes including cam means;
  - (f) first piston operator means for said cam means associated with said mast below said bottom vane mount;
  - (g) said first piston operator means being movable vertically with respect to said mast;
  - (h) second piston operator means for moving said first piston operator means vertically with respect to said mast;
  - (i) said vanes being flexible and bowed outwardly;
  - (j) said bottom vane mount being movable vertically with respect to said mast and connected to said second piston operator means;
  - (k) whereby when said second piston operator means is operated, said bottom vane mount will move toward said top vane mount causing said vanes to bow outwardly at a desired arc; and
  - (l) whereby when said first piston operator means is moved, said vanes are caused to rotate to the desired angle of attack with respect to wind velocity and direction.

**4,422,826**  
**PROPELLER RUNNER HAVING SWIVELLING BLADES**  
**FOR TURBINES**

Severin Casacci, La Tronche, and Paul Jarriand, Grenoble, both of France, assignors to Neyrpic, Grenoble, France

Filed Apr. 8, 1981, Ser. No. 252,101

Claims priority, application France, Apr. 24, 1980, 80 09243

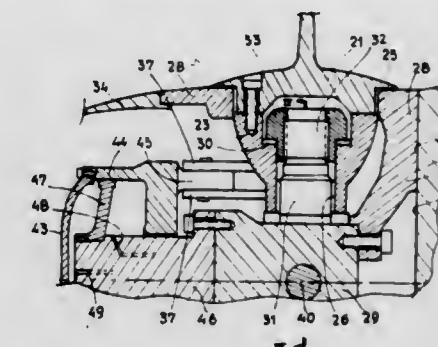
Int. Cl.<sup>3</sup> F03B 3/06

U.S. Cl. 416—157 R

3 Claims

1. A propeller runner having four swivelling blades radially mounted in a hub, each said blade having at its root spaced, coaxial first and second cylindrical bearing surfaces defining the axis of rotation of said blade about itself, this rotation being intended for governing the angle of incidence of said blade, lateral connecting rods on each blade the movement of which is controlled simultaneously by means internal to said runner so

as to regulate jointly the angle of incidence of all of said blades, said first cylindrical bearing surface of each blade being engaged in a bearing formed in the outer portion of said hub, said second cylindrical bearing surface of each blade being engaged around a cylindrical journal, each said journal being rigidly and radially fixed around a central core which in turn is rigidly



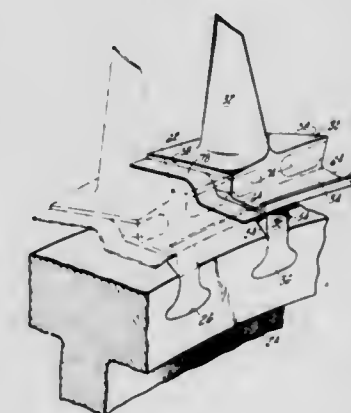
connected to a portion of said hub extending towards the center, said core carrying two diametrically opposite journals, a shaft passing through said core perpendicularly to the axis of said two journals, said shaft being locked in said core and having two ends which constitute two further journals, each said journal forming an axial thrust bearing for the corresponding blade.

**4,422,827**  
**BLADE ROOT SEAL**  
 Paul M. Buxe, Lake Park; James F. Marshall, and Paul A. Smith, Jr., both of Palm Beach Gardens, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.  
 Filed Feb. 18, 1982, Ser. No. 349,747

Int. Cl.<sup>3</sup> F01D 5/30

U.S. Cl. 416—193 A

4 Claims



1. A rotor assembly and adjacent static structure for a gas turbine engine comprising:
  - a disk having a plurality of axially extending blade receiving slots around its periphery; and
  - a plurality of rotor blades each including a platform, an airfoil, and a root having a base portion and a neck portion, said platform, airfoil, and root being of one-piece construction, said base portion of one of said rotor blades being disposed in each of said slots, said neck portion extending radially outwardly from said base portion to said platform and having an upstream and downstream end and laterally facing side surfaces spaced apart from the side surfaces of adjacent blade root neck portions, said airfoil extending radially outwardly from said platform, each platform having an underside surface and an axially extending first edge on each side of said airfoil, each first edge substantially abutting a corresponding first edge of the platform of an adjacent blade, each blade including a seal segment integral with one of said ends of said neck portion and projecting axially away from said end and

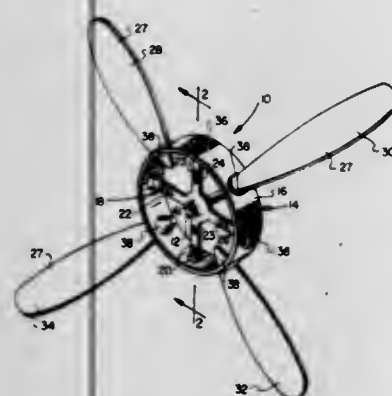


spaced radially inwardly from said platform and radially outwardly from said base portion, said seal segments each having an axially extending second edge on each side of said neck portion substantially abutting a corresponding second edge of an adjacent blade, said segments defining a first segmented annular ring, each segment having an underside surface, said first ring cooperating with said static structure to define a first annular seal, each blade also including air dam means extending laterally from each of said neck portion side surfaces to said edges of said platform and seal segment and extending radially from said platform to said seal segment, said dam means of adjacent blades substantially abutting each other to define a second annular seal, said abutting edges of said platforms and seal segments, and said abutting dam means defining a line of abutment between each pair of adjacent blades along said underside surfaces of said abutting platforms and abutting seal segments, said rotor assembly also including a thin silicone rubber strip overlying the full axial length of said line of abutment to reduce leakage between said abutting edges, each strip being bonded to at least one of said blades.

**4,422,828**  
**METHOD OF AND APPARATUS FOR INCREASING PROPULSIVE EFFICIENCY OF AIRCRAFT PROPELLERS**

Kenneth W. Sambell, 3412 Little Rd., Arlington, Tex. 76016  
Filed Oct. 9, 1981, Ser. No. 310,284  
Int. Cl.<sup>3</sup> B64C 11/12, 11/40  
U.S. Cl. 416-135

5 Claims

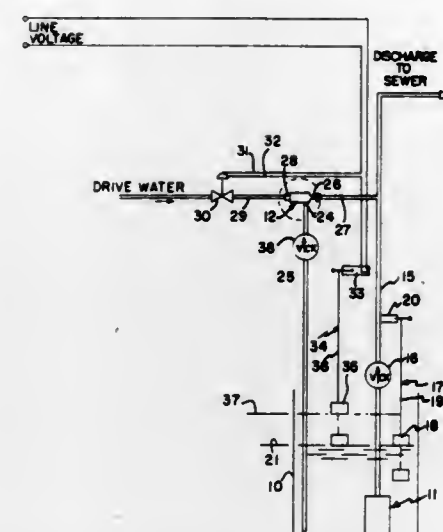


1. An improved aircraft propeller assembly for fixed wing aircraft of the type comprising an array of generally vertically oriented propeller blades secured about a generally horizontal propeller drive shaft driven by an engine secured to the wing of an aircraft, wherein the improvement comprises,  
a beamwise flapping flexure array secured radially about the drive shaft for providing beamwise flapping relative to the drive shaft and providing blade rigidity in radial torsional and inplane directions relative thereto;  
a cylindrical hub flexibly mounted to said flexure array symmetrically around said drive shaft;  
said hub being mounted to said flexure by a pivot pin joint having a longitudinal axis of symmetry substantially within the plane of rotation of the said flexure array and tangential to a circle drawn in said plane;  
said propeller blades being mounted symmetrically to said hub; and  
said flexures constructed for permitting beamwise flapping of said hub and propeller array in response to generally horizontal wind loading of said propellers.

**4,422,829**  
**SUMP DRAIN SYSTEM**  
William T. Buchanan, 32 Hamilton La., Oak Brook, Ill. 60521  
Filed Feb. 25, 1982, Ser. No. 352,361  
Int. Cl.<sup>3</sup> F04F 5/48

U.S. Cl. 417-40

5 Claims

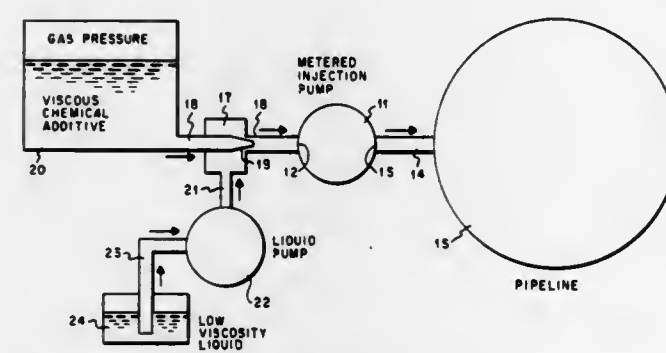


1. A drain system for a sump disposed in a dwelling supplied with electrical power and municipal water, said system comprising a first pump energizable by said electrical power, and a second pump energizable by said municipal water, first means causing said first pump to be energized and drain the sump in response to the water rising to a first predetermined level, and second means causing said second pump to be energized and drain the sump immediately upon a failure of said electrical power, said second means further causing said second pump to be energized and drain the sump upon the water rising to a second predetermined level higher than said first predetermined level.

**4,422,830**  
**PERFORMANCE OF A PIPELINE ADDITIVE INJECTION SYSTEM**  
Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.  
Filed Dec. 14, 1981, Ser. No. 330,113  
Int. Cl.<sup>3</sup> F04F 5/12

U.S. Cl. 417-54

5 Claims



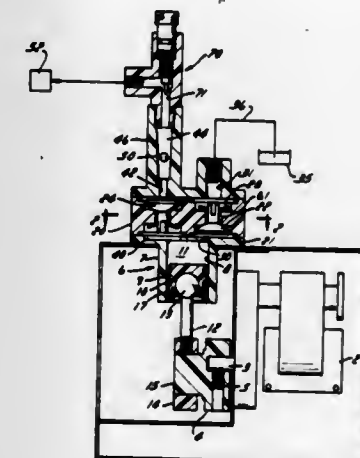
1. In an additive injection method wherein a viscous chemical liquid in a container is pumped in a metered and controlled amount through an inlet line to the suction side of a metering injection pump and thence through the discharge side of said metering injection pump into a pipeline liquid flowing in a pipeline, the improvement comprising injecting a relatively low viscosity liquid into the said inlet line, said low viscosity liquid being compatible with said pipeline liquid, and operating said metering injection pump in a manner such that the rate of throughput of said metering injection pump exceeds the rate at which said low viscosity liquid is pumped into said inlet line

and in a manner such that the amount of said chemical liquid pumped into said pipeline liquid is metered and controlled.

**4,422,831**  
**PUMP**  
Rolyn A. Schmid, Hayward, Wis., assignor to Bender Machine Works, Inc., Hayward, Wis.  
Filed Nov. 2, 1981, Ser. No. 317,168  
Int. Cl.<sup>3</sup> F04B 21/00, 39/00

U.S. Cl. 417-63

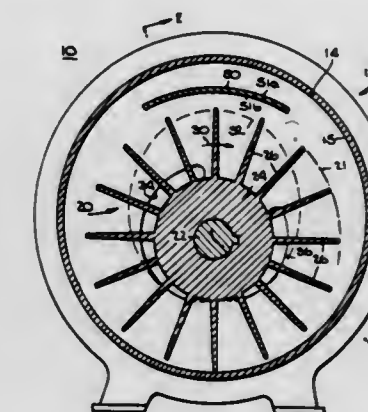
2 Claims



1. A self-priming adjustable output pump assembly for supplying liquid from a source of supply either into a pressurized vessel maintained at some greater pressure greater than atmospheric or to atmosphere comprising: a piston type pump including a pumping chamber and a piston reciprocable therein, said pumping chamber having an inlet port and a discharge port at the upper end thereof, said discharge port being connected to a discharge passage which is connectable to said pressurized vessel or to atmosphere; means for reciprocating said piston in said pumping chamber to effect pumping and suction strokes, said pumping chamber having a maximum volumetric capacity at the end of a suction stroke and a minimum volumetric capacity at the end of a pumping stroke, a valve assembly including a one-way inlet valve for permitting one way flow of fluid from said source of supply through said inlet port into said pumping chamber during a suction stroke and also including a one-way discharge valve for permitting one-way flow of fluid from said pumping chamber through said discharge port to said discharge passage during a pumping stroke, a discharge chamber located between said discharge valve and said discharge port of said pumping chamber, the volumetric capacity of said discharge chamber being equal to or greater than the minimum volumetric capacity of said pumping chamber whereby any air that is drawn into said pumping chamber rises to the top thereof and is discharged through said discharge port, through said discharge chamber, through said discharge valve and through said discharge passage prior to liquid being discharged therethrough to thereby prevent air from accumulating in said pumping chamber and maintaining said pump in a primed condition, and means to vary the liquid flow from said pump comprising a by-pass passage communicating between the inlet side of said inlet valve and said pumping chamber and an adjustable by-pass valve for varying the amount of liquid flow through said by-pass passage from said pumping chamber to said inlet side of said inlet valve during a pumping stroke of said piston when liquid is being supplied to said pressurized vessel, said means further comprising an adjustable output valve for varying the amount of liquid flow through said discharge passage to increase fluid pressure therein to effect liquid flow from said pumping chamber through said by-pass passage to said inlet side of said inlet valve during a pumping stroke of said piston and thereby render said by-pass valve operative when liquid is being supplied to atmosphere.

**4,422,832**  
**LIQUID RING PUMP WITH VANES IN LIQUID RING**  
Harold K. Haavik, South Norwalk, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.  
Filed Oct. 23, 1981, Ser. No. 314,388  
Int. Cl.<sup>3</sup> F04C 19/00

15 Claims



1. In a liquid ring pump including an annular housing; a rotor rotatably mounted within the housing so that it is eccentric to at least a portion of the annular housing, the rotor having a plurality of radially extending blades; and a quantity of pumping liquid maintained in the housing so that it is engaged by a portion of each rotor blade at all times during operation of the pump and forms an annular ring around the inner periphery of the housing when the rotor is rotated, the improvement comprising:

at least one vane mounted relative to the housing and disposed in the liquid ring with at least one axis of each major surface of the vane substantially parallel to the rotational axis of the rotor, the vane being located in the liquid ring so that a substantial portion of the liquid in the liquid ring outside the outer periphery of the rotor flows past the vane on each side of the vane at all times during operation of the pump to reduce energy losses due to turbulence in the liquid ring.

**4,422,833**  
**PNEUMATIC TRANSFER SYSTEM AND A FLUID FLOW CONTROL DEVICE THEREFOR**  
David L. W. Miller, Knoxville, and Billy P. Freeman, Blaine, both of Tenn., assignors to Free Flow, Inc., Blaine, Tenn.  
Filed May 11, 1981, Ser. No. 262,121  
Int. Cl.<sup>3</sup> F04F 5/20, 5/52

U.S. Cl. 417-183

11 Claims

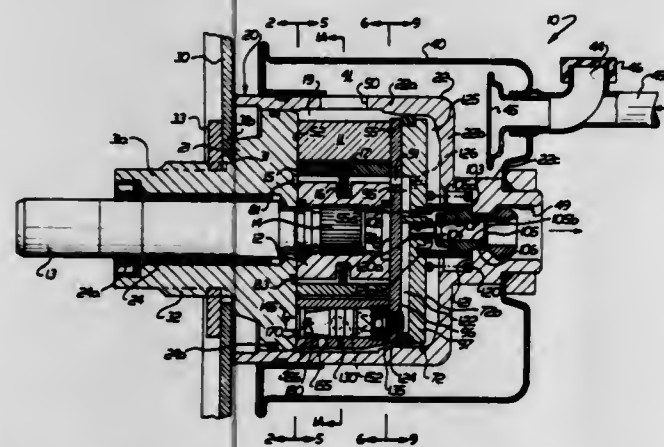


1. A fluid control device, comprising:  
means defining a first fluid flow passageway;  
means defining a fluid inlet into said first fluid flow passageway;  
means defining a fluid outlet from said first fluid flow passageway;  
means defining a second fluid flow passageway mounted for movement between a first position and a second position, said second fluid flow passageway being in fluid communication with said first fluid flow passageway when said second fluid flow passageway is in the first position and when said second fluid flow passageway is in the second position;



means defining a fluid flow-through aperture in fluid flow communication with said second fluid flow passageway; means adapted to define an annular restricted flow area in said first passageway when said second fluid flow passageway is in the first position so that fluid flowing in said first fluid flow passageway from said fluid inlet toward said fluid outlet flows through said annular restricted flow area and is accelerated creating a low pressure zone at the location of flow communication between said first and second fluid flow passageways to induce fluid flow from said flow-through aperture through said second fluid flow passageway and into said first passageway; said annular restricted flow area defining means being removed from cooperation with said first fluid flow passageway defining means when said second fluid flow passageway is in the second position so that the low pressure zone is not created at the location of flow communication between said first and second fluid flow passageways; and said means defining a second fluid flow passageway being operable when moved to the second position to define at least two flow paths so that fluid flowing into the flow control device through said fluid inlet is divided into at least the two flow paths, one path being through said first fluid flow passageway to said fluid outlet and the other path being through said second fluid flow passageway to said flow-through aperture.

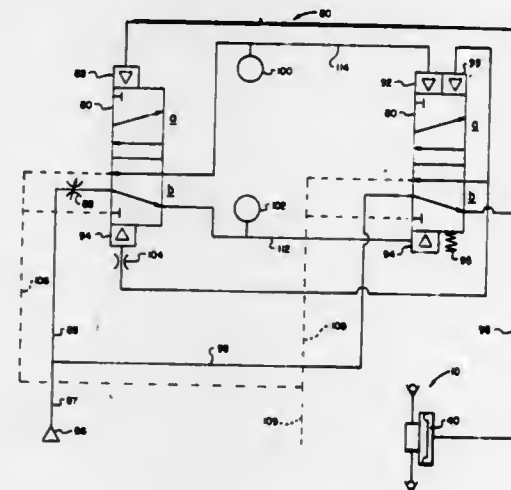
**4,422,834**  
**POWER STEERING PUMP**  
Gilbert H. Drutchas, Birmingham, and David J. Suttkus, Utica, both of Mich., assignors to TRW Inc., Cleveland, Ohio  
Filed May 7, 1981, Ser. No. 261,643  
Int. Cl.<sup>3</sup> F04B 49/08  
U.S. Cl. 417—283 12 Claims



1. A pump for supplying fluid from a reservoir to a system comprising  
a rotor member,  
a cam member encircling said rotor member,  
means for effecting relative rotation of said cam and rotor members about an axis,  
a plurality of vanes carried by one of said cam and rotor members, said vanes engaging the other of said members and defining pumping pockets which expand and contract on relative rotation of said members,  
a cheek plate extending radially of the rotational axis and disposed adjacent one side of said rotor member and said cam member, said cheek plate being movable along the rotational axis to communicate expanding and contracting pockets,  
means defining a cavity on one side of said cheek plate,  
a first fluid passage conducting fluid pressure into said cavity which fluid pressure biases said cheek plate into a position blocking communication between said expanding and contracting fluid pockets,  
a servo valve located in said cam member for venting the pressure in said cavity to thereby control the position of the cheek plate,  
a second fluid passage, said second fluid passage being in said

cheek plate and communicating system pressure to said servo valve so that said servo valve responds to changes in the system pressure,  
a third fluid passage, said third fluid passage being through said cheek plate and a portion of said cam ring and communicating said cavity with said servo valve, and  
said servo valve having a position blocking said third passage and movable to vent said third passage.

**4,422,835**  
**FLUID OPERATED DIAPHRAGM PUMP WITH FLUID TIMING CONTROL AND CONTROL CIRCUIT MANIFOLD MOUNTED ON PUMP BODY**  
James E. McKee, Suite 580, States General Life Building, 708 Jackson, Dallas, Tex. 75202  
Continuation-in-part of Ser. No. 16,185, Feb. 28, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,126  
Int. Cl.<sup>3</sup> F04B 43/06  
U.S. Cl. 417—401 19 Claims



8. A fluid operated pump including power piston means and pumping piston means interconnected one with the other, said power piston means being disposed in an expansible chamber and operable in response to pressure fluid being admitted to said chamber to drive said pumping piston means through a pump discharge stroke, means for driving said piston means through a pump suction stroke when said chamber is vented, and a control system for causing said pump to operate through a pumping cycle including a suction stroke and a discharge stroke, said control system comprising:

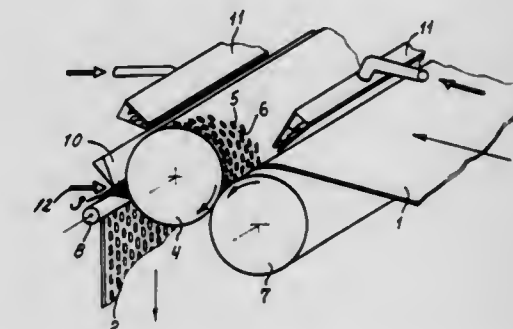
a first pressure fluid actuated two position valve including first and second fluid actuators for moving said first valve to a first position for conducting pressure fluid from a source to said chamber and a second position for venting said chamber, respectively;  
a second pressure fluid actuated two position valve including pressure fluid actuators for moving said second valve between a first position for conducting pressure fluid from said source to actuate said first valve to move to said first position and a second position for conducting pressure fluid from said source to actuate said first valve to move to said second position;  
conduit means interconnecting said second valve and said actuators of said first valve for moving said first valve between its first and second positions in response to movement of said second valve; and,  
pressure fluid timing means including timing chamber means interposed in said conduit means and means for controlling the flow of fluid to said timing chamber means to selectively delay the movement of said first valve to said first position and said second position in response to movement of said second valve so as to control the frequency of said pumping cycle.

14. A fluid operated pump including a body, a fluid operated

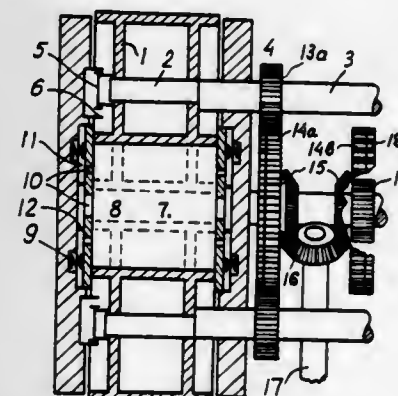
power piston disposed in an expansible chamber formed in said body, and a control system for conducting working pressure fluid to and from said expansible chamber, said control system comprising:

a manifold assembly including a plurality of plates sealingly secured to each other in stacked relationship, said manifold assembly including an inner cover plate and an outer cover plate, said inner cover plate being adapted to be secured in engagement with a mounting face on said pump body, said outer cover plate being adapted to have control valve means mounted thereon, said manifold assembly including an intermediate plate member having at least a first cavity formed therein comprising a pressure fluid timing chamber for said control system.

**4,422,837**  
**APPARATUS FOR CONVERTING THERMOPLASTIC FILM INTO AN OPEN-WORK SHEET**  
Ole-Bendt Rasmussen, 14, Anemonevej, 2820 Gentofte, Denmark  
Division of Ser. No. 284,685, Jul. 20, 1981, Pat. No. 4,377,544, which is a continuation of Ser. No. 179,708, Aug. 20, 1980, abandoned, which is a continuation of Ser. No. 7,713, Jan. 30, 1979, abandoned, which is a continuation of Ser. No. 841,480, Oct. 12, 1977, abandoned, which is a continuation of Ser. No. 639,007, Dec. 9, 1975, abandoned. This application Sep. 30, 1982, Ser. No. 428,804  
Claims priority, application United Kingdom, Dec. 10, 1974, 53268/74  
Int. Cl.<sup>3</sup> B29C 17/02; B29D 27/00  
U.S. Cl. 425—289 1 Claim



**4,422,836**  
**ROTARY MACHINE WITH PERIPHERALLY CONTACTING ROTORS AND END FACE SEALING PLATE**  
Usher Meyman, 230 Ocean Pkwy, Apt. E3, Brooklyn, N.Y. 11218  
Filed Sep. 1, 1981, Ser. No. 298,475  
Int. Cl.<sup>3</sup> F01C 1/02, 17/02, 19/08, 21/00  
U.S. Cl. 418—56 13 Claims



1. A rotary machine, such as a rotary combustion engine and the like, comprising

a plurality of rotors rotatable on eccentric shafts about substantially parallel axes and having peripheral surfaces, said rotors being located relative to one another and each having a shape such that said rotors during the rotation about said axes roll by their peripheral surfaces one over the other without slippage and together bound at least one working cavity which is open at its both axial sides but is permanently closed peripherally by said peripheral surfaces of said rotors;

two covers located at both axial sides of said rotors to close said cavity at the both axial sides;

at least one sealing plate arranged to adjoin one axial end face of said rotors so that it overlaps at least one working cavity, said sealing plate being arranged to form at its side opposite to said rotors a hollow;

means for communicating said hollow with said working cavity so that a working medium flows into said hollow and presses said sealing plate at said opposite side toward and against said end faces of said rotors; and

means for synchronizing rotation of said rotors including gears with inner toothed rims, mounted on at least one of said covers, and gears with outer toothed rims, mounted on said rotors and meshing with said gears with said inner toothed rims.

1. Apparatus for the direct conversion of thermoplastic film material into open-work sheet material having fibers or threads on one surface thereof, comprising: a continuously advancing surface capable of adhering to said thermoplastic material when the latter is in molten condition, means for selectively heating said advancing surface to a temperature above the melting point of said film material in a pattern of heated surface regions separated by unheated regions, feeding means for progressively bringing one surface of a length of said thermoplastic film material into face-to-face contact with said selectively heated surface and for maintaining said contact for a time sufficient to selectively melt the film material in the areas thereof contacting said heated surface regions, while the remaining film areas remain in generally unmelted and nonadhering condition, and means for progressively separating said film and heated surface whereby said molten film areas by adherence to the contacting heated surface regions are drawn out from the unmelted film areas as filiform projections extending from the surrounding unmelted margins and thereby create apertures in said film generally corresponding to said heated surface regions, and means for directing a flow of cooling air toward the surface undergoing such separation to control the drawing of said filiform projections.

**4,422,838**  
**EXTRUSION HEAD FOR USE IN BLOW MOLDING MACHINE**

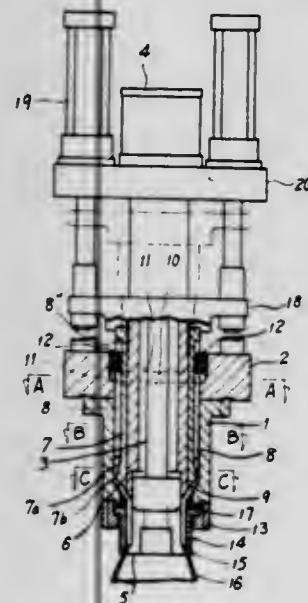
Akira Iwawaki; Eiichi Horiuchi, both of Yokohama; Sadahiko Shinya, Ninomiya; Kinshiro Kojima, Kawasaki; Katsuo Kodama, Yokohama; Kotaro Kawarata, Yamato, and Hisahiko Fukase, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 107,665, Dec. 27, 1979, abandoned. This application Jun. 5, 1981, Ser. No. 270,833  
Int. Cl.<sup>3</sup> B29D 23/04

U.S. Cl. 425—376 A 3 Claims  
1. In an extrusion head for use in blow molding machine having an extruder and supplied with resin wherein an outer periphery of a plunger is in contact with inner walls of a head body and an opening of a support plate, said head body and said support plate being located coaxial with the plunger, and inner periphery of the plunger being in contact with a core



which is positioned coaxially with the plunger, said plunger being slidable in an axial direction, the improvement comprising: a feed port for supplying said resin from the extruder to the head body and being a horizontal hole formed in said support plate above the head body; a sealing block secured to said support plate and having a lower face abutting the upper part of said supply port, the supply port being extended to a lower face of said sealing block, said sealing block being fitted in a longitudinal groove formed axially on the outer periphery of the plunger thereby preventing the resin from remaining in the longitudinal groove in excess of a predetermined time interval when said plunger is slid vertically, said sealing block also preventing the resin from leaking when said plunger is slid vertically; an extended lower part of the longitudinal groove forming a flared portion widening in width in a circumferential



direction of the plunger, a lower part of the flared portion being formed with a throttle which is annular in the circumferential direction of the plunger and shallower than the flared portion, an edge provided on the upper side of said flared portion for scraping off the material adhering to the inner peripheral surface of said head body during each extrusion of material; the side of the throttle portion toward a nozzle being at the lower end of the plunger; an accumulation chamber having a narrow annular flow path between the annular throttle portion and the head body, communicating with the flared portion; and the accumulation chamber being provided with an upper portion surrounded by said annular path and said lower end of the plunger, an outer periphery defined by the inner wall of the head body, an inner periphery defined by the outer wall of the core, and a lower portion extending to the nozzle.

#### 4,422,839 EXIT DIE

Dietmar Przytulla, Sindorf, and Manfred Lehmann, Cologne, both of Fed. Rep. of Germany, assignors to Mauser-Werke GmbH, Bruhl, Fed. Rep. of Germany  
Filed Nov. 12, 1981, Ser. No. 320,481  
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043204

Int. Cl.<sup>3</sup> B29D 23/04

U.S. Cl. 425-465

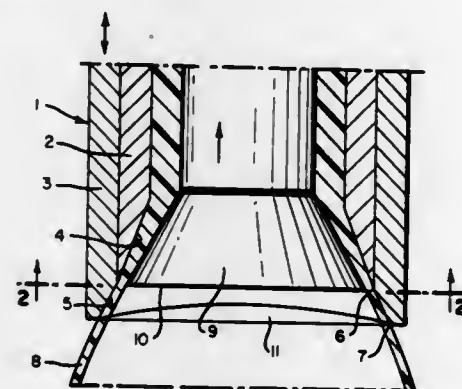
8 Claims

1. In an annular exit die for an extrusion head having a tapered die core and an outer casing ring concentrically disposed around the die core and cooperating with said die core to define an annular die gap for fabricating a hollow extrudate, the die core being tapered radially outwardly as measured in a direction toward the die gap, and wherein the radial width of the die gap varies upon relative axial movement between the die core and casing ring, the improvement wherein the casing ring comprises:

(a) a lower end;

(b) an inner wall defining the outer boundary of the die gap, said wall having:

- (1) a first step adjacent to the lower end of the die casing ring and having an inner radially undulating circumferential profile and a radially undulating first step edge defining the boundary between the first step and the lower end of the casing ring, and
- (2) a second radially inwardly disposed step adjacent to the first step and having an inner radially symmetrical profile and a radially symmetrical second step edge defining the boundary between the first step and the second step;



(c) the ring steps independently defining the outer boundary of the die gap as a function of relative axial positions of the casing ring and die core;

(d) said die core and the casing ring, with the first and second steps thereof, being axially movable with respect to each other to selectively position the die core in cooperating lateral alignment with the first and second steps; and

(e) means for axially moving the die core and casing ring, with the first step and second step thereof, with respect to each other to selectively position the die core in cooperating lateral alignment with the first and second steps.

#### 4,422,840

##### VENTING DEVICE FOR A CLOSED MOLD

Gerhard Posch, Unterhaching, and Rolf Neftzger, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

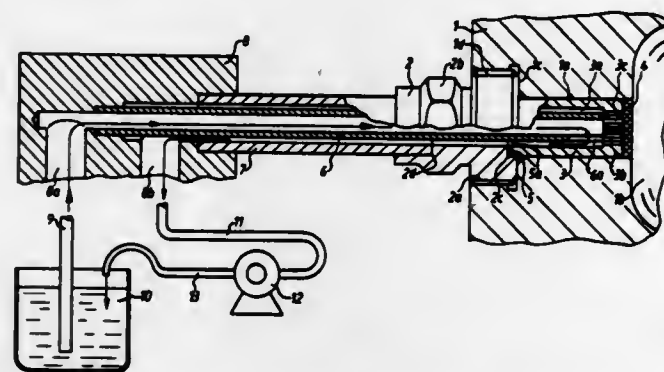
Filed Oct. 30, 1980, Ser. No. 202,060

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948318

Int. Cl.<sup>3</sup> B29C 1/00; B29F 1/00

U.S. Cl. 425-472

21 Claims



1. A ventilating device for a shaping tool having a wall and a mold cavity the device comprising a gas-permeable member communicating with the cavity of the shaping tool; a supporting member connected with and arranged to support said gas-permeable member and having a plurality of ventilating openings communicating with the cavity of the shaping tool through said gas-permeable member; means for holding and fixing said supporting member within the wall of the shaping tool, said holding and fixing means being connected and easily

withdrawable together with said supporting member so as to remove said supporting member together with said gas-permeable member from the wall of the shaping tool, thereby providing easy access to the gas-permeable member so that the latter is replaceable without removing the shaping tool; and means forming a suction chamber which communicates with said ventilating openings of said supporting member 13 suitable for passing flushing liquid to said gas-permeable member.

#### 4,422,841

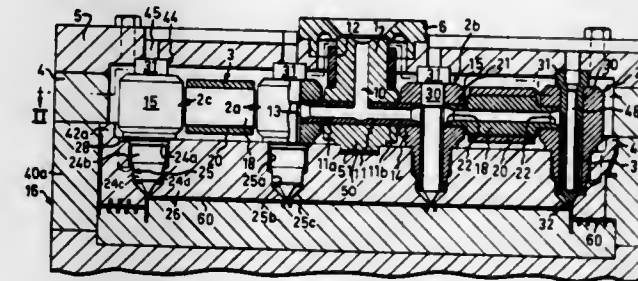
##### HOT RUNNER SYSTEM IN PLASTICS MOLDING TOOLS

Dante Alfonsi, Hedegatan 16, 252 51 Helsingborg, and Stefan Alfonsi, Stationsgatan 10, 253 73 Helsingborg, both of Sweden  
Filed May 4, 1982, Ser. No. 374,774

Claims priority, application Sweden, May 7, 1981, 8102863  
Int. Cl.<sup>3</sup> B29F 1/08

U.S. Cl. 425-548

3 Claims



1. A hot runner system for use in combination with a plastics molding tool having at least one mold cavity, said hot runner system being employed for injection molding of plastics material into said at least one cavity and comprising a heated central inlet means having an inlet channel means, a plurality of heated sprue bushes each having an outlet end portion and an opposite end portion, and a plurality of heated runner pipes connecting said inlet channel means with said sprue bushes, said molding tool comprising a mold platen having bores forming sockets for receiving the outlet end portions of said sprue bushes in positions for injecting plastics material into said at least one molding cavity, each of said sprue bushes and each of said sockets comprising cooperating annular contact surfaces for radially and axially locating said sprue bushes in said sockets, each of said sprue bushes forming a housing for a probe removably inserted therein, each probe having an inner tip end portion at the outlet end of the respective sprue bush and having an opposite outer end, said opposite end portion of each of the sprue bushes comprising a connecting head having at least one transverse channel for connecting the respective sprue bush with at least one of said runner pipes, each of said probes defining with its housing an annular space extending axially from the outlet end of the respective sprue bush, in communication with said at least one mold cavity, to the transverse channel of the respective sprue bush, each probe having an axial bore coaxial with said annular space and extending from the outer end of the respective probe to the tip end portion, and a heating element removably inserted into said axial bore from the outer end of the probe and removably fixed therein, said heating element being coaxial with said annular space and extending substantially along the whole length of the respective annular space for heating plastics material injected through said annular space and for heating the respective sprue bush substantially along the whole length of the annular space, each of said probes having a head at its outer end protruding from the respective sprue bush, and further comprising a clamping plate and means for securing said clamping plate to said mold platen and forcing said clamping plate to exert pressure on said heads of said probes for holding the heads of the probes clamped onto said opposite end portions of said sprue bushes and thereby holding the sprue bushes clamped and fixed in relation to said sockets.

2. A hot runner system for use in combination with a plastics molding tool having at least one mold cavity, said hot runner

system being employed for injection molding of plastics material into said at least one cavity and comprising a heated central inlet means having an inlet channel means, a plurality of heated sprue bushes each having an outlet end portion and an opposite end portion, and a plurality of heated runner pipes connecting said inlet channel means with said sprue bushes, said molding tool comprising a mold platen having bores forming sockets for receiving the outlet end portions of said sprue bushes in positions for injecting plastics material into said at least one molding cavity, each of said sprue bushes and each of said sockets comprising cooperating annular contact surfaces for radially and axially locating said sprue bushes in said sockets, each of said sprue bushes forming a housing for a probe removably inserted therein, each probe having an inner tip end portion at the outlet end of the respective sprue bush and having an opposite outer end, said opposite end portion of each of the sprue bushes comprising a connecting head having at least one transverse channel for connecting the respective sprue bush with at least one of said runner pipes, each of said probes defining with its housing an annular space extending axially from the outlet end of the respective sprue bush, in communication with said at least one mold cavity, to the transverse channel of the respective sprue bush, each probe having an axial bore coaxial with said annular space and extending from the outer end of the respective probe to the tip end portion, and a heating element removably inserted into said axial bore from the outer end of the probe and removably fixed therein, said heating element being coaxial with said annular space and extending substantially along the whole length of the respective annular space for heating plastics material injected through said annular space and for heating the respective sprue bush substantially along the whole length of the annular space, and comprising means for securing said probes in said sprue bushes and securing the latter in said sockets, said securing means including cooperating annular supporting surfaces of each probe and each sprue bush, cooperating supporting surfaces of said mold platen and each sprue bush and a clamping plate which is adapted to be removably fixed to said mold platen and to clamp said sprue bushes in operating positions in said sockets by clamping said probes in operating positions in said sprue bushes.

#### 4,422,842

##### APPARATUS FOR INJECTING PLASTICS AND ELASTOMERS

Bernard Monnet, Bellignat, France, assignor to Pont-A-Mousson S.A., Nancy, France

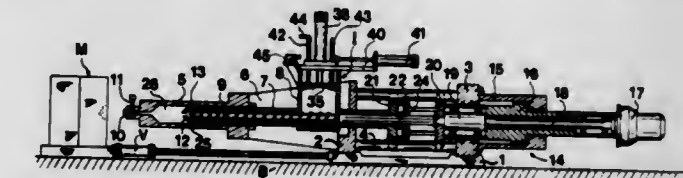
Filed May 28, 1981, Ser. No. 267,979

Claims priority, application France, Jun. 2, 1980, 80 12251; Nov. 28, 1980, 80 25408

Int. Cl.<sup>3</sup> B29F 1/00

U.S. Cl. 425-561

18 Claims



1. An injection apparatus for plastics, elastomers or like materials, comprising: an elongate, hollow fixed sheath (5) having an injection orifice (10) at an exit end thereof, an elongate, smooth walled, hollow movable sheath (7) slidably disposed within the fixed sheath and defining therewith proximate said exit end a variable volume injection material chamber (26), an injection material supply device (8) mounted to and movable with the movable sheath and exiting into the hollow interior thereof, an orifice defined in an exit end of said movable sheath communicating between the hollow interior thereof and the variable volume chamber, valve means (12, 13) for opening and closing said movable sheath orifice, means (22)



for selectively actuating said valve means, said actuating means comprising separation jacks (22), said separation jacks maintaining said valve means in an open state as said injection material supply device supplies said injection material into said variable volume injection material chamber, means (14) for advancing the movable sheath with the fixed sheath to reduce the volume of said chamber and force injection material through said fixed sheath orifice and into a mold (M), means (6) rigidly connecting the fixed sheath to the advancing means, and means (V) for moving the injection apparatus in relation to the mold to minimize thermal heat exchange therebetween.

4,422,843

**INJECTION STRETCHING BLOW MOLDING MACHINE**  
Katsahi Aoki, 6037 Ohazaminamijo, Sakakimachi, Hanishina-gun, Nagano-ken, Japan

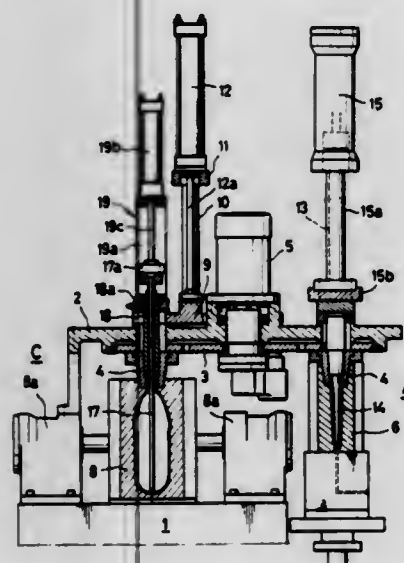
Filed Mar. 10, 1982, Ser. No. 356,919

Claims priority, application Japan, Mar. 13, 1981, 56-36912

Int. Cl.<sup>3</sup> B29C 17/07

U.S. Cl. 425—525

6 Claims



1. An injection, stretching and blow molding machine for parisons, comprising:

a machine bed; a base plate supported spaced above and parallel to the machine bed; a rotary disk supported to the base plate; a plurality of spaced apart neck molds, each for the neck of a respective parison, being supported at the disk, for the parison to be supported at the neck mold and beneath the disk; drive means connected with the disk for rotating the disk, at spaced time intervals, with respect to the base plate;

at spaced locations on the machine bed, there are defined, in the following sequence, around the disk, and located stationary with respect to the rotating disk, the following stages:

- (a) an injection molding stage comprising: an injection mold for injection molding each parison in turn;
- (b) a temperature control stage, comprising: a temperature control core for movement down into and up out of a parison which has been formed in the injection mold and which is supported at this stage by the neck mold; the temperature control core being heatable;
- (c) a stretching and blow molding stage, comprising: a blow mold device, including a blow mold for the parison then at the stretching and blow molding stage and which is supported at this stage by the neck mold; a blow core and a stretching and blowing mechanism for the parison and both being movable up and down, with the blow core having movement down into and up out of the parison supported at that stage;
- (d) a molded product release stage, including a releasing core for opening the neck mold for releasing a molded parison held by the neck mold; the releasing core being movable up and movable down, with the downward

movement operating the neck mold to release the parison at that stage;

an actuating plate on the base plate and extending around the disk to the temperature control stage, the stretching blow molding stage and the releasing stage without extending to the injection molding stage; a lifting device for moving the actuating plate up and down and with respect to the base plate, and guide means for guiding the actuating plate up and down movement;

the temperature control core, the blow core and the stretching and blowing mechanism, and the releasing core being mounted on the actuating plate to all move up and down together.

4,422,844

**SNAP ACTING THERMOSTATIC FLUID VALVE AND ELECTRICAL SWITCH COUPLED THERETO**

Marvin M. Graham, Westminster, and Jay R. Katchka, Cypress, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

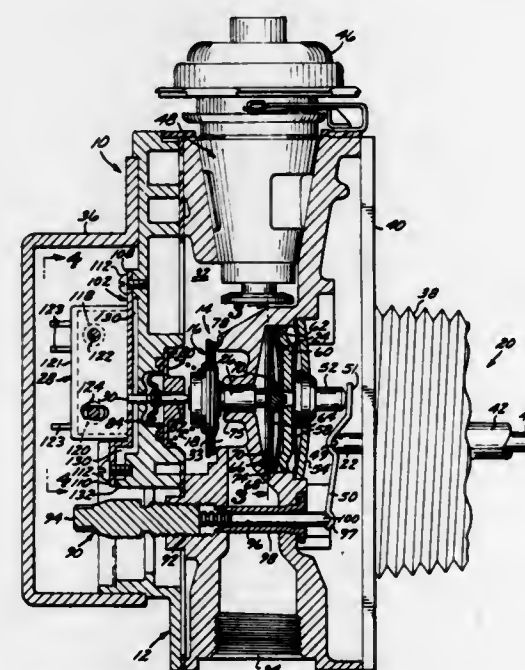
Continuation of Ser. No. 935,165, Aug. 21, 1978, abandoned.

This application Jan. 29, 1981, Ser. No. 229,517

Int. Cl.<sup>3</sup> F23N 5/00; H01H 9/06

U.S. Cl. 431—72

10 Claims



1. A thermostatic gas control valve mechanism comprising a valve housing having an internal valve port, a valve closure member, biasing means interposed between said closure member and said housing urging said closure member to seal said internal valve port, a thermostatic actuator secured to said housing with a force transmitting end received within said housing and coupled to act in opposition to said biasing means, a snap acting member interposed between said thermostatic actuator and said closure member and operable by said thermostatic actuator and said biasing means to move between alternate stable positions, a reciprocal rod interposed between said snap acting member and said closure member to drive said closure member against the bias of said biasing means to unseat said valve port when said snap acting member is in one of its stable positions and to allow said closure member to close said internal valve port when said snap acting member is in an alternative stable position, and electric switch having a push-button actuating means coupled to move with said valve closure member, adjustable securing means for securing said electric switch to said housing, and said securing means for releasably securing said electric switch in a selected position and orientation relative to said housing, whereby the distance between said valve port and said electric switch is adjustably variable, a saddle shaped electric switch mounting bracket defining a channel with opposing walls between which said electric switch is positioned, wherein end flanges extend from

said channel and are secured to said housing, and said channel walls have aligned pairs of apertures therethrough separated in a direction transverse to the direction of movement of said reciprocal rod, and one of said pairs of apertures is remote from axial alignment with said reciprocal rod and the other pair of apertures is proximate to axial alignment with said reciprocal rod, and said electric switch includes an encompassing body which has a circular aperture therethrough aligned with said apertures in said channel walls remote from axial alignment with said reciprocal rod and an arcuate aperture therethrough aligned with said apertures in said channel walls proximate to axial alignment with said reciprocal rod, and wherein said adjustable securing means are releasable fasteners which extend through said apertures in said channel walls and through said body of said electric switch, whereby the rotational orientation of said electric switch in said switch mounting bracket is adjustable within limits defined by said arcuate aperture.

4,422,846

**METHOD AND APPARATUS FOR INDIRECTLY DRYING AND PREHEATING FINE MATERIAL**

Heinrich Weber, Recklinghausen; Kurt Lorenz, Hattingen, and Horst Dunga, Herne, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Japan

Division of Ser. No. 295,496, Aug. 24, 1981, Pat. No. 4,392,823.

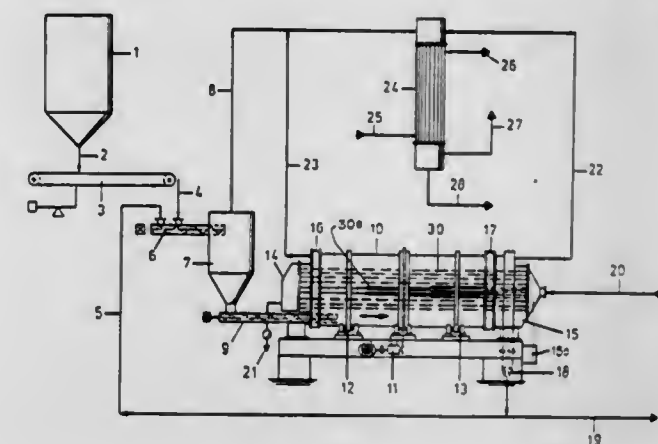
This application Jul. 2, 1982, Ser. No. 394,838

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034952

Int. Cl.<sup>3</sup> F26B 9/12; F27B 7/10

U.S. Cl. 432—18

6 Claims



1. A method of indirectly drying and preheating fine material, comprising:  
providing a rotary drum having a plurality of heating tubes extending therethrough;  
supplying heated cooling gases from a dry coke cooling system, from which dust has been separated, to the heating tubes;  
feeding the fine material to be dried and preheated to the rotary drum for preheating and drying the fine material;  
removing the dried and preheated fine material from the rotary drum; and  
recycling a portion of the dried and preheated material to the rotary drum.

4,422,845

**LIQUID HYDROCARBON BURNER WITH VERTICALLY ADJUSTABLE WICK**

Yozo Yamaguchi, Joetsu, Japan, assignor to Isaburo Yamaguchi, Nigata, Japan

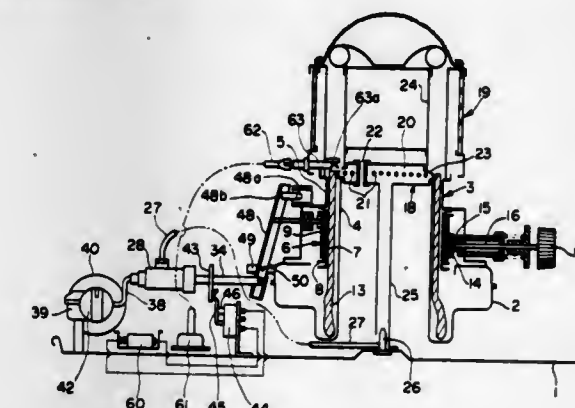
Filed Aug. 12, 1981, Ser. No. 292,153

Claims priority, application Japan, Sep. 8, 1980, 55-123541; Apr. 15, 1981, 56-53242[U]

Int. Cl.<sup>3</sup> F23D 11/36, 3/32

U.S. Cl. 431—153

7 Claims



1. A liquid hydrocarbon burner having a wick adapted to be partially immersed in liquid hydrocarbon, means to raise and lower the wick, means to supply a combustible gas to the region of an exposed portion of the wick, electric means to ignite the gas thereby to ignite liquid hydrocarbon in the wick, means responsive to raising of the wick to supply said gas and to actuate said electric means to ignite said gas, means responsive to the attainment of a raised position by said wick, to discontinue said gas supply and said ignition of said gas, and means responsive to lowering of the wick to actuate once more said gas supply and ignition, thereby to ignite fumes from the wick after extinction of the wick.

4,422,847

**PREHEATING GLASS BATCH**

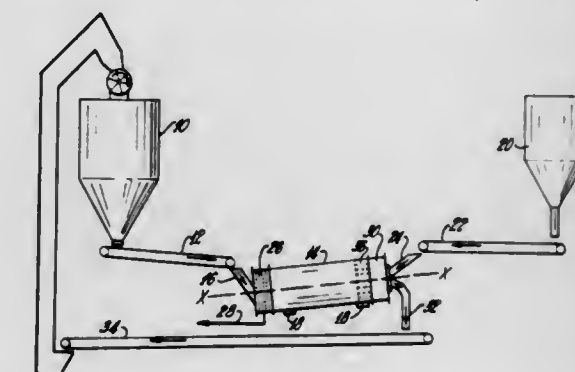
Mark A. Propster, Gahanna; Charles M. Hohman, Granville, and Stephen Seng, Frazeyburg, all of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Dec. 28, 1981, Ser. No. 335,006

Int. Cl.<sup>3</sup> F27D 17/00; F27B 15/00; F28B 3/00

U.S. Cl. 432—28

9 Claims



1. Apparatus for preheating particulate glass batch comprising a rotatable container for mixing said batch with particulate heat transfer media in a heat transfer relationship, said heat transfer media being larger in particle size than said batch, and a media exit vestibule for separating said media from said batch comprising a generally cylindrical screen mounted for rotation about its symmetrical axis, said screen having openings suffi-



ciently small to prevent the passage of said media therethrough and sufficiently large to enable the passage of said batch there-through, carrier means mounted for coaxial rotation with said screen for lifting the separated batch, and means for directing the separated batch from said exit vestibule into said container.

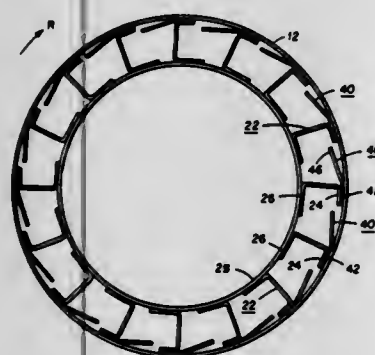
**4,422,848**  
**HEAT SHIELDS FOR DRUM AGGREGATE DRIERS AND**  
**ASPHALTIC DRUM MIXERS**

**Joseph E. Musil, Ely, Iowa, assignor to Iowa Manufacturing  
Company of Cedar Rapids, Iowa, Cedar Rapids, Iowa  
Filed Jan. 29, 1982, Ser. No. 344,208**

Int. Cl.<sup>3</sup> F27B 7/14; F27D 3/00

U.S. Cl. 432-118

### 1 Claim

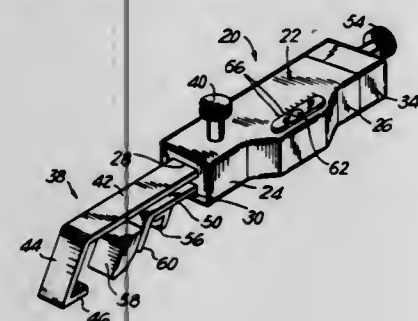


1. In apparatus of the kind described including a cylindrical shell and burner means disposed adjacent one end of the shell, the burner means discharging a flame of hot gases axially into the shell from said end, and a set of flights extending axially of the shell and spaced circumferentially about the inner wall of the shell, the improvement comprising: a set of heat shields extending axially of the shell and disposed between respective ones of the flights in spaced relation to the inner wall of the shell effective to shield the wall of the shell between the flights from the radiant zone of the flame, each heat shield comprising an essentially rectangular plate having opposite edge portions extending axially of the shell, one of the edge portions being planar and sandwiched between one flight and the inner wall of the shell, the remainder of the heat shield being also planar and bent at an obtuse included angle relative to said one portion effective so that the spacing between the inner wall of the shell and said remainder of the heat shield progressively increases toward and is a maximum at the other edge portion, said other edge portion lying close to an adjacent flight but unsecured thereto.

**4,422,849**  
**DENTAL INSTRUMENT AND METHOD FOR**  
**POSITIONING A LINGUAL ORTHODONTIC BRACKET**  
**Michael K. Diamond, 86 Milburn La., Roslyn, N.Y. 11577**  
**Filed Nov. 17, 1981, Ser. No. 322,193**

U.S. Cl. 433-3

### 30 Claims



1. An instrument for positioning a lingual orthodontic bracket, said instrument comprising:

- (a) a housing;
- (b) an arm extending from said housing and including means for releasably holding the orthodontic bracket at a posi-

tion that is in opposition to the lingual surface of the tooth being treated; and

(c) level indicating means for displaying the extent of inclination of said arm with respect to a predetermined plane.

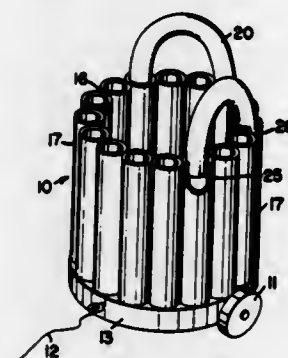
**4,422,850**  
**EDUCATIONAL TOY AND CONTAINER**  
**Bonnie J. Groebner, 18660 Yakmia St., Anoka, Minn. 55303**

Filed Jun. 1, 1981, Ser. No. 268,860

Int. Cl.<sup>3</sup> G09B 19/00

U.S. Cl. 434-98

## 23 Claims



**1. A combination educational toy and container comprising:**

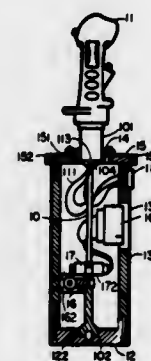
- (a) a base;
- (b) a plurality of cylindrical tubes defining a closed surface and cooperatively connected with said base for defining therewith an internal cavity of generally circular cross-section;
- (c) said plurality of cylindrical tubes having a top surface having at least one hole formed therein;
- (d) an insertable member having first and second ends; and
- (e) said hole being adapted to hold said first end of said insertable member, whereby said first end of said insertable member may be inserted and removed from said hole.

**4,422,851**  
**ISOMETRIC GRIP BENDING BEAM CONTROL**  
Lawrence Hayashigawa, Tustin, and Bertram W. McFadden,  
Downey, both of Calif., assignors to The United States of  
America as represented by the Secretary of the Navy, Wash-  
ington, D.C.

**Filed May 12, 1982, Ser. No. 377,240**  
**Int. Cl.<sup>3</sup> G09B 9/08**

U.S. Cl. 434-45

## 9 Claims



**1. An apparatus for simulating a control stick in an aviation trainer comprising:**

a hand grip;  
a cantilevered bending beam attached to said hand grip, said beam being a circular cross-section steel rod having an endurance limit in excess of the maximum stress exerted on said grip;  
means for restricting the displacement of said bending beam operably positioned therefor;  
means for measuring beam bending stress exerted on said

hand grip operably attached to said bending beam, outputting signals proportional to pitch and roll positions.

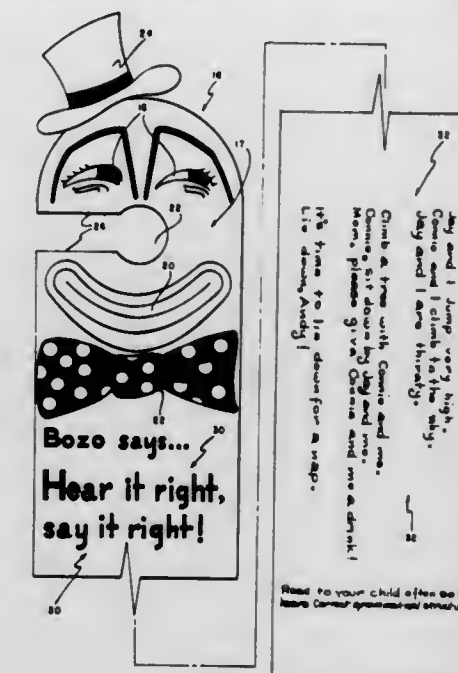
t- to define a hat for the head of said face, said open slot swaths part of the face which pictorially defines an end of the struc-

4,422,852  
TEACHING AID AND PROCESS FOR TEACHING  
Emily A. Mathias, 205 S. Star, El Dorado, Kans. 67042  
Filed Mar. 1, 1982, Ser. No. 353,572  
Int. Cl.<sup>7</sup> G09B 19/00

U.S. Cl. 434-178

## 2 Claims

1. A teaching aid for hanging on the shaft of a doorknob comprising a generally elongated structural backing having an end representing pictorially a face; said structural backing defining an open rectangular slot having a width approximately equivalent to the outside diameter of the doorknob shaft and terminating into a generally central opening having a diameter larger than the width of the rectangular slot and larger than the outside diameter of the doorknob shaft to facilitate pivotation of the structural backing around the knob shaft; arranged erudite indicia printed on the backing in a visual presentation form for rapid and comprehensive understanding; said doorknob shaft sliding through open slot into said central opening such that said doorknob defines a nose for said face, said indicia is printed such that a part of the indicia can be read readily when the teaching aid is hung on the shaft in a generally vertical upright position and the remaining indicia can be read readily if the teaching aid is pivoted around the knob shaft into a generally parallel posture with respect to the horizontal, the end representing pictorially the face is structurally shaped



l, tural backing, and said pictorally represented face additionally  
d comprises a pair of eyes, and a bow tie.



# CHEMICAL

4,422,853

## HAIR DYEING COMPOSITIONS CONTAINING QUATERNIZED POLYMER

Bernard Jacquet, Antony, and Gerard Lang, Deuil-la-Barre, both of France, assignors to L'Oreal, Paris, France  
Continuation-in-part of Ser. No. 849,657, Nov. 8, 1977, Pat. No. 4,217,914, which is a continuation-in-part of Ser. No. 577,836, May 15, 1975, abandoned. This application Jun. 26, 1980, Ser. No. 163,411

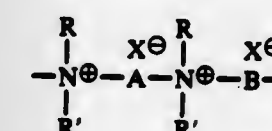
Claims priority, application Luxembourg, May 16, 1974, 70096; Feb. 14, 1975, 71849

Int. Cl.<sup>3</sup> A61K 7/09, 7/11; D06P 3/14

U.S. Cl. 8-406

6 Claims

1. A composition suitable for dyeing hair in the presence of an oxidizing agent comprising an oxidation hair dye in an amount effective to dye said hair and a quaternized polymer having recurring units of the formula



wherein

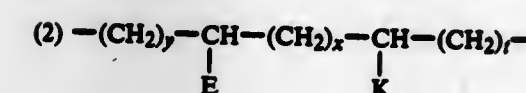
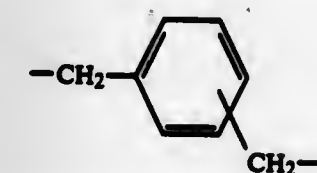
R is lower alkyl or  $-\text{CH}_2-\text{CH}_2\text{OH}$ ;

R' is alkyl or cycloalkyl, containing a maximum of 20 carbon atoms or benzyl,

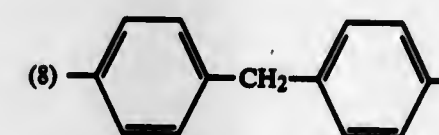
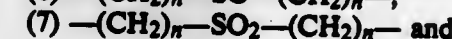
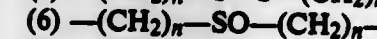
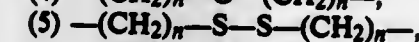
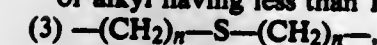
or R and R' together represent  $-(\text{CH}_2)_2-\text{O}-(\text{CH}_2)_2-$ ;

A is divalent group selected from

(1) o-, m- or p-xylylidene of the formula



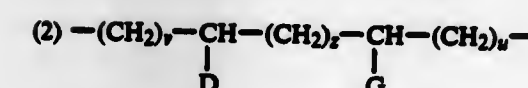
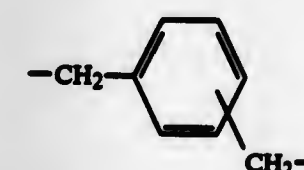
wherein x, y and t are whole numbers ranging from 0 to 11 such that the sum (x+y+t) is greater than or equal to 0 and lower than 18, and E and K represent hydrogen or alkyl having less than 18 carbon atoms,



wherein n is equal to 2 or 3;

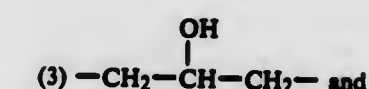
B represents a divalent group selected from

(1) o-, m- or p-xylylidene of the formula



wherein D and G represent hydrogen or alkyl having

less than 18 carbon atoms and v, z and u are whole numbers ranging from 0 to 11, with two of v, z and u simultaneously being capable of being 0, such that the sum (v+z+u) is greater than or equal to 1 and lower than 18 and such that the sum (v+z+u) is greater than 1 when the sum (x+y+t) is equal to 0,



(4)  $-(\text{CH}_2)_n\text{---O---}(\text{CH}_2)_m\text{---}$  wherein n is 2 or 3; and X<sup>⊖</sup> is an anion derived from an organic or mineral acid, said polymer being present in an amount between 0.5 and 10 percent by weight of said composition and a carrier.

4,422,854

## TRANSFER PRINTING SUPPORT, PROCESS FOR THE MANUFACTURE THEREOF, WITH BLUE AZO DYE: DI-CYANO-NITRO-PHENYL-AZO ANILINE

Reinhard Hühne, Königstein; Manfred Schneider, Eppstein; Claus Schuster, Hofheim am Taunus, and Rudolf Schickflus, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 383,732

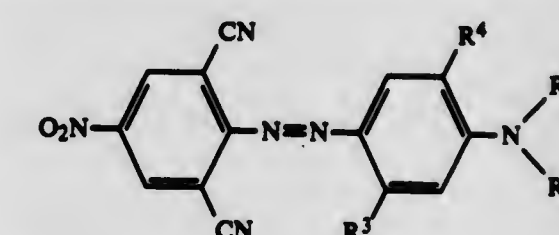
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121981

Int. Cl.<sup>3</sup> B41M 5/02; D06P 5/00

U.S. Cl. 8-471

9 Claims

1. A transfer printing support, impregnated or printed with a formulation containing the dyestuff of the formula



in which

R<sup>1</sup> is alkyl of from 1 to 4 carbon atoms,

R<sup>2</sup> is hydrogen or alkyl of from 1 to 4 carbon atoms,

R<sup>3</sup> is methyl, methoxy or ethoxy, and

R<sup>4</sup> is hydrogen, methyl, methoxy or ethoxy, or containing a mixture of dyestuffs of said formula.

4,422,855

## METHOD OF THICKENING SOLUTIONS USING NORMALLY NONGELLING CLAYS

Edgar W. Sawyer, Jr., Hagerstown, Md., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 15, 1981, Ser. No. 263,808

Int. Cl.<sup>3</sup> C10L 1/32; B01J 13/00

U.S. Cl. 44-51

14 Claims

1. A method of thickening an aqueous solution using a normally nongelling clay comprising the steps of: providing a nongelling clay selected from the group consisting of aluminum montmorillonite and calcium montmorillonite; drying the clay to 10 to 15 percent free moisture; grinding the clay to at least 100 percent finer than about 45 microns; adding a condensed phosphate dispersant to the clay and forming a predispersion; providing a flocculent capable of neutralizing the dispersant; adding the predispersion and flocculent to an aqueous solution; and stirring the solution until said solution thickens.

11. A method of thickening an organic liquid using a normally nongelling clay comprising the steps of:



drying nongelling aluminum or calcium montmorillonite clay to 10 to 15 percent free moisture;  
grinding the clay to at least 100 percent finer than about 45 microns;  
adding the clay with a surfactant selected from the group consisting of a quaternary ammonium compound, an amine salt, an imidazoline and an alkanolamide to an organic liquid; and  
agitating the resulting product until the clay gels.

4,422,856

**N-SUBSTITUTED SUCCINIMIDES, THEIR PREPARATION AND USE AS MOTOR FUEL ADDITIVES**  
Paul Maldonado, Saint Symphorien d'Ozon; Choua Cohen, and Bernard Sillion, both of Lyons, all of France, assignors to Institut Français du Pétrole, Rueil-Malmaison and Elf-France, Paris, both of France

Filed Feb. 13, 1981, Ser. No. 234,134

Claims priority, application France, Feb. 15, 1980, 80 03459

Int. Cl.<sup>3</sup> C10L 1/22

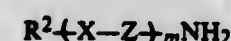
U.S. Cl. 44—63

13 Claims

1. The N-substituted succinimide obtained by reacting maleic anhydride with at least one oxyalkylated or polyoxyalkylated monoalcohol of the general formula



wherein R<sup>1</sup> is a linear or branched, saturated or unsaturated C<sub>12-25</sub> aliphatic radical; A is a linear or branched C<sub>2-4</sub> alkylene radical, at least two carbon atoms of which are in a straight chain; and n is an integer from 1 to 50; and reacting the resulting succinic anhydride oxyether with a monoprimary amine of the general formula



wherein R<sup>2</sup> is a linear or branched, saturated or unsaturated, C<sub>8-25</sub> aliphatic radical; Z is a linear or branched C<sub>2-4</sub> alkylene radical at least two carbon atoms of which are in a straight chain; X is —NH— or —O—; and m is an integer from 0 to 4.

4,422,857

**COKE GASIFICATION METHOD**

Heinrich Weber, Recklinghausen; Horst Dungs, Herne, and Kurt Tippmer, Recklinghausen, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & KG, Fed. Rep. of Germany

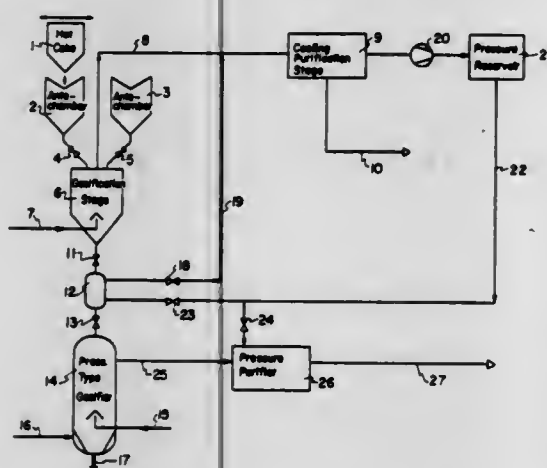
Division of Ser. No. 289,158, Aug. 3, 1981. This application Jul. 15, 1982, Ser. No. 398,593

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032212

Int. Cl.<sup>3</sup> C10J 3/06, 3/16

U.S. Cl. 48—197 R

5 Claims



1. A method of uniformly charging a pressure-type gasifier with hot coke, comprising the steps of charging over a pressure-dosing system with at least four parallel-connected lock

chambers, in which the following steps in the four lock chambers take place simultaneously:

filling a first lock with hot coke;  
comprising a second lock, which has already been filled with hot coke, with a compression gas up to the gasifier pressure;  
transferring hot coke from a third lock to the pressure-type gasifier; and  
expanding a fourth lock, wherein the hot coke is formed in a coking chamber with a temperature of 900° C. to 1,100° C., the hot coke is fed by means of a hot coke conveyor without substantial temperature changes with the coke at a temperature of 900° C. to 1,100° C. to a first gasification chamber, the coke is partially gasified and cooled to 500° C. to 800° C. in the first gasification chamber by the addition of steam, then the partially gasified coke is fed to the pressure-type gasifier via said parallel-connected lock chambers, and wherein the coke is gasified in the pressure-type gasifier in a second gasification chamber thereon with the addition of at least one of oxygen and air, and at least one of steam and carbon dioxide.

4,422,858

**COKE GASIFICATION METHOD**

Heinrich Weber, Recklinghausen; Horst Dungs, Herne, and Kurt Tippmer, Recklinghausen, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

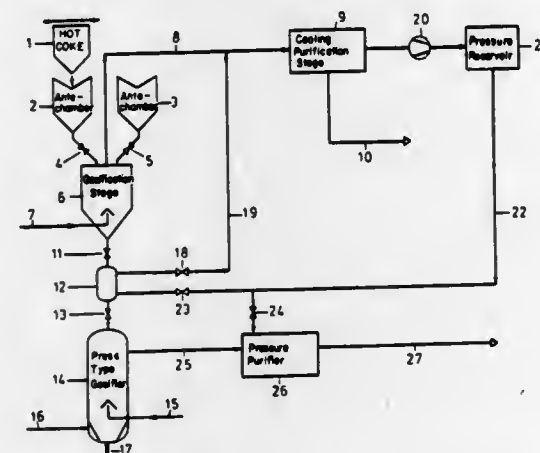
Filed Aug. 3, 1981, Ser. No. 289,158

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032212

Int. Cl.<sup>3</sup> C10J 3/06, 3/16

U.S. Cl. 48—197 R

6 Claims



1. A method for the gasification of coke having a temperature of 900° C. to 1,100° C. after coking in a coking chamber, comprising:

forcing the coke at a temperature of 900° C. to 1,100° C. into a coke bucket, after coking the coke in the coking chamber;  
feeding the coke by means of a hot coke conveyor without substantial temperature changes and with the coke at a temperature of 900° C. to 1,100° C., to a first coking and gasification stage of a gasifier;  
adding steam to the first coking and gasification stage to cool the coke to 500° C. to 800° C. for partially gasifying the coke;  
subsequently feeding the partially gasified and cooled coke over a pressure-dosing system to a second coking and gasifying stage of the gasifier which comprises a pressure-type gasifier stage; and  
gasifying the partially gasified and cooled coke in the second coking and gasification stage by solid bed gasification with the addition of at least one of oxygen and air, and at least one of steam and carbon dioxide.

4,422,859

**APPARATUS AND METHOD FOR SAFELY PURIFYING HYDROGEN GAS**

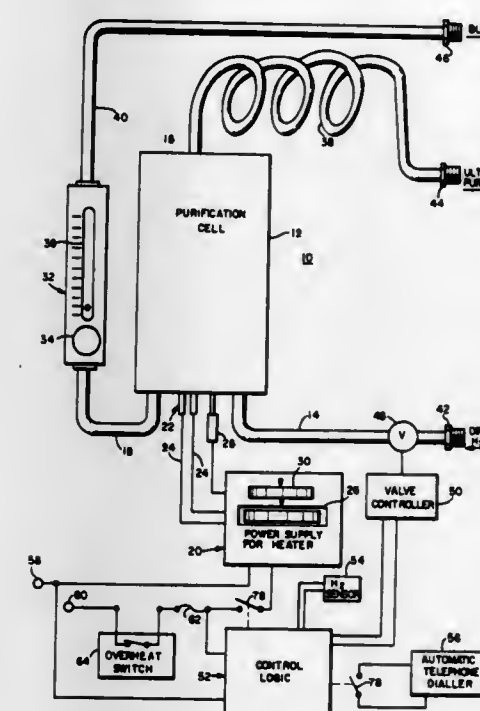
William R. McGee, Newtown Square, Pa., assignor to Consolidated Technology Corporation, West Chester, Pa.

Filed May 24, 1982, Ser. No. 381,723

Int. Cl.<sup>3</sup> B01D 53/22

U.S. Cl. 55—16

12 Claims



1. A method for preventing explosions in hydrogen gas diffusion purification units, each of the units having a hydrogen gas diffusion cell with an input for hydrogen gas to be purified, an electrical power supply for heating the diffusion cell to an operating temperature, a temperature sensor disposed within the diffusion cell and connected to the electrical power supply, an output for ultra-purified hydrogen and an output for waste gas the method comprising the steps of:

continuously sensing for the presence of hydrogen gas, at a predetermined level of concentration, outside and adjacent the diffusion cell, the gas input and the gas outputs; electronically monitoring the continuous sensing for the presence of hydrogen gas; continuously, and independently of the hydrogen gas presence monitoring, sensing the temperature outside and adjacent the diffusion cell and the continuous monitoring; disabling only the electrical power supply for the diffusion cell and interrupting the input of hydrogen gas to be purified whenever hydrogen gas is detected at the predetermined level; and, disabling the electrical power supply to the entire unit whenever a predetermined temperature level is detected, the hydrogen gas flow through the diffusion units being interrupted.

6. An apparatus for safely purifying hydrogen gas, comprising:

a hydrogen gas diffusion cell for filtering hydrogen gas, the cell having an input for hydrogen to be purified, electrical heating means, an output for ultra-purified hydrogen and an output for waste gas, including hydrogen gas mixed with concentrated corrosive agents;  
an electrical power supply for heating the diffusion cell to an operating temperature;  
a temperature sensor disposed within the diffusion cell for detecting the temperature therein;  
means for detecting hydrogen gas, disposed outside of the diffusion cell but adjacent the input and outputs thereof;  
a control circuit, connected to the means for detecting the hydrogen gas, for generating a command signal when hydrogen is detected at a level of concentration exceeding a predetermined amount;  
means for disabling the electrical power supply and for

interrupting the hydrogen gas input in response to the command signal, whereby explosive concentrations of hydrogen gas are avoided; and,  
an independently operable ambient temperature overheat sensing switch disposed adjacent the diffusion cell and the control circuit for interrupting electrical power thereto when ambient temperatures exceed a predetermined level, whereby explosive temperatures due to overheating of either one of the diffusion cell and the control circuit are avoided and the hydrogen gas flow through the diffusion cell is interrupted.

4,422,860

**ON-COLUMN CAPILLARY GAS CHROMATOGRAPHIC INJECTOR**

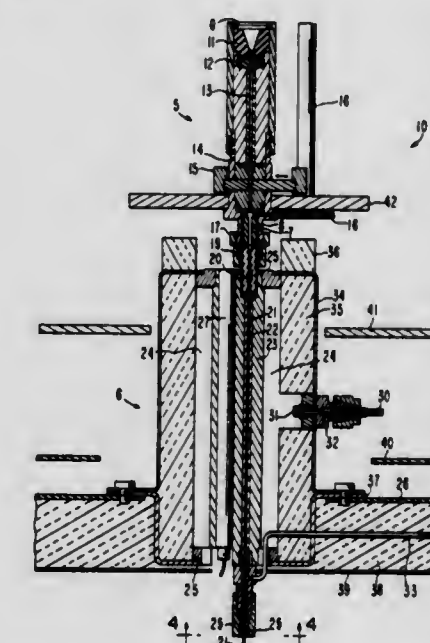
Paul L. Feinstein, Berkeley, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 26, 1982, Ser. No. 342,958

Int. Cl.<sup>3</sup> B01D 15/08

U.S. Cl. 55—67

25 Claims



1. An injector for introduction of a liquid sample directly into a capillary gas chromatographic column, the point of injection within said column being enclosed within a temperature controlled zone, comprising:

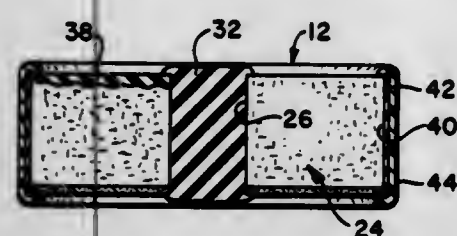
means for heating said column within said temperature controlled zone to at least the vaporization temperature of said sample during a portion of the injection cycle, said temperature controlled zone being located outside the oven of said gas chromatograph;  
means for maintaining said column within said temperature controlled zone at a temperature below the vaporization temperature of said liquid sample while said liquid sample is introduced through the end of said column directly to said point of injection;  
duct means for holding said end of said gas capillary column, said duct means serving to fix and stabilize said column to thereby permit liquid samples to be introduced directly into said column at said point of injection; and  
sealing means within said duct means for enabling introduction of said liquid sample without fluctuation in the carrier gas flow.



**4,422,861**  
**AEROSOL FILTER CARTRIDGE**  
 Robert J. Dusza, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.  
 Filed Feb. 5, 1982, Ser. No. 345,955  
 Int. Cl.<sup>3</sup> B01D 46/52

U.S. Cl. 55-498

10 Claims

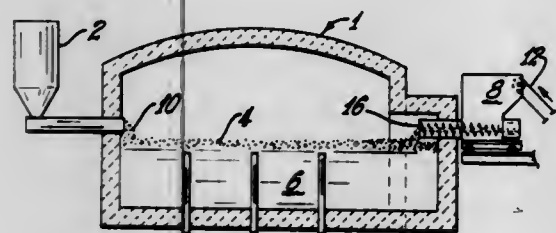


1. A filter for a respirator cartridge, said filter comprising: an encirclement of an accordion pleated filter medium with opposite ends joined and providing an open core area so as to define open internal and external edges of pleating of said encirclement; first adhesive means sealing together said joined opposite ends of said encirclement of filter medium; second adhesive means filling said core area as a seal for said internal open edges of said pleating; third adhesive means extending about said external open edges of pleating for covering and sealing said external open edges of said pleating, said third adhesive means comprising a hot melt adhesive strip; a layer of heat shrinkable material overlying said third adhesive means; and said third adhesive means and said layer of heat shrinkable material being respectively heat softened, and heat shrunken tightly against said encirclement of pleated filter medium so as to effect positive sealing of said external open edges of said pleated medium and rigidifying of said encirclement of filter medium.

**4,422,862**  
**PROCESS FOR REUSING SCRAP GLASS**  
 William G. Wardlaw, Anderson, S.C., assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio  
 Filed Mar. 12, 1982, Ser. No. 357,496  
 Int. Cl.<sup>3</sup> C03B 3/00

U.S. Cl. 65-28

4 Claims



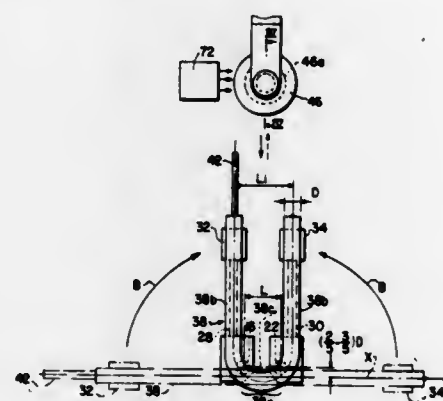
1. A process for using scrap glass with organic material thereon including: feeding unmelted glass batch to a glass melting furnace to form a blanket of the batch on the surface of molten glass in the furnace; and feeding unmelted scrap glass with organic material thereon on top of the blanket in the furnace independently of the batch, the scrap glass being fed so that the organic material is burned off before the scrap glass begins to melt.

**4,422,863**  
**APPARATUS AND METHOD FOR BENDING A GLASS TUBE TO A U SHAPE**  
 Hisao Hosoya, Yokohama, and Yukio Sato, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 12, 1982, Ser. No. 339,050  
 Claims priority, application Japan, Jan. 23, 1981, 56-8764  
 Int. Cl.<sup>3</sup> C03B 23/06

U.S. Cl. 65-110

12 Claims



1. An apparatus for bending a glass tube to a U shape having two generally parallel legs each having a longitudinal axis, said glass tube having a centrally disposed predetermined zone for bending, a diameter, and an axis, the apparatus comprising: a pair of chucks for holding said glass tube at both sides of the centrally disposed predetermined zone for bending; a heating device, said heating device cooperating with said chucks so as to heat and soften said glass tube in the predetermined zone for bending; a turning mechanism on which said chucks are mounted, said turning mechanism being operable to rotate each of said chucks about a respective turning center, said turning centers being disposed along a line generally parallel to said axis and spaced from said axis by a first predetermined distance, said turning centers being spaced from each other along said line by a second predetermined distance which is less than a third predetermined distance defined by the separation of the longitudinal axes of said generally parallel legs; a bending drum to guide bending at said predetermined zone; and a moving device for said bending drum, said bending drum being mounted on said moving device, said moving device being movable so that said bending drum comes into contact with said glass tube in said predetermined zone thereof immediately before the glass tube is bent by said turning mechanism and so that said bending drum is removed from said predetermined zone of said glass tube before bending is complete.

12. A method for bending a glass tube into a U shape, the glass tube having a longitudinal axis and a predetermined zone for bending, the method comprising the steps of: (a) positioning a glass tube in a pair of spaced chucks, such that the tube extends between the chucks, each of the chucks being disposed on an arm which turns about a separate turning point, said turning points being spaced from each other along a line parallel to and spaced from said longitudinal axis; (b) moving a heater into a position adjacent to the predetermined bending zone of the glass tube; (c) heating the predetermined zone of the glass tube to a temperature ready for bending; (d) removing the heater from its position adjacent the predetermined zone; (e) advancing a bending drum into contact with the predetermined bending zone of the glass tube; (f) turning the arms about their respective turning points to move the chucks toward one another, thereby winding

the predetermined bending zone about the bending drum; and (g) retracting the bending drum from the predetermined bending zone before said turning step is complete.

**4,422,864**  
**CYCLOHEXANEDIONE DERIVATIVES, THEIR PREPARATION AND HERBICIDES CONTAINING THEM**

Rainer Becker, Bad Dürkheim; Dieter Jahn, Neckarhausen; Wolfgang Rohr, Wachenheim; Walter Himmele, Walldorf; Harro Siegel, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

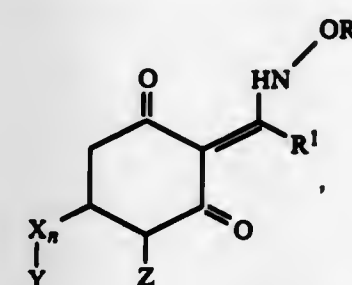
Filed May 20, 1982, Ser. No. 380,469  
 Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121355

Int. Cl.<sup>3</sup> A01N 9/12, 9/20; C07D 309/04, 333/22

U.S. Cl. 71-88

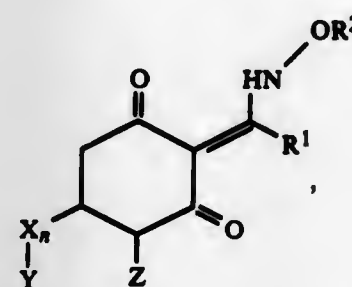
6 Claims

1. A cyclohexadione derivative of the formula



where R<sup>1</sup> is alkyl of 1 to 4 carbon atoms, R<sup>2</sup> is alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms or haloalkenyl of 3 to 4 carbon atoms and 1 to 3 halogen atoms, X is straightchain or branched alkylene of 1 to 5 carbon atoms, which is unsubstituted or substituted by phenyl, n is 0 or 1, Y is selected from the group consisting of tetrahydropyranyl, dihydropyranyl, methyltetrahydropyranyl, dioxanyl, dioxolanyl, dithiolanyl, dihydrothiopyranyl, tetrahydrothiopyranyl, dimethyldihydropyranyl, tetrahydrofuran, and dimethyldihydrothiopyranyl, and Z is hydrogen or methoxycarbonyl, or a salt thereof.

2. A process for combating the growth of unwanted plants, wherein the plants or the soil are treated with a cyclohexanedione derivative of the formula



where R<sup>1</sup> is alkyl of 1 to 4 carbon atoms, R<sup>2</sup> is alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms or haloalkenyl of 3 or 4 carbon atoms and 1 to 3 halogen atoms, X is straightchain or branched alkylene of 1 to 5 carbon atoms, which is unsubstituted or substituted by phenyl, n is 0 or 1, Y is selected from the group consisting of tetrahydropyranyl, dihydropyranyl, methyltetrahydropyranyl, dioxanyl, dioxolanyl, dithiolanyl, dihydrothiopyranyl, tetrahydrothiopyranyl, dimethyldihydropyranyl, tetrahydrofuran, and dimethyldihydrothiopyranyl, and Z is hydrogen or methoxycarbonyl, or a salt thereof.

**4,422,865**  
**IMIDES DERIVED FROM 2-THIOXO-3-(BENZOX-3-THIA)AZOLINE ACETIC AND PROPIONIC ACIDS**  
 John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

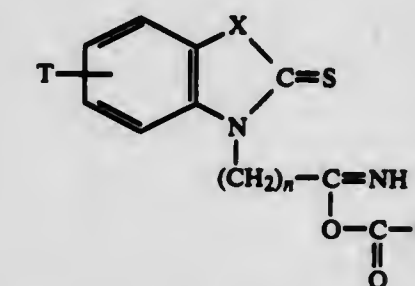
Division of Ser. No. 223,637, Jan. 9, 1981, Pat. No. 4,362,547, which is a division of Ser. No. 55,102, Jul. 5, 1979, Pat. No. 4,289,886. This application Jan. 7, 1982, Ser. No. 337,793. The portion of the term of this patent subsequent to Jan. 29, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> C07D 277/68; A01N 43/78

U.S. Cl. 71-90

10 Claims

1. A method of regulating the growth of desirable leguminous plants which comprises applying to the plant locus a plant growth regulating effective amount of a compound having the formula



wherein X is oxygen or sulfur, R is lower alkyl, T is selected from the group consisting of hydrogen, halogen, nitro, lower alkyl and trifluoromethyl and n is 1 or 2.

**4,422,866**  
**ANTIDOTES FOR PROTECTING PLANTS FROM HERBICIDE DAMAGE**

Hans-Jochem Riebel, Wuppertal; Ludwig Eoe, Leverkusen, and Wilfried Faust, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,279

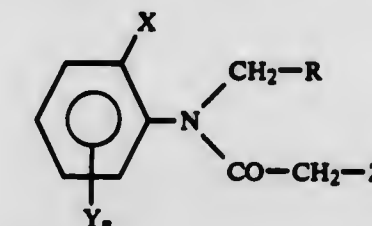
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930448

Int. Cl.<sup>3</sup> A01N 25/32

U.S. Cl. 71-92

11 Claims

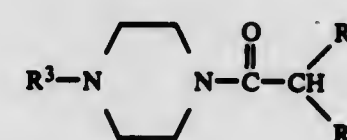
1. Method of protecting maize from damage by herbicidally effective acetanilide of the general formula



in which

R represents pyrazol-1-yl,  
 X and Y are identical or different and represent alkyl with 1 to 4 carbon atoms,  
 Z represents chlorine and  
 n represents 0, 1 or 2,

which method comprises applying to the plants or to their habitat an antidotally effective amount of an N,N'-disubstituted piperazine compound of the general formula



wherein



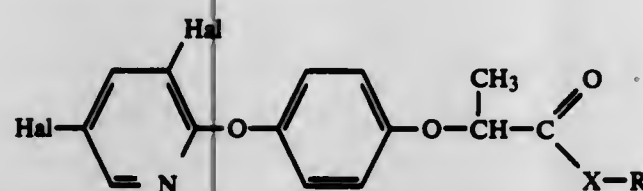
R<sup>1</sup> is alkyl with 1 to 4 carbon atoms or chlorine,  
R<sup>2</sup> is chlorine and  
R<sup>3</sup> is phenyl, substituted phenyl wherein the substituents are selected from alkyl or alkoxy of from 1 to 4 carbon atoms, chlorine, fluorine, trifluoroethyl, nitro and alkanoyl with up to 4 carbon atoms or  
R<sup>3</sup> is benzyl, 2-phenylethyl or 1-phenylethyl.

**4,422,867**  
**HERBICIDALLY ACTIVE UNSATURATED ESTERS OF HALOGENATED**  
 **$\alpha$ -[4-(PYRIDYL-2'-OXY)-PHENOXY]-PROPIONIC ACIDS**  
Beat Böhner, Hermann Rempfer, and Rolf Schurter, all of Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 2,923, Jan. 12, 1979, Pat. No. 4,300,944.  
This application Jul. 2, 1981, Ser. No. 279,505  
Int. Cl.<sup>3</sup> A01N 43/40; C07D 213/36

U.S. Cl. 71-094 6 Claims

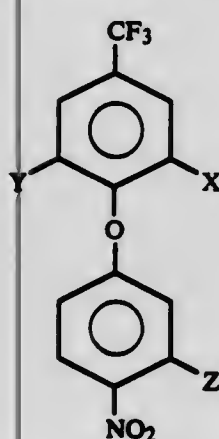
1. A compound of the formula



wherein each Hal is chlorine or bromine; X is oxygen or sulfur; and R is C<sub>1</sub>-C<sub>5</sub> cyanoalkyl or 1-cyanocyclohexyl(1).

**4,422,868**  
**HERBICIDAL**  
**4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS**  
Horst O. Bayer, Levittown; Colin Swithenbank, Perkaskie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.  
Division of Ser. No. 111,560, Jan. 14, 1980, Pat. No. 4,330,324, which is a division of Ser. No. 881,227, Feb. 22, 1978, Pat. No. 4,220,468, which is a division of Ser. No. 719,484, Aug. 31, 1976, Pat. No. 4,093,446, which is a continuation-in-part of Ser. No. 617,560, Sep. 29, 1975, Pat. No. 4,063,929, and a continuation-in-part of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,064,798, said Ser. No. 617,560, is a continuation-in-part of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, said Ser. No. 617,562, is a division of Ser. No. 331,719, Feb. 12, 1973, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Sep. 16, 1981, Ser. No. 302,922  
Int. Cl.<sup>3</sup> A01N 39/00, 37/34; C07C 121/75, 149/00  
U.S. Cl. 71-98 12 Claims

1. A compound of the formula



wherein

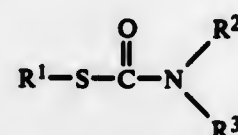
X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a (C<sub>1</sub>-C<sub>4</sub>)alkyl group,  
Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a cyano group or a (C<sub>1</sub>-C<sub>4</sub>)alkylthio group.  
9. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound according to claim 1 in an amount sufficient to control the growth of the weeds.

**4,422,869**  
**HALOGENATED ALLYLTHIOISOPROPYL N-METHYLCARBAMATES AS HERBICIDE EXTENDERS**  
Daniel L. Hyzak, Saratoga, and Ferenc M. Pallos, Walnut Creek, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

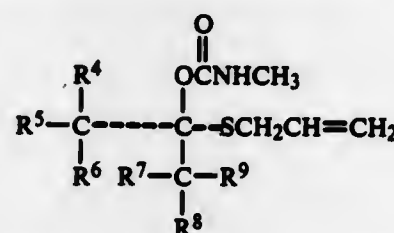
Filed Apr. 20, 1981, Ser. No. 255,209  
Int. Cl.<sup>3</sup> A01N 37/02

U.S. Cl. 71-100 18 Claims  
1. An herbicidal composition of extended soil life comprising:  
(a) an herbicidally effective amount of a thiolcarbamate having the formula



in which R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are independently C<sub>2</sub>-C<sub>4</sub> alkyl; and

(b) an amount of a halogenated allylthioisopropyl N-methylcarbamate sufficient to extend the soil life of said thiolcarbamate, said N-methylcarbamate having the formula



in which R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>9</sup> are independently halogen, and  
(c) an inert diluent carrier, wherein the weight ratio of (a) to (b) ranges from about 1:1 to about 1:20.

**4,422,870**  
**BIOCIDAL 2-ARYL-1,3-CYCLOHEXANEDIONE ENOL ESTER COMPOUNDS**  
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 28, 1977, Ser. No. 781,781

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.  
Int. Cl.<sup>3</sup> A01N 37/02; C07C 69/24

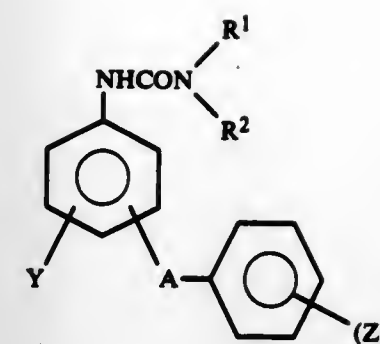
U.S. Cl. 71-106 10 Claims  
1. 3-(2-Ethylhexanoyloxy)-5,5-dimethyl-2-(2',4'-dimethylphenyl)-2-cyclohexenone.

**4,422,871**  
**ARALKYLPHENYLUREAS AND HERBICIDES CONTAINING THESE**  
Ulrich Schirmer, Heidelberg; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany  
Division of Ser. No. 268,120, May 28, 1981. This application May 7, 1982, Ser. No. 376,181

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1980, 3020869

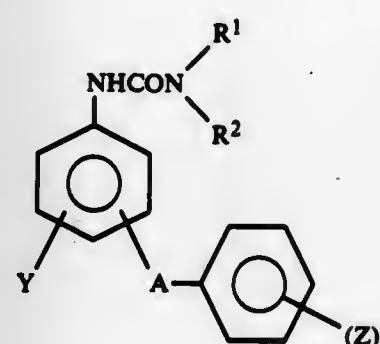
Int. Cl.<sup>3</sup> A01N 47/30; C07C 83/10, 87/50, 103/30  
U.S. Cl. 71-120 3 Claims

1. An aralkylphenylurea of the formula



wherein A is n-propylene or n-butylene, R<sup>1</sup> is methyl, R<sup>2</sup> is methyl or methoxy, Y is hydrogen or chlorine, Z is hydrogen or alkyl of 1 to 4 carbon atoms and n is 1.

2. A process for combating the growth of unwanted plants, wherein the plants or the soil are treated with a herbicidally effective amount of an aralkylphenylurea of the formula

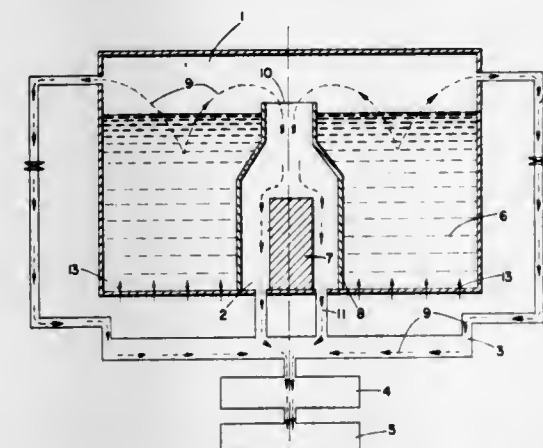


wherein A is n-propylene or n-butylene, R<sup>1</sup> is methyl, R<sup>2</sup> is methyl or methoxy, Y is hydrogen or chlorine, Z is hydrogen or alkyl of 1 to 4 carbon atoms and n is 1.

**4,422,872**  
**METHOD OF HEATING, MELTING, AND COAL CONVERSION AND APPARATUS FOR THE SAME**  
Ernest S. Geskin, 21 Karen Pl., Edison, N.J. 08817  
Filed Oct. 14, 1980, Ser. No. 196,265  
Int. Cl.<sup>3</sup> C21C 7/00

U.S. Cl. 75-51

5 Claims



1. A method of heating, melting and coal conversion in a vessel comprising inner and outer chambers separated from one another by a refractory wall, the method comprising the steps of

depositing a melt in the outer chamber, the melt being a melt selected from the group consisting of a metal, metal oxides and nonmetal oxides;  
injecting coal, air, oxygen, steam, fluxes, hot flue gases and slag into the melt;  
maintaining the melt temperature and composition so as to insure an absorption of oxygen of the injected air and of the injected oxygen and to thereby produce oxides, and

reduction of the oxides produced during the absorption, by the injected coal;  
accommodating a material to be heated in the inner chamber so that the melt flows around the refractory wall and heat through the latter the material in the inner chamber; and continuously withdrawing combustion products from the outer chamber and passing the combustion products through the inner chamber.

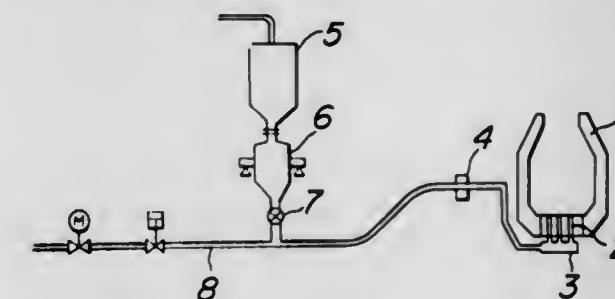
**4,422,873**  
**BLOWING METHOD IN A TOP AND BOTTOM BLOWING CONVERTER**

Hirotsuke Yamada, and Hisashi Omori, both of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan  
PCT No. PCT/JP81/00205, § 371 Date Apr. 30, 1982, § 102(e) Date Apr. 30, 1982, PCT Pub. No. WO82/00835, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 31, 1981, Ser. No. 380,667  
Claims priority, application Japan, Aug. 30, 1980, 55-119008  
Int. Cl.<sup>3</sup> C21C 5/34, 5/36

U.S. Cl. 75-52

3 Claims



1. A method of blowing a molten steel in a top and bottom blowing converter, comprising blowing lime powder into the converter through tuyeres arranged on the bottom thereof according to such a blowing pattern at the initial stage of the blowing, said initial stage being from the beginning of the blowing to the completion of desilicization, that the lime powder is blown into the converter in an amount satisfying the following formula

$$(\text{CaO}/\text{SiO}_2)^{-1} \times \text{SiO}_2 (\text{kg/t}) \leq 13 (\text{kg/t})$$

depending upon the basicity of slag and the amount of SiO<sub>2</sub> formed in the converter during the initial stage of the blowing.

**4,422,874**  
**GOLDEN SINTERED ALLOY FOR ORNAMENTAL PURPOSE**

Tomio Nishimura; Hiraku Yoshino; Kosei Takao, and Yuuji Masumoto, all of Fukuoka, Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Filed Jan. 6, 1982, Ser. No. 337,223  
Claims priority, application Japan, Oct. 9, 1981, 56-161146; Oct. 9, 1981, 56-161147; Oct. 9, 1981, 56-161148  
Int. Cl.<sup>3</sup> B22F 1/00

U.S. Cl. 75-238

2 Claims

1. Gold colored sintered alloy for ornamental purposes consisting essentially of:  
30-80 percent by weight of niobium carbide, 10-40 percent by weight of titanium nitride and 10-30 percent by weight of nickel.



4,422,875

## FERRO-SINTERED ALLOYS

Tohru Nakata, Matsudo; Hiroyuki Endo, Abiko; Masatoshi Harada; Tadao Hayashika, both of Kashiwa, and Osamu Miyamoto, Matsudo, all of Japan, assignors to Hitachi Powdered Metals Co., Ltd., Japan

Filed Feb. 25, 1981, Ser. No. 237,906

Claims priority, application Japan, Apr. 25, 1980, 55-54316; Sep. 5, 1980, 55-60609

Int. Cl.<sup>3</sup> B22F 5/00

U.S. Cl. 75-243

1 Claim

1. A ferro-sintered alloy having wear resistance at elevated temperatures, comprising a perlitic matrix having a copper content of 0.2 to 1.5 weight %, in which are dispersed 10 to 50 weight % of a phase A rich in heat- and corrosion-resistance and having the following composition and 2 to 15 weight % of at least one selected from the group consisting of four phases B rich in wear resistance and having the following composition:

Phase A	Cr 9-20% (by weight)
	Ni 6-15% (by weight)
	Mo 1.5-9.5% (by weight)
	W 1.5-9.5% (by weight)
	Cu 0.7-4.5% (by weight)
Phase B	Fe the remainder
	50-70% Mo-Fe Alloy (by weight)
	50-70% Cr-Fe Alloy (by weight)
	45-60% Fe-33-36% Mo-Si Alloy (by weight)
	45-60% Co-33-36% Mo-Si Alloy (by weight)

4,422,877

# SYNTHETIC POLYMER-PROPELLANT COMPOSITIONS FORMING COLD FOAMED STRUCTURES HAVING A TEMPERATURE AT LEAST 30° C. BELOW AMBIENT TEMPERATURE AND CONTAINING OPEN AND/OR CLOSED CELLS

J. George Spitzer, Palm Beach, Fla., and Lloyd I. Osipow, New York, N.Y., assignors to Restech Research Limited Partnership, New York, N.Y.

Continuation-in-part of Ser. No. 200,847, Oct. 28, 1980, abandoned, and Ser. No. 308,054, Oct. 2, 1981, abandoned. This application Feb. 4, 1982, Ser. No. 345,833

Int. Cl.<sup>3</sup> C08J 9/14

U.S. Cl. 106-122

18 Claims

1. A synthetic polymer-liquefied propellant composition capable of forming a cold foamed structure having a temperature at least 30° C. below the ambient temperature at which the cold foamed structure is formed, and containing open and/or closed cells, which may contain an additive which is deposited in the pores and/or walls of the foamed structure as the foamed structure is formed, comprising, as the essential ingredients:

- a film-forming synthetic polymer in an amount within the range from about 2% to about 30% by weight of the composition;
- at least one liquefied propellant boiling below -10° C.;
- the total propellant being in an amount within the range from about 50% to about 90% by weight of the composition; and having a heat vaporization of at least 55 calories per gram; the propellant being capable of dissolving the synthetic polymer at least in the presence of a co-solvent that is soluble in the propellant and in solutions of the synthetic polymer in the propellant at ambient temperature; and

- at least one nonsolvent that is soluble in the propellant but in which the synthetic polymer is insoluble in an amount within the range from about 1% to about 85% by weight of the composition;

the composition forming on volatilization of propellant at ambient temperature a coherent foamed structure containing open and/or closed cells, and having a temperature at least 30° C. below ambient temperature.

4,422,878

# ASPHALT COMPOSITIONS

Frank R. Fry, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 29, 1982, Ser. No. 445,115

Int. Cl.<sup>3</sup> C08L 91/00, 95/00

U.S. Cl. 106-219

5 Claims

1. An asphalt composition containing a reinforcing amount up to about 10% by weight of fibrous filler and (b) a fatty acid portion comprising a mixture of about 2.5 to 15% by weight of straight chain eighteen carbon unsaturated fatty acid and rosin in an active amount not exceeding about 30% by weight of the acid.

4,422,879

# PAPER SIZING AGENT AND PROCESS FOR THE PREPARATION THEREOF

Guenther Poppel, Horst Schuermann, both of Dueren, and Gabriel Falkenberg, Vettweiss, all of Fed. Rep. of Germany, assignors to Akzona, Inc., Asheville, N.C.

Continuation of Ser. No. 143,987, Apr. 28, 1980, abandoned.

This application Jul. 26, 1982, Ser. No. 402,189

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917439

Int. Cl.<sup>3</sup> C08L 93/04

U.S. Cl. 106-238

12 Claims

1. In an improved inversion process for the preparation of a paper sizing agent which is an aqueous dispersion containing a high content of free rosin in the form of fortified rosin and/or non-fortified rosin, water, and an anionic dispersing agent, the

4,422,876

# METHOD FOR PREPARING PLUGGING MATERIAL

Nikolai I. Nikolaev, V.O. 5 linia, 18, kv. 9; Lev A. Tereschenko, ulitsa Gurdina, 5, kv. 34; Arian M. Yakovlev, Grazhdansky prospekt, 5, korpus 1, kv. 210; Vitaly I. Kovalenko, ulitsa Esenina, 40, korpus 1, kv. 160, all of Leningrad; Ruben A. Tatevosian, ulitsa Gorkogo, 4, kv. 60; Mikhail Y. Titov, ulitsa Kominterny, 34/6, kv. 83, both of Moscow, and Nikolai K. Lipatov, ulitsa Zinovleva, 2, kv. 96, Apatity, Murmanskaya oblast, all of U.S.S.R.

Filed Jan. 28, 1982, Ser. No. 343,509

Claims priority, application U.S.S.R., Apr. 27, 1981, 3270006

Int. Cl.<sup>3</sup> C04B 7/32

U.S. Cl. 106-104

1 Claim

1. A method for preparing a body of plugging material of an alumina-base cement for in-situ cubic expansion on application of water thereto, comprising the steps of mechanically stirring dry alumina cement having dry additives of preterated quantities to improve the physical and mechanical characteristics of the plugging material, said stirring being effected by magnetized working bodies in an alternating electromagnetic field thereafter batch forming said stirred material into a body of determined shape conforming substantially to the body desired for in-situ application, and subsequently compressing said shaped body from all sides at a pressure of between 50 and 120 MN/m<sup>2</sup> to obtain a further compacted body.

improvement comprising using as the dispersing agent a polyethoxylated, sulfated rosin, or a derivative thereof, in an amount from about 1 to about 10%, based on the total weight of all solids in the dispersion.

4,422,880

# PRECIPITATED SILICEOUS PRODUCTS

Satish K. Wason, Havre de Grace, Md., assignors to J. M. Huber Corporation, Locust, N.J. Continuation of Ser. No. 39,062, May 11, 1979, abandoned, which is a division of Ser. No. 876,284, Feb. 9, 1978, abandoned, which is a continuation of Ser. No. 557,707, Mar. 12, 1975, abandoned. This application Jun. 30, 1981, Ser. No. 279,285

The portion of the term of this patent subsequent to Jul. 6, 1993, has been disclaimed.

Int. Cl.<sup>3</sup> C09C 1/30; C01B 33/12

U.S. Cl. 106-288 B

1 Claim

1. A new composition of matter comprising a finely divided, amorphous, precipitated silicon dioxide having a wet cake moisture content of from between about 77.9 to 83.2%; a structure index of from between about 365 to 495; an oil absorption of from between about 193 to 212 cc/100 grams; a void volume of from between about 3.19 to 4.40 cc Hg/gram SiO<sub>2</sub>; a BET surface area of from between about 153 to 220 m<sup>2</sup>/gram; and a percent friability of up to about 93%; said silicon dioxide comprising at least 90% SiO<sub>2</sub> and having incorporated therewith a metal cation selected from the group consisting of aluminum, magnesium, zinc, and calcium to thereby control the surface area thereof and to increase the refractive index thereof to a value of at least 1.45.

4,422,881

# INSTALLATION AND PROCESS FOR THE CONTINUOUS SEPARATION OF MIXTURES OF SUGARS AND/OR OF POLYOLS BY SELECTIVE ADSORPTION

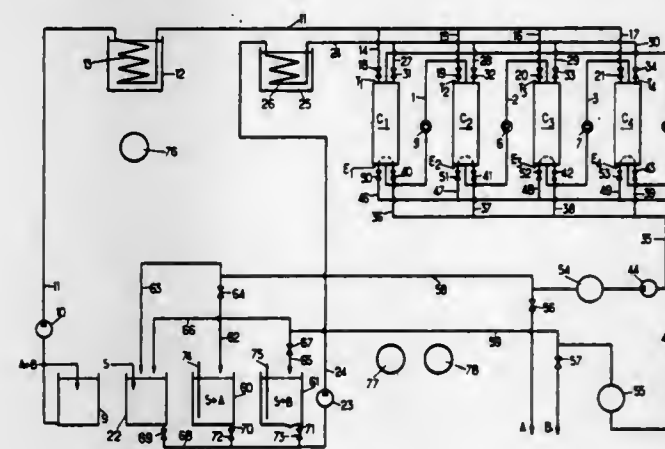
Francis Devos, Hazebrouck; Didier Delobean, Merville; Jean-Jacques Caboche, Lestrem; Patrick Lemay, Estaires, and Michel Hachette, Merville, all of France, assignors to Roquette Freres, Lestrem, France

Filed Oct. 29, 1980, Ser. No. 201,832

Int. Cl.<sup>3</sup> C13D 3/14

U.S. Cl. 127-46.1

3 Claims



1. A process for the continuous separation by selective adsorption of mixtures of sugars and/or polyols which comprises initiating successive feeding/extraction sequences S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub>, the first sequence S<sub>1</sub> comprising:

feeding the said mixture to an installation comprised of at least three columns each filled with adsorbent material, said installation of columns making up an adsorbent zone containing elution solvent, an enrichment zone, and a desorption zone, means successively communicating the outlet or extraction side of each zone with the inlet or top or head of the following one, closure means being located

in the means communicating each zone with the following one,

closing the closure means located directly upstream the desorption zone to prevent communication between the adsorption zone and the desorption zone and opening the other closure means,

continuously feeding to the adsorption zone the mixture to be separated comprising at least a first more adsorbed and a second less adsorbed sugar or polyol, said feeding of the mixture displacing elution solvent in said adsorption zone, continuously feeding elution solvent to said desorption zone and continuously withdrawing from the bottom of said desorption zone, the first more adsorbed sugar or polyol of said mixture in said elution solvent,

simultaneously, extracting from the adsorption zone the elution solvent during a first part of the sequence until the elution solvent is substantially displaced and then withdrawing the second less adsorbed sugar or polyol from said adsorption zone during a second part of the S<sub>1</sub> sequence, initiating a second sequence feeding/extraction (S<sub>2</sub>) comprising closing the closure means in the means communicating the previous desorption and enrichment zone and opening the other closure means whereby the desorption zone of sequence S<sub>1</sub> becomes the adsorption zone to which is fed the mixture to be separated, the enrichment zone of sequence S<sub>1</sub> becomes the desorption zone to which is fed the elution solvent and the adsorption zone of sequence S<sub>1</sub> becomes the enrichment zone,

thus repeating the feeding and extraction steps recited above utilizing the newly designated zones to initiate a third sequence S<sub>3</sub> and so on.

4,422,882

# PULSED LIQUID JET-TYPE CLEANING OF HIGHLY HEATED SURFACES

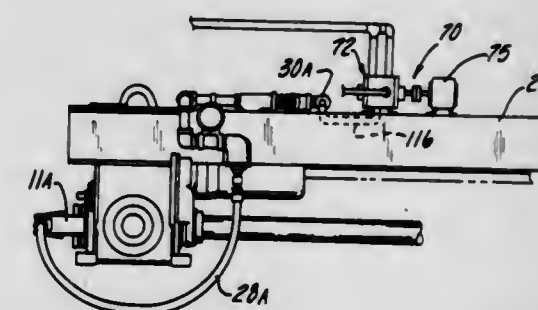
John E. Nelson; Charles W. Hammond; Rolland E. Huston, all of Lancaster, and Michael R. Helton, Englewood, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 29, 1981, Ser. No. 335,351

Int. Cl.<sup>3</sup> B08B 3/02

U.S. Cl. 134-22.18

9 Claims



1. The method of dislodging an adherent coating from the coated area of the heated surface of a heat exchanger or the like, which comprises projecting a high velocity liquid jet in the form of a plurality of discrete pulses against the coated area in a predetermined spacing and sequence, moving the jet over the coating at a controlled rate of progression, and forming said pulses by interrupting the jet with a frequency high enough to cause the leading portion of at least one pulse to strike the coating during each increment of movement of the jet which corresponds to the diameter of the jet at the position of impact, the duration of interruption being long enough to permit the liquid of each pulse to substantially dissipate from an area impacted thereby before a succeeding pulse strikes the same area.

2. A method as defined in claim 1 wherein the liquid is projected through a lance tube which is moved both longitudinally and angularly about its axis to cause the positions of impact of the pulses on the coated area to progress at a con-



trolled rate along a predetermined path, the frequency of the pulses lying outside the range of natural frequencies of oscillation of the lance tube.

#### 4,422,883 METHOD FOR REMOVING CYANOACRYLATE ADHESIVES FROM SURFACES

Warren G. Lazar, 8401 N. Rancho Catalina Dr., Tucson, Ariz. 85704

Continuation of Ser. No. 293,872, Aug. 18, 1981, Pat. No. 4,381,248. This application Sep. 30, 1982, Ser. No. 430,798  
Int. Cl.<sup>3</sup> B08B 3/08

U.S. Cl. 134—38

6 Claims

1. The method of removing a cyanoacrylate adhesive from a surface to which it has been bonded consisting essentially of applying to the surface a composition which comprises acetonitrile in sufficient concentration to dissolve the bond between the adhesive and the surface, and removing the adhesive from the surface, after the application of said composition.

#### 4,422,884 METHOD OF TREATING A CONTINUOUSLY CAST STRAND FORMED OF STAINLESS STEEL

David P. Vickers; Kenneth Mayland, both of Sheffield, and Gordon K. Allan, Rotherham, all of England, assignors to Concast AG, Zurich, Switzerland

Filed Oct. 16, 1978, Ser. No. 951,997  
Claims priority, application United Kingdom, Oct. 20, 1977, 43724/77

Int. Cl.<sup>3</sup> C21D 8/00

U.S. Cl. 148—2

11 Claims

1. A method of treating a continuously cast strand formed of stainless steel, comprising the steps of: casting a continuously cast strand of stainless steel; passing the cast strand through oppositely situated rollers of a plurality of opposed rollers; deforming the surface layer of oppositely situated sides of the strand prior to cutting of the strand by means of the oppositely situated rollers of said plurality of opposed rollers, in order to store energy in the surface layer of said oppositely situated sides of the strand and to concentrate the deformation at the strand surface; subsequently heating the strand; and thus producing by the deformation and subsequent heating a recrystallized marginal zone of more than three millimeters thickness at each of the oppositely situated deformed sides of the case strand.

#### 4,422,885 POLYSILICON-DOPED-FIRST CMOS PROCESS

Ronald W. Brower, Kettering; Samuel Y. Chiao, West Carrollton; Robert F. Pfeiffer, Centerville, and Roberto Romano-Moran, Centerville, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 18, 1981, Ser. No. 332,037  
Int. Cl.<sup>3</sup> H01L 21/22, 29/78, 11/14

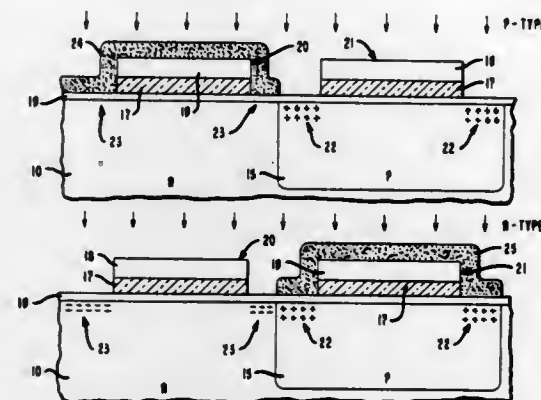
U.S. Cl. 148—1.5

1 Claim

1. A process for forming a CMOS device from a structure comprising a body of n-type semiconductor material having first and second active regions, respectively, with a p-well formed in the first active region, and a 300–700 Angstroms thin silicon dioxide layer formed over said body encompassing a gate region within each of said active regions, said process consisting of:

forming a polysilicon layer doped with n-type impurities over the thin silicon dioxide layer formed in said first and second active regions;  
forming an oxide mask over the polysilicon defining gates and interconnecting conductors;  
patterning the polysilicon in the presence of the oxide mask into gates corresponding to the gate regions and interconnecting conductors;

forming a first photoresist mask over the second active region;  
implanting n-type impurities in source and drain regions defined in the first active region by the oxide mask;  
removing said first photoresist mask;  
forming a second photoresist mask over the first active region;



implanting p-type impurities in source and drain regions defined in the second active region by the oxide mask; whereby said device has all n-type gates and interconnecting conductors of a single conductivity and is free of dopant penetration from said gates into said substrate via said thin silicon dioxide layer.

#### 4,422,886 SURFACE TREATMENT FOR ALUMINUM AND ALUMINUM ALLOYS

Narayan Das, Westmont, and Joy M. Schaefer, Park Ridge, both of Ill., assignors to Chemical Systems, Inc., Chicago, Ill. Division of Ser. No. 343,992, Jan. 29, 1982, Pat. No. 4,391,652.

This application Mar. 16, 1983, Ser. No. 475,911

Int. Cl.<sup>3</sup> C23F 7/06

U.S. Cl. 148—31.5

8 Claims

1. An aluminum or aluminum alloy surface obtained by contacting said surface with a coating solution consisting essentially of at least about 0.025 grams/liter of zirconium, at least about 0.050 grams/liter of fluoride ion, at least about 0.025 grams/liter of nickel and sufficient acid to adjust the pH to the range of about 1.2 to about 2.5.

#### 4,422,887 HEAT TREATMENT

Donald F. Neal, Tamworth, and Paul A. Blenkinsop, Sutton Coldfield, both of England, assignors to IMI Kynoch Limited, Birmingham, England

Filed Aug. 18, 1981, Ser. No. 293,960

Claims priority, application United Kingdom, Sep. 10, 1980, 8029075

Int. Cl.<sup>3</sup> C22F 1/18

U.S. Cl. 148—133

3 Claims

1. A method of heat treating a titanium base alloy containing by weight 5.5% aluminum, 3.5% tin, 3% zirconium, 1% niobium, 0.25% molybdenum, 0.3% silicon which includes the steps of solution treating the alloy at a temperature in the range 1030° C. to 1070° C. and then heat treating the alloy at a temperature of 435° to 635° C. and without mechanically working the alloy giving the alloy a second heat treatment at a higher temperature than the first heat treatment at a temperature of 600° to 700° C. wherein the duration of the first heat treatment is 2 to 168 hours.

#### 4,422,888 METHOD FOR SUCCESSFULLY DEPOSITING DOPED II-VI EPITAXIAL LAYERS BY ORGANOMETALLIC CHEMICAL VAPOR DEPOSITION

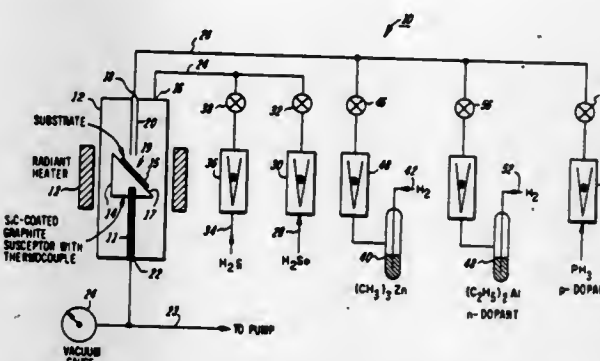
Wolfgang E. Stutius, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1981, Ser. No. 239,080

Int. Cl.<sup>3</sup> H01L 21/365, 29/22

U.S. Cl. 148—175

9 Claims



1. A method of depositing a doped epitaxial layer of a II-VI compound on the surface of a substrate in a deposition zone of a reactor of an organometallic chemical vapor deposition system comprising the steps of heating the deposition zone of the reactor to a temperature in the range of about 300° C. to 400° C. to produce pyrolytic action that provides sufficient surface mobility of the compound to be deposited to form a smooth epitaxially deposited layer, the temperature employed in said range being not so high as to produce a substantial concentration of native intrinsic defects, said defects being comparatively smaller in number relative to the number of electrically active donors therein, introducing into the reactor a gas phase composition containing a gaseous mixture of a reactant having a Group II containing component, a reactant having a Group VI containing component and a dopant selected from the Group III for n-type dopant or from the Group V for the p-type dopant, said step of introducing characterized by one of the gas phase reactants thereof and said selected dopant being initially introduced in close proximity to the substrate surface in the deposition zone whereas other gas phase reactants are introduced directly into the reactor proper. selecting a low pressure environment in the range of about 10 mTorr to 200 mTorr in the reactor, said selection sufficient to suppress the probability of the gas phase pyrolytic reaction of said mixture prior to deposition thereof on the substrate.

forming said epitaxial layer by contacting the substrate with the introduced mixture in the deposition zone causing the pyrolyzation and deposition on the substrate of an elemental II and VI compound with a predetermined doping concentration.

#### 4,422,889 METHOD OF MANUFACTURING AN OPTICAL FIBRE CABLE

Jean-Pierre Trezeguet, and Jean-Patrick Vives, both of Calais, France, assignors to Les Cables De Lyon, Clichy, France

Filed Nov. 17, 1981, Ser. No. 322,128

Claims priority, application France, Nov. 20, 1980, 80 24628  
Int. Cl.<sup>3</sup> B32B 3/00; B65H 5/00; G02B 5/16

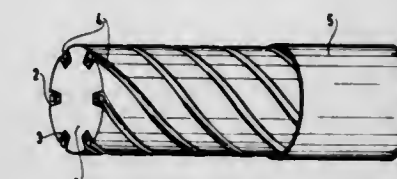
U.S. Cl. 156—70

2 Claims

1. A method of manufacturing an optical fibre cable comprising the steps of:

filling helical grooves formed about the periphery of a generally cylindrical elongate central support structure with a compound which is viscous at cable operation temperature to an intermediate level while in a viscous state;  
cooling said support structure and said viscous compound to reversibly harden said compound partially filling said grooves;  
laying optical fibres in said grooves over said hardened

compound while said compound is maintained at a temperature below its hardening temperature to locate said fibres at the intermediate depth; and  
filling the balance of the grooves with the said viscous compound at a temperature above its hardening temperature; and  
covering said support structure with its filled-in grooves with a sheet to retain the fibres in the grooves at their



intermediate depth position such that, when at higher operation temperatures the compound returns to its viscous state with the fibres remaining at the level they occupied as originally laid in the grooves, unless there is a strain differential between the optical fibres and the support to permit the fibres to sink deeper within the grooves to satisfy tractive stresses which elongate the support structure.

#### 4,422,890 PROCESS FOR THE MANUFACTURE OF DIMENSIONALLY RECOVERABLE ARTICLES

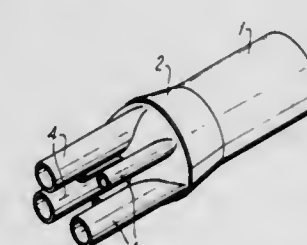
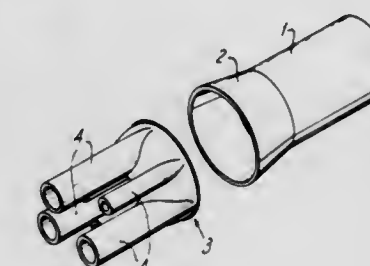
Richard J. Penneck, Lechlade, England, assignor to Raychem Limited, London, England

Filed Apr. 28, 1981, Ser. No. 258,310

Claims priority, application United Kingdom, May 15, 1979, 7916725; May 3, 1980, 8014927

Int. Cl.<sup>3</sup> B29C 27/00; B32B 31/00; B32C 13/00; F16L 1/00  
U.S. Cl. 156—73.5

10 Claims



1. A process for the manufacture of an article that is dimensionally-heat-recoverable, which comprises the steps of forming a plurality of shaped component parts of the article from a polymeric material, assembling the component parts to form a hollow article, said article having at least one outlet and having internal lateral dimensions that are greater than the lateral dimensions of the or any outlets, bonding the component parts



together, cross-linking the polymeric material after the component parts have been bonded together and then applying heat to expand at least a portion of the article to bring that portion of the article to a temperature above its crystalline melting point, or, for amorphous materials, the softening point of the polymer.

4,422,891

**VITRIFIABLE ADHESIVE PROCESS**

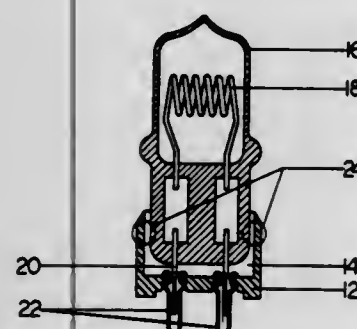
Donald I. Gonser, York, Pa., assignor to Dentsply Research & Development Corporation, Millford, Del.

Filed Jan. 16, 1981, Ser. No. 274,065

Int. Cl.<sup>3</sup> B32B 31/26; C04B 37/00, 39/00

U.S. Cl. 156—89

29 Claims



1. A method of adhering a first article to a second article comprising: contacting each of said articles with a polymerizable adhesive comprising: at least about 25% by weight of said adhesive of an inorganic particulate filler, and a polymerizable resin comprising at least about 0.25% by weight of said adhesive of a polymerizable silane, polymerizing said adhesive to adhere said objects together, and heating said polymerizable adhesive at a temperature and for a time sufficient to drive off or vaporize volatile organic components of the polymerized adhesive to effect vitrification thereof.

4,422,892

**METHOD OF MAKING A BONDED CORRUGATED NONWOVEN FABRIC AND PRODUCT MADE THEREBY**

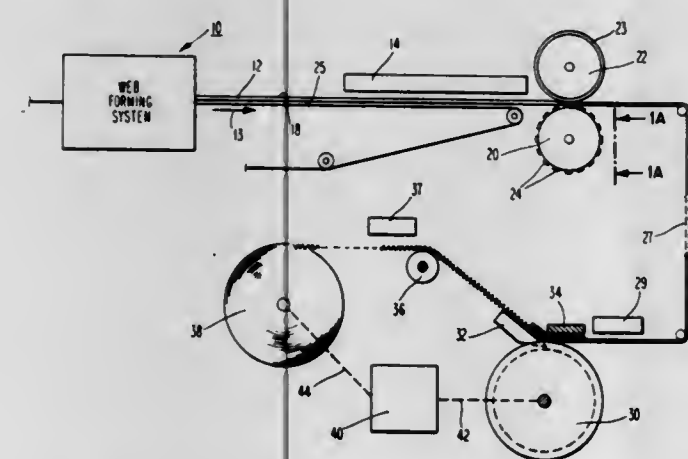
Derek Plant, Runnemede, N.J., assignor to Scott Paper Company, Philadelphia, Pa.

Filed May 4, 1981, Ser. No. 260,507

Int. Cl.<sup>3</sup> B32B 3/30, 3/02

U.S. Cl. 156—209

11 Claims



1. A method of making a corrugated, nonwoven fabric comprising the steps of: (a) forming a web predominately of thermoplastic fibers; (b) pattern embossing the web at an elevated temperature so

as to form autogenous bonds extending through the web and in said pattern;

- (c) creping the bonded web at an elevated temperature by pressing the web against a driven roll which feeds the web against a retarding member, said roll having grooves extending perpendicular to the axis of the roll;
- (d) controlling the removal of the web from the retarding member so that the web is foreshortened in the driven direction by at least 40 percent and so that said grooves cause noticeable ridges to be formed in the web, said ridges extending in the driven direction of the web; and
- (e) controlling the temperature of the web during the creping step so that some of the thermoplastic fibers are softened and the fabric tends to retain the crepe and ridges when the web cools.

4,422,893

**METHOD OF MANUFACTURING MIRRORS AND MIRRORS SO OBTAINED**

Jacques Duchateau, Recquignies, and Maurice Nicolas, la Rabo-Here, both of France, assignors to B F G Glassgroup, Paris, France

Continuation of Ser. No. 919,958, Jun. 28, 1978, abandoned.

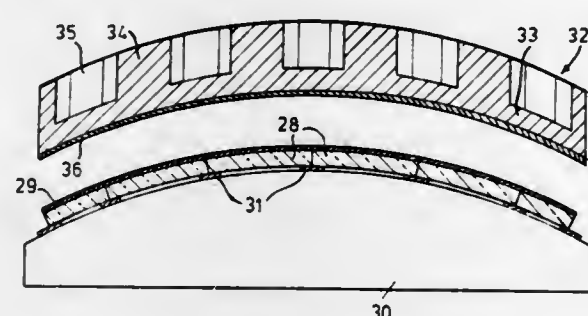
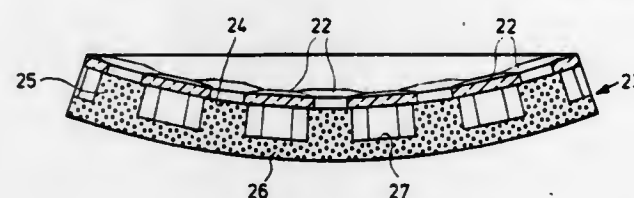
This application Apr. 15, 1980, Ser. No. 140,591

Claims priority, application United Kingdom, Jun. 28, 1977, 27026/77; Mar. 20, 1978, 27026/78

Int. Cl.<sup>3</sup> B32B 31/00, 3/14, 3/16; G02B 5/08

U.S. Cl. 156—232

20 Claims



1. A method of manufacturing a curved mirror having a solar reflective surface of large area sufficient to concentrate solar energy for use as a solar reflective panel, said method comprising the steps of: selecting a former of large area and curved shape complementary to the large area and curved shape of the mirror solar reflective surface which is to be used for concentrating solar energy, applying to such former a plurality of mirror elements in substantially juxtaposed relationship, to form a solar reflective surface each mirror element being constituted by a glass element having a reflective coating on one face thereof, and applying and adhesively bonding directly to the so positioned mirror elements a preformed substantially rigid unitary structural support of similar large area and curved shape made from material comprising expanded vitreous material.

4,422,894

**GASKET MANUFACTURE**

Alan W. Atkinson, Rochdale, and Janet M. Lancaster, Dearnley, both of England, assignors to T & N Materials Research Limited, Manchester, England

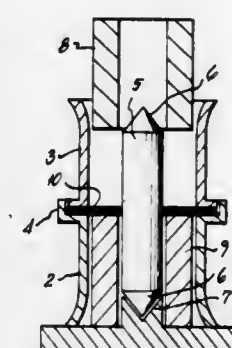
Filed Nov. 13, 1981, Ser. No. 321,230

Claims priority, application United Kingdom, Nov. 15, 1980, 8036727; Dec. 1, 1980, 8038419

Int. Cl.<sup>3</sup> B32B 31/00, 17/00; B28B 1/46

U.S. Cl. 156—62.2

7 Claims



1. A method of making an annular expanded graphite gasket incorporating an annular metallic reinforcement layer which is enclosed within the annular gasket in relation to one edge thereof, the method comprising the step of pressing said gasket from relatively uncompact expanded graphite particles onto the opposed faces of said metallic reinforcement layer substantially simultaneously between a pair of concentric rams including spacing means to define said one edge thereby forming compacted graphite foils in situ thereon, while at the same time pressing some of said particles relative to said one edge to form a single unreinforced graphite foil portion extending from and integral with the other foils to enclose said one edge.

4,422,895

**METHOD OF PRODUCING A COMPRESSIBLE LAYER AND A BLANKET FOR PRINTING OPERATION**

Haruo Shimura, and Takao Kawata, both of Saitama, Japan, assignors to Fujikura Rubber Ltd., Tokyo, Japan

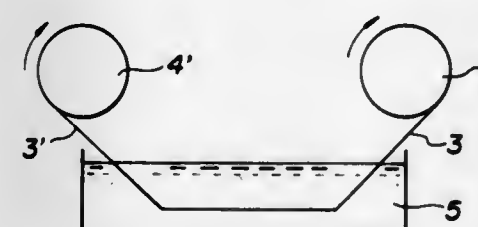
Filed Jul. 18, 1983, Ser. No. 515,310

Claims priority, application Japan, Jul. 16, 1982, 57-122831; Jul. 16, 1982, 57-122832; Jul. 16, 1982, 57-122833

Int. Cl.<sup>3</sup> B32B 5/18, 31/14; B44C 1/22; C03C 15/00

U.S. Cl. 156—633

30 Claims



1. A method of producing a compressible layer to be utilized for a blanket for printing operation having compression stress in the range of 2.0 to 8.0 kg/cm<sup>2</sup> in terms of compressibility and peeling strength of 200 g/m or more, characterized in that said method comprises the following steps:

- adding to elastomer compound of oil resistant polymer pulverized material having an average grain size in the range of 10 to 50 microns at a rate of 30 to 250 parts by weight relative to said elastomer compound of 100 parts by weight, said pulverized material being dissolvable in a certain effluent;
- placing the elastomer compound with the pulverized material added thereto over a base fabric at a rate of coverage in the range of 100 to 1000 g/m<sup>2</sup> and subjecting to vulcanization so as to form a layered structure; and
- immersing the layered structure in the effluent at a tempera-

ture ranging from room temperature to 100° C. for 3 minutes to 6 hours.

4,422,896

**MAGNETICALLY ENHANCED PLASMA PROCESS AND APPARATUS**

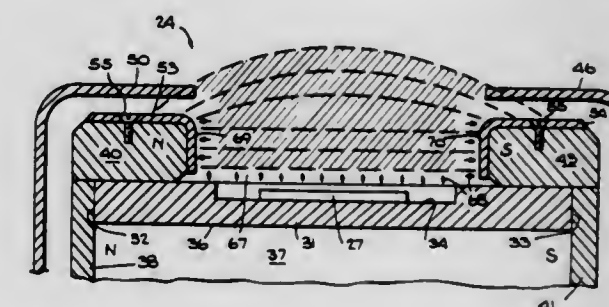
Walter H. Class, Yonkers, N.Y.; Steven D. Hurwitz, Park Ridge, N.J.; Michael L. Hill, New York, N.Y., and Marvin K. Hutt, Oakland, N.J., assignors to Materials Research Corporation, Orangeburg, N.Y.

Filed Jan. 26, 1982, Ser. No. 342,976

Int. Cl.<sup>3</sup> H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643

16 Claims



1. A method of plasma processing which includes the steps of placing at least one substrate on a substrate support electrode positioned in a hermetic chamber, evacuating the chamber, introducing a reactant gas into the chamber, and applying a voltage to the substrate support, wherein the improvement comprises:

- providing a magnetic field having lines of force which leave the support electrode, extend across the surface of the substrate exposed to the coating source, and re-enter the support to enclose said exposed surface in a magnetic electron-trapping field;
- adjusting the voltage applied to the substrate support to produce a dense glow discharge closely adjacent to said substrate surface such that molecules of the reactant gas become ionized and are electrically attracted to the substrate; and
- chemically reacting a selected material on the surface of the substrate with ions of the reactant gas.

4,422,897

**PROCESS FOR SELECTIVELY ETCHING SILICON**

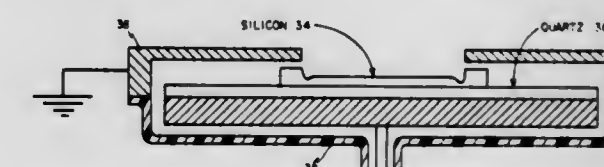
Christopher M. Horwitz, Summer Hill, Australia, assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 25, 1982, Ser. No. 382,050

Int. Cl.<sup>3</sup> H01L 21/306; B44C 1/22; B05D 5/12; C03C 15/00

U.S. Cl. 156—643

12 Claims



1. The process for selectively etching silicon in preference to a masking material on a surface of said silicon which comprises positioning a patterned masking material on said silicon, positioning said silicon on a target connected to a radio frequency electrode, introducing an etchant gas composition into said chamber under conditions to convert said etchant gas composition to a plasma, providing a source of oxygen and silicon to the interior of said chamber under conditions to deposit silicon dioxide selectively on said masking material layer and to etch silicon selectively from said silicon layer.

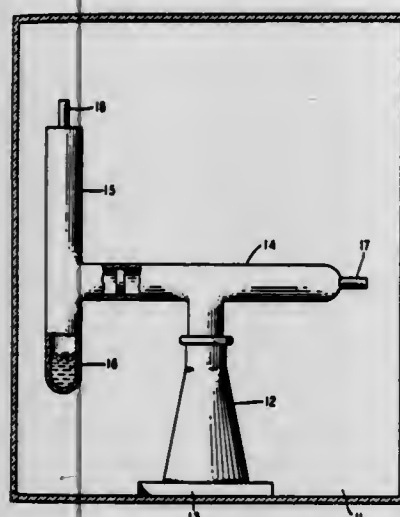


# 4,422,898 TECHNIQUE FOR THE FABRICATION OF AN IRON OXIDE MASK

John B. MacChesney, Stirling; Paul B. O'Connor, Plainfield, and Miles V. Sullivan, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Continuation of Ser. No. 934,815, Aug. 18, 1978, abandoned, which is a continuation of Ser. No. 540,398, Jan. 13, 1975, abandoned, which is a continuation of Ser. No. 377,582, Mar. 2, 1973, abandoned, which is a continuation of Ser. No. 29,560, Apr. 17, 1970, abandoned. This application Jun. 2, 1982, Ser. No. 384,406

Int. Cl.<sup>3</sup> B05D 5/06; B41N 1/24  
U.S. Cl. 156—655

4 Claims



4. In a method of fabricating a photomask, made up of a transparent substrate and a patterned layer thereon of a material relatively opaque to light of a wavelength used for exposing photoresists and relatively transparent to visible light of a higher wavelength, said method comprising the steps of depositing a metal oxide layer on the surface of said substrate and selectively etching said layer to form the required pattern, the improvement which comprises depositing iron oxide on said surface by decomposing iron pentacarbonyl at said surface in the presence of oxygen while the substrate is maintained at a temperature within the range of 100 degrees C. to 160 degrees C., within which the iron oxide layer is deposited in a form which is soluble in etchants compatible with photoresist processing.

# 4,422,899 APPARATUS AND METHOD FOR THE VAPORIZATION OF LIQUID

Pentti Juhola, and Arvi Artamo, both of Espoo, Finland, assignors to Rintekno Oy, Espoo, Finland  
PCT No. PCT/FI81/00004, § 371 Date Sep. 15, 1981, § 102(e) Date Sep. 15, 1981, PCT Pub. No. WO81/02112, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 22, 1981, Ser. No. 305,628

Claims priority, application Finland, Jan. 24, 1980, 800216

Int. Cl.<sup>3</sup> B01D 1/08, 1/10, 1/22

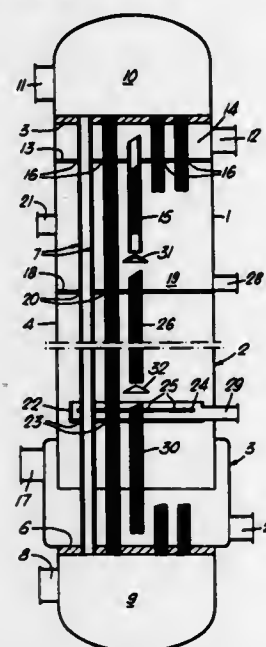
U.S. Cl. 159—13 B

2 Claims

1. A heat exchanger of the film vaporizer vertical tube type which comprises:

- a shell or mantle having closed upper and bottom parts and a bank of tubes therein vertically supported by means of first and second tube-supporting end plates, with one plate located adjacent the bottom part of said mantle and defining an end space therewith, and the other end plate located adjacent the upper part thereof and defining an end space therewith, each of said end spaces being adapted to receive heat exchanger fluid therein for flowing through said tubes in heat exchanger relationship therewith,
- a nozzle plate located intermediate said tube-supporting end

plates and having openings therein through which said tubes pass, said nozzle plate extending and contacting the inner walls of said mantle, each of said openings defining with respect to the tube passing therethrough a film-forming nozzle for feeding liquid down and along the surface of said tube, at least one nozzle basin spaced from said nozzle plate through which the tubes pass, said basin similarly having nozzle openings through which the tubes pass which define with said tubes film-forming nozzles for feeding liquid down and along the surface of said tubes, said at least one nozzle basin having a tube-support plate spaced from its bottom such as to be submerged in the liquid reservoir during operation of said heat exchanger and thus assure a continuous flow of liquid film down along said tubes,



the nozzle basin tube-support plate also having openings therein between the spaced tubes passing through said plate, said at least one nozzle basin having at least one overflow pipe for allowing excess liquid to overflow into said pipe down to another nozzle basin located below said at least one nozzle basin,

means for feeding heat exchange fluid into one of said end spaces of said mantle for passage through said tubes and out through the other end space of said mantle, means for feeding liquid to be evaporated into the interior of the mantle in the space outside of said tubes onto a nozzle plate and onto at least one nozzle basin to provide a reservoir of said liquid for flowing through the nozzles surrounding the tubes and provide a liquid film flowing down and along the surface of said tubes for evaporation by heat exchange fluid flowing through each of said tubes, and means by which the vapor formed from the liquid is removed from said mantle.

# 4,422,900 SPRAY DRYING APPARATUS FOR AVAILABLE CHLORINE-CONTAINING COMPOUNDS

Kent J. Bordelon; Robert C. Eschenbacher, both of Lake Charles, La., and William H. Bridendall, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 25, 1981, Ser. No. 324,727

Int. Cl.<sup>3</sup> B01D 1/14, 1/18

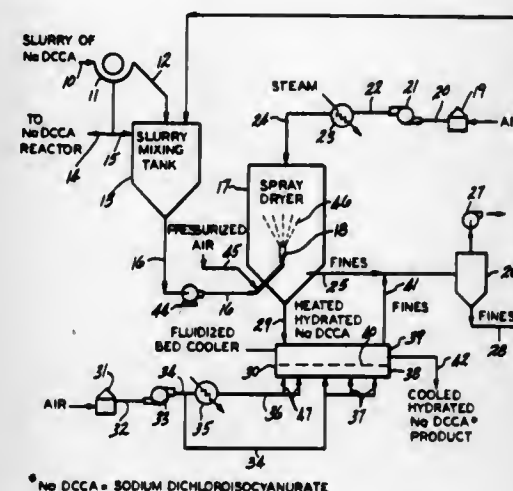
U.S. Cl. 159—48.1

9 Claims

1. A process for preparing granular particles of an available chlorine compound which comprises:

- a. conveying a flowing stream of an aqueous slurry of said compound under pressure through a tubular chamber hav-

- ing a longitudinal axis parallel to the direction of flow of said slurry;
- b. conveying said slurry to an exit port positioned in said tubular chamber;
- c. discharging said aqueous slurry from said tubular chamber through said port into a zone of reduced pressure and enlarged area;



\* No DCCA = SODIUM DICHLOROISOCYANURATE

- d. conveying jets of atomizing medium into said exit port, thereby impinging said jets of atomizing medium into said slurry as it passes out of said exit port into said zone, whereby free expansion of said slurry into a cone of aerated droplets of said slurry is effected, and
- e. contacting said droplets with heated gas in said zone to evaporate water from said droplets and produce dry granules of said compound.

# 4,422,901 APPARATUS FOR THE CONTINUOUS SOLVENT EXTRACTION OF BITUMEN FROM OIL-BEARING SAND

George B. Karnofsky, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

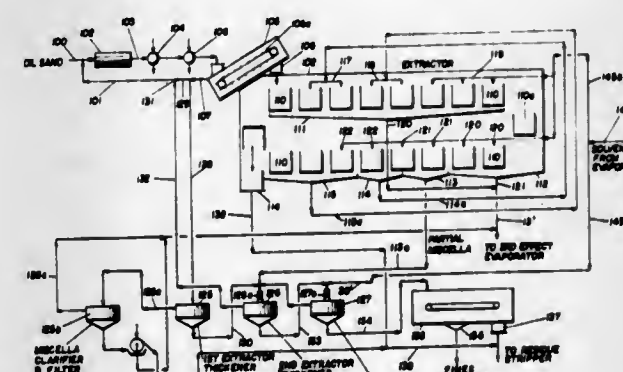
Continuation of Ser. No. 202,146, Oct. 30, 1980, abandoned, which is a division of Ser. No. 41,769, May 23, 1979, abandoned.

This application Sep. 30, 1982, Ser. No. 431,677

Int. Cl.<sup>3</sup> B01D 11/02; C10C 3/08

U.S. Cl. 196—14.52

3 Claims



1. In an apparatus for the continuous extraction of bitumen from oil sand having means for continuously producing a feed slurry by mixing said oil sand and a miscella comprising solvent and bitumen, and a means for separating the feed slurry into an overflow stream having primarily finer particles of feed sand dispersed therein and an underflow stream having primarily coarse particles of feed sand dispersed therein and means for separately washing with solvent the sand in the underflow and overflow streams, the improvement comprising:

- (a) means for washing the sand in said overflow stream by countercurrent decantation with solvent to produce a first miscella and spent fine sand;
- (b) means for washing the sand in said underflow stream

wherein the sand, confined in beds, is countercurrently washed by solvent, which percolates through the beds by gravity, to produce a second miscella and spent coarse sand, comprising a horizontally traveling conveyor with a continuous succession of strainer baskets arranged to receive, in turn, the underflow stream, stationary compartments under said baskets over which they travel which collect liquid draining from the baskets, sparger means arranged to discharge liquid into the baskets as they are carried beneath the sparger means by the conveyor, means for circulating liquid from some of the compartments to some of the sparger means, and means for removing from at least one of the compartments liquid comprising said second miscella;

- (c) means for steam stripping solvent from the spent fine sand and the spent coarse sand;
- (d) means for evaporation in which said first and second miscellas are separated into product bitumen and solvent; and
- (e) means for recycling solvent recovered in said evaporation means and in said sand stripping means to both said means for washing sand.

# 4,422,902 METHOD OF OPERATING A COKE OVEN

Dieter Breidenbach, Waltrip, and Wilhelm Mosebach, Kamen-Metheler, both of Fed. Rep. of Germany, assignors to WSW Stahl-Und Wasserbau GmbH, Rippaushof, Fed. Rep. of Germany

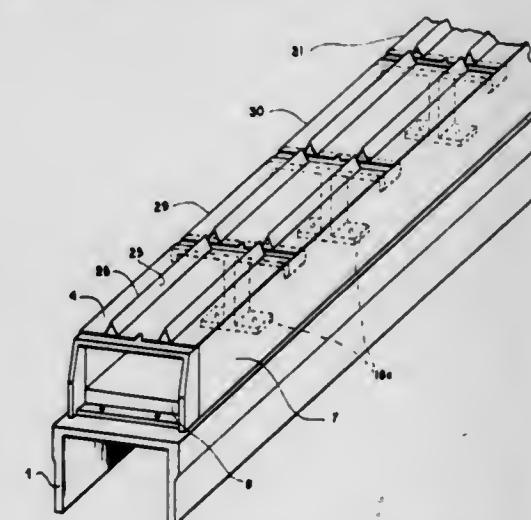
Division of Ser. No. 182,004, Aug. 27, 1980, abandoned. This application Sep. 18, 1980, Ser. No. 303,609

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945017; Jan. 4, 1980, 3000161

Int. Cl.<sup>3</sup> C10B 23/00, 27/00

U.S. Cl. 201—14

2 Claims



1. In a method of operating a coking chamber of rectangular horizontal outline, with major sides bounded by heated lateral walls and with minor sides closed by respective doors, to transform a charge of coal in said chamber into coke by heat transmitted thereto through said lateral walls, the improvement whereby hot gases evolving from the charge under the transmitted heat are channeled toward a flue through a vertical passage in each door separated from the interior of the chamber only by a thermally conductive metal partition in contact with the charge whereby the gases rising in said passage transfer part of their heat through said partition by excellent heat conduction to the end region of said charge in contact with said partition to ensure full coking of said charge along said end region thereof, the heat of the gases being prevented by a thermally insulating layer on an outer wall of said passage from escaping to the exterior.



# 4,422,903 ANHYDROUS ETHANOL DISTILLATION METHOD AND APPARATUS

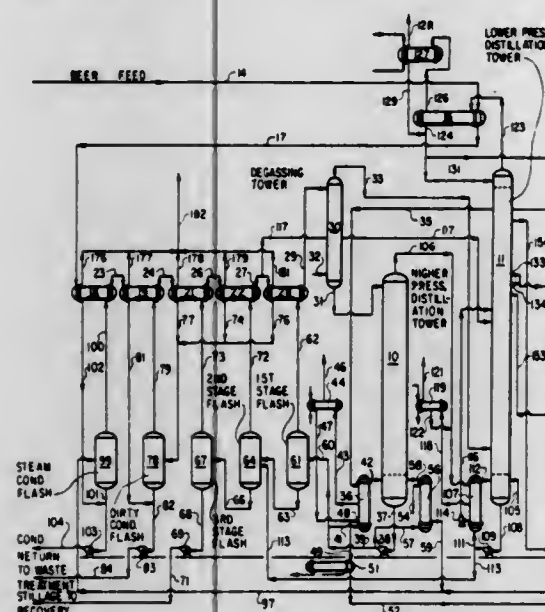
John R. Messick; William R. Ackley, and George D. Moon, Jr.,  
all of Cincinnati, Ohio, assignors to Raphael Katzen Associ-  
ates International Inc., Cincinnati, Ohio

Filed Feb. 17, 1981, Ser. No. 234,771

Int. Cl.<sup>3</sup> B01D 3/36; C07C 31/08, 29/80

U.S. Cl. 203—19

19 Claims



1. In a distillation method for recovering anhydrous ethanol from a dilute ethanol-containing feedstock wherein the feedstock is introduced into a stripping and rectification section, a concentrated ethanol stream is removed from said stripping and rectification section and is introduced into a dehydrating tower, an azeotropic agent is also introduced into said dehydrating tower, a substantially azeotropic overhead is removed from said dehydrating tower, an anhydrous ethanol product is removed from the bottom portion of said dehydrating tower, the substantially azeotropic overhead from said dehydrating tower is condensed and separated into an upper phase rich in azeotropic agent and a lower water-rich phase, the upper phase is returned to said dehydrating tower, and the lower water-rich phase is introduced into an azeotropic agent stripping tower wherein the azeotropic agent is recovered and returned to the system;

the improvement which comprises the steps of:

- providing in said stripping and rectification section a first stage distillation tower comprising an ethanol stripping tower and a second stage distillation tower comprising a stripper-rectifier tower;
- preheating said feedstock;
- splitting the preheated feedstock into two preheated feed streams of unequal size;
- further preheating the larger of said feed streams;
- introducing said larger feed stream into the top portion of said first stage distillation tower;
- introducing the smaller of said feed streams into said second stage distillation tower;
- maintaining a higher pressure in said first stage distillation tower than in said second stage distillation tower;
- maintaining a higher pressure in said dehydrating tower than in said first stage distillation tower;
- condensing steam to supply the heat required in said dehydrating tower;
- supplying the heat required in said first stage distillation tower by condensing said substantially azeotropic overhead from said dehydrating tower;
- removing overhead ethanol-containing vapors from said first stage distillation tower and condensing said vapors to supply the heat required in said second stage distillation tower;
- introducing the condensate from step (k) into said second stage distillation tower;

- condensing overhead vapors from said second stage distillation tower;
- obtaining said concentrated ethanol stream by removing the same from the upper portion of said second stage distillation tower;
- withdrawing bottoms streams from said first and second stage distillation towers;
- said preheating of said feedstock in step (b) being effected first by means of the heat obtained in condensing step (m) and then by means of the heat contained in a bottoms stream withdrawn from at least the first of said first and second stage distillation towers; and
- said further preheating of said larger feed stream in step (d) being effected by means of the heat contained in the bottoms stream withdrawn from said first stage distillation tower.

4,422,904

# METHOD FOR FORMING VIDEO DISCS

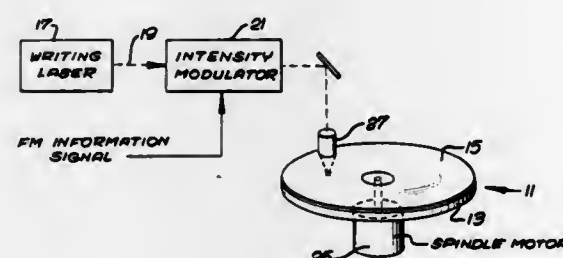
Richard L. Wilkinson, El Toro, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 329,800, Dec. 11, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,352

Int. Cl.<sup>3</sup> C25D 1/10

U.S. Cl. 204—5

1 Claim



1. A method for forming a stamper for use in molding video disc replicas, comprising steps of:

- forming a disc-shaped master recording that includes a glass substrate and a thin recording layer, an information signal being recorded in the recording layer in a sequence of spaced pits arranged in a plurality of substantially circular and concentric recording tracks;
- vapor depositing a first thin, uniform, metallic film on the recording layer of the master recording, the vapor depositing occurring in a pressure of about  $1 \times 10^{-6}$  torr or less; electroplating a second thin, uniform, metallic film onto the first film, the first and second films together forming an integral, metallic layer;
- separating the metallic layer from the underlying master recording; and
- removing residual recording layer material from the under-surface of the separated metallic layer, to form a stamper suitable for use in molding video disc replicas.

# 4,422,905 METHOD FOR PRODUCING SEPARATING NOZZLE ELEMENTS USED FOR SEPARATING GASEOUS OR VAPOROUS MIXTURES

Erwin-Willy Becker; Wolfgang Ehrfeld; Gunther Krieg, all of Karlsruhe, and Wilhelm Bier, Eggenstein-Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

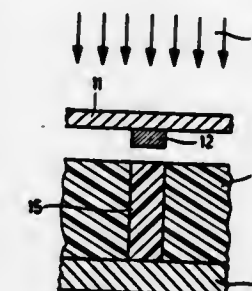
Filed Jun. 2, 1980, Ser. No. 155,652

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922642

Int. Cl.<sup>3</sup> C25D 1/02, 1/20

U.S. Cl. 204—9

10 Claims



1. A method for producing a component of a separation element for separating a gaseous or vaporous mixture into fractions, which element is composed of a plurality of separating nozzle structures presenting passages defining mixture supply channels, separating chambers and fraction discharge channels, said method comprising:

- forming a negative mold of the component by: providing a layer of a selectively electrically nonconductive material whose ability to be removed is influenced by application of selected radiation and mounting such layer on a substrate of an electrically conductive material; irradiating portions of the layer with such radiation in a pattern corresponding to the passages presented by the nozzle structure and to an extent such that material outside of the regions delimiting the passages is removable more easily than material within those regions; and removing the more easily removable material from the layer to create the negative mold of the component; and
- forming the component by: filling the openings formed by said step of removing with a second material, which is a metal, by electrochemical deposition to create a solid plate-shaped member; removing the negative mold from the plate-shaped member; and removing the substrate after said step of filling.

4,422,906

# PROCESS FOR DIRECT GOLD PLATING OF STAINLESS STEEL

Masami Kobayashi, 3-13-15, Hachimanyama, Setagaya-ku, Tokyo, Japan

Filed Sep. 17, 1981, Ser. No. 303,175

Int. Cl.<sup>3</sup> C25D 5/36

U.S. Cl. 204—34

13 Claims

1. A process for direct gold plating of stainless steel which comprises the steps of:

- dipping stainless steel in an activating solution which is an aqueous mixed acid solution containing, based on the weight of the solution,
  - 3% to 20% by weight of hydrochloric acid,
  - 2 to 30% by weight of sulfuric acid,
  - 0.1 to 5% by weight of a nonionic or cationic surface active agent, and
  - 0.1 to 20% by weight of a compound selected from the group consisting of 2-pyrrolidone and N-alkyl-2-pyrrolidone, the alkyl moiety having 1 to 5 carbon atoms;

subjecting the activated stainless steel to cathodic electrolysis in a cathode electrolytic activation solution; and then electroplating the cathodically electrolyzed stainless steel with gold.

4,422,907

# PRETREATMENT OF PLASTIC MATERIALS FOR METAL PLATING

Albert A. Birkmaier, Mendham; Gary A. Harpell, Morristown, both of N.J.; Bruce E. Kurtz, Marcellus, N.Y.; Gordhanbhai N. Patel, Camillus, N.Y.; Ruston P. Poncha, Syracuse, N.Y.; Adam L. Skovrinski, Memphis, N.Y., and James M. Lesco, Anaheim Hills, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 30, 1981, Ser. No. 335,773

Int. Cl.<sup>3</sup> C25D 5/00; B05D 3/04

U.S. Cl. 204—38 B

23 Claims

20. An improved process for plating one or more metals onto the surfaces of a plastic material which comprises:

- exposing said material to an atmosphere containing an effective amount of ozone;
  - contacting said exposed material with an effective amount of one or more strong organic or inorganic bases;
  - coating said contacted material with a catalyst for electroless plating of metal thereon; and
  - depositing a metal coating on said catalyzed material by electroless plating.
22. An improved process according to claim 20 which further comprises depositing one or more additional metal coatings onto said metal coated material of step d, by electroplating.

4,422,908

# ZINC PLATING

Charles W. Welch, New Castle, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 23, 1981, Ser. No. 324,116

Int. Cl.<sup>3</sup> C25D 3/22

U.S. Cl. 204—55 R

16 Claims

1. A process for producing zinc electrodeposits which comprises passing current from a zinc anode to a metal cathode wherein the current is passed through an acidic aqueous bath having a pH of from about 4.0 to about 5.5, containing from 20 to 35 grams per liter of zinc ions; from 55 to 155 grams per liter of sulfamate ions; from 15 to 30 grams per liter of boric acid; from 15 to 45 grams per liter of sodium chloride or potassium chloride; from 0.6 to 3.0 grams per liter of an organic salt which is an alkali metal salt of a carboxylic acid complexing agent; from 0.1 to 0.4 grams per liter of aromatic carbonyl compound, from 0.5 to 1.1 grams per liter of a sulfonated fixed oil, and from 1.0 to 15 grams per liter of a polyether surfactant.

4,422,909

# ELECTROLYTIC PROCESS FOR THE MANUFACTURE OF ALKALI METAL HALATE

Everett M. Spore, Tonawanda, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 104,231, Dec. 17, 1979, Pat. No. 4,332,659.

This application Dec. 27, 1981, Ser. No. 328,173

Int. Cl.<sup>3</sup> C25B 1/24

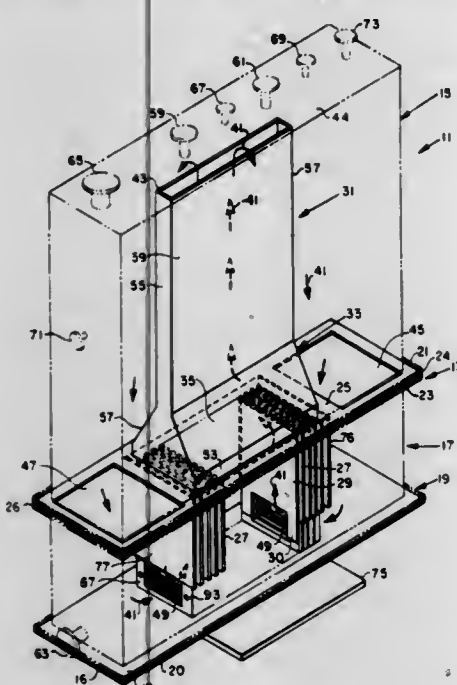
U.S. Cl. 204—95

1 Claim

1. A method for manufacturing sodium chlorate in an electrolytic cell comprising a cell housing, electrode pairs and an electrolyte which includes an aqueous solution of sodium chloride, which method comprises applying to a plurality of electrode pairs in said cell a voltage of from 1.8 to 3 volts to cause a direct current flow at a current density in the range of 0.1 to 0.3 ampere/sq. cm. of anode surface, with the temperature of the electrolyte being maintained in the range of 10° to 95° C., flowing the electrolyte, including hypochlorite and hydrogen gas, through a common funneling chimney in the cell extending over the electrode pairs, said funneling chimney



having a lower funneling portion and an upper passageway portion, removing hydrogen gas from such electrolyte after passage thereof through the passageway, flowing the electrolyte downwardly within the cell housing to the bottom of the cell, during which movement at least some hypochlorite is converted to chlorate, and moving it upwardly through the passageway at a velocity in the range of 20 to 100 cm./second, caused by the lifting power of the hydrogen gas in the passage-



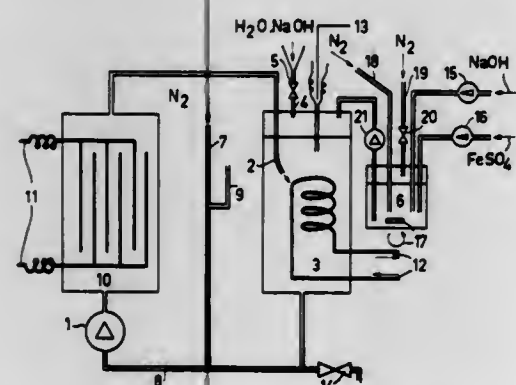
way, the velocity of electrolyte in the passageway being 0.2 to 0.8 times the velocity of electrolyte traveling past the electrodes, whereby the hydrogen gas produced and removed contains less than 3% of oxygen on a volumetric basis, and continuing the electrolysis and such operations of the apparatus so that the electrolyte, when ready for removal from the apparatus, contains 350 to 700 g./l. of sodium chlorate, 80 to 160 g./l. of sodium chloride and 1 to 6 g./l. of sodium hypochlorite, and removing such electrolyte from the apparatus.

#### 4,422,910 METHOD OF MANUFACTURING ACICULAR GOETHITE

Heinz Scholz, Kelmis-Hergenrath, Belgium; Wolfgang Schnitker, and Ernst Klein, both of Roetgen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 403,953  
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1981, 3141421

Int. Cl.<sup>3</sup> C25B 1/00  
U.S. Cl. 204—96 20 Claims



1. A method of manufacturing acicular goethite comprising the steps of:

providing a suspension of an iron(II)-containing compound

in a liquid consisting essentially of water, said iron(II)-containing compound having a low water solubility; oxidizing the suspension to form acicular goethite crystals; and filtering off, washing, and drying the acicular goethite crystals; characterized in that the step of oxidizing the suspension includes electrolytically oxidizing the suspension.

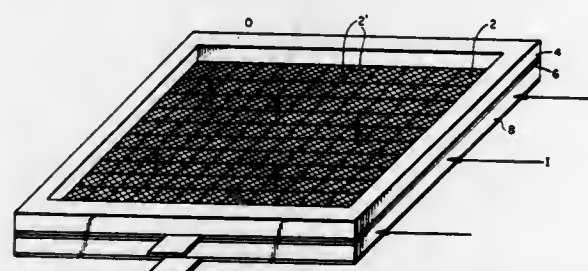
#### 4,422,911 METHOD OF RECOVERING HYDROGEN-REDUCED METALS, IONS AND THE LIKE AT POROUS CATALYTIC BARRIERS AND APPARATUS THEREFOR

Walter Juda, Lexington; Robert J. Allen, Saugus; Robert Lindstrom, Gloucester, and Amiran Bar-Ilan, Newtonville, all of Mass., assignors to Prototech Company, Newton, Mass.

Filed Jun. 14, 1982, Ser. No. 387,963

Int. Cl.<sup>3</sup> C25C 1/12, 7/00

U.S. Cl. 204—106 17 Claims



1. A process for recovering hydrogen-reduced metals or ions from an aqueous electrolyte solution thereof, that comprises, providing a catalytic barrier having openings distributed therethrough to render said barrier pervious to said solution, applying hydrogen to said barrier and flowing the solution transversely through the barrier openings while contacting both surfaces of said barrier by the solution.

#### 4,422,912 METHOD AND APPARATUS FOR RECOVERING METALS FROM METAL RICH SOLUTIONS

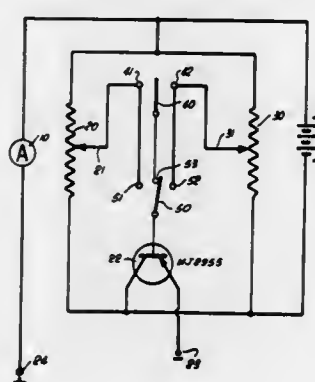
William J. Stevens, 23/25 Woodstock St., Bondi Junction, New South Wales, Australia

Filed May 20, 1982, Ser. No. 380,444

Claims priority, application Australia, Jun. 12, 1981, PE9272

Int. Cl.<sup>3</sup> C25C 1/20, 7/00

U.S. Cl. 204—109 5 Claims



1. A method for recovering metal from a metal rich electrolyte solution comprising the steps of:

(a) flowing the solution from a vessel through a continuously acting electrolytic plating cell at a first feed rate when the solution level in the vessel is greater than a predetermined level and at a lesser feed rate when the solution level is below the predetermined level;

(b) adjusting the plating current of the cell from a first current when the cell is supplied at the first feed rate to a

lower current when the cell is supplied at the lesser feed rate.

#### 4,422,913 PROCESS FOR THE PRODUCTION OF 1,1,2-TRICHLORO-2,2-DIFLUOROETHANE

Eric R. Larsen, and Ernest L. Ecker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 23, 1981, Ser. No. 324,184

Int. Cl.<sup>3</sup> B01J 19/12; C07C 17/04

U.S. Cl. 204—158 HA 15 Claims

11. A process comprising contacting 1,1-difluoroethylene with chlorine in the presence of ultraviolet light at a temperature of from about -20° C. to about 100° C. in a liquid reaction medium comprising CF<sub>2</sub>ClCH<sub>2</sub>Cl and CF<sub>2</sub>ClCHCl<sub>2</sub> wherein the molar ratio of CF<sub>2</sub>ClCH<sub>2</sub>Cl to CF<sub>2</sub>ClCHCl<sub>2</sub> is at least about 1.5, thereby selectively producing 1,1,2-trichloro-2,2-difluoroethane.

#### 4,422,914 POLYMER COMPOSITION HAVING TERMINAL ALKENE AND TERMINAL CARBOXYL GROUPS

Jung-Hsien Tsao, Marietta, and Paul R. Hein, Atlanta, both of Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 16, 1981, Ser. No. 225,809

Int. Cl.<sup>3</sup> C08G 18/00, 63/00, 69/00

U.S. Cl. 204—159.19 10 Claims

1. A polymer composition wherein the polymer consists essentially of a polymer having a molecular weight of about 250 to 10,000 and acid content of about 0.1 to 4.0 milliequivalents/gram comprising a terminal carboxyl group at one end and a single terminal alkene unsaturation at the other end, said carboxyl group and alkene unsaturation being in a ratio on said polymer of about 1 to 1.

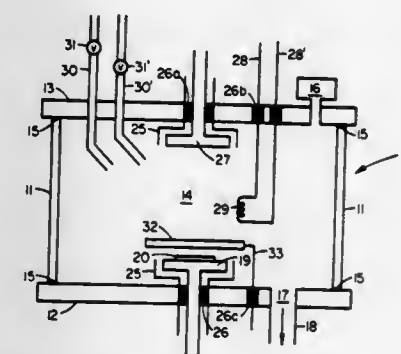
#### 4,422,915 PREPARATION OF COLORED POLYMERIC FILM-LIKE COATING

Roy F. Wielonski, Worthington, and Harry A. Beale, Columbus, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Sep. 4, 1979, Ser. No. 72,509

Int. Cl.<sup>3</sup> B05D 3/06; C08F 00/00

U.S. Cl. 204—165 10 Claims



1. A method for coating a surface of a substrate with a colored polymeric film-like coating of selected visible color, which process comprises:

(a) introducing a plasma-polymerizable material into an apparatus having an evacuated interior environment with the introduced material passing through an electrical discharge region adjacent to said surface and of a frequency conducive to polymerize said material to a polymer and with said apparatus and said environment adapted to plasma polymerize said material;

(b) plasma polymerizing said plasma-polymerizable material to said polymer and depositing said polymer onto the surface of said substrate which serves as a cathode element or is contacting a cathode element within said apparatus

while said cathode element is maintained at an electrical potential conducive for said depositing; and (c) concurrently depositing discrete particulates which are opaque and of colloidal size and of a metal or metalloid along with the depositing of said polymer onto the surface of said substrate and with the depositing particulates of a size and dispersed distribution throughout the concurrently deposited polymer so as to alter the color of the polymer through selective scattering and adsorption of light by said deposited particulates to provide said selected visible color.

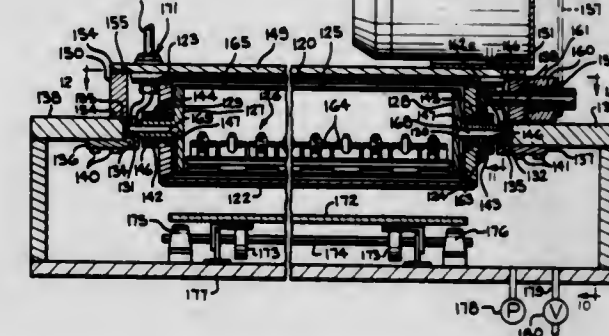
#### 4,422,916 MAGNETRON CATHODE SPUTTERING APPARATUS

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 233,974, Feb. 12, 1981, Pat. No. 4,356,073. This application Feb. 11, 1982, Ser. No. 347,699

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C23C 15/00 12 Claims



12. The method of sputtering thin films of a selected coating material upon substantially planar substrates, comprising providing an elongated, cylindrical tubular member having a layer of the target material to be sputtered applied to the outer surface thereof, providing within said tubular member a magnetic field defining the length and width of the erosion zone on the target material, rotating said tubular member continuously about its longitudinal axis during the sputtering operation to bring different portions of the target material within the erosion zone for sputtering, and simultaneously moving the planar substrates past said erosion zone to receive the material being sputtered.

#### 4,422,917 ELECTRODE MATERIAL, ELECTRODE AND ELECTROCHEMICAL CELL

Peter C. S. Hayfield, Bickenhill, near Solihull, England, assignor to IMI Marston Limited, Wolverhampton, England

Filed Aug. 18, 1981, Ser. No. 293,961

Claims priority, application United Kingdom, Sep. 10, 1980, 8029076

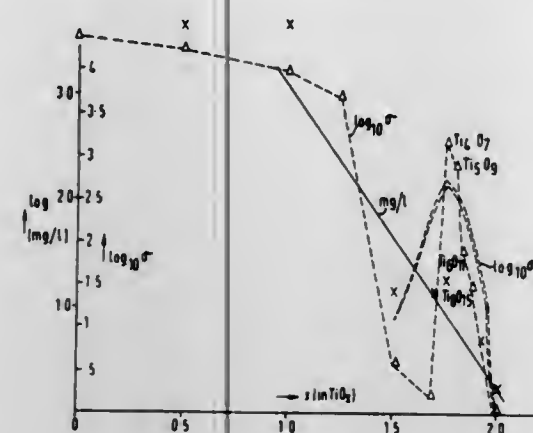
Int. Cl.<sup>3</sup> C23F 13/00; C25B 11/10, 9/00; H05B 3/60

U.S. Cl. 204—196 25 Claims

1. An electrochemical cell incorporating an electrode in which the electrode is formed from an electrode material of



solid coherent bulk titanium oxide having the general formula  $TiO_x$  where  $x$  is a number in the region 1.67 to 1.9.

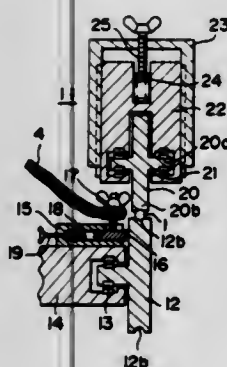


9. A cell as in claim 1 in which the electrode is formed of a range of titanium oxide compositions.

#### 4,422,918 CURRENT-CONDUCTING ASSEMBLY FOR A TRAVELING WIRE-ELECTRODE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan  
Continuation-in-part of Ser. No. 115,390, Jan. 25, 1980, Pat. No. 4,263,116. This application Feb. 13, 1981, Ser. No. 234,578

Claims priority, application Japan, Feb. 14, 1980, 55-16512[U]  
Int. Cl.<sup>3</sup> C25D 17/00; B23P 1/04, 1/12; H01R 39/28  
U.S. Cl. 204—206 17 Claims



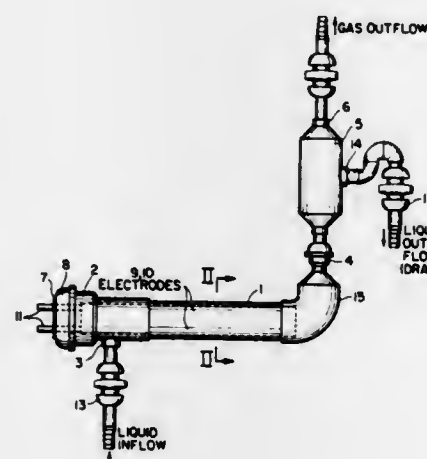
1. A current-conducting assembly for conducting a machining current to a wire electrode axially displaced by drive means and thereby continuously transported from a supply side to a collection side through the region of a workpiece in an electroerosion machine, the assembly comprising:  
a pair of freely rotatable coplanar wheels having their respective shafts extending in parallel with each other, at least one of said wheels being grooved along its periphery for retaining said wire electrode in said groove;  
reboundable pressure means coupled with one of said shafts for urging said shafts towards one another while substantially maintaining the parallelism thereof to press said wire electrode between said wheels to allow said wheels to rotate with said wire electrode traveling axially; and  
brush means connectable electrically to a source of said machining current and adapted to be in electrical contact with a flank of at least one of said wheels which is electrically conductive for conducting the current to said wire electrode.

#### 4,422,919 ELECTROLYTIC CELL

Peter Fabian, Freigericht; Manfred Gündling, Alzenau, and Peter Rössler, Ronneburg, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,391  
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138438

Int. Cl.<sup>3</sup> C25B 9/00; C25C 7/00  
U.S. Cl. 204—270 19 Claims



1. An electrolytic cell for use in the treatment of water in a flow-through piping system, comprising:  
a horizontally extending tubular housing section (1) having an end opening at respective opposite ends thereof, and a liquid inflow means (3) communicating with the interior of said tubular housing section;  
an end-cap (2) removably coupled to one end of said tubular housing section (1) for closing off the end opening at said one end of said tubular housing section (1), said end cap including a distributor plate (7);  
an electrode stack, formed as a cartridge-like unit, mounted to said distributor plate (7) of said end-cap (2), said electrode stack comprising a plurality of anodes (9) and cathodes (10) alternately mounted substantially parallel and at a spacing from one another and adapted to be inserted in said tubular housing section (1); first and second power distributing parts (9a, 10a) respectively electrically coupled to said anodes and cathodes (9, 10), said power distributing parts (9a, 10a) being connected to said distributor plate (7), said cartridge-like electrode stack being tightly insertable into and fixed to said end opening at said one end of said tubular housing section (1) by means of said end cap being coupled to said one end of said tubular housing section (1); and  
a connecting unit (15, 4, 5) coupled to the other end of said tubular housing section (1) and being external of said tubular housing section (1), said connecting unit comprising a liquid outflow means (14) and a gas outflow means (6) for exhausting gas from said tubular housing section (1);  
said end cap (2) being structurally independent of said liquid inflow means (3) and said connecting unit (15, 4, 5) such that said end cap is removable with said electrode stack for servicing of said electrode stack without moving said liquid inflow means (3) and without moving said connecting unit (15, 4, 5) or said liquid outflow means (6).

#### 4,422,920 HYDROGEN CATHODE

John Z. O. Stachurski, Amherst, and Gerald F. Pokrzyk, Lewiston, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,879  
Int. Cl.<sup>3</sup> C25B 11/04

U.S. Cl. 204—290 R 7 Claims  
1. A cathode for use in electrolytic processes comprising a substrate material and a surface layer applied to at least a part of the substrate comprising a codeposit of a first metal selected from the group consisting of iron, cobalt, nickel and mixtures thereof, and a second metal selected from the group consisting of molybdenum, manganese, titanium, tungsten, indium, chromium, and combinations thereof, said surface layer being applied from an electroplating solution containing said metals, an alkaline metal thiocyanate or thiourea and a minor amount of zinc ions.

#### 4,422,921 BIPOLAR ELECTRODES WITH GRAPHITE AS THE CARRIER AND THEIR PRODUCTION

Hans Roos, Bad Dürkheim; Hugo Boehn, Ludwigshafen; Knut Bittler, Speyer, and Dieter Schlaefer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,600  
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132753

Int. Cl.<sup>3</sup> C25B 11/00 2 Claims  
U.S. Cl. 204—290 R  
1. A bipolar electrode with graphite as the carrier, which has a chromium trioxide layer not less than 10  $\mu$ m thick on both the anode face and the cathode face.

#### 4,422,922 COAL LIQUEFACTION AND HYDROPROCESSING OF PETROLEUM OILS

Joel W. Rosenthal, El Cerrito, and Arthur J. Dahlberg, Rodeo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 241,805, Mar. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,730, Oct. 6, 1980, Pat. No. 4,330,393, which is a continuation-in-part of Ser. No. 12,185, Feb. 14, 1979, Pat. No. 4,330,390, which is a continuation-in-part of Ser. No. 754,198, Dec. 27, 1976, Pat. No. 4,330,389. This application Jul. 26, 1982, Ser. No. 401,455

Int. Cl.<sup>3</sup> C10G 1/00, 1/06  
U.S. Cl. 208—8 LE 10 Claims

1. A process for obtaining enhanced demetallation of a petroleum oil containing soluble metal compounds during the hydroprocessing of the oil in a hydroprocessing zone and substantially eliminating the accumulation of coke in said zone comprising:

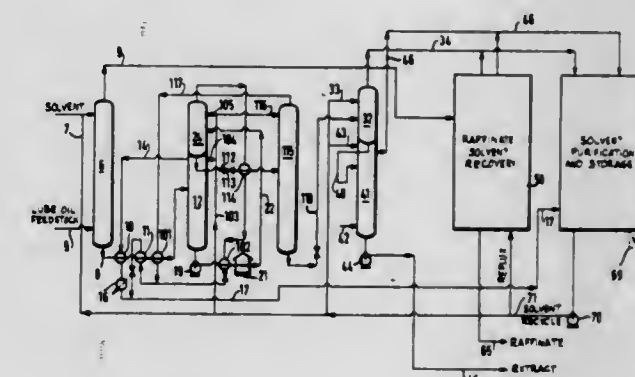
- forming a mixture consisting essentially of petroleum oil containing soluble metal compounds and particulate coal to form a feed slurry so as to provide a concentration of coal ash in the hydroprocessing zone of from about 0.2 to 6% by weight; and
- contacting the feed slurry with added hydrogen in the hydroprocessing zone in the absence of externally supplied catalyst under hydroprocessing conditions under which coke would tend to accumulate in the absence of the coal to dissolve at least 50% of the coal on a moisture- and ash-free basis to produce an effluent comprising a normally liquid portion having an enhanced reduction in soluble metals concentration and an undissolved solids portion containing metals from the petroleum oil whereby accumulation of coke in the hydroprocessing zone is substantially eliminated.

#### 4,422,923 PROCESS FOR RECOVERING SOLVENTS FROM SOLVENT-CONTAINING HYDROCARBON PHASES IN HYDROCARBON RAFFINATION SYSTEMS

Gerhard Wirtz, Frankfurt, and Rainer Maxelon, Raunheim, both of Fed. Rep. of Germany, assignors to Edeleann Gesellschaft mbH, Frankfurt, Fed. Rep. of Germany

Filed Jan. 19, 1981, Ser. No. 226,415  
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3002984

Int. Cl.<sup>3</sup> C10G 21/28 5 Claims  
U.S. Cl. 208—33



1. In a process for treating a mineral oil stock with a selective solvent to separate components of different chemical nature, wherein solvent is recovered from the solvent-rich product phase by subjecting said product phase to sequential flash evaporation in a low pressure first evaporation stage followed by heating the unvaporized portion of the product phase from said first stage and flash vaporization in a high pressure second evaporation stage and finally by vacuum flash evaporation and stripping of residual solvent from said product phase at subatmospheric pressure, the improvement which comprises subjecting the unvaporized portion of the product phase from said second evaporation stage to flash evaporation in an additional intermediate pressure evaporation stage following the high-pressure stage at an operating pressure between the pressure of the low pressure stage and the pressure of the high-pressure stage, heat from an external source is supplied to said high pressure evaporation stage, and all of the heat for evaporation in said intermediate pressure evaporation stage is supplied as heat of condensation from condensing vapors of said high pressure evaporation stage.

#### 4,422,924 SOLVENT DEWAXING WAXY HYDROCARBONS USING AN ALPHA OLEFIN POLYMER-OLEFIN VINYL ACETATE COPOLYMER COMPOSITE DEWAXING AID

Takashi Onodera, Urawa; Kikuzi Komine, Tokorozawa; Fumio Ohashi, and Tsutomu Naito, both of Oni, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 305,919, Sep. 28, 1981, which is a continuation-in-part of Ser. No. 233,380, Feb. 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 184,921, Sep. 8, 1980, abandoned, which is a continuation of Ser. No. 102,652, Dec. 12, 1979, abandoned, which is a continuation of Ser. No. 36,044, May 4, 1979, abandoned, which is a division of Ser. No. 926,811, Jul. 21, 1978, Pat. No. 4,192,733. This application Aug. 23, 1982, Ser. No. 410,879

Int. Cl.<sup>3</sup> C10G 73/04, 73/06

U.S. Cl. 208—33 14 Claims  
1. In a solvent dewaxing process wherein a waxy hydrocarbon oil is mixed with a dewaxing aid and dewaxing solvent and chilled to form a slurry comprising solid particles of wax and a mixture of dewaxed oil and solvent, the improvement which comprises using as a dewaxing aid a mixture of (A) an alpha-olefin homopolymer prepared from at least one alpha-olefin having from 10 to 25 carbon atoms or a copolymer made up of a monomer mixture comprising more than 50 wt. % of at least



2 C<sub>10</sub> to C<sub>25</sub> alpha-olefin monomers, said alpha-olefin polymer having an average molecular weight of from between about 10,000 to 1,000,000, and having a melt index greater than 1.8 g/10 minutes and (B) an olefin-vinyl acetate copolymer having a vinyl acetate molecular weight of from about 50,000 to 1,000,000, and a melt index greater than 2 g/10 minutes and wherein components (A) and (B) are used in a weight ratio to each other ranging from about 95/5 to 5/95 of (A)/(B).

4,422,925

## CATALYTIC CRACKING

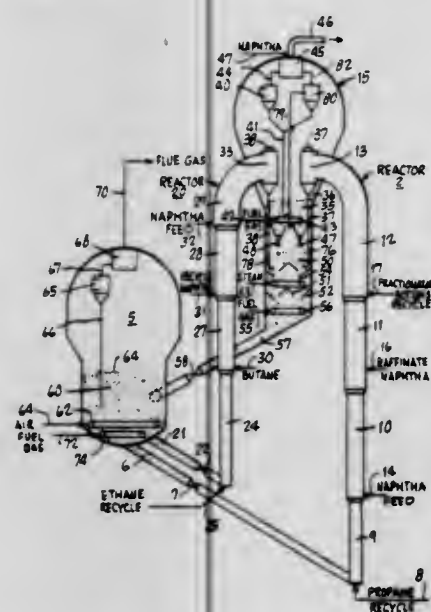
Dale Williams, and John C. Strickland, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 28, 1981, Ser. No. 335,303

Int. Cl.<sup>3</sup> C10G 11/05

U.S. Cl. 208—75

11 Claims



1. A process for the production of normally gaseous olefins from a hydrocarbon feedstock in a transport type fluid catalytic cracking reaction zone in the presence of a zeolite catalyst in which fresh feedstock is brought into contact with hot regenerated catalyst in a riser reaction zone, which comprises charging heavy hydrocarbon charge stock to an upper section of a riser reaction zone near its discharge end, charging a normally gaseous C<sub>2</sub> to C<sub>3</sub> rich paraffinic charge stock into the lowermost portion of said riser reaction zone into contact with hot freshly regenerated catalyst and introducing a paraffinic normally liquid naphtha or gas oil into a section of said riser reaction zone intermediate said lower and upper sections of said riser reaction zone.

4,422,926

## SEPARATING BASIC ASPHALTENES USING BRONSTED ACID TRANSITION METAL OXIDE ACID CATALYSTS

Kenneth A. Gould, Berkeley Heights; Dane C. Grenoble, Plainfield; Lawrence L. Murrell, South Plainfield, and Wim J. M. Pieters, Morristown, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 24, 1981, Ser. No. 305,265

Int. Cl.<sup>3</sup> C10G 11/04, 25/00, 25/12

U.S. Cl. 208—86

19 Claims

1. A process for selectively removing basic asphaltenes from a basic asphaltene-containing hydrocarbon feed which comprises contacting said feed, in an adsorption zone, with a fresh or regenerated solid acid catalyst having primarily Bronsted acidity, said catalyst comprising at least one catalytic metal oxide selected from the group consisting of the oxides of (a) tungsten, niobium and mixtures thereof and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof supported on a pyrogenic alumina support, for a time sufficient to adsorb at least a portion of said basic

asphaltenes from said feed to produce a feed of reduced basic asphaltene content.

4,422,927

## PROCESS FOR REMOVING POLYMER-FORMING IMPURITIES FROM NAPHTHA FRACTION

Dennis C. Kowalczyk, Pittsburgh; Bruce A. Brickley, Avonmore, and Joseph J. Svoboda, Pittsburgh, all of Pa., assignors to The Pittsburg & Midway Coal Mining Co., Englewood, Colo.

Filed Jan. 25, 1982, Ser. No. 341,234

Int. Cl.<sup>3</sup> C10G 45/00

U.S. Cl. 208—211

17 Claims

1. A process for preventing polymer formation from polymer precursor material in a naphtha fraction which comprises passing said naphtha fraction containing polymer precursor materials to a vaporization zone, introducing a wash oil stream into said vaporization zone concurrently with said naphtha fraction, passing a stream comprising heated hydrogen through said vaporization zone in a direction countercurrent to that of said naphtha-wash oil admixture, recovering a vaporized naphtha fraction from said vaporization zone which can be subjected to hydrotreating without substantial formation of polymer deposits, passing a feed consisting essentially of said vaporized naphtha fraction and hydrogen to a catalytic hydrotreating zone under hydrotreating conditions to produce a naphtha feed stock of sufficient purity to use as a reformer charge stock.

4,422,928

## SILICA FLOTATION COLLECTORS DERIVED FROM ISONONYL ALCOHOL

Quentin T. McGlothlin, Spring, and Barry M. O'Brien, Houston, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 141,707, Mar. 9, 1981, abandoned. This application Sep. 17, 1982, Ser. No. 419,308

Int. Cl.<sup>3</sup> B03D 1/14

U.S. Cl. 209—166

7 Claims

1. A froth flotation process for separating silica from iron ore, which comprises frothing said ore in an aqueous medium in the presence of 0.1 to 2 pounds per ton of said ore of a water dispersible, liquid aliphatic ether amine having the general formula:



where R— is an aliphatic methyl branched radical having 9 carbon atoms, R<sup>1</sup> is ethyl or propyl and z is an integer of from 0 to 10.

4,422,929

## WASTEWATER TREATMENT PLANT

Dewey E. Owens, P.O. Box 2443, Lafayette, La. 70502

Filed Sep. 2, 1981, Ser. No. 298,810

Int. Cl.<sup>3</sup> B01D 23/24

U.S. Cl. 210—108

6 Claims

1. A wastewater treatment plant including, a plurality of separate adjacent chambers, one said chamber comprising an aeration chamber adapted to receive wastewater, other ones of said chambers comprising clarifier, filter and backwash chambers, said filter and backwash chambers each comprising airtight sealed chambers, fluid flow conveying means connecting adjacent ones of said chambers to provide communication of fluid serially from said aeration chamber to said clarifier chamber to said filter chamber to said backwash chamber and then to discharge clean fluid from said backwash chamber, means in said aeration chamber biologically attacking and breaking down organic matter in said wastewater therein, means in said clarifier chamber collecting heavier solid waste matter from

adjacent the lower reaches thereof and returning said matter to said aeration chamber, means in said clarifier chamber collecting lighter floating solid waste particles from adjacent the surface of said wastewater therein and returning said particles to said aeration chamber, said collecting means including a floating skimmer, a filter bed in said filter chamber disposed intermediate said fluid conveying means therein communicating wastewater from said clarifier chamber to said filter chamber and that said conveying means discharging fluid from said filter chamber to said backwash chamber, said fluid flow conveying means from said clarifier chamber to said filter chamber including a weir within said clarifier chamber, said filter chamber including an upper and bottom compartment, said filter bed disposed intermediate said two compartments, said fluid flow conveying means from said filter chamber to said backwash chamber disposed within said upper compartment, said fluid flow conveying means between said clarifier chamber and filter chamber including a coupling communicating with said filter chamber bottom compartment to normally direct incoming fluid upwardly through said filter bed to said upper compartment, means in said backwash chamber operable to exert a forced backflush of clean fluid from said backwash chamber and serially into said filter chamber upper compartment thence, downwardly through said filter bed and thence through said coupling, said fluid flow conveying means dis-

4,422,930

## APPARATUS FOR TREATING WASTE WATER

Misao Hatanaka, Toda, Japan, assignor to Kajima Kensei Kabushiki Kaisha and Nippon Sangyo Kikai Kabushiki Kaisha, both of Tokyo, Japan

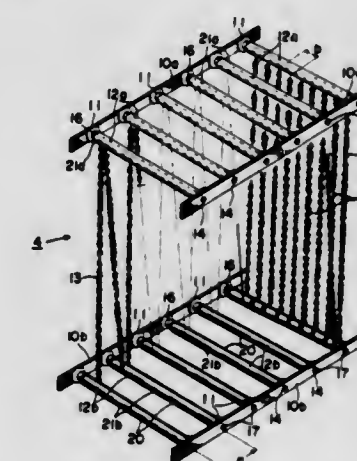
Filed Jan. 29, 1982, Ser. No. 343,894

Claims priority, application Japan, Nov. 19, 1981, 56-172254[U]

Int. Cl.<sup>3</sup> C02F 3/04

U.S. Cl. 210—150

3 Claims



1. Apparatus for promoting biological oxidation of sludge in a waste water treatment tank, comprising:

- A. means defining a substantially rigid frame having
  - (1) a pair of horizontally extending upper rails that are laterally spaced apart and opposite one another and
  - (2) a pair of laterally opposite horizontally extending lower rails, each spaced below one of said upper rails;
- B. a first plurality of rods, each bridging across said pair of upper rails and resting upon the upper rails to be shiftable along them;
- C. a second plurality of rods, each bridgingly engageable with said lower rails at the undersides of the latter to be shiftable along said lower rails;
- D. a plurality of ribbon-like contact members,
  - (1) each having numerous laterally projecting strands along its length,
  - (2) each trained in zigzag, with substantially vertically extending stretches, alternately over successive rods of said first plurality and under successive rods of said second plurality, to be supported by the rods of said first plurality and to support the rods of said second plurality in engagement with said lower rails, and
  - (3) the several contact members being engaged with each rod in spaced relation to one another along the length of the rod; and
- E. a pair of supple, belt-like gap-retaining members for each of said pluralities of rods, each of said gap-retaining members having a connection with one end of each of the rods of its plurality, said connections being spaced apart at predetermined distances along the gap-retaining member so that each pair of gap-retaining members, when maintained under lengthwise tension, establishes the distances between adjacent rods of its plurality.

4,422,931

## OIL CONCENTRATOR

Girma Wolde-Michael, 100 Canabury Ct., Little Canada, Minn. 55117

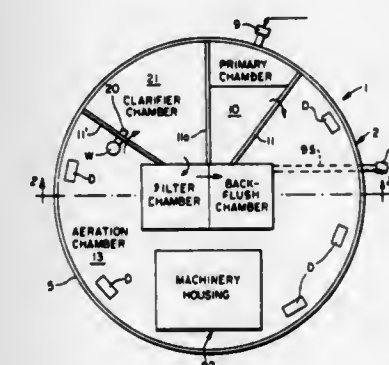
Filed Apr. 15, 1982, Ser. No. 368,648

Int. Cl.<sup>3</sup> B01D 21/10; B01F 3/04; C02F 1/24

U.S. Cl. 210—168

12 Claims

1. An oil concentrator for separating a fluid comprising: a fluid tight tank having a first chamber with a sloping bottom; a second chamber opposite said first chamber; a third chamber between said first and second chambers; means for allowing

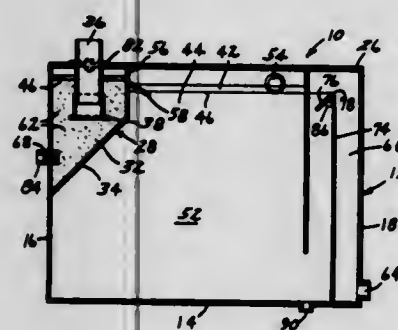


charging clean fluid from said backwash chamber including a discharge coupling, said operable means to exert a forced backflush including an air pressure line in said sealed backwash chamber, a normally opened check valve between said air pressure line and said discharge coupling operable by air from said air pressure line to close said check valve to seal said discharge coupling, said air pressure line including an end portion having an internal bore, a valve head having a plug slidably fitted within said bore, said air pressure line provided with air holes whereby, air pressure upon said plug displaces said plug to expose said air holes and admit air into a backwash chamber concurrently with said closing of said check valve and forced backflush, agitator means disposed within said filter bed, a pipe joined to said agitator means and adapted to supply fluid from an external source to said agitator means to loosen said filter bed, a by-pass line in said clarifier chamber receiving said backflush fluid from said filter chamber and directing it into said aeration chamber without disturbing wastewater within said clarifier chamber, said fluid flow conveying means between said clarifier chamber and said filter chamber including a substantially vertical discharge line having a lowermost portion joined to said clarifier chamber coupling, a normally opened check valve in said discharge line and adjacent said weir, and said by-pass line communicating with said discharge line intermediate said check valve and clarifier chamber coupling.



mixed fluid containing heavy and light fluids to ingress said first chamber; means for allowing egress of said fluids from said first chamber and ingress into said third chamber; first baffle means located within said third chamber for directing the flow of fluid between said third chamber and said second chamber; second baffle means separating said third and said second chambers; said second baffle means including means for agglomerating material within said fluid located near an upper edge of said second baffle means; a light fluid outlet located within said second chamber; a heavy fluid outlet located within said third chamber; and; means for aerating the contents of said first chamber, located within said first chamber.

12. A waste oil concentrator for receiving and separating a mixture of oil and machine coolant comprising: a fluid tight tank having a bottom, a first end wall joined to said bottom and ascending vertically therefrom to an upper limit defining an upper edge, said upper edge encircling said tank a uniform distance from said bottom, a front side wall joined to said bottom and said first end wall and ascending vertically to said upper edge, a second end wall joined to said front side wall and said bottom and ascending vertically to said upper edge, a back side wall joined to said first and second end walls and to said bottom, and ascending vertically to said upper edge; a first chamber defined by an angled baffle plate affixed in fluid tight contact to said front and back side walls near said first end wall and having an upper portion positioned parallel to said first end wall, said upper portion of said baffle plate depending verti-



cally from said upper edge for a predetermined distance, said angled baffle plate having a lower portion extending in a plane approximately forty five degrees below a horizontal plane and making a fluid tight contact with said upper portion and said first end wall; ingress means for introducing fluid containing oil and coolant into said first chamber said ingress means including a mounting plate extending between said front and back side walls near said first end wall; said angled baffle plate having means for egressing said fluid and means for quietening said egressing flow positioned adjacent said means for egressing; a first vertical baffle, extending between said front and back side walls and depending parallel to said second end wall, from said upper edge a distance less than the distance between said upper edge and said bottom near said second end wall; a second vertical baffle extending between said front and back side walls and ascending parallel to said second end wall from said bottom a distance less than the distance between said upper edge and said bottom, said second vertical baffle located between said first vertical baffle and said second end wall and having an upper edge; an agglomeration baffle affixed to said upper edge of said second vertical baffle and extending in a direction generally toward said first vertical baffle, said agglomeration baffle extending from said front wall to said back wall; means for allowing light fluid to egress said tank positioned in one of said side walls, between said first vertical baffle and said angled baffle plate, and; means for allowing heavy fluid to egress said tank positioned in said second end wall near said bottom.

#### 4,422,932 DEVICE FOR THE REMOVAL OF HEAT FROM WASTE WATER

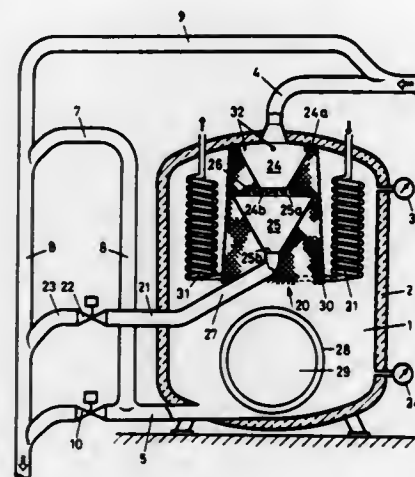
Felix Kalberer, Bahweg 34, CH-7320 Sargans, Switzerland  
Filed Feb. 10, 1982, Ser. No. 347,609

Claims priority, application Switzerland, Feb. 16, 1981, 991/81

Int. Cl.<sup>3</sup> B01D 25/00; F28F 19/00

U.S. Cl. 210—186

6 Claims



1. Device for removing heat from waste water by means of heat exchangers (31) arranged in a container (1) traversed by said waste water, comprising an inlet conduit (4) at the top of said container (1) connected by a connecting means (20) with a first outlet conduit (21) disposed in the lower portion of said container (1) and having a check valve (22), said connecting means (20) comprising two superposed hollow bodies (24, 25) in a stepwise arrangement with one another and a coarse screen (26) arranged therebetween for closing an overflow opening, a second outlet conduit (5) discharging at the floor of said container (1) and connected through a riser (6) and a bend (7) with a sewerage conduit (8) into which said first outlet conduit (21) is also directed, and a fine screen (30) surrounding said connecting means (20) at least in the region of said coarse screen (26) being disposed in said container (1) between said connecting means (20) and said heat exchangers (31).

#### 4,422,933 MAGNETIC WATER CONDITIONING DEVICE

Severin F. Sverre, 3187 Thompson Pl., West Vancouver, B.C., Canada, V7V 3E3, John O. Richmond, 4750 Narvaez Dr., Vancouver, B.C. Canada, V6L 2J2

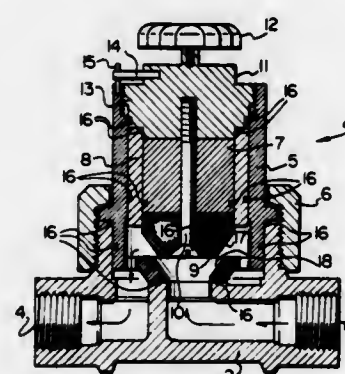
Filed Oct. 26, 1981, Ser. No. 314,729

Claims priority, application Canada, Jun. 19, 1981, 380251

Int. Cl.<sup>3</sup> B01D 35/06

U.S. Cl. 210—222

10 Claims



1. A magnetic water conditioning device comprising:  
(a) a hollow housing suitable for the passage therethrough of water;  
(b) a hollow cup affixed to housing (a);  
(c) a permanent magnet enclosed around its circumference within a water-protective sleeve, and at its ends respec-

tively by an adjusting cap and a magnet extension, said components fitting as an assembled group within the interior of internal cup (b); and

(d) internal cup (b) having therein one or more ports through which water may pass, and embodying therein externally adjustable interface surfaces which can be adjusted in distance from one another to thereby regulate the rate of flow of water through the interface area.

#### 4,422,935 APPARATUS FOR MAGNETIC TREATMENT OF WATER OR OTHER LIQUIDS

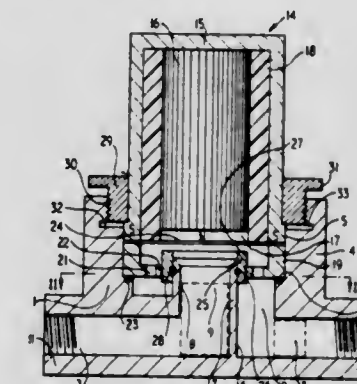
Denis A. E. Mattingly, Enfield, England, assignor to Bernard Strutt Agencies Limited, Kingston-Upon-Thames, England  
PCT No. PCT/GB79/00218, § 371 Date Jul. 21, 1981, § 102(e)  
Date Jul. 21, 1981, PCT Pub. No. WO81/01840, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 21, 1979, Ser. No. 285,123

Int. Cl.<sup>3</sup> C02F 1/48

U.S. Cl. 210—223

5 Claims



#### 4,422,934 MAGNETIC DEVICE FOR THE TREATMENT OF CALCAREOUS FLUIDS

Howard A. Debney, Mississauga, and Darrell C. Spencer, River-view, both of Canada, assignors to Debney-Spencer Industries Ltd., Mississauga, Canada

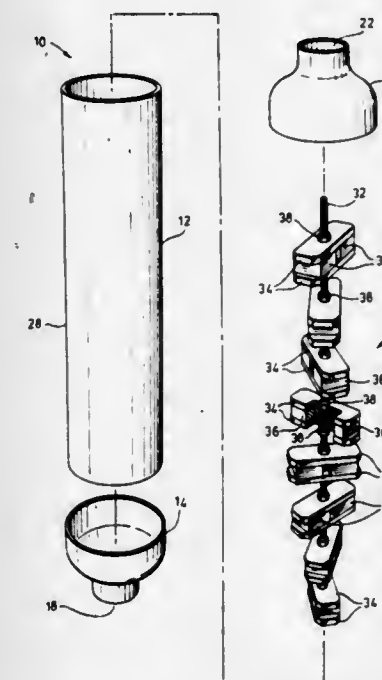
Filed Jun. 2, 1982, Ser. No. 384,208

Claims priority, application Canada, Apr. 22, 1982, 401443

Int. Cl.<sup>3</sup> B01D 35/06

U.S. Cl. 210—222

13 Claims



1. An apparatus for magnetically conditioning a stream of water, which comprises:  
a flow-through housing defining a fluid flow-path, the housing having an inlet and outlet connected by said flow path,  
a first magnetic pole provided by a pole piece disposed in said housing, made of a magnetic material resistant to sensitive contact with said water, said pole piece being of hollow cylindrical form and said flow path having a first portion defined within the cylinder of said pole piece and a second portion in a region outside thereof,  
a second magnetic pole provided by a surface made of a material sensitive to contact with said water and disposed in spaced apart juxtaposed relation with respect to said first pole, an annular magnetic gap being defined within the housing by said spacing apart, with said first and second portions of said flow path communicating through said gap, and  
a magnetically-permeable separator disposed in said gap over the water-contacting surfaces of the second pole, said separator protecting said surfaces from contact with said water and permitting magnetic flux to pass through said separator and into said magnetic gap.

#### 4,422,936 DEVICE FOR THE DIFFUSION OF SUBSTANCES BETWEEN TWO FLUIDS VIA SEMIPERMEABLE MEMBRANES

Gerhard Riede, Vellinge, and Nils-Joel E. Nilsson, Södala, both of Sweden, assignors to Gambro AG, Switzerland

PCT No. PCT/SE80/00083, § 371 Date Mar. 17, 1981, § 102(e)

Date Mar. 17, 1981, PCT Pub. No. WO81/02682, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 19, 1980, Ser. No. 245,648

Int. Cl.<sup>3</sup> B01D 31/00

U.S. Cl. 210—321.4

9 Claims

1. A device for magnetically treating water to prevent the formation of scale, the device comprising:  
an elongate housing having an inlet and an outlet for the flow of water therethrough, said housing being dimensioned so as not to restrict liquid flow through the device and to prevent the formation of settlement reservoirs inside the housing;  
a support member located in the housing;  
a plurality of transverse holding elements in the form of metal plate members connected to the support member and arranged longitudinally spaced-apart inside the housing, said holding elements being arranged in pairs with each pair being arranged in parallel;  
a plurality of magnets located inside the housing for directly contacting the water in the housing, the magnets being angularly disposed in a helical arrangement and oriented with their poles all facing the same direction, each magnet being located between and retained in position by a respective pair of holding elements; and  
clamping means connected between the support member and the holding elements for clamping the magnets between the holding elements.

1. A device for the diffusion of substances between first and second fluids through semi-permeable membranes, comprising a stack of alternating spacer plates and semi-permeable membranes, each of said spacer plates and semi-permeable membranes being substantially flat and including an elongated middle portion and tapered end portions extending away from said middle portion, said stack thus having tapered end portions and being of a substantially uniform height throughout, said stack having opposite substantially parallel top and bottom faces, first and second end plates each having an inner surface and an outer surface, said inner surfaces facing said top and bottom faces of said stack, clamping means for clamping said



first and second end plates together with said stack therebetween, inlet and outlet passages for said first fluid, inlet and outlet passages for said second fluid, first fluid inlet means for feeding said first fluid to said inlet passage for said first fluid, first fluid outlet means for withdrawing said first fluid from said outlet passage for said first fluid, second fluid inlet means for feeding said second fluid to said inlet passage for said second fluid, second fluid outlet means for withdrawing said second fluid from said outlet passage for said second fluid, distribution means for conducting said first and second fluids on opposite sides of said semi-permeable membranes as said first and second fluids pass from their respective inlet passages to their respective outlet passages, first fluid duct means forming a part of one of said first fluid inlet and outlet means and being disposed within one of said tapered end portions between



the outer surfaces of said first and second end plates, said one of said first fluid inlet and outlet means also including first fluid nipple means sealingly connected to said first fluid duct means, and wherein said first fluid nipple means extends exteriorly of and away from said one of said tapered end portions and is entirely contained within a volume bounded by a portion of a rectangular perimeter defined by the maximum width of said stack and the maximum length of said stack, by the outer surface of the tapered surface from which said first fluid nipple means extends, and by said outer surfaces of said first and second end plates such that said first fluid nipple means is disposed within a volume defined by outer surfaces of said device which cooperate to provide an enclosure which provides protection against inadvertent damage to said first fluid nipple means.

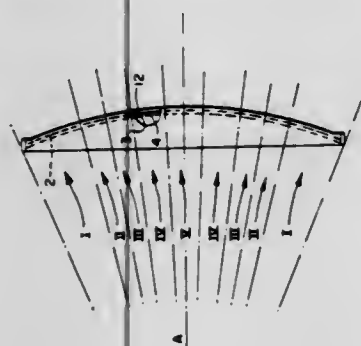
4,422,937

## STATIC SCREEN

James D. Connolly, P.O. Box 1238, Princeton, W. Va. 24740  
Filed Mar. 14, 1980, Ser. No. 130,461  
Int. Cl.<sup>3</sup> B01D 39/10

U.S. Cl. 210-409

8 Claims



1. In screening apparatus for separating by size particles of a slurry fed thereto, the improvement comprising a reversible static screen in operative position removably mounted at a predetermined slope in the apparatus, said screen having longitudinally spaced ends and transversely spaced sides and presenting to the slurry for flow longitudinally therealong a longitudinally arcuately concave sloping flow surface formed by laterally spaced parallel screen rods extending transversely of said screen normal to the flow direction of the slurry, said

screen being bisected longitudinally by a transverse centerline thereof into counterpart halves each having in an end portion openings between screen rods of reduced width longitudinally of said screen relative to openings between screen rods in a center part of said screen longitudinally intermediate said end portions, the actual openings between the screen rods reducing progressively in width from the transverse centerline toward each end of the screen, and the effective width of the openings determinative of the maximum size of particles passable there-through being substantially uniform from the centerline to whichever end is then the trailing end of the screen.

4,422,938

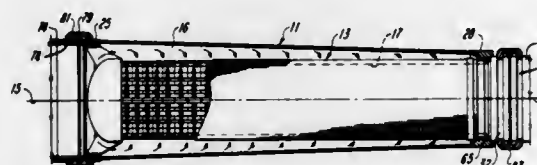
## BACKWASHING-TYPE FILTERING APPARATUS

Wendell R. Miller, Denver, Colo., assignor to Quantum Systems Corporation, Denver, Colo.

Filed Jan. 25, 1982, Ser. No. 342,484  
Int. Cl.<sup>3</sup> B01D 25/02, 27/12

U.S. Cl. 210-411

10 Claims



1. In a filtering apparatus for removing solid particles and the like from a liquid adapted to be cleaned by backwashing, the combination comprising:

an outer housing and an inner filter disposed within the outer housing defining therebetween an annular outer flow passage,

said filter having an inner flow passage and having an outer face and an inner face with liquid flow openings extending between said outer and inner faces through which the liquid flows to pass between said inner and outer flow passages whereby a forward flow liquid with solid particles is passed through an inlet into said outer flow passage, the solid particles being deposited on said filter and the liquid passing through the filter openings into and along said inner flow passage and out an outlet in said inner flow passage in the forward flow direction, and whereby a backwash liquid is passed into and along said inner flow passage, through said filter openings, and into said outer flow passage to remove solid particles collected on said filter in a backflow direction,

said outer housing having an internal dimension related to the external dimension of said inner filter so that said outer flow passage changes in dimension along the filter surface that has said liquid flow openings in such a way as to provide substantially a uniform liquid velocity through said filter at all points along said filter in both said forward flow direction and said backflow direction,

said outer housing being tapered along its length to converge in a direction away from said inlet toward said outlet in the forward liquid flow direction and wherein said inner filter has a substantially uniform external dimension substantially throughout its lengthwise extent.

4,422,939

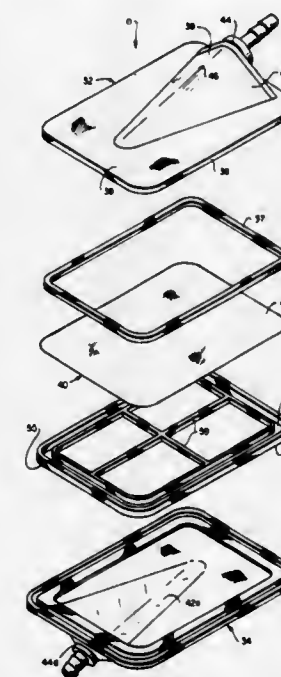
## BLOOD AND PERFUSATE FILTER

Russell G. Sharp, Sugar Land; William R. Wilkinson, Missouri City; Charles C. Reed, and Denton A. Cooley, both of Houston, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 92,013, Nov. 7, 1979, abandoned. This application Apr. 8, 1982, Ser. No. 366,747  
Int. Cl.<sup>3</sup> B01D 25/04

U.S. Cl. 210-445

26 Claims



1. A filter for biological fluids comprising:  
a first housing member having a generally planar upper surface, said first housing member having a secondary distribution reservoir formed in the upper surface thereof; an inlet port located in the secondary distribution reservoir of the first housing member;  
a second housing member having a generally planar lower surface, said second housing member having a secondary collection reservoir formed in the lower surface thereof; an outlet port located in the secondary collection reservoir of the second housing member;  
a rigid band bonded between said first and second housing members, said band spacing the housing members apart; and  
a permeable filter element mounted in said band, said filter element forming a primary distribution reservoir with respect to the upper surface of the first housing member and forming a primary collection reservoir with respect to the lower surface of the second housing member, said band forming the sides of both said primary distribution reservoir and said primary collection reservoir.

4,422,940

## METHOD OF NEUTRALIZING AND DETOXYFYING WASTES CONTAINING ORGANIC COMPOUNDS

James L. Cousino; James A. Nalewick, both of Montague, and Blair H. Hills, Whitehall, all of Mich., assignors to Bofors Nobel, Incorporated, Muskegon, Mich.

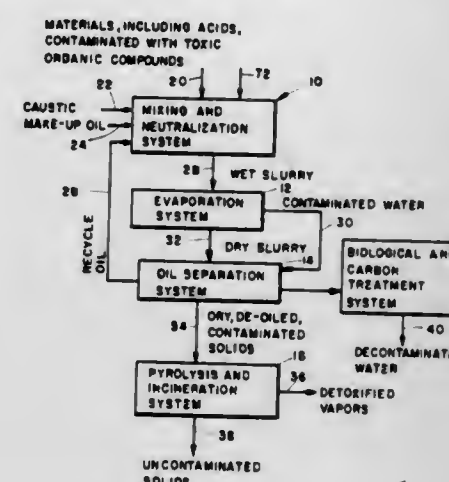
Filed May 17, 1982, Ser. No. 378,763  
Int. Cl.<sup>3</sup> B01D 1/26; C02F 3/02, 11/10

U.S. Cl. 210-631

36 Claims

1. A method for treating waste material containing both an acid and a toxic organic compound comprising the steps of:  
combining said waste material with sufficient oil and sufficient caustic to form a pumpable slurry having a pH of 7 or higher, said pumpable slurry containing water, a salt, and said toxic organic compound;  
separating said oil from said pumpable slurry to form a deoiled material containing said salt and said toxic organic compound;  
pyrolyzing said deoiled material at a temperature below the

melting point of said salt but sufficiently high to vaporize said toxic organic compound; and



incinerating the resultant vapor to detoxify said vaporized organic compound.

4,422,941

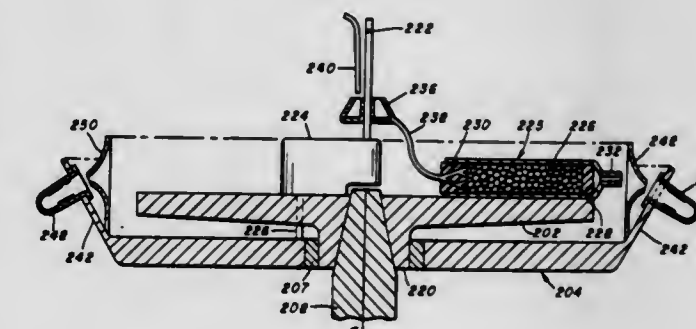
## APPARATUS FOR LIQUID-SOLID COLUMN CENTRIFUGATION CHROMATOGRAPHY AND METHOD

Maurice H. Vaughan, Jr., Pittsburgh, Pa., and Klaus B. Andersen, Copenhagen, Denmark, assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Sep. 8, 1980, Ser. No. 185,335  
Int. Cl.<sup>3</sup> B01D 15/08

U.S. Cl. 210-657

22 Claims



1. Column centrifugation chromatography apparatus comprising

column rotor means for supporting and applying centrifugal force to a plurality of circumferentially spaced nonhelical centrifugation columns,

said centrifugation columns being generally radially oriented, collector rotor means for collecting material discharged from said columns,

a plurality of receptacles secured to said collector rotor means for receiving liquid discharged from said column, said receptacles disposed radially outwardly of said columns,

power means for establishing synchronized relative movement of said column rotor means and said collector rotor means,

said column rotor means and said collector rotor means being mounted for substantially coaxial rotation, and distribution means for supplying liquid to said columns while said column rotor means is subjected to said movement.



4,422,942

## METHOD FOR LIQUID CHROMATOGRAPHY

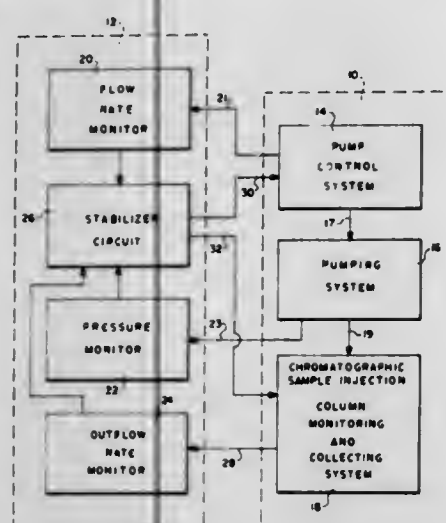
Robert W. Allington, Lincoln, Nebr., assignor to Isco, Inc., Lincoln, Nebr.

Filed Sep. 9, 1981, Ser. No. 300,567

Int. Cl.<sup>3</sup> B01D 15/08

U.S. Cl. 210—659

41 Claims



1. A method of rapidly bringing a chromatographic column to equilibrium pressure comprising the steps of:

setting a pumping speed for pumping fluid from a pumping system into said column for a predetermined rate of flow; measuring, at a time of a low value of pressure, a characteristic of fluid being transferred from the pumping system to the chromatographic column related to the pressure of the fluid;

estimating the equilibrium value of pressure from said measurements of said characteristic mode at said low value characteristic;

increasing the pumping rate of flow until said estimated equilibrium value of pressure is reached; and

the step of estimating including the steps of taking the time derivative of the pressure; measuring the pressure at a predetermined fraction of the difference between the maximum time derivative of the pressure and zero; and multiplying the pressure at that point by a factor which is the reciprocal of the predetermined fraction; and reducing said rate of flow from the pumping system to said predetermined rate of flow.

4,422,943

## METHOD FOR PRECIPITATION OF HEAVY METAL SULFIDES

Ronald G. Fender, Thorndale, and Alan S. MacGregor, Chadds Ford, both of Pa., assignors to Environmental Resources Management, Inc., West Chester, Pa.

Filed May 21, 1982, Ser. No. 380,815

Int. Cl.<sup>3</sup> C02F 1/52

U.S. Cl. 210—716

12 Claims

1. A method for the removal of heavy metal ions from an aqueous solution, comprising the steps of:

admixing an aqueous slurry of FeS<sub>2</sub> with a heavy metal ion bearing aqueous solution at a pH above 7, said slurry providing at least the stoichiometric amount of FeS<sub>2</sub> for precipitating said heavy metal ions from said solution as sulfides; and separating said precipitated sulfides from said aqueous solution.

## CATIONIC POLYMERS SUITABLE FOR REDUCING TURBIDITY IN LOW TURBIDITY WATERS

Radhakrishnan Selvarajan, Oak Park; Edward G. Ballweber, Glenwood, and Manuel Slovinsky, Woodridge, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 253,405, Apr. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 138,045, Apr. 7, 1980, abandoned. This application Oct. 25, 1982, Ser. No. 436,537

Int. Cl.<sup>3</sup> C02F 1/56

U.S. Cl. 210—736

7 Claims

1. A method of reducing the turbidity in low turbidity waters containing less than 1000 ppm of suspended solids which comprises adding thereto an effective amount of a flocculant consisting essentially of a water-soluble polymer prepared by reacting, under acid conditions, aniline or an alkyl substituted aniline, formaldehyde, and a polyamine selected from the group consisting of ethylene polyamines, polyalkylene polyamines, and cycloaliphatic polyamines, said water-soluble polymer having a molar ratio of aniline or alkyl substituted aniline to formaldehyde to polyamine of at least 1:2:1 to flocculate said suspended solids, and separating the flocculated solids from the water.

5. The method of claim 1 where the polyamine is a polyethylene polyamine resulting from the reaction of ethylene dichloride and ammonia.

4,422,945

## STABILIZATION OF PLEUROMUTILIN DERIVATIVES AGAINST OXIDATION BY SODIUM HYPOCHLORITE IN AQUEOUS SOLUTION

Frank Ridgway, Birkenhead, and Richard D. G. Woolfenden, Bridgend, both of England, assignors to E. R. Squibb &amp; Sons, Inc., Princeton, N.J.

Division of Ser. No. 241,167, Mar. 6, 1981, Pat. No. 4,390,558. This application Sep. 27, 1982, Ser. No. 424,122

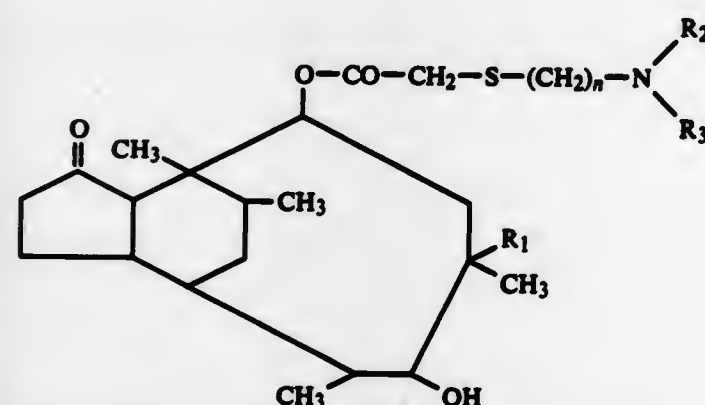
Claims priority, application United Kingdom, Mar. 14, 1980, 8008792

Int. Cl.<sup>3</sup> C02F 1/50

U.S. Cl. 210—764

7 Claims

1. A method of water treatment comprising providing an aqueous solution by providing water and adding to said water a hypochlorite scavenger and 0.0045 to 0.0125% (based on the weight of the aqueous solution) of a compound of the formula



wherein either R<sub>1</sub> is ethyl or vinyl, n is an integer from 2 to 5 and each of R<sub>2</sub> and R<sub>3</sub> is an alkyl of 1 to 10 carbon atoms, and pharmaceutically acceptable salts of said compound, said hypochlorite scavenger being selected from the group consisting of sodium thiosulphate, acetone sodium bisulphite, ascorbic acid, dithiothreitol dithioerythritol, sodium sulphite, sodium nitrate, and urea, said compound being present in a weight ratio to the hypochlorite scavenger of from about 0.1:1 to about 500:1.

4,422,946

## CALCINED α-ALUMINA FILTER AIDS

Friedrich W. Diekötter, Langenfeld, Fed. Rep. of Germany, assignor to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany Filed May 17, 1982, Ser. No. 379,107

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121953

Int. Cl.<sup>3</sup> B01D 37/02

U.S. Cl. 210—777

9 Claims

1. A process for filtering an alkaline solution to remove solid contaminants therefrom comprising the steps of

(a) passing the alkaline solution containing solid contaminants through a filter in the presence of calcined α-aluminum oxide as a filter aid to produce a clear filtrate; and

(b) recovering the clear filtrate produced by step (a).

4,422,947

## WELLBORE FLUID

David L. Dorsey, and Wallace T. Corley, both of Houston, Tex., assignors to Mayco Wellchem, Inc., Houston, Tex.

Filed Dec. 19, 1980, Ser. No. 218,055

Int. Cl.<sup>3</sup> C09K 7/02

U.S. Cl. 252—8.5 C

16 Claims

1. An aqueous wellbore fluid having improved water loss control, desirable flow characteristics, and low sensitivity to shale for use in drilling a well, comprising; water or a brine base including an effective amount of an additive consisting (1) from about 60% to about 98% by weight potato starch heteropolysaccharide crosslinked with a crosslinking compound having at least two groups that react with hydroxymethyl groups on a glucopyranose unit of potato starch, said crosslinking compound being selected from the group consisting of phosphorus oxychloride and urea-formaldehyde, (2) from about 1% to about 20% by weight of a heteropolysaccharide derived from a carbohydrate by bacteria of the genus Xanthomonas, and (3) from about 1% to about 20% by weight hydroxyethylcellulose.

4,422,948

## LOST CIRCULATION MATERIAL

Wallace T. Corley, and David L. Dorsey, both of Houston, Tex., assignors to Mayco Wellchem, Inc., Houston, Tex.

Filed Sep. 8, 1981, Ser. No. 300,375

Int. Cl.<sup>3</sup> C09K 7/02

U.S. Cl. 252—8.5 LC

9 Claims

1. A composition for preventing loss of drilling fluids to drilled formations to be introduced into a well penetrating the formation by a carrying liquid, said composition comprising water- and hydrocarbon-insoluble shredded paper, mineral wool and rigid granular alkaline earth metal carbonate particles as components wherein the components degrade in the presence of an acid to the extent that a permeability is restored after acidification to allow hydrocarbons to be produced from the formation;

wherein said shredded paper is present in an amount from about 3% to about 40% by weight of the composition, said mineral wool is present in an amount from about 2% to about 40% by weight of the composition, and said granular particles are present in an amount from about 20% to about 95% by weight of the composition.

4,422,949

## TEXTILE TREATMENT COMPOSITIONS AND PREPARATION THEREOF

Julius Ooms, Langdorp, Belgium, assignor to The Procter &amp; Gamble Company, Cincinnati, Ohio

Filed Mar. 3, 1982, Ser. No. 354,280

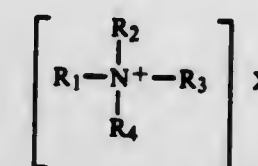
Claims priority, application United Kingdom, Mar. 7, 1981, 8107236

Int. Cl.<sup>3</sup> D06M 13/20, 13/46

U.S. Cl. 252—8.8

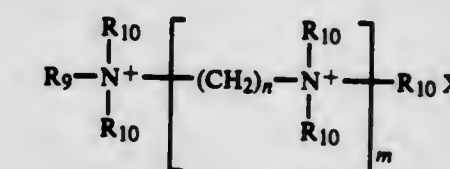
14 Claims

1. An aqueous textile treatment composition from about 12% to about 25% of an active mixture consisting essentially of (a) from about 8% to about 22% of a substantially water-insoluble cationic fabric softener having the general formula I



wherein R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of alkyl and alkenyl groups having from about 12 to about 24 carbon atoms. R<sub>3</sub> and R<sub>4</sub> are independently selected from the group consisting of hydrogen, alkyl, alkenyl and hydroxyalkyl groups containing from about 1 to about 4 carbon atoms; and X is an equivalent amount of a counteranion,

(b) from about 0.6% to about 3% of water-soluble surfactant comprising apolyalkoxylated ammonium salt having the general formula II



wherein R<sub>9</sub> is selected from the group consisting of alkyl and alkenyl groups of from about 8 to about 22 carbon atoms, and each R<sub>10</sub> is independently selected from the group consisting of C<sub>1</sub>-C<sub>4</sub> alkyl, -(C<sub>2</sub>H<sub>4</sub>O)<sub>p</sub>H, -(C<sub>3</sub>H<sub>6</sub>O)<sub>q</sub>H and -(C<sub>2</sub>H<sub>4</sub>O)<sub>r</sub>(C<sub>3</sub>H<sub>6</sub>O)<sub>s</sub>H; wherein n is an integer from 2 to about 6; m is an integer from 1 to about 5; p, q, r, s, are each a number average in the range from 0 to about 14, the sum total of p, q, r, and s in the molecule being from 2 to about 14, X is an equivalent amount of a counteranion and

(c) from about 0.2% to about 5% of a fatty acid ester of a polyhydric alcohol, the ester having a total of from about 10 to about 40 carbon atoms and at least one free hydroxy group per molecule.

4,422,950

## BLEACH ACTIVATOR GRANULES AND PREPARATION THEREOF

Hermanus C. Kemper, Brielle, and Pieter Veraluis, Rotterdam, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,535

Claims priority, application United Kingdom, Dec. 9, 1980, 8039373

Int. Cl.<sup>3</sup> C11D 3/395, 7/54

U.S. Cl. 252—186.38

12 Claims

1. Effervescent bleach activator granules for use in washing and/or bleaching compositions, of a size of from 0.1 to 2.0 mm, comprising

(a) a bleach activator which in aqueous solutions reacts with a bleaching percompound which in aqueous solution releases active oxygen, to form a peroxy acid;



- (b) a peroxoborate of a metal selected from the group consisting of alkali metals, alkaline earth metals and mixtures thereof which on contact with water releases molecular oxygen causing the granules to effervesce; thereby reducing losses due to incomplete dissolution to a substantial degree; and
- (c) a carrier which is inert to the bleach activator and soluble or dispersible in the wash liquor.

4,422,951

## LIQUID CRYSTAL BENZENE DERIVATIVES

Shigeru Sugimori, Fujisawashi; Tetsukiko Kojima, and Masakazu Tsuji, both of Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 16, 1982, Ser. No. 358,794

Claims priority, application Japan, Apr. 2, 1981, 56-49688; Apr. 2, 1981, 56-49689; Aug. 18, 1981, 56-129070; Sep. 3, 1981, 56-138875; Oct. 27, 1981, 56-171696

Int. Cl.<sup>3</sup> G02F 1/13; C09K 3/34; C07C 43/21, 13/28

U.S. Cl. 252-299.63

5 Claims

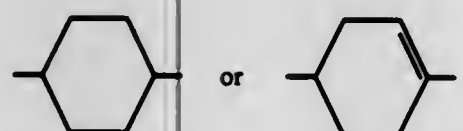
1. A benzene derivative expressed by the formula



wherein R represents a hydrogen atom or an alkyl group of 1 to 10 carbon atoms; R' represents a hydrogen atom, an alkyl group of 1 to 10 carbon atoms or an alkoxy group of 1 to 10 carbon atoms;



represents



and wherein either one of R or R' must be an alkyl or alkoxy group.

4,422,952

## EMULSIONS OF THE WATER-IN-OIL TYPE USEABLE AS COSMETIC SUPPORTS OR PHARMACEUTICAL EXCIPIENTS

Constantin Koulbanis, Paris; Jean-Claude Ser, Beynes, and Quang L. N'Guyen, Antony, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 28, 1980, Ser. No. 172,825

Claims priority, application France, Aug. 2, 1979, 79 19841

Int. Cl.<sup>3</sup> B01J 13/00; C09F 5/08; A61K 7/42, 7/021

U.S. Cl. 252-309

8 Claims

1. A water-in-oil emulsion comprising 20 to 75% by weight of a water phase, 20 to 75% by weight of an oil phase and as an emulsifying agent 5 to 20% by weight of a metal lanolinyl lactylate selected from the group consisting of magnesium, zinc, calcium and aluminum lanolinyl lactylate.

4,422,953

## CORROSION INHIBITION OF HALOCARBON SYSTEMS

Mark T. Grace; Michael I. Naiman, both of St. Louis, and Eddie C. French, Manchester, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 21, 1982, Ser. No. 370,330

Int. Cl.<sup>3</sup> C23F 11/12, 11/14, 11/16

U.S. Cl. 252-392

10 Claims

1. A process of inhibiting the corrosion of a halocarbon system which comprises treating the system with an alkyl, alkenyl, or alkyl-X succinic acid or a salt thereof, where X is an oxygen, sulfur, or amino containing group.

4,422,954

## METHOD TO RESTORE THE METAL CONTENT OF A NOBLE METAL HYDROGENATION CATALYST

Jan F. Van Peppen, Chester, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 31, 1982, Ser. No. 364,109

Int. Cl.<sup>3</sup> B01J 23/96, 23/38; C07C 45/00, 29/20

U.S. Cl. 502-25

7 Claims

1. A method to restore metal content of a supported noble metal catalyst in a reaction mass comprising adding the appropriate amount of a salt of a weak acid of said noble metal to a fluid feed passing across the catalyst wherein the feed is phenol and hydrogen.

2. The method of claim 1 wherein the catalyst is from about 0.2 to about 5 percent by weight palladium on finely divided carbon support.

3. The method of claim 2 wherein the catalyst is present in an amount between about 0.1 and 15 percent by weight of the reaction mass, phenol is present in an amount between about 1 and 99 percent by weight of the reaction mass, hydrogen is present in an amount between about 0.01 and 5 percent by weight of the reaction mass, the hydrogenation of phenol takes place at a temperature between about 120° and 200° C., a pressure between about 10 (6.89×10<sup>4</sup> pascals) and 500 (3.4×10<sup>6</sup> pascals) psig and a flow rate of between about 1000 (28 m<sup>3</sup>) and 20 000 (560 m<sup>3</sup>) cubic feed of hydrogen per minute and between about 10 (38 liters) and 150 (570 liters) gallons per minute of phenol.

4,422,955

## PROCESS FOR SUBSTITUTION OF AROMATIC ORGANIC COMPOUNDS

Robert J. Bryant, Stanley, England, assignor to Sterling Drug Inc., New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,714

Claims priority, application United Kingdom, Dec. 17, 1980, 8040383

Int. Cl.<sup>3</sup> B01J 31/28, 31/30

U.S. Cl. 502-169

8 Claims

1. A catalyst for use in a process for substituting for a halogen atom attached to the nuclear carbon atom of an aromatic ring, wherein the halogen-substituted aromatic ring comprises the whole or part of a partially or wholly aromatic substrate selected from the group consisting of a monocyclic carbocyclic compound, a polycyclic carbocyclic compound, a monocyclic heterocyclic compound and a polycyclic heterocyclic compound; a substituent of the formula —O—R, wherein R represents a substituent selected from the group consisting of alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 12 carbon atoms, alkynyl having from 3 to 12 carbon atoms and benzyl; which process comprises reacting said substrate with an alcoholate of the formula:



wherein M represents an alkali metal atom or an alkaline earth metal atom; n is the valency of M, and R is as defined above, in the presence of a catalytically-effective amount of said

catalyst; which catalyst comprises a mixture of a formic acid ester of an organic alcohol having the formula



wherein R<sup>2</sup> represents a substituent selected from the group consisting of alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 12 carbon atoms, alkynyl having from 3 to 12 carbon atoms and benzyl; and a cuprous salt; said catalyst being substantially anhydrous and protected against oxidative breakdown.

4,422,956

## ACTIVATION OF COMPLEXED REDUCED TITANIUM HALIDE OLEFIN POLYMERIZATION CATALYST WITH HALOALKYLCHLOROSILANES

Gregory G. Arzoumanidis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 14, 1982, Ser. No. 378,405

Int. Cl.<sup>3</sup> C08F 4/64

U.S. Cl. 502-158

32 Claims

1. A titanium-containing olefin polymerization catalyst component formed by reducing titanium tetrachloride with an organoaluminum compound, optionally contacting the reduced solid with a pretreatment amount of alpha-olefin monomer under polymerization conditions, and reacting with a Lewis base complexing agent and a haloalkylchlorosilane.

4,422,957

## METHODS OF PRODUCING POLYOLEFINS USING SUPPORTED HIGH EFFICIENCY POLYOLEFIN CATALYST COMPONENTS

Malcolm J. Kaus, Mohegan Lake, N.Y., and Nemesio D. Miro, Woodridge, N.J., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 146,341, May 2, 1980, Pat. No. 4,347,158.

This application Jun. 18, 1982, Ser. No. 389,619

Int. Cl.<sup>3</sup> C08F 4/02

U.S. Cl. 502-177

19 Claims

1. In a supported high efficiency catalyst component for the polymerization of alpha-olefins to produce homopolymers or copolymers wherein the support base contains water, the improvement of the catalyst component being formed by co-communiting a quantity of a dehydrating agent with the water containing support base, said dehydrating agent being selected from the group consisting of the silicon tetrahalides, calcium hydride and calcium carbide and being of sufficient quantity to react with water which might interfere with catalyst activity.

4,422,958

## CATALYST FOR DESULFURIZATION OF INDUSTRIAL WASTE GASES AND PROCESS FOR PREPARING THE CATALYST

Thierry Dupin, Garges les Gonesse, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 1, 1982, Ser. No. 353,219

Claims priority, application France, Mar. 13, 1981, 81 05029

Int. Cl.<sup>3</sup> B01J 21/06, 23/02, 27/02

U.S. Cl. 502-217

28 Claims

1. A catalyst composition having enhanced mechanical strength and activity, and displaying marked resistance to sulfation, consisting essentially of (i) titanium dioxide, and (ii) the sulfate of calcium, barium, strontium or magnesium.

4,422,959

## HYDROCRACKING PROCESS AND CATALYST

Randy J. Lawson, Arlington Heights; Russell W. Johnson, Villa Park, and Lee Hilfman, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 7, 1982, Ser. No. 376,080

Int. Cl.<sup>3</sup> C10G 13/02; B01J 37/02, 21/12

U.S. Cl. 502-247

4 Claims

1. A method for the preparation of catalysts, having a hydrocracking activity, comprising a combination of a catalyst composite comprising a combination of a carrier material, a nickel component, which is incorporated in said composite by means of an aqueous nickel solution in an amount from about 0.1 to about 10 weight percent of said composite based on the elemental metal, said carrier material comprising a co-gelled silica-alumina carrier material which comprises from about 20 weight percent to about 80 ght percent silica, which method comprises:

- (a) the sequential incorporation of each metal component on said carrier material; and
- (b) the calcination of said carrier material following each metal component incorporation.

4,422,960

## CATALYSTS FOR HYDROTREATMENT OF HEAVY HYDROCARBON OILS CONTAINING ASPHALTENES

Yoshimi Shiroto, Yokohama; Takeo Ono, Kawasaki; Sachio Asaka, and Munekazu Nakamura, both of Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Dec. 14, 1980, Ser. No. 210,059

Claims priority, application Japan, Feb. 19, 1980, 55-19596

Int. Cl.<sup>3</sup> B01J 21/04, 23/22, 23/24, 27/04

U.S. Cl. 502-206

30 Claims

1. A catalyst for hydrotreating a heavy hydrocarbon oil containing asphaltenes, comprising:

a porous carrier composed of one or more inorganic oxides of at least one member selected from the group consisting of the elements belonging to Groups II, III and IV of the Periodic Table; and

one or more catalytic metal components composited with said carrier, the metal of said catalytic metal components being selected from the group consisting of the metals belonging to Groups VB, VIB, VIII and IB of the Periodic Table, said catalytic metal components being present in an amount of between about 0.1% and about 30% in terms of metal oxide based on the total weight of said catalyst, said catalyst having the following pore characteristics (a)-(c) with regard to its pores having a diameter of 75 Å or more:

- (a) an average pore diameter APD being between about 180 and about 500 Å,
- (b) a total pore volume PV in terms of cc/g being at least a value X calculated according to the following equation:

$$X = \frac{0.46}{1 - \left( \frac{100}{APD} \right)^2}$$

the volume of pores with a diameter of between about 180 and about 500 Å being at least about 0.35 cc/g, the volume of pores with a diameter of at least 1500 Å being not greater than about 0.03 cc/g, and

(c) a total surface area SA being at least about 104 m<sup>2</sup>/g, said catalyst having an average catalyst diameter ACD of at least about 0.6 mm.



4,422,961

**RANEY ALLOY METHANATION CATALYST**

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 353,534, Mar. 1, 1982. This application Apr. 1, 1982, Ser. No. 364,576

Int. Cl.<sup>3</sup> B01J 25/02

U.S. Cl. 502—301

10 Claims

1. A monolithic catalyst comprised of a metallic substrate with an integral Raney metal exterior surface, said surface being predominantly derived from an adherent  $\text{Ni}_x\text{M}_{1-x}\text{Al}_3$  Beta structured crystalline precursory layer, where said layer is integral with and derived from said substrate, M is a catalytic enhancer selected from the group consisting of molybdenum, titanium, tantalum, ruthenium or mixtures thereof and where x, the weight fraction of nickel in the combined weight of Ni and M, is within the range of from about 0.80 to about 0.95.

4,422,962

**POLYGLYCOL DIELECTRIC CAPACITOR FLUID**

Stanley W. Cichanowski, Bennington, Vt., assignor to General Electric Company, Hudson Falls, N.Y.

Division of Ser. No. 235,810, Feb. 19, 1981. This application Jan. 10, 1983, Ser. No. 456,661

Int. Cl.<sup>3</sup> H01B 3/20

U.S. Cl. 252—578

9 Claims

1. An improved dielectric fluid for electrical capacitors comprising:

- a polyglycol fluid refined to have a moisture content below about 75 PPM and a power factor of less than about 10% measured at room temperature and 100 Hz, said polyglycol fluid being a dielectric and having a molecular weight above about 1,000; and
- a plurality of additives therein taken from the class consisting of:
  - a hydrogen gas absorber,
  - an anti-oxidant and
  - a voltage stabilizer.

4,422,963

**LIGHT VALVE POLARIZING MATERIALS AND SUSPENSIONS THEREOF**

Robert I. Thompson, Plainview, and Robert L. Saxe, New York, both of N.Y., assignors to Research Frontiers Incorporated, Plainview, N.Y.

Continuation-in-part of Ser. No. 795,760, May 11, 1977, abandoned. This application Nov. 15, 1978, Ser. No. 960,842

Int. Cl.<sup>3</sup> G02F 1/07

U.S. Cl. 252—583

2 Claims

1. A light polarizing perhalide of an alkaloid acid salt having incorporated in its molecular structure at least one halide of the formula



wherein M is rubidium or cesium, X is chlorine, bromine or iodine and n is the valence of M, said perhalide being the reaction product of an alkaloid acid salt, elemental iodine and said halide.

4,422,964

**RADIOACTIVE WASTE CONTAINER WITH IMMOBILIZATION COMPARTMENT AND METHOD**

Richard E. Capolupo, Salisbury, Mass., assignor to Capolupo &amp; Gundal, Inc., Salisbury, Mass.

Filed Nov. 30, 1981, Ser. No. 325,683

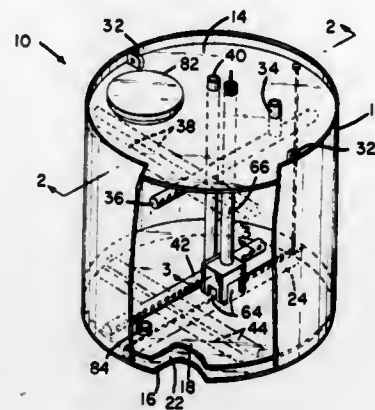
Int. Cl.<sup>3</sup> G21F 9/16

U.S. Cl. 252—628

52 Claims

1. A unitary waste storage container including a solid waste storage compartment, a liquid waste storage compartment located below and joined to the solid waste storage compartment, a liquid drainage passage connecting the compartments and a closure extending across the passage to close the passage

during filling of the solid waste storage compartment and an operator for moving the closure to a position opening the



passage thereafter to permit liquid from the waste in the solid waste storage compartment to drain into the liquid waste storage compartment.

4,422,965

**NUCLEAR WASTE ENCAPSULATION IN BOROSILICATE GLASS BY CHEMICAL POLYMERIZATION**

Ronald W. Chickering, Hempfield Township, Westmoreland County; Bulent E. Yoldas, Churchill, and Bruce H. Neuman, Salem Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 11, 1980, Ser. No. 176,738

Int. Cl.<sup>3</sup> G21F 9/16

U.S. Cl. 252—629

11 Claims

1. A method of encapsulating an aqueous solution of nuclear waste, comprising:

- adjusting the pH of said solution of nuclear waste to about 4 to about 6;
- preparing a composition in an alcohol which consists essentially of:
  - about 1 to about 99% by weight of a silicon compound having the general formula  $\text{Si}(\text{OR})_4$  where each R is independently selected from alkyl to  $\text{C}_6$ ; and
  - about 1 to about 99% by weight of a boron compound having the general formula  $\text{B}(\text{OR})_3$  where each R is independently selected from alkyl to  $\text{C}_6$ , said composition being partially hydrolyzed;
- adjusting the pH of said composition to about the pH of said solution of nuclear waste;
- drying said composition to about 50 to about 75% of its original volume;
- mixing together up to about 30% by weight of said solution of nuclear waste with said composition, based on total weight, to form a gel;
- drying the mixture at a temperature between room temperature and the boiling point of said alcohol;
- heating said mixture at up to  $500^\circ\text{C}$ ;
- consolidating said mixture by
  - warm pressing at about  $400$  to about  $800^\circ\text{C}$ . at about 40,000 to about 100,000 psi; or
  - melting said mixture at about  $700^\circ$  to about  $1150^\circ\text{C}$ .

4,422,966

**SEPARATION OF NEUTRALS FROM TALL OIL SOAPS**

Gamal I. Amer, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Mar. 18, 1983, Ser. No. 476,599

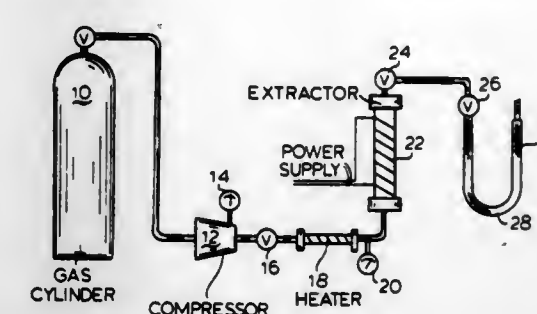
Int. Cl.<sup>3</sup> C09F 1/00

U.S. Cl. 260—97.6

7 Claims

1. A process for separating neutral compounds from tall oil soaps, which comprises; contacting tall oil soap with a supercritical fluid solvent for the

tall oil neutral compounds whereby neutrals are extracted into said solvent to form a mixture of solvent and extract;



separating the mixture from the remainder of the contacted soap; and separating the solvent from the mixture.

4,422,967

**PURIFICATION OF CALCITONIN BY PARTITION CHROMATOGRAPHY**

Ronald C. Orlowski, Frankfort, Ill.; Charles M. Groginsky, Tucson, Ariz., and Jay K. Seyler, Bourbonnais, Ill., assignors to Armour Pharmaceutical Company, Tuckahoe, N.Y.

Continuation-in-part of Ser. No. 189,812, Sep. 22, 1980, Pat. No. 4,336,187, which is a continuation-in-part of Ser. No. 94,323, Nov. 14, 1979, abandoned. This application May 19, 1982, Ser. No. 379,853

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C07C 103/52

U.S. Cl. 260—112.5 T

12 Claims

1. In a process for purifying crude ultimobranchial calcitonin the step of subjecting said crude ultimobranchial calcitonin to partition chromatography using a solvent mixture containing (1)n-butanol (2) a lower aliphatic alcohol selected from the group consisting of ethanol, methanol, propanol and mixtures thereof (3) acetic acid or formic acid or mixtures thereof, or ammonia and (4) ammonium acetate or ammonium formate or mixtures thereof, said solvent mixture having a pH of from 5.5 to 7.0.

4,422,968

 **$\beta$ -ENDORPHIN ANALOGS**

Choh Haoli, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 13, 1982, Ser. No. 416,998

Int. Cl.<sup>3</sup> C07C 103/52

U.S. Cl. 260—112.5 E

3 Claims

1. Analogs of  $\beta$ -endorphin of the formula  $[\text{D-Ala}^2, \text{Phe}^3, \text{Gly}^4, \text{Tyr}^5, \text{Pro}^6]\text{-}\beta\text{-endorphin}$  and the pharmaceutically acceptable acid addition salts thereof.

4,422,969

**CATIONIC STYRYL DYESTUFFS**

Hermann Beecken, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 313,111

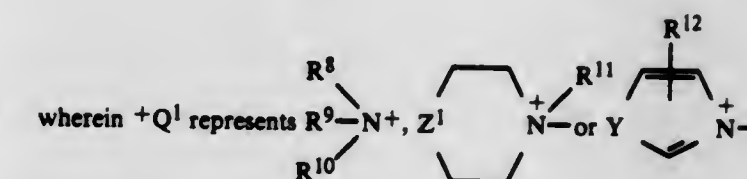
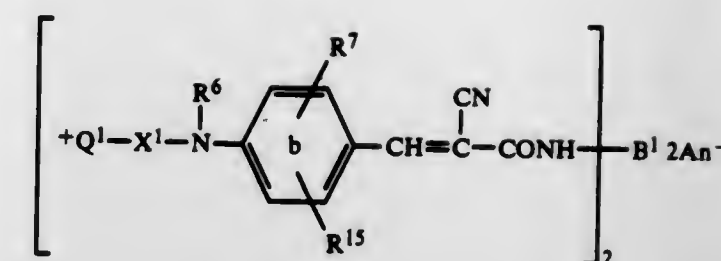
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040911

Int. Cl.<sup>3</sup> C07D 213/57; C07C 121/78

U.S. Cl. 260—152

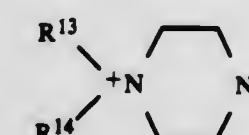
4 Claims

1. A cationic styryl dyestuff of the formula



and wherein

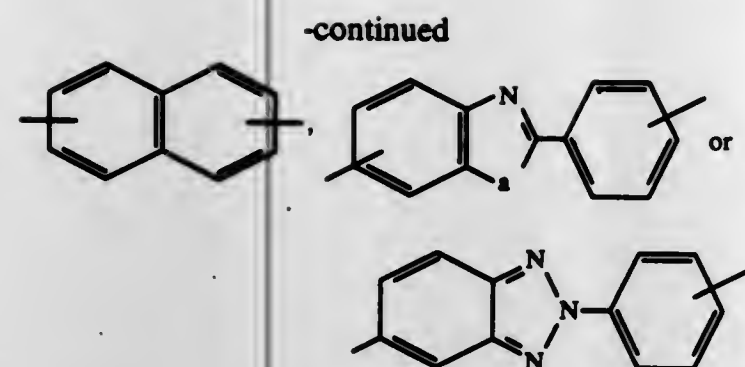
$\text{R}^8, \text{R}^9, \text{R}^{10}$  and  $\text{R}^{11}$ , independently of one another, represent hydrogen or  $\text{C}_1$ - to  $\text{C}_4$ -alkyl, which can be substituted by hydroxyl, amino, formylamino,  $\text{C}_1$ - to  $\text{C}_4$ -alkoxy, hydroxy- $\text{C}_2$ - to  $\text{C}_4$ -alkoxy, phenyl, phenyloxy,  $\text{C}_1$ - to  $\text{C}_3$ -alkylcarbonyloxy, fluorine, chlorine or bromine, and  $\text{R}^8$  additionally represents  $\text{C}_1$ - to  $\text{C}_4$ -alkoxy, amino, formylamino, phenyl, cyclopentyl or cyclohexyl,  $\text{Z}^1$  represents a direct bond,  $\text{CH}_2$ ,  $\text{C}_2\text{H}_4$ , O, S, NH or  $\text{N}-\text{C}_1$ - to  $\text{C}_2$ -alkyl,  $\text{R}^{12}$  represents 1 to 3 radicals from the series comprising hydrogen,  $\text{C}_1$ - to  $\text{C}_4$ -alkyl, fluorine, chlorine or bromine, Y represents O, S, NH,  $\text{N}-\text{C}_1$ - to  $\text{C}_2$ -alkyl or  $\text{CH}=\text{CH}$ ,  $\text{X}^1$  represents  $\text{C}_2$ - to  $\text{C}_3$ -alkylene, which is optionally branched and/or substituted by hydroxyl,  $\text{C}_1$ - to  $\text{C}_4$ -alkoxy or phenyl, and  $\text{R}^6$  represents  $\text{C}_1$ - to  $\text{C}_4$ -alkyl, which is optionally substituted by chlorine, cyano,  $\text{C}_1$ - to  $\text{C}_4$ -alkyloxy, phenyl or phenyloxy or  $\text{R}^6$  represents phenyl or the radical  $-\text{X}-\text{Q}^+$ , or  $\text{R}^6$  with  $-\text{X}-\text{Q}^+$  and the N atom, to which both are bonded, together form a piperazinium system of the structure



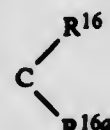
$\text{R}^{13}$  represents hydrogen or  $\text{C}_1$ - to  $\text{C}_4$ -alkyl, which can be substituted by  $\text{C}_1$ - to  $\text{C}_4$ -alkyloxy, hydroxyl,  $\text{C}_1$ - to  $\text{C}_3$ -alkylcarbonyloxy or phenyl,  $\text{R}^{14}$  represents  $\text{C}_1$ - to  $\text{C}_4$ -alkyl, or  $\text{R}^{13}$  and  $\text{R}^{14}$  together represent  $(\text{CH}_2)_4$  or  $(\text{CH}_2)_5$ , or  $\text{R}^6$  and  $\text{R}^7$ , together with the benzene ring and the nitrogen atom to which  $\text{R}^6$  is bonded, are constituents of an indoline, 1,2,3,4-tetrahydroquinoline or 2,3-dihydro-1,4-benzoxazine ring system, which is optionally substituted in the heterocyclic ring by 1 to 4  $\text{C}_1$ - to  $\text{C}_4$ -alkyl groups or by a phenyl radical, or  $\text{R}^7$  and  $\text{R}^{15}$ , independently of one another, denote hydrogen,  $\text{C}_1$ - to  $\text{C}_2$ -alkyl,  $\text{C}_1$ - to  $\text{C}_2$ -alkyloxy, bromine or chlorine, and  $\text{B}^1$  represents



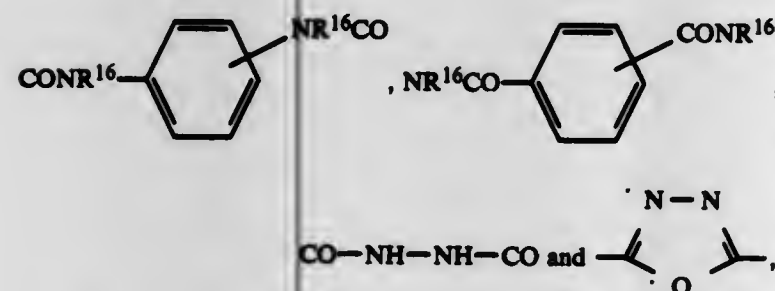




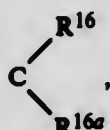
wherein  
Z<sup>2</sup> designates a direct bond or a connecting member from the series O, S,



(CH<sub>2</sub>)<sub>2</sub>, CH=CH, CH<sub>2</sub>O, CH<sub>2</sub>OCH<sub>2</sub>, NR<sup>16</sup>, N=N, NR<sup>16</sup>CO, NR<sup>16</sup>CONR<sup>16</sup>, NR<sup>16</sup>CO(CH<sub>2</sub>)<sub>1-4</sub>CONR<sup>16</sup>, CONR<sup>16</sup>CO, NR<sup>16</sup>SO<sub>2</sub>,



and  
R<sup>16</sup> and R<sup>16a</sup>, independently of one another, represent C<sub>1</sub>- to C<sub>2</sub>-alkyl and, particularly, hydrogen, and in the case of



also together represent (CH<sub>2</sub>)<sub>4</sub> or (CH<sub>2</sub>)<sub>5</sub>,  
a represents O, S or NR<sup>16</sup> and  
An<sup>-</sup> represents an anion,

wherein phenylene nuclei are present as 1,3- or 1,4-phenylene, and the phenyl radicals and phenylene, naphthylene and fused benzoid nuclei mentioned can additionally be substituted by 1 to 3 C<sub>1</sub>- to C<sub>4</sub>-alkyl groups, C<sub>1</sub>- to C<sub>4</sub>-alkyloxy groups, C<sub>1</sub>- to C<sub>4</sub>-alkyloxycarbonyl groups, cyano groups or CF<sub>3</sub> groups and/or Br or Cl.

**4,422,970**  
**METHOD OF SYNTHESIS OF 1-DODECYLAZACYCLOHEPTAN-2-ONE**  
Vithal J. Rajadhyaksha, Mission Viejo; James V. Peck, Costa Mesa, and Gevork Minakian, Encino, all of Calif., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed May 20, 1982, Ser. No. 380,162  
Int. Cl.<sup>3</sup> C07D 223/10

U.S. Cl. 260—239.3 R

4 Claims

1. The method of synthesis of 1-dodecylazacycloheptan-2-one comprising reacting under aqueous conditions azacycloheptan-2-one with 1-bromo-dodecane in the presence of a catalytic amount of tripropylmethyl-ammonium chloride.

**4,422,971**  
**PROCESS FOR THE PREPARATION OF 6-AMINOPENICILLANIC ACID-1,1-DIOXIDE**  
Piet J. Akkerboom, RT Zoetermeer, and Christophorus Oldenhof, TM Zoetermeer, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands  
PCT No. PCT/NL80/00039, § 371 Date Aug. 4, 1981, § 102(e) Date Aug. 4, 1981, PCT Pub. No. WO81/01707, PCT Pub. Date Jun. 25, 1981  
PCT Filed Dec. 10, 1980, Ser. No. 293,621  
Claims priority, application Netherlands, Dec. 10, 1979, 7908867

Int. Cl.<sup>3</sup> C07D 499/04, 499/42

U.S. Cl. 260—245.2 R

9 Claims

1. A process for the preparation of 6-amino-penicillanic acid-1,1-dioxide comprising protecting the 3-carboxylic acid of a penicillin-1,1-dioxide with an easily removable silicon, phosphorus or boron containing residue, reacting the latter with an imino halogenating agent to form the corresponding 6-imino compound, reacting the latter with an alcohol of the formula R—OH wherein R is selected from the group consisting of alkyl of 1 to 6 carbon atoms and aralkyl with 1 to 6 alkyl carbon atoms to form the corresponding imino ether and hydrolyzing the latter to obtain 6-amino-penicillanic acid-1,1-dioxide.

**4,422,972**  
**NOVEL LIGHT-SENSITIVE COMPOUNDS AND PHOTOREACTABLE COMPOSITIONS COMPRISING SAME**

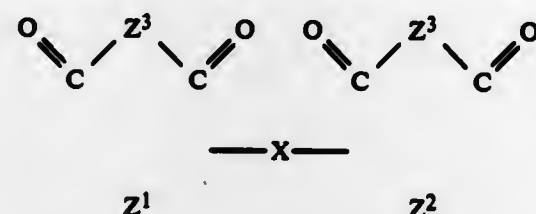
Robert C. Daly, Rochester; Danny R. Thompson, Fairport, and Samir Y. Farid, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Division of Ser. No. 180,211, Aug. 21, 1980, Pat. No. 4,302,527.  
This application May 4, 1981, Ser. No. 260,434

Int. Cl.<sup>3</sup> C07C 49/72

U.S. Cl. 260—368

9 Claims

1. A light-sensitive compound having a structural formula



wherein

Z<sup>1</sup> and Z<sup>2</sup> are each independently the number of non-metallic atoms necessary to complete 1, 2, 3, or 4 unsaturated carbocyclic rings of from 6 to 18 nuclear atoms;  
Z<sup>3</sup> is either a carbon-to-carbon bond or vinylene;  
and X is a linking group.

**4,422,973**  
**PROCESS FOR THE PREPARATION OF 1,4-DIAMINO-2,3-DICYANO-ANTHRAQUINONE**  
Friedrich W. Krück, Cologne, and Rütger Neeff, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Del.X  
Filed Jan. 15, 1981, Ser. No. 225,544  
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003656

Int. Cl.<sup>3</sup> C07C 97/24

U.S. Cl. 260—382

10 Claims

1. A process for the preparation of 1,4-diamino-2,3-dicyano-anthraquinone comprising in a first step reacting 1-amino-4-bromo-anthraquinone-2-sulphonic acid, or its salts, with ammonia in formamide or N-methyl-formamide as a solvent and thereafter, without isolation, in a second step reacting the resulting product with compounds which yield cyanide ions.

**4,422,974**  
**PROCESS FOR THE PURIFICATION OF β-SITOSTEROL ISOLATED FROM THE UNSAPONIFIABLES IN CRUDE SOAP FROM THE SULPHATE CELLULOSE PROCESS**  
Antti Hamunen, Lappeenranta, Finland, assignor to OY Kaukas AB, Finland

Filed Jul. 8, 1982, Ser. No. 396,335

Claims priority, application Finland, Jul. 21, 1981, 812279

Int. Cl.<sup>3</sup> C07J 9/00

U.S. Cl. 260—397.25

4 Claims

1. A process for isolating beta-sitosterol containing less than 5% alpha-sitosterol from a sterol mixture isolated from the unsaponifiables in crude soap derived from the sulphate cellulose process, comprising:

- adding to the sterol mixture one organic solvent and water, said organic solvent selected from the group consisting of 1,2-dichloroethylene, methyl ethyl ketone and ethyl acetate, the sterol mixture and the organic solvent having a weight ratio between about 1:3 and about 1:20, and wherein the amount of water is greater than 2% of the organic solvent,
- heating the admixture obtained from step (a) until the sterol mixture is dissolved,
- precipitating a product rich in beta-sitosterol by cooling the admixture to at least room temperature, and
- separating the precipitated product rich in beta-sitosterol from the solution by filtration.

**4,422,975**  
**ORGANIC SALT COMPOSITIONS IN EXTRACTION PROCESSES**

Howard L. Mitchell, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 3, 1981, Ser. No. 289,323

Int. Cl.<sup>3</sup> C07F 5/06

U.S. Cl. 260—448 AD

20 Claims

1. A composition of matter, being a solid salt, of the formula:

[C] [A]

wherein [C] is a monovalent or divalent cation selected from the group consisting of the formulae:

[R<sub>4</sub>Q]

[R<sub>3</sub>R'Q]

[R<sub>3</sub>Q-L-QR<sub>3</sub>], and

[A] is a monovalent or divalent anion or a solid polyanionic metal oxide selected from the group consisting of the formulae:

[R'<sub>4</sub>M]

[AS]

[R'<sub>3</sub>M-L'-MR'<sub>3</sub>]

wherein

Q is independently N, P or As;

R is independently selected from the group consisting of phenyl, naphthyl, biphenyl, and their monochloro and monomethyl derivatives;

R' is independently selected from the group consisting of benzyl, naphthylmethyl, and their monochloro and monomethyl derivatives; linear and branched C<sub>6</sub>-C<sub>12</sub> alkyl; cyclopentyl, cyclohexyl, adamantyl, bicyclooctyl, their monomethyl, dimethyl, partially fluorinated and partially chlorinated derivatives;

R'' is independently selected from the group consisting of phenyl, naphthyl, phenoxy, naphthoxy, and their methyl, polymethyl, chloro, polychloro, fluoro and polyfluoro derivatives;

L is —CH<sub>2</sub>(p—C<sub>6</sub>H<sub>4</sub>)CH<sub>2</sub>—;

L' is p—C<sub>6</sub>H<sub>4</sub>;

M is B or Al;

[AS] comprises a solid polyanionic metal oxide in which the metal is independently selected from the group consisting of Al, Si, Ti, Zr, Th, Hf, W, B and mixtures thereof; and wherein the number of cations and anions are sufficient to render the salt electrically neutral.

**4,422,976**  
**CONTINUOUS PREPARATION OF ORGANIC ISOCYANATES**

Ryuichi Yamamoto; Akinobu Takagi; Masafumi Kataita; Kenji Obata, and Shigeki Mori, all of Ohmura, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Japan

Filed Apr. 2, 1982, Ser. No. 364,894

Claims priority, application Japan, Apr. 7, 1981, 56-51216; Nov. 18, 1981, 56-183734

Int. Cl.<sup>3</sup> C07C 118/02

U.S. Cl. 260—453 PH

12 Claims

1. In a process for continuously preparing an organic isocyanate by reacting a corresponding organic primary amine and stoichiometrically excess phosgene in an inert organic solvent, the improvement which comprises the steps of:

- bringing the organic primary amine in a practically dispersed state into contact with phosgene at a gauge pressure of 2–7 Kg/cm<sup>2</sup> and a temperature in the range of 60°–100° C., thereby forming a corresponding organic carbamyl chloride, converting the bi-produced hydrochloric acid salt of said amine, and phosgene into the organic carbamyl chloride and decomposing 30–70% of the thus-formed organic carbamyl chloride present in the reaction mixture into the organic isocyanate; and
- maintaining the resultant reaction mixture at a gauge pressure of 3–7 Kg/cm<sup>2</sup> and a temperature in the range of 120°–160° C., thereby converting the hydrochloric acid salt of said amine and phosgene present in the reaction mixture into the organic carbamyl chloride and completing the decomposition of said organic carbamyl chloride into said organic isocyanate.

**4,422,977**  
**HYDROESTERIFICATION OF 1-ALKENE**  
Paul Foley, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 26, 1982, Ser. No. 342,636

Int. Cl.<sup>3</sup> C07C 153/017

U.S. Cl. 260—455 R

29 Claims

1. A process for hydroesterification of 1-alkene which consisting essentially of (1) reacting 1-alkene with carbon monoxide and hindered thiol compound in a liquid medium containing a halide-free catalyst complex of palladium and tertiary hydrocarbylphosphine ligand; and (2) recovering alkyl thioalkanoate product.

**4,422,978**  
**METHOD FOR PREPARING OPTICALLY ACTIVE CARBOXYLIC ACID ESTERS**

Yukio Suzuki; Masahiro Hayashi, both of Toyonaka, and Kenzi Takuma, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 20, 1981, Ser. No. 313,089

Claims priority, application Japan, Oct. 20, 1980, 55-147265; Apr. 15, 1981, 56-56115

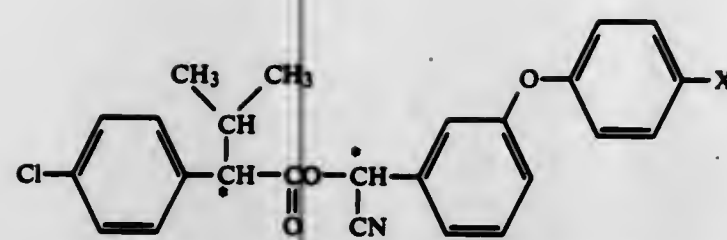
Int. Cl.<sup>3</sup> C07C 121/75

U.S. Cl. 260—465 D

59 Claims

1. A method for preparing an optically active carboxylic acid ester of the formula (I):





wherein X is a hydrogen atom or a fluorine atom, and \* indicates an asymmetric carbon atom, which is an A $\alpha$ -isomer having an (S)-configuration on both the acid and alcohol moieties, or rich in said A $\alpha$ -isomer, which method comprises crystallizing said A $\alpha$ -isomer from a solution of an A-isomer of the compound of formula (I) having an (S)-configuration on the acid moiety in the presence of a crystal of substantially pure A $\alpha$ -isomer and in the absence of any crystal of the A-isomer and in the presence or absence of a basic catalyst, wherein the solution of the A-isomer is heated to a temperature of 40° C. or higher before the A $\alpha$ -isomer is crystallized from that solution.

4,422,979

### FLUORO-SUBSTITUTED BIPHENYLYL COMPOUNDS AND PROCESSES

Edward J. Zaiko, Cary, N.C., and Paul F. Ranken, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va. Division of Ser. No. 189,779, Sep. 22, 1980, Pat. No. 4,371,473, which is a division of Ser. No. 53,060, Jun. 28, 1979, Pat. No. 4,278,516. This application Apr. 16, 1982, Ser. No. 369,339 Int. Cl.<sup>3</sup> C07C 121/66, 53/23

U.S. Cl. 260—465 D 5 Claims  
1. A method for the preparation of 2-(2-fluoro-4-biphenyl)-propionic acid which comprises

- reacting a mixture of 2-amino-4-methylbiphenyl, a fluoridizing agent and a diazotizing agent to form 2-fluoro-4-methylbiphenyl,
  - reacting said 2-fluoro-4-methylbiphenyl with N-bromosuccinimide or bromine under irradiation with light to form 2-fluoro-4-monobromomethylbiphenyl,
  - reacting said 2-fluoro-4-monobromomethylbiphenyl with an alkali metal cyanide to form 2-(2-fluoro-4-biphenyl)-acetonitrile,
  - reacting a mixture of said acetonitrile, a dialkyl carbonate and an alkali metal alkoxide, and then adding a methylating agent to form alkyl-2-(2-fluoro-4-biphenyl)-2-cyano-propionate,
  - reacting said cyanopropionate, an alkali metal alkoxide and an alcohol to form 2-(2-fluoro-4-biphenyl)propionitrile, and then
  - reacting a mixture of said propionitrile and an alkali metal hydroxide in an aqueous-organic medium to form 2-(2-fluoro-4-biphenyl)propionic acid.
3. Ethyl-2-(2-fluoro-4-biphenyl)-2-cyanopropionate.

4,422,980

### ACRYLIC DIMERIZATION USING SUPPORTED CATALYSTS

R. K. Grasselli, Chagrin Falls; J. D. Burrington, Richmond Heights; F. A. Pesa, Aurora, and H. F. Hardman, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Aug. 10, 1981, Ser. No. 291,708  
Int. Cl.<sup>3</sup> C07C 121/26, 121/30, 121/00

U.S. Cl. 260—465.8 D 10 Claims

1. A process for dimerizing acrylonitrile to produce adiponitrile and/or 1,4-dicyanobutenes comprising contacting acrylonitrile with a catalyst at a temperature of 20° to 250° C. in the presence of hydrogen, said catalyst comprising a polymer support having a ruthenium complex bonded thereto, said polymer support comprising an organic polymer backbone having trivalent P pendant atoms covalently bonded thereto

and randomly distributed in said polymer, said ruthenium complex being capable of catalyzing the dimerization of acrylonitrile to adiponitrile and/or 1,4-dicyanobutenes and comprising Ru and at least two homogeneous ligands having at least four ligating bonds bonding to said Ru, the Ru in each ruthenium complex datively bonding to a pendant atom in said polymer support, the Ru/pendant atom ratio in said catalyst being at least 0.001, said complex being substantially free of homogeneous phosphine ligands.

4,422,981

### PROCESS FOR PRODUCTION OF 2-METHYLENEGLUTARONITRILE

Hiroyuki Omori, Yokkaichi; Makoto Takeda, Ami; Koichi Fujita, Matsusaka, and Mitsugi Kataoka, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,379

Claims priority, application Japan, Mar. 25, 1981, 56-43715 Int. Cl.<sup>3</sup> C07C 121/20, 120/00

U.S. Cl. 260—465.8 D 11 Claims

1. In a process for production of 2-methyleneglutaronitrile by the dimerization of substantially anhydrous acrylonitrile by contacting said acrylonitrile in a liquid phase with a catalyst composed of a trialkylamine and a metal halide of the formula MeX<sub>n</sub>, wherein Me represents aluminum, titanium, vanadium, iron, cobalt or zinc; X is chlorine, bromine or iodine; and n is an integer equal to the valence of the metal Me, the improvement comprising the steps of:

- contacting the resulting liquid reaction product while being agitated with an aromatic hydrocarbon selected from the group consisting of benzene, toluene and xylene and added water;
- separating the resulting aromatic hydrocarbon phase from the mixture; and
- recovering 2-methyleneglutaronitrile from the aromatic hydrocarbon phase, the quantities of the aromatic hydrocarbon and the water being, respectively, 1 to 50-fold by weight and 1 to 10% by weight relative to the amount of liquid reaction product, said water being added to effect the contact step no earlier than the contact of the liquid reaction product with said aromatic hydrocarbon thereby forming a mass which comprises the catalyst component and a polymeric material which precipitates when the mass is not agitated.

4,422,982

### METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

N. Subramanian, San Leandro, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 30, 1982, Ser. No. 393,574

Int. Cl.<sup>3</sup> C07F 9/38

U.S. Cl. 260—502.5 F 11 Claims

1. A method for the production of N-phosphonomethylglycine which comprises the steps of:

- adding about one mole of formaldehyde to about two moles of formamide at a pH of between 9 and 10, to form N-(hydroxymethyl)formamide,
- reacting N-(hydroxymethyl)formamide with triethyl phosphite in about a 1:1 mole ratio to form diethyl, N-(formyl)aminomethylphosphonate,
- reacting diethyl, N-(formyl)aminomethylphosphonate with methylchloroacetate in about a 1:1 mole ratio in the presence of a suitable solvent and a proton-extracting base to form N-(diethylphosphonomethyl), N-(formyl)glycine-methyl ester, and
- reacting N-(diethylphosphonomethyl) N-(formyl)glycine methyl ester with a hydrolyzing agent to form N-phosphonomethylglycine.

4,422,983

### FIBERGLASS REINFORCED COOLING TOWER

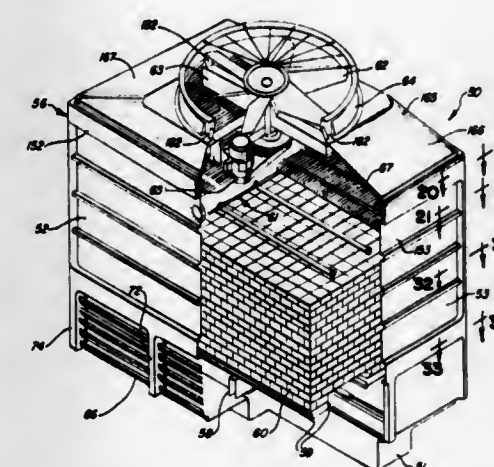
Charles J. Bardo, Arlington, and Andrew Green, Galveston, both of Tex., assignors to Ceramic Cooling Tower Company, Fort Worth, Tex.

Filed Jun. 16, 1982, Ser. No. 388,906

Int. Cl.<sup>3</sup> B01F 3/04

U.S. Cl. 261—24

32 Claims



1. A liquid cooling tower comprising four generally rectangular vertically extending side panels formed of fiberglass reinforced polyester resin, the four side panels being arranged in two pairs of opposed parallel panels to provide a generally rectangular enclosure, at least one support beam extending between one pair of opposed side panels and secured thereto, each support beam being formed of fiberglass reinforced polyester resin, a plurality of lintels extending generally perpendicularly to the support beam, means on the other pair of opposed side panels for supporting the lintels, each end of each lintel being supported by either a support beam or by the lintel support means of a side panel, porous means for heat/mass exchange within said enclosure and supported by the lintels for permitting air and liquid to pass through the exchange means, a top portion supported by the side panels and having an air opening therein, a fan in the air opening supported by the top portion, and liquid distribution means within the enclosure for supplying liquid to the exchange means.

4,422,985

### METHOD AND APPARATUS FOR ENCAPSULATION OF A LIQUID OR MELTABLE SOLID MATERIAL

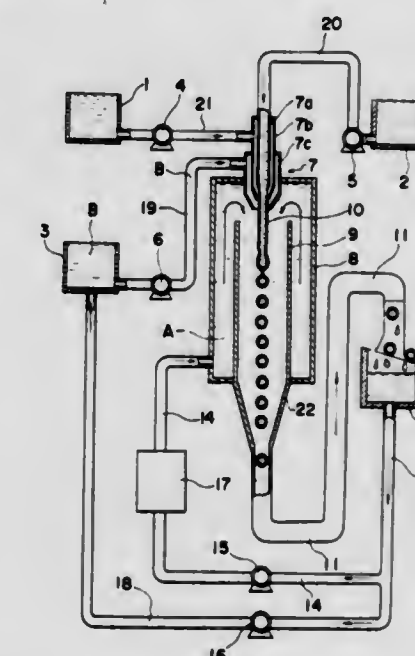
Takashi Morishita, Nishinomiya; Hideki Sunohara, Osaka, and Shinsuke Sonoi, Itami, all of Japan, assignors to Morishita Jintan Co., Ltd., Osaka, Japan

Filed Sep. 24, 1982, Ser. No. 423,102

Int. Cl.<sup>3</sup> A61J 5/04

U.S. Cl. 264—4.4

2 Claims



1. A method for encapsulation of a liquid or meltable solid material, comprising the steps of forming a jet of a material to be encapsulated, simultaneously forming a coaxial jet of a capsule-forming material surrounding the jet of the material to be encapsulated, forming a coaxial jet of a heated circulating liquid surrounding the coaxial composite jet of the capsule-forming material and the material to be encapsulated, introducing the resultant coaxial triple jet into a flow of a cooling liquid to form capsules composed of a core of the material to be encapsulated and a capsule or coating film of the capsule-forming material, said heated circulating liquid has a temperature close to or higher than that of the capsule-forming material.

4,422,986

### METHOD AND APPARATUS FOR INJECTION MOLDING BRUSHES

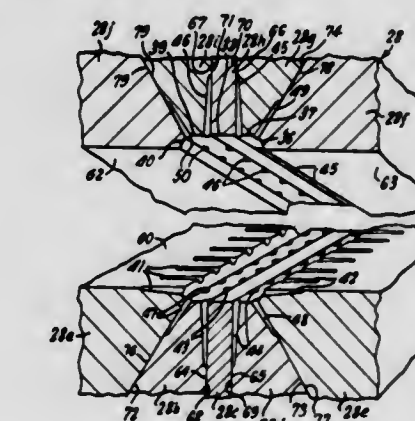
William E. Cole, Residence Europea, Monte Carlo, Monaco

Filed Sep. 23, 1981, Ser. No. 304,836

Int. Cl.<sup>3</sup> B28B 7/04

U.S. Cl. 264—39

5 Claims



1. A method of injection molding at least a part of a brush including a stem and a plurality of rows of bristles extending longitudinally along the stem, the bristles in at least one row extending outwardly from the stem at an angle which is differ-

4,422,984

### CENTRIFUGAL CASTING OF CONTACT LENSES

Charles W. Neefe, 811 Scurry St., Box 429, Big Spring, Tex. 79720

Filed Sep. 13, 1982, Ser. No. 417,555

Int. Cl.<sup>3</sup> B29D 11/00

U.S. Cl. 264—2.1

10 Claims

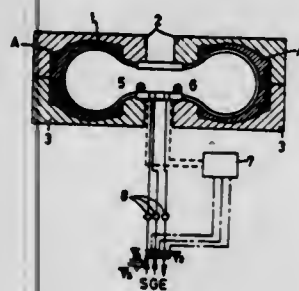
1. A method of centrifugal casting optical lenses by the steps of, placing a selected liquid lens monomer between an inner mold and an outer mold, revolving a plurality of these lens molds around a common center with the lens optical axis passing through the common center of rotation, allowing the liquid lens monomer to begin polymerization and the liquid monomer viscosity to increase to form a syrup, adding rotational power to increase the speed of rotation of the lens molds around their common center and allowing the polymerization to proceed and the volume of lens monomer to decrease and the speed of rotation of the lens molds to increase until a solid resinous lens fills the space between the lens molds allowing the rotation to cease and removing the finished lens from the lens molds.



ent than the angle at which the bristles from at least one other row extend from said stem, said method comprising the steps of clamping a plurality of mold pieces together in mold defining positions to form a mold defining the said at least part of a brush and in which each bristle forming cavity is defined by the juxtaposed surfaces of at least two separate mold pieces, injecting molten material into the mold to fill the mold including all of the bristle forming cavities therein, permitting the molten material to solidify, and opening of the mold by separating at least one set of mold pieces from at least one other mold piece to permit removal of the molded part of a brush, at least the majority of said mold pieces being retained in their said mold defining positions relative to each other during ejection molding and removal of the said molded part of a brush, and, when needed, separating the mold pieces defining any bristle forming cavity for purposes of cleaning foreign material therefrom.

4. A mold for injection molding at least part of a brush having a stem and a plurality of rows of bristles extending longitudinally along the stem, the bristles in at least one row extending outwardly from the stem at an angle which is different than the angle at which the bristles from at least one other row extend from said stem, said mold comprising a plurality of mold pieces which form bristle forming cavities for molding of the individual bristles, each bristle forming cavity being defined by the juxtaposed surfaces of at least two separate mold pieces, clamping means for clamping the said plurality of mold pieces together in mold defining positions to form a mold for injection molding of said at least part of a brush, said clamping means retaining at least the majority of said mold pieces in their said mold defining positions during removal of the molded part of a brush, at least a portion of one of the mold pieces defining an ejector rod and being movable relative to its adjacent mold pieces for sliding a molded part of a brush out of engagement with the mold to simplify its removal from the mold, and means for releasing said clamping means to separate the juxtaposed surfaces defining any bristle forming cavity for cleaning any said bristle forming cavity.

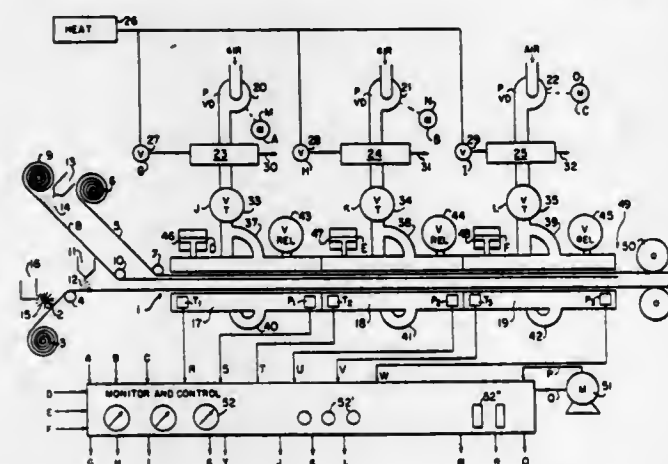
**4,422,987**  
**METHOD FOR VULCANIZING AN ELASTOMER**  
Toshio Arimatsu, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan  
Filed Nov. 16, 1981, Ser. No. 321,929  
Claims priority, application Japan, Jul. 24, 1981, 56-116644  
Int. Cl.<sup>3</sup> B29H 5/01  
U.S. Cl. 264—40.1



1. In a method for vulcanizing an elastomer set in a vulcanizing chamber by use of a fluid of a low enthalpy gas and a high thermal capacity fluid, the improvement wherein the said gas and thermal fluid are mixed directly in the vulcanizing chamber and controlled under optimal pressure and temperature conditions suitable for vulcanizing the elastomer by means of a controller which operates in response to a pressure sensor and temperature sensor located within the vulcanizing chamber.

**4,422,988**  
**FLUID FILM CONTINUOUS PROCESSING METHOD AND APPARATUS**  
Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio  
Continuation-in-part of Ser. No. 954,448, Oct. 25, 1978, Pat. No. 4,278,624. This application Jul. 13, 1981, Ser. No. 282,510  
The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.  
Int. Cl.<sup>3</sup> B29D 27/04  
U.S. Cl. 264—40.3

7 Claims



1. Apparatus for continuously processing an endless web moving in the longitudinal direction of the web comprising:  
a base;  
a first, generally planar, normally stationary, process surface mounted on said base;  
a second, generally planar normally stationary, process surface mounted on said base to be spaced from and parallel to said first process surface;  
each of said first and second process surfaces being composed of a plurality of sections serially arranged in longitudinal direction of the apparatus corresponding to the processing direction with an entrance end and an exit end for the web;  
a plurality of holes extending over substantially the entire first and second process surfaces in a fixed pattern;  
means operatively associated with said process surfaces forming a separate plenum chamber for each of said surface sections on the side of each of said surfaces opposite from the other surface so that all of said holes within each surface section open up into their corresponding plenum chamber;  
means operatively associated with said plenum chambers for supplying pressurized fluid separately to each of said plenum chambers so that the fluid will exit from said holes and form fluid films respectively along said process surfaces sufficient to form an anti-friction fluid bearing for the web;  
side supports closing the side space between each longitudinal side of the first and second process surfaces to form therewith a generally four-sided closed stationary tube extending for substantially the full longitudinal length of the apparatus and being open at opposed entrance and exit ends;  
feeding means operatively associated with said process surfaces for engaging the endless web and for continuously moving the web through the apparatus;  
means operatively associated with said process surfaces for depositing foamable chemicals at said entrance end of the apparatus to produce a continuous web of synthetic foam;  
means operatively associated with said apparatus for separately monitoring a physical characteristic of the fluid for each surface section and providing a correlated monitor signal;  
central monitor and control means operatively associated with said apparatus for receiving all of said monitor signals, comparing said monitor signals respectively to sepa-

rate fixed reference signals of a stored profile of reference characteristic value versus longitudinal length and producing respective control signals correlated to the comparison for each monitor location;  
a plurality of separate means operatively associated with each of said plenum chambers for controlling the characteristic of the fluid being supplied to its plenum chamber in accordance with a temperature control signal; and  
said control means operating said separate means in a fixed sequential order only so long as said comparison signal is different than a fixed value as determined after a delay correlated to each operation of the sequence.

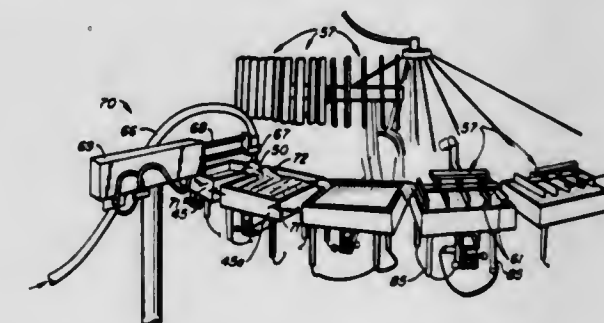
**4,422,989**  
**METHOD OF PRODUCING HYDROTHERMALLY CURED AERATED CONCRETE BUILDING UNITS**  
Dieter Hums, Schrobenehausen; Armin Hartmann, Rheinau; Klaus F. Lippe, Aresing, and Werner Wetzig, Messel, all of Fed. Rep. of Germany, assignors to Intong AB, Kumla, Sweden  
Continuation of Ser. No. 937,749, Aug. 29, 1978, abandoned.  
This application Dec. 15, 1980, Ser. No. 216,381  
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739181  
Int. Cl.<sup>3</sup> C04B 15/04, 31/02

U.S. Cl. 264—42 3 Claims  
1. In a method of producing gas concrete in which a mass comprising water, lime, rising agent, cement, and sand, said mass being suitable for production of gas concrete, is cast into a mold where it is permitted to rise and harden into a mass capable of being cut into a desired shape and wherein the hardened material is hydrothermally cured with steam in an autoclave to form a gas concrete product, the improvement wherein said castable mass is prepared by the steps of:  
providing water in a mixing vessel, adding lime, cement, and sand to the water in the mixing vessel while stirring and mixing for 40 to 80 seconds, said lime and cement together forming a binding agent in which the lime is predominant; mixing a calcium sulphate-containing component with said homogeneous pre-mixture for 30 to 35 seconds to form a homogeneous calcium sulphate-containing mixture, said calcium sulphate-containing component being selected from the group consisting of calcium sulphate anhydrite and gypsum and being present in an amount of 6-12% by weight SO<sub>3</sub> based on the weight of CaO in said lime; mixing a rising agent with said homogeneous calcium sulphate-containing mixture for 20 to 40 seconds to form said castable mass; and  
after mixing is completed, retaining the castable mass in the mixing vessel until rising starts.

**4,422,990**  
**METHOD AND APPARATUS FOR MAKING SOIL PLUGS**  
Errol C. Armstrong, Mountain View; William A. Hanacek, Salinas, both of Calif.; Paul F. Hermann, Booth Harbor, and Thorburn S. Kennedy, East Booth Bay, both of Me., assignors to Castle & Cooke Techniculture, Inc., Salinas, Calif.  
Filed Apr. 1, 1982, Ser. No. 364,578  
Int. Cl.<sup>3</sup> B29D 27/04  
U.S. Cl. 264—45.3

36 Claims  
1. In the method of forming soil plugs within carrying trays comprising the steps of introducing a soil-water-resistive expandable prepolymer resin mixture into a mold receptacle onto a base mold member therein, positioning thereon a tray mold member having an array of plug-molding cavities, urging the tray and base mold members together to squeeze soil-water-reactive expandable prepolymer resin mixture therebetween into the plug-molding cavities, and clamping the tray and base mold members together while the soil-resin mixture cures, the improved method of the continuously forming highly regular and homogeneous soil plugs comprising the steps of:  
continuously bringing the water-reactive expandable pre-

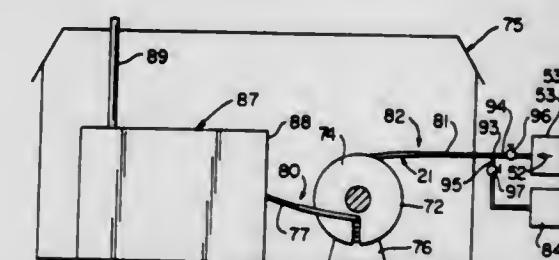
polymer resin compound into initial reactive contact with a water-containing soil slurry;  
mixing said pre-polymer compound and soil slurry and continuously dispensing the resulting mixture into mold receptacles in a time span short compared with the primary reaction time of the soil slurry and the pre-polymer compound;  
continuously dispensing the resulting mixtures seriatim into



said mold receptacles to form an approximately uniform layer covering the base mold members therein;  
positioning a tray mold member within a receptacle upon said approximately uniform layer before the layer noticeably expands; and  
performing the step of urging the tray and base mold members together to squeeze the soil-water-resistive expandable prepolymer resin mixture therebetween into the plug-molding cavities before the layer noticeably expands.

**4,422,991**  
**METHOD OF MAKING HOSE CONSTRUCTION**  
Alfred R. Phillips, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio  
Filed Feb. 22, 1982, Ser. No. 350,968  
Int. Cl.<sup>3</sup> B29C 17/07  
U.S. Cl. 264—83

5 Claims



1. In a method of making a hose construction for conveying fluids having nonpolar hydrocarbons comprising the step of providing a seamless tube of a polyolefin material and of indefinite length, and treating the inner surface of said tube with a fluorine gas to define a barrier layer having a fluorocarbon composition as an integral portion of said tube, said barrier layer rendering said tube substantially impermeable to said hydrocarbons, the improvement comprising the steps of disposing an inert treating gas inside said tube as said tube is being extruded from a mass of said material through a tube forming die means so that the inner surface of said tube is maintained oxygen free at the time of forming thereof, sealing a leading end portion of said tube to prevent loss of said treating gas, winding the treated tube to define a first supply roll thereof, cutting said tube between a pair of sealing clamps after extruding a predetermined length thereof thereby sealing both the trailing end of said tube wound on said first supply roll and a leading end of said tube to be wound on another supply roll, forcing said fluorine gas through said trailing end of said tube while in said first supply roll thereof to displace said inert treating gas and to treat said inner surface thereof while the same is still oxygen free, and, thereafter, purging said fluorine gas from said tube while still in said first supply roll thereof by forcing a purging gas through said trailing end thereof.



**4,422,992**  
**EXTRUDER PROCESS FOR PREPARATION OF**  
**CARBON FIBER REINFORCED FLUOROPOLYMER**  
**COMPOSITIONS**

Rudolph H. Michel, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.  
 Filed Feb. 12, 1982, Ser. No. 348,365  
 Int. Cl.<sup>3</sup> B29B 1/10

U.S. Cl. 264-108

2 Claims

1. A process for preparing a blend of a melt-extrudable tetrafluoroethylene copolymer and carbon fiber comprising:
  - (i) providing a corotating, intermeshing twin screw extruder with a screw speed of 50 to 120 RPM, a barrel temperature of 220° to 410° C., a first zone wherein the ratio of screw length to screw pitch is about 11 to 15, a second zone for metering the blend and a die slot having an opening of 2 to 4 mm;
  - (ii) feeding the polymer and 20 to 35 weight percent based on polymer of continuous carbon fiber into the first zone, therein melting the polymer, chopping the fibers so that a substantial fraction is from about 1.5 to 13 mm in length and blending the polymer and chopped fibers; and
  - (iii) transferring the polymer/fiber blend through the second zone of the extruder and out of the extruder through the die slot.

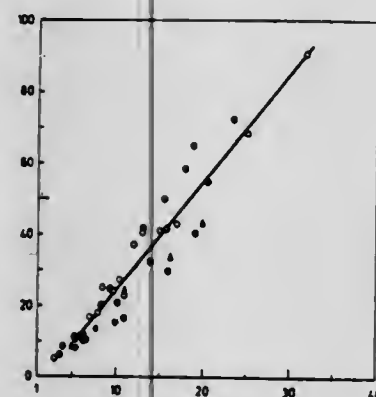
**4,422,993**  
**PROCESS FOR THE PREPARATION OF FILAMENTS OF**  
**HIGH TENSILE STRENGTH AND MODULUS**

Paul Smith, Sittard, and Pieter J. Lemstra, Brunssum, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands  
 Filed Jun. 24, 1980, Ser. No. 162,449

Claims priority, application Netherlands, Jun. 27, 1979, 7904990  
 The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> D01D 5/12  
 U.S. Cl. 264-210.8

6 Claims



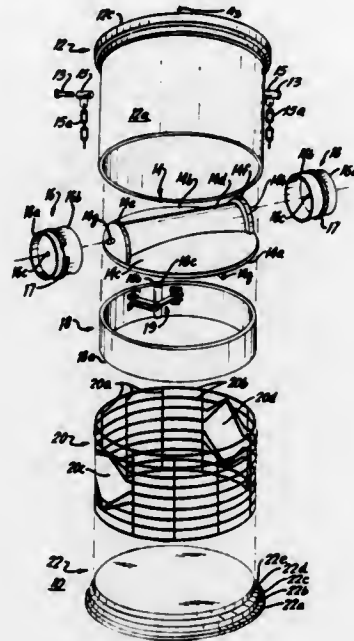
1. Process for the preparation of polyethylene filaments of high modulus and tensile strength which comprises spinning a solution having a concentration of from 1% to 20% by weight of a high-molecular-weight linear polyethylene polymer with a weight-average molecular weight of  $\bar{M}_w$  of at least  $8 \times 10^5$ , and thereafter drawing the spun filaments using a draw ratio of at least  $(12 \times 10^6 / \bar{M}_w) + 1$ , at a drawing temperature of between 75° to 135° C. such that, at the draw ratio, concentration and temperature used, the modulus of the filaments is at least 20 GPa.

**4,422,994**  
**METHOD AND APPARATUS FOR FORMING INVERTS**  
**IN MANHOLE ASSEMBLIES, AND THE LIKE**

Jack Ditcher, Langhorne, Pa., assignor to A-Lok Products, Inc., Tullytown, Pa.  
 Filed Feb. 17, 1981, Ser. No. 234,639  
 Int. Cl.<sup>3</sup> B28B 1/14, 7/06, 7/16

U.S. Cl. 264-219

15 Claims



1. A method for producing an invert in a manhole base member having openings for receiving conduit comprising the steps of:
  - locating centering means in the position occupied by the openings in said manhole base member, said centering means having centering openings;
  - placing an invert forming mold assembly having curved surface portions defining the invert to be provided in the manhole base member, said invert forming mold assembly having openings at the ends of said curved surface portions, said openings lying on a line substantially parallel to the longitudinal axis of the curved portion;
  - moving alignment members axially only through said openings and into said centering means to join and accurately align said centering means and said invert forming mold assembly; and
  - pouring casting material to a level sufficient to substantially cover the curved surface portions of said invert forming mold assembly for forming the invert in said manhole base member.

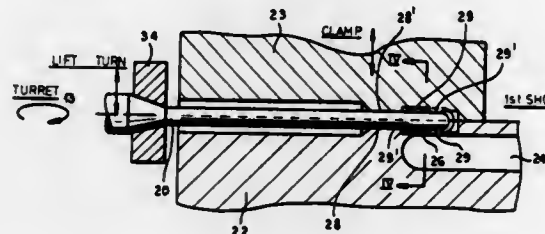
**4,422,995**  
**METHOD AND APPARATUS FOR MOLDING HOLLOW,**  
**SLENDER WORKPIECES**

Robert D. Schad, Toronto, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada  
 Filed Dec. 7, 1981, Ser. No. 327,900

Int. Cl.<sup>3</sup> B29C 5/00; B29D 23/08; B29F 1/022

U.S. Cl. 264-250

20 Claims



1. A method of injection-molding an elongate hollow workpiece of plastic material, comprising the steps of:
  - (a) introducing an elongate core, having one end fixedly

**4,422,997**  
**METHOD FOR MAKING AN INSULATED PANEL**  
 Alfred Machnik, 6386 Curtis Rd., Plymouth, Mich. 48170  
 Continuation of Ser. No. 969,484, Dec. 14, 1978, abandoned.  
 This application Feb. 17, 1981, Ser. No. 234,886  
 Int. Cl.<sup>3</sup> B28B 1/50, 1/30

U.S. Cl. 264-261

3 Claims



1. A process for making a building module 110 comprising, providing a frame having sides, ends and an open top, forming an enclosure having inside dimensions equal to the dimensions of said module to be formed comprising, placing said frame on a relatively horizontal flat surface, placing blocks of insulation material in said frame spaced from each other a sufficient distance to provide spaces for concrete to form webs and spaced inwardly from the edges of said frame to receive concrete, forming sides, placing furring strips in said frame in the spaces between said insulation blocks and resting on the flat surface forming the bottom of said frame, the furring strips resting on said flat surface, said furring strips having nails driven from the side opposite said flat surface therein, said nails being crossed forming a cradle to receive reinforcing rods, supporting the reinforcing rods in said cradle spaced at a distance from said furring strips and pouring concrete into the space between said frame and around said reinforcing rods and around said nails and between said insulation blocks and said frame whereby an insulation panel is formed with concrete between and around said insulation material.

**4,422,996**  
**METHOD FOR MAKING COATED MOLDED ARTICLES**  
 Robert F. Navin, and James R. Prom, both of Port Washington, Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.  
 Continuation of Ser. No. 145,800, May 1, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,272  
 Int. Cl.<sup>3</sup> B29G 7/00

U.S. Cl. 264-255

6 Claims

1. A method for producing a coated, molded, fiber-reinforced thermoset plastic article comprising producing a fiber-reinforced, thermoset plastic article in a matched metal mold; opening the said mold after the article has attained its intended shape; introducing into the open mold a single-component composition consisting essentially of:
  - A. an alpha, beta ethylenically unsaturated monomer solution of a polyurethane polyacrylate which is the reaction product, substantially free of unreacted-NCO radicals of
    - (1) an organic diisocyanate;
    - (2) a hydroxy alkyl acrylate or methacrylate;
    - (3) an organic diol, selected from the class consisting of alkylene diols, alkylene diol esters and polyesters; alkylene diol ethers and polyethers;
  - B. a copolymerizable alpha-, beta-ethylenically unsaturated monomer solution of an acrylic or methacrylic ester of a diepoxide;
  - C. an initiator for addition polymerization;
  - D. fillers;
- closing the mold and thereby spreading the said composition over at least one surface of the said article; retaining the mold in the closed condition at a molding temperature sufficient to cause said article to cure further and cause said composition to cure by addition polymerization;
- opening the mold and recovering a molded, fiber-reinforced thermoset plastic article having an adherent coating over at least one surface thereof.

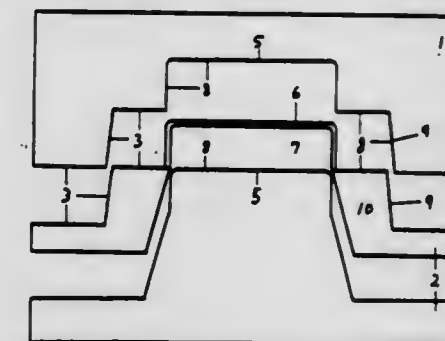
**4,422,998**  
**CONTROLLED EJECTION METHOD FOR INJECTION**  
**MOLDING**

Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Filed Apr. 22, 1982, Ser. No. 370,937

Int. Cl.<sup>3</sup> B29C 7/00  
 U.S. Cl. 264-335

6 Claims



1. A method of cyclic injection molding of plastic where the mold comprises two parts which are separated by a parting surface and at least one cavity situated internally to the boundaries of the parting surface, and wherein each production cycle comprises the steps of:



- Combining the two mold parts by moving, in a predetermined direction, the mold parts in relation to each other;
- Injecting plastic in a fluid state into a cavity situated within the parting surface;
- Solidifying the injected plastic in the cavity, thereby creating a plastic product;
- Separating the two mold parts by moving, in a direction opposite to the predetermined direction, said mold parts in relation to each other to create a substantially enclosed guide conduit having contours defined by the regions of the parting surface and the internally positional cavity/ies that are exposed subsequent to separation and leading in a direction substantially perpendicular to said predetermined direction;
- Ejecting the plastic product into said guide conduit; and
- Guiding and transporting the ejected product from between the mold parts through the guide conduit.

4,422,999

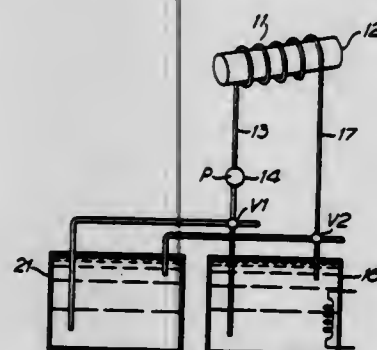
## THERMOFORMING TUBULAR ARTICLES

Peter R. Mitchell, The Cottage, London Rd., Kingsworth, Winchester, Hampshire SO23 7QN, England  
PCT No. PCT/GB80/00480, § 371 Date Dec. 31, 1981, § 102(e)  
Date Dec. 31, 1981, PCT Pub. No. WO81/03145, PCT Pub. Date Nov. 12, 1981

PCT Filed May 7, 1980, Ser. No. 336,342  
Int. Cl.<sup>3</sup> B29C 17/02

U.S. Cl. 264—339

2 Claims



1. A method of manufacturing an open ended tubular article of predetermined shape or form from a tube of heat mouldable plastics material comprising preheating a tube to a forming temperature at which it can be bent to a predetermined shape by passing a heated fluid therethrough, bending the tube to the predetermined shape, heating the tube above the temperature at which it is bent to the annealing temperature of the material by passing heated fluid therethrough in direct contact with the interior of the tube, maintaining the flow of heated fluid for a period of time sufficient to anneal the tube and cooling the tube while constrained in the predetermined shape by passing a cooling fluid therethrough, the heating and cooling fluids comprising the same substance.

4,423,000

## METHOD FOR MOLDING HOLLOW PLASTIC ARTICLES

Syoichi Teraoka, 3767-2, Kamura-cho, Fukuyama-shi, Hiroshima-Ken, Japan

Filed Jul. 13, 1981, Ser. No. 282,704

Claims priority, application Japan, Oct. 17, 1980, 55-145964; Mar. 20, 1981, 56-40995; Mar. 25, 1981, 56-44344

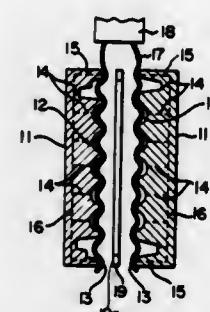
Int. Cl.<sup>3</sup> B29C 17/04, 17/07

U.S. Cl. 264—524

6 Claims

1. A method for producing a hollow synthetic resin molded article, which comprises opening a split mold having mold cavities with a contour conforming to the configuration of the desired article, feeding a heated parison of a thermoplastic synthetic resin in the form of a tube or two parallel-laid sheets extruded

from a die into a space between the opposing mold members of the split mold, applying negative pressure to vacuum suction holes provided in the cavities of said split mold and the vacuum suction holes provided in parting surfaces surrounding said cavities, the positions of said latter vacuum suction holes relative to said cavities being determined according to the depth of said cavities, simultaneously blowing heated compressed air against the



inside surface of that portion of the parison which corresponds to said parting surfaces in the direction facing said parting surfaces to facilitate attaching of the parison to said parting surfaces, closing said split mold, while applying said negative pressure, to form the parison into a crude hollow molded article, blowing pressurized air into the hollow portion of said crude molded article with said split mold being kept closed to thereby form the parison into a desired final configuration.

4,423,001

## SYSTEM AND METHOD FOR GENERATING CURRENT BY SELECTIVE MINORITY SPECIES HEATING

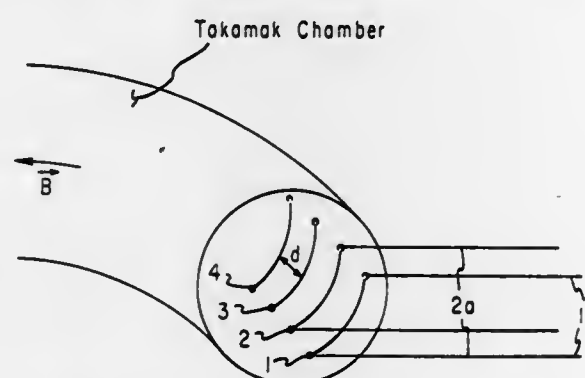
Nathaniel J. Fisch, Princeton, N.J., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 9, 1981, Ser. No. 233,297

Int. Cl.<sup>3</sup> G21B 1/00

U.S. Cl. 376—123

12 Claims



1. A system for generating steady-state toroidal current in a toroidal plasma comprising:

means for immersing the toroidal plasma in a steady-state toroidal magnetic field, and

means for preparing said plasma with at least one minority ion species which has a different ion charge state than does the majority ion species and which also has a different charge to mass ratio than does the majority ion species, and

means for injecting rf energy into said toroidal plasma such that the rf energy comprises a spectrum of waves traveling substantially in one toroidal direction,

where said rf energy is of predetermined frequency and is phased in a predetermined manner such as to increase preferentially the cyclotron motion of minority species ions traveling in a selected toroidal direction, thereby heating the minority species ion so as to yield a velocity of the heated minority species ions parallel to the selected

toroidal direction,  $v_{||}$ , which is approximately equal to  $v_{te}(m/m_e)^{1/2}[(1/2)(m\alpha/m_e)/(1+m\alpha/m_e)]^{1/2}$ , where  $v_{te}$  is the electron thermal velocity, and where  $m\alpha, m_e, m_e$  denote the masses of, respectively, the minority ion species, the majority ion species, and the electron species.

4,423,002

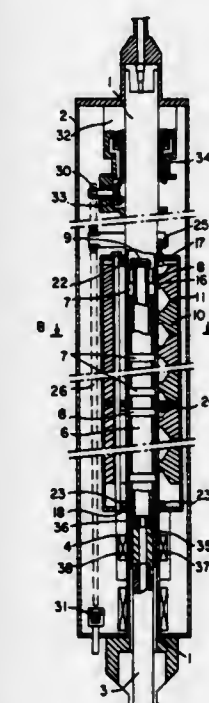
## APPARATUS FOR CONTROLLING A NUCLEAR REACTOR BY VERTICAL DISPLACEMENT OF A UNIT ABSORBING NEUTRONS

Albert Wiart, Sannois; Jacques Defauchaux, Jeumont; Gilbert Pasqualini, Maubeuge, and Jean Martin, Chatillon, all of France, assignors to Framatome, Courbevoie, France  
Filed Dec. 8, 1980, Ser. No. 214,291

Int. Cl.<sup>3</sup> G21C 7/12

U.S. Cl. 376—227

5 Claims



1. Apparatus for controlling a nuclear reactor by vertical displacement of a unit absorbing the neutrons inside the core of the reactor and dropping of the absorbent unit into maximum insertion position under the action of its own weight for emergency shutdown, said absorbent unit being fixed to the lower end of a vertical control shaft (3), said vertical control shaft displaceable into a cylindrical sealed enclosure (1), said enclosure having a vertical axis, and the interior of said enclosure communicating with the interior of said reactor, said apparatus comprising:

(a) a generally cylindrical piece (6) coaxial with and inside said enclosure (1), said piece being made of magnetic material, vertically movable in said enclosure, guided in its displacements and connected to the upper end of said vertical control shaft (3), said cylindrical piece also having a plurality of successive annular projections arranged along the axial direction of the cylindrical piece, said annular projections being of smaller diameter than the internal diameter of said enclosure;

(b) at least one inductor (10) disposed outside of the said enclosure (1), comprising at least two pole shoes (16) axially separated by a distance equal to the space between said successive annular projections, said pole shoes (16) being at a radial distance from the enclosure which allows magnetic coupling between said inductor and said cylindrical piece;

(c) vertically movable mechanical means (22, 23, 24, 26, 27, 28) for accurate guidance and displacement of said inductor (10) in the vertical direction with predetermined stops, said displacements producing a corresponding displacement of said cylindrical piece (6);

(d) electromagnetic control means located outside said enclosure for detachably connecting said cylindrical piece to said vertical control shaft, said magnetic control adapted

to release said control shaft and said absorbent unit when electric current to the electromagnet is cut off.

4,423,003

## THERMAL INSULATION DEVICE

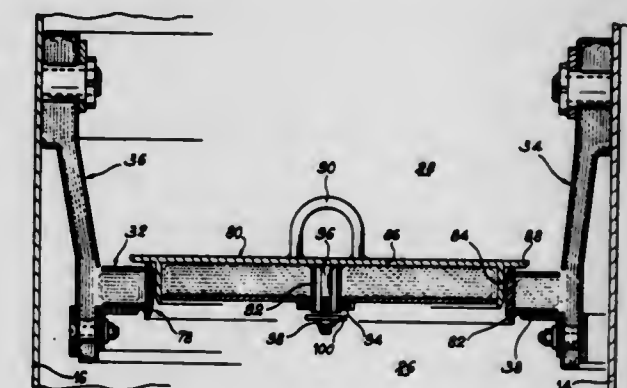
Guy Lemercier, 67, Avenue de la Bourgade, 13610 Le Puy Ste Reparde, France

Filed Sep. 18, 1981, Ser. No. 303,471

Claims priority, application France, Sep. 30, 1980, 80 20917  
Int. Cl.<sup>3</sup> G21C 15/12

U.S. Cl. 376—290

9 Claims



1. A thermal insulation device for insulating the upper area of the annular space separating the main vessel and safety vessel of a fast neutron nuclear reactor, said two vessels having a common vertical axis and are sealed in their upper part by a horizontal slab which is also responsible for the suspension of the two vessels, wherein the said device comprises a lower thermal insulation ring having a generally annular shape defining an inner peripheral edge spaced from the main vessel and fixed to the lower end of an inner thermal insulation baffle whose upper end is fixed to the main vessel, and an outer peripheral edge spaced from the safety vessel and fixed to the lower end of an outer thermal insulation baffle whose upper end is fixed to the safety vessel, each of the thermal insulation baffles being deformable so as to compensate any differential expansion or deformation of the vessels.

4,423,004

## TREATMENT OF TANTALUM POWDER

Sidney D. Ross, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 24, 1983, Ser. No. 478,384

Int. Cl.<sup>3</sup> B22F 1/00, 1/02

U.S. Cl. 419—35

4 Claims

1. A process for treating tantalum powder for electrolytic capacitors comprising contacting the powder after a thermal treatment in the absence of oxygen step at 700° C. and above and before exposure to an oxygen-containing fluid with a nonaqueous solution of ammonium thiocyanate in an amide solvent to passivate said powder to oxygen pickup on exposure to said oxygen-containing fluid.



# 4,423,005 DETERMINING QUANTITATIVE DEGREE OF ETHYLENE OXIDE EXPOSURE IN STERILIZATION PROCESSES

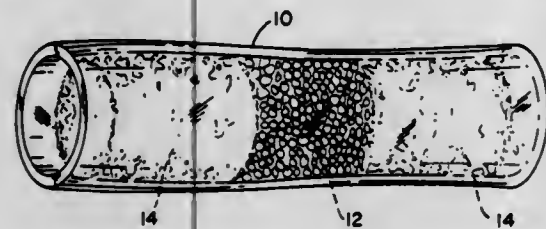
J. Barry Murtaugh, Barrington; Dean G. Larrin, Lake Zurich, both of Ill.; John E. Kling, Dallas, Tex., and Archie G. Woodworth, Barrington, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 305,418, Sep. 25, 1981, Pat. No. 4,348,209. This application Apr. 9, 1982, Ser. No. 366,945

Int. Cl.<sup>3</sup> G01N 31/00, 31/10

U.S. Cl. 422—61

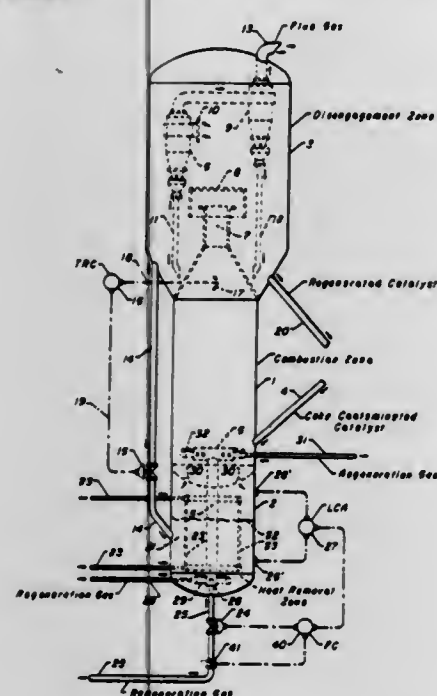
6 Claims



1. A device for quantitatively determining the amount of exposure of an object to ethylene oxide gas, which comprises: a tube containing a catalyst for the hydrolysis of ethylene oxide, said tube being sealed at both ends thereof, the seal at at least one end being gas-permeable, but impermeable to said catalyst and liquid hydrolysis products of ethylene oxide.

**4,423,006**  
**FLUID CATALYST REGENERATION APPARATUS**  
 Anthony G. Vickers, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.  
 Division of Ser. No. 265,502, May 20, 1981, Pat. No. 4,371,453. This application Sep. 24, 1982, Ser. No. 423,373  
 Int. Cl.<sup>3</sup> F27B 15/08; B01J 21/20, 29/38; C10G 11/18  
 U.S. Cl. 422—109

3 Claims



1. An apparatus for regenerating a coke-contaminated, fluid catalyst, which apparatus comprises in combination:

- (a) a vertically-oriented combustion chamber having means by which said coke-contaminated fluid catalyst may be introduced therein and contacted with regeneration gas;
- (b) a disengagement chamber located superadjacent to and above said combustion chamber and in communication therewith;
- (c) a heat removal chamber located superadjacent to and below said combustion chamber in which may be maintained a dense-phase fluid catalyst bed;
- (d) heat removal means comprising substantially vertically orientated conduits containing heat absorbing material

positioned within said heat removal chamber so as to enable immersion of said heat removal means in said dense-phase fluid catalyst bed, said conduits being sealed with respect to the interior of said heat removal chamber such that said heat-absorbing material is in indirect heat exchanging contact with the interior of said heat removal chamber;

(e) a catalyst recycle conduit connecting said disengagement chamber with said heat removal chamber, such that hot regenerated fluid catalyst can pass from said disengagement chamber to said heat removal chamber;

(f) a cooled catalyst transfer conduit of vertical orientation connecting the lower portion of said heat removal chamber with the lower portion of said combustion chamber, such that fluid catalyst can pass from said dense-phase fluid catalyst bed in said heat removal chamber to said combustion chamber;

(g) a regeneration gas inlet line connecting with a lower portion of said cooled catalyst transfer conduit for introducing at least a portion of said regeneration gas into said lower portion of said cooled catalyst inlet conduit below the level of said dense-phase fluid catalyst bed, thereby effecting the flow of cooled fluid catalyst from said dense-phase fluid catalyst bed in said heat removal chamber to said combustion chamber; and

(h) a control system for maintaining the extent of immersion of said heat removal means in said dense-phase fluid catalyst bed by selectively adjustably maintaining the level of said dense-phase fluid catalyst bed in said heat removal zone comprising means to sense said level of said dense-phase fluid catalyst bed in said heat removal chamber, level control means having an adjustable set point and developing a level output signal, flow control means regulating the rate of flow of said regeneration gas into said cooled catalyst transfer conduit, and means for transmitting said level output signal to said flow control means, wherein said regeneration gas passed through said cooled catalyst transfer conduit is adjusted responsive to said desired level, to maintain said desired level of said dense-phase fluidizing bed and thereby said extent of immersion of said substantially vertically oriented conduits containing said heat absorbing material in said heat removal chamber in accordance with said desired set point.

# 4,423,007 REMOVAL OF RADIUM FROM AQUEOUS SULPHATE SOLUTIONS

Donald R. Weir, Ian M. Masters, both of Fort Saskatchewan, and Manfred Neven, Saskatoon, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Jul. 13, 1981, Ser. No. 283,318

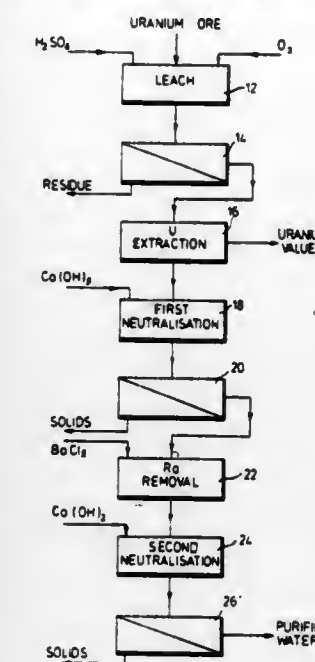
Claims priority, application Canada, Aug. 22, 1980, 358965 Int. Cl.<sup>3</sup> C01F 13/00

U.S. Cl. 423—2

8 Claims

1. A process for removing radium from a radium-containing aqueous sulphate solution also containing dissolved magnesium at a pH not greater than about 10, comprising treating the solution with a soluble barium salt to precipitate radium as barium radium sulphate, raising the pH of the solution to at

least about 11 to precipitate an insoluble magnesium compound which collects the barium radium sulphate precipitate, and



separating substantially all of the precipitates from the solution.

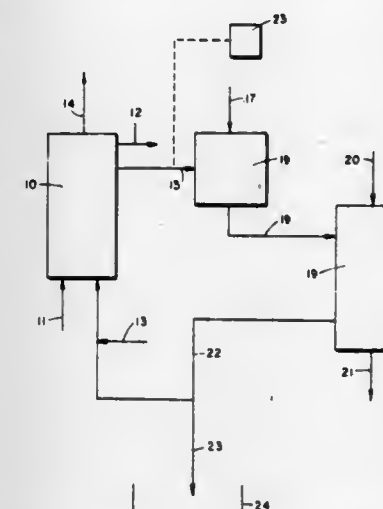
**4,423,008**  
**DIRECT ACID ELUTION OF ANIONIC EXCHANGE  
 RESINS FOR RECOVERY OF URANIUM**  
 Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 80,627, Oct. 1, 1979, abandoned, and Ser. No. 327,543, Dec. 4, 1981, abandoned, which is a continuation of Ser. No. 80,627, Oct. 1, 1979, abandoned. This application Feb. 25, 1982, Ser. No. 352,288

Int. Cl.<sup>3</sup> C01G 43/01

U.S. Cl. 423—7

12 Claims



1. A method for recovering uranium values from a carbonate leach solution comprising:

flowing said carbonate leach solution containing said uranium values through a column of a basic, anionic exchange resin to exchange said uranium values onto said resin;

ceasing the flow of said carbonate leach solution when said column of said resin is sufficiently loaded with said uranium values;

directly eluting said column of said resin without pretreatment of said resin by flowing a concentrated acidic eluant through said column of said resin to exchange said uranium values from said resin, said eluant comprising hydrochloric acid and further comprising sodium chloride in a concentration of less than 1.5 normal;

ceasing the flow of said concentrated acidic eluant when

said uranium values have been exchanged from said column of resin; and  
 again flowing said carbonate leach solution containing said uranium values through said column of said resin to exchange said uranium values onto said resin without treatment of said resin after said eluting.

**4,423,009**  
**CARBONATE, SULPHATE AND HYDROXIDE OR  
 HYDROGEN CARBONATE**  
 Pierre Maurel, and Francois Nicolas, both of Aix-en-Provence, France, assignors to Aluminium Pechiney, Lyons, France  
 Filed Mar. 23, 1981, Ser. No. 246,398  
 Claims priority, application France, Apr. 2, 1980, 80 07878  
 Int. Cl.<sup>3</sup> C01G 56/00, 31/00, 39/00

U.S. Cl. 423—15

13 Claims

1. A process for the treatment of aqueous solutions containing alkali metal carbonate, sulfate, and hydroxide or hydrogen carbonate, at least one metal selected from the group consisting of vanadium, uranium and molybdenum, in the form of alkali metal salts, and inorganic and/or organic impurities, which comprises adding lime to the solution for reaction at a temperature below the boiling point temperature of the solution to precipitate insoluble calcium salts as a first precipitate and to form an alkali metal hydroxide-enriched liquor, separating said precipitate from the alkali metal hydroxide-enriched liquor, concentrating said liquor to provide a solution wherein the alkali metal hydroxide is present in an amount up to 50% by weight of the solution to form a second precipitate containing alkali metal sulfate and the alkali metal hydroxide-enriched liquor, separating the second precipitate from the alkali metal hydroxide-enriched liquor, dissolving the alkali metal sulfate precipitate in an aqueous medium and treating the solution first with barium aluminate and then with carbon dioxide, separating the resulting precipitate and the corresponding liquor which essentially contains carbonate ions, and heating the resulting precipitate to regenerate the barium aluminate for reuse.

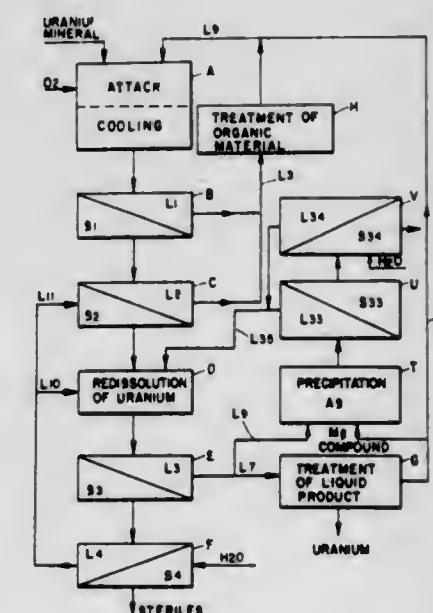
**4,423,010**  
**PROCESS FOR THE SELECTIVE REMOVAL OF  
 ARSENIC IN THE COURSE OF THE OXIDIZING  
 ATTACK BY MEANS OF A CARBONATED LIQUOR ON A  
 URANIFEROUS ORE CONTAINING SAME**  
 Pierre Maurel, Aix-en-Provence, France, assignor to Aluminium Pechiney, Lyons, France

Filed Jul. 19, 1982, Ser. No. 399,699

Claims priority, application France, Jul. 29, 1981, 81 15065  
 Int. Cl.<sup>3</sup> C22B 60/02, 30/04

U.S. Cl. 423—15

6 Claims



1. In a process for the selective removal of arsenical materi-



als, in the course of a continuous hot oxidizing attack process, comprising attacking a uraniferous ore containing arsenical materials as impurities in the presence of an oxidizing agent in the reaction medium by means of an aqueous liquor formed by a recycling solution containing alkali metal carbonate and bicarbonate, and uranium close to the limit of solubility thereof, under concentration, temperature and pressure conditions which cause solubilization of the uranium and arsenic present in the ore, and re-precipitation of uranium values in the attack medium, collecting a suspension of a solid phase in a liquid phase, cooling the suspension, separating the solid phase from the liquid phase, recycling the liquid phase to the attack operation, and treating the separated solid phase by means of an aqueous liquor to re-dissolve the precipitated uranium, the improvement comprising introducing a magnesium compound into one of the solutions containing arsenic in an amount which is at least equal to the stoichiometric amount required to cause precipitation of magnesium arsenate.

4,423,011

# SELECTIVE RECOVERY OF BASE METALS AND PRECIOUS METALS FROM ORES

Elizabeth G. Baglin, and John M. Gomes, both of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 20, 1982, Ser. No. 435,535

Int. Cl.<sup>3</sup> C01G 55/00, 3/10, 53/10, 7/00

U.S. Cl. 423—22

7 Claims

1. A process for recovery of nickel, iron, copper, platinum, palladium and gold values from ore concentrates consisting essentially of:

- smelting the concentrate with a flux to form a matte and slag,
- grinding the matte to a particle size suitable for leaching,
- leaching, in a first-stage leach, the ground matte with sulfuric acid of a concentration of about 10 to 40 wt-pct at a temperature of about 40° to 100° C. and atmospheric pressure to selectively extract nickel and iron values, and
- leaching, in a second-stage leach, the residue from the first stage leach with a leach solution comprising an acidic aqueous solution of a ferric or cupric salt, said solution having a pH of less than about 1.5, at a temperature of about 50° to 100° C. and atmospheric pressure, to selectively extract copper values and provide a residue containing a high concentration of platinum, palladium and gold.

4,423,012

# MANGANESE AND ZINC SOLVENT EXTRACTION PROCESS

James E. Reynolds, Golden, and Nicholas J. Lombardo, Boulder, both of Colo., assignors to Hazen Research Incorporated, Golden, Colo.

Filed Dec. 31, 1981, Ser. No. 336,502

Int. Cl.<sup>3</sup> C01G 9/00, 45/00

U.S. Cl. 423—49

27 Claims

1. In a process for recovering a desired component selected from the group consisting of manganese and zinc by electro-winning the desired component from an aqueous solution containing impurities selected from the group consisting of magnesium when said desired component is zinc and potassium, when said desired component is manganese, the improvement comprising substantially reducing the amount of at least one of the aforesaid impurities in the electro-winning feed solution and substantially increasing the amount of metal ions of the desired component therein by:

- mixing an aqueous bleed stream from said electro-winning feed solution with a solvent extraction agent comprising diethylhexylphosphoric acid as an organic extraction agent and an organic solvent therefore to form a mixture having a pH of from about 1 to about 5 and an organic to aqueous

ratio of from about 0.5 to about 4 to selectively extract desired metal ions;

- separating the aqueous and organic portions of the mixture of step (a);
- stripping the loaded organic extractant of step (b) with a dilute acidic solution;
- recycling the loaded strip solution of step (c) to said electro-winning process.

4,423,013

# PROCESS FOR THE PURIFICATION OF SOLUTIONS CONTAINING ALKALI METAL CARBONATE, SULPHATE, HYDROXIDE OR POSSIBLY HYDROGEN CARBONATE, AND ONE AT LEAST OF THE METALS VANADIUM, URANIUM AND MOLYBDENUM

Pierre Maurel, and Francois Nicolas, both of Aix-en-Provence, France, assignors to Aluminium Pechiney, Lyons, France

Filed Mar. 23, 1981, Ser. No. 246,405

Claims priority, application France, Apr. 2, 1980, 80 07877

Int. Cl.<sup>3</sup> C01G 39/00, 56/00; C11G 31/00

U.S. Cl. 423—55

7 Claims

1. A process for extracting molybdenum from aqueous solutions to be purified which contain alkali metal carbonate, sulphate, hydroxide or hydrogen carbonate and at least one other of the metals selected from the group consisting of vanadium and uranium, in the form of alkali metal salts, and mineral and/or organic impurities comprising treating the solution with lime at a temperature below the boiling point of the solution to precipitate insoluble calcium salts as a first precipitate, separating the first precipitate from the remaining alkali metal hydroxide-enriched liquor, concentrating the remaining liquor to provide a solution wherein the alkali metal hydroxide is present in an amount up to 50% by weight to produce a second precipitate containing a mixture of alkali metal molybdate and sulphate, separating the second precipitate from the liquor, dissolving the second precipitate in an aqueous liquor including sulphide ions and then acidifying the liquor to quantitatively precipitate molybdenum sulphide, separating the precipitated molybdenum sulphide from the remaining liquor which essentially contains alkali metal sulphate and separating the molybdenum sulphide from the remaining liquor.

4,423,014

# SOLVENT EXTRACTION

Alkis S. Rappas, Chagrin Falls, Ohio, and Lloyd R. Allen, Belmont, Mass., assignors to Cabot Corporation, Kokomo, Ind.

Filed Jan. 21, 1981, Ser. No. 226,977

Int. Cl.<sup>3</sup> C22B 23/04; C01G 51/00

U.S. Cl. 423—139

2 Claims

1. In a process for separating cobalt from a pregnant liquor, which process includes the steps of: mixing said pregnant liquor with an organic mixture comprised of an organic amine and a diluent, said organic mixture being substantially insoluble in said pregnant liquor, said organic mixture absorbing said metallic value from said pregnant liquor; separating said organic mixture from said liquor; and stripping said metallic value from said organic mixture; the improvement comprising the steps of mixing said pregnant liquor with an organic amine and iso-butyl-heptyl ketone, said organic mixture having at least 10%, by volume, of iso-butyl-heptyl ketone.

4,423,015

# PROCESS OF PRODUCING DEFLUORINATED PRODUCT FROM LOW BPL PHOSPHATE ROCK

John W. Roy, Jr., Gainesville; Melvin J. Arble, Live Oak, and Joel P. Holmes, Lake City, all of Fla., assignors to Occidental Chemical Company, Los Angeles, Calif.

Filed Feb. 4, 1982, Ser. No. 345,949

Int. Cl.<sup>3</sup> C01F 1/00, 5/00, 11/00

U.S. Cl. 423—167

6 Claims

1. In a process for producing a defluorinated, calcined product having a weight ratio P to F greater than 50 to 1 and

4,423,017

# PROCESS FOR REDUCING NO EMISSIONS

Anthony M. Dean, Westfield, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 29, 1981, Ser. No. 316,143

Int. Cl.<sup>3</sup> C01B 21/00; B01J 8/00

U.S. Cl. 423—235

6 Claims

1. In a non-catalytic combustion process wherein a reducing gas comprising ammonia, either alone or in combination with one or more additional reducing gases, is injected into a flowing combustion effluent containing NO and oxygen when at least a portion of said combustion effluent is in a reduction zone at a temperature within the range of about 850° C. to about 1100° C. to reduce the NO concentration therein, the improvement which comprises placing a metallic material selected from the group consisting of heat resistant iron-based alloys, nickel-based alloys, cobalt-based alloys, and oxide dispersion strengthened alloys substantially at the end of the reduction zone, said metallic material having a surface area greater than about  $0.5 \times 10^{-2} \text{ m}^2$  per  $\text{Nm}^3/\text{H}$  of the combustion gas effluent flow within a gas residence time zone of less than one second from the ammonia source, thereby substantially reducing ammonia breakthrough without substantially producing additional amounts of NO.

4,423,018

# BUFFERED FLUE GAS SCRUBBING SYSTEM USING ADIPIC ACID BY-PRODUCT STREAM

J. Harvey Lester, Jr., and Donald E. Danly, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 23, 1982, Ser. No. 391,083

Int. Cl.<sup>3</sup> C01B 17/00

U.S. Cl. 423—243

7 Claims

1. In a method for the removal of sulfur dioxide from waste combustion gases which comprises bringing the gases into interfacial contact with an aqueous solution or slurry of limestone or lime buffered by a compound or compounds which significantly increase the dissolution of limestone or lime, the improvement comprising employing as the buffer a byproduct stream which is the byproduct of the process comprising:

- oxidizing cyclohexane to cyclohexanol and cyclohexanone;
- oxidizing the cyclohexanol and cyclohexanone with a strong oxidizing acid into a product stream comprising adipic acid with minor amounts of glutaric and succinic acids;
- crystallizing adipic acid from the product stream in one or more stages leaving said byproduct stream comprising glutaric acid, succinic acid, residual amounts of adipic acid and water, and the strong oxidizing acid.

4,423,019

# PROCESS FOR REMOVING SULFUR OXIDES FROM A GAS

Ralph J. Bertolacini, Naperville; Eugene H. Hirschberg, Park Forest, and Frank S. Modica, Downers Grove, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 29,264, Apr. 11, 1979. This application Jul.

31, 1981, Ser. No. 288,995

Int. Cl.<sup>3</sup> B01J 8/00; C01B 17/00; C10G 11/02

U.S. Cl. 423—244

23 Claims

1. A process for removing sulfur oxides from a gas which comprises:

- absorbing sulfur oxides from the gas with an absorbent which comprises a physical mixture of:
  - a particulate cracking catalyst comprising from about 0.5 to about 50 weight percent of a crystalline aluminosilicate zeolite which is distributed throughout a porous matrix wherein said matrix comprises from about 70 to about 100 weight percent of alumina and
  - a particulate solid other than cracking catalyst which comprises at least one inorganic oxide selected from the

4,423,016

# PROCESS FOR THE PRODUCTION OF DRY FLUE GAS GYPSUM

Franz Wirsching, In den Weinbergen 7; Rolf Hüller, Neubergstrasse 37, both of 8715 Iphofen, and Bärbel Limmer, Virchowstr. 39, 8500 Nürnberg, all of Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,738

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3107951

Int. Cl.<sup>3</sup> C01F 1/00, 5/12; C22B 26/20; C01B 17/00

U.S. Cl. 423—170

14 Claims

1. In a process for the production of flue gas gypsum dihydrate from a furnace installation wherein a main flue gas stream is passed to a drying stage to dry gypsum dihydrate containing free water, by transferring flue gas stream heat thereto, passing the cooled flue gas stream containing gypsum dihydrate to a desulfuration stage and producing and separating gypsum dihydrate containing free water in the desulfuration, and passing the separated gypsum dihydrate containing free water to the drying stage to be dried therein, the improvement comprising the steps of:

dedusting the main flue gas stream obtained from the furnace installation; separating a partial flue gas stream from the main flue gas stream in an amount of about 1-10% of the main flue gas stream; feeding a resultant stream of 90-99% of the main flue gas stream to a desulfuration stage for forming flue gas gypsum dihydrate containing free water, and separating flue gas gypsum dihydrate containing free water from the flue gas in the desulfuration stage; and simultaneously feeding the formed flue gas gypsum dihydrate containing free water from said desulfuration stage, and said partial flue gas stream to a drying stage to contact the flue gas gypsum dihydrate containing free water with the partial flue gas stream for drying the flue gas gypsum dihydrate under temperature and time conditions to form dried flue gas gypsum dihydrate consisting essentially of calcium sulfate dihydrate substantially free of hemihydrate and anhydrous calcium sulfate, and removing dried flue gas gypsum dihydrate having a particle size greater than about 20 micron from the drying stage, and recycling dry flue gas gypsum dihydrate having a particle size of less than about 20 micron along with the main flue gas stream and the partial cooled flue gas stream to the desulfuration stage.



group consisting of the oxides of aluminum and magnesium in association with at least one free or combined rare earth metal selected from the group consisting of lanthanum, cerium, praseodymium, samarium and dysprosium, wherein the ratio by weight of inorganic oxide or oxides to rare earth metal or metals is from about 1.0 to about 1,000 and

(b) removing said absorbed sulfur oxides from the absorbent as a sulfur-containing gas which comprises hydrogen sulfide by contacting said absorbent with a hydrocarbon at a temperature in the range from about 375° to about 900° C.

## 4,423,020

**CRYSTALLINE METAL SILICATE COMPOSITIONS**  
James A. Hinnenkamp, and Vernon V. Walatka, Jr., both of Hamilton, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 92,127, Nov. 7, 1979, Pat. No. 4,331,641. This application Oct. 15, 1981, Ser. No. 311,724. The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C01B 33/20, 35/10

U.S. Cl. 423—277

6 Claims

1. A crystalline metal silicate which is substantially free of aluminum having a composition in terms of mole ratios as follows:

$0.8 \pm 0.4 M_{2/n}O:W_2O_3$  to 500  $SiO_2:O$  to 100  $H_2O$  where M is a cation, n is the valence of said cation and  $W_2O_3$  is a metal oxide, said metal silicate having the X-ray diffraction pattern set forth in Table 1 of the specification prepared by the method which comprises preparing a reaction mixture which is substantially free of aluminum ions and which contains tetraalkylammonium compound, sodium hydroxide, an oxide of the desired metal, an oxide of silicon, water and an aluminum chelating agent effective to provide a catalytically active crystalline metal silicate, maintaining the mixture at an elevated temperature until crystals said metal silicate are formed and separating and recovering said crystals, and in terms of mole ratios falling within the following ranges, the reaction mixture contains:

$OH^-/SiO_2$	.05-3
$R_4N^+/(R_4N^+ + Na^+)$	0.1-1
$H_2O/OH^-$	10-500
$SiO_2/W_2O_3$	5-500
$SiO_2/Chelating\ agent$	1-1000

where R is propyl.

## 4,423,021

**METHOD OF PREPARING SILICO-CRYSTAL ZSM-48**  
Louis D. Rollmann, Princeton, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 64,703, Aug. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 13,640, Feb. 21, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 207,897

Int. Cl.<sup>3</sup> C01B 33/20, 33/32

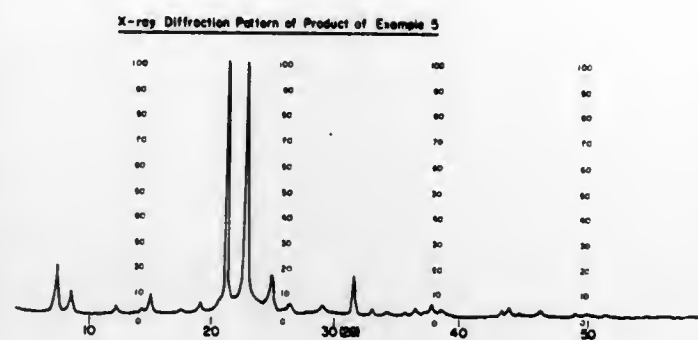
U.S. Cl. 423—333

2 Claims

1. A method for preparing a porous silico-crystal characterized by an x-ray diffraction pattern whose values are set forth in Table 1 of the specification which comprises preparing a substantially alumina-free reaction mixture containing a source of a silica, an alkali metal oxide, RN, water and having a composition in terms of mole ratios of oxides, falling within the following ranges:

$Al_2O_3/SiO_2=0$   
 $Na/SiO_2=0$  to 2.0  
 $OH^-/SiO_2=0$  to 0.1

$H^+ (added)/SiO_2=0$  to 0.2  
 $H_2O/SiO_2=10$  to 100  
 $RN/SiO_2=0.01$  to 2.0



wherein RN is an organic diamine of the formula  $NH_2-C_nH_{2n}-NH_2$  and wherein n=4 to 12 and maintaining said mixture at crystallization temperature until crystals of said silico-crystal are formed.

## 4,423,022

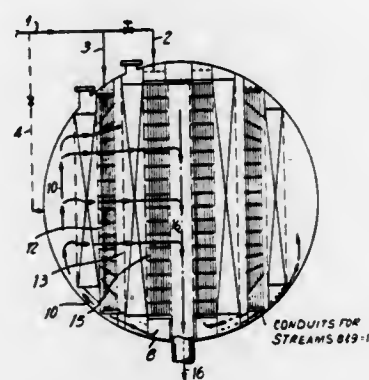
**PROCESSES FOR CARRYING OUT CATALYTIC EXOTHERMIC AND ENDOTHERMIC HIGH-PRESSURE GAS REACTIONS**

John V. Albano, Oradell, and George Friedman, Clark, both of N.J., assignors to The Lummus Company, Bloomfield, N.J. Continuation of Ser. No. 130,895, Mar. 17, 1980, abandoned, which is a division of Ser. No. 41,378, May 22, 1979, Pat. No. 4,341,737. This application Apr. 21, 1983, Ser. No. 487,173

Int. Cl.<sup>3</sup> C01C 1/04

U.S. Cl. 423—360

2 Claims



1. A process for performing exothermic catalytic reactions in the gaseous phase, which comprises passing a synthesis gas selected from the group consisting of ammonia synthesis gas, methanol synthesis gas and methane synthesis gas into a reactor having a single-walled pressure shell, a plurality of annular catalyst beds with particulate catalyst in each bed, and a plurality of annular-shaped cross-flow heat exchange means, said annular catalyst beds and said annular heat exchange means being alternately disposed; passing said synthesis gas through the first of said beds in a radially inward direction away from the pressure containment walls of said reactor; passing the effluent from said first bed through the first of said cross-flow heat exchange means in said radially inward direction; passing the resulting effluent successively through the next bed and the next cross-flow heat exchange means for each of the remaining beds and heat exchange means in said radially inward direction, each cross-flow heat exchange means providing inter-stage feed-effluent heat exchange, the shell-side fluid of said heat exchange means flowing radially inwardly in a direction substantially normal to the direction in which the tube-side fluid flows; and recovering a gas which is enriched in the desired product.

## 4,423,023

**PROCESS FOR THE PRODUCTION OF HYDROCYANIC ACID FROM CARBON MONOXIDE AND AMMONIA**  
Louis J. Velenyi; Harley F. Hardman, both of Lyndhurst, and Fred A. Pesa, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 26, 1982, Ser. No. 401,464

Int. Cl.<sup>3</sup> C01C 3/02

U.S. Cl. 423—376

19 Claims

1. A process for producing HCN by contacting CO and  $NH_3$  with a catalyst comprising a noncarbonaceous, porous catalyst support, a Group VIII metal which comprises at least one member selected from the group consisting of Fe, Ni, Co and Ru, and carbon, wherein the metal is disposed on the pore surfaces of the support and the carbon is randomly bonded to the metal, the catalyst having from about 8 to about 30 percent metal loading and from about 5 to about 50 percent carbon loading.

## 4,423,024

**SELECTIVE CONVERSION OF CHLORINATED ALKANES TO HYDROGEN CHLORIDE AND CARBON DIOXIDE**

Thomas L. Wolford, Brush Prairie, Wash., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 129,285, Mar. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 16,641, Mar. 1, 1979, abandoned. This application May 26, 1982, Ser. No. 382,333

Int. Cl.<sup>3</sup> C01B 21/20, 7/01

U.S. Cl. 423—437

15 Claims

1. A method of reacting at least one saturated aliphatic chlorinated hydrocarbon to selectively produce carbon dioxide and hydrogen chloride which comprises contacting a vaporized mixture containing said chlorinated hydrocarbon, at least a stoichiometric quantity of water and at least a stoichiometric quantity of oxygen with an effective amount of a suitable molecular sieve catalyst at a temperature and for a sufficient period of time to convert at least 10 mole percent of said chlorinated hydrocarbon to carbon dioxide and hydrogen chloride without substantial formation of free chlorine and phosgene.

## 4,423,025

**DEGASSING MOLTEN SULFUR**

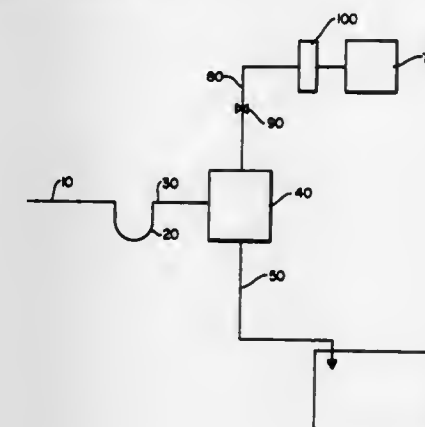
Thomas H. Ledford, Baton Rouge, La., and Howard Lerner, Parsippany, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 174,433, Aug. 1, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,604

Int. Cl.<sup>3</sup> C01B 17/14

U.S. Cl. 423—578 R

14 Claims



1. A method for decreasing the concentration of hydrogen sulfide or hydrogen polysulfides present in molten sulfur comprising the addition to the molten sulfur of an effective amount of a non-ammonia degassing agent, selected from the class consisting of dithionates, dithionites, bisulfides, bisulfites and

organo-phosphorous compounds selected from the class of compounds consisting of phosphates, phosphines, phosphites, phosphine oxides, phosphine sulfides and hypophosphates.

## 4,423,026

**DENSIFICATION OF CAUSTIC MAGNESIA AND SINTERED PERICLASE BY ACID DOPING**  
Richard A. Snellgrove, Cherry Hill, N.J., assignor to General Refractories Company, Bala Cynwyd, Pa.

Filed Apr. 22, 1980, Ser. No. 142,659

Int. Cl.<sup>3</sup> C01F 5/08

U.S. Cl. 423—636

13 Claims

8. A method for improving the densification of sintered periclase comprising:

(a) forming an admixture of  $Mg(OH)_2$  and an aqueous acid or salt thereof selected from the group consisting of acetic acid, benzoic acid and hydrochloric acid, wherein the amount of acid or salt is from about 0.1 mole percent to 2 mole percent relative to said  $Mg(OH)_2$ ;

(b) pressing said admixture into compacts; and

(c) high-firing said pressed compacts at a temperature between about 1300° C. and 1900° C. for a period of time from about 1 to 10 hours to obtain sintered periclase of high density.

10. A method for improving the properties of caustic magnesia comprising:

(a) forming an admixture of  $Mg(OH)_2$  and an acid or a salt thereof selected from the group consisting of acetic acid, benzoic acid, and hydrochloric acid, wherein the amount of acid or salt is from about 0.1 mole percent to 2 mole percent relative to said  $Mg(OH)_2$ ;

(b) caustic-firing said admixture at a temperature between about 500° C. and 1100° C. for a period of time from about 1 to 24 hours to obtain caustic magnesia of high density.

## 4,423,027

**PHARMACEUTICAL COMPOSITIONS OF DEGLYCYRRHIZINATED LICORICE (DGL)**

Lionel N. Simon, 11772 Las Palmas, Santa Ana, Calif. 92705, and Kameron W. Maxwell, 24671 Acropolis St., Mission Viejo, Calif. 92691

Filed Dec. 22, 1982, Ser. No. 452,085

Int. Cl.<sup>3</sup> A61K 9/28, 9/36

U.S. Cl. 424—16

17 Claims

1. A tablet suitable for treating gastric or duodenal ulcers consisting essentially of an inner core containing deglycyrrhizinated licorice, a pharmaceutically acceptable disintegrant and an outer core including a pharmaceutically acceptable disintegrant, and a pharmaceutically acceptable coating of a film capable of being removed in the gastrointestinal tract.

## 4,423,028

**CONTROL OF HOUSEFLIES BY FUMIGANT ACTIVITY**  
Frank H. Walker, Mill Valley, and Ordell L. Wolfe, San Jose, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 28, 1981, Ser. No. 334,704

Int. Cl.<sup>3</sup> A01N 25/06, 25/18, 25/20, 57/00

U.S. Cl. 424—40

4 Claims

1. A method of controlling houseflies comprising contacting houseflies with a vapor consisting essentially of an insecticidally effective amount of O-(4-methylthiophenyl)-O,O-dimethylphosphorothioate.



4,423,029

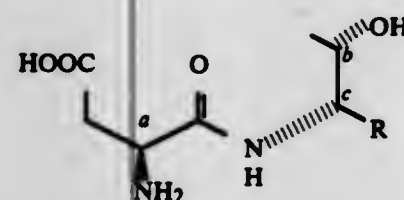
(S)-3-AMINO-4-[(S,S)-1-(1-HYDROXYETHYL)ALKYL AMINO]-4-OXO-BUTYRIC ACID COMPOUNDS SUITABLE AS NON-NUTRITIVE SWEETENERS

George P. Rizzi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 25, 1981, Ser. No. 277,307

Int. Cl.<sup>3</sup> C07C 101/30; A61K 7/22; A23L 1/236  
U.S. Cl. 424—54 16 Claims

1. A compound of the formula:



wherein R is isopentyl, and wherein carbons a, b and c have the (S) configuration, and toxicologically acceptable salts thereof.

3. A composition of matter for oral ingestion comprising a sweetening amount of a compound or salt according to claim 1, and an ingestible carrier.

4,423,030

FLAVORED AQUEOUS ORAL COMPOSITION

Harry Hayes, Warrington, and Munir A. Ahmed, Firwood, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 6, 1982, Ser. No. 375,783  
Claims priority, application United Kingdom, May 13, 1981, 8114566

Int. Cl.<sup>3</sup> A61K 7/16, 7/26, 35/78  
U.S. Cl. 424—58 11 Claims

1. An aqueous oral composition comprising an aqueous liquid dental cream or mouthwash vehicle having dispersed therein a two-tone flavour composition comprising essential oil and water-insoluble oleoresin extract of dried fruit, which oleoresin has higher sensation effect than said essential oil and is soluble in the said essential oil, the said flavour composition comprising about 0.01–5% by weight of the said aqueous oral composition, the said oleoresin comprising about 0.001–0.1% by weight of the said aqueous oral composition and the weight ratio of the said essential oil to the said oleoresin being at least about 10:1.

4,423,031

EYE MAKEUP PREPARATION

Yukio Murui, and Masaki Saitoh, both of Yokohama, Japan, assignors to Shiseido Company, Ltd., Japan

Continuation of Ser. No. 92,267, Nov. 8, 1979, abandoned. This application Jul. 30, 1981, Ser. No. 288,506

Int. Cl.<sup>3</sup> A61K 7/021, 31/74, 31/78, 31/00  
U.S. Cl. 424—63 11 Claims

1. In an aqueous dispersion type eye makeup preparation comprising from 20 to 50% by weight of a film forming agent, from 1 to 10% by weight of at least one humectant, from 5 to 30% by weight of at least one pharmaceutically acceptable finely divided inorganic pigment, from 0.1 to 5% by weight of at least one surface active agent, from 0.1 to 3% by weight of at least one thickener, from 0.5 to 5% by weight of at least one plasticizer and a balance of water; wherein the improvement comprises that said film forming agent consists essentially of an aqueous emulsion of at least one member selected from the group consisting of copolymers derived from monomer mixtures of 30 to 80% by weight, of at least one alkyl acrylate having from C<sub>4</sub> to C<sub>18</sub> alkyl groups in the ester portion and 70 to 20% by weight of at least one alkyl methacrylate having from C<sub>1</sub> to C<sub>4</sub> alkyl groups in the ester portion.

4,423,032

HAIR TREATMENTS

Yoshiaki Abe, Tokyo, and Rikio Tsushima, Wakayama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,636

Claims priority, application Japan, Feb. 5, 1981, 56-16172  
Int. Cl.<sup>3</sup> A61K 7/06, 7/09, 7/11

U.S. Cl. 424—70 12 Claims

1. A hair treatment composition selected from the group consisting of shampoo, hair rinse, hair treatment, pre-shampoo, hair spray, hair brushing lotion, hair setting lotion, hair liquid and hair tonic which comprises the following two ingredients (A) and (B):

(A) 0.05–10 wt% of at least one decomposition derivative of keratin material selected from the group consisting of (1) alkali salts of decomposition products obtained by oxidation of keratin material and (2) alkali salts of derivatives in the thiol group of decomposition products obtained by reduction of keratin material; and

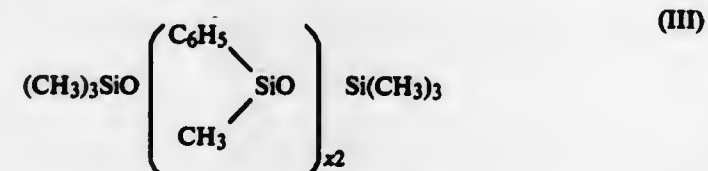
(B) 0.1–30 wt% of at least one silicone derivative selected from the group consisting of

(1) dimethylpolysiloxanes of the formula (II)



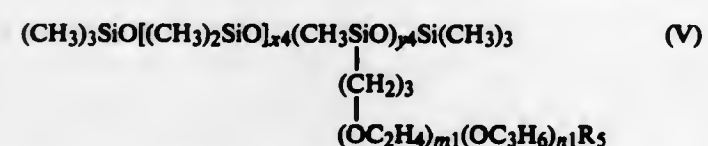
in which x1 is an integer of 3–650,

(2) methylphenylpolysiloxanes of the formula (III) or (IV)



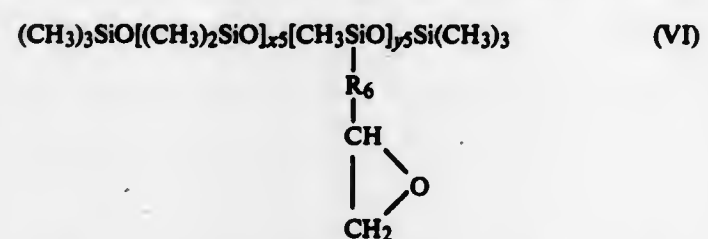
in which x2 is an integer of 1–500, and the sum of x3 and y3 is an integer of 1–500,

(3) polyether-modified silicone oils of the formula (V)



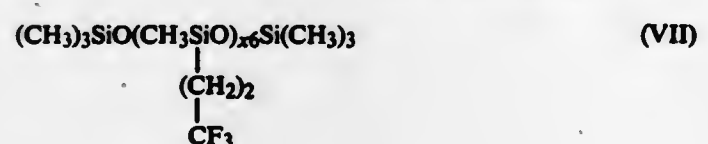
in which R<sub>5</sub> represents an alkyl group having 1–12 carbon atoms, an alkoxy group having 1–6 carbon atoms or a hydroxyl group, x4 is an integer of 1–100, y4 is an integer of 1–20, m1 is an integer of 0–50, and n1 is an integer of 0–50,

(4) epoxy-modified silicone oils of the formula (VI)



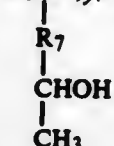
in which R<sub>6</sub> represents an alkylene group having 1–3 carbon atoms, x5 is an integer of 1–500, and y5 is an integer of 1–50,

(5) fluorine-modified silicone oils of the formula (VII)



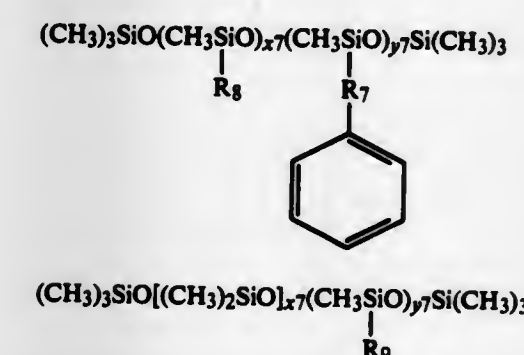
in which x6 is an integer of 1–400,

(6) alcohol-modified silicone oils of the formula (VIII) or (IX) blood from the mammal, and concentrating said antibodies from said collected blood.



in which R<sub>7</sub> is not present or represents an alkylene grouping have 1–4 carbon atoms, and x7 and y7 are independently an integer of 1–500, and

(7) alkyl-modified silicone oils of the formula (X) or (XI)



in which R<sub>8</sub> represents an alkyl group having 2–18 carbon atoms, R<sub>9</sub> represents an alkyl group having 10–16 carbon atoms, and R<sub>7</sub>, x7 and y7 have the same meanings as defined before, respectively, and a solvent.

4,423,033

PHARMACEUTICAL COMPOSITIONS

Charles B. Taskis, Worthing, England, assignor to Beecham Group Limited, England

Continuation of Ser. No. 73,100, Sep. 6, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,312

Claims priority, application United Kingdom, Dec. 8, 1978, 47768/78

Int. Cl.<sup>3</sup> A61K 31/79, 31/43  
U.S. Cl. 424—80 11 Claims

1. A pharmaceutical composition for the treatment of bacterial infections, which on reconstitution with water yields an injectable solution, which composition comprises a water soluble salt of amoxycillin, and polyvinylpyrrolidone (PVP) of molecular weight 1000 to 12000, wherein the weight ratio of amoxycillin salt, taken as the free acid equivalent weight, to PVP is 1:0.25 to 1:5.

4,423,034

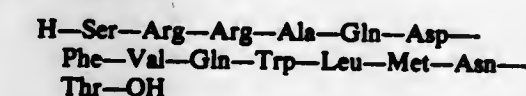
PROCESS FOR THE PREPARATION OF ANTIBODIES

Nobuaki Nakagawa; Kikuo Kotani; Shigeo Katsuragi; Kaoru Morita; Kunio Ohya, and Toshiharu Noda, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 197,535, Oct. 16, 1980, abandoned. This application Apr. 28, 1982, Ser. No. 372,824

Int. Cl.<sup>3</sup> A61K 39/00; C07G 7/00; C07C 103/52  
U.S. Cl. 424—85 2 Claims

1. A process for the preparation of specific antibodies which comprises sensitizing a mammal by administering to said mammal a peptide of the formula



which on SDS-PAGE electrophoresis produces bands characteristic of the following molecular weights:

Lysine	30.1	Glycine	287.8
Histidine	14.4	Alanine	111.9
Hydroxylysine	6.4	Cysteine	6.3
Hydroxyproline	36.1	Valine	41.2
Aspartic Acid	51.3	Methionine	8.1
Threonine	19.6	Isoleucine	18.9
Serine	38.6	Leucine	41.1
Glutamic Acid	90.3	Tyrosine	7.8
Proline	100.8	Phenylalanine	20.1
		Arginine	69.2

4,423,035

METHOD FOR PREVENTING INJECTION SITE ABSCESS

James G. Strayer, Waterloo, Nebr., assignor to Schering Corporation, Kenilworth, N.J.

Filed Aug. 10, 1981, Ser. No. 291,157  
Int. Cl.<sup>3</sup> A61K 39/10 3 Claims

1. A method of preventing injection site abscess while vaccinating a food producing animal comprising injecting said animal with a vaccine that comprises inactivated whole cell cultures of Bordetella bronchiseptica, an effective amount of compatible adjuvant, an effective amount of non-antibiotic biocidal compound, and about 30 micrograms per milliliter of gentamicin sulfate.







4,423,041

## DETACKIFYING COMPOSITIONS

Charles E. Clum, Kingston, N.J., and Lanny G. Felty, Pine Grove, Pa., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 51,592, Jun. 25, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,283 Int. Cl.<sup>3</sup> A61K 31/695, 47/00

U.S. Cl. 424-184

5 Claims

1. A detackifying composition consisting essentially of a mixture of a silicone fluid and a silicone wax in a ratio of 9:1 to 1:3 wherein said silicone fluid is selected from the group consisting of dimethicone, methicone and cyclomethicone and said silicone wax is selected from the group consisting of stearoxy dimethicone and dipolyoxyethylene dimethyl silane.

4,423,042

## INSECTICIDAL COMPOSITIONS

Silvia Dorn, Dielsdorf, and Ulrich Schwieter, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

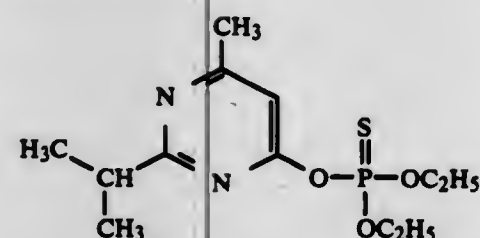
Continuation of Ser. No. 226,324, Jan. 19, 1981, abandoned. This application Apr. 5, 1982, Ser. No. 365,675

Claims priority, application Switzerland, Feb. 1, 1980, 837/80 Int. Cl.<sup>3</sup> A01N 57/16, 37/34

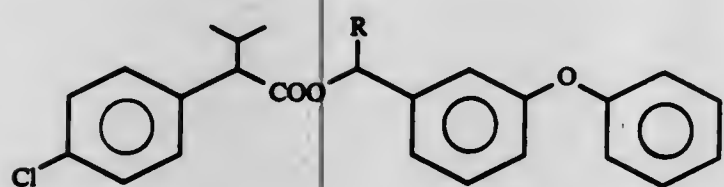
U.S. Cl. 424-200

4 Claims

1. An insecticidal composition which comprises a mixture of a compound of the formula



and a compound of the formula



wherein R is cyano, in a ratio of I to II of from about 0.6:1 to about 1:0.6 and an inert carrier material.

4,423,043

## AQUEOUS LIQUID FORMULATIONS FOR CONTROL OF BACTERIAL AND PROTOZOAL DISEASES

Gerhard Lukas, Muttentz, and Kaya Atasoy, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 216,587, Dec. 15, 1980, abandoned, which is a continuation of Ser. No. 59,425, Jul. 20, 1979, abandoned. This application Feb. 5, 1982, Ser. No. 345,990 Claims priority, application Switzerland, Aug. 1, 1978, 8216/78

Int. Cl.<sup>3</sup> A61K 31/625

U.S. Cl. 424-229

1 Claim

1. A concentrated but stable sulfonamide/trimethoprin formulation dilutable in livestock drinking water without causing sedimentation, which formulation comprises a solution of

(i) from 15 to 25%, by weight of the formulation, of a 1:4 to 1:5 by weight mixture of 2,6-diamino-5-(3,4,5-trimethoxybenzyl)-pyrimidine and a sulfonamide selected from the group consisting of

(i) sulfachlorpyrazine,  
(ii) a salt of sulfachlorpyrazine,

(iii) sulfachlorpyridazine, and

(iv) a salt of sulfachlorpyridazine;

(2) from 0.1 to 1.0%, by weight of the formulation, of sodium dioctylsulfosuccinate;

(3) from about 1 to about 10%, by weight of the formulation, of a solubilizer selected from the group consisting of hydroxyethyltheophylline, nicotinic acid amide and sodium benzoate;

(4) from about 60 to 80%, by weight of the formulation, of a liquid carrier, said liquid carrier consisting essentially of

(i) an organic solvent selected from the group consisting of (a) N-methylpyrrolidone and (b) a combination of N-methylpyrrolidone and glycol monoethyl ether, and

(ii) water; and

(5) when a salt of sulfachlorpyrazine or a salt of sulfachlorpyridazine is present, a quantity of ethanolamine sufficient to solubilize said salt.

4,423,044

## 3,4-DIHYDRO-5H-2,3-BENZODIAZEPINE DERIVATIVES AND PHARMACEUTICAL USE THEREOF

Jeno Korösi; Tibor Lang; Ferenc Andrasi; Jozsef Szekely; Tamas Hamori; Tibor Balogh; Lajos Ila; Katalin Goldschmidt; Eleonora Sineger, and Imre Moravcsik, all of Budapest, Hungary, assignors to Egyt Gyógyszervegyészeti Gyár, Budapest, Hungary

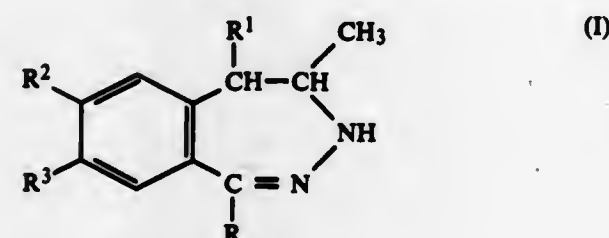
Filed Feb. 25, 1982, Ser. No. 352,346

Claims priority, application Hungary, Mar. 12, 1981, 620/81 Int. Cl.<sup>3</sup> A61K 31/55; C07D 243/00, 405/04, 409/04

U.S. Cl. 424-244

9 Claims

1. 3,4-Dihydro-5H-2,3-benzodiazepine derivatives of the formula (I) and pharmaceutically acceptable acid addition salts thereof,



wherein

R represents a phenyl group optionally carrying one or two substituents selected from the group consisting of halogen, hydroxy, C<sub>1-4</sub> alkoxy and benzyloxy; a furyl or a thienyl group,

R<sup>1</sup> stands for a hydrogen atom or a C<sub>1-4</sub> alkyl group,

R<sup>2</sup> and R<sup>3</sup> each represent hydrogen atom, C<sub>1-4</sub> alkoxy, C<sub>4-7</sub> cycloalkoxy or benzyloxy group.

9. A pharmaceutical composition containing as an active ingredient an effective amount of at least one compound of the formula (I) as described in claim 1 or a pharmaceutically acceptable acid addition salt thereof, together with a conventional inert, non-toxic, solid or liquid carrier and/or additive.

4,423,045

## THIAZIDINES

David Brown, Macclesfield; Robert I. Dowell, Congleton; Rodney B. Hargreaves, Poynton, and Brian Main, Sandbach, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 16, 1981, Ser. No. 321,899

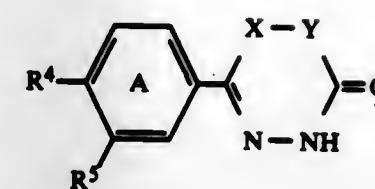
Claims priority, application United Kingdom, Nov. 14, 1980, 8036680

Int. Cl.<sup>3</sup> C07D 285/16; A61K 31/54

U.S. Cl. 424-246

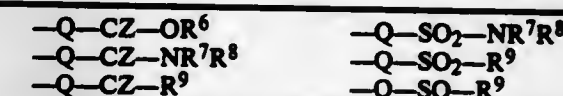
8 Claims

1. A heterocyclic compound of the formula:



wherein

X is sulphur and Y is —CH<sub>2</sub>—; wherein R<sup>4</sup> and R<sup>5</sup>, which may be the same or different, each is hydrogen, cyano, nitro or amino has the formula:



wherein

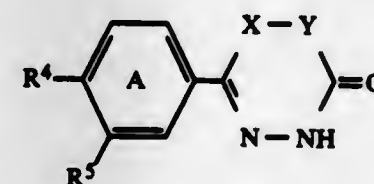
Q is a direct link, or is imino (—NH—), or is oxyalkylene of up to 4 carbon atoms, wherein Z is oxygen or sulphur and wherein R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup>, which may be the same or different, each is hydrogen, alkyl, alkenyl, cycloalkyl or alkoxyalkyl each of up to 6 carbon atoms, or aryl or arylalkyl each of up to 12 carbon atoms, or wherein R<sup>7</sup> and R<sup>8</sup> together with the adjacent nitrogen atom form a 5- or 6-membered fully-saturated heterocyclic ring, provided that R<sup>4</sup> and R<sup>5</sup> are not both hydrogen;

or wherein R<sup>4</sup> and R<sup>5</sup> are joined together such that with the benzene ring A they form a benzheterocyclic ring wherein the heterocyclic part is a 5- or 6-membered ring containing one oxygen, sulphur or nitrogen atom, and which heterocyclic part may optionally contain an oxo substituent or an alkyl or alkanoyl substituent each of up to 6 carbon atoms;

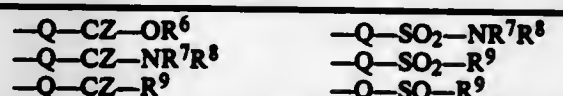
and wherein the benzene ring A may optionally bear one or more substituents;

or a salt thereof where appropriate.

8. A method for the treatment of acute or chronic heart failure in a warm-blooded animal in need of such treatment which comprises administering to said animal an effective amount of a heterocyclic compound of the formula:



wherein X is sulphur and Y is —CH<sub>2</sub>—; wherein R<sup>4</sup> and R<sup>5</sup>, which may be the same or different, each is hydrogen, cyano, nitro, amino or hydroxy, or alkylthio of up to 4 carbon atoms, or has the formula:



wherein Q is a direct link, or is imino (—NH—), or is oxyalkylene of up to 4 carbon atoms, wherein Z is oxygen or sulphur and wherein R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup>, which may be the same or different, each is hydrogen, alkyl, alkenyl, cycloalkyl or alkoxyalkyl each of up to 6 carbon atoms, or aryl or arylalkyl each of up to 12 carbon atoms, or wherein R<sup>7</sup> and R<sup>8</sup> together with the adjacent nitrogen atom form a 5- or 6-membered fully-saturated heterocyclic ring, provided that R<sup>4</sup> and R<sup>5</sup> are not both hydrogen;

or wherein R<sup>4</sup> and R<sup>5</sup> are joined together such that with the benzene ring A they form a benzheterocyclic ring wherein the heterocyclic part is a 5- or 6-membered ring

containing one oxygen, sulphur or nitrogen atom, and which heterocyclic part may optionally contain an oxo substituent or an alkyl or alkanoyl substituent each of up to 6 carbon atoms; and wherein the benzene ring A may optionally bear one or more substituents; or a salt thereof where appropriate, the amount of said compound being effective for said treatment.

4,423,046

## ANTIBACTERIAL AND ANTIPROTOZOAL

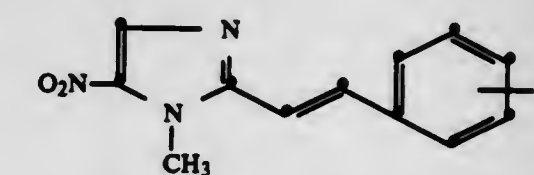
1-METHYL-5-NITRO-2-(2-PHENYLVINYL)IMIDAZOLES John A. Carlson, Nassau, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,482

Int. Cl.<sup>3</sup> A01N 43/50, 43/84; C07D 233/94, 413/10 U.S. Cl. 424-248,4

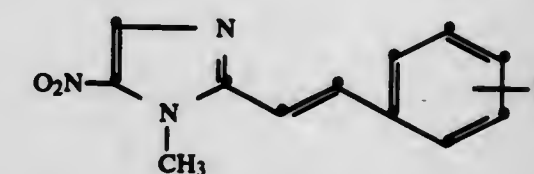
10 Claims

1. A member of the group consisting of (A) compounds having the formula:



where R is lower-alkoxyiminocarbonyl, amidinyl, 2-oxazolyl or 2-oxazinyl; and (B) acid-addition salts thereof.

10. A method of killing bacteria on surfaces or in media containing such bacteria which comprises treating said surfaces or such media with a composition containing, as the active ingredient therein, a bactericidally effective amount of a compound having the formula:



where R is lower-alkoxyiminocarbonyl, amidinyl, 2-oxazolyl or 2-oxazinyl.

4,423,047

## PYRIMIDINE-2-SULPHIDES AND THEIR S-OXIDES FOR USE IN MEDICINE AND METHODS OF USE THEREFOR, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, PROCESSES FOR THEIR PREPARATION AND PER SE NOVEL SULPHIDES AND S-OXIDES

Tore Benneche; Mikkel J. Gacek, and Kjell Undheim, all of Oslo, Norway, assignors to Nyegaard & Co. A/S, Oslo, Norway

Filed Jan. 9, 1981, Ser. No. 223,760

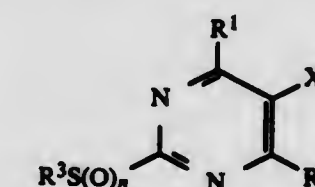
Claims priority, application United Kingdom, Jan. 10, 1980, 8008802

Int. Cl.<sup>3</sup> A61K 31/505; C07D 239/38

U.S. Cl. 424-251

13 Claims

1. A pharmaceutical composition for combating abnormal cell proliferation comprising as active ingredient an effective amount of a compound of the formula:

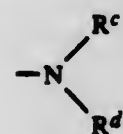


wherein X represents a halogen atom; n is 0, 1 or 2; R<sup>1</sup> and



R<sup>2</sup>, which may be the same or different, each represents a hydrogen atom or a C<sub>1-4</sub> alkyl group, an amido group, a mono- or di-C<sub>1-4</sub> alkylamido group, a carboxyl group or a group of the formula —COOR<sup>a</sup> in which R<sup>a</sup> represents a C<sub>1-8</sub> alkyl, C<sub>2-8</sub> alkenyl or C<sub>2-8</sub> alkynyl group, a C<sub>3-8</sub> cycloalkyl or C<sub>3-8</sub> cycloalkenyl group, an aralkyl, aralkenyl or aralkynyl group with up to 4 carbon atoms in the aliphatic moiety, which moiety may be saturated or unsaturated, and up to 10 carbon atoms in the aryl moiety or a C<sub>6-10</sub> aryl group, the aryl moiety or group being optionally substituted by a C<sub>1-4</sub> alkyl group; and

R<sup>3</sup> represents a C<sub>1-8</sub> alkyl, C<sub>2-8</sub> alkenyl or C<sub>2-8</sub> alkynyl group, a C<sub>3-8</sub> cycloalkyl group, a C<sub>3-8</sub> cycloalkenyl group, the group Het, wherein Het is a 3-7 membered heterocyclic ring having one or two heteroatoms selected from oxygen, nitrogen or sulphur and optionally carrying one or more C<sub>1-4</sub> alkyl or C<sub>6-10</sub> aryl groups; a Het substituted C<sub>1-8</sub> alkyl, C<sub>2-8</sub> alkenyl or C<sub>2-8</sub> alkynyl group, an aralkyl, aralkenyl or aralkynyl group with up to 4 carbon atoms in the aliphatic moiety which moiety may be saturated or unsaturated and up to 10 carbon atoms in the aryl moiety or a C<sub>6-10</sub> aryl group, the aryl moiety or group being optionally substituted by a C<sub>1-4</sub> alkyl group, said moieties or groups being optionally substituted by one or more substituents selected from halogen atoms and oxo, nitro, hydroxy, mercapto, Het as herein defined, —OR<sup>b</sup>, —COOR<sup>b</sup>, —SR<sup>b</sup>, R<sup>b</sup>SO—, R<sup>b</sup>SO<sub>2</sub>—, wherein R<sup>b</sup> is as defined for R<sup>a</sup> or Het and is optionally substituted by one or more substituents selected from halogen, oxo, amino, hydroxy, mercapto, Het as herein defined, —OR<sup>a</sup>, —COOR<sup>a</sup>, —SR<sup>a</sup>, R<sup>a</sup>SO—, or R<sup>a</sup>SO<sub>2</sub>—; C<sub>1-8</sub> alkanoylamino, di(C<sub>1-8</sub> alkyl)phosphonate and amino groups of the formula



in which R<sup>c</sup> and R<sup>d</sup>, which may be the same or different, each represents a hydrogen atom or a C<sub>1-4</sub> alkyl, C<sub>6-10</sub> aralkyl or C<sub>6-10</sub> aryl group, the aryl moiety or group being optionally substituted by a C<sub>1-4</sub> alkyl group or R<sup>c</sup> and R<sup>d</sup> together with the nitrogen atom therebetween represents a perhydroazocinyl group; with the proviso that R<sup>3</sup> is other than a 1-alkyl-5-nitro-imidazolyl-2-alkyl group when n is 0 or, where an acidic or basic group is present, a physiologically compatible salt thereof in association with a pharmaceutical carrier or excipient.

13. A compound which is:  
2-(chloromethyl)sulfonyl-5-chloropyrimidine,  
2-(3-oxobuten-1-yl)sulfonyl-5-chloropyrimidine,  
3-(iodomethyl)sulfonyl-5-chloropyrimidine or  
2-(5-chloropyrimidine-2-oxymethyl)sulfonyl-5-chloropyrimidine.

4,423,048

#### ANTIALLERGIC AND ANTIULCER 1-OXO-1H-THIAZOLO[3,2-a]PYRIMIDINE-2-CARBOXY- MIDES AND INTERMEDIATES THEREOF

Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

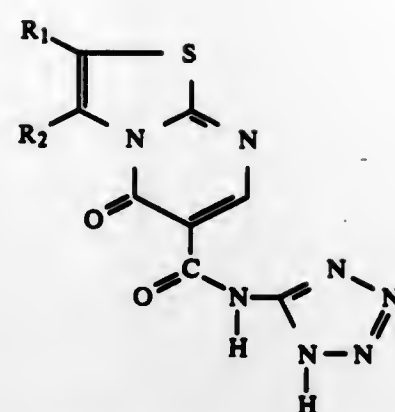
Division of Ser. No. 96,631, Nov. 23, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,372

Int. Cl.<sup>3</sup> A61K 31/505

U.S. Cl. 424—251

8 Claims

1. A method of inhibiting gastric ulcers in a mammal which comprises administering to said mammal in an amount sufficient to inhibit said gastric ulcers a compound of the formula



or a pharmaceutically-acceptable cationic salt thereof, wherein R<sub>1</sub> and R<sub>2</sub> taken together are alkylene of 3 to 9 carbon atoms or phenylalkylene of 9 to 11 carbon atoms, with the proviso that the ring system so formed is 5- to 8-membered, and R<sub>1</sub> and R<sub>2</sub> taken separately are each hydrogen or alkyl of 1 to 5 carbon atoms.

4,423,049

#### 2-[4-[(4,4-DIALKYL-2,6-PIPERIDINEDION-1-YL)BUTYL]- 1-PIPERAZINYL]PYRIMIDINES

Davis L. Temple, Jr., Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

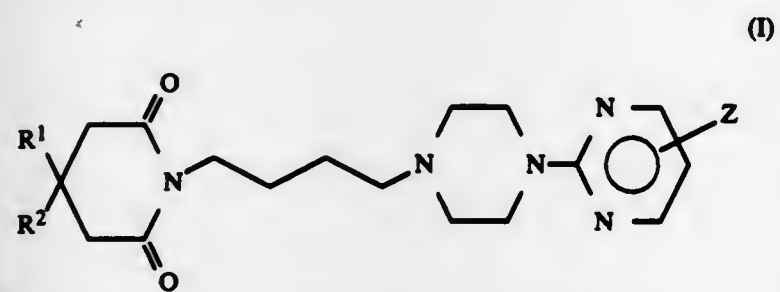
Filed Dec. 28, 1981, Ser. No. 334,688

Int. Cl.<sup>3</sup> A61K 31/505; C07D 403/04

U.S. Cl. 424—251

12 Claims

1. A compound selected from the group consisting of a compound having Formula (I)



wherein R<sup>1</sup> and R<sup>2</sup> are independently selected from C<sub>1</sub> to C<sub>4</sub> alkyl groups; with Z being hydrogen, hydroxyl, halogen, or trifluoromethyl;

and the non-toxic pharmaceutically acceptable acid addition salts thereof.

9. The process for ameliorating an undesirable anxiety state in a mammal comprising systemic administration to said mammal of an effective anxiolytic dose of from 0.01 to 40 mg/kg body weight of a compound claimed in claim 1.

4,423,050

#### 9-(1,3-DIHYDROXY-2-PROPOXYMETHYL)GUANINE AS ANTIVIRAL AGENT

Julien P. H. Verheyden, Los Altos, and John C. Martin, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 267,210, May 21, 1981, Pat. No. 4,355,032. This application May 24, 1982, Ser. No. 380,969. The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/52

U.S. Cl. 424—253

3 Claims

1. Method of treating viral infections in a warm blooded or a cold blooded animal having a viral infection which comprises administering an effective amount of 9-(1,3-dihydroxy-2-propoxymethyl)guanine or a pharmaceutically acceptable salt thereof or a composition containing same as an active ingredient.

#### 4,423,051 4-[(CYCLOALKYL OR CYCLOALKENYL SUBSTITUTED) AMINO, ALKYLAMINO OR ALKENYLAMINO]BENZOIC ACIDS, SALTS AND DERIVATIVES THEREOF

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 137,199, Apr. 4, 1980, abandoned, which is a division of Ser. No. 881,457, Feb. 27, 1978, Pat. No. 4,227,014.

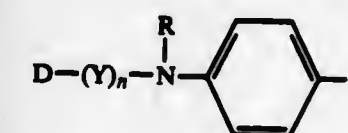
This application Jul. 20, 1981, Ser. No. 285,206

Int. Cl.<sup>3</sup> A61K 31/44; C07D 309/12, 213/55; C07C 101/62

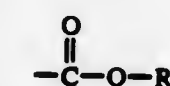
U.S. Cl. 424—263

30 Claims

1. A compound of the formula:



wherein Z is a moiety of the formula:



wherein R<sub>1</sub> is selected from the group consisting of phenyl, benzyl, 3-pyridyl, pyridylmethyl and tetrahydropyranyl;

R is selected from the group consisting of hydrogen and methyl;

n is either zero or one;

Y is a divalent radical selected from the group consisting of unbranched or branched C<sub>1</sub>-C<sub>13</sub> alkylene or alkenylene and is either unsubstituted or substituted with C<sub>1</sub>-C<sub>4</sub> alkyl group;

and D is selected from the group consisting of C<sub>3</sub>-C<sub>16</sub> cycloalkyl or C<sub>4</sub>-C<sub>17</sub> cycloalkenyl and is either unsubstituted or substituted with C<sub>1</sub>-C<sub>13</sub> alkyl, C<sub>4</sub>-C<sub>8</sub> cycloalkyl, decahydronaphthyl, methylene, ethylidene, or isopropylidene group;

with the proviso that the total number of carbon atoms in D and Y shall not exceed twenty; and with the further proviso that when n is 1, D is not an unsubstituted cyclopropyl nor a cyclopropyl substituted with C<sub>1</sub>-C<sub>13</sub> alkyl; and the pharmaceutically acceptable non-toxic acid-addition and cationic salts thereof.

25. The method of inhibiting atherosclerotic lesion development in a mammal comprising the administration of an effective lesion-development inhibiting amount of a compound of claim 1.

4,423,052

#### 1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTER DERIVATIVES

Kazuhiko Araki, Hideki Ao, both of Nakatsu; Kenichi Aihara, Yoshitomimachi, and Tomohiko Kimura, Izumi, all of Japan, assignors to Yoshitomi Pharmaceutical Industries Ltd., Japan  
PCT No. PCT/JP81/00262, § 371 Date Jun. 1, 1982, § 102(e)  
Date Jun. 1, 1982, PCT Pub. No. WO82/01185, PCT Pub. Date Apr. 15, 1982

PCT Filed Oct. 2, 1981, Ser. No. 387,856

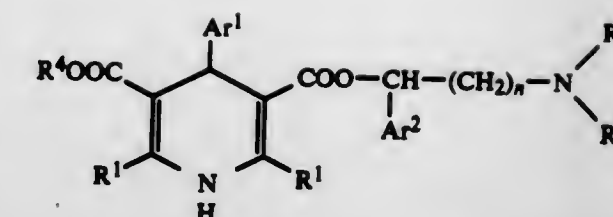
Claims priority, application Japan, Mar. 10, 1980, 55/138940

Int. Cl.<sup>3</sup> C07D 213/55; A61K 31/44

U.S. Cl. 424—266

11 Claims

1. 1,4-Dihydropyridine-3,5-dicarboxylic acid ester derivatives represented by the formula:



wherein Ar<sup>1</sup> and Ar<sup>2</sup> are each the same or different and represent phenyl group which may be substituted by 1 to 3 substituents on the benzene ring, each substituent being independently selected from halogen atom, C<sub>1-4</sub> alkyl group, C<sub>1-4</sub> alkoxy group, hydroxyl group, nitro group, cyano group, methylenedioxy group, trihalomethyl group, di-C<sub>1-4</sub> alkylamino group, C<sub>1-4</sub> alkylthio group and C<sub>1-4</sub> alkylsulfonyl group; R<sup>1</sup> represents C<sub>1-4</sub> alkyl group; R<sup>2</sup> and R<sup>3</sup> are each the same or different and represent C<sub>1-4</sub> alkyl group or phenyl-C<sub>1-2</sub> alkyl group which may be substituted by 1 or 2 substituents on the benzene ring, each substituent being selected from halogen atom or C<sub>1-4</sub> alkoxy group; n is 1 or 2; and R<sup>4</sup> represents C<sub>1-4</sub> alkyl group; or the pharmaceutically acceptable acid addition salts thereof.

10. An antihypertensive composition comprising a compound of claim 1 in combination with an inert pharmaceutically acceptable excipient, said compound being present in a therapeutically effective amount.

4,423,053

#### 2-AMINO-5-(O-SULPHAMIDOPHENYL)-1,3,4- THIAZOL AS ANTIVIRAL AGENTS AND A PROCESS FOR THE PREPARATION THEREOF

Giovanni Orzalesi, Florence, Italy, assignor to Società Italo-Britannica L. Manetti-H. Roberts & Co., Florence, Italy

Filed Mar. 16, 1982, Ser. No. 358,561

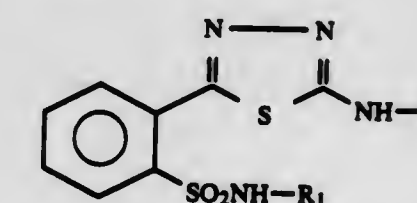
Claims priority, application Italy, Mar. 18, 1981, 48047 A/81

Int. Cl.<sup>3</sup> A61K 31/41; C07D 285/12

U.S. Cl. 424—269

11 Claims

1. A compound of the formula



wherein R is a hydrogen atom, or a methyl, ethyl, isopropyl, n-butyl or allyl group and wherein R<sub>1</sub> is a hydrogen atom, or a methyl or ethyl group.

3. A pharmaceutical composition for the therapeutical treatment of virus infections in warm blood vertebrates, characterized in that it comprises as an active ingredient a therapeutically effective amount of a compound of formula I as defined in claim 1, in association with a pharmaceutical carrier or excipient.



4,423,054

## ANTIHERPESVIRUS 4-THIAZOLIDINECARBOXYLIC ACIDS (SUBSTITUTED ALKYL DERIVATIVES)

Junichi Iwao, Takarazaka; Masayuki Oya, Osaka; Toshio Baba, Suita; Tadashi Iso, Toyohashi, and Takehisa Chiba, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

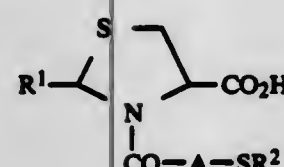
Division of Ser. No. 23,397, Mar. 23, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,600

Claims priority, application Japan, Apr. 8, 1978, 53-41632; Apr. 25, 1978, 53-49657; Jul. 3, 1978, 53-81116

Int. Cl.<sup>3</sup> C07D 277/04; A61K 31/425

U.S. Cl. 424—270

1. A compound of the formula



wherein

R<sup>1</sup> is selected from the group consisting of mercapto-lower alkyl, S-(lower alkanoyl)mercapto-lower alkyl, 2,6-dimethyl-5-heptenyl, cyclohexyl, and phenyl-lower alkyl, and the terms lower alkyl and lower alkanoyl refer to groups having 1 to 6 carbon atoms;

R<sup>2</sup> is hydrogen or benzoyl;

A is straight or branched alkylene of 1 to 3 carbon atoms; and pharmaceutically acceptable salts thereof.

4,423,055

## 6-SUBSTITUTED-HYDROCARBON-2-(SUBSTITUTED-THIO)PENEM-3-CARBOXYLIC ACIDS

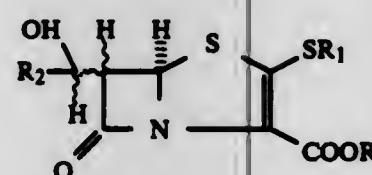
Stuart W. McCombie, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 62,875, Aug. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 2,471, Jan. 10, 1979, abandoned, and Ser. No. 91,610, Nov. 5, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,317

Int. Cl.<sup>3</sup> C07D 499/00; A61K 31/425

U.S. Cl. 424—270

1. A compound of the formula:



wherein R is hydrogen, an alkali metal cation, a metabolizable ester group; R<sub>1</sub> is lower alkyl, lower alkyl substituted by one or more phenyl groups, amino(lower)alkyl, mono- or di-(lower)alkylamino(lower)alkyl, carboxy(lower)alkyl, loweralkylcarbonylamino(lower)alkyl, halo(lower)alkylcarbonylamino(lower)alkyl, hydroxy(lower)alkyl, hydroxyaralkyl wherein the aralkyl moiety is a lower alkyl substituted by one or more phenyl groups, alkoxy(lower)alkyl, or lower alkyl substituted with an unsubstituted or a lower alkyl substituted aromatic heterocyclic group having at least one nitrogen, oxygen or sulfur ring heteroatom; and R<sub>2</sub> is phenyl or substituted phenyl wherein said substituents are one or more of lower alkyl, lower alkoxy, or halogen, lower alkyl substituted by one or more phenyl groups, an unsubstituted or substituted aromatic heterocyclic group having at least one nitrogen, oxygen or sulfur heteroatom wherein said substituents are from 1 to 3 lower alkyl groups, lower alkyl substituted with an unsubstituted or a lower alkyl substituted aromatic heterocyclic group having at least one nitrogen, oxygen or sulfur ring heteroatom or hydroxyaralkyl wherein the aralkyl moiety is a

lower alkyl substituted by one or more phenyl groups; and the pharmaceutically acceptable salts thereof.

4,423,056

## 5(AMINOMETHYL)-4,5,6,7-TETRAHYDRO[D]THIAZOLE CONTAINING COMPOSITIONS FOR AND MEDICAL USE IN TREATING CIRCULATORY INSUFFICIENCIES

Jacques G. Maillard, Versailles; Perre P. A. Delaunay, Herblay, and Jacky M. G. Legeol, Palaiseau, all of France, assignors to Laboratoires Jacques Logeais, Issy-les-Moulineaux, France

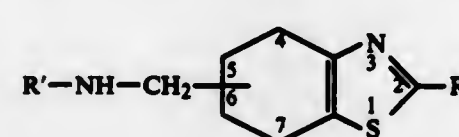
Division of Ser. No. 160,458, Jun. 18, 1980, Pat. No. 4,337,343.

This application Mar. 10, 1982, Ser. No. 356,617

Claims priority, application France, Jun. 20, 1979, 79 15774

Int. Cl.<sup>3</sup> A61K 31/425

U.S. Cl. 424—270 6 Claims  
4. A process for the treatment of circulatory insufficiencies which comprises administering to a human in need thereof an amount, effective for increasing the blood rate of flow, of a compound selected from the compounds of the formula:



in which:

the group R'-NH-CH2- is in the 4, 5 or 6 position,

R is selected from hydrogen and C<sub>1-6</sub> alkyl,

R' is selected from hydrogen and C<sub>1-6</sub> alkyl,

and a pharmaceutically acceptable acid addition salt thereof.

4,423,057

## METHODS OF USE OF 1-(SUBSTITUTED-NAPHTHYL)ETHYL-IMIDAZOLE DERIVATIVES

Keith A. M. Walker, Los Altos Hills, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 19,202, Mar. 9, 1979, Pat. No. 4,277,486.

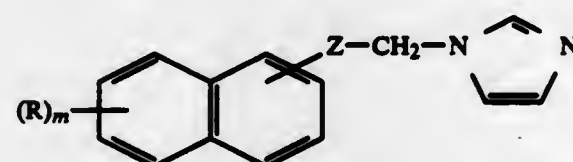
This application Mar. 9, 1981, Ser. No. 241,772

The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/415

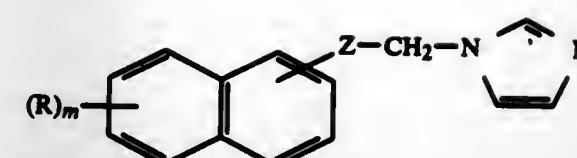
U.S. Cl. 424—273 R 2 Claims

1. A method for preventing or treating convulsions in a mammal which comprises administering an effective amount of a compound of the formula



wherein m is the integer 1, 2 or 3; R is independently selected from the group C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> alkoxy, halo, trifluoromethyl and hydroxy when m is the integer 1, 2, or 3 and methylenedioxy when m is the integer 2; Z is hydroxymethylene, hydroxymethylene esterified with an alkanic acid of 1 to 6 carbon atoms or with benzoic acid optionally substituted with one to three substituents independently selected from the group consisting of C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> alkoxy and halo, C<sub>1</sub> to C<sub>6</sub> alkoxyethylene, or C<sub>1</sub> to C<sub>6</sub> alkylthiomethylene; or pharmaceutically acceptable acid addition salts thereof.

2. A method of inhibiting gastric secretion in a mammal which comprises administering an effective amount of a compound of the formula



where m is the integer 1, 2 or 3; R is independently selected from the group C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> alkoxy, halo, trifluoromethyl and hydroxy when m is the integer 1, 2 or 3 and methylenedioxy when m is the integer 2; Z is hydroxymethylene, hydroxymethylene esterified with an alkanic acid of 1 to 6 carbon atoms or with benzoic acid optionally substituted with one to three substituents independently selected from the group consisting of C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> alkoxy and halo, C<sub>1</sub> to C<sub>6</sub> alkoxyethylene, or C<sub>1</sub> to C<sub>6</sub> alkylthiomethylene; or pharmaceutically acceptable acid addition salts thereof.

4,423,058

## COMBATING PESTS WITH NOVEL PYRAZOL-4-YL N-ALKYLCARBAMATES

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,138

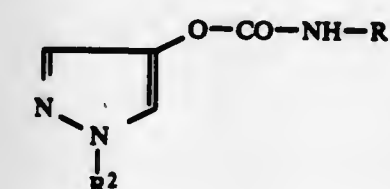
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114833

Int. Cl.<sup>3</sup> A01N 435/56; C07D 231/18

U.S. Cl. 424—273 P

9 Claims

1. A 1-substituted-pyrazol-4-yl N-alkylcarbamate of the formula



in which

R<sup>1</sup> is an alkyl group having 2 to 5 carbon atoms, an alkenyl or alkynyl group, each having 3 to 5 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms, and

R<sup>2</sup> is an alkyl group having 1 to 6 carbon atoms, an alkenyl or alkynyl group, each having 3 to 5 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an aralkyl group having 6 to 10 carbon atoms in the aryl part and 1 or 2 carbon atoms in the alkyl part, or a phenyl group.

2. A method for combating insects and nematodes comprising applying to the insects or nematodes, or to a habitat thereof, an insecticidally or nematocidally effective amount of a compound according to claim 1.

4,423,059

## FUNGICIDAL N-(PYRROLIDINOACETYL)-ANILINES

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

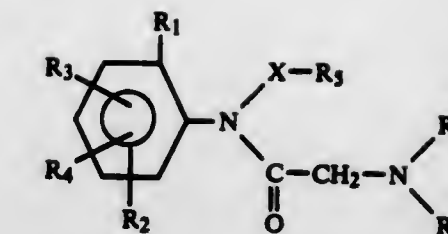
Division of Ser. No. 39,012, May 14, 1979, Pat. No. 4,244,962, which is a division of Ser. No. 905,312, May 12, 1978, Pat. No. 4,165,381, which is a division of Ser. No. 726,320, Sep. 24, 1976, Pat. No. 4,098,895. This application Nov. 10, 1980, Ser. No. 205,357

Int. Cl.<sup>3</sup> A61K 31/40; C07D 207/04

U.S. Cl. 424—274

8 Claims

1. A compound of the formula



wherein

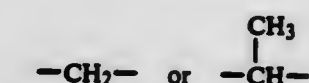
R<sub>1</sub> represents a C<sub>1</sub>-C<sub>4</sub>-alkyl group, a C<sub>1</sub>-C<sub>4</sub>-alkoxy group or a halogen atom,

R<sub>2</sub> represents a hydrogen atom, a C<sub>1</sub>-C<sub>3</sub>-alkyl group, a C<sub>1</sub>-C<sub>4</sub>-alkoxy group or a halogen atom,

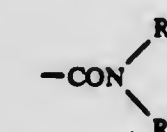
R<sub>3</sub> represents a hydrogen atom, a C<sub>1</sub>-C<sub>3</sub>-alkyl group or a halogen atom,

R<sub>4</sub> represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> on the phenyl ring does not exceed 8, and

X represents



R<sub>5</sub> represents -COOR', -COSR' or



wherein each of R', R'' and R''' independently represents a methyl or ethyl group,

R<sub>6</sub> and R<sub>7</sub> together with the nitrogen atom to which they are attached are pyrrolidine, or salts of the compounds of the formula I with an inorganic or organic acid.

6. A method of controlling phytopathogenic fungi or of preventing fungus attack, which comprises applying to the plants, parts of plants or their environment, a fungicidally effective amount of a compound of the formula I according to claim 1.

4,423,060

## ALDOSE REDUCTASE INHIBITION BY 1-METHYL-5-(4-METHYLBENZOYL)-1H-PYRROLE-2-ACETIC ACID

Dushan M. Dvornik, Mount Royal, and Nicole Simard-Duquesne, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Inc., Montreal, Canada

Filed Aug. 17, 1981, Ser. No. 293,585

Int. Cl.<sup>3</sup> A61K 31/40

U.S. Cl. 424—274

3 Claims

1. A method of treating a diabetes mellitus associated complication selected from the group consisting of cataracts, neuropathy, nephropathy and retinopathy in a diabetic mammal in need of such treatment which comprises administering to said mammal an effective aldose reductase inhibiting amount of 1-methyl-5-(4-methylbenzoyl)-1H-pyrrole-2-acetic acid, or a therapeutically acceptable salt thereof with an organic or inorganic base.



4,423,061  
PERFLUOROCYCLOAMINE EMULSION  
PREPARATION

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita; Yoshihisa Inoue, Kyoto; Youichiro Naito, Hirakata, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Dec. 24, 1982, Ser. No. 454,106

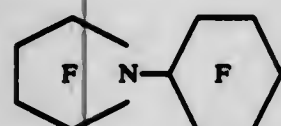
Claims priority, application Japan, Aug. 30, 1982, 57-151098

Int. Cl.<sup>3</sup> A61K 31/40

U.S. Cl. 424—274

6 Claims

1. A perfluorocycloamine emulsion preparation having oxygen carrying ability comprising 5–50% (w/v) of perfluorocycloamine of the general formula



wherein any position may optionally be substituted with a perfluoromethyl group, as an oxygen carrying component, 1–5% (w/v) of an emulsifying agent and a balance of a physiologically acceptable aqueous solution, and the emulsion having a particle diameter of 0.3  $\mu$  or less.

4,423,062  
CYANOVINYL PYRETHROIDS AND PESTICIDAL USE  
THEREOF

Dale G. Brown, Hopewell, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 124,153, Feb. 25, 1980, Pat. No. 4,325,969, Continuation of Ser. No. 937,360, Aug. 28, 1978, abandoned.

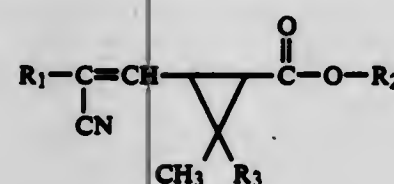
This application Jan. 22, 1982, Ser. No. 341,973

Int. Cl.<sup>3</sup> A01N 43/02, 37/34

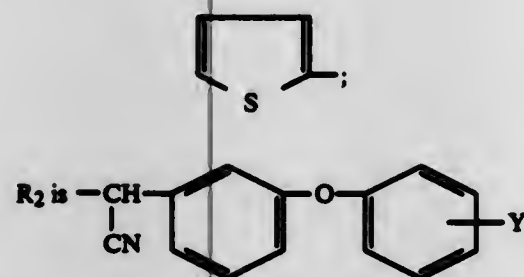
U.S. Cl. 424—275

4 Claims

4. A method for the control of insect pests of agriculturally important crops and ectoparasites of domesticated warm-blooded animals comprising contacting the insects and ectoparasites, or applying to their hosts and to their habitat an insecticidally effective amount compound of the formula:



wherein  
R<sub>1</sub> is



R<sub>3</sub> is hydrogen or methyl; and Y is hydrogen, halogen, methyl or methoxy.

4,423,063  
2,4-DIOXO-4-SUBSTITUTED-1-BUTAOIC ACID  
DERIVATIVES USEFUL IN TREATING URINARY  
TRACT CALCIUM OXALATE LITHIASIS

Clarence S. Rooney, Worcester, Pa.; Haydn W. R. Williams, Dollard des Ormeaux, Canada; Edward J. Cragoe, Jr., Lansdale, Pa., and Arthur A. Patchett, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 220,648, Dec. 29, 1980, Pat. No. 4,337,258.

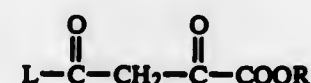
This application Mar. 5, 1982, Ser. No. 354,995

Int. Cl.<sup>3</sup> A61K 31/335, 31/235, 31/19; C07C 149/40

U.S. Cl. 424—278

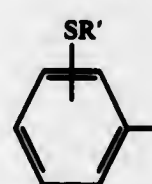
7 Claims

1. A compound of the formula:



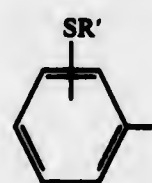
where

R is hydrogen or C<sub>1-4</sub> alkyl; and  
L is a lipophilic group having the structure:

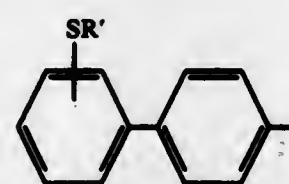


(1)

where R' is (a) hydrogen; (b) C<sub>1-3</sub> alkyl; (c) benzyl; or (d) (3,4-dihydro-3-hydroxy-2H-1,5-benzodioxepin-3-yl)methyl; provided that positions 2 and 6 of



may not be substituted; or



(2)

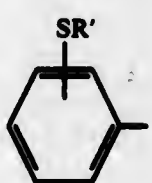
where R' has the same meaning as above; or a pharmaceutically acceptable salt thereof.

7. A pharmaceutical composition for use in treating or preventing the formation of calcium oxalate urinary tract lithiasis, especially kidney or bladder stones, comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound of the formula:



where

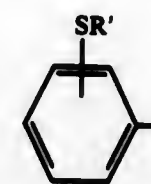
R is hydrogen or C<sub>1-4</sub> alkyl; and  
L is a lipophilic group having the structure



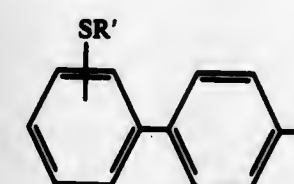
(1)

where R' is (a) hydrogen; (b) C<sub>1-3</sub> alkyl; (c) benzyl; or (d)

(3,4-dihydro-3-hydroxy-2H-1,5-benzodioxepin-3-yl)methyl; provided that positions 2 and 6 of



may not be substituted; or



where R' has the same meaning as above; or a pharmaceutically acceptable salt thereof.

4,423,064  
BIOCIDAL ESTERS OF ALKYNOLIC ACIDS  
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

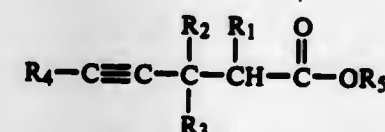
Filed Jun. 29, 1981, Ser. No. 278,721

Int. Cl.<sup>3</sup> A01N 37/34, 37/06; C07C 69/606, 121/75

U.S. Cl. 424—304

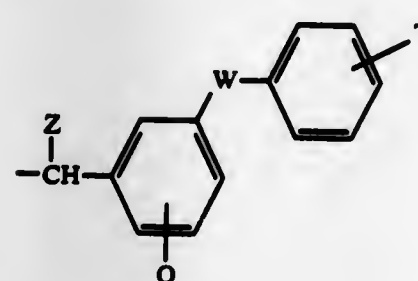
27 Claims

7. A compound of the formula:



wherein:

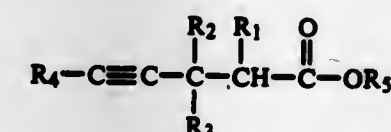
R<sub>1</sub> is ethyl, isopropyl or cyclopropyl,  
R<sub>2</sub> and R<sub>3</sub> are independently hydrogen or methyl,  
R<sub>4</sub> is hydrogen, and  
R<sub>5</sub> is



wherein:

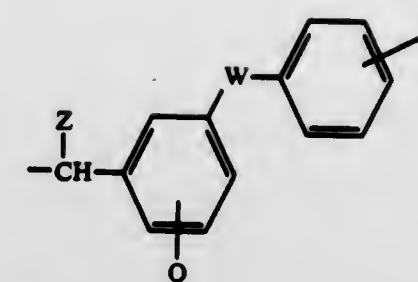
Z is cyano,  
Q and T are hydrogen, and  
W is oxygen.

27. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:

R<sub>1</sub> is ethyl, isopropyl or cyclopropyl,  
R<sub>2</sub> and R<sub>3</sub> are independently hydrogen or methyl,  
R<sub>4</sub> is hydrogen, and  
R<sub>5</sub> is



wherein:

(2) Z is cyano,  
Q and T are hydrogen, and  
W is oxygen.

4,423,065  
NAPHTHALENAMINE INSECTICIDES  
Albert J. Clinton, deceased, late of Indianapolis, Ind. (by American Fletcher National Bank and Trust Company, Administrator), and George O. P. O'Doherty, Greenfield, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

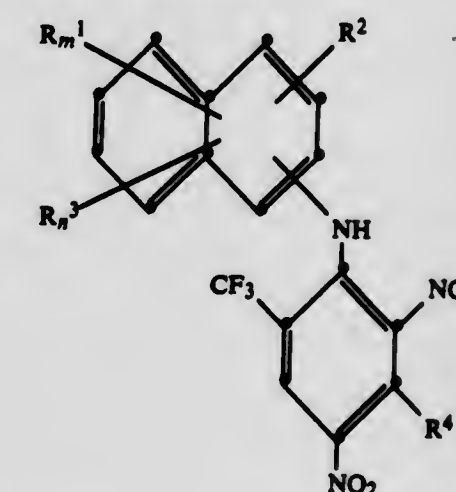
Filed May 4, 1982, Ser. No. 374,802

Int. Cl.<sup>3</sup> A01N 37/34, 33/06

U.S. Cl. 424—304

36 Claims

1. A method for suppressing insects which comprises applying to a locus of the insects an insecticidally-effective amount of a compound of the formula

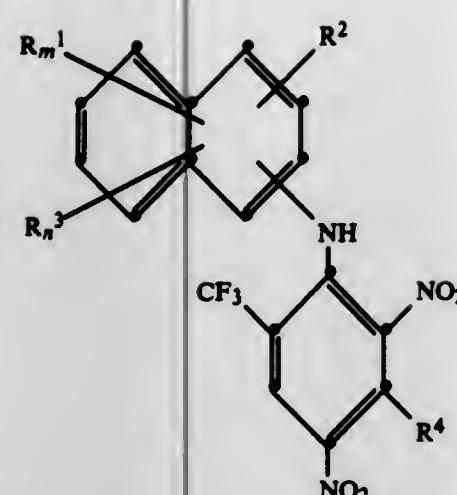


wherein:

R<sup>1</sup> is C<sub>1-4</sub> alkyl;  
R<sup>2</sup> is halogen, phenyl, nitro, cyano, C<sub>1-4</sub> fluoroalkyl, C<sub>1-4</sub> fluoroalkoxy or C<sub>1-4</sub> fluoroalkylthio;  
R<sup>3</sup> is halogen;  
R<sup>4</sup> is hydrogen or halogen;  
m is 0, 1 or 2; and  
n is 0 or 1;  
with the proviso that R<sup>2</sup> and the dinitroaniline moiety are on the same ring.

19. A method of killing insects which consume living tissues of a host animal which comprises orally or percutaneously administering to a host animal infested with such insects an ectoparasitically-effective amount of a compound of the formula





wherein:

- R<sup>1</sup> is C<sub>1</sub>-C<sub>4</sub> alkyl;  
 R<sup>2</sup> is halogen, phenyl, nitro, cyano, C<sub>1</sub>-C<sub>4</sub> fluoroalkyl, C<sub>1</sub>-C<sub>4</sub> fluoroalkoxy or C<sub>1</sub>-C<sub>4</sub> fluoroalkylthio;  
 R<sup>3</sup> is halogen;  
 R<sup>4</sup> is hydrogen or halogen;  
 m is 0, 1 or 2; and  
 n is 0 or 1;  
 with the proviso that R<sup>2</sup> and the dinitroaniline moiety are on the same ring.

**4,423,066**  
**COMBATING ARTHROPODS WITH**  
**PERFLUOROBENZYL**  
**2,2-DIMETHYL-3-VINYL-CYCLOPROPANE**  
**CARBOXYLATES**

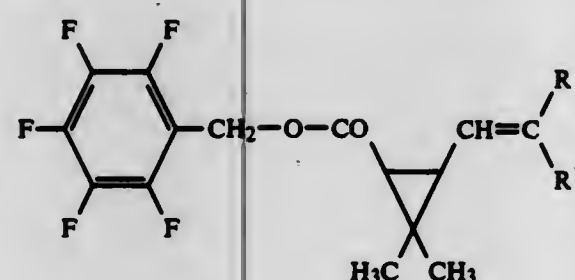
Rainer Fuchs, Wuppertal; Klaus Naumann, Cologne; Wolfgang Behrenz, Overath; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,660

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2810634

Int. Cl.<sup>3</sup> A01N 53/00; A61K 31/215; C07C 69/753  
 U.S. Cl. 424-305 10 Claims

1. A pentafluorobenzyl 2,2-dimethyl-3-vinylcyclopropane carboxylate of the formula



in which

- R is hydrogen or halogen, and  
 R<sup>1</sup> is phenyl, halogeno phenyl or C<sub>1</sub>-alkyl phenyl, or R and R<sup>1</sup> together constitute an alkylene chain with two to six carbon atoms.  
 8. An arthropodicidal composition containing as active ingredient an arthropodically effective amount of a compound according to claim 1 in admixture with a diluent.  
 9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodically effective amount of a compound according to claim 1.

**4,423,067**  
**NOVEL CARBACYCLINS, THEIR PREPARATION AND**  
**USE**

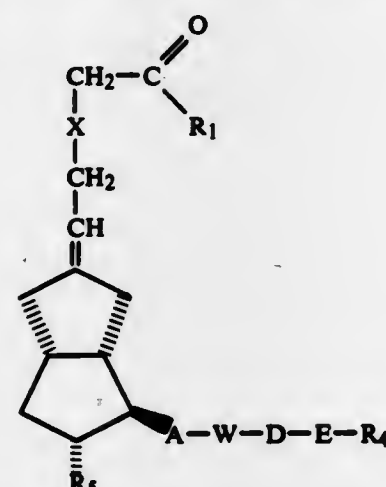
Werner Skuballa; Bernd Radüchel; Norbert Schwarz; Helmut Vorbrüggen; Jorge Casals-Stenzel; Ekkehard Schillinger, and Michael H. Town, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 333,099

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048906

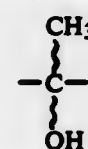
Int. Cl.<sup>3</sup> C07C 177/00; A61K 31/557  
 U.S. Cl. 424-305 22 Claims

1. A carbacyclin derivative of the formula:



wherein

- R<sub>1</sub> is OR<sub>2</sub> or NHR<sub>3</sub>,  
 R<sub>2</sub> is hydrogen; C<sub>1-10</sub> alkyl; C<sub>1-10</sub> alkyl substituted by halogen, C<sub>1-4</sub> alkoxy, C<sub>6-10</sub> aryl, C<sub>6-10</sub> aryl substituted as defined below for R<sub>2</sub> aryl, di-C<sub>1-4</sub>-alkylamino or tri-C<sub>1-4</sub>-alkylammonium; C<sub>4-10</sub>-cycloalkyl; C<sub>4-10</sub>-cycloalkyl substituted by C<sub>1-4</sub>-alkyl; C<sub>6-10</sub>-aryl; C<sub>6-10</sub>-aryl substituted by 1-3 halogen atoms, a phenyl group, 1-3 alkyl groups of 1-4 carbon atoms each, or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy, or alkoxy group of 1-4 carbon atoms; or a 5- or 6-membered aromatic heterocycle containing one O, N or S atom, all other atoms being C-atoms;  
 R<sub>3</sub> is hydrogen or an acyl group of a C<sub>1-15</sub> hydrocarbon carboxylic or sulfonic acid;  
 X is oxygen;  
 A is a —CH<sub>2</sub>—CH<sub>2</sub>—, trans—CH=CH—, or —C≡C— group;  
 W is a free or functionally modified hydroxymethylene group or a free or functionally modified



- group wherein the OH-group can be in the α- or β-position;  
 R<sub>5</sub> is a free or functionally modified hydroxy group;  
 wherein the term "functionally modified" refers to replacement of the H-atom on the hydroxy group with an acyl group of a C<sub>1-15</sub> hydrocarbon carboxylic or sulfonic acid or tetrahydropyranyl, tetrahydrofuranyl, p-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, or tri-p-benzylsilyl;  
 D is C<sub>1-10</sub> alkylene, or C<sub>2-10</sub> alkenylene, each optionally substituted by fluorine, 1,2-methylene or 1,1-trimethylene;  
 E is —C≡C—;  
 R<sub>4</sub> is a C<sub>1-10</sub> aliphatic group; a C<sub>1-10</sub> aliphatic group substituted by C<sub>6-10</sub>-aryl or C<sub>6-10</sub>-aryl in turn substituted as defined for R<sub>2</sub> above; C<sub>4-10</sub>-cycloalkyl; C<sub>4-10</sub>-cycloalkyl substituted by C<sub>1-4</sub> alkyl; C<sub>6-10</sub>-aryl; C<sub>6-10</sub>-aryl substituted as defined for R<sub>2</sub> aryl above; or a 5- or 6-membered aro-

matic heterocycle containing one O, N or S-atom, all other atoms being C-atoms; or, when R<sub>2</sub> is hydrogen, a physiologically compatible salt thereof with a base.

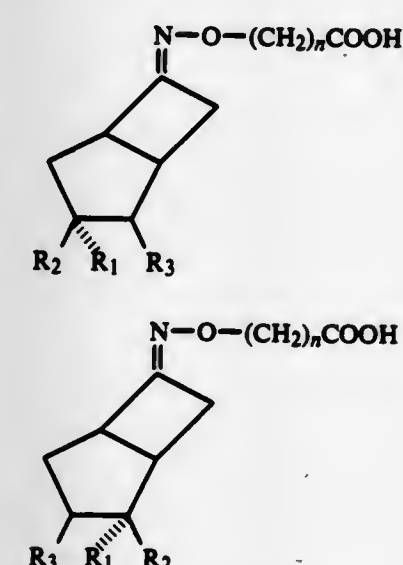
**4,423,068**  
**(3,2,0) BICYCLOHEPTANONE OXIME ETHERS WITH**  
**THERAPEUTIC PROPERTIES**

Tsung-tee Li, Los Altos Hills, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 14, 1982, Ser. No. 397,951

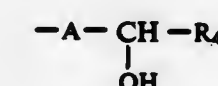
Int. Cl.<sup>3</sup> C07C 131/02; A61K 31/215, 31/195  
 U.S. Cl. 424-305 25 Claims

1. A compound chosen from those represented by the formulas



and the pharmaceutically acceptable non-toxic salts and esters thereof, wherein:

- n is an integer from one to four;  
 R<sub>1</sub> is hydroxy;  
 R<sub>2</sub> is hydrogen; or  
 R<sub>1</sub> and R<sub>2</sub> together are an oxo group; and R<sub>3</sub> is



wherein

- A is —CH<sub>2</sub>—CH<sub>2</sub>—; trans—CH=CH—; or —C≡C—; and R<sub>4</sub> is linear or branched alkyl of one to twelve carbons, cycloalkyl of three to eight carbons, or phenyl optionally substituted with one or two identical substituents selected from the group consisting of lower alkyl, lower alkoxy, hydroxy, trifluoromethyl and halo; and optionally substituted phenylalkyl.

25. A method for preventing or treating cardiovascular disorders in mammals which method comprises administering to a subject in need of such treatment a therapeutically effective amount of a compound of claim 1 or a pharmaceutically acceptable non-toxic salt and ester thereof.

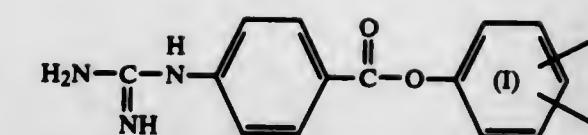
**4,423,069**  
**CONTRACEPTIVE METHOD**

Joanne M. Kaminski, Chicago; Ludwig Baner, Wilmette, and Lourens Zaneveld, Forest Park, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

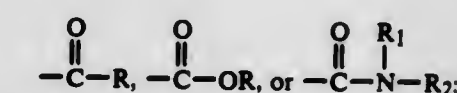
Filed Jan. 20, 1982, Ser. No. 340,975

Int. Cl.<sup>3</sup> A61K 31/155, 31/245  
 U.S. Cl. 424-310 4 Claims

1. A method for inhibiting conception in a mammal which comprises maintaining in the genital tract of said mammal an effective amount of a compound having the formula



or a pharmaceutically acceptable salt thereof, in which A is halo, trihalomethyl, cyano, formyl, R, —OR,



and B is hydrogen or A;  
 wherein R is a lower alkyl group having up to 8 carbon atoms, and R<sub>1</sub> and R<sub>2</sub> are hydrogen or a lower alkyl group having up to 8 carbon atoms.

**4,423,070**  
**ESTERS**

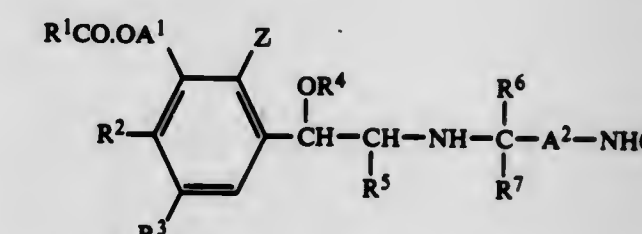
Geraint Jones; John Preston, and David S. Thomson, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 23, 1977, Ser. No. 855,004

Claims priority, application United Kingdom, Dec. 16, 1976, 52553/76; Sep. 30, 1977, 40773/77

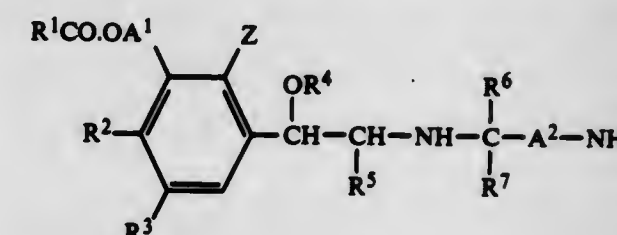
Int. Cl.<sup>3</sup> C07C 69/14, 69/16; A61K 31/22  
 U.S. Cl. 424-311 5 Claims

1. An ester of the formula:



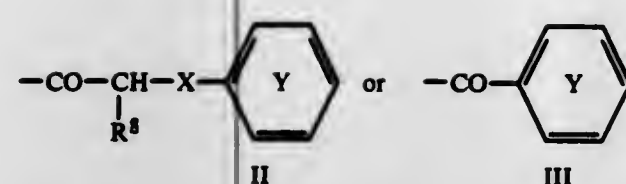
wherein R<sup>1</sup> is an isopropyl, t-butyl, isobutyl or (cyclopentyl)-methyl radical; R<sup>2</sup> is a radical of the formula R<sup>1</sup>CO.O—; R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are hydrogen; R<sup>6</sup> and R<sup>7</sup> are both hydrogen or methyl radicals; A<sup>1</sup> is a direct bond; A<sup>2</sup> is a methylene radical; Z is hydrogen; and Q is a phenylacetyl, phenoxyacetyl or 2-phenylpropionyl radical; or a pharmaceutically-acceptable acid-addition salt thereof.

4. A method for the topical treatment of an area of inflammation affecting the skin of a warm-blooded animal which comprises administering to said area of said animal requiring such treatment an effective amount of an ester of the formula:



wherein R<sup>1</sup> is a C<sub>1-11</sub>-alkyl or (C<sub>3-6</sub>-cycloalkyl)-C<sub>1-5</sub>-alkyl radical, or a phenyl or benzyl radical optionally bearing a C<sub>1-6</sub>-alkyl or C<sub>1-6</sub>-alkoxy radical as a nuclear substituent; one or R<sup>2</sup> and R<sup>3</sup> is hydrogen; the other of R<sup>2</sup> and R<sup>3</sup> is a radical of the formula R<sup>1</sup>CO.O— wherein R<sup>1</sup> has the meaning stated above; R<sup>4</sup> and R<sup>5</sup> are hydrogen; R<sup>6</sup> and R<sup>7</sup> are hydrogen, or methyl radicals; A<sup>1</sup> is a direct bond or a methylene radical; A<sup>2</sup> is a methylene radical; Z is hydrogen or chlorine; and Q is a radical of the formula:

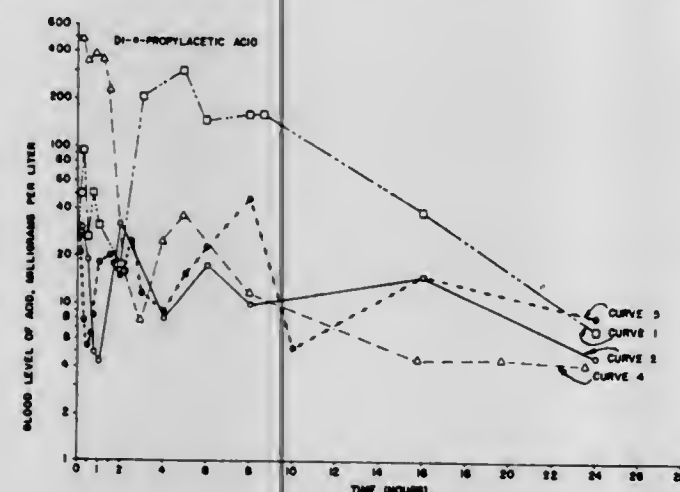




wherein R<sup>8</sup> is hydrogen or a methyl radical, X is a direct bond or oxygen, and benzene ring Y optionally bears a halogen atom, or trifluoromethyl, C<sub>1</sub>-6-alkyl or C<sub>1</sub>-6-alkoxy radical as a substituent; or a pharmaceutically acceptable acid-addition salt thereof.

**4,423,071**  
**POLYOL DERIVATIVES, PROCESSES FOR PREPARING THE SAME AND THEIR USES IN THERAPEUTICS**  
 Michel Chignac, Sisteron; Claude Grain, Volonne; Fernand Jammot, Sisteron; Charles Pigerol, Saint-Ouen; Pierre Eyraud, Fontaine, and Bernard Ferrandes, Claix, all of France, assignors to Sanofi, Courbevoie, France  
 Filed Mar. 3, 1980, Ser. No. 126,191  
 Claims priority, application United Kingdom, Mar. 6, 1979, 7907932

Int. Cl.<sup>3</sup> A61K 31/22  
 U.S. Cl. 424—311 6 Claims



1. A pharmaceutical or veterinary composition for treating anoxia, convulsive states and seizures, which comprises as essential active ingredient at least one glyceryl ester selected from the group consisting of glyceryl 1,2-bis-(di-n-propylacetate) and glyceryl 1,3-bis-(di-n-propylacetate), in combination with a pharmaceutical carrier or excipient therefor, in dosage unit form containing 50 to 600 mg. of active ingredient.

3. A method of treating anoxia, convulsive states and seizures in a human being in need of such treatment, which comprises administering to said human being an effective dose of from 10 mg/kg to 50 mg/kg of a glyceryl ester selected from the group consisting of glyceryl 1,2-bis-(di-n-propylacetate) and glyceryl 1,3-bis-(di-n-propylacetate).

**4,423,072**  
**METHOD FOR IMPROVING THE METABOLIC STABILITY AND SURVIVAL OF NEONATAL PIGS**  
 Tim S. Stahlly, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.  
 Continuation-in-part of Ser. No. 107,886, Dec. 28, 1979, Pat. No. 4,329,359. This application Apr. 13, 1982, Ser. No. 368,007  
 The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

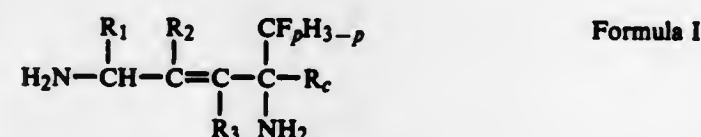
Int. Cl.<sup>3</sup> A61K 31/23, 31/045  
 U.S. Cl. 424—312 8 Claims  
 1. A method of improving the metabolic stability of neonatal pigs and increasing their survival rate which comprises administering to a pregnant sow during its latter stages of gestation,

up to about 80 days prior to parturition, an effective amount of a material selected from the group consisting of

- (1) a dihydroxy alkanol having 3 to 10 carbon atoms;
- (2) a triglyceride of glycerol and fatty acids wherein at least one of the fatty acid moieties contains 8 to 12 carbon atoms with the remaining acid moieties containing 13 to 20 carbon atoms;
- (3) the mono and diol esters of said dihydroxy and said fatty acids wherein at least one of the fatty acid moieties contains 8 to 12 carbon atoms with the remaining acid moieties containing 13 to 20 carbon atoms; and
- (4) the ester of said dihydroxy alkanol and said fatty acids containing 13 to 20 carbon atoms.

**4,423,073**  
**FLUORINATED DIAMINOPENTENE DERIVATIVES**  
 Fritz Gerhart, Kehl-Leutesheim, Fed. Rep. of Germany, and Viviane Van Dorsselaer, Strasbourg, France, assignors to Merrell Toroude et Compagnie, Strasbourg, France  
 Filed Aug. 11, 1982, Ser. No. 407,226  
 Claims priority, application United Kingdom, Aug. 19, 1981, 8125360

Int. Cl.<sup>3</sup> C07C 101/28, 87/26; A61K 31/13, 31/22, 31/195  
 U.S. Cl. 424—314 17 Claims  
 1. A fluorinated alkenylene diamine derivative of the following Formula I:



wherein:

- R<sub>c</sub> represents hydrogen or —COR<sub>5</sub>, where R<sub>5</sub> is as defined below;  
 R<sub>1</sub> represents hydrogen or C<sub>1</sub>-C<sub>6</sub> alkyl;  
 one of R<sub>2</sub> and R<sub>3</sub> represents hydrogen and the other represents C<sub>1</sub>-C<sub>6</sub> alkyl;  
 R<sub>5</sub> represents hydroxy or C<sub>1</sub>-C<sub>8</sub> alkoxy; and  
 p represents 1 or 2  
 or a pharmaceutically acceptable salt thereof.

16. A pharmaceutical composition for inhibiting arnithine decarboxylase comprising a compound as defined in claim 1 as an active ingredient and a pharmaceutically acceptable carrier or diluent.

**4,423,074**  
**ALDOSE REDUCTASE INHIBITION BY 5-FLUORO-2-METHYL-1-[[4-(METHYLTHIO)PHENYL]-METHYLENE]-1H-INDENE-3-ACETIC ACID**  
 Dushan M. Dvornik, Mount Royal, and Nicole Simard-Duquesne, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Inc., Montreal, Canada  
 Continuation-in-part of Ser. No. 160,873, Jun. 19, 1980, Pat. No. 4,307,114. This application Dec. 21, 1981, Ser. No. 332,566  
 The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

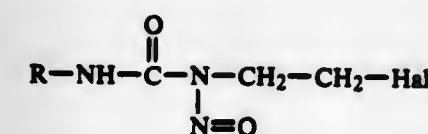
Int. Cl.<sup>3</sup> A61K 31/19  
 U.S. Cl. 424—317 4 Claims  
 1. A method of preventing or relieving a diabetic complication in a diabetic mammal which comprises administering to said mammal an effective alleviating or prophylactic amount of 5-fluoro-2-methyl-1-[[4-(methylthio)phenyl]methylene]-1H-indene-3-acetic acid, or a therapeutically acceptable salt thereof with an organic or inorganic base.

**4,423,075**  
**ALDOSE REDUCTASE INHIBITION BY 5-FLUORO-2-METHYL-1-[[4-(METHYLSULFONYL)-PHENYL]METHYLENE]-1H-INDENE-3-ACETIC ACID**  
 Dushan M. Dvornik, Town of Mount Royal, and Nicole Simard-Duquesne, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Inc., Montreal, Canada  
 Continuation-in-part of Ser. No. 160,873, Jun. 19, 1980, Pat. No. 4,307,114. This application Dec. 21, 1981, Ser. No. 332,567  
 The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> A61K 31/19  
 U.S. Cl. 424—317 4 Claims  
 1. A method of preventing or relieving a diabetic complication in a diabetic mammal which comprises administering to said mammal an effective alleviating or prophylactic amount of 5-fluoro-2-methyl-1-[[4-(methylsulfonyl)phenyl]methylene]-1H-indene-3-acetic acid, or a therapeutically acceptable salt thereof with an organic or inorganic base.

**4,423,076**  
**1-BRANCHED-ALKYL-3-(2-HALOETHYL)-3-NITROSOUREAS AS NOVEL ANTITUMOR AGENTS**  
 Koloman Laki, Bethesda, Md., assignor to National Foundation for Cancer Research, Inc., Bethesda, Md.  
 Filed Aug. 8, 1979, Ser. No. 64,886  
 Int. Cl.<sup>3</sup> C07C 127/15; A61K 31/17

U.S. Cl. 424—322 13 Claims  
 1. A compound of the formula



wherein Hal is selected from the group consisting of fluorine and chlorine and wherein R is selected from the group consisting of neopentyl, neohexyl, isopentyl and isobutyl.

12. A method of inhibiting tumor growth comprising administering to humans or animals an effective amount of a compound of claim 1.

**4,423,077**  
**PERFLUOROCHEMICAL EMULSION ARTIFICIAL BLOOD**  
 Henry A. Sloviter, Philadelphia, Pa., assignor to The University of Pennsylvania, Philadelphia, Pa.  
 Filed Jul. 27, 1982, Ser. No. 402,451  
 Int. Cl.<sup>3</sup> A61K 31/13, 31/025

U.S. Cl. 424—325 11 Claims  
 1. A stable emulsion of perfluoro compound particles comprising about 30-75% (w/v) perfluoro compound, about 7-9% (w/v) of a non antigenic lipid which coats the perfluoro compound particles, and a physiologically acceptable aqueous medium.

**4,423,078**  
**PRODUCTION OF ORIENTAL-STYLE BREADING CRUMBS**  
 Kenneth S. Darley, Whitby; David V. Dyson, Richmond Hill, and David J. Grimshaw, Thornhill, all of Canada, assignors to The Griffith Laboratories, Limited, Scarborough, Canada  
 Filed Apr. 14, 1982, Ser. No. 368,165  
 Int. Cl.<sup>3</sup> A21D 2/00, 8/04, 2/08

U.S. Cl. 426—20 30 Claims  
 1. A method of forming oriental-style breading crumbs, which comprises the sequential steps of:  
 forming a leavened dough from bread-forming ingredients, including flour and water, and at least one leavening agent,  
 forming a tow of the leavened dough,

longitudinally stretching the dough tow to about 3 to about 8 times its initial length,  
 baking the stretched dough while maintaining the dough in stretched form, and  
 comminuting the baked dough to particulate form.

**4,423,079**  
**GROWTH PROMOTING COMPOSITIONS FOR LACTOBACILLUS SANFRANCISCO AND METHOD OF PREPARATION**  
 Leo Kline, 1828 Mendocino St., Richmond, Calif. 94804  
 Continuation of Ser. No. 167,858, Jul. 14, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,308  
 Int. Cl.<sup>3</sup> A21D 2/34

U.S. Cl. 426—20 19 Claims  
 1. A method for making a composition useful for promoting growth of *Lactobacillus sanfrancisco* in bakery products comprising:

- a. inoculating a water:flour culture with natural mother sponge or starter sponge containing strains of *L. sanfrancisco* and *Torulopsis holmii*,
- b. developing said inoculated culture under conditions including controlled temperature which promotes growth of said microorganisms,
- c. cooling said developed culture and holding it at the cooled temperature for a time sufficient to create a relatively high residual acidity, and
- d. drying said culture by exposure to heat and air, substantially all viable *L. sanfrancisco* being destroyed during said drying.

**4,423,080**  
**CONTROLLED ATMOSPHERE PRODUCE PACKAGE**  
 Karakian Bedrosian, Alpine, N.J., and Robert F. Schiffmann, New York, N.Y., assignors to Bedrosian and Associates, Alpine, N.J.  
 Continuation-in-part of Ser. No. 749,063, Dec. 9, 1976, Pat. No. 4,079,152, which is a continuation of Ser. No. 556,630, Mar. 10, 1975, abandoned. This application Mar. 6, 1978, Ser. No. 883,392  
 The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.<sup>3</sup> B65B 25/04  
 U.S. Cl. 426—124 8 Claims  
 1. A package for the storage of produce comprising a sealed enclosure containing a quantity of produce, said produce being of any stage of maturity, a sealed packet within said sealed enclosure, a desiccant material within said sealed packet, a carbon dioxide absorbent within said sealed enclosure, said sealed packet being formed from a film which is permeable to water vapor, but which will retain any solution formed in said packet, said desiccant material being present in an amount sufficient to retard the formation of mold on the produce and to reduce the pressure within said sealed enclosure by the removal of water vapor from the atmosphere within said sealed enclosure for the desired period of storage, said carbon dioxide absorbent being present in a quantity sufficient to maintain the carbon dioxide content of the atmosphere within said sealed enclosure below the level which would cause carbon dioxide injury to the produce, and to reduce the pressure within said sealed enclosure by the removal of carbon dioxide from the atmosphere within said sealed enclosure for the desired period of storage, said sealed enclosure being constructed from a gas permeable film which permits additional oxygen to enter the enclosure in response to the reduced pressure created by said desiccant material and said carbon dioxide absorbent, the amount of said additional oxygen being sufficient to maintain the oxygen level of the atmosphere within said sealed enclosure at a level above the anaerobic respiration point of said produce, and below the point at which said produce experiences rapid ripening, the initial atmosphere within said sealed enclosure having been established by sealing the enclosure



from the outside ambient atmosphere without modification of the ambient atmosphere within the enclosure, and the resulting atmosphere within said sealed enclosure being established and maintained by the respiration of the enclosed produce, the removal of carbon dioxide and water vapor from the atmosphere within said sealed enclosure, and the entry of additional oxygen into said sealed enclosure in response to reduced pressure within said sealed enclosure.

4,423,081

## ACIDULATION OF MILK

Michel Salmon, Sancerques, France, assignor to Laiteries Hubert Triballat, France

Continuation of Ser. No. 16,093, Feb. 28, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 207,927

Claims priority, application France, Mar. 2, 1978, 78 06006

Int. Cl.<sup>3</sup> A23C 9/146

U.S. Cl. 426—271

4 Claims

1. A process for the acidulation of milk having a starting normal pH value which comprises:

- suspending and stirring particles of a cationic exchange resin in its H form in the milk until the milk has a pH value which is lower than the starting pH value, but which is still higher than that at which flocculation of the milk takes place, then
- separating the particles from the milk with a sieve, and then
- adding to the milk an acid solution in an amount sufficient for flocculation of the milk to take place.

4,423,082

## METHOD FOR MANUFACTURING QUICK COOKING PASTA PRODUCTS

John Banerfeld, Cherry Valley, N.Y.; Russell W. Carnahan, Evanston, Ill.; Norman Lodal, and Domingo Vazquez, both of Skokie, Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Nov. 23, 1981, Ser. No. 323,723

Int. Cl.<sup>3</sup> A23L 1/16

U.S. Cl. 426—557

14 Claims

1. A method for preparing quick cooking pasta products comprising the steps of combining water, direct injection steam, and a dry cereal flour in a first extrusion cooking zone, mixing said combination under conditions of mechanical shear to provide a substantially fully gelatinized dough mixture having a water content in the range of about 25 to about 50 percent by weight of the total mixture, whereby said cereal dough mixture is rapidly heated above the atmospheric gelatinization temperatures of starches contained in the cereal composition to provide a homogeneous pasta dough;

maintaining the pasta dough at a temperature of 235° F. to 350° F. under pressure for a sufficient period of time in the range of about 15 to about 100 seconds to substantially completely gelatinize the starch component of the pasta composition;

introducing said dough into a cooling-forming extruder wherein the dough is cooled to a temperature in the range of about 130° F. to below the boiling temperature of water, and

extruding the dough from the cooling-forming extruder through a die to shape the same and continuously drying the pasta shapes at temperatures from 130° F. to 250° F. to rapidly reduce the moisture of the pasta products to from 6 to 13% by weight of the total weight of the product.

4,423,083

## FABRICATED PROTEIN FIBER BUNDLES

Soliman Y. K. Shesouda, Tarrytown, N.Y., assignor to General Foods Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 137,214, Apr. 4, 1980, abandoned. This application Sep. 3, 1981, Ser. No. 299,254

Int. Cl.<sup>3</sup> A23J 3/00

U.S. Cl. 426—574

15 Claims

1. A process for preparing white, bland-tasting protein fiber

bundles which are texturally and nutritionally similar to the meat flesh of mammals, poultry or seafood, said process comprising the steps of:

- preparing a mixture comprising heat coagulable protein which is water-soluble or partially water-soluble, a water-soluble alginate and water;
- cooling the mixture to unidirectionally freeze the water into elongated ice crystals and to separate the protein into well-defined, well-ordered, substantially independent fibers;
- slicing the solid mass of step (b) in a direction parallel to the longitudinal axis of the ice crystal formation to form fiber bundles, each slice having a predetermined thickness;
- melting the ice crystals;
- gelling, via infusion of gelation ions, the water-soluble alginate in each fiber bundle to reinforce the well-defined, well-ordered, fiber-like structure wherein the rate of gelling the water-soluble alginate is at the same speed as the melting rate of ice crystals in the fiber bundles and wherein the thickness of each slice permits ion infusion into the solid mass such that the rate of gelling is at the same speed as the rate of melting;
- heating the resulting fiber bundles to coagulate the protein;
- treating the coagulated protein fiber bundles with an aqueous solution of a sequestering agent for texture modification and to extract undesirable salts contributing off-flavors; and
- separating the white, bland-tasting protein fiber bundles from the bath containing the sequestering agent.

4,423,084

## PROCESS FOR PREPARING SALAD DRESSINGS

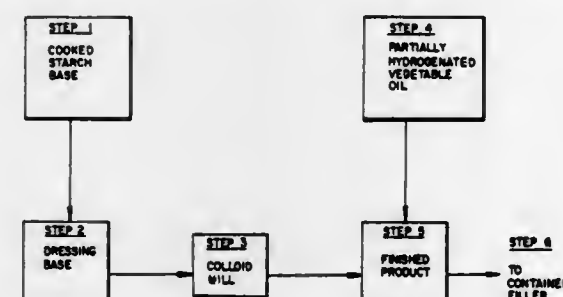
Thomas M. Trainor, Danbury, Conn., and Daniel R. Sullivan, Fort Wayne, Ind., assignors to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Nov. 25, 1981, Ser. No. 324,643

Int. Cl.<sup>3</sup> A23L 1/24

U.S. Cl. 426—589

1 Claim



1. A process for preparing emulsified salad dressing and the like comprising:

- cooking to at least about 195° F. a starch base composed of starch and water and optionally salt, sugar and vinegar to form a starch paste, thereafter cooling said starch base to below about 100° F., said starch constituting from about 1% to about 8% of the final dressing weight,
- forming an aqueous mixture containing water and gum or gum equivalent and optionally spices, natural and artificial flavors and emulsifier-stabilizers, said gum or gum equivalent constituting from about 0.05% to about 1.0% of the final dressing weight, the water in said starch base and said aqueous mixture constituting from about 30% to about 70% of the final dressing weight,
- adding said starch base along with egg yolk or egg yolk equivalent to said aqueous mixture while continuing mixing, said egg yolk or egg yolk equivalent constituting from about 2% to about 10% of the final dressing weight,
- adding liquid vegetable oil having a temperature in the range of about 40° F. to about 55° F. and in an amount of about 5% to about 30% of the final dressing weight to the

mixture of said starch paste and said another mixture while continuing mixing to form a loose emulsion having a temperature of about 60° F. to about 90° F.,

- colloid milling said loose emulsion to form a colloid-milled base,
- mixing into said colloid-milled base a partially hydrogenated oil having a temperature of about 115° F. to about 130° F. and in an amount up to about 20% of the final dressing weight, and
- after mixing to form a uniform composition, filling said uniform composition into containers to provide dressing having a viscosity in the range of about 50,000 to about 250,000 cps and effective to withstand at least 10 freeze-thaw and mechanical stress cycles, each cycle consisting of holding a sample in a freezer for 72 hours, thereafter storing the sample at a temperature of 65°-75° F. for five hours, rapidly stirring the sample with 25 strokes of a standard four tine kitchen fork, holding the sample at about 75° F. for one hour and inspecting the sample for the presence of free water.

4,423,085

## COCRYSTALLIZED SUGAR-NUT PRODUCT

Andy C. C. Chen, Belle Mead; Anthony B. Rizzuto, Hacketts-town, and Martin F. Veiga, Wallington, all of N.J., assignors to Amstar Corporation, New York, N.Y.

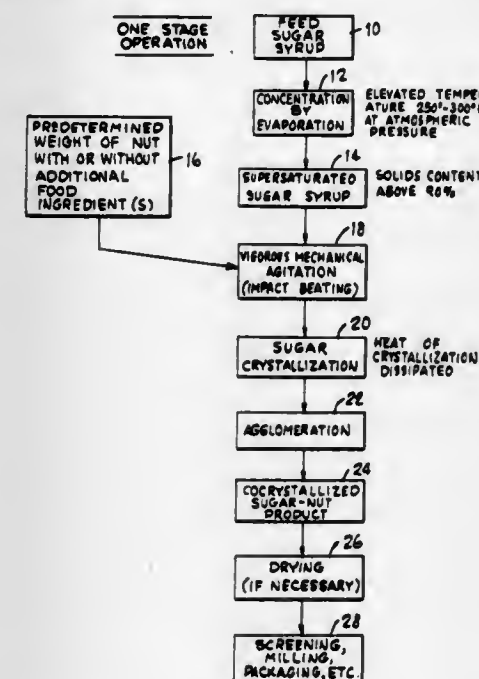
Filed Apr. 23, 1982, Ser. No. 371,266

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> A23L 1/36, 1/38; C13F 3/00

U.S. Cl. 426—632

37 Claims



1. A method for preparing a cocrystallized sugar-nut product comprising:

- concentrating a sugar syrup at atmospheric pressure or under vacuum at a temperature in the range of about 250° F. to about 300° F. to a solids content in excess of about 90% by weight;
- directly admixing the concentrated sugar syrup at a temperature not less than about 240° F. to about 300° F. at atmospheric pressure with nuts or finely divided nuts to form a mixture;
- subjecting the resulting mixture to impact beating within a crystallization zone until a cocrystallized sugar-nut product is formed comprising nuts and crystalline sugar, the crystalline sugar of said product being made up of aggregates of fondant-size sugar crystals, and the product having a moisture content of less than about 2.5% by weight; and
- recovering the cocrystallized sugar-nut product from the crystallization zone.

4,423,086

## PROCESS FOR HARD COATING WITH SORBITOL AND PRODUCTS OBTAINED THEREBY

Francis Devos, Morbecque-Merville; Guy Bussiere, La Gorgue, and Michel Huchette, Merville, all of France, assignors to Roquette Freres, Lestrem, France

PCT No. PCT/FR80/00151, § 371 Date Jun. 16, 1981, § 102(e) Date Jun. 16, 1981, PCT Pub. No. WO81/01100, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 16, 1980, Ser. No. 276,361

Claims priority, application France, Oct. 17, 1979, 79 25840; Switzerland, Apr. 3, 1980, 2652/80

Int. Cl.<sup>3</sup> G01K 9/32

U.S. Cl. 427—3

22 Claims

1. Process for hard coating with sorbitol of cores of confectionery and pharmaceutical products, comprising: applying the sorbitol by addition, on a moving bed of cores to be coated, of a syrup having a concentration of dry matter comprised between 60 and 85% by weight and a richness in D-sorbitol higher than 80%, maintaining the temperature existing in the moving bed of cores to be coated at a value below 55° C., selecting these conditions within the limits indicated in such a way that, when the sorbitol syrup arrives in contact with the cores to be coated, that is to say at the temperature maintained in the moving bed, the said sorbitol is at a saturation level comprised between 0.65 and 1.25.

4,423,087

## THIN FILM CAPACITOR WITH A DUAL BOTTOM ELECTRODE STRUCTURE

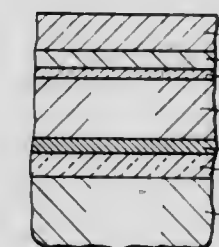
James K. Howard, Fishkill, and Kris V. Srikrishnan, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1981, Ser. No. 335,136

Int. Cl.<sup>3</sup> H01G 1/01, 4/12, 4/08

U.S. Cl. 427—79

3 Claims



1. A method for forming a thin film capacitor comprising the steps of:

- depositing on a substrate a first layer of metal selected from the group consisting of hafnium, zirconium, and tantalum,
- depositing a second layer of platinum on said first layer,
- depositing a dielectric layer on said second layer, and
- forming a counter electrode.

4,423,088

## METHOD FOR DEPOSITING ASPHALT

Peter E. Graf, Orinda, and Judson E. Goodrich, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 22,762, Mar. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 820,261, Aug. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 732,849, Oct. 18, 1976, abandoned. This application Aug. 14, 1980, Ser. No. 178,056

Int. Cl.<sup>3</sup> B05D 5/10; E01C 5/12

U.S. Cl. 427—138

5 Claims

1. A method for depositing asphalt from an asphalt emulsion onto an aggregate, that comprises wetting down the aggregate with water containing between about 0.01 weight percent and



about 1.0 weight percent of coupling agent selected to have charge opposite to the charge of said asphalt emulsion and applying said asphalt emulsion to the wetted aggregate.

4,423,089

# SUBBING PROCESS FOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Masayoshi Sekiya, Tokyo; Masao Yabe, Fujinomiya; Tamotsu Suzuki, Fujinomiya; Takeji Ochiai, Fujinomiya, and Sumitaka Tatsuta, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Nippon Zeon Co., Ltd., Tokyo, both of, Japan

Filed May 15, 1981, Ser. No. 264,155

Claims priority, application Japan, May 15, 1980, 55-64739  
Int. Cl.<sup>3</sup> B05C 3/107; B05D 3/02

U.S. Cl. 427—171

17 Claims

1. A subbing process for a photographic light-sensitive material comprising applying a polymer latex to a plastic film base, wherein said polymer is a copolymer composed of (1) a diolefin monomer, (2) at least one monovinyl monomer, and (3) at least one monomer having two or more vinyl groups, acryloyl groups, methacryloyl groups, or allyl groups excepting the diolefin monomer, and having a gel fraction of the polymer in the latex from 50% to 95% by weight, wherein said plastic film base is biaxially stretched and wherein said polymer latex is applied in solution on the plastic film base and dried at a temperature of from 120° C. to 200° C. from 30 seconds to 10 minutes.

4,423,090

# METHOD OF MAKING WALL-FLOW MONOLITH FILTER

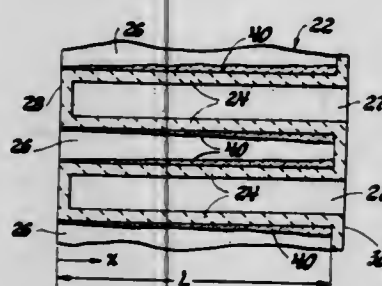
Dean C. Hammond, Jr., Birmingham, and Paul T. Vickers, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 345,005, Feb. 2, 1982, Pat. No. 4,390,355.  
This application Jan. 6, 1983, Ser. No. 455,926

Int. Cl.<sup>3</sup> B05D 7/22

U.S. Cl. 427—181

2 Claims



1. A method of making a particulate filter trap with a configuration for more uniform trapping of particulates, said method including the steps of placing a ceramic monolith filter trap, of the type having interlaced porous internal walls defining parallel, constant area, inlet and outlet channels in a fluid stream consisting of a suspension of ceramic powder dispersed in a carrier fluid so that said carrier fluid carries said ceramic powder into said inlet channels whereby said ceramic powder will be trapped by and accumulate along the inlet channel walls according to the axial distribution of transverse velocity of said carrier fluid flowing through said inlet channels and the walls defining the same to thereby increase the inlet channel wall thickness and to decrease the inlet channel area with increasing X/L wherein:

L=total length of an inlet channel, and,

X=distance from inlet end of an inlet channel; removing said ceramic filter trap from said fluid stream after a predetermined amount of ceramic powder has accumulated in said inlet channels; and, firing said ceramic monolith filter trap with said accumulated ceramic powder therein

to effect fusion of said ceramic powder to said inlet channel walls.

4,423,091

# METHOD OF MAKING MICROCAPSULES

Hiroshi Iwasaki; Shinsuke Irii, and Haruo Omura, all of Hyogo, Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 328,175

Claims priority, application Japan, Dec. 13, 1980, 55-176297  
Int. Cl.<sup>3</sup> B05D 7/24; B01J 13/02

U.S. Cl. 427—213.34

6 Claims

1. A method of making microcapsules comprising performing polycondensation for producing aminoaldehyde resin in an aqueous dispersion including particles of hydrophobic core material in the presence of cation-modified polyvinyl alcohol to form aminoaldehyde resin microcapsule walls around said particles of hydrophobic core material, said cation-modified polyvinyl alcohol present in an amount of 0.1 to 20% by weight of said aqueous dispersion and in the form of an aqueous solution.

4,423,092

# LUBRICATING COMPOSITIONS FOR ORGANIC FIBERS

Karl Huhn; Helga Lampelzammer, and Wolfgang Kaiser, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 328,976

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100803

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427—316

5 Claims

1. A composition to improve the slip properties of organic fibers which comprises at least one organosilicon compound of the formula



where R is selected from the group consisting of hydrocarbon radicals and substituted hydrocarbon radicals having from 1 to 10 carbon atoms, D is a radical of the formula



where X is selected from the group consisting of



$-OR''-, -SR''-,$  and  $-SO_2R''-,$  R' is hydrogen or R, R'' is a bivalent aliphatic hydrocarbon radical having from 1 to 8 carbon atoms, Ar is selected from the group consisting of a bivalent aromatic hydrocarbon radical and a substituted bivalent aromatic hydrocarbon radical, M is a radical of the formula



a is 0 or 1, b is 0, 1 or 2, c is 0 or a number of from 1 to 5, m is 0 or an integer having a value of from 1 to 20 and x is 0 or an integer having a value of from 1 to 1000, with the proviso that at least one OSiR<sub>2</sub> unit and at least one  $-X_aArX_a-$  group is present per molecule and at least one compound selected from the group consisting of a phosphorus compound

of the formula  $O=P\{(OCHR^1CHR^1)_nOR^2\}_3$  and a mixture of the phosphorus compound and an ammonium compound of the formula  $NR_4^{2+}x^-$ , where R<sup>1</sup> is selected from the group consisting of hydrogen and a methyl group, with the proviso that in each  $-OCHR^1CHR^1$  unit at least one R<sup>1</sup> is hydrogen, R<sup>2</sup> is selected from the group consisting of hydrogen and a monovalent hydrocarbon radical having from 1 to 20 carbon atoms, with the proviso that in each ammonium compound having the formula  $NR_4^{2+}x^-$ , at least two of the R<sup>2</sup> radicals are hydrocarbon radicals and n represents 0 or an integer of from 1 to 15, with the proviso that when R<sup>2</sup> is hydrogen in the phosphorus compound, n must be at least 1 and at least one  $-OCHR^1CHR^1$  unit must be present in the phosphorus compound and x<sup>-</sup> represents an anion selected from the group consisting of an organic and inorganic acid.

4,423,093

# METHOD OF APPLYING POLYARYLENE SULPHIDE COMPOSITIONS TO A BEARING

Glyndwr J. Davies, Middlesex, England, assignor to The Glacier Metal Company Limited, Middlesex, England

PCT No. PCT/GB81/00129, § 371 Date Mar. 3, 1982, § 102(e)

Date Mar. 3, 1982, PCT Pub. No. WO82/00182, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 3, 1981, Ser. No. 355,737

Claims priority, application United Kingdom, Jul. 4, 1980, 8022064

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427—385.5

8 Claims

1. A method of applying a coating of polyarylene sulphide to a bearing which comprises:

applying a mixture of polyarylene sulphide and an aryl ester of an aryl alcohol to the surface of a bearing blank; and subsequently heating said mixture to evaporate said ester and to cure said coating.

4,423,094

# DURABLE CAST EPOXY TOOLING COMPOSITION

Thomas J. Dearlove, Troy; Richard K. Gray, Warren, and Richard P. Atkins, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1982, Ser. No. 440,976

Int. Cl.<sup>3</sup> B05D 3/02

U.S. Cl. 427—386

2 Claims

1. A method of providing a wear resistant surface on a tool for deforming sheet metal comprising coating at least the working surface of a said tool with a mixture comprising a liquid epoxy novolac resin having an epoxide functionality greater than two, a liquid aliphatic epoxy resin having a lower viscosity than said epoxy novolac resin, a particulate filler having a microhardness substantially equal to or greater than the microhardness of silicon carbide, an aliphatic amine curing agent for said epoxy resins that is active at room temperature, and an imidazole curing agent for said epoxy resins that is first active at a temperature above the peak exotherm generated in the mixture by the activity of the aliphatic amine curing agent; allowing said coated mixture to stand at room temperature until it hardens; and thereafter heating said hardened coated mixture to an elevated temperature whereat the imidazole curing agent is active to further cross link the epoxy constituents and increase the toughness of the mixture.

4,423,095

# SILICONE-ORGANIC COATING COMPOSITIONS

John D. Blizzard, Bay City, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 28, 1983, Ser. No. 461,814

Int. Cl.<sup>3</sup> A23F 3/00

U.S. Cl. 427—387

20 Claims

1. A composition consisting essentially of a homogeneous mixture of

(I) a liquid silicone resin prepared by

(A) forming a homogeneous mixture having an acid number greater than zero and consisting essentially of

(a) an organic solvent solution of a resinous copolymeric siloxane containing silicon-bonded hydroxyl radicals and consisting essentially of R<sub>3</sub>SiO<sub>1/2</sub> siloxane units and SiO<sub>4/2</sub> siloxane units wherein the ratio of the number of said R<sub>3</sub>SiO<sub>1/2</sub> siloxane units to the number of said SiO<sub>4/2</sub> siloxane units has a value of from 0.6/1 to 0.9/1 and each R denotes, independently, a monovalent hydrocarbon radical and

(b) a liquid organohydrogenpolysiloxane wherein each organic radical is, independently, a monovalent hydrocarbon radical, there being an average of at least one, silicon-bonded hydrogen radical per molecule of said organohydrogenpolysiloxane, and

(B) heating the homogeneous mixture of (A) to remove substantially all of said organic solvent therefrom,

(II) one or more silicon-free, film-forming organic polymers, and

(III) a compatibilizing liquid in at least a sufficient amount to render the composition homogeneous; the weight ratio of the amount of component (I) to the amount of component (II) having a value of from 1/99 to 99/1.

14. A method for coating a substrate, said method comprising

(I) applying to said substrate a composition consisting essentially of

(I) a liquid silicone resin prepared by

(A) forming a homogeneous mixture having an acid number greater than zero and consisting essentially of

(a) an organic solvent solution of a resinous copolymeric siloxane containing silicon-bonded hydroxyl radicals and consisting essentially of R<sub>3</sub>SiO<sub>1/2</sub> siloxane units and SiO<sub>4/2</sub> siloxane units wherein the ratio of the number of said R<sub>3</sub>SiO<sub>1/2</sub> siloxane units to the number of said SiO<sub>4/2</sub> siloxane units has a value of from 0.6/1 to 0.9/1 and each R denotes, independently, a monovalent hydrocarbon radical and

(b) a liquid organohydrogenpolysiloxane wherein each organic radical is, independently, a monovalent hydrocarbon radical, there being an average of at least one silicon-bonded hydrogen radical per molecule of said organohydrogenpolysiloxane, and

(B) heating the homogeneous mixture of (A) to remove substantially all of said organic solvent therefrom,

(II) one or more silicon-free, film-forming organic polymers,

(III) a compatibilizing liquid in at least a sufficient amount to render the composition homogeneous; the weight ratio of the amount of component (I) to the amount of component (II) having a value of from 1/99 to 99/1, and optionally,

(IV) a curing catalyst in sufficient amount to improve the curing rate of the coating, and

(2) evaporating the compatibilizing liquid from the applied composition.

4,423,096

# METHOD FOR PROTECTING POROUS CERAMIC BUILDING MATERIALS EXPOSED TO WEATHERING

David E. Jackson, Glen Ellyn, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 3, 1982, Ser. No. 438,992

Int. Cl.<sup>3</sup> B05D 5/00

U.S. Cl. 427—397.7

2 Claims

1. A method of protecting porous ceramic building materials such as brickwork, stone, and mortar exposed to weathering which comprises coating the exposed surfaces of such porous ceramics with a composition comprising an aqueous silica sol having suspended therethroughout a finely divided granular ceramic powder.



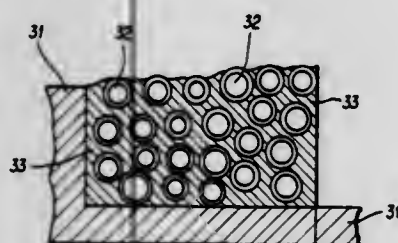
# 4,423,097 ABRADABLE SEAL AND ITS METHOD OF PRODUCTION

Claude M. Mons, Savigny Le Temple; Michel J. Pernot, Fontenay Sous Bois, and Roland R. Spinat, Bretigny Sur Orge, all of France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation "S.N.E.C.M.A.", Paris, France

Filed Jun. 14, 1982, Ser. No. 387,818  
Claims priority, application France, Jun. 12, 1981, 81 11564  
Int. Cl.<sup>3</sup> B05D 1/10

U.S. Cl. 427-423

13 Claims



1. A method for producing a seal consisting of a dispersion of hollow microspheres in a binder and fixed to a support, said method comprising:

- forming a mixture of binder material powder and hollow microspheres made of an uncoated inorganic refractory material, said binder powder being fusible at a temperature lower than the melting temperature of said microspheres;
- transporting said mixture to a spraying torch; and
- using said torch to heat and project said mixture onto said support such that said binder powder is fused and bonded to said microspheres and said support, and such that said microspheres are not substantially deformed and fragmented.

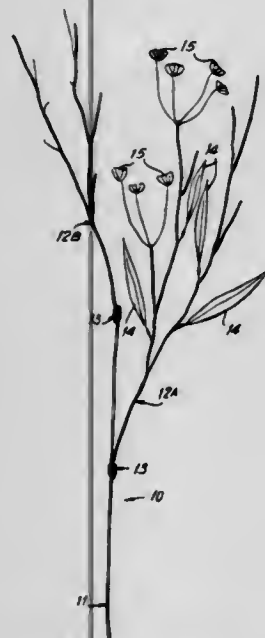
# 4,423,098 CONNECTORS FOR ASSEMBLING COMPONENT PARTS OF ARTIFICIAL PLANTS

Henry Weitz, Prosperity House, 11th Floor, 8A-10 Granville Rd., Kowloon, Hong Kong

Filed Jan. 17, 1983, Ser. No. 458,303  
Int. Cl.<sup>3</sup> A41G 1/00; A47G 7/00

U.S. Cl. 428-17

4 Claims



1. An artificial plant comprising an elongated main stem member; a plurality of similar, separately formed auxiliary stem assemblies having respective end portions to be secured to portions of said main stem member at respective locations spaced apart along the latter; and connectors securing said end

portions of the auxiliary stem assemblies to said portions of the main stem member at said respective locations and each consisting of a strip of malleable sheet metal wrapped about the respective portion of said main stem member and the respective end portion of an auxiliary stem assembly and having tapering end portions which overlap in side-by-side relation to an extent depending on the thicknesses of said portion of the main stem member and said respective end portion of an auxiliary stem assembly secured together thereby.

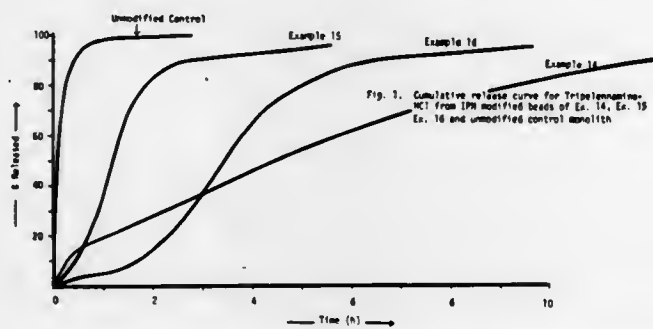
# 4,423,099 MEMBRANE MODIFIED HYDROGELS

Karl F. Mueller, New York, and Sonia J. Heiber, Bedford Hills, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,908  
Int. Cl.<sup>3</sup> B32B 11/20

U.S. Cl. 428-35

20 Claims



1. A non-uniform substantially water-insoluble interpenetrating polymer blend composition comprising a water swellable first polymer substrate interpenetrated in a gradient substantially normal to the substrate surface by a less permeable condensation second polymer to form a diffusion rate controlling membrane therein.

10. A composition according to claim 1, which is in the form of a sheet, tube or pouch.

# 4,423,100 DIFFERENTIALLY ADHERING RELEASE COATINGS FOR VINYL CHLORIDE-CONTAINING COMPOSITIONS

Jack H. Witman, East Hempfield Township, Westmoreland County, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jun. 28, 1982, Ser. No. 392,646  
Int. Cl.<sup>3</sup> B65B 33/00; B32B 23/08, 27/10

U.S. Cl. 428-42

34 Claims

1. A process for preparing a fused vinyl chloride-containing structure, said process comprising the steps of providing a carrier with a releasable coating film, said film comprising

- (a) at least one cellulosic ether or cellulosic ester having a melting point not less than about 220° F., and
- (b) at least one adhesion-promoting compound having an affinity for polymeric vinyl chloride-containing compositions,

adhering a polymeric vinyl chloride-containing composition to the coated carrier, selectively processing and fusing the composite structure, and separating said carrier from the resulting fused polyvinyl chloride-containing composition, said coating film securely bonding said carrier to said composite structure during processing, but substantially losing its bonding capability when said composite structure is fused.

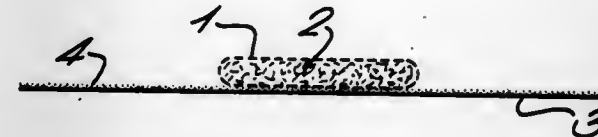
# 4,423,101 ABSORBENT PRODUCTS

Donald A. Willstead, Southampton, England, assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 13, 1981, Ser. No. 310,547  
Int. Cl.<sup>3</sup> A61L 15/00, 15/01

U.S. Cl. 428-76

6 Claims



1. An absorbent product comprising an absorbent material for retaining absorbed fluid at least partially faced by a cellular plastic film having perforations which have been produced by passing electrical discharges therethrough, said film having at least the following characteristics:

- (a) it comprises no more than 14% by volume of the film of closed cells;
  - (b) it has an apparent density which is 90 to 20% of the density of a non-cellular unstretched composition;
  - (c) it has a cell factor equal to or less than +0.65, which factor may be zero or negative;
  - (d) it contains from 0 to 25% by weight based on the polyolefin of the filler and/or pigment;
  - (e) it has a thickness of up to 11 mils;
  - (f) it comprises cells with dimensions such that the average cell volume is no greater than 10<sup>-4</sup> cc;
  - (g) it has been stretched in the plane of the film by an amount corresponding to a stretch ratio of at least 1.1:1 in one direction or in two substantially mutually perpendicular directions;
- said perforated film being pitted and oxidized by the electrical discharges, and the pitted and oxidized side of the film facing said absorbent material.

# 4,423,102 COVERING STRUCTURE FOR SEATING OR THE LIKE

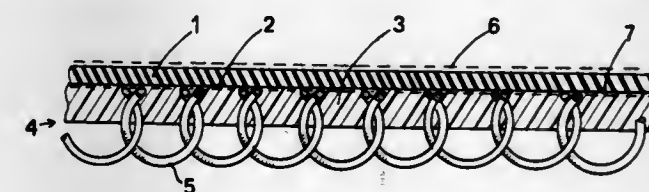
Jean-Louis Danton, Boulogne, France, assignor to Etablissements M. Duret & Fils, France

Continuation-in-part of Ser. No. 16,341, Feb. 27, 1979, abandoned. This application May 11, 1982, Ser. No. 376,948

Int. Cl.<sup>3</sup> B32B 3/10, 5/18, 5/24, 7/04

U.S. Cl. 428-92

13 Claims



1. Covering structure resisting laceration, especially for seating or the like, comprising:

- (a) a covering layer of a dense plastic material, relatively thick, presenting little elasticity in its plane but good flexibility;
- (b) a network formed by a continuous layer of spiral metallic springs whose axes are parallel to the covering layer of dense plastic material, and whose spirals are intertwined with each other so as to obtain, seen in plane view, a structure in the form of a meshed checkerboard, the spirals of said springs on one side being substantially flush against the lower face of the covering layer; and,
- (c) a foamed plastic material layer with a thickness less than the diameter of the spiral metallic springs layer, said foamed plastic material layer adhering on one side to a lower face of the dense plastic material layer with the

spiral metallic springs layer being partially embedded in said foamed plastic material layer.

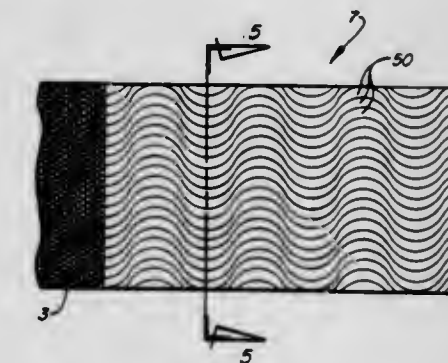
# 4,423,103 PATTERNIZED COATING

John Bogdany, Fort Oglethorpe, Ga., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Jun. 6, 1983, Ser. No. 501,580  
Int. Cl.<sup>3</sup> B32B 3/30, 5/20

U.S. Cl. 428-95

12 Claims



9. A carpet having a resilient foam underlay adhered to the back of said carpet and comprising a plurality of parallel, serpentine rows of a cured cellular organic polymeric composition.

# 4,423,104 WIDE-BAND CAMOUFLAGE NETTING

Günter Pusch, Bannholzweg 12, 6903-Neckargemünd-2; Dieter Aisslinger, Heldestr. 54, 6222-Geisenheim, and Alexander Hoffmann, Schlossstr. 32, 6909-Rotenberg, all of Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,370  
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943430

U.S. Cl. 428-101

Int. Cl.<sup>3</sup> B32B 3/06

9 Claims



1. A camouflage net comprising two or more layers of a carrier net with garnishing stretch fabric materials spread out on said layers and so affixed on each of said layers as to effectively overlap at least partially from one of said layers to the other thus preventing any radiation perpendicular to said layers from penetrating said net with the average spacing of the layers held together by tapes or cords, the length of which defines the spacing between said layers.



**4,423,105**  
**ARTICLE FOR CLOTHES CONDITIONING AND METHOD OF MAKING SAME**

Alan Dillarstone, Rocourt, and Genevieve B. Delstange, Loncin-Ans, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,025

Int. Cl.<sup>3</sup> B32B 7/14, 27/02, 27/06

U.S. Cl. 428—198

10 Claims



1. A laundry conditioning product comprising a substrate of a non-woven hydrophobic thermoplastic having a water absorption capacity of less than 400% and being impregnated with a clothes conditioning composition, there being a weight ratio of conditioning composition to substrate of between 2:1 to 0.5:1, said substrate including a plurality of sheets arranged in a butterfly configuration with the edges thereof being free from each other, said sheets being bonded to each other along a substantially centrally located line forming a spine for said butterfly configuration of sheets.

9. A method for making the product of claim 1, which comprises impregnating the substrate sheets with a paste of the conditioning composition, assembling a plurality of said sheets into a butterfly configuration, and bonding the assembly in a unitary structure along a substantially centrally located spine.

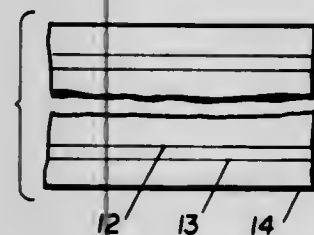
**4,423,106**  
**LAMINATED MATERIAL AND METHOD OF FORMING**

John E. Mahn, 5688 Woodhaven Dr., Cincinnati, Ohio 45211  
 Continuation of Ser. No. 172,818, Jul. 28, 1980, abandoned, which is a division of Ser. No. 6,750, Jan. 26, 1979, Pat. No. 4,269,885. This application Apr. 23, 1982, Ser. No. 371,202  
 The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> B32B 3/00, 7/02; B29C 19/00

U.S. Cl. 428—207

23 Claims



1. A combination comprising a laminate of two layers, at least one layer of which contains a polyurethane and one layer includes a polyester, one of said layers being directly adhered to a fabric, said polyester being amorphous and said laminate prior to being adhered to said fabric being non-curling.

3. A combination according to claim 1 wherein both the polyurethane and the polyester are thermoplastic.

10. A combination according to claim 3 wherein one of said layers has printing thereon.

**4,423,107**  
**Patent Not Issued For This Number**

**4,423,108**  
**METHOD FOR DURABLE PRESS FINISH USING FORMALDEHYDE-FREE ORGANOSILICON COMPOSITIONS AND TEXTILE THEREFROM**

Robert E. Kalinowski, Auburn, and Gary A. Vincent, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 22, 1982, Ser. No. 360,137

Int. Cl.<sup>3</sup> D06M 13/18, 15/30

U.S. Cl. 428—266

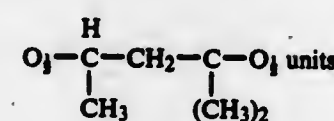
10 Claims

1. A method for imparting durable press characteristics to a cellulosic fiber containing textile fabric, said method comprising:

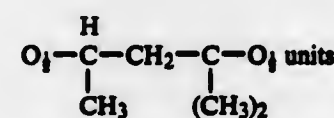
(a) impregnating the textile fabric with a homogeneous composition comprising a volatile liquid carrier and a fluid organosilicon polymer selected from the group consisting of

(i) polymers consisting of  $(\text{CH}_3\text{O})_x\text{C}_6\text{H}_5\text{SiO}_{(3-x)/2}$  units and  $(\text{CH}_3\text{O})_y(\text{CH}_3)_2\text{SiO}_{(2-y)/2}$  units wherein x has a value of 2, 1 or 0, y has a value of 1 or 0, the sum of x+y has a value greater than 0, and the molar ratio of  $(\text{CH}_3\text{O})_x\text{C}_6\text{H}_5\text{SiO}_{(3-x)/2}$  units to  $(\text{CH}_3\text{O})_y(\text{CH}_3)_2\text{SiO}_{(2-y)/2}$  units has a value of from 1:4 to 1:40 and

(ii) polymers consisting of  $(\text{CH}_3\text{O})_x\text{C}_6\text{H}_5\text{SiO}_{(3-x)/2}$  units,  $(\text{CH}_3\text{O})_z\text{CH}_3\text{SiO}_{(3-z)/2}$  units, and



wherein x has a value of 2, 1 or 0, z has a value of 2, 1 or 0, the sum of x+z has a value greater than 0, the molar ratio of  $(\text{CH}_3\text{O})_x\text{C}_6\text{H}_5\text{SiO}_{(3-x)/2}$  units to  $(\text{CH}_3\text{O})_z\text{CH}_3\text{SiO}_{(3-z)/2}$  units has a value from 1:0.5 to 1:4, and the molar ratio of  $(\text{CH}_3\text{O})_x\text{C}_6\text{H}_5\text{SiO}_{(3-x)/2}$  units to



has a value of from 1:0.85 to 1:3.5; and

(b) heating the impregnated textile fabric of (a) to crosslink the fluid organosilicon polymer.

8. A durable press textile fabric produced by the method of claim 1, 2 or 3.

**4,423,109**  
**FIBER REINFORCED RUBBER GASKET MATERIAL**  
 Norman L. Greenman, Woodstock; Richard C. Berry, Danielson; Douglas H. Tracy, Putnam; Bruce M. Arnio, Danielson; Michael S. Lunt, Abington, and Jeffrey B. Otto, Brooklyn, all of Conn., assignors to Rogers Corporation, Rogers, Conn.

Filed Oct. 2, 1981, Ser. No. 307,653

Int. Cl.<sup>3</sup> D04H 1/58

U.S. Cl. 428—288

18 Claims

1. A fiber reinforced gasket material comprising:  
 70% to 90% by weight of a composition comprising:  
 10% to 80% elastomeric binder;  
 10% to 80% inorganic particulate filler;  
 2% to 20% compounding agents; and  
 10% to 30% by weight of a nonwoven fabric of organic fibers selected from the group consisting of cellulose, polyolefin, polyamide, polyimide, polyester and polyacrylic fibers;  
 said fabric being impregnated with said composition to constitute a fiber reinforced gasket material.

**4,423,110**  
**PROCESS FOR FORMING OPEN CELL SHEET, SHEET FORMED BY PROCESS, INTERMEDIATE FOR FORMING SAID SHEET AND PROCESS FOR FORMING SAID INTERMEDIATE**

Akira Sato, Tsuchiura, Japan, assignor to Lonseal Kogyo Co., Ltd., Tokyo, Japan

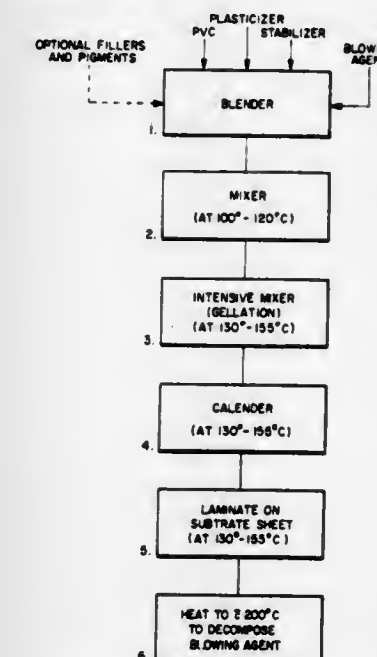
Filed Mar. 27, 1980, Ser. No. 134,535

Claims priority, application Japan, Mar. 27, 1979, 54-36509

Int. Cl.<sup>3</sup> B29D 27/00; B32B 5/18

U.S. Cl. 428—304.4

22 Claims



1. A process for producing an open-cell foam sheet, said process comprising the steps of:

(a) mixing a polyvinyl chloride plastisol; at least one stabilizer containing a Group I metal selected from the group consisting of sodium, potassium, lithium, or mixtures thereof and further comprising zinc; and a blowing agent to form a blend;

(b) mixing said blend at a temperature greater than ambient but lower than gelling temperature to convert said blend to a granular state;

(c) intensively mixing the product of step (b) at gelling temperature to form a gel;

(d) forming the gelled blend of step (c) into a sheet; and  
 (e) heating said sheet to decompose said blowing agent, thereby forming said open-cell foam.

18. The process as defined in claim 1 wherein step (b) is performed at a temperature between 100° C. and 120° C., and step (c) is performed at a temperature of 130° C. to 155° C.

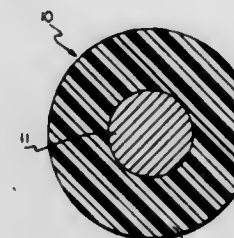
**4,423,111**  
**POLYETHERIMIDE RESIN AND ELECTRICAL CONDUCTORS INSULATED THEREWITH**  
 Yue-Guey L. Lee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 137,991, Apr. 7, 1980, abandoned. This application Mar. 20, 1981, Ser. No. 246,046

Int. Cl.<sup>3</sup> C08G 18/30; B32B 27/00; D02G 3/00

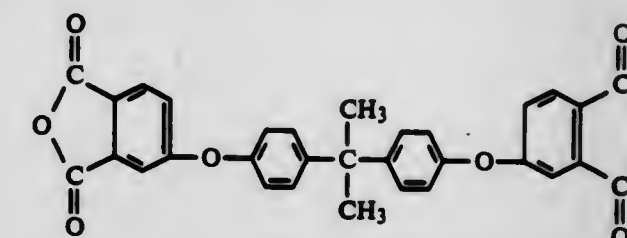
U.S. Cl. 428—383

7 Claims



42 POLYETHERIMIDE OF BISPHENOL-A DIANHYDRIDE AND DIISOCYANATE

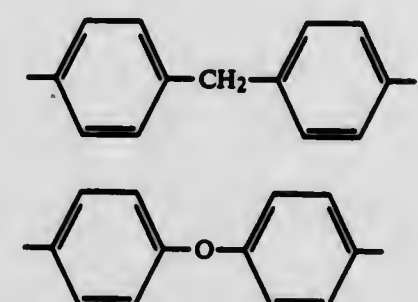
1. An electrical conductor having an insulating resin coating thereon, said coating consisting of a base coat of a polyester or polyetherimide and an overcoat of a resin prepared by subjecting a dianhydride of the formula



or a mixture thereof with at least one other dianhydride of a tetracarboxylic acid, and 0.99 to 1.01 moles, per mole of the dianhydride, of an organic diisocyanate compound of the formula



wherein R is divalent alkylene radical of 2 to 20 carbon atoms,



to polycondensation at a temperature of about 60° to 200° C. in the presence of an inert solvent.

**4,423,112**  
**IMPREGNATING AGENT FOR MATERIALS CONTAINING CELLULOSE**

Bruno Luthringhauser, St. Augustin, and Claus Lindzus, Cologne, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 214,593

Int. Cl.<sup>3</sup> B27K 3/16; C09K 3/00

U.S. Cl. 428—389

25 Claims

1. An impregnating agent for a cellulose article comprising  
 (a) An alkyltrialkoxysilane of the formula  $\text{R Si}(\text{OR}')_3$ , in which R represents an alkyl moiety of 1 to 18 carbon atoms and R' and alkyl moiety of 1 to 4 carbon atoms, and  
 (b) A chelate of a metal of the third main group or fourth or



fifth secondary group of the periodic system of the elements, wherein component (a) is present in the mixture in an amount between 5 and 99.5% by-weight and component (b) is present in said mixture in an amount between 0.5 and 95 wt.-%, said alkyltrialkoxysilane and said chelate being present in amounts effective to produce an impregnating agent which has a waterproofing action on cellulose.

4,423,113

**ZIRCONIUM OXIDE COATED NYLON FIBERS**

Salvador Olive, and Gisela Olive, both of Cantonment, Fla., assignors to Monsanto Company, St. Louis, Mo.  
Filed Mar. 22, 1982, Ser. No. 360,714  
Int. Cl.<sup>3</sup> D02G 3/00

U.S. Cl. 428—389

4 Claims

1. A nylon fiber coated with a composition consisting essentially of the reaction product of polymeric zirconium oxide and a hydroxycarboxylic acid or salt thereof.

4,423,114

**MAGNETIC POWDER FOR MAGNETIC RECORDING MEDIUM**

Hiroto Saguchi, Masashi Hayama, and Keitaro Sakai, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,551

Claims priority, application Japan, Sep. 11, 1980, 55-126200

Int. Cl.<sup>3</sup> C01G 49/06

U.S. Cl. 428—403

1 Claim

1. A magnetic powder for a magnetic recording medium which is a cobalt-adsorbed magnetic iron oxide comprising  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub>, having a coercive force of at least 1000 Oe and a ratio of a coercive force at -196° C. to a coercive force at room temperature of 3 or less, which magnetic powder is obtained by coating said  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> in dispersion with a cobalt component by adding cobalt ion to  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> at a ratio of 6 wt. % or more, and then adding ferrous ion at a ratio of 20 wt. % or more as Fe<sup>2+</sup> based on  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> and at a ratio of said ferrous salt to said cobalt salt of 3.0 to 4.5 by weight so as to adsorb Fe<sup>2+</sup> and Co<sup>2+</sup> in a Fe<sup>2+</sup>/Co<sup>2+</sup> weight ratio of 2.0 to 3.5.

4,423,115

**MAGNETIC RECORDING MEDIUM**

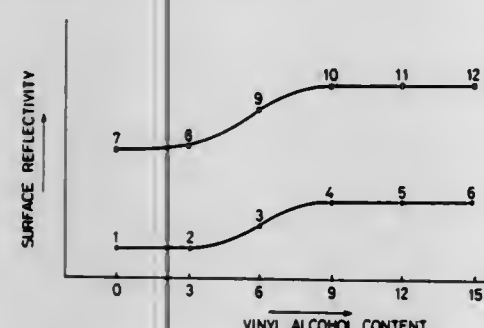
Fuminori Tokuda, and Yutaka Nakashima, both of Komoro, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan  
Filed Sep. 22, 1982, Ser. No. 421,385

Claims priority, application Japan, Oct. 23, 1981, 56-168727; Oct. 23, 1981, 56-168728

Int. Cl.<sup>3</sup> H01F 10/02

U.S. Cl. 428—425.9

6 Claims



1. A magnetic recording medium comprising a base and a magnetic coating material applied thereon, said coating being made of a binder which consists of a polyurethane resin having a metal sulfonate group, a vinyl chloride-vinyl acetate copolymer containing not less than 8% vinyl alcohol on the basis of the total copolymer weight, and nitrocellulose, and magnetic particles dispersed in said binder.

4,423,116

**REUSABLE PROJECTION TRANSPARENCY**

Richard E. Fox, Dayton, Ohio, assignor to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 15, 1982, Ser. No. 358,165

Int. Cl.<sup>3</sup> B41M 5/18

U.S. Cl. 428—411

12 Claims

1. A reversibly thermally-responsive transparent film comprising a transparent film substrate coated with a solid solution consisting essentially of:

(a) at least one chromogenic compound selected from the group consisting of:

crystal violet lactone, 3,3-bis(p-dimethylaminophenyl)phthalide, 3,3-bis(1-ethyl-2-methylindol-3-yl)phthalide, 3-(1-ethyl-2-methylindol-3-yl)-3-(4-diethylamino-2-ethoxyphenyl)phthalide, a mixture of the isomers 5-(1-ethyl-2-methylindol-3-yl)-5-(4-dimethylamino-2-ethoxyphenyl)-5,7-dihydrofuro[3,4-b]pyridin-7-one and 7-(1-ethyl-2-methylindol-3-yl)-7-(4-diethylamino-2-ethoxyphenyl)-5,7-dihydrofuro[3,4-b]pyridin-5-one, a mixture of the isomers 5-(1,2-dimethylindol-3-yl)-5-(4-dimethylaminophenyl)-5,7-dihydrofuro[3,4-b]pyridin-7-one and 7-(1,2-dimethylindol-3-yl)-7-(4-dimethylaminophenyl)-5,7-dihydrofuro[3,4-b]pyridin-5-one, 6-diethylamino-2-(N-heptanoylamino)fluoran, 6-diethylamino-2-butoxyfluoran, 2-chloro-6-diethylamino-3-methyl-fluoran, 6-diethylamino-1,3,4-trimethylfluoran, 6-cyclohexylamino-2-methylfluoran, 9-diethylamino-spiro[12H-benzo(a)xanthene-12,1'(3'H)isobenzofuran-3'-one], 3',6'-diethylamino-spiro[1H-2-N-acetylisoindole-3-one-1,9'-xanthene], 3',6'-diethylamino-spiro[1,2-benz-2-N-ethyl-1,1-dioxiso-thiazoline-3,9'-xanthene], bis(4,4'-diethylaminophenyl)ketone, N-Benzoylauramine, 1-(4-dimethylaminophenyl)-2-(quinolin-4-yl)ethylene, 1-phenyl-1-p-dimethylaminophenyl-6-dimethylamino-3-oxo-isochroman, bis(4,4'-diethylaminophenyl)-phenyliminomethane, 4-(p-ethoxyphenylazo)-m-phenylene diamine, 5',5'-dibromo-o-cresol-sulfonephthalin, 3-(1-ethyl-2-methylindol-3-yl)-3-(4-diethylamino-2-butoxyphenyl)phthalide and 6-diethylamino-2-dibenzylaminofluoran;

(b) at least one color developer selected from the group consisting of: phloroglucinol, gallic acid and 2',4',6'-trihydroxyacetophenone; and

(c) a suitable transparent binder therefor wherein a heat-developed image, formed by said chromogenic compound and said color developer, is stable to changes in temperature below the imaging temperature of the film.

4,423,117

**COMPOSITE STRUCTURE**

John Machonis, Jr., Schaumburg; Seymour Schmukler; Robert J. Zeitlin, both of Palatine, and Mitsuo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.  
Division of Ser. No. 820,611, Aug. 1, 1977, Pat. No. 4,298,712, which is a continuation-in-part of Ser. No. 681,480, Apr. 29, 1976, abandoned. This application May 24, 1978, Ser. No. 909,298

Int. Cl.<sup>3</sup> B32B 27/10

U.S. Cl. 425—475.8

10 Claims

1. A composite structure comprising a solid substrate having intimately adhered thereto a modified polyolefin blend consisting essentially of:

(A) about 0.1-95 parts by weight in said blend of a graft copolymer of about 70-99.999 wt. % of a high density polyethylene backbone grafted with about 30-0.001 wt. % of  $\alpha$ -methylbicyclo(2.2.1)hept-5-ene-2,3-dicarboxylic acid anhydride blended with both

(B) at least one elastomer of the class consisting of homopolymers of isobutylene, copolymers of isobutylene, homopolymers of chloroprene, copolymers of a diene and a vinyl aromatic compound, block copolymers of diene and a vinyl aromatic compound, copolymers of a hydroge-

nated diene and a vinyl aromatic compound, hydrogenated block copolymers of a diene and a vinyl aromatic compound, homopolymers of butadiene, and a copolymer of an ethylenically unsaturated nitrile and a diene, and (C) at least one polyolefin resin of the class consisting of homopolymers of ethylene, copolymers of ethylene and an ethylenically unsaturated ester, and copolymers of ethylene and  $\alpha$ -olefin.

4,423,118

**THICKENED PAPER COATING COMPOSITION**

Peter J. Corbett, Rheinfelden, Fed. Rep. of Germany, and Martin G. Aschwanden, Zug, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 20, 1981, Ser. No. 294,596

Int. Cl.<sup>3</sup> B32B 23/08

U.S. Cl. 428—514

9 Claims

1. A thickened coating color comprising (a) a coating color of an aqueous dispersion of a pigment and a binder therefor and (b) a water-soluble copolymer, different from the binder, comprising, in polymerized form, an  $\alpha,\beta$ -ethylenically unsaturated carboxylic acid, and ethylenically unsaturated amide and a hydrophobic monomer having limited solubility in water which, when homopolymerized, forms a water-insoluble polymer, said water-soluble copolymer being employed in amounts sufficient to thicken the coating color.

4,423,119

**COMPOSITE WIRE FOR FORMING WEAR RESISTANT COATINGS, AND METHOD OF MANUFACTURE**

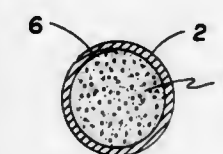
Roger K. Brown, 16300 N. Park Dr., Apt. 1011, Southfield, Mich. 48075, and Charles K. Deak, 29844 Wagner, Warren, Mich. 48093

Filed Nov. 5, 1981, Ser. No. 318,881

Int. Cl.<sup>3</sup> B22F 5/00

U.S. Cl. 428—558

13 Claims



1. A composite wire for application of a wear resistant coating to a workpiece, said wire having a metal sheath swaged around, and thereby compacting and confining, a core of a particulate mixture containing carbon, titanium and at least one other metal, the amount of titanium being from 8 to 24% of the total weight of all the metal in the wire and the amount of carbon being at least sufficient to react with substantially all the titanium to form titanium carbide, whereby upon the wire being heated substantially all the titanium in the core reacts with carbon in the core to form titanium carbide and the other metal in the core alloys with the sheath metal to form a coating matrix in which the titanium carbide is present as a dispersed phase in an amount of from 10 to 30% by weight of the coating.

4,423,120

**LAMINATING METHOD AND ARTICLE**

Manfred Paulus, Pforzheim-Eu., and Norbert Frömel, Eisingen, both of Fed. Rep. of Germany, assignors to Fr. Kammerer GmbH, Pforzheim, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,734

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1981, 3106607

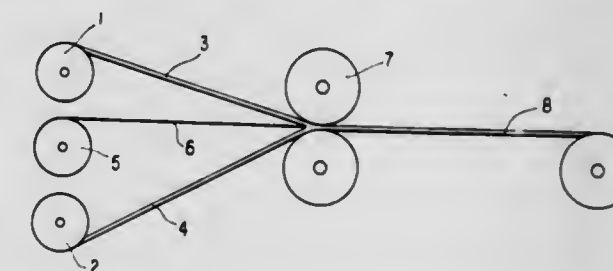
Int. Cl.<sup>3</sup> B23K 20/04

U.S. Cl. 428—614

22 Claims

1. A method of laminating first and second metal sheets to one another, comprising the following steps:

(a) superposing said first and second metal sheets and including therebetween a layer of amorphous metal and (b) subsequent to step (a) bonding to one another, by cold rolling, said first and second sheets, whereby said first and second sheets are laminated to one another while the amorphous metal is maintained in the amorphous state.  
12. A laminate product comprising first and second metal sheets being in a superposed relationship and a layer of amor-



phous metal positioned between said first and second sheets, said product being obtained by a process comprising the following steps:

(a) superposing said first and second metal sheets and including therebetween a layer of amorphous metal and (b) subsequent to step (a) bonding to one another, by cold rolling, said first and second sheets, whereby said first and second sheets are laminated to one another while the amorphous metal is maintained in the amorphous state.

4,423,121

**METAL HALOGEN BATTERY CONSTRUCTION WITH COMBUSTION ARRESTER TO PREVENT SELF PROPAGATION OF HYDROGEN-HALOGEN REACTIONS**

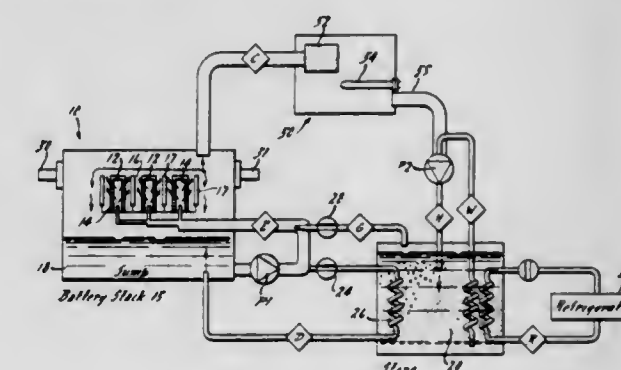
Michael J. Hammond, Sterling Heights, Mich., and Sidika Kilic, Mystic, Conn., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Oct. 28, 1981, Ser. No. 316,044

Int. Cl.<sup>3</sup> H01M 10/36

U.S. Cl. 429—19

2 Claims



1. In a zinc-chloride battery construction, the improved combination of:

stack means for providing a plurality of cells, each of said cells having a positive electrode and a negative electrode separated by an aqueous zinc-chloride electrolyte; sump means for collecting and containing a supply of said electrolyte; store means for forming and storing chlorine hydrate from the chlorine gas generated in said stack means during the charging of said battery; means for circulating said electrolyte from said sump means to said plurality of cells; conduit means for conveying the chlorine gas generated in said stack means during the charging of said battery to said store means; reactor means, associated with said conduit means, for reacting the chlorine gas being conveyed to said store means



with small amounts of hydrogen gas also generated in said stack means to form hydrogen chloride; and combustion arrester means, associated with said reactor means such that the chlorine and hydrogen gases conveyed from said stack means must first pass through said combustion arrester means when being introduced to said reactor means, for resisting the self-propagation of the hydrogen chlorine reaction from said reactor means back to said stack means, said combustion arrester means comprising a high surface area gas dispersing fritted device.

4,423,122

**ELECTRODE FOR MOLTEN CARBONATE FUEL CELL**  
Charles D. Iacovangelo, Schenectady, and Kenneth P. Zarnoch, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,896

Int. Cl.<sup>3</sup> H01M 27/04

U.S. Cl. 429—45

5 Claims



1. A porous sintered electrode useful for a molten carbonate fuel cell consisting essentially of a plurality of alloy encapsulated ceramic particle sintered together only by means of said alloy, said alloy being composed of about 5 weight % to about 95% weight % nickel balance copper, said ceramic particles ranging in size from about 0.1 micron to about 20 microns and being selected from the group consisting of lithium aluminate, strontium titanate,  $\alpha$ -alumina and mixtures thereof, said electrode having a pore volume greater than 40% by volume but less than 85% by volume of the electrode and a pore size ranging from about 0.1 micron to about 20 microns.

4,423,123

**ELECTRIC STORAGE BATTERY AND A METHOD OF MAKING THE SAME**

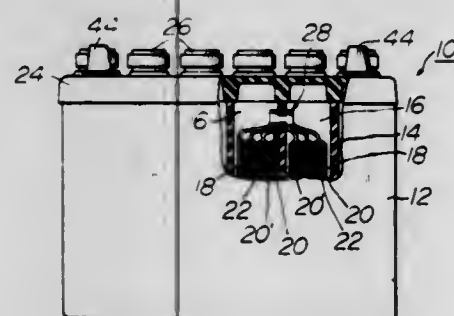
Sadao Okamatsu, Fukaya, Japan, assignor to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan

Division of Ser. No. 140,966, Apr. 17, 1980, abandoned. This application Mar. 3, 1981, Ser. No. 240,178

Int. Cl.<sup>3</sup> H01M 2/24

U.S. Cl. 429—160

6 Claims



1. An electric storage battery comprising a battery case having partition walls provided to form compartments therein, cell components disposed within the respective compartments and each including a plurality of positive and negative plates alternately arranged with insulating separators disposed between the adjacent positive and negative plates, and connectors provided between the adjacent cell components for elec-

trically connecting them, characterized by each of said connectors comprising;  
first plate lugs of said positive plates for one of said adjacent cell components;  
second plate lugs of said negative plates for the other cell component;  
said first and second plate lugs facing each other through the corresponding partition wall of said battery case;  
and a welded portion of said first and second plate lugs being deformed to be gathered together;  
all said plate lugs being unitary with and of substantially the same thickness as the respective plates, said welded portion being the gathered-together group of first plate lugs on one side of a partition wall and the gathered-together group of second plate lugs on the other side of the partition wall with a portion of each of the proximate one of said first and second plate lugs deformed toward each other to be in mutual contact and welded together.

4,423,124

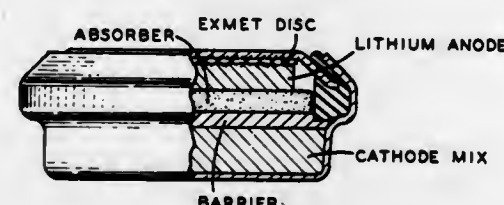
**LITHIUM-METAL CHROMATE ORGANIC ELECTROLYTE CELL AND METHOD FOR CATHODE**  
Arabinda N. Dey, Needham, Mass., assignor to Duracell Inc., Bethel, Conn.

Continuation of Ser. No. 545,637, Jan. 30, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,775

Int. Cl.<sup>3</sup> H01M 6/14

U.S. Cl. 429—194

9 Claims



1. A non-aqueous primary battery having  
(a) a light metal anode selected from the group consisting of lithium, magnesium, aluminum, beryllium, calcium, sodium, and potassium;  
(b) an electrolyte solution comprised of an organic solvent and a light inorganic salt dissolved therein;  
(c) a separator; and  
(d) a cathode consisting of silver chromate without binder or conductive additives.

7. A method for preparing cathodes of metal chromates for use in high energy density, organic-electrolyte, electrochemical cells which consists essentially of the steps of compressing powdered metal chromate and uncured binder into cathode form at a pressure in the range 1500–5000 psi, and maintaining said cathodes at a temperature below about 25° C. throughout the formation of the cathodes, wherein said metal chromate is selected from the group consisting of metal chromates, metal dichromates and metal basic chromates.

4,423,125

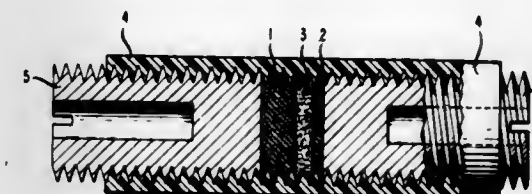
**AMBIENT TEMPERATURE RECHARGEABLE BATTERY**  
Samar Basu, Somerset, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 13, 1982, Ser. No. 416,968

Int. Cl.<sup>3</sup> H01M 6/14

U.S. Cl. 429—194

7 Claims



1. A rechargeable battery comprising an organic solvent containing a solute as the electrolyte, an anode comprising lithium intercalated graphite as its active material, and a cathode.

4,423,126

**COLOR-FORMING CARBOXAMIDONAPHTHALENE DYE PRECURSOR AND CARBOXIMIDE DYE IN PHOTOGRAPHIC MATERIAL AND PROCESS**

James E. Klijanowicz, Pittsford, and Csaba A. Kovacs, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

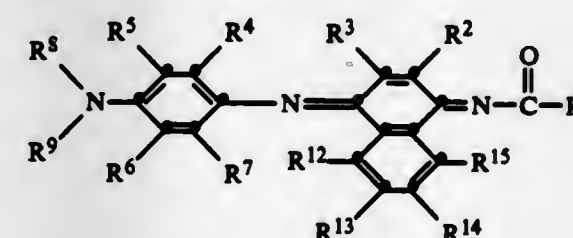
Filed May 27, 1982, Ser. No. 382,546

Int. Cl.<sup>3</sup> G03C 7/00, 1/10

U.S. Cl. 430—9

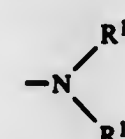
57 Claims

51. An exposed and processed photographic element comprising a support having thereon an image comprising a dye represented by the formula:



wherein:

R<sup>1</sup> is alkyl containing 1 to 25 carbon atoms, cycloalkyl containing 5 to 8 carbon atoms, aryl containing 6 to 25 carbon atoms, alkoxy containing 1 to 25 carbon atoms, aryloxy containing 6 to 25 carbon atoms,



or a 5 or 6 member heterocyclic group;

R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> are individually hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, alkoxy containing 1 to 25 carbon atoms, aryl-sulfonyl containing 6 to 25 carbon atoms, chlorine, bromine, carbamoyl, sulfamoyl, carboxy, sulfonamido; and carbox-amido;

R<sup>8</sup> is hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, acyl containing 2 to 25 carbon atoms, or carbamoyl containing 2 to 25 carbon atoms;

R<sup>9</sup> is alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, acyl containing 2 to 25 carbon atoms, or carbamoyl;

R<sup>10</sup> and R<sup>11</sup> are individually hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, a carbocyclic group containing 6 to 8 carbon atoms, or taken to-

gether represents the atoms necessary to complete a 5 or 6 member heterocyclic ring;  
R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, and R<sup>15</sup> are individually hydrogen, alkyl containing 1 to 25 carbon atoms, cyano, sulfamoyl, chlorine, carboxamido, sulfonamido, bromine and alkoxy containing 1 to 25 carbon atoms.

4,423,127

**METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE**

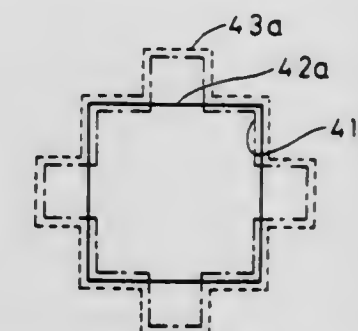
Shuzo Fujimura, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 16, 1981, Ser. No. 331,477

Claims priority, application Japan, Dec. 29, 1980, 55-187308  
Int. Cl.<sup>3</sup> G03C 5/06

U.S. Cl. 430—22

6 Claims



1. In a method of manufacturing a semiconductor device by successively superimposing and printing on a semiconductor substrate a plurality of patterns, the improvement comprising:

(a) transferring onto said substrate a mask pattern including a first alignment mark of a first photomask, said first alignment mark having a closed loop contour,  
(b) in the transfer of a mask pattern of a second photomask onto said substrate, positioning and then transferring a second alignment mark having a closed loop contour provided with said second photomask, relative to said first alignment mark on said substrate, in such a manner that the contour of each mark intersects with that of the other, and at least one part of one contour is offset from a closely adjacent part of the contour of the other and substantially parallel thereto, and  
(c) in the transfer of a mask pattern of a third photomask, positioning and then printing a third alignment mark having a closed loop contour provided with said third mask in such a manner that a part of the contour thereof is offset from a closely adjacent part of the contour of said first alignment mark and substantially parallel thereto, and at least one part of another portion of the contour of the third mark is offset from a closely adjacent part of the contour of said second alignment mark and substantially parallel thereto.

4,423,128

**METHOD OF MAKING PICTURE TUBE FLUORESCENT SCREEN**

Norio Kotke, Fukaya; Takeshi Takahara, Yokosuka; Yasuhiro Shirakawa, Kawasaki, and Kunihiro Ikari, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 20, 1982, Ser. No. 419,629

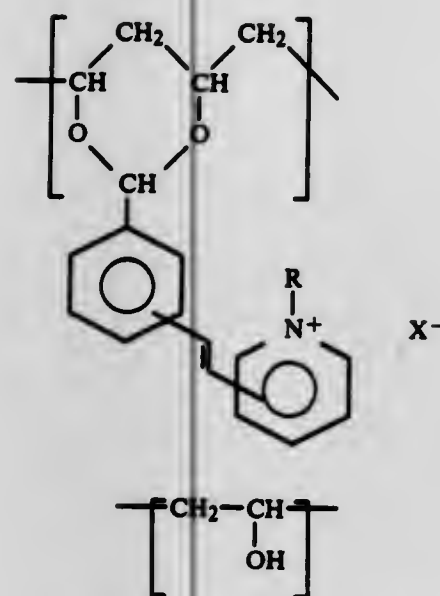
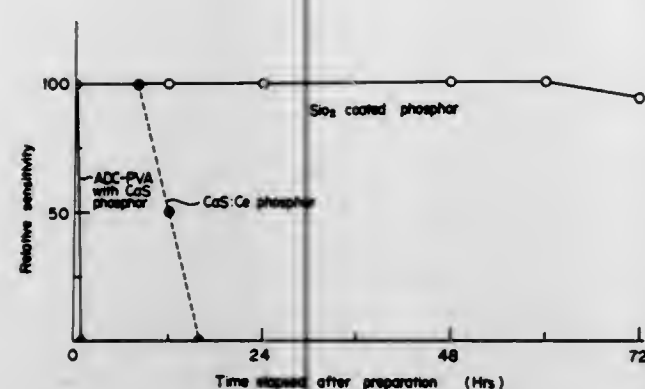
Claims priority, application Japan, Feb. 16, 1982, 57-022139  
Int. Cl.<sup>3</sup> G03C 5/00

U.S. Cl. 430—28

4 Claims

1. A method of making a picture tube fluorescent screen, comprising the steps of applying, to the inner surface of a face plate panel of a picture tube, a composition essentially consisting of a light-sensitive resin at least having recurring units (1) and (2) represented by the following general formulas:





in which R designates a hydrogen atom, an alkyl group or a lower hydroxyalkyl group, and X<sup>-</sup> designates an anion of a strong acid, and CaS-based phosphor particles surface-coated with SiO<sub>2</sub>, said light-sensitive resin and said CaS-based phosphor particles being dispersed in an aqueous medium; exposing the coat thus formed to light in a required pattern by use of a mask; developing and then baking the coat to form a fluorescent screen in a required pattern.

4,423,129

#### ELECTROPHOTOGRAPHIC MEMBER HAVING LAYER CONTAINING METHYLIDENYL HYRAZONE COMPOUND

Yoshio Takasu, Tama; Kiyoshi Sakai, Mitaka; Minoru Mabuchi, Tokyo; Shozo Ishikawa, Sayama, and Katsunori Watanabe, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 325,838

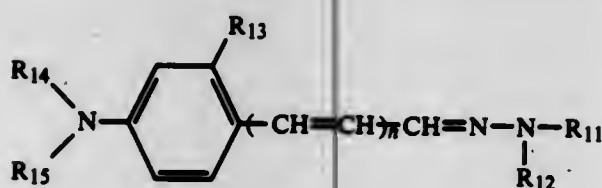
Claims priority, application Japan, Dec. 17, 1980, 55-178532; Mar. 3, 1981, 56-30342; Jun. 11, 1981, 56-90024

Int. Cl.<sup>3</sup> G03G 5/14

U.S. Cl. 430-59

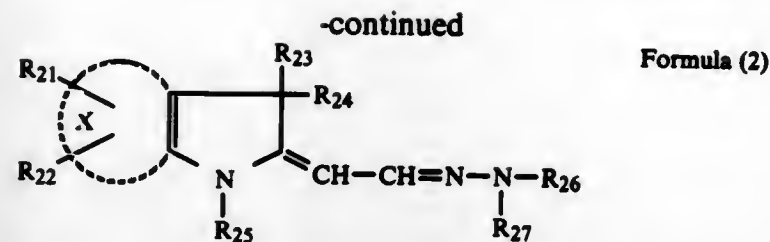
39 Claims

1. An electrophotographic photosensitive member characterized by having a charge transport layer or photosensitive layer which contains at least one hydrazone compound represented by the following formula (1) or (2):



Formula (1)

wherein  
X is an oxygen atom, a sulfur atom, a selenium atom, an imino group a substituted imino group, a methylene group or a substituted methylene group;  
R<sup>1</sup> is an alkoxy group, an aralkyloxy group, or a substituted amino group shown by



Formula (2)

wherein R<sub>11</sub> represents substituted or unsubstituted naphthyl; R<sub>12</sub> represents substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl; R<sub>13</sub> represents hydrogen, alkyl, or alkoxy; R<sub>14</sub> and R<sub>15</sub> each represent substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl; n is 0 or 1; when n=1, R<sub>14</sub> and R<sub>15</sub>, together with the nitrogen which links them, may complete a cyclic amino group; X represents a group necessary for completing a benzene ring or naphthalene ring; R<sub>21</sub> and R<sub>22</sub> each represent hydrogen, halogen, alkyl, alkoxy, or dialkylamino; and R<sub>23</sub>, R<sub>24</sub>, R<sub>25</sub>, R<sub>26</sub> and R<sub>27</sub> each represent substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl.

4,423,130

#### ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE HYDRAZONE MATERIALS

Seiji Horie, Junji Nakano, and Hideo Sato, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1982, Ser. No. 357,112

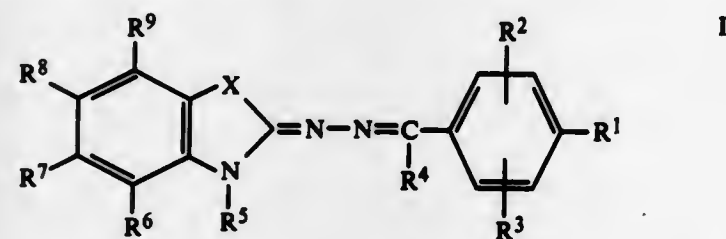
Claims priority, application Japan, Mar. 11, 1981, 56-33832

Int. Cl.<sup>3</sup> G03G 5/06, 5/14

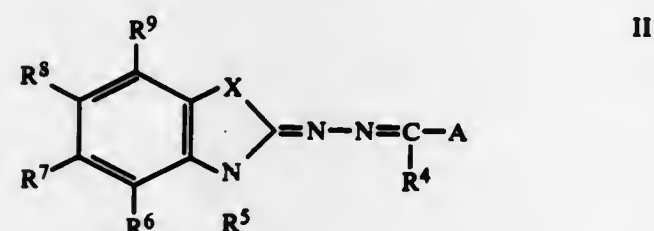
U.S. Cl. 430-59

10 Claims

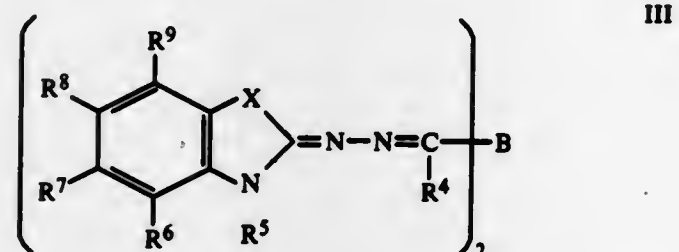
1. An electrophotographic light-sensitive material comprising a conductive support having formed thereon a light-sensitive layer containing a compound selected from the group of compounds consisting of general formula I, II or III:



I



II



III

4,423,131

#### PHOTORESPONSIVE DEVICES CONTAINING POLYVINYLSILICATE COATINGS

William W. Limburg, Penfield; John M. Pochan, Ontario, both of N.Y., and Charles L. Beatty, Gainesville, Fla., assignors to Xerox Corporation, Stamford, Conn.

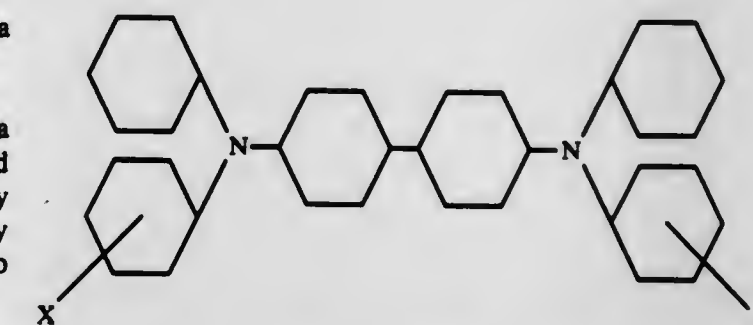
Filed May 3, 1982, Ser. No. 373,909

Int. Cl.<sup>3</sup> G03G 5/14

U.S. Cl. 430-59

15 Claims

1. An improved photoresponsive device consisting essentially of a supporting substrate, a photogenerating layer, a charge transport layer containing diamine molecules of the following formula,



wherein X is ortho (CH<sub>3</sub>), meta (CH<sub>3</sub>), para (CH<sub>3</sub>), ortho (Cl), meta (Cl), or para (Cl), and as a protective overcoating a top layer of a cross-linked polyvinylsilicate resulting from the reaction of polysilicic acid with a polyvinyl alcohol having a number average molecular weight of from about 10,000, to about 100,000.

4,423,132

#### ELECTROSTATIC IMAGE HOLDER HAVING INSULATING OVERLAYER OF FLUORINATED SURFACTANT

Hideyo Kondo, Toride, and Hitoshi Touma, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 30,838, Apr. 17, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,459

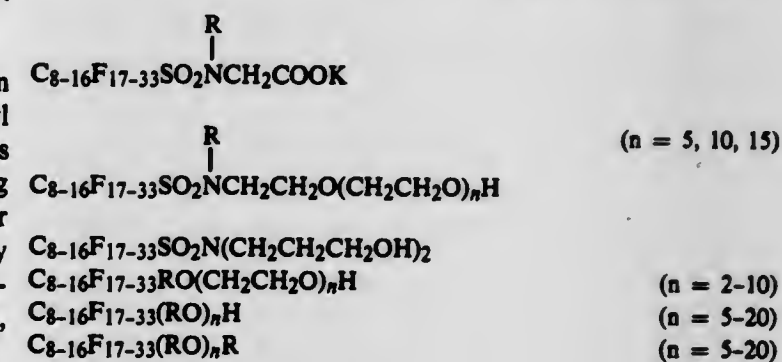
Claims priority, application Japan, Apr. 27, 1978, 53-50628

Int. Cl.<sup>3</sup> G03G 5/14

U.S. Cl. 430-67

6 Claims

1. An electrophotographic image-holding member for holding electrostatic images and toner images comprising an insulating layer formed on a surface thereof, the insulating layer consisting essentially of a fluorine-containing surface active agent, a lubricant powder for improving the surface lubrication property of the insulating layer and a resin, wherein said surface active agent is selected from the group consisting of:

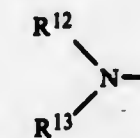


wherein R is alkyl, alkylene, aryl, and arylene and said lubricant powder is selected from the group consisting of resins, waxes, fatty acid amides, carbons, molybdenums, boron nitride, talc, metal carbonates, or silicon dioxide.

6. An electrophotographic image-holding member for hold-

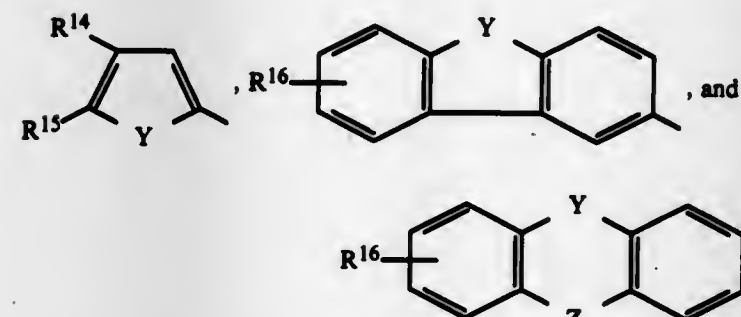


(wherein R<sup>10</sup> and R<sup>11</sup> independently are an alkyl group, a substituted alkyl group, a phenyl group, a substituted phenyl group or groups capable of forming a heterocyclic ring containing a nitrogen atom;  
R<sup>2</sup> and R<sup>3</sup> independently are a hydrogen atom, a halogen atom, an alkyl group, or a lower alkoxy group;  
R<sup>4</sup> is a hydrogen atom, an alkyl group, a phenyl group or a substituted phenyl group;  
R<sup>5</sup> is an alkyl group or a substituted alkyl group;  
R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup> and R<sup>9</sup>, independently are an alkyl group, a substituted alkyl group, a phenyl group, a substituted phenyl group, an alkoxy group, a substituted alkoxy group, an aralkyloxy group, a substituted aralkyloxy group, a hydrogen atom, a halogen atom, or an amino group shown by



(wherein R<sup>12</sup> and R<sup>13</sup> are same as the groups shown by R<sup>10</sup> and R<sup>11</sup>), or form a condensed carbon ring or a condensed heterocyclic ring by combining;

A is a monocyclic heterocyclic 5-membered ring, a condensed 5-membered heterocyclic ring or a condensed heterocyclic 6-membered ring shown by following formulae

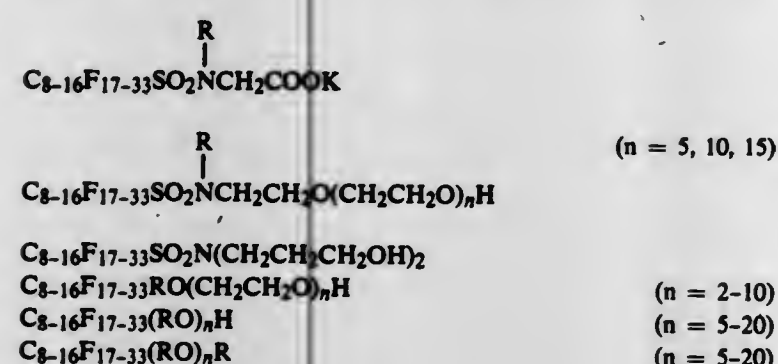


(wherein Y and Z independently are a sulfur atom, an oxygen atom, or N-R<sup>17</sup> and (wherein R<sup>17</sup> is an alkyl group having 1-4 carbon atoms); R<sup>14</sup> and R<sup>15</sup> are groups capable of forming a benzene ring or a naphthalene ring by combining; and R<sup>16</sup> is a hydrogen atom, substituted or unsubstituted alkyl groups, alkoxy groups, aryloxy groups, acyl groups, alkoxycarbonyl groups, aryloxy carbonyl groups, halogen atoms, monoalkylamino groups, dialkylamino group, amido groups, or nitro groups; and B is an aryl group or a substituted aryl group and wherein said electrophotographic material includes a charge generation material.

5. The electrophotographic light-sensitive material as claimed in claim 1 wherein the light-sensitive layer is comprised of a charge generating layer containing a charge generating material as the main component and a charge transporting layer comprising a compound shown by general formulae I, II and III.



ing electrostatic images and toner images comprising an insulating layer formed on a surface thereof, the insulating layer consisting essentially of a fluorine-containing surface active agent, a lubricant powder and a resin selected from polyethylene, polyester, polypropylene, polystyrene, polyvinyl chloride, polyvinyl acetate, vinyl chloride-vinyl acetate copolymer, acrylic resin, polycarbonate resin, silicone resin, fluorine-containing resin and epoxy resin, said lubricant powder for improving the surface lubrication property of the insulating layer and wherein said surface active agent is selected from the group consisting of:



wherein R is alkyl, alkylene, aryl, and arylene and said lubricant powder is selected from the group consisting of resins, waxes, fatty acid amides, carbons, molybdenums, boron nitride, talc, metal carbonates, or silicon dioxide.

4,423,133

#### PHOTOCONDUCTIVE MEMBER OF AMORPHOUS SILICON

Junichiro Kanbe, Yokohama; Shigeru Shirai, Yamato; Kyosuke Ogawa, Sakurashin; Keishi Saitoh, Tokyo, and Yoichi Osato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

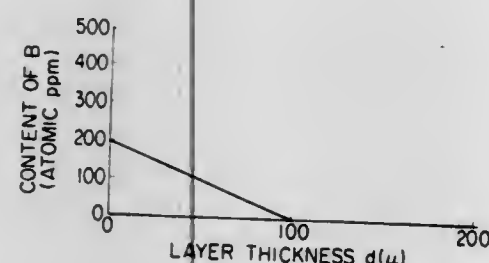
Filed Nov. 10, 1982, Ser. No. 440,639

Claims priority, application Japan, Nov. 17, 1981, 56-184639; Dec. 24, 1981, 56-215484; Dec. 24, 1981, 56-215487

Int. Cl.<sup>3</sup> G03G 5/082

U.S. Cl. 430-95

26 Claims



1. A photoconductive member which comprises a support for a photoconductive member and an amorphous layer having photoconductivity constituted of an amorphous material comprising silicon atoms as a matrix and at least one member se-

lected from hydrogen atoms and halogen atoms as constituent atoms, said amorphous layer having a layer region which contains atoms belonging to the group III of the periodic table as constituent atoms in such a distribution that the distribution is continuous in the direction of layer thickness and said atoms are more enriched on the aforesaid support side than on the opposite side to the aforesaid support side in said layer.

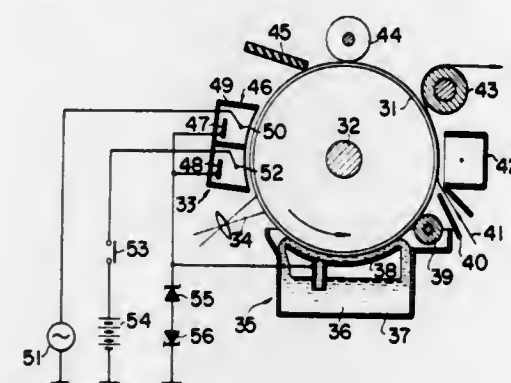
4,423,134

**DEVELOPING UNIT FOR ELECTROPHOTOGRAPHY**  
Seichi Miyakawa, Nagareyama; Akira Midorikawa, Yokohama; Kenzo Ariyama, Tokyo, and Susumu Tatsumi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Japan  
Continuation of Ser. No. 630,519, Nov. 10, 1975, abandoned.  
This application Feb. 17, 1978, Ser. No. 878,749  
Claims priority, application Japan, Nov. 12, 1974, 49-130156; Dec. 24, 1974, 49-3294

Int. Cl.<sup>3</sup> G03G 9/04

U.S. Cl. 430-103

16 Claims



15. A process for developing electrostatic latent images formed by an electrophotographic process on a photosensitive member movable cyclically passed a plurality of processing stations including a developing station, the process comprising the steps of maintaining a developing electrode in electrically floating condition in spaced relation to said member to thereby vary the potential of said electrode according to the potential of said image, supplying a developing solution to the space between said electrode and said member, providing a source of voltage to said electrode, and maintaining the potential of said electrode between an upper limit and a lower limit.

4,423,135

#### PREPARATION OF PHOTOSENSITIVE BLOCK COPOLYMER ELEMENTS

Gwendolyn Y. Y. T. Chen, Wilmington, and James F. Brennan, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 229,068, Jan. 28, 1981, Pat. No. 4,369,246, which is a continuation-in-part of Ser. No. 160,439, Jun. 17, 1980, abandoned, which is a division of Ser. No. 926,579, Jul. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 374,567, Jun. 28, 1973, abandoned, which is a

continuation-in-part of Ser. No. 130,470, Apr. 1, 1971, abandoned. This application Aug. 16, 1982, Ser. No. 408,494

Int. Cl.<sup>3</sup> G03C 1/78

U.S. Cl. 430-271

4 Claims

1. A process for forming a solvent-soluble, photosensitive elastomeric element comprising applying to a sheet support a layer of a photosensitive, elastomeric composition to a dry thickness of from about 0.005 to about 0.25 inch, said composition comprising

(1) at least 30% by weight of at least one solvent-soluble, thermoplastic, elastomeric block copolymer containing at least two thermoplastic, nonelastomeric polymer blocks having a glass transition temperature above 25° C. and an average molecular weight of 2000-100,000, and between said thermoplastic, nonelastomeric polymer blocks an

elastomeric polymer block having a glass transition temperature below 10° C. and an average molecular weight of about 25,000 to 1,000,000,

(2) at least 1% by weight of an addition-polymerizable ethylenically unsaturated compound containing at least one terminal ethylenic group, and

(3) a polymerization-effective amount of polymerization initiator activatable by actinic radiation; laminating onto said layer a combination of (a) a strippable flexible cover sheet having coated thereon (b) a solvent-soluble, flexible, polymeric film, so that the surface of said film is contiguous to the surface of said layer.

4,423,136

#### FREE RADICAL CURABLE RESIN COMPOSITIONS CONTAINING TRIARYLSULFONIUM SALT

James V. Crivello, Elnora, and James E. Moore, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 151,390, May 19, 1980, abandoned, which is a continuation of Ser. No. 31,508, Apr. 17, 1979, abandoned, which is a continuation of Ser. No. 822,220, Aug. 15, 1977, abandoned. This application Dec. 14, 1981, Ser. No. 330,428

Int. Cl.<sup>3</sup> G03C 1/68

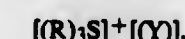
U.S. Cl. 430-281

3 Claims

1. A free radical photocurable organic resin composition consisting essentially of

(A) a free radical curable organic resin free of oxirane oxygen selected from the class consisting of acrylic resins, thiolene resins, unsaturated polyesters and a mixture of unsaturated polyester and vinyl aromatic compound,

(B) from 0.1 to 15% by weight of a triarylsulfonium salt of the formula,



where R is a monovalent C<sub>6-13</sub> aromatic organic radical, and "Y" is an anion.

4,423,137

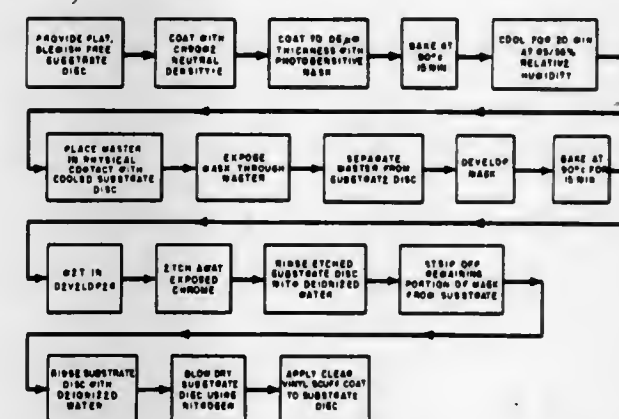
#### CONTACT PRINTING AND ETCHING METHOD OF MAKING HIGH DENSITY RECORDING MEDIUM

Marshall D. Rester, Anaheim, Calif., assignor to Quixote Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 201,554, Oct. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 64,177, Aug. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 43,429, May 29, 1979, abandoned. This application Jul. 31, 1981, Ser. No. 289,064

Int. Cl.<sup>3</sup> G03C 5/00; G01D 15/14; G11B 7/02; H04N 5/76  
U.S. Cl. 430-320

15 Claims



1. A method for fabricating a high density recording medium comprising the following steps:

(a) providing a substrate having a first surface covered by a reflecting layer;

(b) coating at least a portion of the reflecting layer with a

masking layer of a radiation sensitive material, said masking layer having a thickness less than about 0.1 microns;

(c) exposing a microscopic pattern on the masking layer by a contact printing step such that a first patterned plurality of microscopic regions of the masking layer, each having a minimum dimension of less than about 0.6 microns, is exposed to a radiation to a different extent than is a second region of the masking layer;

(d) then selectively removing the first plurality of microscopic regions of the masking layer to expose a plurality of corresponding regions of the underlying reflecting layer, each corresponding region having a minimum dimension of less than about 0.6 microns;

(e) selectively removing the plurality of corresponding regions of the reflecting layer by an etching step to expose a plurality of corresponding regions of the underlying substrate, the second region of the masking layer acting to mask and protect the corresponding region of the underlying reflecting layer during the etching step; and then

(f) removing the second region of the masking layer.

4,423,138

#### RESIST DEVELOPER WITH AMMONIUM OR PHOSPHONIUM COMPOUND AND METHOD OF USE TO DEVELOP O-QUINONE DIAZIDE AND NOVOLAC RESIST

John R. Guild, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 21, 1982, Ser. No. 341,419

Int. Cl.<sup>3</sup> G03C 5/22, 5/34; G03F 7/08

U.S. Cl. 430-326

11 Claims

1. In an aqueous developer solution for a positive-working light-sensitive composition, the solution including a solute effective to provide a pH of at least 12.0;

the improvement wherein said solution includes a cation selected from the group consisting of tetraalkylammonium or phosphonium wherein each said alkyl individually has from 2 to 7 carbon atoms, benzyltrialkylammonium or phosphonium wherein each alkyl of said trialkyl individually has from 1 to 5 carbon atoms, and benzyltriarylammonium or phosphonium wherein each said aryl individually has from 6 to 10 nuclear atoms;

and an anion for said cation;

said cation being (a) different from the cations of said solute and (b) present in solution in an amount which enhances the selectivity of the solution and which, along with the solute, produces a development time no longer than about 60 sec. for a sufficiently imagewise-exposed resist composition comprising a (1) cresol-formaldehyde resin with a weight average molecular weight of about 6000 in admixture with (2) about 18% by weight of said resin of a quinone diazide sulfonic acid ester of a trihydroxy benzophenone.

11. A method of selectively developing a sufficiently image-wise-exposed layer of a light-sensitive novolak and quinone diazide composition, comprising contacting said layer with an aqueous solution of a solute effective to provide a pH of at least 12.0; and a cation soluble in said solution and selected from the group consisting of tetraalkylammonium or phosphonium wherein each said alkyl individually has from 2 to 7 carbon atoms, benzyltrialkylammonium or phosphonium wherein each alkyl of said trialkyl individually has from 1 to 5 carbon atoms, and benzyltriarylammonium or phosphonium wherein each said aryl individually has from 6 to 10 nuclear carbon atoms; and an anion for said cation; said cation being different from the cations of said solute; to remove exposed areas of said layer.



4,423,139

**STABILIZER COMBINATION FOR DYE OXIDATION**  
 Russell R. Isbrandt, White Bear Lake Township, County of Ramsey, and Robert D. Lowrey, Aitkin, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

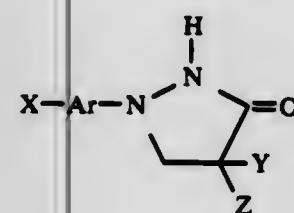
Continuation-in-part of Ser. No. 218,558, Dec. 22, 1980, abandoned. This application Feb. 24, 1982, Ser. No. 352,053  
 Int. Cl.<sup>3</sup> G03C 1/52

U.S. Cl. 430—338

12 Claims

1. In a thermally developable imaging material, an imageable layer comprising a polymeric binder, at least one leuco dye, and nitrate salt, said nitrate salt having a cation which is nonreactive with said leuco dye and said nitrate salt capable of liberating an oxidizing amount of HNO<sub>3</sub> or oxides of nitrogen when heated to a temperature of no more than 200° C. for 60 seconds, wherein the improvement comprises the presence of a stabilizing combination, said combination comprising

- (1) an aromatic compound having at least two substituents selected from the group consisting of amino and hydroxy substituents, wherein said polyhydroxy aromatic compounds form quinones upon oxidation, said polyamino aromatic compounds form diimines upon oxidation, and said aromatic compounds having amino and hydroxy substituents form quinonimines upon oxidation, and
- (2) 1-phenyl-3-pyrazolidinone, or derivatives of 1-phenyl-3-pyrazolidinone having the general formula



wherein

Ar is selected from the group consisting of phenyl and naphthyl groups;

X is selected from the group consisting of an aryl group, and alkyl group, straight or branched chain, having from about 1 to 5 carbon atoms, an alkoxy group, straight or branched chain, having from about 1 to 5 carbon atoms, H, F, Cl, Br and I; and

Y and Z are independently selected from the group consisting of H and alkyl groups, straight or branched chain, having about 1 to 5 carbon atoms,

said stabilizing combination being present in an amount sufficient to promote a synergistic stabilizing effect in said thermally developable imaging material.

4,423,140

# **SILVER HALIDE EMULSIONS CONTAINING AROMATIC LATENT IMAGE STABILIZING COMPOUNDS**

Arthur H. Herz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 25, 1978, Ser. No. 392,043

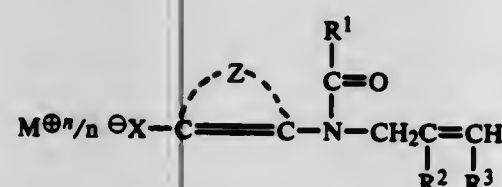
The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> G03C 1/34

U.S. Cl. 430—445

17 Claims

1. A photographic silver halide emulsion containing a latent image stabilizing amount of a compound represented by the formula:



wherein:

R<sup>1</sup> is hydrogen, alkyl, or aryl;

R<sup>2</sup> and R<sup>3</sup> are each individually hydrogen, alkyl, alkoxy, carboxy, alkoxycarbonyl, or aminocarbonyl;

X is a middle chalcogen;

Z represents the atoms completing an aryl aromatic nucleus; n is an integer of 1 or 2; and

M<sup>⊕n</sup> is a cation of valence n chosen from the group consisting of an onium ion, an ion from Group IA or IIA, and a metal ion from Group IIB, VIIB, IVA, or VA.

4,423,141

# **CARBOXY-ESTER LACTONE POLYMER NEUTRALIZING-TIMING LAYER FOR COLOR TRANSFER ASSEMBLAGES**

Edward P. Abel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 341,412, Jan. 21, 1982, Pat. No. 4,395,477.

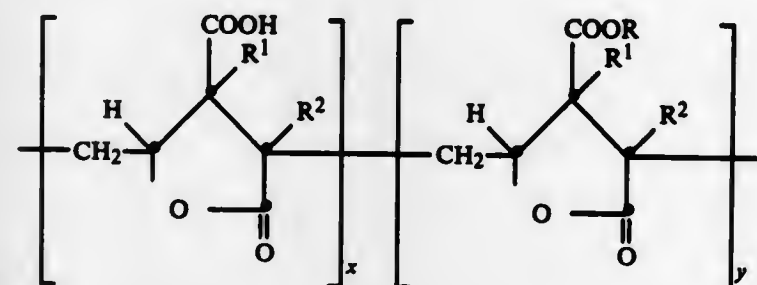
This application Dec. 10, 1982, Ser. No. 448,572

Int. Cl.<sup>3</sup> G03C 1/40, 5/34; B32B 27/06; C08F 34/02

U.S. Cl. 430—454

3 Claims

1. A cover sheet adapted to be permeated by an alkaline processing composition comprising a transparent support having thereon a neutralizing-timing layer consisting essentially of a carboxy-ester-lactone polymer having recurring units of the formula



wherein

R is alkyl having from 1 to about 12 carbon atoms or aralkyl having from 7 to about 12 carbon atoms;

R<sup>1</sup> and R<sup>2</sup> are each independently hydrogen or methyl;

x is about 1 to about 15 mole %;

y is about 85 to about 99 mole %;

said polymer comprising an acid content of up to about 1 milliequivalent of acid per gram of polymer.

4,423,142

# **PHOTOGRAPHIC SILVER HALIDE COLOR MATERIALS AND PROCESS FOR THE PRODUCTION OF DYE IMAGES BY DIFFUSION TRANSFER**

Wilhelmus Janssens, Aarschot, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium

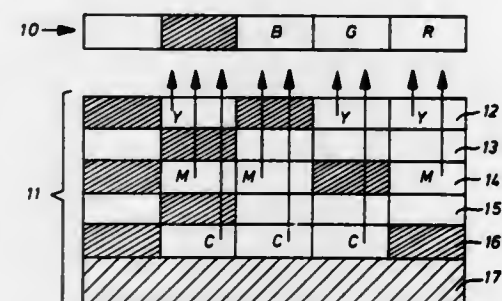
Filed Feb. 18, 1982, Ser. No. 350,033

Claims priority, application United Kingdom, Mar. 2, 1981, 8106515

Int. Cl.<sup>3</sup> G03C 5/54, 1/40, 1/10

U.S. Cl. 430—504

10 Claims



1. A photographic material suitable for producing by diffusion transfer a positive colour image in a diffusion transfer

4,423,145

**ENHANCED GROWTH MEDIUM AND METHOD FOR CULTURING HUMAN MAMMARY EPITHELIAL CELLS**  
 Martha R. Stampfer, 7290 Sayre Dr.; Helene S. Smith, 5693 Cabot Dr., both of Oakland, Calif. 94611, and Adeline J. Hackett, 82 Evergreen Dr., Orinda, Calif. 94563

Filed May 7, 1981, Ser. No. 261,086

Int. Cl.<sup>3</sup> C12Q 1/18; C12N 5/00; C12R 1/91

U.S. Cl. 435—32

14 Claims

1. A method for preparing samples of human mammary tissue to obtain a mass culture of mammary epithelial cells, said method comprising:

digesting the tissue samples with an enzyme digestion mixture including at least one enzyme selected to break down the mammary tissue into clumps of epithelial cells substantially free from attached stromal cells;

separating the clumps of epithelial cells from the stromal cells and other cellular material; and,

culturing the clumps of epithelial cells in a medium including conditioned media obtained from cultures of cells selected from the group consisting of human fetal intestine epithelial cells and human bladder epithelial cells so that the mammary epithelial cells in the clumps proliferate.

4,423,146

# **COMPOSITION OF MATTER AND PROCESS**

John C. Knight, and Merle G. Wovcha, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

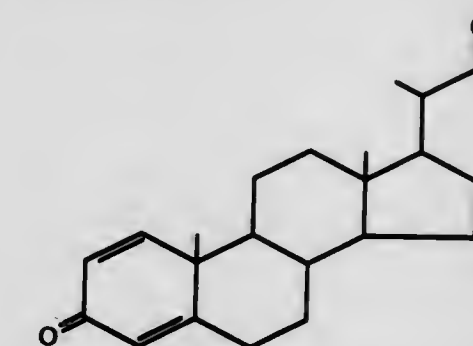
Filed Aug. 10, 1981, Ser. No. 291,725

Int. Cl.<sup>3</sup> C12P 33/16; C12N 1/20; C12R 1/32

U.S. Cl. 435—55

5 Claims

1. A one-stage fermentation process for preparing a compound of the formula



which comprises cultivating *Mycobacterium fortuitum* NRRL B-12505 in an aqueous nutrient medium under aerobic conditions in the presence of a steroid with a C-17 side chain and recovering the desired product.

4,423,147

**MONOCLONAL ANTIBODY TO INTERFERON-α**  
 David S. Secher, 2 Nightingale Ave., Cambridge, England (CB1 4SQ), and Derek C. Burke, 41 Portland St., Leamington Spa, Warwickshire, England CV32 5EY

PCT No. PCT/GB81/00067, § 371 Date Dec. 10, 1981, § 102(e) Date Dec. 10, 1981, PCT Pub. No. WO81/02899, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 13, 1981, Ser. No. 333,856

Claims priority, application United Kingdom, Apr. 11, 1980, 8012096

Int. Cl.<sup>3</sup> G01N 33/54, 33/68; C12Q 1/00

U.S. Cl. 435—68

7 Claims

1. A monoclonal antibody produced by a murine derived hybrid cell line wherein the antibody is capable of specifically binding to at least one antigenic determinant of interferon-α.

receptor layer, said material comprising on a support at least two differently spectrally sensitive negative working silver halide emulsion layers and having operatively associated with each of said emulsion layers a different dye providing compound that is initially immobile in an alkali-permeable colloid medium and from which by reduction in an alkaline medium a dye or dye precursor can be split off in diffusible state, characterized in that at least one of said negative working silver halide emulsion layers is associated in water-permeable relationship with a visible light-sensitive direct-positive working silver halide emulsion layer.

4,423,143

# **β-D-GALACTOSIDASE CONJUGATE FOR ENZYME IMMUNOASSAYS**

Kenneth E. Rubenstein, Menlo Park, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 221,235, Dec. 30, 1980, Pat. No. 4,376,825, which is a division of Ser. No. 36,929, May 7, 1979,

Pat. No. 4,282,325, which is a continuation-in-part of Ser. No. 857,145, Dec. 5, 1977, Pat. No. 4,203,802, which is a division of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774, which is a

continuation of Ser. No. 481,022, Jun. 20, 1974, abandoned, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 802,683,

Jun. 2, 1977, Pat. No. 4,190,496, which is a continuation of Ser. No. 760,499, Jan. 19, 1977, Pat. No. 4,191,613, which is a

continuation-in-part of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774. This application Apr. 29, 1981, Ser. No. 258,848

The portion of the term of this patent subsequent to Jun. 18, 1991, has been disclaimed.

Int. Cl.<sup>3</sup> G01N 33/54; C12N 9/96

U.S. Cl. 435—7

5 Claims

1. An enzyme conjugate of β-D-galactosidase bonded to on the average with from about 1 to 24 haptens of molecular weight of from about 125 to 1,000 and having at least one heteroatom, wherein said conjugated enzyme retains at least about 10% of the original enzyme activity and wherein the enzymatic activity of the conjugate is reduced by at least 30%, when said haptens are bound to receptors for said haptens.

4,423,144

**RADIOENZYMATIC ASSAY OF CATECHOLAMINES**  
 Garland A. Johnson, Charleston Township, Kalamazoo County, and Jacob D. Peuler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 931,651, Aug. 8, 1978, Pat. No. 4,288,542, which is a continuation of Ser. No. 681,999, Apr. 30, 1976, abandoned. This application Sep. 2, 1981, Ser. No. 298,560

Int. Cl.<sup>3</sup> C12Q 1/48; C12N 9/10, 9/99

U.S. Cl. 435—15

7 Claims

1. A method for reducing the inhibition of catechol-O-methyl transferase enzymatic activity by a component of mammalian blood serum or plasma in a mixture comprising catechol-O-methyl transferase, a cation of oxidation number +2 selected from the group consisting of magnesium, cobalt and manganese, a compound which stabilizes the catechol-O-methyl transferase catechol-amine enzyme-substrate system selected from the group of glutathione dithiothreitol, ascorbic acid, sodium metabisulfite, mercaptoethanol and cysteine, the methyl donor S-adenosyl-L-methionine-(<sup>3</sup>H)-methyl, and mammalian blood serum or plasma which comprises contacting said mixture with an anti-catechol-O-methyl transferase enzyme inhibiting effective amount of ethylene glycol bis(aminoethyl-ether)N,N'-tetraacetic acid, the transferase, cation, stabilizing compound and methyl donor present in such quantities that substantially all the epinephrine, norepinephrine and dopamine present in the mammalian blood serum or plasma are O-methylated.



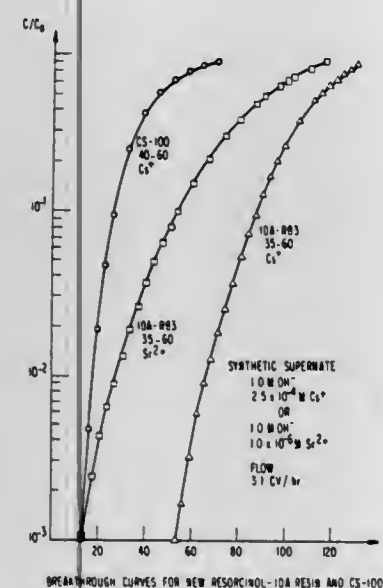




4,423,159

**PHENOLIC CATION EXCHANGE RESIN MATERIAL FOR RECOVERY OF CESIUM AND STRONTIUM**  
Martha A. Ebra, and Richard M. Wallace, both of Aiken, S.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.  
Filed May 5, 1982, Ser. No. 375,232  
Int. Cl.<sup>3</sup> B01J 39/18

U.S. Cl. 521—35



1. Process for the simultaneous recovery of cesium or strontium or both from an aqueous alkaline solution containing such cesium or strontium or both which comprises:

- (A) contacting said aqueous alkaline solution with a phenolic chelating resin material to sorb said cesium or strontium or both from said aqueous alkaline solution, said phenolic chelating resin material having been prepared by the process which comprises (i) reacting resorcinol with iminodiacetic acid or catechol in the presence of formaldehyde in an alkaline medium to form a condensation polymer gel, (ii) drying the condensation polymer gel, and (iii) comminuting the dried condensation polymer gel to form said phenolic cation exchange material; and  
(B) separating said aqueous alkaline solution depleted of cesium and strontium from the cesium-and-strontium-loaded phenolic cation resin material.

4,423,160

**PROCESS FOR FORMING ANTI-LUMPING AND FAST-COOL VINYL AROMATIC EXPANDABLE POLYMER PARTICLES**  
Adolph V. DiGiulio, Wayne, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.  
Filed Jan. 31, 1983, Ser. No. 462,157  
Int. Cl.<sup>3</sup> C08J 9/18

U.S. Cl. 521—59

8 Claims

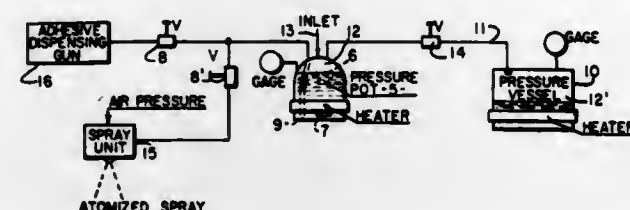
1. A process for producing expandable vinyl aromatic polymer particles which exhibit antilumping properties, and fast-cooling properties in molded products produced therefrom comprising:  
polymerizing a vinyl aromatic monomer in which is dissolved about 0.5 to 4.0 percent by weight, based on the vinyl aromatic monomer, of a graded diblock rubbery copolymer of 2-50 weight percent of polymerized vinyl aromatic monomer and 50-98 weight percent of polymerized conjugated diene, to form vinyl aromatic polymer particles containing said graded diblock rubbery copolymer; and impregnating the vinyl aromatic polymer particles, containing said graded diblock rubbery copolymer, with a blowing agent.

4,423,161

**APPARATUS AND METHOD FOR DISPENSING FOAMABLE COMPOSITIONS**  
Walter H. Cobbs, Jr., Amherst, and William R. Rehman, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio  
Division of Ser. No. 16,207, Feb. 28, 1979, Pat. No. 4,301,119.  
This application May 11, 1981, Ser. No. 262,468  
Int. Cl.<sup>3</sup> C08J 9/30

U.S. Cl. 521—73

9 Claims



1. A method for dispensing a foamable composition having a constant foam-volume ratio comprising  
containing in a vessel a foamable mixture of polymeric liquid composition and a blowing agent under pressure, said vessel having means defining a vapor space above said liquid composition and a dispensing outlet,  
holding in a pressure container the blowing agent under pressure, said pressure container having means defining a vapor space,  
delivering blowing agent from the vapor space of said pressure container to the vapor space of said vessel to maintain a substantially constant composition of said blowing agent in said vapor space of said vessel above said liquid mixture under a vapor pressure at least equal to the vapor pressure of said mixture, and  
dispensing a foam of constant foam-volume ratio from said foamable mixture.

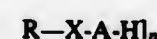
4,423,162

**POLYURETHANES FROM HYDROXYMETHYL POLYOLS AND POLYISOCYANATES**  
Dwight E. Peerman, and Edgar R. Rogier, both of Minnetonka, Minn., assignors to Henkel Corporation, Minneapolis, Minn.  
Filed Sep. 7, 1982, Ser. No. 415,734  
Int. Cl.<sup>3</sup> C12P 7/12

U.S. Cl. 521—164

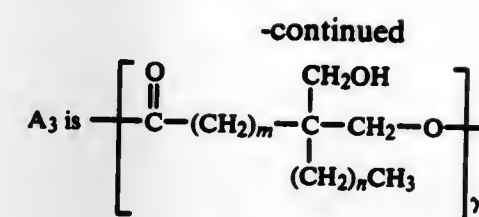
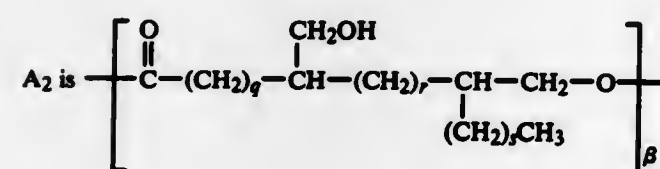
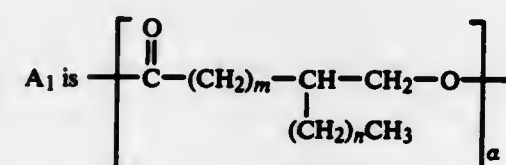
56 Claims

1. Urethane linked reaction products of at least one non-gelled polyol of the formula:



where

R is a polyol, polyamine or aminoalcohol residue;  
X may be the same or different and is O, N or NH;  
p is an integer from 2 to 6; and,  
A may be the same or different and is selected from the group consisting of A<sub>1</sub>, A<sub>2</sub> and A<sub>3</sub> and combinations of A<sub>1</sub>, A<sub>2</sub> and A<sub>3</sub>,  
where



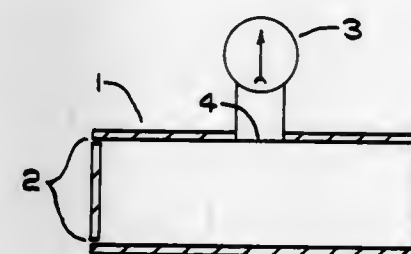
where m, n, q, r, s, α, β and γ are integers and where  
m > 3  
n ≥ 0 and  
m+n is from 11 to 19  
q > 3  
r ≥ 0  
s ≥ 0 and  
q+r+s is from 10 to 18  
α is from 0 to 10  
β is from 0 to 10 and  
γ is from 1 to 10, except that all α's, β's and γ's in any given compound are not all zero;  
and from about 80% to about 120% on a hydroxy-isocyanate equivalent basis of at least one polyisocyanate.

4,423,163

**METHOD OF PRODUCING PHENOLIC FOAM USING PRESSURE AND FOAM PRODUCED BY THE METHOD**  
Herman P. Doerge, Oakmont, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.  
Filed Oct. 9, 1980, Ser. No. 195,457  
Int. Cl.<sup>3</sup> B29D 27/04

U.S. Cl. 521—181

8 Claims



1. A method for making a phenolic foam having an initial K factor less than 0.15 and having substantial K factor retention from a phenolic resole resin foamable composition comprising from 40 to 90 percent by weight phenolic resole resin, from 1 to 20 percent by weight fluorine containing blowing agent, from 0.1 to 10 percent by weight surfactant, from 2 to 40 percent by weight water and from 2 to 35 percent by weight acid catalyst comprising introducing the phenolic resole resin foamable composition into a substantially closed volume wherein the composition is allowed to foam under initially ambient atmospheric pressure until the foam fills the volume and wherein a pressure in excess of about 2 pounds per square inch on the outer surface of the foam is attained within the volume and wherein the temperature during foaming is from about 4° C. to 122° C.

5. The phenolic foam produced by the method of claim 1.

4,423,164

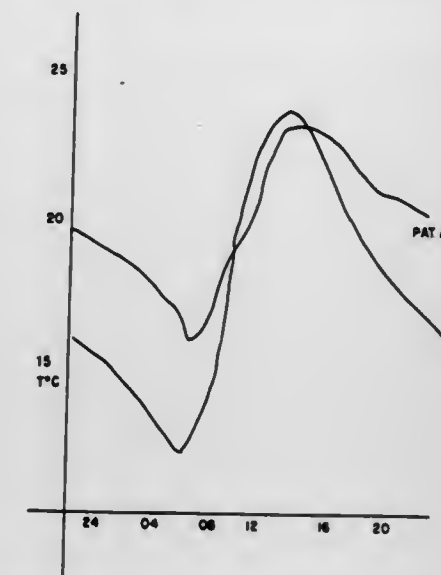
**POLYMERIC FILMS FOR USE IN AGRICULTURE**  
Rami Bar, Kibbutz Ginegar, Israel  
Filed Jan. 18, 1982, Ser. No. 340,248  
Claims priority, application Israel, Feb. 4, 1981, 62066  
Int. Cl.<sup>3</sup> C08K 3/26, 3/20

U.S. Cl. 523—135

7 Claims

1. A polymeric composition in film or sheet form, adapted to transmit a large part of incident sunlight, a substantial part thereof by forward scattering, and to reflect a large part of incident IR radiation, consisting essentially of:  
a polymer or copolymer, which is generally transparent; and

micron size particles of an additive comprising 1-12% magnesium oxide and 0-8% calcium carbonate, the total com-



combined additive being in the range of 1 to 12%, all percentages being by weight of the polymeric composition.

4,423,165

**WATER-BORNE COATING COMPOSITION MADE FROM EPOXY RESIN, FIRST POLYMERIC ACID, TERTIARY AMINE AND SECOND POLYMERIC ACID**  
Lee R. Harper, Media; Judith E. Obetz, Bryn Mawr, both of Pa., and William H. Steinmetz, Collingswood, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Filed Apr. 16, 1982, Ser. No. 369,077  
Int. Cl.<sup>3</sup> C08K 3/20; C08L 63/00

U.S. Cl. 523—409

39 Claims

1. A water-borne coating composition consisting essentially of liquid carrier and a second reaction product made by blending a second carboxyl-functional polymer with a first reaction product, wherein said first reaction product is the product of the reaction in an organic media of:

(A) 50-90% by weight, based on the weight of (A) plus (B), of an epoxy resin containing, on the average, about 1½ to 2 terminal 1,2-epoxy groups per molecule and having an epoxy equivalent weight of 750-5000;

(B) a first carboxyl-functional polymer in an amount sufficient to provide at least 1.25 equivalents of carboxyl groups, when the source of the carboxyl group is a monoprotic acid, and at least 2.0 equivalents of carboxyl groups, when the source of such groups is a diprotic acid, per equivalent of 1,2-epoxy groups in the epoxy resin, said polymer having a weight average molecular weight (determined by light scattering) of about 10000-160000 and an acid number of 100-500;

(C) at least 1.25 equivalents of a tertiary amine per equivalent of 1,2-epoxy groups in the epoxy resin, said tertiary amine being selected from the group consisting of R<sub>1</sub>R<sub>2</sub>R<sub>3</sub>N, pyridine, N-methylpyrrolidine, N-methyl piperidine, N-methyl pyrrolidine, N-methyl morpholine, and mixtures thereof and wherein R<sub>1</sub> and R<sub>2</sub> are substituted or unsubstituted monovalent alkyl groups containing one or two carbon atoms in the alkyl portion and R<sub>3</sub> is a substituted or unsubstituted monovalent alkyl group containing 1-4 carbon atoms;

(D) optionally, 10-90% of the amount required for stoichiometric reaction with the carboxyl-functional polymer of (B) of at least one primary, secondary or tertiary amine or monofunctional quaternary ammonium hydroxide;

wherein for increasing ratios of carboxyl groups to 1,2-epoxy groups, the amount of amine is increased to keep the carboxyl-functional polymer water dispersible;

(E) said second carboxyl-functional polymer being blended in an amount of 5 to 200 parts by weight per 100 parts by weight of (A) plus (B) and having a weight average mo-



molecular weight (determined by light scattering) of about 10,000-160,000 and an acid number of 50-500, said acid number being at least 50 units different than the acid number of said first carboxyl-functional polymer, said second reaction product containing not less than 30% by weight of epoxy resin (A) based on the total of (A), (B) and (E).

#### 4,423,166 UNGELLED

**POLYEPOXIDE-POLYOXYALKYLENEPOLYAMINE RESINS, AQUEOUS DISPERSIONS THEREOF, AND THEIR USE IN CATIONIC ELECTRODEPOSITION**  
Thomas C. Moriarty, Allison Park, and William J. Gelger, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 284,865, Jul. 20, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,552

Int. Cl.<sup>3</sup> C08L 63/02; C08G 59/14

U.S. Cl. 523-414 16 Claims

1. An ungelled resin formed from reacting:  
(A) a polyepoxide and  
(B) a polyoxyalkylene polyamine;  
the ratio of equivalents of active hydrogens in (B), with primary amine groups being considered monofunctional, to equivalents of epoxy in (A) being within the range of 1.20 to 1.70:1.

#### 4,423,167

**RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM**  
Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 288,238

Int. Cl.<sup>3</sup> C08L 63/02

U.S. Cl. 523-414 12 Claims

1. A coating composition which is heat curable to give a solvent-resistant coating comprising:  
(A) a polymeric polyol,  
(B) a polyester crosslinking agent having at least two beta-alkoxyester groups per molecule,  
(C) a transesterification catalyst;  
said composition being substantially free of polyesters containing more than one beta-hydroxyester group per molecule.

#### 4,423,168

**RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM**  
Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 288,241

Int. Cl.<sup>3</sup> C08L 63/02

U.S. Cl. 523-414 9 Claims

1. A coating composition which is heat curable to give a solvent-resistant coating comprising:  
(A) a polymeric polyol,  
(B) a crosslinking agent having at least two beta-amido ester groups per molecule,  
(C) a transesterification catalyst.

#### 4,423,169

**RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM**  
Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 288,240

Int. Cl.<sup>3</sup> C08L 63/02

U.S. Cl. 523-414 18 Claims

1. A coating composition which is heat curable to give a solvent-resistant coating comprising:  
(A) a polymeric polyol,

(B) a crosslinking agent having at least two beta- and/or gamma-ester ester groups per molecule,  
(C) a transesterification catalyst.

#### 4,423,170

**ONE COMPONENT WATER REDUCED EPOXY ADHESIVES**

Harold G. Waddill, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,684

Int. Cl.<sup>3</sup> C08L 63/00, 63/02; C08G 59/50

U.S. Cl. 523-417 13 Claims

1. An epoxy resin composition comprising:  
(A) a diepoxide comprising the condensation product of  
(a) epichlorohydrin with  
(b) an aromatic or aliphatic diol,  
which diepoxide is partially reacted with a polyoxyalkyleneamine of molecular weight of about 900 to about 2500; and  
(B) a latent curative agent in an aqueous medium.

#### 4,423,171

**TERTIARY ALCOHOL-DIBLOCKED DIISOCYANATE DIUREA OLIGOMERS AND COATING COMPOSITIONS COMPRISING SAME**

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 334,792

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.<sup>3</sup> C08G 18/28; C08K 5/05, 5/07; C08L 63/00

U.S. Cl. 523-454 37 Claims

1. A chain-extendable, crosslinkable tertiary alcohol-diblocked diisocyanate diurea oligomer of number average molecular weight about 300 to about 5000 comprising the reaction product of diamine of molecular weight about 50 to about 700, with half-blocked organic diisocyanate of molecular weight about 120 to about 2000 in molar ratio of about 1:2, respectively, said half-blocked organic diisocyanate comprising the reaction product of an alcohol blocking agent bearing a tertiary hydroxyl group, with organic diisocyanate in molar ratio of about 1:1, said oligomer having a de-blocking temperature of about 80° C. to about 220° C.

15. A solvent based resin composition comprising:  
A. a chain-extendable, crosslinkable tertiary alcohol-diblocked diisocyanate diurea oligomer of number average molecular weight about 300 to about 5000 comprising the reaction product of diamine of molecular weight of about 50 to about 700, with half-blocked organic diisocyanate of molecular weight about 120 to about 2000 in molar ratio of about 1:2, respectively, said half-blocked organic diisocyanate comprising the reaction product of an alcohol of 4 to 20 carbons bearing a tertiary hydroxyl group, with organic diisocyanate in molar ratio of about 1:1, said oligomer having de-blocking temperature of about 80° C. to about 220° C.;  
B. polyepoxide having 2 to about 10 epoxide groups and having a molecular weight of about 100 to about 1000, in weight ratio to said oligomer of about 1:1 to about 1:10; and  
C. organic solvent.

#### 4,423,172

**SELF-CURABLE COATING COMPOSITION FOR CATHODE-PRECIPTATING ELECTRODEPOSITION**  
Yutaka Otsuki, Yokohama; Yoshihiko Araki, Tokyo; Hiroyoshi Omika, Yokohama; Hajime Hara, Fujisawa, and Kazuo Aoyama, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

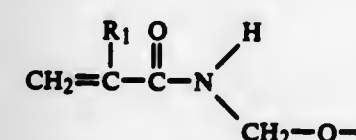
Filed Mar. 30, 1982, Ser. No. 363,427

Claims priority, application Japan, Apr. 3, 1981, 56-50359

Int. Cl.<sup>3</sup> C08K 5/07

U.S. Cl. 523-454 8 Claims

1. A self-curable coating composition for cathode-precipitating electrodeposition comprising: (i) 95-50 parts of Resin (A) which is a high molecular weight compound having a number average molecular weight of 500-50,000 and containing 50-200 millimols of a tertiary amino group per 100 grams of Resin (A) and 200-2,000 millimols of a non-conjugated carbon-carbon double bond per 100 grams of Resin (A); and (ii) 5-50 parts of Resin (B) which is a high molecular weight epoxy resin having a number average molecular weight of 300-30,000 and containing 50-300 millimols of a tertiary amino group per 100 grams of Resin (B) and 50-600 millimols of a group of the formula



wherein R<sub>1</sub> is hydrogen or a methyl group, per 100 grams of Resin (B), said composition being neutralized with an acid to become water-soluble or water-dispersible.

#### 4,423,173

**LIGNOSULFONATE-PHENOL-FORMALDEHYDE RESIN BINDER**

Eugene R. Janiga, Roselle, Ill., assignor to Masonite Corporation, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,841

Int. Cl.<sup>3</sup> C08L 97/02, 97/00, 61/14; C08H 5/02

U.S. Cl. 524-14 20 Claims

1. A method of manufacturing a lignosulfonate-phenol-formaldehyde resin comprising heating a mixture of phenol, formaldehyde, lignosulfonate and alkali wherein said lignosulfonate comprises about 5 to about 80 percent of the total weight of phenol, formaldehyde and lignosulfonate and wherein said lignosulfonate is mixed with said phenol and formaldehyde under alkaline conditions before substantial reaction between said phenol and said formaldehyde; and heating said mixture to form a lignosulfonate-phenol-formaldehyde polymer.

#### 4,423,174

**SYNTHETIC RESIN COMPOSITIONS CONTAINING 2,2,6,6-TETRAMETHYL PIPERIDYL ETHERS**

Motonobu Minagawa, Koshigaya; Naohiro Kubota, Ageo, and Ryoji Kimura, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

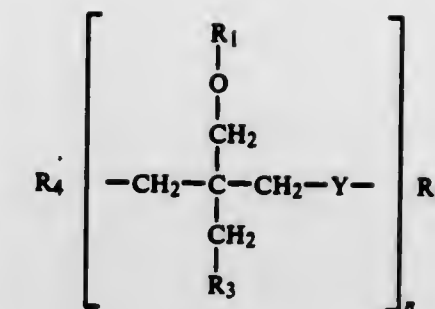
Filed Jul. 26, 1982, Ser. No. 401,481

Claims priority, application Japan, Aug. 20, 1981, 56-129349

Int. Cl.<sup>3</sup> C07D 401/02, 405/30; C08K 5/34, 5/51

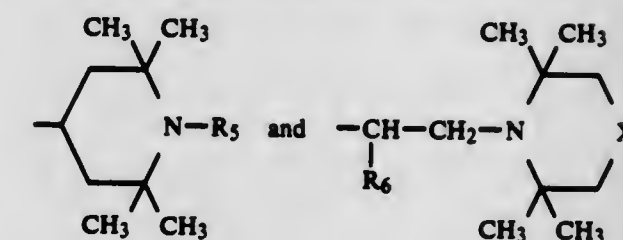
U.S. Cl. 524-99 43 Claims

1. A stabilizer composition for synthetic resins comprising: (1) at least one 2,2,6,6-tetramethyl piperidyl ether having the formula:

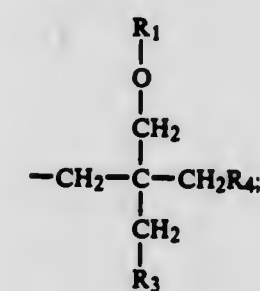


wherein:

R<sub>1</sub> is selected from the group consisting of



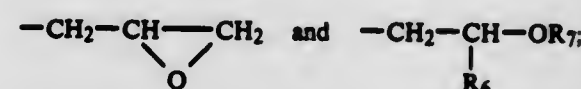
R<sub>2</sub> is selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, saturated and unsaturated acyl having from one to about eighteen carbon atoms; R<sub>1</sub> and



R<sub>3</sub> is selected from the group consisting of hydrogen, alkyl and hydroxyalkyl having from one to about eighteen carbon atoms; cycloalkyl and alkylphenyl having from six to about eighteen carbon atoms; and -OR<sub>1</sub>;

R<sub>4</sub> is selected from the group consisting of hydroxyl, alkoxy having from one to about ten carbon atoms, acyloxy having from one to about ten carbon atoms, and -OR<sub>1</sub>;

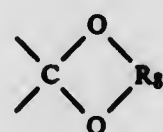
R<sub>5</sub> is selected from the group consisting of hydrogen, oxy, alkyl, hydroxyalkyl and alkenyl having from one to about eighteen carbon atoms; cycloalkyl and alkylphenyl having from six to about eighteen carbon atoms;



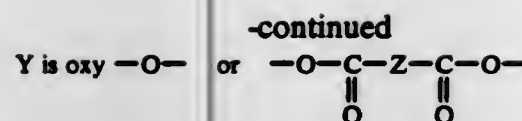
R<sub>6</sub> is selected from the group consisting of hydrogen, alkyl and hydroxyalkyl having from one to about eighteen carbon atoms; cycloalkyl and alkylphenyl having from six to about eighteen carbon atoms;

R<sub>7</sub> is hydrogen or acyl having from one to about eighteen carbon atoms;

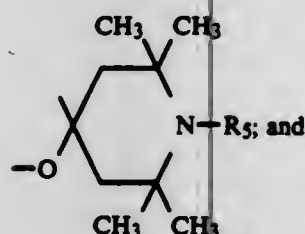
R<sub>8</sub> is alkylene having from one to about ten carbon atoms; X is selected from the group consisting of methylene, -CH<sub>2</sub>-, carbonyl C=O, >CH-O-R<sub>7</sub> and



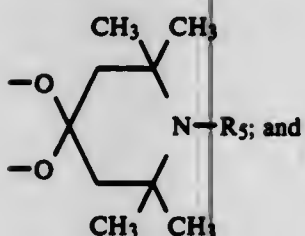




where Z is alkylene or thioalkylene having from two to about ten carbon atoms; or phenylene having from six to about ten carbon atoms; and n is a number from 1 to 50; R<sub>2</sub> and R<sub>3</sub>; or R<sub>2</sub> and R<sub>4</sub> can be taken together to form



when n is 1 and Y is —O—, R<sub>2</sub> and R<sub>3</sub> or R<sub>2</sub> and R<sub>4</sub> can be connected together as a C—C linkage to form a cyclic ring, or



(2) at least one phenolic antioxidant having at least one phenolic hydroxyl group, and at least one phenolic nucleus, and from about eight to about three hundred carbon atoms.

## 4,423,175

**HALOGEN-CONTAINING RESIN COMPOSITIONS STABILIZED BY METHIONINE DIKETOPIPERAZINE**  
Nobuyoshi Kitamura, Sagami-hara; Nobuo Ito, Oosomachi, and Koji Takeuchi, Yokohama, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan  
Continuation of Ser. No. 348,274, Feb. 12, 1982, Pat. No. 4,384,059. This application Feb. 7, 1983, Ser. No. 464,698  
Claims priority, application Japan, Feb. 26, 1981, 56-27270; Feb. 26, 1981, 56-27271

Int. Cl.<sup>3</sup> C08K 5/37

U.S. Cl. 524—100

7 Claims

1. A halogen-containing resin composition, which comprises:
- (A) a halogen-containing resin;
  - (B) as a stabilizer an amount sufficient for thermal stabilization of methionine diketopiperazine; and
  - (C) at least one stabilizer selected from the group consisting of alkaline earth metal, zinc and organotin compounds.

## 4,423,176

**MOLDING COMPOSITIONS COMPRISING POLYPHENYLENE ETHER, POLYSULFONE AND VINYL AROMATIC-DIENE BLOCK COPOLYMER**  
Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 106,921, Dec. 26, 1979, abandoned.

This application May 11, 1981, Ser. No. 262,702

Int. Cl.<sup>3</sup> C08K 5/51

U.S. Cl. 524—153

13 Claims

1. A molding composition comprising a polyphenylene ether, a polysulfone, an effective amount of a plasticizer consisting essentially of an aromatic phosphate and an impact strength improving amount of a selectively hydrogenated block copolymer of the linear or radial teleblock type compris-

ing blocks of polymerized vinyl aromatic compound and blocks of polymerized diene.

## 4,423,177

**THICKENABLE COMPOSITION BASED ON AN ADDUCT OF ALKADIENE POLYMERS AND ACID ANHYDRIDE**

Guy Senatore, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 5, 1982, Ser. No. 355,277

Int. Cl.<sup>3</sup> C08K 3/22

U.S. Cl. 524—251

10 Claims

1. A composition comprising an admixture of
- (a) an adduct of a medium to high vinyl alkadiene polymer, said polymer having about 60 to about 95% of the alkadiene units bonded in the 1,2-mode, and a cyclic or acyclic anhydride of a mono or dicarboxylic acid,
  - (b) a thickening agent selected from the group consisting of alkaline earth metal oxides, alkaline earth metal hydroxides and mixtures thereof,
  - (c) an organic peroxide,
  - (d) a thickening additive selected from the group consisting of water, alkanols, phenols, amines and mixtures thereof.

## 4,423,178

**PLASTICIZERS FOR VINYL CHLORIDE POLYMERS**  
James T. Renshaw, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 150,877, May 19, 1980, Pat. No. 4,313,866, which is a continuation-in-part of Ser. No. 972,762, Dec. 26, 1978, abandoned. This application Oct. 28, 1981, Ser. No. 315,687

Int. Cl.<sup>3</sup> C08K 5/10

U.S. Cl. 524—287

14 Claims

1. A solid film prepared by casting a film of a vinyl chloride polymer composition on a solid surface, fusing the cast film and then cooling the fused film below its freezing point, said composition comprising a finely divided vinyl chloride polymer essentially uniformly dispersed in a plasticizing amount of a plasticizer consisting essentially of, by weight, from about 50% to about 90% prime ester at least about 40 parts per hundred parts by weight of which is aromatic diester selected from alkyl benzyl succinates, glutarates and mixtures thereof in which said alkyl contains from about 3 to about 6 carbon atoms, up to about 20% essentially non-olefinic hydrocarbon boiling between about 200° and about 325° C. and from about 10% to about 50% non-aromatic diester having a molecular weight from about 230 to about 300.

11. A method which comprises dispersing finely divided particles of a vinyl chloride polymer in a plasticizing amount of a plasticizer consisting essentially of, by weight, from about 50% to about 90% prime ester at least about 40 parts per hundred parts by weight of which is aromatic diester selected from alkyl benzyl succinates, glutarates and mixtures thereof in which said alkyl contains from about 3 to about 6 carbon atoms, up to about 20% essentially non-olefinic hydrocarbon boiling between about 200° and about 325° C. and from about 10% to about 50% non-aromatic diester having a molecular weight from about 230 to about 300, casting a film of the resulting composition on a solid surface, fusing the cast film and then cooling the fused film to provide a solid film.

## 4,423,179

**DIMER ACID BASED POLYURETHANE COATING COMPOSITIONS**

Matthew Guagliardo, Bloomfield, N.J., assignor to Inmont, Clifton, N.J.

Continuation-in-part of Ser. No. 306,817, Sep. 29, 1981, abandoned. This application Mar. 21, 1983, Ser. No. 476,951  
Int. Cl.<sup>3</sup> C09D 3/52, 3/72

U.S. Cl. 524—539

17 Claims

1. A coating composition consisting essentially of
- (A) a urethane reaction product of a diisocyanate and a polyester polyol wherein the polyester polyol has a molecular weight of from about 1200 to about 2500 and is formed from
  - (1) an alcohol component having an average functionality of at least 2.0, and
  - (2) an acid component consisting essentially of dimer acid said urethane reaction product having a hydroxyl value of at least 10; and
  - (B) an aminoplast resin.

## 4,423,180

**ORGANIC ZIRCONIUM COMPOUNDS TO REDUCE VISCOSITY OF FILLED LIQUID POLYMERS**

Bernardas Brizgys, Southgate, and James A. Gallagher, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 12, 1982, Ser. No. 407,654

Int. Cl.<sup>3</sup> C08K 5/06, 5/09

U.S. Cl. 524—394

12 Claims

1. A composition useful in the preparation of a polyurethane comprising an inorganic filler, a liquid polymer containing at least two active hydrogen-containing groups per molecule, as determined by the Zerewitinoff Method, and an effective amount of a viscosity reducing organic zirconium compound selected from the group consisting of zirconium tetraacetate and the zirconium salts of aliphatic, aromatic and arylaliphatic carboxylic acids, wherein said aliphatic carboxylic acids have 1 to about 18 carbon atoms; said aromatic carboxylic acids have 1 to 3 aromatic rings; and said arylaliphatic carboxylic acids have 1 to about 18 aliphatic carbon atoms and 1 to 3 aromatic rings.

## 4,423,181

**POLYETHYLENE-POLYBUTADIENE BLEND**  
Eric G. Kent, Sarnia, Canada, assignor to Polymer Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 232,625, Feb. 9, 1981, abandoned. This application Jun. 14, 1982, Ser. No. 388,223  
Claims priority, application Canada, Mar. 10, 1980, 347358

Int. Cl.<sup>3</sup> C08L 9/00, 23/06; C08K 3/00, 3/26

U.S. Cl. 524—425

6 Claims

1. A process for the production of a thermoplastic composition having improved low temperature impact properties comprising, per 100 parts by weight of polymer components, from about 80 to about 95 parts by weight of polyethylene having a density of from about 0.95 to about 0.965 g/cm<sup>3</sup> and from about 5 to about 20 parts by weight of an unhydrogenated polybutadiene having from about 85 to about 98 percent of 1,4-content and having from about 95 to 100 percent of the theoretical unsaturation, in which process the polyethylene is supplied to a two roll mill or an internal mixer preheated to a temperature of about 120° to 155° C. and fluxed for 2 to 3 minutes, the polybutadiene is added and the mixing continued for about 5 to 7 minutes to produce a uniform mixture, after which the mixture is removed and cooled.

## 4,423,182

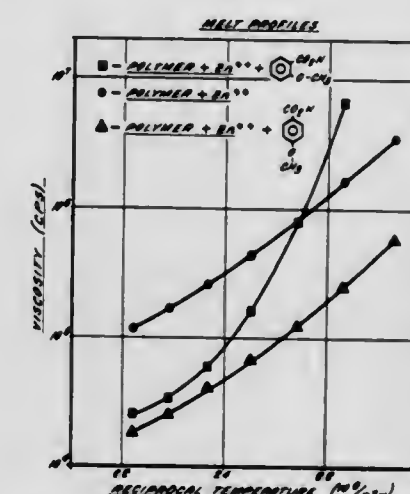
**PRESSURE SENSITIVE HOT MELT ADHESIVES**  
Benjamin Bartman, Maple Glen, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 339,202, Jan. 13, 1982, Pat. No. 4,360,638. This application Feb. 18, 1982, Ser. No. 349,725  
The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08K 5/09

U.S. Cl. 524—367

12 Claims



1. A composition comprising
- (a) an organic polymer containing at least one carboxylic group per polymer molecule, and
  - (b) at least one miscible metal salt of an o-methoxy aryl acid in a ratio of at least 10<sup>-3</sup> moles of total metal salt to moles of polymer carboxylic acid.

## 4,423,183

**FLUOROELASTOMER FILM COMPOSITIONS AND SOLUTIONS CONTAINING FATTY POLYAMIDE CURATIVES**

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Continuation of Ser. No. 187,721, Sep. 16, 1980, abandoned, which is a continuation of Ser. No. 178,895, Aug. 18, 1980, abandoned. This application Nov. 25, 1981, Ser. No. 324,845

Int. Cl.<sup>3</sup> C08F 8/30

U.S. Cl. 524—546

5 Claims

1. An improved cured fluoroelastomer film composition comprising:
- a fluoroelastomer gum; and
  - from about 0.5 to 10 parts of a fatty polyamide curative, per 100 parts of rubber the improvement wherein said film composition is devoid of metal oxides.
2. An improved fluoroelastomer solution comprising:
- a fluoroelastomer gum;
  - from about 0.5 to 10 parts of a fatty polyamide curative per 100 parts of rubber; and
  - a solvent for said gum and said curative with the provision that said solution is devoid of metal oxides.

## 4,423,184

**SYNTHETIC SUPERABSORBENT FIBERS**

Stephen L. Koplow, Plainsboro, and Pronoy K. Chatterjee, Spotswood, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Sep. 8, 1981, Ser. No. 300,086

Int. Cl.<sup>3</sup> C08F 255/00

U.S. Cl. 525—57

9 Claims

1. Hydrophilic, water retentive synthetic wood pulp fibers capable of forming low density fluff and comprising polyolefin and polyvinyl alcohol, said polyvinyl alcohol having grafted thereto hydrolyzed ethylene acrylate acrylonitrile copolymer, said fibers having been freeze dried.



2. Hydrophilic, water retentive synthetic wood pulp fibers capable of forming low density fluff and comprising polyolefin and polyvinyl alcohol, said polyvinyl alcohol having grafted thereto hydrolyzed ethylene acrylate acrylonitrile copolymer, said fibers having been solvent dried.

4,423,185

## THERMOPLASTIC RESINOUS COMPOSITION

Koichi Matsumoto; Yoshihiko Katayama, and Hisaya Sakurai, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1980, Ser. No. 126,273

Claims priority, application Japan, Mar. 8, 1979, 54-26136; Mar. 27, 1979, 54-35070; Apr. 13, 1979, 54-44272; Jun. 29, 1979, 54-81446; Jul. 4, 1979, 54-8396

Int. Cl.<sup>3</sup> C08L 75/04, 51/06

U.S. Cl. 525—66

4 Claims

1. A thermoplastic resinous composition consisting essentially of, based on the weight of the thermoplastic resinous composition,

- (a) 5% to 70% by weight of a thermoplastic polyurethane elastomer, and
- (b) 30% to 95% by weight of a modified polyolefin which is an olefin polymer having grafted thereon 0.005% through 5% by mole of maleic acid or maleic anhydride per mole of the recurring unit in the olefin polymer.

4,423,186

## IMPACT RESISTANT POLYAMIDE MOULDING COMPOSITIONS

Ulrich Grigo, New Martinsville, W. Va.; Friedrich Fahnler, and Rudolf Binsack, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,174

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151441

Int. Cl.<sup>3</sup> C08L 31/00, 51/04, 77/00

U.S. Cl. 525—66

9 Claims

- I. from 35 to 99% by weight of a polyamide, and
  - II. from 65 to 1% by weight of a partly cross-linked polymer mixture containing a gel proportion of from 5 to 95% by weight and consisting of:
    - (a) from 5 to 80% by weight of (a1) a copolymer of ethylene with (meth)acrylic acid and/or with a (meth)acrylate containing a C<sub>1</sub>—C<sub>8</sub> alcohol residue (a2) a graft product of polyethylene or an ethylene/vinyl acetate copolymer as the graft substrate and (meth)acrylic acid and/or a (meth)acrylate containing a C<sub>1</sub>—C<sub>8</sub> alcohol residue as the grafted-on monomers or mixtures of (a1) and (a2) and
    - (b) from 95 to 20% by weight of a polybutadiene rubber having a Mooney viscosity ML<sub>1+4</sub> (100) of from 5 to 100 and having a gel proportion of less than 2% by weight, determined in boiling chlorobenzene,
  - III. optionally conventional additives, and
  - IV. optionally from 10 to 60% by weight, based on the total moulding composition, of fillers of reinforcing materials or mixtures thereof,
- the total of I and III and of (a) and (b) being 100% by weight in each case.

4,423,187

## THERMOPLASTIC MOLDING MATERIALS

Franz Brandstetter, Neustadt; Adolf Echte, Ludwigshafen; Juergen Hambrecht, Neckargemuend-Dilsberg; Karl H. Illers, Otterstadt, and Edmund Priebe, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 356,067

Int. Cl.<sup>3</sup> C08L 61/04

U.S. Cl. 525—68

3 Claims

1. A thermoplastic molding material based on an impact

- resistant polystyrene and a polyphenylene ether comprising
- (a) 5 to 95 parts by weight of an impact resistant polymer consisting of styrene alone or styrene and up to 10 percent by weight of acrylonitrile, maleic anhydride or methacrylic acid esters wherein
  - (1) 5 to 95 parts by weight of a flexible component of the impact resistant polymer consisting of a graft polymer of styrene and a compound selected from the group consisting of polybutadiene and styrene butadiene block copolymer have a glass temperature below -70° C. and
  - (2) 95 to 5 parts by weight of a flexible component of the impact resistant polymer, containing a polymer of acrylic acid ester as the rubber component made by grafting styrene to a cross-linked acrylate polymer have a glass temperature in the range from 0° to -70° C. and
  - (b) 95 to 50 parts by weight of a polyphenylene ether.

4,423,188

## VINYL HALIDE POLYMER BLENDS OF ENHANCED IMPACT RESISTANCE

Gilbert Witschard, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 172,929, Jul. 28, 1980, Pat. No. 4,319,002, which is a continuation of Ser. No. 881,949, Feb. 28, 1978, abandoned. This application Mar. 8, 1982, Ser. No. 355,425

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C08L 51/00, 53/00

U.S. Cl. 525—71

30 Claims

1. In a vinyl halide polymer composition which is capable of being molded to an impact resistant, substantially transparent to translucent article and which comprises a blend of a vinyl halide polymer wherein the major proportion of the monomer units are vinyl halide monomer residues and a polymeric impact modifier for polyvinyl halide wherein the monomer units consist essentially of methyl methacrylate, 1,3-butadiene and styrene residues and which has about the same refractive index as said vinyl halide polymer, the improvement wherein the blend also comprises a block thermoplastic elastomer wherein the major proportion of the monomer units are residues of a mono-alkenyl-substituted aromatic compound of a benzene or naphthalene series of 8 to 20 atoms and a conjugated alkadiene hydrocarbon of 4 to 10 carbon atoms, said block elastomer being normally incompatible with said vinyl halide polymer, said vinyl halide polymer being present in a proportion of about 50 to about 99 weight percent in said blend, and said polymeric impact modifier and said block elastomer together being present in a proportion of about one to about 50 weight percent in said blend with the weight ratio of said block elastomer to said polymeric impact modifier being about 5:1 to about 1:5.

4,423,189

## COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN, LOW MOLECULAR WEIGHT POLYSTYRENE AND A BLOCK COPOLYMER

William R. Haaf, Voorheesville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 28, 1981, Ser. No. 315,893

Int. Cl.<sup>3</sup> C08L 53/00

U.S. Cl. 525—92

12 Claims

1. A thermoplastic composition which comprises:
- (a) a polyphenylene ether resin;
  - (b) a low molecular weight homopolystyrene having a number average molecular weight in the range between about 400 and 65,000; and
  - (c) a hydrogenated block copolymer of an alkenyl aromatic compound and a conjugated diene.

4,423,190

## BLOCK COPOLYMER MIXTURE OF CONJUGATED DIENE AND VINYL AROMATIC HYDROCARBON

Isaburo Fukawa; Kunio Satake, both of Yokohamashi; Tsuyoshi Yamada, Yokosukashi; Kiyoshi Hayakawa, Yokohamashi, and Yasushi Sato, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 58,940, Jul. 19, 1979, abandoned, which is a division of Ser. No. 609,684, Sep. 2, 1975, Pat. No. 4,208,356. This application Dec. 23, 1981, Ser. No. 333,656 Claims priority, application Japan, Sep. 17, 1974, 49-105970; Mar. 7, 1975, 50-27064

Int. Cl.<sup>3</sup> C08F 297/04

U.S. Cl. 525—98

1 Claim

1. A block copolymer mixture of conjugated diene and vinylaromatic hydrocarbon produced by the following two step polymerization:

a first step (A) for preparing (a) a living block copolymer having the following general formula:



where A is a polymer block consisting mainly of conjugated diene, B a polymer block consisting mainly of vinylaromatic hydrocarbons, and n is an integer of 1 or more, by polymerizing a conjugated diene and a vinylaromatic hydrocarbon, in a ratio by weight of vinylaromatic hydrocarbon to conjugated diene of 60/40 or less, the monomers being employed in an amount of 1 to 80% by weight of the total monomers to be used in the two polymerization steps, using an organolithium compound as a catalyst and a solvent consisting mainly of aliphatic hydrocarbon, the polymers not being inactivated with an inactivating agent, and

a second step (B) of (1) preparing (b) a vinylaromatic hydrocarbon polymer and (2) simultaneously extending block copolymer chains obtained in said step (A), by adding to the living block copolymer obtained in said step (A), a vinylaromatic hydrocarbon, the monomer being employed in an amount of 99 to 20% by weight of total monomers to be used in the two polymerization steps, and adding an organolithium compound as a catalyst and a solvent consisting mainly of an aliphatic hydrocarbon, and polymerizing the said monomer to simultaneously obtain polymer (b) by the freshly added organolithium compound and an ultimate block copolymer by extending the chains of the living block copolymer obtained in said step (A), thereby obtaining a block copolymer mixture;

the block copolymer mixture being characterized in that the structure of the polymer (b) obtained in the second polymerization step (B) alone is substantially the same as the structure of the portion of the ultimate block copolymer obtained by extending, in the second step, the chains of the living block copolymer obtained in the first polymerization step (A), and the block copolymer mixture having a ratio of the vinylaromatic hydrocarbon content, in weight percent, of the ultimate block copolymer to the vinylaromatic hydrocarbon content, in weight percent, of the polymer (b) of at least 1/1.8, and having a ratio of vinylaromatic hydrocarbon content to conjugated diene content of 60/40 to 95/5.

4,423,191

## HIGH FREQUENCY ELECTRIC FIELD CURING OF POLYMERIC COMPOSITES

Richard E. Haven, Mountain View, Calif., and Nam P. Suh, Sudbury, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 1, 1981, Ser. No. 259,657

Int. Cl.<sup>3</sup> C08L 67/06

U.S. Cl. 525—169

16 Claims

1. A method for curing a resinous composition comprising an admixture of a thermosetting resin and dielectrically lossy particles, said lossy particles having a dielectric constant sub-

stantially the same as the dielectric constant of the resin, said method comprising subjecting said admixture to a high frequency alternating electric field for sufficient time to heat the lossy particles and initiate the chemical reaction to cure the resin.

4,423,192

## LUBRICATED THERMOPLASTIC COMPOSITIONS OF POLYVINYLIDENE FLUORIDE

Huynh Van Lang, Lyons, and Jean-Paul Ollivier, Paris, both of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 173,879, Jul. 31, 1980, abandoned, and Ser. No. 916,279, Jun. 16, 1978, abandoned. This application Jun. 16, 1982, Ser. No. 388,948

Claims priority, application France, Jun. 24, 1977, 77 19382 Int. Cl.<sup>3</sup> C08L 27/18

U.S. Cl. 525—199

3 Claims

1. A process for molding polyvinylidene fluoride compositions using a lubricated polyvinylidene consisting essentially of:

- (a) blending said polyvinylidene fluoride composition with from about 0.1 W% to about 10 W% low molecular weight polytetrafluoroethylene wherein from about 0.1 W% to about 0.8 W% low molecular weight polytetrafluoroethylene is used to lubricate high molecular weight polyvinylidene fluoride compositions and from about 0.5 W% to about 10 W% low molecular weight polytetrafluoroethylene is used to lubricate medium and low molecular weight polyvinylidene fluoride compositions, said polytetrafluoroethylene having a molecular weight of about 800,000 or less and being sufficiently low in molecular weight to reduce the viscosity of said polyvinylidene fluoride in its molten state, said polytetrafluoroethylene having at least 90 mole percent tetrafluoroethylene groups, and said polyvinylidene fluoride having at least 90 mole percent vinylidene fluoride groups and having a melt index when measured at 250° C. of: (1) from about 50 to 1000 when it is a high molecular weight polymer, (2) from about 1000 to 4000 when it is a medium molecular polymer and (3) over 4000 when it is a low molecular weight polymer; and
- (b) molding said lubricated polyvinylidene fluoride composition.

3. A thermoplastic product produced according to the process of claim 1.

4,423,193

## DEHYDROCHLORINATION OF VINYL CHLORIDE RESINS FOLLOWED BY GRAFT COPOLYMERIZATION WITH COPOLYMERIZABLE MONOMERS

Earl G. Melby, Uniontown; Harry W. Cocain, Cuyahoga Falls, and Hubert J. Fabris, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 287,462, Jul. 27, 1981, abandoned. This application Sep. 1, 1982, Ser. No. 414,090

Int. Cl.<sup>3</sup> C08F 6/00, 8/26, 263/04, 259/02

U.S. Cl. 525—296

8 Claims

1. The method which comprises dehydrochlorinating a vinylchloride resin selected from the group consisting of homopolyvinylchloride, a copolymer of vinylchloride and vinyl acetate containing up to about 50% by weight of vinyl acetate and a copolymer of vinylchloride and vinylidene chloride containing up to about 50% by weight of vinylidene chloride and mixtures thereof as finely divided particles suspended in water, by heating said resin in said water at from about 50 to 150 psi and at a temperature of from about 150° to 180° C. for from about 1 to 2 hours to remove not over about 3% by weight, or from about 1 to 2% by weight, of chlorine from said resin, said water containing dissolved therein from about 0.1 to 5 parts by weight per 100 parts by weight of said resin of a material to prevent agglomeration of said resin during dehydrochlorination and being selected from the group consisting



of a solid water soluble electrolyte and a weak base, where said electrolyte is selected from the group consisting of the lithium, sodium, potassium, magnesium, calcium, strontium and barium bromide, chloride and iodide salts and mixtures of the same, ammonium chloride and the sodium, potassium, lithium and magnesium acetates and where said weak base is selected from the group consisting of the lithium, sodium and potassium carbonates and phosphates and mixtures of the same, and, in said water, free radical aqueous graft suspension polymerizing on said dehydrochlorinated vinylchloride resin a monomer containing a polymerizable ethylenically unsaturated double bond and being selected from the group consisting of maides, nitriles, acrylates, alkacrylates, dienes and vinyl benzenes and mixtures thereof, said monomer being used in the amount of from about 50 to 200 parts by weight per 100 parts by weight of said dehydrochlorinated resin.

4,423,194

# POLYQUATERNARY AMMONIUM COMPOUNDS, THEIR PREPARATION, THEIR USE IN THE PRODUCTION OF PAPER AND PAPER TREATMENT AGENTS CONTAINING THEM

Wilfried Löbach, Bonn; Peter Haas, Haan; Günter Kolb; Güter Sackmann, both of Leverkusen, and Joachim Probst, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 180,556, Aug. 22, 1980, abandoned.

This application Aug. 23, 1982, Ser. No. 410,744

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936239

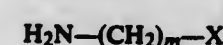
Int. Cl.<sup>3</sup> C08F 8/32

U.S. Cl. 525—327.6

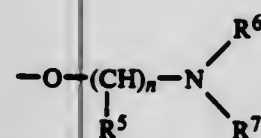
6 Claims

1. A water-soluble polyquaternary compound obtained by reaction of:

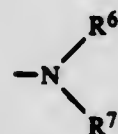
- (A) a copolymer of maleic anhydride with an olefin selected from the group consisting of styrene, diisobutylene, isobutylene and propylene, said copolymer having a number average molecular weight of at least 10,000, with
- (B) an amine of the general formula



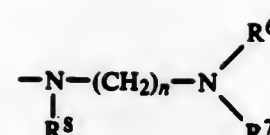
in which  
m can be an integer between 2 and 5 and  
X the formulae



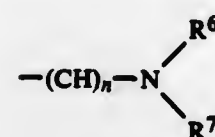
in which  
n represents an integer between 2 and 5,  
R<sup>5</sup> represents hydrogen or C<sub>1</sub>- to C<sub>8</sub>-alkyl which can be substituted by



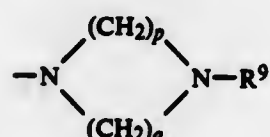
and  
R<sup>6</sup> and R<sup>7</sup> independently of one another represent C<sub>1</sub>- to C<sub>5</sub>-alkyl, which can be substituted by hydroxyl, or together represent C<sub>2</sub>- to C<sub>6</sub>-alkylene,



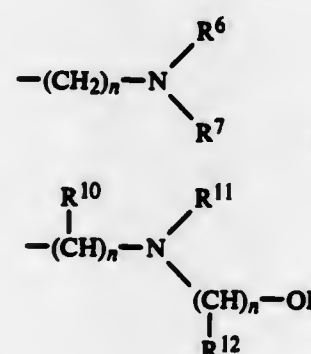
in which  
R<sup>8</sup> represents C<sub>1</sub>-C<sub>8</sub>-alkyl or the radical



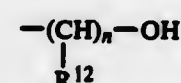
and  
n, R<sup>6</sup> and R<sup>7</sup> have the above-mentioned meaning



in which  
p and q independently of one another stand for an integer between 2 and 5 and  
R<sup>9</sup> represents C<sub>1</sub>- to C<sub>8</sub>-alkyl, which can be substituted by hydroxyl, or the radical



in which  
R<sup>10</sup> and R<sup>12</sup> independently of one another represent hydrogen or C<sub>1</sub>- to C<sub>8</sub>-alkyl and  
R<sup>11</sup> represents C<sub>1</sub>- to C<sub>5</sub>-alkyl or the radical



and;  
(C) alkylation of the reaction product of said copolymer with said amine.

4,423,195

# OCULAR MEMBRANE AND METHOD FOR PREPARATION THEREOF

William S. Covington, West Cornwall, Conn., assignor to Danker Laboratories, Inc., Parsippany, N.J.

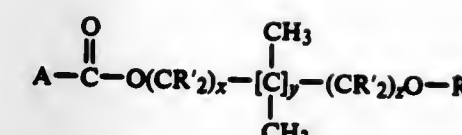
Division of Ser. No. 973,818, Dec. 28, 1978, Pat. No. 4,245,069, which is a continuation-in-part of Ser. No. 677,246, Apr. 15, 1976, Pat. No. 4,169,119. This application Dec. 22, 1980, Ser. No. 218,950

Int. Cl.<sup>3</sup> C08F 283/00

U.S. Cl. 525—479

20 Claims

1. An ocular membrane formed from a composition comprising a uniform polymer selected from the group consisting of copolymers and terpolymers of an addition cross-linked polysiloxane and one or more esters having the formula:

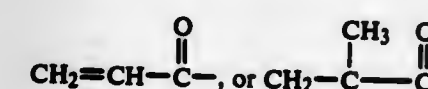


wherein:

A is CH<sub>2</sub>=CH-or



R<sup>1</sup> may be the same or different in each occurrence and may be hydrogen or methyl,  
R is hydrogen, lower alkyl having one to three carbon atoms,



x and z are integers from 0 to 4,

y is 0 or 1,

the sum of x and z is one or more, and when y is 1, x and z are equal,

the amount of the ester in the polymer being effective to provide the composition with sufficient transparency, lipophobicity, mucophobicity, and surface wettability, for wearing in contact with the human eye but less than that which would make the composition water swellable.

4,423,196

# COPOLYMERS OF PROPYLENE AND ALLYL ALCOHOL

Klaus-Peter Arlt, Senden; Rudolf Binsack, Krefeld; Ulrich Grigo, Krefeld, and Dieter Neuray, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 122,575, Feb. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 110,790, Jan. 9, 1980, abandoned. This application Nov. 13, 1981, Ser. No. 321,277

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901646

Int. Cl.<sup>3</sup> C08F 216/08, 220/62

U.S. Cl. 526—72

1 Claim

1. Copolymers of alpha-olefins having a melt flow index of from 2 to 20 g/10 minutes, said alpha-olefins being propylene and 1 to 50% by weight of allyl alcohol incorporated by polymerization.

4,423,197

# CYCLIC PERFLUOROALIPHATIC-DISULFONIC ACID ANHYDRIDES AND SULFONAMIDE DERIVATIVES THEREOF

Fred E. Behr, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

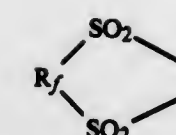
Division of Ser. No. 326,422, Dec. 1, 1981, Pat. No. 4,386,214, which is a division of Ser. No. 229,871, Jan. 30, 1981, Pat. No. 4,329,478. This application Jan. 31, 1983, Ser. No. 462,668

Int. Cl.<sup>3</sup> C08F 4/00; C07C 143/74

U.S. Cl. 526—220

10 Claims

1. Sulfonamides, useful as latent catalysts for the polymerization of cationically-sensitive monomers, comprising the reaction product of at least one cyclic anhydride of perfluoroaliphaticdisulfonic acids, having the formula:



wherein R<sub>f</sub> is perfluoroalkylene having 2 to 5 catenary carbon atoms or perfluorocycloalkylene having 4 to 7 ring atoms, R<sub>f</sub> optionally being substituted by one or more straight chain, branched, or cyclic perfluoroalkyl groups of 1 to 12 carbon atoms, with R<sub>f</sub> having a total of up to 14 carbon atoms, together with at least one protonic nitrogenous base having a pK<sub>b</sub> of less than about 13.2.

4,423,198

# HIGH GREEN STRENGTH SYNTHETIC RUBBERS AND METHOD

Tom Tsai, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Continuation of Ser. No. 303,870, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 208,570, Nov. 20, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 422,881

Int. Cl.<sup>3</sup> C08F 236/16, 236/18

U.S. Cl. 526—263

18 Claims

1. A method of producing synthetic rubbers characterized by high green strength and tack comprising interpolymerizing a rubber forming monomer selected from the group consisting of a diolefin selected from the group consisting of butadiene, 1,3-isoprene, piperylene, 2,3-dimethylbutadiene and said diolefin and an unsaturated monomer selected from the group consisting of styrene, alpha-methyl styrene, vinyl toluene, acrylonitrile and methacrylonitrile with one or more polymerizable unsaturated organic tertiary amines and one or more polymerizable unsaturated organic cross linking agents in the form of an organic compound containing active halogen groups in which the tertiary amine is incorporated with the polymerizable rubber forming monomers in an amount within the range of 0.5–100 millimoles per 100 grams of rubber forming monomers and in which the cross linking agent is incorporated in the ratio of 0.03–10.0 halogen mole atoms per mole of tertiary amine.

10. A synthetic rubber characterized by high green strength and tack comprising an interpolymer of rubber forming monomer selected from the group consisting of a diolefin selected from the group consisting of butadiene, 1,3-isoprene, piperylene, 2,3-dimethylbutadiene and said diolefin and an unsaturated monomer selected from the group consisting of styrene, alpha-methyl styrene, vinyl toluene, acrylonitrile and methacrylonitrile, an unsaturated polymerizable organic tertiary amine incorporated in an amount within the range of 0.5–100 millimoles per 100 grams of rubber forming monomers and a polymerizable unsaturated cross linking agent in the form of an organic compound having active halogen groups in the ratio of 0.03–10 halogen mole atoms per mole of the tertiary amine.

4,423,199

# ACRYLAMIDE CONTAINING EMULSION COPOLYMERS FOR THICKENING PURPOSES

Ching-Jen Chang, Chalfont, and Travis E. Stevens, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 30, 1982, Ser. No. 431,880

Int. Cl.<sup>3</sup> C08F 20/54

U.S. Cl. 526—307.6

22 Claims

1. A copolymer polymerized from a monomer system comprising

(1) at least about 10 weight percent of a monomer or a mixture of monomers selected from the group consisting of methacrylic acid, itaconic acid, acrylic acid, acryloxypropionic acid, fumaric acid, maleic acid, citraconic acid and crotonic acid;



- (2) about 0.5 to 25 weight percent of at least one monomer of the formula:



wherein:

R is selected from the group consisting of alkyl, alkylaryl, and polycyclic alkyl groups having 8 to 30 carbon atoms;

- (3) optionally at least one copolymerizable ethylenically unsaturated monomer selected from the group consisting of compounds of the formula



wherein

(a) Y is H and Z is  $\text{COOR}''$ ,  $\text{C}_6\text{H}_4\text{R}'''$ , CN, Cl,  $\text{CONH}_2$ ,  $\text{OC}(\text{O})\text{R}''''$  or  $\text{CH}=\text{CH}_2$ ;

(b) Y is  $\text{C}_1-\text{C}_4$  alkyl and Z is  $\text{COOR}''$ ,  $\text{C}_6\text{H}_4\text{R}'''$ , CN,  $\text{CONH}_2$ , or  $\text{CH}=\text{CH}_2$ ; or

(c) Y and Z are Cl; and

R'' is  $\text{C}_1-\text{C}_8$  alkyl or  $\text{C}_2-\text{C}_8$  hydroxyalkyl or lower alkoxy( $\text{C}_2-\text{C}_8$ )alkyl;

R''' is H, Cl, Br, or  $\text{C}_1-\text{C}_4$  alkyl; and

R'''' is  $\text{C}_1-\text{C}_8$  alkyl; and

- (4) zero to 1.0 weight percent of a polyethylenically unsaturated monomer.

4,423,200

#### PROCESS FOR THE PRODUCTION OF POLYURETHANE UREA PRODUCTS

Otto Ganster, Leverkusen, and James M. Barnes, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany  
Filed Dec. 23, 1982, Ser. No. 452,575

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1982, 3200412

Int. Cl. C08G 18/79, 18/32

U.S. Cl. 528-67

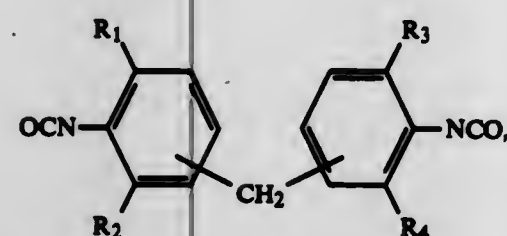
9 Claims

1. A process for the production of polyurethane urea products by reacting

(A) an isocyanate blend comprising

(a) an NCO-prepolymer which is substantially monomer-free and which is produced by reacting substantially linear, relatively high molecular weight polyhydroxyl compounds which have molecular weights of from 440 to 12,000, with toluene diisocyanate, phenylene diisocyanate, hexamethylene diisocyanate or a combination of these diisocyanates, in an NCO:OH ratio of greater than 1:1; and

(b) from 0.1 to 25%, by weight, of diphenylmethane diisocyanates which are tetra-alkyl-substituted in o-positions to the NCO-groups which correspond to the general formula:



wherein

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> which may be the same or different represent straight- or branched-chain alkyl radicals having from 1 to 4 carbon atoms, with

- (B) chain-lengthening aromatic diamines in quantities of from 0.8:1 to 1.2:1 of isocyanate to isocyanate-reactive groups to prepare said polyurethane urea products.

4,423,201

#### CO-REACTIVE URETHANE SURFACTANTS AND STABLE AQUEOUS EPOXY DISPERSIONS

Darrell D. Hicks, Jeffersonton, Ky., assignor to Celanese Corporation, New York, N.Y.

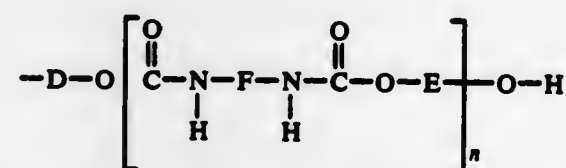
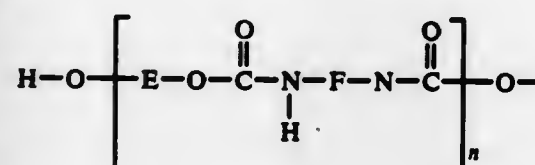
Filed Oct. 29, 1982, Ser. No. 437,706

Int. Cl. C08G 18/32

U.S. Cl. 528-76

22 Claims

1. A co-reactive surfactant for epoxide resins having the general formula



wherein D is the residue of a long-chain aliphatic polyether glycol, F is the residue of a diisocyanate and E is the residue of a dihydric phenol, and wherein n is 1-3.

4,423,202

#### PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT PARA ORDERED AROMATIC HETEROCYCLIC POLYMER

Eui W. Choe, Randolph, N.J., assignor to Celanese Corporation, New York, N.Y.

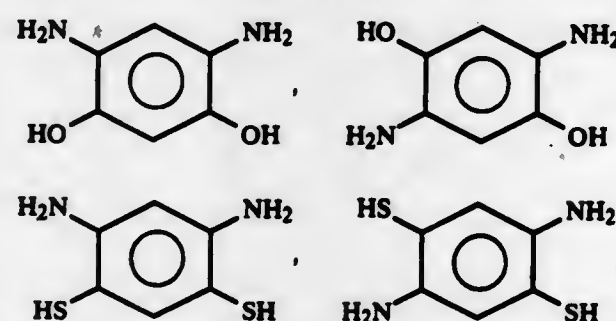
Filed May 5, 1981, Ser. No. 260,573

Int. Cl. C08G 73/06, 73/22

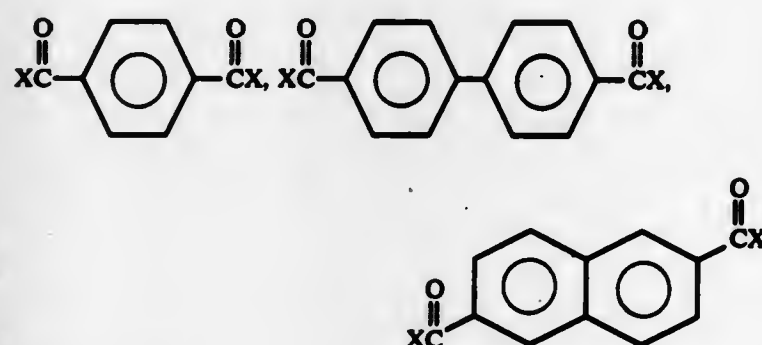
U.S. Cl. 528-179

27 Claims

1. A process for the production of para ordered heterocyclic polymer having a number average molecular weight of at least approximately 10,000 which comprises heating a first reactant selected from the group consisting of



their dihydrochloride salts and mixtures thereof with at least one dihalogen derivative selected from the group consisting of



wherein X is F, Cl, Br or I, in polyphosphoric acid at a temper-

ature within the range of approximately 100° C. to 250° C. until the polymerization reaction is complete.

4,423,203

#### ELECTRICALLY PHOTSENSITIVE POLYMERS CONTAINING VINYLENE-1,4-PHENYLENE-IMINO-1,4-PHENYLENE-VINYLENEARYLENE GROUPS

Peter J. Corvan; Jeanne E. Kaeding, both of Rochester, N.Y.; Cesar Rodriguez, Boston, Mass., and Norman G. Rule, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

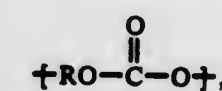
Filed Aug. 20, 1982, Ser. No. 409,800

Int. Cl. C08G 12/04

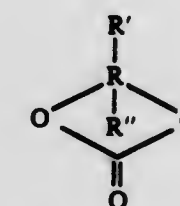
U.S. Cl. 528-266

3 Claims

1. An electrically photosensitive polymer in which recurring units comprise a vinylene-1,4-phenylene-imino-1,4-phenylene-vinylenearylene group.



said process comprising heating a cyclic carbonate of structure I:



(I)

4,423,204

#### AMORPHOUS COPOLYAMIDE FROM LACTAM, DICARBOXYLIC ACID AND BISIMIDAZOLINE

Edward A. Barsa, East Haven, and Kemal Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 2, 1982, Ser. No. 414,507

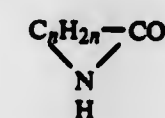
Int. Cl. C08G 69/14

U.S. Cl. 528-323

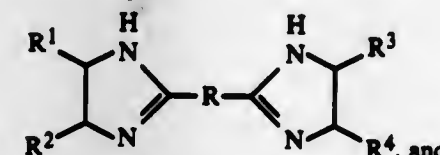
14 Claims

1. An amorphous moldable copolyamide comprising the reaction product of,

A. a lactam having the formula



B. a bisimidazoline having the formula



C. a dicarboxylic acid having the formula



wherein  $\text{CnH}_{2n-1}$  is alkylene having from 5 to 11 carbon atoms in the chain, R is a diradical selected from the group consisting of 1,3-arylene, alkylene having 1 to 12 carbon atoms, inclusive, and cycloalkylene, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup> are independently selected from the group consisting of hydrogen and inert substituents, and R<sup>5</sup> is a diradical selected from the group consisting of 1,3-arylene, alkylene having 4 to 12 carbon atoms, inclusive, and cycloalkylene, provided at least one of the diradicals R and R<sup>5</sup> is 1,3-arylene and wherein the proportions of reactants based on 100 mole percent are from about 43 to about 82 mole percent of said lactam and the remaining 18 to 57 mole percent divided between said bisimidazoline and said dicarboxylic acid in substantially equimolar proportions.

4,423,205

#### CATIONIC POLYMERIZATION OF CYCLIC CARBONATES

Sundar J. Rajan, Ferndale, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed May 24, 1982, Ser. No. 381,207

Int. Cl. C08G 63/62

U.S. Cl. 528-371

17 Claims

1. A process for the production of a polycarbonate glycol,

said process comprising heating a cyclic carbonate in the presence of a catalytic amount of a cationic initiator.

11. A process for the production of a polycarbonate glycol containing units of

said process comprising heating a cyclic carbonate of structure I:

in the presence of a cationic initiator, where R is an alkylene group of 2 or more carbons, and R' and R'' are independently hydrogen, alkyl, alkaryl, aralkyl, or aryl.

16. The polycarbonate glycol product formed by the process of claim 11.

4,423,206

#### VICINAL ALKYLENE OXIDE POLYMERIZATION

David L. Wolfe, Midland, Mich., and Frederick P. Corson, Miami, Fla., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 274,135, Jun. 16, 1981, Pat. No. 4,376,723.

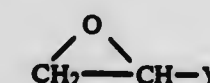
This application Jun. 21, 1982, Ser. No. 390,017

Int. Cl. C08G 65/12

U.S. Cl. 528-416

8 Claims

1. A process for the polymerization of a vicinal alkylene oxide represented by the formula



where Y represents R<sub>1</sub> or CH<sub>2</sub>OR<sub>2</sub>; R<sub>1</sub> represents H, an aliphatic hydrocarbyl group of about 1 to 20 carbon atoms, a chloromethyl or a bromomethyl group; and R<sub>2</sub> represents the acyl residue of a carboxylic or fatty acid of about 1 to 30 carbon atoms or a hydrocarbyl group of about 1 to 20 carbon atoms which may bear other vicinal alkylene oxide groups or inert substituents; said process comprising contacting said vicinal alkylene oxide with a catalytically effective amount of a catalyst comprising a composition prepared by contacting:

Component A, a compound represented by the formula RR'AlX wherein R and R' each independently represent an alkyl group of 1 to 4 carbon atoms, and X represents hydrogen or an alkyl or alkoxy group of 1 to 4 carbon atoms;

Component B, an organic nitrogen base compound selected from secondary nitrogen-containing compounds having basicity about equal to or less than the basicity of dimethylamine and having no active hydrogen atoms other than those of the secondary nitrogen;

Component C, a beta-diketone; and

Component D, water;

in the molar ratios of

B:A—about 0.01 to 2.5:1

C:A—about 0.1 to 1.5:1

D:A—about 0.1 to 1.5:1

provided that when the molar ratio of (C+2D):A is greater than about 3:1 then the B:A molar ratio is at least about 1:1.



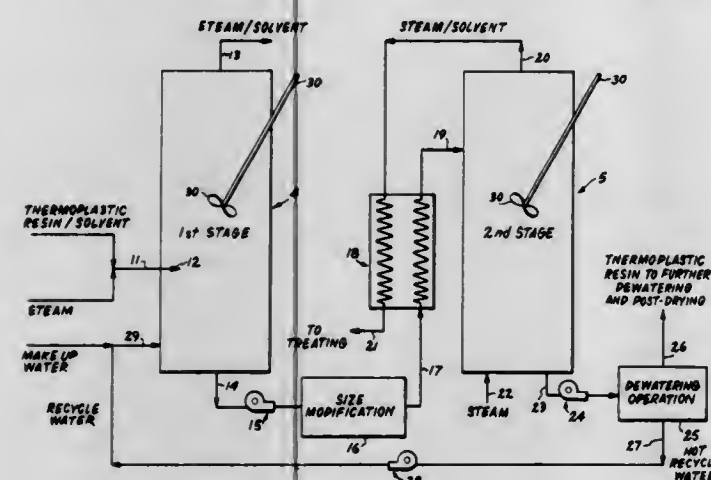
**4,423,207**  
**PROCESS FOR RECOVERY OF SOLID THERMOPLASTIC RESINS FROM SOLUTIONS THEREOF IN ORGANIC SOLVENTS**

John W. Flock; Stephen L. Matson, both of Schenectady, N.Y., and Peter H. Bollenbeck, Mt. Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 217,603, Dec. 18, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,381 Int. Cl.<sup>3</sup> C08G 63/70, 65/46

U.S. Cl. 528—499

16 Claims



1. A process for recovering a thermoplastic polycarbonate or polyphenylene oxide resin from a solution of said resin in a solvent comprising introducing said solvent solution into a first separation vessel by a first conduit means terminated with atomizing means in communication with an intermediate region of said first separation vessel and below the surface of the liquid contained therein, removing a mixture of solvent and water vapor as an overhead product from said first separation vessel, condensing said overhead product and passing the condensate to a solvent recovery apparatus, removing a bottom product comprising a slurry mixture of a thermoplastic resin, solvent and water and passing said bottom product to subsequent separation stages for further solvent and water removal.

**4,423,208**  
**AFFINITY GEL-ADSORBENT**

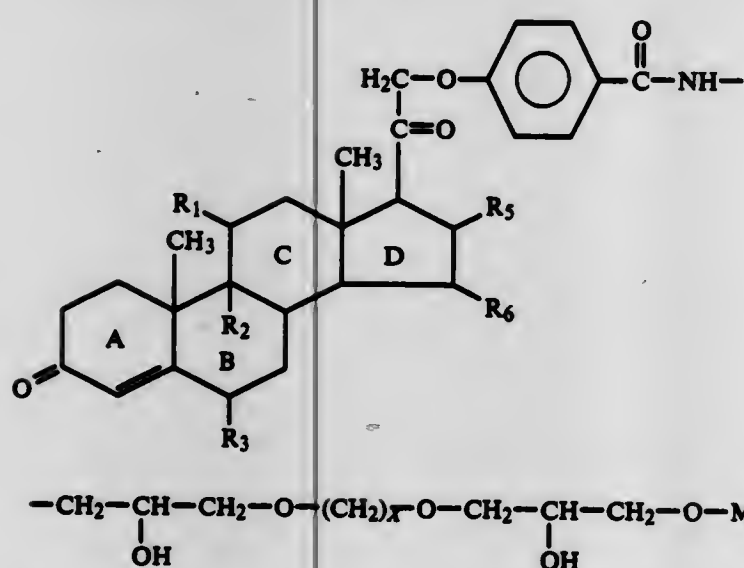
Peter Grandica, 260 S. 16th St., Philadelphia, Pa. 19102  
 Filed Feb. 24, 1982, Ser. No. 352,013

Int. Cl.<sup>3</sup> C07J 17/00

U.S. Cl. 536—5

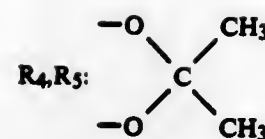
7 Claims

1. An improved affinity gel-adsorbent having the formula:

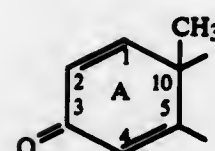


R<sub>1</sub>: H or OH or =O  
 R<sub>2</sub>: H or F  
 R<sub>3</sub>: H or F

R<sub>4</sub>: OH or H  
 R<sub>5</sub>: OH or H



R<sub>6</sub>: H or CH<sub>3</sub>  
 X: 1 through 8  
 M: Matrix



Alternative A ring with Δ1,2 double bond.  
 wherein M is a polysaccharide matrix including agarose, dextran, and cellulose.

**4,423,209**  
**PROCESSES FOR THE INTERCONVERSION OF AVERMECTIN COMPOUNDS**

Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

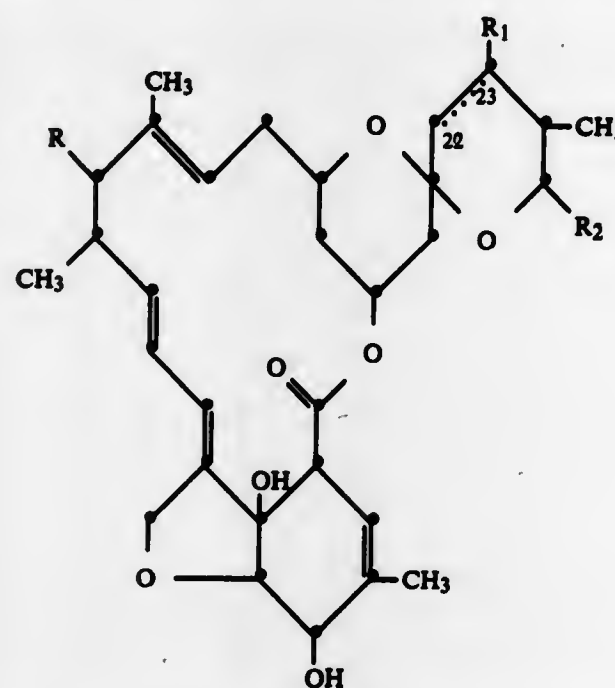
Filed Feb. 26, 1982, Ser. No. 352,666

Int. Cl.<sup>3</sup> C07H 17/08; C07D 313/00

U.S. Cl. 536—7.1

4 Claims

1. A process for the preparation of a compound having the formula:



wherein  
 the broken line at the 22,23-position indicates a single or a double bond, provided that the double bond is present only when R<sub>2</sub> is iso-propyl or sec-butyl;  
 R<sub>1</sub> is hydrogen or hydroxy, provided R<sub>1</sub> is hydroxy only when the broken line indicates a single bond;  
 R<sub>2</sub> is methyl, ethyl, sec-butyl or isopropyl; and  
 R is hydrogen, hydroxy.

aluminum hydride or lithium aluminum hydride to produce the desired compound.

**4,423,210**  
**INTERMEDIATES FOR THE PREPARATION OF 3-DEMETHOXYFORTIMICINS**

James B. McAlpine, Libertyville, and Ronald E. Carney, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

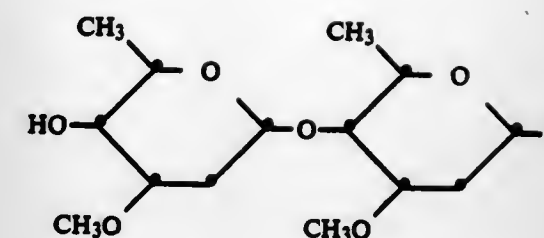
Filed Apr. 9, 1982, Ser. No. 366,797

Int. Cl.<sup>3</sup> A61K 31/71; C07H 15/22

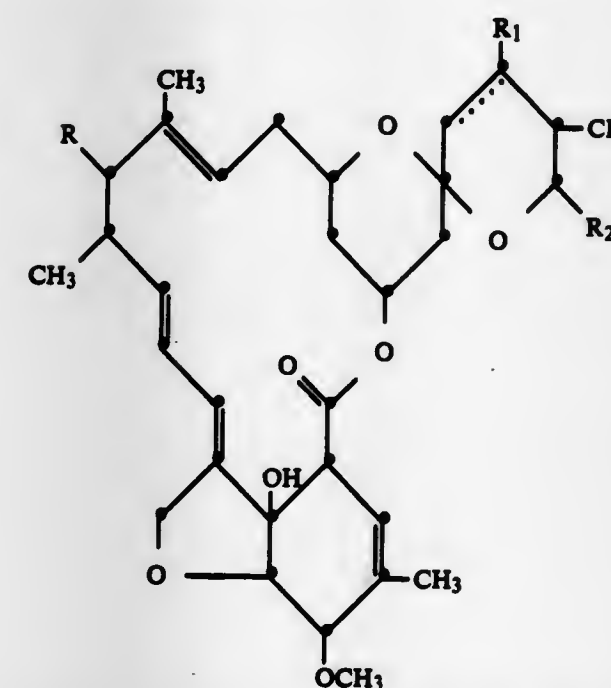
U.S. Cl. 536—16.1

12 Claims

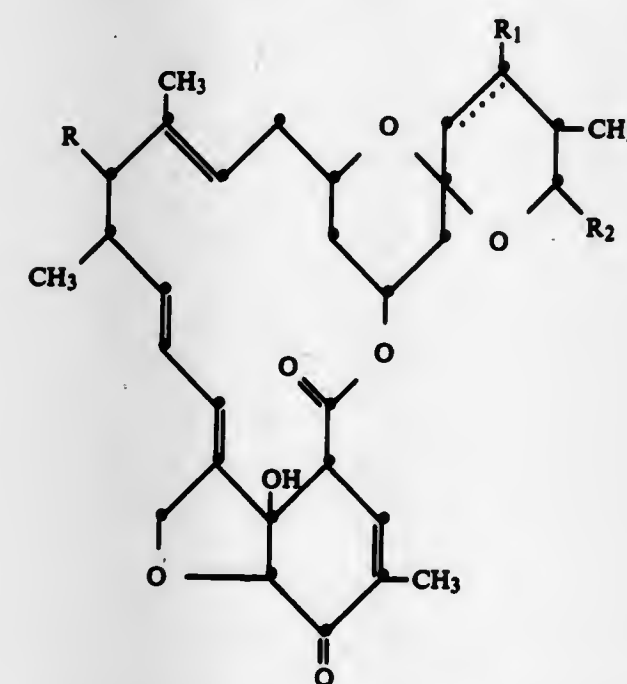
1. A compound of the formula



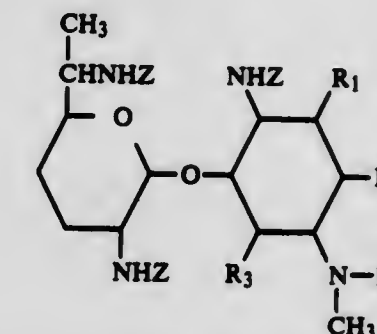
which comprises treating a compound having the formula:



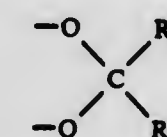
wherein R, R<sub>1</sub> and R<sub>2</sub> are as previously defined, with mercuric acetate and hydrolyzing the thus produced 3-acetoxy enol ether with a mild acid to produce a 5-keto compound having the formula:



which is reduced with sodium borohydride, tri-*t*-butoxy



wherein R<sub>2</sub> is a monocyclicaryloxycarbonyl amine protecting group, or is loweralkyl, hydroxyloweralkyl, loweracyl, hydroxyloweracyl, or a monocyclicaryloxycarbonyl-protected aminoloweralkyl, diaminoloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl, aminoloweracyl, diaminoloweracyl, N-loweralkylaminoloweracyl, N,N-diloweralkylaminoloweracyl, or aminohydroxyloweracyl; R<sub>1</sub> is hydroxy or loweracyloxy; R<sub>2</sub> is hydrogen or —OR<sub>4</sub>, wherein R<sub>4</sub> is tert-butylidimethylsilyl or thiocarbonylimidazolyl; or R<sub>1</sub> and R<sub>2</sub> can be taken together to form



wherein R<sub>5</sub> and R<sub>6</sub> are loweralkyl; R<sub>3</sub> is hydroxy or loweracyloxy; and Z is a monocyclicaryloxycarbonyl amine protecting group.

**4,423,211**  
**PROCESS FOR THE WHOLE BROTH EXTRACTION OF AVERMECTIN**

Carl Bagner, Paramus, and Arthur S. Wildman, Martinsville, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 21, 1981, Ser. No. 332,418

Int. Cl.<sup>3</sup> C07H 17/08

U.S. Cl. 536—16.9

10 Claims

1. A process for separating an avermectin rich fraction from an avermectin containing whole fermentation broth comprising acidifying the whole broth to a pH of from 1.5 to 6; admixing the acidified whole broth with an extractant in which the avermectins are soluble selected from toluene, xylene, benzene, chlorotoluene, chlorobenzene and alcohols of from 4 to 8 carbon atoms in a ratio of extractant to broth of from 0.2 to 3 in volume; heating the admixture of whole broth and extractant to a temperature of from about 20° C. to 100° C. or to the reflux temperature of the extractant in a first stage for a period of at least 1 hour; decanting the avermectin containing extractant fraction from the admixture; stripping the extractant from the avermectin containing extractant fraction; and collecting the avermectin.

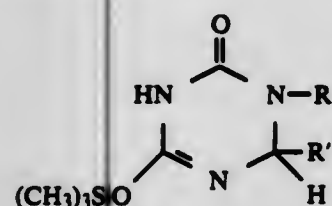


4,423,212

## NUCLEOSIDES AND PROCESS

Harvey I. Skulnick, Oaktemo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
Filed Dec. 14, 1980, Ser. No. 217,935  
Int. Cl.<sup>3</sup> C07H 19/06, 17/02

U.S. Cl. 536—23 34 Claims  
1. The chemical process which comprises reacting a monosilyl compound of the formula:



wherein R is selected from the group consisting of hydrogen, lower alkyl of 1 through 4 carbon atoms, and cyclopropyl and R' is selected from the group consisting of hydrogen and lower alkyl of 1 through 4 carbon atoms; with a 2-deoxy-3,5-blocked-D-pentofuranosyl halide in the presence of a Lewis acid and a solvent selected from the group consisting of acetonitrile or nitromethane at a temperature of about minus (−) 25° C. with subsequent warming to about 25° C.; to form a 1-(2-deoxy-3,5-di-O-blocked-D-pentofuranosyl)-5-R-6-R'-5,6-dihydro-s-triazine-2,4-(1H,3H)-dione.

4,423,213

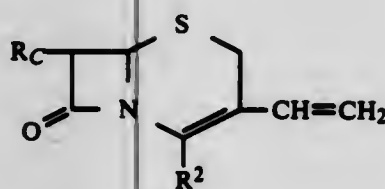
## 7-ACYLAMINO-3-VINYLCEPHALOSPORANIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Kawanishi, Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamataka, Hirakata, and Kohji Kawabata, Sumiyoshi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan  
Continuation-in-part of Ser. No. 205,334, Nov. 10, 1980. This application May 7, 1981, Ser. No. 261,618

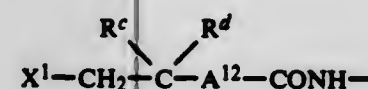
Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991; Jul. 14, 1980, 8022920

Int. Cl.<sup>3</sup> C07D 501/22

U.S. Cl. 544—16 9 Claims  
1. A compound of the formula:



in which R<sub>c</sub> is a group of the formula:



wherein A<sup>12</sup> is methylene wherein the carbon thereof has attached a group of the formula:



wherein R<sup>4</sup> is hydrogen, cyclo(lower)alkenyl, lower alkynyl, lower alkenyl, lower alkenyl substituted by carboxy or a protected carboxy group, lower alkyl, or lower alkyl substituted by one or more substituents selected from carboxy, a protected carboxy group, amino, a protected amino group, cyano, phosphono, a protected phosphono group, a heterocyclic group, and a heterocyclic group substituted by one or more substituents selected from lower alkyl, lower alkoxy, lower alkylthio, lower alkylamino, cyclo(lower)alkyl, cyclo(lower)alkenyl,

hydroxy, halogen, amino, protected amino, cyano, nitro, carboxy, protected carboxy, sulfo, sulfamoyl, imino, oxo and amino(lower)alkyl,  
R<sup>c</sup> and R<sup>d</sup> combined together form oxo or a protected oxo group selected from di(lower)alkoxy and lower alkylene-dioxy,  
X<sup>1</sup> is halogen, and  
R<sup>2</sup> is carboxy or a protected carboxy group, or a salt thereof.

4,423,214

## 3-VINYLCEPHALOSPORIN DERIVATIVES

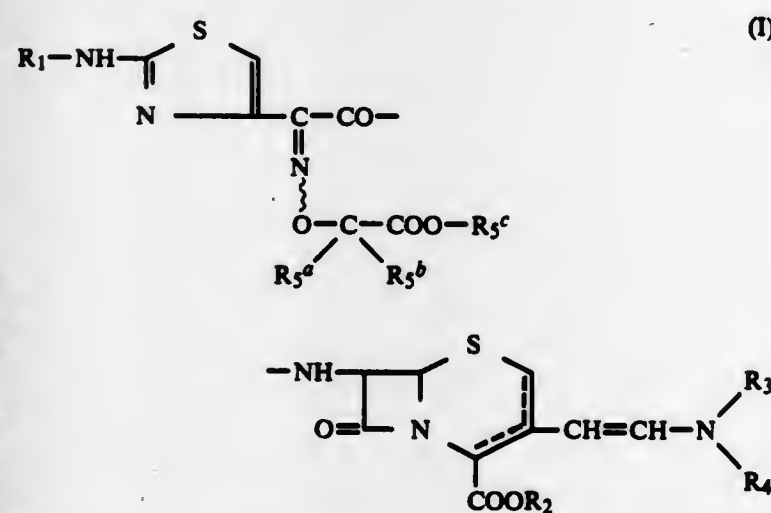
Daniel Farge, Pierre L. Roy, both of Thiais; Claude Moutonier, Le Plessis Robinson, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 19, 1981, Ser. No. 322,949

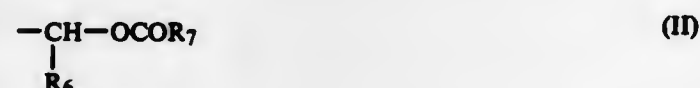
Claims priority, application France, Nov. 20, 1980, 80 24634  
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.<sup>3</sup> C07D 501/24

U.S. Cl. 544—22 4 Claims  
1. A 3-vinylcephalosporin of the formula:



in the form of a bicyclooct-2-ene or bicyclooct-3-ene in which the substituent in the 3-position of the bicyclooctene is in the E or Z form or a mixture thereof; and the imine group of the substituent in the 7-position is in the syn or anti form or a mixture thereof; wherein R<sup>a</sup> and R<sup>b</sup>, which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms; R<sup>c</sup> represents an acid-protecting radical; R<sup>1</sup> represents an amine-protecting radical; R<sup>2</sup> represents a radical which can easily be removed by an enzymatic method having the formula:



in which R<sub>6</sub> represents a hydrogen atom or an alkyl radical and R<sub>7</sub> represents an alkyl radical or the cyclohexyl radical, or R<sub>2</sub> represents a methoxymethyl, t-butyl, benzhydryl, p-nitrobenzyl or p-methoxybenzyl radical; and the symbols R<sub>3</sub> and R<sub>4</sub>, which are identical or different, represent alkyl radicals, which are unsubstituted or substituted by a hydroxyl, alkoxy, amino, alkylamino or dialkylamino radical, or phenyl radicals, or together form, with the nitrogen atom to which they are attached, a saturated heterocyclic ring of 5 or 6 ring members, which may contain another hetero-atom chosen from nitrogen, oxygen and sulphur, and is unsubstituted or substituted by an alkyl radical, the abovementioned alkyl portions or radicals being (unless otherwise mentioned) straight or branched and containing 1 to 4 carbon atoms.

4,423,215

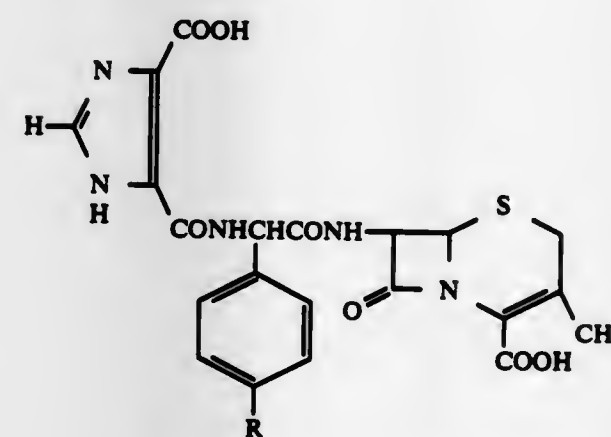
## METHOD OF PREPARING SODIUM SALTS OF IMIDAZOLEDICARBOXYLIC ACID SUBSTITUTED CEPHALOSPORIN DERIVATIVES

Naohiko Yasuda, Yokosuka; Hisao Iwagami, Kawasaki; Yasuo Irie, Kawasaki; Eiji Nakanishi, Kawasaki, and Hideomi Saito, Sagami-hara, all of Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,809

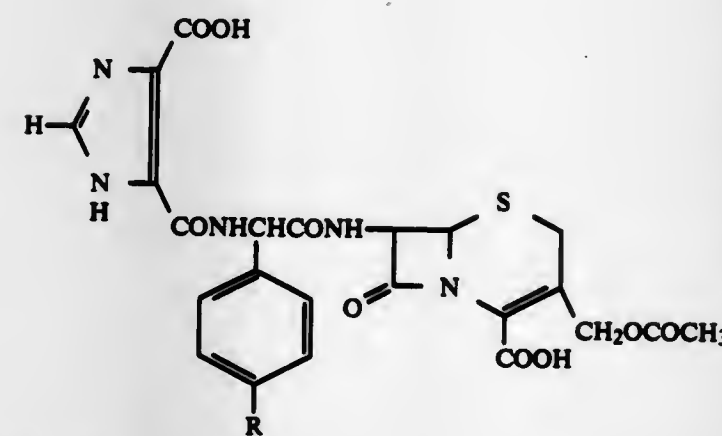
Claims priority, application Japan, Mar. 2, 1981, 56-29541  
Int. Cl.<sup>3</sup> C07D 501/38

U.S. Cl. 544—025 2 Claims  
1. A method of preparing sodium salts of imidazolidicarboxylic acid derivatives of substituted cephalosporins having the formula:



R: H, OH

comprising:  
reacting a compound of the formula:



R: H, OH

wherein R is hydrogen or hydroxyl, with 4-pyridineethanesulfonic acid in an aqueous solution of sodium iodide at pH 6.0 to 7.5;  
contacting the reaction solution with a hydrophilic organic solvent selected from the group consisting of C<sub>1</sub>–C<sub>4</sub> alcohols, acetone, acetonitrile and mixtures thereof to precipitate the sodium salt of the imidazolidicarboxylic acid reaction product; and  
separating said precipitated sodium salt from the remainder of the reaction mixture.

4,423,216

## PREPARATION OF CYANURIC ACID

John A. Wojtowicz, Cheshire, and Haywood Hooks, West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 24, 1981, Ser. No. 334,208

Int. Cl.<sup>3</sup> C07D 251/32

U.S. Cl. 544—192 37 Claims

1. In a process for making cyanuric acid by pyrolyzing a nitrogenous material capable of yielding a cyanuric acid product, said material being dissolved in an N-methylpyrrolidone solvent in a pyrolysis vessel to produce a hot reaction mass comprising a slurry of crude cyanuric acid product suspended in said solvent, characterized by the improvements which comprise:

a. adding said nitrogenous material to said pyrolysis vessel in a gradual controlled manner wherein the rate for said gradual addition is from about 0.1 to about 1.15 pounds of nitrogenous material/hour/pound of solvent; and  
b. maintaining said reaction mass at a temperature in excess of about 100° C. during recovery of said cyanuric acid from said reaction mass.

4,423,217

## PROCESS FOR THE PRODUCTION OF HETEROCYCLIC THIO COMPOUNDS

Laurent Duc, Yverdon; Karl-Josef Boosen, Erlach, and Jean-Francois Marrel, Yverdon, all of Switzerland, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 20, 1981, Ser. No. 236,577

Claims priority, application Switzerland, Feb. 28, 1980, 1590/80; Dec. 5, 1980, 8987/80

Int. Cl.<sup>3</sup> C07D 207/36, 239/58, 473/20, 215/36

U.S. Cl. 544—267 8 Claims

1. Process for the production of a heterocyclic thio compound having the formula Het-S-R, wherein R is H, or a lower alkyl residue and wherein Het is a heterocyclic residue selected from the group consisting of pyrrolidyl, furyl, triazolyl, pyridyl, pyrimidyl, triazinyl, purinyl, carbazoyl, acridyl, 1,4-benzisoxazinyl, chromonyl, guanyl, quinolyl, isoquinolyl, quinazolyl, naphthyridyl, pyrido [3,4-b] pyridyl, coumaryl, benzoxazolyl, indolyl, thiophenyl, benzothiazolyl, pyrrolyl, thiazolyl and thiazolyl, from the corresponding amino compound, which comprises reacting the corresponding heterocyclic amino compound, having the formula Het-NH<sub>2</sub>, Het-NHR or Het-NR<sub>2</sub>, with a monocarboxylic acid having 1 to 4 C-atoms, a dicarboxylic acid having 1 to 4 C-atoms or a sulfonic acid, the corresponding amino salt resulting, and reacting, and reacting the corresponding amino salt with a compound having the formula HSR, wherein R has the above-stated meaning, at a temperature of 80° to 180° C., the heterocyclic thio compound resulting.

4,423,218

## ANTIBIOTIC NEPLANOCIN A

Masaru Otani; Satoshi Yaginuma; Masatoshi Tsujino; Naoki Muto; Tetsu Saito, all of Shizuoka, and Tadashi Fujii, Mishima, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 18,790, Mar. 8, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 205,350

Claims priority, application Japan, May 25, 1978, 53-62899; Aug. 10, 1978, 53-98027; Jan. 29, 1979, 54-8295

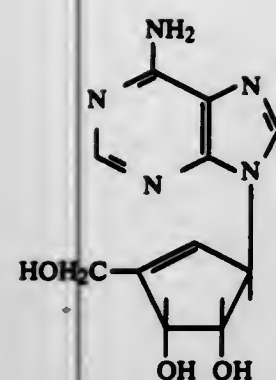
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C07D 473/32

U.S. Cl. 544—277 1 Claim

1. Antibiotic neplanocin A of the formula





or a pharmaceutically acceptable salt thereof.

4,423,219

### PRODUCTION OF PURINE DERIVATIVES AND INTERMEDIATES THEREFOR

Kin-ichi Imai, Toyonaka, and Mitsubishi Mano, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 4, 1981, Ser. No. 318,277

Claims priority, application Japan, Nov. 14, 1980, 55-161099; Aug. 18, 1981, 56-129518

Int. Cl.<sup>3</sup> C07D 239/50

U.S. Cl. 544—326

1 Claim

1. 6-(2-chloro-6-fluorobenzyl)amino-4-methylamino-5-phenylazopyrimidine or an acid addition salt thereof.

4,423,220

### PROCESS FOR THE PRODUCTION OF O,O-DIALKYLPHOSPHORODITHIOATES

Jean-Pierre Ledouble, St. Louis, France, and Markus Tschopp, Liestal, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

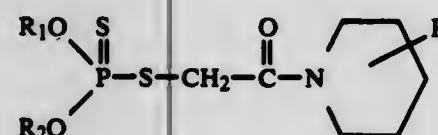
Continuation of Ser. No. 636,780, Dec. 1, 1975, abandoned. This application Nov. 26, 1979, Ser. No. 97,592

Int. Cl.<sup>3</sup> C07F 9/65

U.S. Cl. 546—22

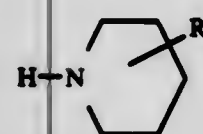
9 Claims

1. In the production of an O,O-disubstituted phosphorodithioate of the formula:

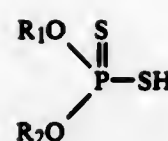


wherein

R is methyl or ethyl and each of R<sub>1</sub> and R<sub>2</sub>, independently of the other, is alkyl, alkenyl or alkoxyalkyl having a maximum total of 5 carbon atoms, the improvement permitting said production directly which comprises simultaneously bringing into contact under reactive conditions essentially equimolar amounts of the reactants (a) chloroacetyl chloride, (b) a methyl- or ethylpiperidine of the formula:



wherein R is as herein defined, and (c) a source of the anion of an O,O-disubstituted dithiophosphoric acid of the formula:



wherein R<sub>1</sub> and R<sub>2</sub> are as herein defined, in the presence of at least an essentially equimolar amount of an acid binding agent.

4,423,221

### 7-CARBOETHOXY-MORPHINAN-6-ONE COMPOUNDS

Raj K. Razdan, Belmont, and Haldean C. Dalzell, Weston, both of Mass., assignors to S/SA Pharmaceutical Laboratories, Inc., Cambridge, Mass.

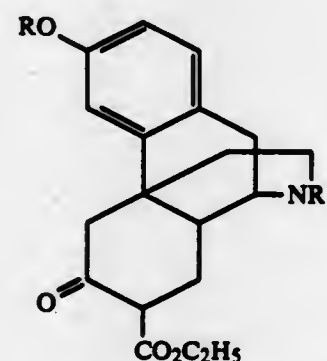
Filed Jun. 10, 1982, Ser. No. 386,921

Int. Cl.<sup>3</sup> C07D 221/28; A61K 31/485

U.S. Cl. 546—74

11 Claims

1. 7-carboethoxy-morphinan-6-one compounds characterized by the formula:



wherein R is H or methyl and R<sub>1</sub> is methyl, cyclopropylmethyl, cyclobutylmethyl, propargyl, allyl, dimethylallyl or furfuryl.

4,423,222

### PYRIDINYL FUNGICIDES AND HERBICIDES

Mary L. Ash, and Richard G. Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

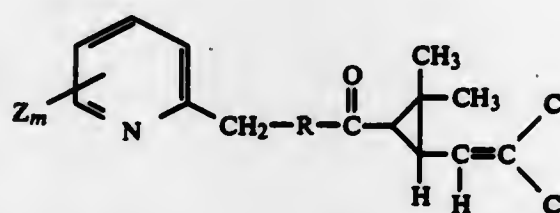
Filed May 21, 1982, Ser. No. 380,644

Int. Cl.<sup>3</sup> C07D 213/61, 213/40

U.S. Cl. 546—337

2 Claims

1. A compound represented by the formula:



wherein, R is imino (—NH—); each Z is independently selected from the group consisting of chlorine, bromine, fluorine, and iodine; and m is an integer of from zero to four, both inclusive.

4,423,223

### BENZOTHAZOLE DERIVATIVES

Charles M. Hall, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich. Continuation of Ser. No. 2,803, Jan. 11, 1979, abandoned, which is a continuation of Ser. No. 753,717, Dec. 23, 1976, Pat. No. 4,150,140. This application Jun. 2, 1980, Ser. No. 155,712

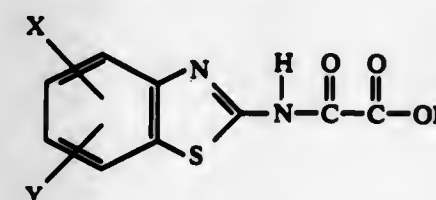
The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.

Int. Cl.<sup>3</sup> C07D 277/62

U.S. Cl. 548—163

16 Claims

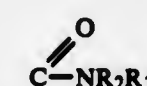
1. A compound of the formula



wherein X and Y are the same or different and are hydrogen, fluoro, chloro, bromo, alkyl of one to six carbon atoms, inclusive, alkoxy of one to six carbon atoms, inclusive, nitro, cyano, amino, trifluoromethyl,



wherein R<sub>1</sub> is alkyl of one to six carbon atoms, inclusive,



wherein R<sub>2</sub> and R<sub>3</sub> are the same or different and are hydrogen or alkyl of one to three carbon atoms, inclusive, or CO<sub>2</sub>Q where Q is alkyl of one to six carbon atoms, inclusive, hydrogen or a physiologically acceptable metal or amine cation with the proviso that when R is alkyl of two carbon atoms, one of X or Y is other than hydrogen; and R is hydrogen, alkyl of one to eight carbon atoms, inclusive, (—CH<sub>2</sub>)<sub>m</sub> phenyl wherein m is 0, 1 or 2 (CH<sub>2</sub>)<sub>n</sub>NH<sub>4</sub>R<sub>5</sub> wherein n is 1 or 2, and R<sub>4</sub> and R<sub>5</sub> are the same or different and are alkyl of one to three carbon atoms, inclusive, and a physiologically acceptable metal or amine cation, and physiologically acceptable acid addition salts thereof.

4,423,224

### 4-ME-1-(2-(1H-TETRAZOL-5-YL)ETHYL)BENZENE SULFONATE AND N-2-(1H-TETRAZOL-5-YL)ETHYL METHANESULFONAMIDE

Paul E. Marecki, Painesville, and John M. Weaver, Mentor, both of Ohio, assignors to SDS Biotech Corporation, Painesville, Ohio

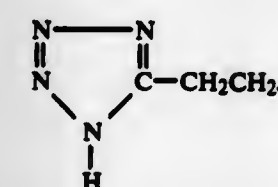
Filed Sep. 8, 1980, Ser. No. 185,171

Int. Cl.<sup>3</sup> C07D 257/04

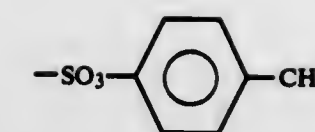
U.S. Cl. 548—252

2 Claims

1. A compound selected from the group consisting of:



where J represents —NHSO<sub>2</sub>CH<sub>3</sub> or



4,423,225

### PROCESS FOR THE PREPARATION OF PYRAZOLE

Reinhard Lantzsch, Leverkusen; Klaus Ditzgen, Wuppertal; Ulrich Heinemann, Wuppertal; Rudolf Thomas, Wuppertal, and Erhard Weber, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,320

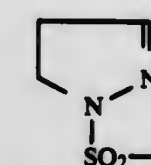
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035394

Int. Cl.<sup>3</sup> C07D 231/12

U.S. Cl. 548—373

18 Claims

1. Process for the preparation of pyrazole which comprises heating a pyrazoline derivative of the formula



wherein R is optionally substituted phenyl or alkyl or haloalkyl without the addition of an acid or base, at a temperature between 100° and 200° C. and under a pressure between 1 mbar and 10 bars.

4,423,226

### ZINC CHLORIDE COMPLEX COMPOUNDS

Reinhard Mohr, Offenbach am Main, and Rudolf Neeb, Obertshausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 243,876

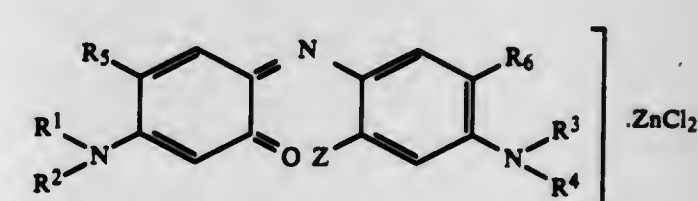
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011154

Int. Cl.<sup>3</sup> C07D 209/82; C07F 3/06

U.S. Cl. 548—402

1 Claim

1. A zinc chloride complex compound corresponding to the general formula (I)



wherein:

R<sup>1</sup> is hydrogen or lower alkyl unsubstituted or substituted by chlorine, hydroxy, lower alkoxy, cyano, lower alkanoyloxy, carbamoyl or phenyl, R<sup>2</sup> is hydrogen or lower alkyl unsubstituted or substituted by chlorine, hydroxy, lower alkoxy, cyano, lower alkanoyloxy, carbamoyl or phenyl, or is phenyl unsubstituted or substituted by substituents belonging to the group comprising chlorine, lower alkyl, lower alkoxy, carbamoyl, sulfamoyl, carbamoyl monosubstituted or disubstituted by lower alkyl, and sulfamoyl monosubstituted or disubstituted by lower alkyl, R<sup>3</sup> is hydrogen or lower alkyl unsubstituted or substituted by chlorine, hydroxy, lower alkoxy, cyano, lower alkanoyloxy, carbamoyl or phenyl, R<sup>4</sup> is hydrogen, lower alkyl unsubstituted or substituted by



chlorine, hydroxy, lower alkoxy, cyano, lower alkanoyloxy, carbamoyl or phenyl, or is phenyl unsubstituted or substituted by substituents belonging to the group comprising chlorine, lower alkyl, lower alkoxy, carbamoyl, sulfamoyl, carbamoyl monosubstituted or disubstituted by lower alkyl, and sulfamoyl monosubstituted or disubstituted by lower alkyl,

R<sup>5</sup> is hydrogen, halogen, lower alkyl or lower alkoxy, or R<sup>1</sup> and R<sup>5</sup> together form the o-phenylene,  
R<sup>6</sup> is hydrogen, halogen, lower alkyl or lower alkoxy,  
Z is lower alkoxy or lower alkoxy substituted by cyano, or is acyloxy, acylamino, lower alkylamino or lower dialkylamino.

4,423,227

# PROCESS FOR THE PREPARATION OF REACTIVE, COUPLABLE DERIVATIVES OF THE THYROID HORMONES

Hans-Georg Batz, Tutzing; Winfried Albert, Pähl; Helmut Lenz, Tutzing; Hans-Ralf Linke, Raisting; and Fritz Stähler, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,141

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037858

Int. Cl.<sup>3</sup> C07F 7/10

U.S. Cl. 548—406

11 Claims

1. Process for the preparation of reactive, couplable derivatives of the thyroid hormones 3,3',5-triiodothyronine (T<sub>3</sub>) and 3,3',5,5'-tetraiodothyronine (T<sub>4</sub>) by reaction with reactive carboxylic acid derivatives, which process comprises silylating all the functional groups of the thyroid hormone by reaction with a reactive triorganosilyl derivative and then reacting the persilylated derivative of the thyroid hormone thus obtained with an activated carboxylic acid derivative.

4,423,228

# PROCESS FOR PREPARING

N-(METHYLSULFONYL)-1,2,8,8A-CYCLOPROPA[c]BENZO[1,2-b:4,3-b'DIPYRROL-4(5H)-ONE

Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

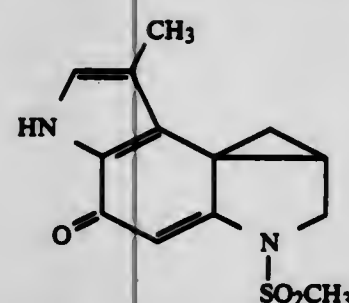
Division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,460

Int. Cl.<sup>3</sup> C07D 487/04

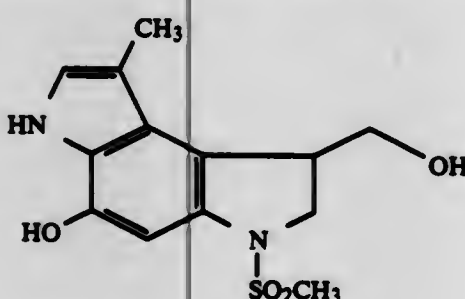
U.S. Cl. 548—421

1 Claim

1. A process for preparing a compound of the formula



which comprises reacting a compound of the formula



with triphenylphosphine/carbon tetrahalide, concentrating the

reaction mixture in vacuo to a concentrate, applying said concentrate to a thick-layer silica gel plate, and eluting the desired compound therefrom with a non-polar organic solvent in which the desired compound is soluble.

4,423,229

# COMPOSITION OF MATTER AND PROCESS

Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

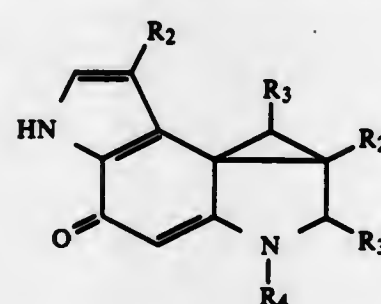
Division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,461

Int. Cl.<sup>3</sup> C07C 487/02; A01N 43/38

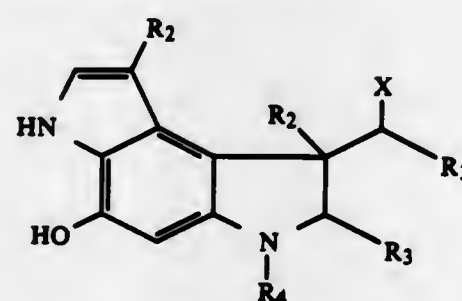
U.S. Cl. 548—421

1 Claim

1. A process for preparing a compound of the formula



wherein R<sub>2</sub> and R<sub>3</sub> are hydrogen, alkyl of from 1 to 5 carbon atoms, inclusive, and phenyl; R<sub>4</sub> is selected from the group consisting of SO<sub>2</sub>R<sub>2</sub>, SO<sub>2</sub>CH<sub>2</sub>COphenyl, CO<sub>2</sub>CH<sub>2</sub>Z where Z is selected from the group consisting of CH<sub>2</sub>I, CCl<sub>3</sub>, CH<sub>2</sub>SO<sub>2</sub>R<sub>2</sub>, phenyl, and fluorenylmethyl, which comprises reacting a compound of the formula



wherein R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are as defined above, and X is selected from the group consisting of OSO<sub>2</sub>R<sub>2</sub>, Cl, Br, and I, with triphenylphosphine/carbon tetrahalide, concentrating the reaction mixture in vacuo to a concentrate and applying said concentrate to a thick-layer silica gel plate to give the desired compound.

4,423,230

# PREPARATION OF AN INTERMEDIATE FOR N-(METHYLSULFONYL)-1,2,8,8A-CYCLOPROPA[c]BENZO[1,2-b:4,3-b'DIPYRROL-4(5H)-ONE

Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

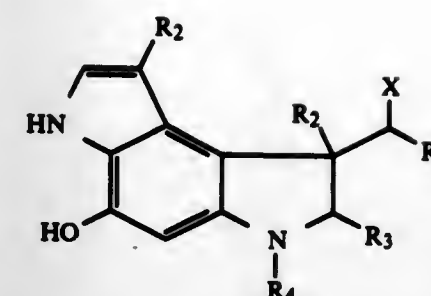
Division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,459

Int. Cl.<sup>3</sup> C07D 487/04

U.S. Cl. 548—433

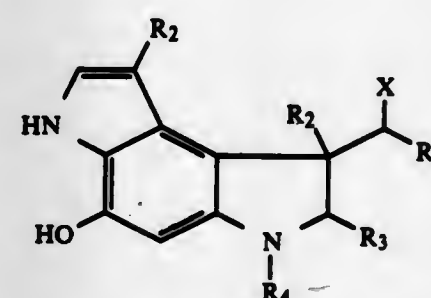
1 Claim

1. A process for preparing a compound of the formula



wherein R<sub>2</sub> and R<sub>3</sub> are H, alkyl of from 1 to 5 carbon atoms, inclusive, and phenyl; R<sub>4</sub> is selected from the group consisting of SO<sub>2</sub>R<sub>2</sub>, SO<sub>2</sub>CH<sub>2</sub>CO phenyl, CO<sub>2</sub>CH<sub>2</sub>Z where Z is selected from the group consisting of CH<sub>2</sub>I, CCl<sub>3</sub>, CH<sub>2</sub>SO<sub>2</sub>R<sub>2</sub>, Ph(phenyl), and fluorenylmethyl,

and X is selected from the group consisting of OSO<sub>2</sub>R<sub>2</sub>, Cl, Br, and I, which comprises reacting a compound of the formula



wherein R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are as defined above, with a reagent selected from the group consisting of sulfonyl chloride, carbon tetrachloride/triphenylphosphine, carbon tetrabromide/triphenylphosphine, and N-iodosuccinimide triphenylphosphine, separating the organic phase from the reaction mixture, drying and concentrating said organic phase, and recovering the desired product by silica gel chromatography.

4,423,231

# TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden; and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,119

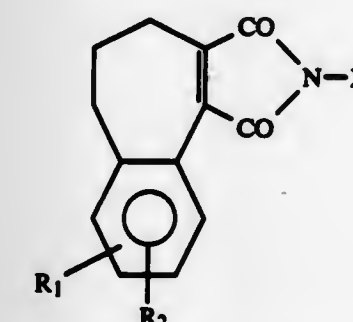
Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

Int. Cl.<sup>3</sup> C07D 209/94

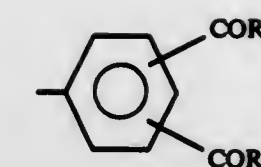
U.S. Cl. 548—451

4 Claims

1. A compound of the formula



in which R and R<sub>1</sub> independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, and X is a group of the formula



the two —COR<sub>2</sub>s are bonded to the benzene ring in the meta- or para-position relative to one another and the R<sub>2</sub>s are each —OH, —Cl, alkoxy having 1 to 4 carbon atoms or phenoxy, or the two —COR<sub>2</sub>s are bonded to the benzene ring in the ortho-position relative to one another and the two R<sub>2</sub>s together are —O—.

4,423,232

# TRICYCLIC ISOINDOLE DERIVATIVES

Christopher A. Demerson, Montreal; Lealie G. Humber, Dollard des Ormeaux, and Jean-Marie Ferland, Laurent, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

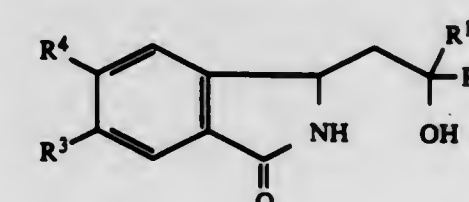
Division of Ser. No. 78,547, Sep. 24, 1979, Pat. No. 4,273,773. This application Feb. 19, 1981, Ser. No. 235,814

Int. Cl.<sup>3</sup> C07D 209/46

U.S. Cl. 548—472

2 Claims

1. A compound of formula XVIII



in which R<sup>3</sup> and R<sup>4</sup> each is hydrogen, lower alkoxy, lower alkyl, trifluoromethyl, halo or hydroxy, or R<sup>3</sup> and R<sup>4</sup> together form a OCH<sub>2</sub>O chain; and R<sup>14</sup> and R<sup>15</sup> each is hydrogen or lower alkyl.

4,423,233

# HYPOGLYCEMIC 5-SUBSTITUTED OXAZOLIDINE-2,4-DIONES

Rodney C. Schnur, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

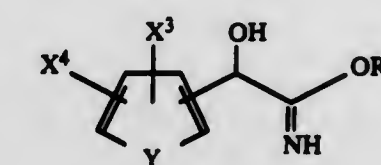
Division of Ser. No. 252,961, Apr. 23, 1981, Pat. No. 4,332,952, which is a continuation-in-part of Ser. No. 173,206, Jul. 28, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,777

Int. Cl.<sup>3</sup> C07D 333/00; A61K 31/44

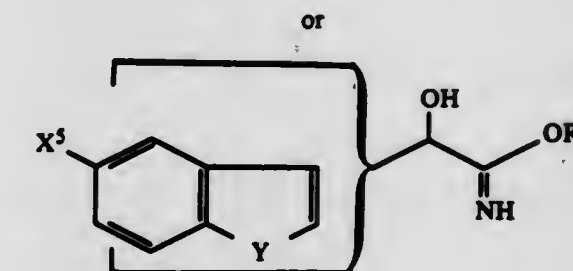
U.S. Cl. 549—58

16 Claims

1. A compound of the formula



(III)



(IV)

wherein R' is lower alkyl; Y is sulfur or oxygen;



X<sup>3</sup> is hydrogen, fluoro, chloro, bromo, iodo, methyl, phenyl or (C<sub>1</sub>-C<sub>3</sub>)-alkoxy;  
 X<sup>4</sup> is hydrogen or methyl; and  
 X<sup>5</sup> is hydrogen, fluoro, chloro, bromo or iodo; or an acid addition salt thereof.

#### 4,423,234 COPPER-CATALYZED BIAROMATIC COUPLING PROCESS

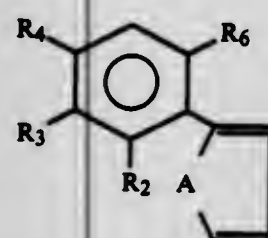
Ernest L. Plummer, North Tonawanda, and David E. Seelye, Lockport, both of N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 17, 1982, Ser. No. 378,539  
 Int. Cl.<sup>3</sup> C07C 2/00

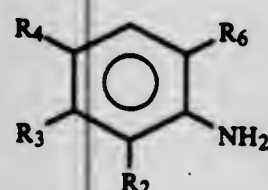
U.S. Cl. 549—80

10 Claims

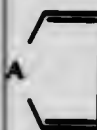
1. In a process for preparing a biaromatic compound of the formula



by treating an aniline derivative of the formula



with a lower alkyl nitrite in a solvent of the formula



wherein R<sub>2</sub> is hydrogen, halogen, or lower alkyl, R<sub>3</sub> is hydrogen (unless R<sub>2</sub> is lower alkyl) or halogen, R<sub>4</sub> and R<sub>6</sub> are independently hydrogen or halogen, and A is —CH=CH—, —NH—, —CH=N—, O, or S, the improvement which comprises adding copper metal to the reaction mixture, thereby increasing the yield of the desired biaromatic compound.

#### 4,423,235 CARBONATES CARRYING CYCLIC CARBONATE GROUPS

Michel Burgard, Strasbourg; Marc D. Piteau, Itteville; Alain J. Rollat, Strasbourg Neudorf, and Jean-Pierre G. Senet, La Chapelle la Reine, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

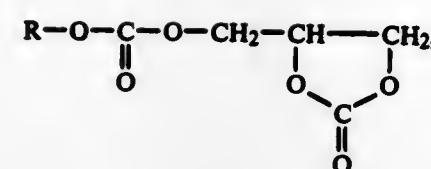
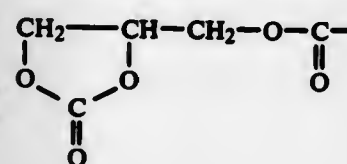
Filed Apr. 14, 1980, Ser. No. 139,155

Claims priority, application France, Apr. 13, 1979, 79 09402  
 Int. Cl.<sup>3</sup> C07D 317/36

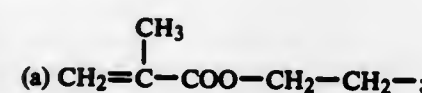
U.S. Cl. 549—229

9 Claims

1. A carbonate carrying cyclic carbonate groups, of the general formula:



in which R is

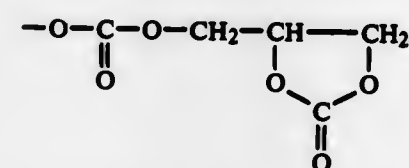


(b) a polyoxyethylene of formula

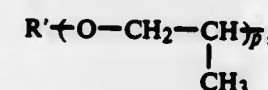


in which n is between 1 and 40 and in which R' is a hydrocarbon group of 1 to 10 carbon atoms;

(c) a polyoxyethylene of formula  $\text{R}'(\text{OCH}_2\text{CH}_2)_n$  in which R' is a hydrocarbon group of 1 to 10 carbon atoms, n is between 1 and 40 and R' carries one or two chains  $(\text{O}-\text{CH}_2-\text{CH}_2)_n$ , in which n' is between 1 and 40, which chains are terminated by a group

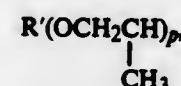


(d) a polyoxypropylene of the formula

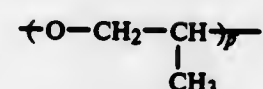


in which p is between 1 and 40 and in which R' is a hydrocarbon group of 1 to 10 carbon atoms;

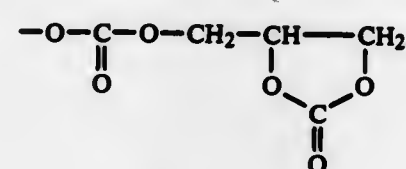
(e) a polyoxypropylene of formula



in which p is between 1 and 40, R' is a hydrocarbon group of 1 to 10 carbon atoms which carries one or two chains



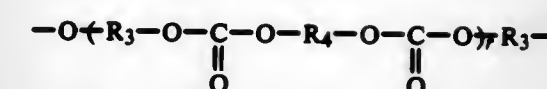
in which p' is between 1 and 40, which chains are terminated by a group



(f) phenyl;

(g) an aliphatic polycarbonate

-continued



in which r is between 1 and 20 and in which R<sub>3</sub> and R<sub>4</sub> are identical or different, and are polymethylene groups containing from 2 to 8 carbon atoms or polyoxyethylene groups



in which t is equal to 1, 2, 3, 4 or 5,  
 (h) an alkyl of 1 to 8 carbon atoms.

#### 4,423,236 5,6-O-ISOALKYLIDENE ASCORBIC ACID DERIVATIVES

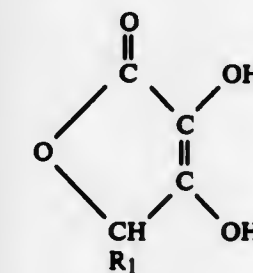
Andrew J. Welebir, Falls Church, Va., assignor to National Foundation for Cancer Research, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 177,940, Aug. 14, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,423  
 Int. Cl.<sup>3</sup> C07D 407/00, 307/62

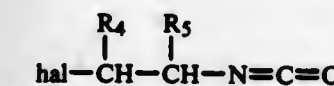
U.S. Cl. 549—320

5 Claims

1. A chemical composition comprising the addition products obtained through the reaction of an enediol ketolactone of the formula:



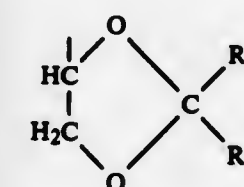
with a 2-haloethyl isocyanate of the formula:



wherein:

hal is selected from the group consisting of I, Br and Cl;

R<sub>1</sub> is selected from the group consisting of hydrogen, alkyl, lower alkyl ether, lower alkyl ester, carbonate ester, carboxylic acid or amide, and a ketal or acetal of the formula:



wherein:

R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> are selected from the group consisting of lower alkyl containing 1 to 3 carbons and H and may be the same or different.

4. A composition according to claim 1, wherein said reaction which forms said addition products is carried out in a dipolar aprotic solvent.

#### 4,423,237 BENZODIOXANE HERBICIDES

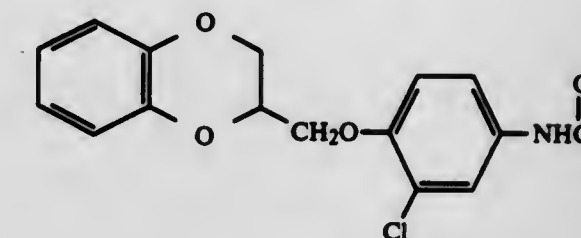
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 114,867, Jan. 24, 1980, abandoned, which is a continuation of Ser. No. 938,590, Aug. 31, 1978, abandoned. This application May 24, 1982, Ser. No. 381,136  
 Int. Cl.<sup>3</sup> C07D 319/14; A01N 43/00

U.S. Cl. 549—362

11 Claims

1. A compound having the formula



wherein R is selected from the group consisting of alkoxy having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkyl having from 1 to 6 carbon atoms, thioalkyl having from 1 to 6 carbon atoms, chloroalkyl having from 1 to 6 carbon atoms, and alkynyl having from 2 to 6 carbon atoms.

#### 4,423,238 PROCESS FOR PURIFYING ACETALS

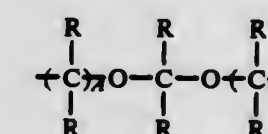
Jeff T. Fenton, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Jun. 17, 1982, Ser. No. 378,660

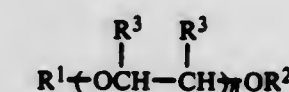
Int. Cl.<sup>3</sup> C07D 323/06, 321/06, 323/00, 319/06, 317/12, 41/58  
 U.S. Cl. 549—368

7 Claims

1. A method for removing impurities from trioxane and acetals having the general formula



wherein each R is, independently, hydrogen, alkyl groups containing from 1 to 20 carbon atoms and cycloaliphatic or aromatic groups containing from 6 to 20 carbon atoms and A and B are numbers from 1 to about 3, comprising contacting said trioxane or acetal with an alkali metal in the presence of a phase transfer catalyst, refluxing for a time sufficient to purify the acetal, and separating alkali metals and phase transfer catalysts, wherein the phase transfer catalyst is at least one material selected from the group consisting of cryptates, crown ethers, sulfur or nitrogen analogues of crown ethers, and polyethers having the general formula



wherein R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> are, independently, hydrogen or alkyl radicals containing from 1 to 20 carbon atoms, and n ≥ 1.



# 4,423,239 METHOD FOR PURIFYING AN EPOXIDATION PRODUCT

Kazuo Miyazaki, Yokohama; Hajime Hara, Fujisawa; Kojiro Teramoto, Kamakura; Hideo Hori, Tokyo; Humiaki Oshimi, Yokohama, and Yoshihiko Araki, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 426,061

Claims priority, application Japan, Oct. 21, 1981, 56-167058  
Int. Cl.<sup>3</sup> C07D 301/32

U.S. Cl. 549-541

3 Claims

1. In a method for purifying a crude epoxidation product of a liquid conjugated diolefin polymer or a vegetable oil which comprises the steps of adding an aqueous washing agent to a crude epoxidation product which is obtained by the reaction of a liquid conjugated diolefin polymer or a vegetable oil with an organic peracid or an epoxidizing agent capable of generating an organic peracid in situ, stirring the mixture, leaving the mixture to stand to induce phase separation and thereafter withdrawing the organic layer, the improvement wherein 50 to 300 parts by weight, per 100 parts by weight of the crude epoxidation product, of a 10-80% by weight aqueous solution of isopropanol is used as the washing agent.

# 4,423,240

METHODS FOR PREPARING CYCLOPOLYSILOXANE  
Yaw D. Yeboah, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,704

Int. Cl.<sup>3</sup> C07F 7/04, 7/08

U.S. Cl. 556-460

5 Claims

1. In a process for preparing cyclic dimethylsiloxanes of the formula:  
(CH<sub>3</sub>)<sub>2</sub>SiO)<sub>m</sub>

where m predominantly equals a whole number 3-6, by hydrolysis and condensation of dimethyldichlorosilane, the improvement which comprises conducting the reaction in the presence of an effective amount of sodium lauryl sulfate.

# 4,423,241

## HERBICIDAL COMPOSITION

Paul J. Caruso, Philadelphia, Pa., assignor to Union Carbide Corporation, Danbury, Conn.

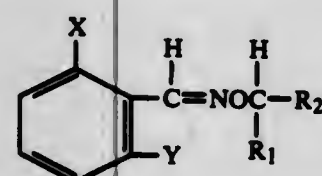
Continuation of Ser. No. 192,703, Oct. 1, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,017

Int. Cl.<sup>3</sup> C07C 101/00

U.S. Cl. 560-35

12 Claims

1. A process for the selective control of undesirable vegetation which comprises applying to the locus to be treated a herbicidally effective amount of a compound of the formula:



where X and Y are halogen; R<sub>1</sub> is hydrogen or C<sub>1</sub> to C<sub>7</sub> alkyl; and, R<sub>2</sub> is selected from the group consisting of a carboxyl group, a metal salt of a carboxyl group, a C<sub>1</sub> to C<sub>12</sub> ester of a carboxyl group, a C<sub>1</sub> to C<sub>4</sub> alkylamine salt of a carboxyl group, an amide of a carboxyl group, a hydrazid of a carboxyl group, and cyano group.

# 4,423,242 PHARMACEUTICAL AMIDES, AND PREPARATION, FORMULATIONS AND USE OF THEREOF

Samuel Wilkinson, Beckenham; George W. Hardy, Biggin Hill, and Roger Wrigglesworth, Sevenoaks, all of England, assignors to The Wellcome Foundation Ltd., London, England  
Filed Sep. 24, 1982, Ser. No. 422,995

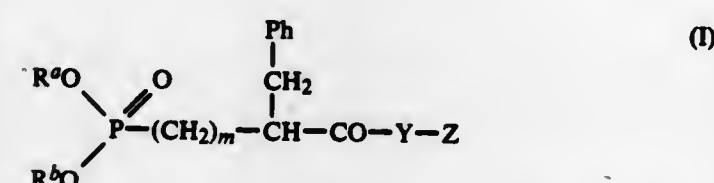
Claims priority, application United Kingdom, Sep. 25, 1981, 8129055

Int. Cl.<sup>3</sup> C07F 9/38; C07C 69/612; A61K 31/66, 31/215

U.S. Cl. 560-41

19 Claims

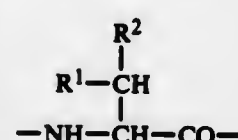
1. Compounds of the general formula



wherein Ph is a phenyl group which is optionally substituted by one or more substituents selected from halo (i.e. fluoro, chloro, bromo or iodo), C<sub>1-4</sub>alkyl, amino, C<sub>1-4</sub>alkylamino, di-C<sub>1-4</sub>alkylamino, nitro, sulphonyl, aminosulphonyl, trihalomethyl, carboxy, C<sub>1-4</sub>alkoxycarbonyl, amido, C<sub>1-4</sub>alkylamido, C<sub>1-4</sub>alkoxy, C<sub>2-4</sub>alkenyl, cyano, aminomethyl or methylsulphonyl; R<sup>a</sup> and R<sup>b</sup>, which may be the same or different, each represents a hydrogen or alkali metal atom or a C<sub>1-4</sub>alkyl group; m is 0 or 1; Y is a group of formula:



or a group of formula:



where

R<sup>1</sup> is hydrogen or methyl;

R<sup>2</sup> is alkyl of 1 to 3 carbon atoms or is methylthiomethyl; and

Z is -OR<sup>3</sup> or -NR<sup>4</sup>R<sup>5</sup> where R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are each hydrogen or alkyl of 1 to 4 carbon atoms (i.e. methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, or t-butyl) and R<sup>3</sup> can further be phenylalkyl having 1 to 3 carbon atoms in the alkylene moiety thereof, or phenyl; and basic salts thereof.

# 4,423,243

## PROCESS FOR THE PREPARATION OF 2,2-DIMETHYL-3-VINYL-CYCLOPROPANECARBOXYLIC ACIDS AND ESTERS

Manfred Jantelat, Burscheid, and Dieter Arlt, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,403

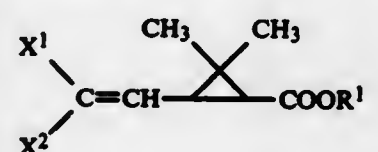
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, 3100354

Int. Cl.<sup>3</sup> C07C 69/743

U.S. Cl. 560-124

7 Claims

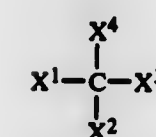
1. A process for the production of 2,2-dimethyl-3-vinyl-cyclopropanecarboxylic acid derivative of the formula



in which

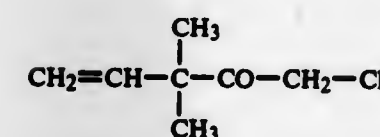
R<sup>1</sup> is a hydrogen atom, an alkyl group or a radical of an alcohol selected from the group consisting of 5-benzyl-3-hydroxymethyl-furan, 5-benzyl-2-hydroxymethyl-furan, 5-benzyl-3-hydroxymethyl-thiophene, 5-phenoxy-5-hydroxymethyl-furan, 3-hydroxy-4-methyl-5-allyl-cyclopent-4-en-1-one, N-hydroxymethyl-phthalimide, N-hydroxymethyl-3,4,5,6-tetrahydrophthalimide, pentafluorobenzyl alcohol, 4-phenyl-3-chloro-2-buten-1-ol, 3-trifluoromethoxybenzyl alcohol, 3-dichlorovinylbenzyl alcohol, 3-propargyloxybenzyl alcohol, 3-dichlorovinyl-α-cyano-benzyl alcohol, 3-phenoxybenzyl alcohol, 3-phenyloxy-α-cyano-benzyl alcohol, 3-phenoxy-α-methoxycarbonyl-benzyl alcohol, 3-phenoxy-α-ethinyl-benzyl alcohol, 3-phenoxy-4-fluoro-benzyl alcohol, 3-(4'-fluorophenoxy)-benzyl alcohol, 3-(4'-chlorophenoxy)-benzyl alcohol and 3-(4'-bromophenoxy)-benzyl alcohol, and

X<sup>1</sup> and X<sup>2</sup> each independently is a halogen atom or a fluorine-substituted alkyl radical, comprising adding (a) a polyhalogeno alkane of the formula

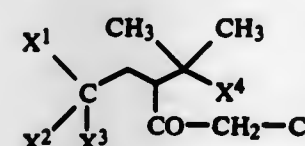
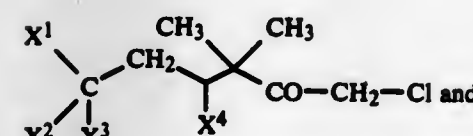


in which

X<sup>3</sup> and X<sup>4</sup> each independently is a halogen atom, to 1-chloro-3,3-dimethyl-pent-4-en-2-one of the formula



in the presence of a catalyst which yields free radicals, or in the presence of a metal salt of the VIII main group or of the sub-group IVa, VIIa or Ib of the periodic system, thereby to obtain a mixture of compounds of the formula



(b) reacting either or both of such compounds with a base of the formula



in which

M is an alkali metal or alkaline earth metal, and n is 1 or 2.

# 4,423,244

PROCESS FOR THE PREPARATION OF THE D-2-(6-METHOXY-2-NAPHTHYL)-PROPIONIC ACID  
Vincenzo Cannata, Borgo Nuovo di Pontecchio Marconi, and Giancarlo Tameriani, Pontecchio Marconi, both of Italy, assignors to Alfa Chemicals Italiana S.p.A., Milan, Italy

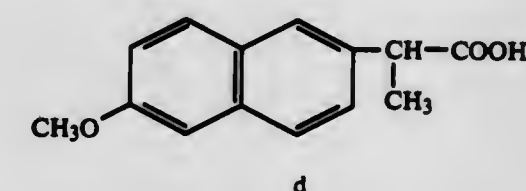
Filed Mar. 29, 1982, Ser. No. 362,679

Claims priority, application Italy, Apr. 1, 1981, 3385 A/81  
Int. Cl.<sup>3</sup> C07C 65/105

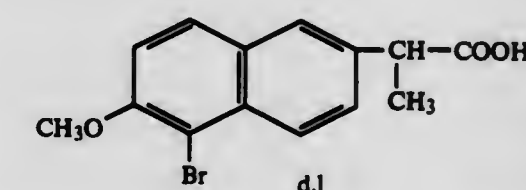
U.S. Cl. 562-466

14 Claims

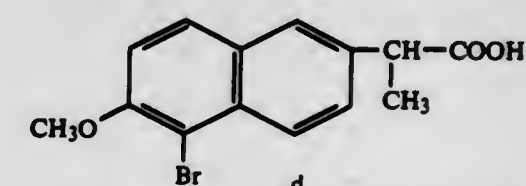
1. A process for preparing the d-2-(6-methoxy-2-naphthyl)-propionic acid of formula I



which consists of (1) reacting a mixture of d- and l-2-(5-bromo-6-methoxy-2-naphthyl)-propionic acids of formula II



with N-methyl-D-glucamine in a solvent system selected from mixtures of toluene and methanol in various volumetric ratios, in the presence of an optically inactive organic or inorganic base, at a temperature between about room temperature and about 65° C., whereby the N-methyl-D-glucamine salts of the d- and l-isomers of said compound of formula II are formed, letting the less soluble N-methyl-D-glucamine salt of the d-isomer precipitate, separating said salt from the reaction mixture, (2) reacting said salt with a strong mineral acid, whereby the compound d-2-(5-bromo-6-methoxy-2-naphthyl)-propionic acid of formula III



is obtained, and (3) catalytically hydrogenating said compound of formula III in an alkaline medium at a temperature between about room temperature and about 100° C. for a period of time varying from 1 to about 4 hours, whereby the bromine atom in the 5-position is replaced by hydrogen and isolating said compound of formula I from the reaction mixture.

# 4,423,245

## PROCESS FOR PREPARING 2,5-DICHLORO-3-NITROBENZOIC ACID FROM 2,5-DICHLORO-3-NITRO-P-XYLENE

Young-Jin Lee, Raleigh, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 18, 1982, Ser. No. 340,262

Int. Cl.<sup>3</sup> C07C 51/265

U.S. Cl. 562-416

21 Claims

1. A process for the preparation of 2,5-dichloro-3-nitrobenzoic acid which comprises reacting 2,5-dichloro-3-nitro-p-xylene in a saturated aliphatic carboxylic acid solvent with oxygen in the presence of a catalyst system, wherein such catalyst system comprises:

(a) a transition metal oxidation catalyst; and



(b) a bromine promoter.

4,423,246

## SELECTED TRICHLOROACETAMIDINES

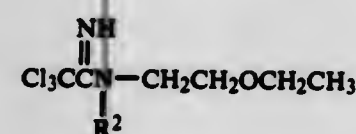
Lawrence E. Katz, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 22, 1982, Ser. No. 350,912

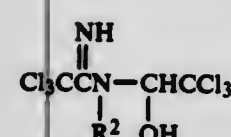
Int. Cl.<sup>3</sup> C07C 123/00, 103/32, 145/02

U.S. Cl. 564—102

1. A compound having the formula:

wherein R<sup>2</sup> is selected from the group consisting of SCCl<sub>3</sub> and COCCl<sub>3</sub>.

2. A compound having the formula:

wherein R<sup>2</sup> is selected from the group consisting of H, SCCl<sub>3</sub> and COCCl<sub>3</sub>.

4,423,247

## MANUFACTURE OF ARALKYLARYLAMINES AND ALKYLARYLAMINES

Franz Merger, Frankenthal, Fed. Rep. of Germany, and Ludwig Schrott, deceased, Ludwigshafen, Fed. Rep. of Germany (by Meinie Thea Schrott, heiress), assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 781,148, Mar. 25, 1977, abandoned.

This application Sep. 21, 1978, Ser. No. 944,292

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618033

Int. Cl.<sup>3</sup> C07C 87/28

U.S. Cl. 564—391

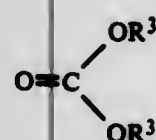
10 Claims

1. A process for the manufacture of aralkylarylamines and alkylarylamines which comprises:

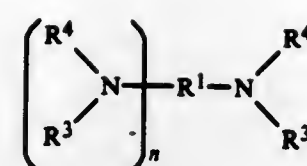
reacting at a temperature above 150° C. in the absence of catalytic amounts of Lewis acid a primary or secondary amine of the formula



with a carbonate of the formula



where R<sup>1</sup> is naphthyl, naphthylene, phenyl or phenylene and the individual radicals R<sup>2</sup> and R<sup>3</sup> are identical or different and each is aralkyl of 7 to 12 carbon atoms or alkyl of 1 to 7 carbon atoms, said radicals R<sup>2</sup> and R<sup>3</sup> being unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carbalkoxy each of 2 to 4 carbon atoms, cyano, halogen or nitro, R<sup>2</sup> may also be hydrogen and n is 0 or 1, to form an aralkylarylamine or alkylarylamine of the formula



III

3 Claims

where R<sup>1</sup> and R<sup>3</sup> are defined as above, R<sup>4</sup> has the meanings of R<sup>2</sup> or R<sup>3</sup> and n is 0 or 1.

4,423,248

## PROCESS FOR ZONE REFINING WITH A HELICAL SOLUTION ZONE

Philip J. Rennolds, Wilmington, Del., assignor to E. I. Du Pont de Nemours &amp; Co., Wilmington, Del.

Filed Dec. 3, 1981, Ser. No. 327,059

Int. Cl.<sup>3</sup> C07C 45/79

U.S. Cl. 568—324

6 Claims

1. A method for refining a solid ingot of impure material contained in the annular sample space of zone refiner comprising:

- forming a continuous helical liquid solution zone from one end of the ingot to be purified to the other by heating the impure material at a temperature below its melting point along a helical path, said solution zone comprising solvent and the material to be purified,
- rotating the solution zone through the annular sample space thereby separating the pure material from the impurity, the method further characterized in that (a) the pure material and the impurity are soluble in the solvent but to a different extent and (b) there is no displacement of the ingot from one end of the zone refiner to the other end.

4,423,249

## PREPARATION OF HALOFLUOROALKYL ETHERS

William P. Carl, Angleton, and Bobby R. Ezzell, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

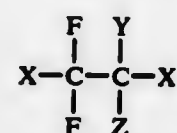
Filed Aug. 26, 1981, Ser. No. 296,607

Int. Cl.<sup>3</sup> C07C 41/16

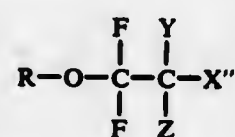
U.S. Cl. 568—655

11 Claims

1. A process comprising contacting in an aprotic solvent a metal hydrocarboxide with a haloalkyl compound represented by formula I



wherein X is selected from the group consisting of Cl, Br and I; X' is selected from the group consisting of Br and I; and Y and Z are independently selected from the group consisting of F, Cl, Br, I and R', wherein R' is selected from the group consisting aryl, alkyl including cycloalkyl, or substituted alkyl with the proviso that R' does not interfere with the reaction between the metal hydrocarboxide and the compound of formula I; under conditions sufficient to form an ether represented by formula II



II

wherein Y and Z are as previously described; X'' is selected from the group consisting of Br, I and H; and R is aryl or alkyl with the proviso that the carbon of said alkyl which is bonded to the oxygen atom shown in formula II must not have any fluorine substituent.

4,423,250

## PROCESS FOR THE PRODUCTION OF OXYGEN-CONTAINING ORGANIC PRODUCTS

Giuseppe Fachinetti, Faenza, Italy, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 12, 1981, Ser. No. 273,055

Int. Cl.<sup>3</sup> C07C 41/00, 41/12, 43/00

U.S. Cl. 568—678

13 Claims

1. The process for the production of oxygen-containing organic products which comprises reacting, in a homogeneous liquid phase, carbon monoxide and hydrogen in the presence of an effective amount of a cobalt-containing compound to form said oxygen-containing organic products said cobalt-containing compounds having the formula:



wherein Y is selected from the group consisting of hydrogen, deuterium, hydroxy, and alkoxy at an effective temperature and pressure such that the oxygen containing organic product formed contains the substituent Y and at least 2 carbon atoms and 1 oxygen atom more than are present in Y.

4,423,251

## PROCESS EMPLOYING SEQUENTIAL ISOBUTYLENE HYDRATION AND ETHERIFICATION

Peter R. Pujado, Palatine, and Bipin V. Vora, Elk Grove Village, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 9, 1982, Ser. No. 416,414

Int. Cl.<sup>3</sup> C07C 41/06, 29/04

U.S. Cl. 568—697

15 Claims

1. A hydrocarbon conversion process which comprises the steps of:

- dividing a feed stream comprising isobutylene and isobutane into a first portion and a second portion;
- passing the first portion of the feed stream into a hydration zone wherein isobutylene is converted into tertiary butyl alcohol and producing a first product stream comprising tertiary butyl alcohol and a first effluent stream comprising isobutylene and isobutane; and
- passing the first effluent stream and the second portion of the feed stream into an etherification zone wherein isobutylene is converted into an ether by reaction with an alcohol and producing a second product stream comprising the ether and a second effluent stream comprising isobutane.

4,423,252

## PROCESS FOR PREPARING BISPHENOLS

Takao Maki, Fujisawa; Tetsuo Masuyama, Machida; Toshiharu Yokoyama, and Yoshiko Fujiyama, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,692

Claims priority, application Japan, Aug. 7, 1980, 55-108595; Aug. 12, 1980, 55-110785

Int. Cl.<sup>3</sup> C07C 39/16

U.S. Cl. 568—728

5 Claims

1. A process for preparing bisphenols, comprising subjecting a phenol and a ketone to condensation in the presence of a sulfonic acid type cation exchange resin partially modified with a pyridinealkanethiol of the formula:



wherein n is a positive integer and Py is 3-pyridyl when n is 1, or 2-, 3- or 4-pyridyl when n is more than 1, at a temperature of 30° to 120° and at atmospheric pressure or a slight positive pressure, said phenol being selected from the group consisting of phenol, o-cresol, m-cresol, o-chlorophenol, m-chlorophenol, o-t-butylphenol, 2,6-xyleneol, 2,6-di-t-butylphenol and o-phenylphenol, said ketone being selected from the group consisting of acetone, ethyl methyl ketone, isobutyl methyl

ketone, acetophenone, cyclohexanone and 1,3-dichloroacetone.

4,423,253

## PROCESS FOR SEPARATING T-BUTYLATED PHENOLS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1982, Ser. No. 372,056

Int. Cl.<sup>3</sup> C07C 37/68

U.S. Cl. 568—756

24 Claims

1. A process for resolving a mixture of two or more phenolics at least one of which is a t-butylated phenolic, comprising the steps of:

treating a mixture of two or more closely-boiling phenolics at least one of which is a t-butylated phenolic, said mixture having a temperature in a range from about 0° C. to about 150° C., with a metal halide salt selected from the group consisting of calcium bromide, calcium chloride, lithium bromide, magnesium chloride and magnesium bromide so as to form preferentially a complex comprised of the selected metal halide salt and one of the phenolics, whereby the preferentially-formed metal halide salt-phenolic complex may be isolated and thereafter decomposed to a product comprising a predominantly greater amount of one phenolic over other phenolics present, as compared to the relative amounts of phenolics present in the original mixture of phenolics.

4,423,254

## SUPERACID CATALYZED PREPARATION OF RESORCINOL FROM META-ISOPROPYLPHENOL

George A. Olah, Beverly Hills, Calif., assignor to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation-in-part of Ser. No. 211,772, Dec. 1, 1980, abandoned, which is a division of Ser. No. 130,402, Mar. 14, 1980, Pat. No. 4,339,614. This application Jun. 1, 1982, Ser. No. 383,941

Int. Cl.<sup>3</sup> C07C 39/06, 37/14

U.S. Cl. 568—781

5 Claims

1. A process of preparing substantially pure meta-isopropylphenol which comprises propylating phenol with:

- propylene,
  - an isopropyl halide,
  - an isopropyl alcohol,
  - di isopropylbenzene,
  - tri isopropylbenzene,
  - di isopropylphenol, or
  - tri isopropylphenol,
- in the presence of a combination catalyst of:
- an excess of anhydrous hydrogen fluoride and a Lewis acid fluoride, or
  - an excess of anhydrous hydrogen fluoride and a perfluorinated alkanesulfonic superacid of one to eighteen carbon atoms,

at a temperature sufficient to produce substantially pure meta-isopropylphenol.

4,423,255

## (+)4-SUBSTITUTED-2-INDANOLS

John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 221,656, Dec. 31, 1980, and a continuation-in-part of Ser. No. 42,372, May 24, 1979, which is a continuation of Ser. No. 927,198, Jul. 24, 1978, and Ser. No. 870,973, Jan. 20, 1978. This application May 17, 1982, Ser. No. 379,390

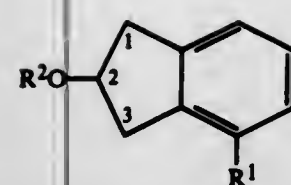
Int. Cl.<sup>3</sup> C07C 35/32

U.S. Cl. 568—808

3 Claims

1. A 4-substituted-2-indanyl compound of the formula





wherein R<sup>1</sup> is phenyl which may be substituted with halogen or lower alkyl, R<sup>2</sup> is hydrogen, and the isomer of S configuration at C-2 of the indanyl ring is present in an enantiomeric excess of at least 25% over the isomer of R configuration at C-2 of the indanyl ring.

4,423,256

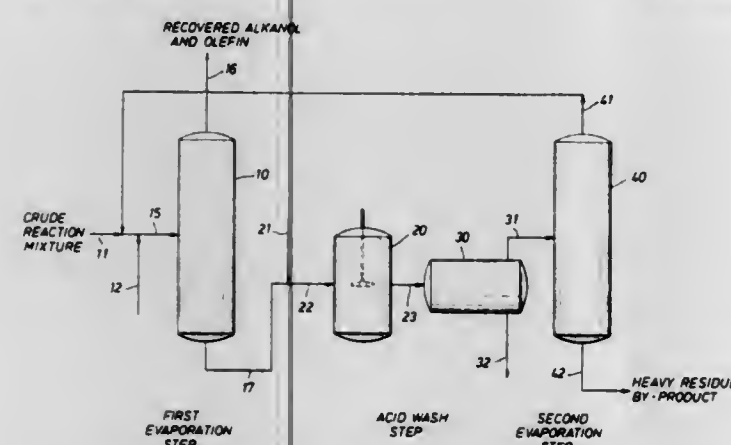
## RECOVERY OF SECONDARY ALKANOLS

Paul V. Shaw; Larry W. Payne, both of Houston, Tex.; Charles E. Sanborn, Walnut Creek, Calif., and Eugene F. Lutz, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.  
Filed Oct. 20, 1982, Ser. No. 435,429

Int. Cl.<sup>3</sup> C07C 29/06

U.S. Cl. 568—886

10 Claims



1. In the process for the preparation of a C<sub>6</sub> to C<sub>20</sub> alkanol which comprises sulfating a C<sub>6</sub> to C<sub>20</sub> olefin starting material, hydrolyzing resulting alkylsulfuric acids to obtain a crude alkanol reaction mixture containing C<sub>6</sub> to C<sub>20</sub> alkanol together with C<sub>6</sub> to C<sub>20</sub> olefin starting material and heavy by-product, and separating the crude alkanol reaction mixture into alkanol and olefin rich vapor and heavy by-product rich liquid, the improvement in separation of alkanol and olefin from the crude alkanol reaction mixture which comprises:

- a first evaporation step, evaporating the crude reaction mixture under alkaline pH, withdrawing an alkanol and olefin rich first evaporation overhead vapor containing between about 80 and 98 percent by weight of the alkanol present in the crude reaction mixture and withdrawing a first evaporation bottoms liquid,
- in an acid wash step, contacting the first evaporation bottoms liquid with an aqueous acid contact solution, withdrawing a washed organic contact phase, and withdrawing an aqueous contact effluent phase, with the provision that the acid content of the aqueous acid contact solution is sufficient to result in the aqueous contact effluent phase having a pH less than about 1.5, and
- in a second evaporation step, evaporating the washed organic contact phase under acidic pH, at a temperature of at least 400° F., withdrawing a heavy by-product rich second evaporation bottoms liquid, with the provision that the average residence time of the second evaporation bottoms liquid at the temperature of the second evaporation is at least about 15 minutes, and withdrawing an alkanol and olefin rich second evaporation overhead vapor, said second evaporation overhead vapor containing a combined quantity by mole of alkanol and olefin greater than that contained in the washed organic contact phase.

4,423,257

## PROCESS FOR PRODUCING ETHANOL

Nobuo Isogai; Motoyuki Hosokawa; Takashi Okawa; Natsuko Wakui, and Toshiyasu Watanabe, all of Niigata, Japan, assignors to Seichi Ishizaka, President of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 414,020

Claims priority, application Japan, Sep. 7, 1981, 56-139731  
Int. Cl.<sup>3</sup> C07C 31/08, 29/00

U.S. Cl. 568—902

9 Claims

1. A process for producing ethanol which comprises reacting methanol, carbon monoxide and hydrogen, characterized in that the reaction is carried out in the presence of (a) at least one solvent selected from the group consisting of hydrocarbons, ethers and mixtures thereof and (b) a catalyst and in the absence of iodine, bromine, an iodine compound or a bromine compound, said catalyst comprising at least one cobalt compound in amount of 1 to 300 milligram atom (mg-atom) in terms of cobalt, at least one ruthenium compound in amount of 0.1 to 100 mg-atom in terms of ruthenium and at least one tertiary phosphine in amount of 2-600 mg-atom in terms of phosphorus per 1 mol of methanol, and atomic ratio of cobalt:ruthenium:phosphorus in the catalyst being 1:from 0.05 to 0.5:from 0.1 to 2.

4,423,258

## PROCESS FOR PRODUCING ETHANOL

Nobuo Isogai; Motoyuki Hosokawa; Takashi Okawa; Natsuko Wakui, and Toshiyasu Watanabe, all of Niigata, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,140

Claims priority, application Japan, Feb. 8, 1982, 57-17411

Int. Cl.<sup>3</sup> C07C 31/08, 29/00

U.S. Cl. 568—902

13 Claims

1. A process for producing ethanol which comprises reacting methanol, carbon monoxide and hydrogen, characterized in that the reaction is carried out in the presence of (a) at least one inert solvent and (b) a catalyst containing at least one cobalt compound, at least one manganese compound and at least one tertiary phosphine.

4,423,259

## PROCESS FOR PRODUCING PHENYL-[3,3,3-TRIFLUOROPROPYL]PHENYL]METHANE

Yoshiro Kobayashi, Tokyo; Isumaro Kumadaki, Hachiohji; Masaaki Takahashi, Tokyo, and Takashi Yamauchi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 233,715, Feb. 12, 1981, Pat. No. 4,356,335.

This application Feb. 10, 1982, Ser. No. 347,728

Claims priority, application Japan, Feb. 22, 1980, 55/21090; Feb. 22, 1980, 55/21091; Feb. 22, 1980, 55/21092; Feb. 22, 1980, 55/21093; Feb. 22, 1980, 55/21094; Sep. 1, 1980, 55/120928; Nov. 21, 1980, 55/164434

Int. Cl.<sup>3</sup> C07C 17/26

U.S. Cl. 570—144

2 Claims

1. A process for producing phenyl-[(3,3,3-trifluoropropyl)-phenyl]methane, which comprises bringing (3,3,3-trifluoropropyl)benzene into reaction with benzyl chloride in the presence of an acid catalyst.

4,423,260

## METHOD FOR INTRODUCING FLUORINE INTO AN AROMATIC RING

Karl O. Christe, Calabasas, and Carl J. Schack, Chatsworth, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 343,033

Int. Cl.<sup>3</sup> C07C 17/12

U.S. Cl. 570—147

3 Claims

1. A process for introducing a fluorine atom into the ring structure of an aromatic compound which comprises the step of effecting a substitution reaction between (1) an aromatic compound selected from the group consisting of benzene, toluene and nitrobenzene and (2) a hydrogen fluoride solvent solution of NF<sub>4</sub>BF<sub>4</sub>.

4,423,261

PROCESS FOR PRODUCING A GRAPHITE FLUORIDE COMPRISING MAINLY POLYDICARBON MONOFLUORIDE REPRESENTED BY THE FORMULA (C<sub>2</sub>F)<sub>n</sub>

Nobuatsu Watanabe, 136, Uguisudai, Nagaokakyo-shi, Kyoto, Japan; Tsuyoshi Nakajima, Kyoto, and Masayuki Kawaguchi, Arida, both of Japan, assignors to Nobuatsu Watanabe and Applied Science Research Institute, both of Kyoto, Japan

Filed Jan. 8, 1982, Ser. No. 338,108

Claims priority, application Japan, Sep. 10, 1981, 56-143007

Int. Cl.<sup>3</sup> C07C 17/00

U.S. Cl. 570—150

6 Claims

1. A process for producing a graphite fluoride comprising mainly poly-dicarbon monofluoride which comprises contacting a graphite material having Franklin's P-value of 0 to 0.4 with fluorine at a temperature in the range of room temperature to about 100° C. in the presence of a fluoride of at least one element selected from the group consisting of alkali metals, alkaline earth metals, elements belonging to Groups I(b), II(b) and III of the periodic table, and elements of the first period of the transition elements; and then heating the resulting reaction system to a temperature in the range of about 300° C. to 500° C., at which temperature the reaction system is maintained until a constant weight of the resulting reaction product is attained.

4,423,262

## PREPARATION OF DIBROMOSTYRENE

Philip F. Jackisch, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 13, 1980, Ser. No. 130,119

Int. Cl.<sup>3</sup> C07C 17/34

U.S. Cl. 570—193

7 Claims

1. A process for the preparation of an ar-dibromostyrene, said process comprising heating a 2-bromoethyl dibromobenzene at a temperature sufficient to remove HBr from said dibromobenzene and form said ar-dibromostyrene; said process being conducted in the presence of an alkaline mixture of (i) a promoter quantity of aqueous t-alkoxide ion, and (ii) a catalytic quantity of a phase transfer catalyst.

4,423,263

## PROCESS FOR THE SIDE-CHAIN POLYHALOGENATION OF POLYALKYLAROMATIC HYDROCARBONS

Francesco Minisci, Milan; Giancarlo Serboli, Saronno, and Edoardo Platone, San Donato Milanese, all of Italy, assignors to ANIC, S.p.A., Palermo, Italy

Continuation of Ser. No. 279,260, Jul. 1, 1981, abandoned. This application Jun. 29, 1982, Ser. No. 393,441

Claims priority, application Italy, Jul. 15, 1980, 23440 A/80

Int. Cl.<sup>3</sup> C07C 21/24, 17/14

U.S. Cl. 570—197

7 Claims

1. A process for the selective polyhalogenation of an alkylbenzene having at least two alkyl chains so as to place a single

halogen atom on each alkyl chain which comprises reacting an alkylbenzene with an N-halogenamine at a temperature of from -20° C. to +40° C. in the presence of a proton donor and of a catalyst constituted of a metal ion which is capable of existing in various oxidation states but which is in a lower oxidation state, the quantity of said catalyst varying from 1 to 50 mol % with respect to the alkyl side chains of the starting alkylbenzene, the molar ratio of said proton donor to said N-halogenamine being between 1.2 and 8.

4,423,264

PROCESS FOR THE JOINT PRODUCTION OF HIGHLY PURE 1-BUTENE AND PREMIUM GASOLINE FROM A C<sub>4</sub> OLEFINIC CUT

Bernard Juguin, Ruell-Malmaison; Jean Cosyns, Maule, and Jean Miquel, Paris, all of France, assignors to Institut Français du Pétrole, Ruell-Malmaison, France

Filed Jun. 25, 1982, Ser. No. 392,056

Claims priority, application France, Jun. 26, 1981, 81 12795; Jul. 2, 1981, 81 13211; Dec. 8, 1981, 81 23065

Int. Cl.<sup>3</sup> C07C 2/74

U.S. Cl. 585—255

22 Claims

1. A process for producing highly pure 1-butene and premium gasoline from C<sub>4</sub> olefinic cut, characterized in that:

- a C<sub>4</sub> olefinic cut which, at this stage, contains isobutane, n-butane, 1-butene, 2-butenes, isobutene and butadiene, is subjected to a polymerization-disproportionation during which, on the one hand, the isobutene of said cut is converted at least partly to gasoline and, on the other hand, the so-produced gasoline is subjected at least partly to a reaction of partial disproportionation so as to recover, on the one hand, a cut of the jet fuel base type and, on the other hand, 2-butenes and mainly 1-butene produced by said disproportionation,
- the effluent withdrawn from the polymerization-disproportionation zone is subjected to a fractionation giving, on the one hand, a mixture (α) of gasoline and jet fuel base and, on the other hand, a fraction (β) consisting essentially of isobutane, n-butane, 1-butene, 2-butenes, a minor proportion of isobutene and a minor amount of butadiene,
- the cut (β) obtained in step (b) is fed to a selective polymerization zone called finishing polymerization zone, wherein more than 90% of the residual isobutene is converted to gasoline,
- the effluent withdrawn from said finishing polymerization zone of step (c) is subjected to a fractionation giving, on the one hand, a cut (γ) consisting in major part of gasoline containing a mixture of dimers and trimers of isobutene and of 1- and 2-butenes and, on the other hand, a fraction (δ) consisting essentially of isobutane, n-butane, 1-butene, 2-butenes, a minor proportion of isobutene, (less than 0.3% and butadiene traces, less than 100 parts per million),
- the cut (δ) issued from step (d) is fed to a selective hydrogenation zone so as to reduce its butadiene content to a maximum of 10 parts per million by weight with respect to the 1-butene of said cut,
- the effluent from the selective hydrogenation step (e) is supplied to a deisobutanization zone in order to remove the major part of the isobutane contained therein,
- the so-deisobutanized fraction is subjected to a fractionation giving on the one hand, a cut containing a major portion of 2-butenes and n-butane and, on the other hand, a fraction containing at least 99% by weight of 1-butene, and the mixture (α) formed by the gasoline and the jet fuel base obtained in step (b) is admixed with the gasoline cut (γ) obtained in step (d).



# 4,423,265 PROCESS FOR SYNGAS CONVERSIONS TO LIQUID HYDROCARBON PRODUCTS

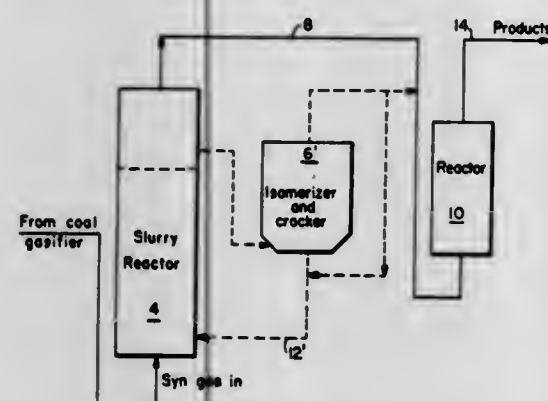
Yung-Feng Chu, Cherry Hill; Tai-Sheng Chou, Sewell, and Arthur W. Chester, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 1, 1982, Ser. No. 445,810

Int. Cl.<sup>3</sup> C07C 1/04, 1/06

U.S. Cl. 585—322

14 Claims



1. A process for converting synthesis gas to liquid hydrocarbons having a boiling range within that of gasoline and distillate comprising the steps of:

- charging said synthesis gas to a Fischer-Tropsch synthesis conversion zone comprising a catalyst providing CO reducing characteristics in a single or a combination of catalyst particles in direct contact with a suspending liquid medium;
- separating at least a fraction of said suspending liquid medium containing dissolved heavier hydrocarbons from said catalyst particles;
- contacting said separated suspending medium containing heavier hydrocarbons with a cracking and isomerization catalyst under conditions effective to crack and isomerize at least a portion of said heavier hydrocarbons to lighter hydrocarbons;
- separating the resultant product stream of (c) into two streams;
- removing an effluent stream from said conversion zone of (a) to a second reaction zone containing a crystalline zeolite catalyst;
- returning one of said streams of (d) to said effluent stream from zone (a);
- returning the remaining stream of (d) to said conversion zone of (a); and
- contacting said effluent stream from said conversion zone of (a) with a crystalline zeolite catalyst to convert the product of said Fischer-Tropsch synthesis gas conversion to hydrocarbons boiling within the range of distillate and gasoline.

# 4,423,266 EXTENDING ISOMERIZATION CATALYST LIFE BY TREATING WITH PHOSPHORUS AND/OR STEAM

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 195,032, Oct. 8, 1980, Pat. No. 4,356,338, which is a division of Ser. No. 61,223, Jul. 27, 1979, abandoned. This application Jul. 30, 1982, Ser. No. 403,756

Int. Cl.<sup>3</sup> C10G 49/08

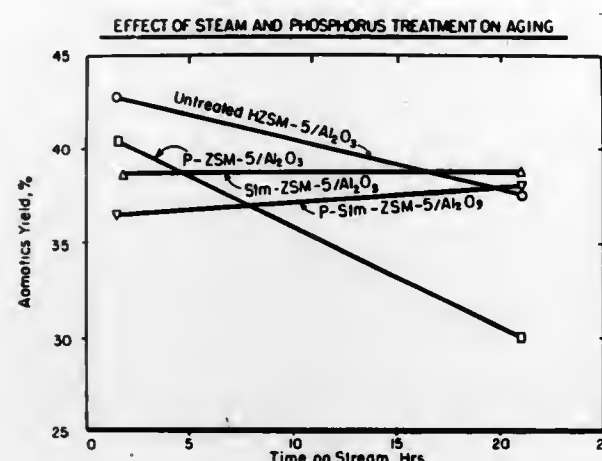
U.S. Cl. 585—481

8 Claims

1. A process for carrying out hydrocarbon isomerization conversion reactions over a catalyst comprising a crystalline zeolite characterized by a silica to alumina molar ratio of at least 12 and a Constraint Index of from about 1 to 12, the improvement which comprises:

- pretreating said catalyst to reduce the rate of catalyst aging and detrimental formation of coke thereon which occurs during said conversion reactions, by reacting said catalyst with a phosphorus-containing compound to deposit be-

tween about 2% and 15% by weight of phosphorus on said catalyst and by subjecting said catalyst to an atmo-



sphere comprising from about 5% to 100% of steam at a temperature from about 250° C. to about 1000° C. for a period of from about 15 minutes to about 100 hours.

# 4,423,267 SUPPORTED FERRIC SULFATE AND COBALT SULFATE CATALYSTS FOR THE OLIGOMERIZATION OF OLEFINS

Robin M. Dowling, Tonkawa, and David P. Higley, Ponca City, both of Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 1, 1982, Ser. No. 383,412

Int. Cl.<sup>3</sup> C07C 2/02

U.S. Cl. 585—531

12 Claims

1. A process for the oligomerization of olefins which comprises:

- contacting lightly branched and/or linear olefins in the range of C<sub>2</sub> to C<sub>40</sub> at temperatures in the range of -10° C. to 400° C., and under pressures between 1 and 75 atmospheres, with a catalyst prepared by combining a ferric sulfate solution of a minimum 0.05 molar strength and alumina or silica-alumina support, permitting the support to adsorb the ferric sulfate for a period between 15 minutes to 24 hours so that the weight percent of iron on the support is between 0.005 to 50%, recovering the solid catalyst, drying and calcining the recovered catalyst for a period of from 1 to 12 hours and at a temperature in the range of 250° C. to 700° C.;

collecting the oligomerized olefinic product.

# 4,423,268 LOW PRESSURE OLIGOMERIZATION OF GASEOUS OLEFINS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 8, 1982, Ser. No. 338,178

Int. Cl.<sup>3</sup> C07C 2/02

U.S. Cl. 585—533

10 Claims

1. A process for oligomerizing normally gaseous alkenes, comprising:

- contacting under low pressure oligomerization conditions a feed comprising normally gaseous alkenes with a catalyst comprising an essentially alumina free intermediate pore size siliceous crystalline molecular sieve having a silica:alumina mole ratio greater than about 200:1, selected from silicalite, CZM, or mixtures thereof; and
- recovering an effluent comprising oligomers of said alkenes.

# 4,423,269 OLIGOMERIZATION OF GASEOUS OLEFINS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1981, Ser. No. 305,680

Int. Cl.<sup>3</sup> C07C 2/02

U.S. Cl. 585—533

22 Claims

- A process for oligomerizing alkenes, comprising:
  - contacting under oligomerization conditions a feed comprising one alkene which is a gas under said oligomerization conditions with a catalyst comprising an intermediate pore size siliceous crystalline molecular sieve substantially free of hydrogen transfer activity selected from silicalite, an organosilicate disclosed in RE 29,948, CZM or mixtures thereof; and
  - recovering an effluent comprising oligomerized alkene wherein at least some of said oligomerized alkenes are liquid under said oligomerization conditions.

# 4,423,270 PROCESS FOR CATALYTIC DEHYDRATION OF ETHANOL VAPOR TO ETHYLENE

Donald E. Pearson, 112 Clydelan Ct., Nashville, Tenn. 37205

Continuation-in-part of Ser. No. 306,087, Sep. 28, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,482

Int. Cl.<sup>3</sup> C07C 1/00

U.S. Cl. 585—639

10 Claims

- In a process for the catalytic dehydration of an aqueous ethanol vapor to ethylene, the process improvement comprising carrying out said reaction in a catalyst bed containing a substituted phosphoric acid catalyst, said catalyst comprising a granular porous catalyst support compatible with phosphoric acid having absorbed thereon a catalytically effective amount of a substituted phosphoric acid in which at least one of the hydroxyl groups thereof has been replaced by a hydrophobic organic group containing from 4 to 22 carbons.

# 4,423,271 PROCESS FOR PRODUCING HIGH PURITY ISOBUTENE BY DEHYDRATING TERTIARY BUTANOL

Fritz Obenaus; Bernd Greving, both of Marl; Heinrich Balke, Herten, and Bernhard Scholz, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

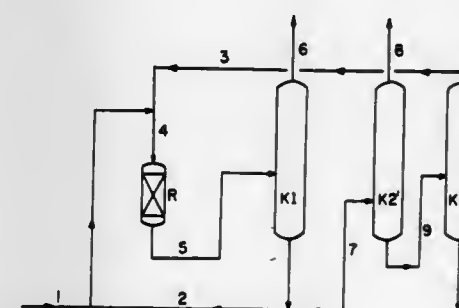
Filed Sep. 27, 1982, Ser. No. 424,576

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151446

Int. Cl.<sup>3</sup> C07C 5/22

U.S. Cl. 585—639

5 Claims



1. A process for producing high-purity isobutene by dehydrating tertiary butanol in the presence of an acid catalyst, comprising:

- continuously feeding an aqueous solution containing from about 40 to 90 percent by weight of tertiary butanol into a reactor and dehydrating in a homogeneous and liquid phase at a fixed catalyst bed consisting of a strongly acidic ion exchange resin at a temperature from about 80° to 150° C. and a pressure of about 5 to 25 bars;
- fractionating the homogeneous, liquid reaction mixture in a distillation part separate from the reaction chamber

- and separating isobutene from the water and from the unreacted tertiary butanol; and
- concentrating the unreacted tertiary butanol by distillation and feeding back a first portion of the mixture of water and unreacted tertiary butanol from step (b) to step (a), and discharging a second portion of said mixture at a rate sufficient to remove excess water.

# 4,423,272 REGENERATION OF METHANOL/METHYL ETHER CONVERSION CATALYSTS

Nancy P. Forbus, Princeton, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,797

Int. Cl.<sup>3</sup> C07C 1/24, 1/20; B01J 29/38

U.S. Cl. 585—640

6 Claims

- In a process whereby the organic reactants methanol and/or methyl ether are catalytically converted in the vapor phase to a hydrocarbon product rich in ethylene and propylene in a reaction zone under conversion conditions including elevated temperature and pressure and in the presence of a catalyst comprising a crystalline aluminosilicate zeolite material characterized by a crystalline structure having pore windows formed by 8-membered rings of oxygen atoms, the improvement which comprises:

effecting regeneration of said catalyst, to restore catalytic activity diminished during conversion of the organic reactants, by contacting said catalyst with hydrogen-containing gas in the reaction zone, in the presence of said vapor phase organic reactants and at a regeneration pressure which exceeds the elevated pressure of the conversion conditions existing in said reaction zone immediately prior to said catalyst regeneration and at a regeneration temperature of from about 200° C. to 600° C. and a regeneration pressure of from about 50 to 700 psig.

- A process according to claim 1 wherein said regeneration temperature ranges from about 300° C. to 500° C. and said regeneration pressure ranges from about 100 psig to 500 psig.
- A process according to claim 2 wherein said zeolite material is selected from erionite, offretite, chabazite, Zeolite T, Zeolite W, and ZSM-34.

# 4,423,273 PREPARATION OF OLEFINS FROM METHANOL AND/OR DIMETHYL ETHER

Wolfgang Hoelderich; Wolf D. Mross, both of Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,698

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1981, 3132024

Int. Cl.<sup>3</sup> C07C 1/20

U.S. Cl. 585—640

8 Claims

- A process for the preparation of olefins by converting methanol and/or dimethyl ether at elevated temperature in the presence of a zeolite catalyst which has been treated by contacting the zeolite with hydrogen fluoride.



4,423,274

**METHOD FOR CONVERTING ALCOHOLS TO HYDROCARBONS**

Nicholas Daviduk, Pennington, and James H. Haddad, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 193,675, Oct. 3, 1980, Pat. No. 4,338,475, which is a division of Ser. No. 89,705, Oct. 30, 1979, Pat. No. 4,251,484. This application Apr. 15, 1982, Ser. No. 368,549

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.<sup>3</sup> C07C 1/20, 1/24

U.S. Cl. 585—640

9 Claims

1. A method for converting reactant materials selected from the group consisting of lower alcohols, either derivatives thereof, oxygenates of synthesis gas and any one or a combination thereof, which process comprises:

passing the reactant material in vaporous, liquid or mixed liquid-vapor condition upwardly through a fluid bed of zeolite catalyst particles, said zeolite characterized by a silica/alumina ratio of at least 12, a pore opening of at least 5 Angstroms and a Constraint Index within the range of about 1 to 12, at a temperature constrained within the range of about 530° F. to about 800° F. under pressure and space velocity conditions selected to achieve from about 40% to about 95% conversion of the reactant materials passed to the bed to olefin-enriched hydrocarbon products, said temperature constrained limits achieved at least in part by a plurality of heat exchange tubes immersed in a fluid bed of said catalyst and providing high pressure steam therein as a result of said heat exchange, said reactant material restricted in gasified bubble growth to less than 24 inch equivalent hydraulic diameter during contact with said bed of fluid catalyst particles by said heat exchange tubes or by a plurality of vertical open ended baffle tubes slotted in the wall thereof for flow of catalyst and gasiform reactant material therethrough adjacently positioned in combination with said heat exchange tubes, said reactant conversion exotherm further constrained by maintaining from 5% to 30% by weight of coke-like material on the zeolite catalyst in the reaction zone; maintaining a high rate of catalyst circulation from a dispersed catalyst phase above said fluid catalyst bed to a bottom portion of said bed following separation of reaction product from said catalyst passing into said dispersed phase; and recovering olefin-enriched hydrocarbon products of said conversion operation.

4,423,275

**OLEFIN CONVERSION**

William H. Myers, Richmond, Va., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 17, 1982, Ser. No. 419,211

Int. Cl.<sup>3</sup> C07C 6/00

U.S. Cl. 585—645

16 Claims

1. A disproportionation process which comprises contacting a suitable olefinic reactant with a catalyst comprising a dicarbonyl(cyclopentadienyl)nitrosyl complex of molybdenum or tungsten and an alkylaluminum halide.

4,423,276

**OLEFIN ISOMERIZATION PROCESS**

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 26, 1982, Ser. No. 444,755

Int. Cl.<sup>3</sup> C07C 5/24, 5/30

U.S. Cl. 585—665

14 Claims

1. A process for the isomerization of an internal olefin in the carbon number range from 4 to about 30 to an alpha olefin, which comprises steps for:

(a) contacting a compound of the formula  $Cp_2TaH_3$ ,

wherein Cp represents an optionally alkyl-substituted cyclopentadienyl, indenyl, or fluorenyl radical, with the internal olefin to form a complex, and

(b) liberating alpha olefin from said complex.

4,423,277

**ALKYLATION PROCESS UTILIZING ABSORPTION REFRIGERATION**

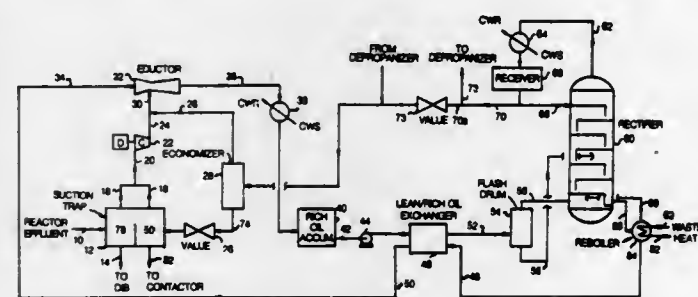
William R. Stroud, 10537 Beinhorn, Houston, Tex. 77024

Filed Jun. 25, 1982, Ser. No. 392,418

Int. Cl.<sup>3</sup> C07C 2/56

U.S. Cl. 585—719

44 Claims



1. A process for catalytic alkylation of isoparaffinic hydrocarbons with at least one olefin, comprising the steps of,

- contacting the olefin with a molar excess of an isoparaffinic hydrocarbon in the presence of an acid catalyst in a reactor, the reactor effluent including at least alkylate, acid catalyst, and unreacted isoparaffinic hydrocarbons,
- separating substantially all of the acid catalyst from the reactor effluent,
- subjecting the reactor effluent less than acid catalyst from step (b) to a separation step resulting in a substantially liquid stream containing alkylate and hydrocarbons and a substantially vaporous stream containing isoparaffinic hydrocarbon,
- recovering alkylate product from the substantially liquid stream from step (c),
- admixing the substantially vaporous stream from step (c) with an adsorbent and condensing the mixture to substantially a liquid,
- heating and rectifying the condensed liquid from step (e) whereby an isoparaffinic hydrocarbon stream is separated as distillate from the adsorbent, and
- condensing the isoparaffinic hydrocarbon stream from step (f) and returning at least a portion of it ultimately to step (a), and returning the adsorbent from step (f) to step (e).

4,423,278

**REMOVING COLOR FROM POLYPHENYLATED ALKANE**

Kang Yang; James D. Reedy; S. E. McGuire, and O. C. Kerfoot, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 17, 1983, Ser. No. 436,214

Int. Cl.<sup>3</sup> C07C 7/13

U.S. Cl. 585—823

11 Claims

1. A method for the removal of color causing compounds from polyphenylated alkane comprising: contacting colored polyphenylated alkane with a solid adsorbant selected from the group consisting of

- bauxite clays containing from about 0.1 to about 20% by weight of at least one material selected from the group consisting of ferric oxide, titanium dioxide, and zirconium oxide, said clay contacted with from about 0.1 to about 20% by weight sulfuric acid, then activated for the removal of color causing compounds by calcining the mixture at a temperature and time sufficient to activate the adsorbant prior to use, and,
- crystalline zeolite suspended in a silica alumina matrix

wherein said zeolite is present in the range of from about 5% to about 20% by weight of zeolite based on the total weight of the adsorbants.

4,423,279

**SEPARATION OF BI-ALKYL SUBSTITUTED MONOCYCLIC AROMATIC ISOMERS WITH PYROLYZED ADSORBENT**

Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 25, 1982, Ser. No. 352,395

Int. Cl.<sup>3</sup> C07C 7/12

U.S. Cl. 585—828

21 Claims

1. A process for separating a para-isomer from a feed mixture comprising at least two bi-alkyl substituted monocyclic aromatic isomers, including the para-isomer, said isomers having from 8 to about 18 carbon atoms per molecule, which process comprises contacting at adsorption conditions said feed with an adsorbent comprising a zeolite which has been contacted at pyrolyzing conditions comprising a substantially oxygen-free environment at a temperature of from about 200° C. to about 800° C. for a period of contact time comprising from about 2 hours to about 10 hours with a pyrolyzing agent comprising an organic solvent containing from 1 to 5 carbon atoms to effect the adsorption of the para-isomer and thereafter recovering the para-isomer.

4,423,280

**SELECTIVE SORPTION BY ZEOLITES**

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 105,190, Dec. 19, 1979, Pat. No. 4,309,281. This application Sep. 30, 1981, Ser. No. 307,050

Int. Cl.<sup>3</sup> C07C 7/13

U.S. Cl. 585—829

15 Claims

1. A process for the selective separation of non-aromatic

compounds in admixture with aromatic compounds which comprises contacting the mixture with zeolite ZSM-23 or ZSM-35, said zeolites characterized by a silica to alumina mole ratio of greater than about 12 to effect the selective sorption of said non-aromatic compounds by said zeolite.

4,423,281

**PROCESS FOR PRODUCING CONJUGATED DIOLEFINS**

Haruhisa Yamamoto, and Nobuaki Yoneyama, both of Takaoka, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,614

Claims priority, application Japan, Apr. 4, 1980, 55-44137

Int. Cl.<sup>3</sup> C07C 5/18, 5/48

U.S. Cl. 585—626

7 Claims

1. In a process for producing a conjugated diolefin which comprises oxidatively dehydrogenating a monolefin having at least 4 carbon atoms in the vapor phase with molecular oxygen to form the corresponding conjugated diolefin; the improvement wherein the oxidative dehydrogenation is carried out in the presence of a catalyst having the general composition formula



wherein X represents at least one element selected from Li, Na, K, Rb, Cs, Tl and P, Y represents at least one element selected from Al, Ga, Zr, Pb, Nb, Ta, Hf and Mn, and a, b, c, d, e, f and g respectively represent the number of Mo, Bi, Cr, Ni, X, Y and O atoms, and when a=12, b=0.05-20, c=0.05-20, d=0.1-30, e=0.01-10, f=0.01-20, and g is the number of oxygen atoms which satisfies the atomic valences of the other elements.



## ELECTRICAL

4,423,282

### FLAT CABLE

Hirotsuke Suzuki, 205-22, Kitamaka, Tokorozawa, Saitama-ken, Japan (359), and Norikazu Ishigohoka, 2175-82, Takahagi, Hidaka-machi Iruma-gun, Saitama-ken, Japan 350-12

Filed Jun. 29, 1981, Ser. No. 278,871

Int. Cl.<sup>3</sup> H01B 11/04, 7/08, 11/06

U.S. Cl. 174—36

5 Claims



1. A flat cable comprising a plurality of conductors, arranged in a parallel spaced relationship and embedded in an expanded porous polytetrafluoroethylene insulation the dielectric constant of said porous insulation being variable between adjacent conductors; said embedded conductors contained within said insulation being contained between at least two layers of a substantially nonporous polytetrafluoroethylene insulation having a higher dielectric constant than said porous insulation.

4,423,283

### CONTROLLABLE STIFFNESS DUCT

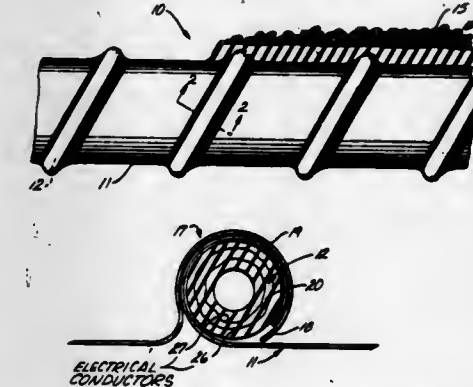
Victor P. Weismann, 430 Prospect Cir., South Pasadena, Calif. 91030

Filed Jun. 25, 1981, Ser. No. 277,182

Int. Cl.<sup>3</sup> F16L 11/11, 11/12, 11/16

U.S. Cl. 174—47

8 Claims



1. A spiral wound strip having a turns interlock continuously along the spiral for defining a flexible duct, and an inflatable seal disposed in the interlock, said seal when inflated stiffening the duct.

4,423,284

### MOULDING DUCT

Steve E. Kaplan, 155 Overbrook Rd., Elyria, Ohio 44035

Filed Jun. 4, 1982, Ser. No. 384,783

Int. Cl.<sup>3</sup> H02G 3/04

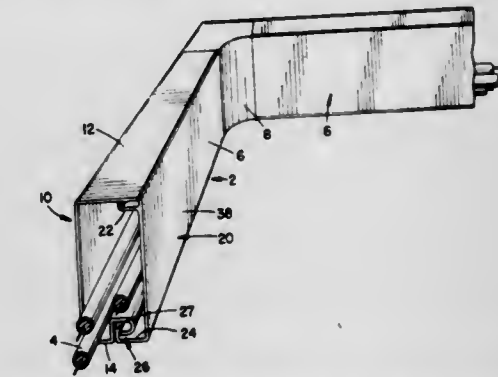
U.S. Cl. 174—101

5 Claims

1. A generally rectangular wiring raceway having a back panel with a back portion adapted to be secured to a wall and further having a top leg and a bottom leg extending substantially perpendicularly from said back portion and wherein said top leg terminates in a snap closure member and said bottom leg terminates in a first hinge member, said first hinge member being formed by extending the bottom leg in a predetermined distance from the back portion to a point at which the leg turns upwards toward said top leg in a direction substantially parallel to the back portion, then again perpendicularly outwardly from said back panel in a direction substantially parallel to said bottom leg, then in a curved fashion such that it folds back

upon itself, thereby defining a channel open at the bottom for reception of a second hinge member;

a front panel having a top snap portion for engagement with the snap closure member of said top leg of said back panel and a bottom portion defining a second hinge member for reception in the first hinge member of the bottom leg of the back panel, said second hinge member being formed by extending a leg from the bottom of the front panel in a direction substantially perpendicular to said front panel a predetermined distance, said leg then angling upwardly in



a direction substantially parallel to the front panel, said leg having a terminal portion, said second hinge member further having a longitudinally extending bead at its terminal portion, and wherein said bead is adapted for receipt in the first hinge member and wherein the portions of both hinge members running substantially parallel respectively to the back of the back panel and the front panel abut each other when the front panel is opened so as to hold the front panel in a position so that cables contained within the raceway may rest on the front panel when said raceway is opened.

4,423,285

### ELECTRIC INSULATOR, IN PARTICULAR FOR A PHASE SPACER, A COMPENSATING ARM OR A DISTANCE PIECE

Denis Thuillier, Vichy, and Michel Willem, Abrest, both of France, assignors to Societe Anonyme dite: CERAVER, Paris, France

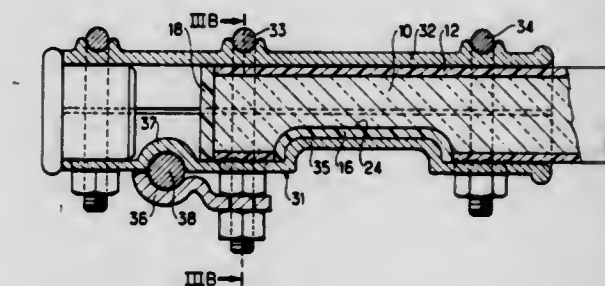
Filed Feb. 9, 1982, Ser. No. 347,290

Claims priority, application France, Feb. 13, 1981, 81 02889

Int. Cl.<sup>3</sup> H02G 7/12; H01B 7/16

U.S. Cl. 174—146

5 Claims



1. An electric insulator to be used as a spacer associated with at least one electric cable, said insulator including an elongated glass fiber reinforced insulating rod covered with an insulating sheath and having adjacent to at least one of its ends means for fixing an electric cable to said at least one end, wherein the improvement comprises:

said insulating rod is formed with an indentation spaced from said at least one end and extending transversely to the longitudinal axis of the rod on only one side of the neutral axis of the rod in bending, and said means for fixing an electric cable to said at least one end comprises first and second rigid half sleeves, the first half sleeve having an internal boss which conforms to said indentation in the rod, and means for holding the first and



second half sleeves against corresponding opposed semi-peripheral portions of the insulator at the at least one end of the rod and for fixing an electric cable against said first half sleeve.

4,423,286

# APPARATUS AND METHOD FOR DETERMINING THE POSITION OF A DRIVEN COIL WITHIN A GRID OF SPACED CONDUCTORS

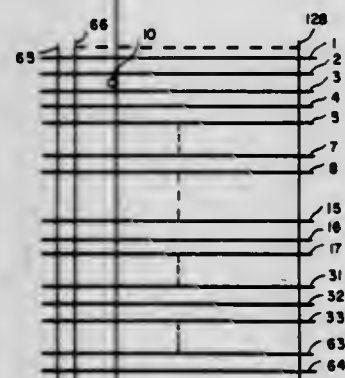
Gary A. Bergeron, Phoenix, Ariz., assignor to Talos Systems, Inc., Scottsdale, Ariz.

Filed Jul. 21, 1982, Ser. No. 400,511

Int. Cl.<sup>3</sup> G08C 21/00

U.S. Cl. 178—19

20 Claims



1. Apparatus for determining the position of a transmitting coil with respect to a grid of spaced parallel conductors located adjacent to the transmitting coil, comprising:  
means for sampling the signals induced in only a selected small percentage of the conductors so as to successively reduce the possible position of the coil to smaller and smaller areas until the position is determined to be intermediate two of the conductors; and  
means responsive to the signals induced in the two conductors to determine the precise position of the coil.

4,423,287

# END-TO-END ENCRYPTION SYSTEM AND METHOD OF OPERATION

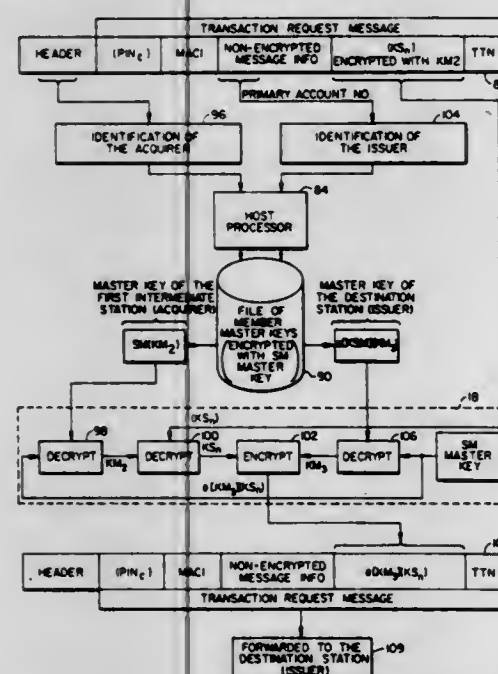
Howard M. Zeidler, Palo Alto, Calif., assignor to VISA U.S.A., Inc., San Francisco, Calif.

Filed Jun. 24, 1981, Ser. No. 278,001

Int. Cl.<sup>3</sup> H04L 9/00

U.S. Cl. 178—22.08

12 Claims



6. A method of operating a network/interchange transaction

execution system of the type which includes a plurality of issuer stations, each having a separate data processor which stores account information for a plurality of accounts, a plurality of transaction terminals for input and output processing of user initiated transactions, including network/interchange transactions, a plurality of acquirer stations, each connected to a plurality of separate transaction terminals, and a network switch which communicatively interconnects the acquirer stations with the issuer stations, the method comprising the steps of:

- at an acquirer station, batch generating and storing a plurality of session keys, each key being encrypted in a first master key and in a second master key to form session key encryption pairs,
- at one of the transaction terminals, receiving the transaction data and a personal identification number, PINc, from a user, encrypting the PINc with a session key, KS<sub>1</sub>, received by said transaction terminal from said acquirer station during the immediately preceding network/interchange transaction, concatenating the PINc and selected elements of the transaction data and computing a first message authentication code, MAC1, using the concatenated data and the session key, and transmitting a network/interchange request message comprised of the encrypted PIN, the MAC1 and the transaction data, to said acquirer station,
- at said acquirer station, receiving the network/interchange request message from said transaction terminal, locating the corresponding session key, KS<sub>1</sub>, of the encryption pair which is encrypted in the second master key and relaying it along with the message to the network switch,
- at the network switch, translating the session key from second master key encryption to encryption in a third master key and relaying it along with the network/interchange request message to a particular issuer as specified by data in the network/interchange request message,
- at said issuer, receiving the network/interchange request message, decrypting the encrypted session key, KS<sub>1</sub>, re-computing and verifying the MAC1 using the decrypted session key, KS<sub>1</sub>, accessing the data base for the account specified by data in the network/interchange request message, translating the session key encrypted PINc into a data base encrypted PINc and comparing and verifying it with a data base encrypted PIN stored in association with the specified account in the data base, then generating an authorization code, re-computing a second message authentication code MAC2 using the session key, and transmitting a response message, including the authorization code and the MAC2 via the network switch to said acquirer station,
- at said acquirer station, receiving the response message with the authorization code and the MAC2, retrieving the first master key encrypted session key e[KM<sub>1</sub>](KS<sub>2</sub>) of a new session key encryption pair, and relaying the response message, including the authorization code, the MAC2 and e[KM<sub>1</sub>](KS<sub>2</sub>) to said transaction terminal, and
- at said transaction terminal, receiving the response message, including the authorization code, the MAC2 and e[KM<sub>1</sub>](KS<sub>2</sub>), re-computing and verifying the MAC2 using the previous session key, KS<sub>1</sub>, acting on the authorization code to carry out the transaction, and replacing the old encrypted session key e[KM<sub>1</sub>](KS<sub>1</sub>) with the new encrypted session key e[KM<sub>1</sub>](KS<sub>2</sub>).

4,423,288

# MODULAR TELEPHONE JACK

Gerald F. Webb, Thorndale, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 29, 1979, Ser. No. 89,242

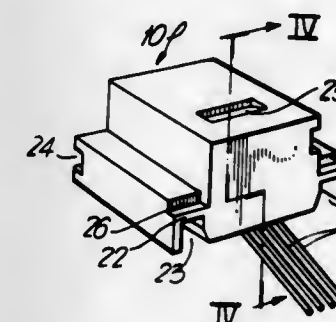
Int. Cl.<sup>3</sup> H01R 13/40, 13/54

U.S. Cl. 339—176 M

6 Claims

1. A modular telephone jack having a top part and a bottom

part, in superposed position, said top and bottom parts defining an aperture therebetween for reception of a modular plug; said top part comprising a main body portion, a lateral extension along each side of the main body portion, a groove extending along the bottom surface of each extension, a recess in the forward end of each extension; a recess in the top surface of each extension adjacent to the rear end thereof, and a recess in the top surface of the main body portion adjacent to the rear end thereof;



said bottom part comprising a wall member having an aperture therein for reception of said top part, two parallel spaced apart walls extending forward normal to the plane of said wall member, an upper edge on each side wall, said edges forming ribs for sliding engagement in said grooves in said lateral extensions; a rearward facing extension at the front end of each upper edge for engagement in the recesses in the forward ends of the extensions; at least one deformable member extending into said aperture and engageable in one of said recesses.

4,423,289

# SIGNAL PROCESSING SYSTEMS

Malcolm A. Swinbanks, Cambridge, England, assignor to National Research Development Corporation, London, England

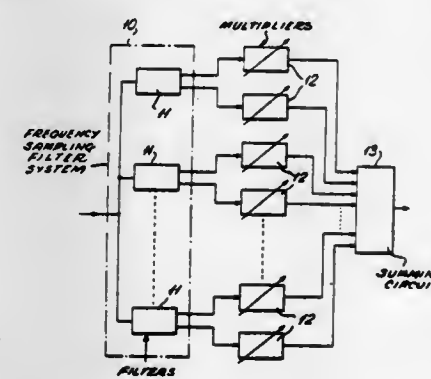
Filed Jun. 23, 1980, Ser. No. 162,242

Claims priority, application United Kingdom, Jun. 28, 1979, 7922572

Int. Cl.<sup>3</sup> E04B 1/99

U.S. Cl. 381—71

8 Claims



1. A signal processing system comprising:  
means for generating a plurality of signal sets, each of said sets including at least an in-phase component and being generated by performing a filtering operation on a common input signal, each said filtering operation having an amplitude response characteristic which has a peak at one of a series of particular frequencies interrelated by a predetermined function, a substantially zero value at all other particular frequencies of said series and intermediate values at frequencies between the particular frequencies of said series, said one of said series being a different one for each of said filtering operations; and  
means, responsive to said signal sets generating means, for generating an output signal related to the sum of said in-phase components and quadrature components related thereto, said output signal generating means including means, responsive to said signal sets for independently

varying the magnitude of the contribution made by each of said components to said sum.

4,423,290

# SPEECH SYNTHESIZER WITH CAPABILITY OF DISCONTINUING TO PROVIDE AUDIBLE OUTPUT

Hideo Yoshida, Kashiwara, and Hiroshi Tsuda, Uji, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

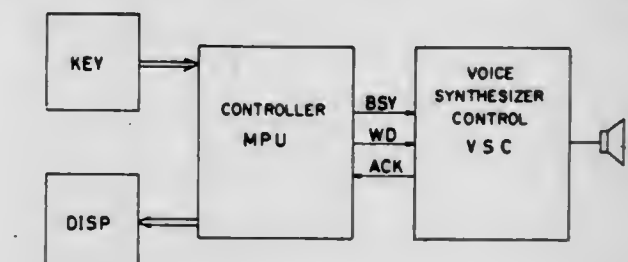
Filed Dec. 22, 1980, Ser. No. 218,752

Claims priority, application Japan, Dec. 28, 1979, 54-171551

Int. Cl.<sup>3</sup> G10L 1/00

U.S. Cl. 381—51

8 Claims



1. A speech synthesizer device comprising:  
synthesizing means for providing a sound synthesis waveform signal in response to an input signal applied thereto;  
instructing means for providing an interruption instruction when speech synthesis by said synthesizer device is to be interrupted;  
means for determining the level of the waveform signal; and  
interrupting means responsive to said determining means and operatively connected to said synthesizing means for interrupting said synthesizing means in response to the instruction from said instructing means when the waveform signal is at a relatively low amplitude level.

4,423,291

# METHOD FOR OPERATING A SPEECH RECOGNITION DEVICE

Eberhard Zwicker, Icking, and Wolfgang Daxer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

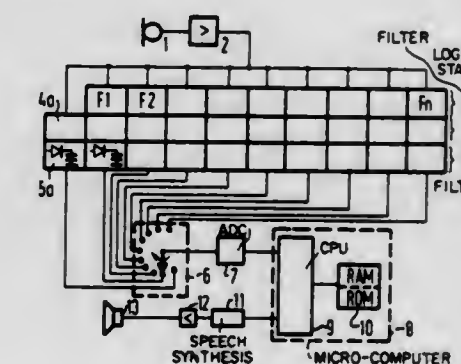
Filed Feb. 4, 1981, Ser. No. 231,452

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3006830

Int. Cl.<sup>3</sup> G10L 1/00

U.S. Cl. 381—43

10 Claims



1. A method for operating a speech recognition device in which a plurality of rectified channel signals of different frequencies are derived from the speech signal of a spoken word, said channel signals being periodically sampled and digitized to produce digital signals which are stored in a digital memory and compared with a plurality of stored groups of corresponding comparison signals, and in which the group of comparison signals producing the best coincidence is employed as the recognition result, comprising the steps of modifying one of said digital signals having a channel-time pattern (P11 . . . Pmn) by suppressing bits belonging to a prescribed group of sampled



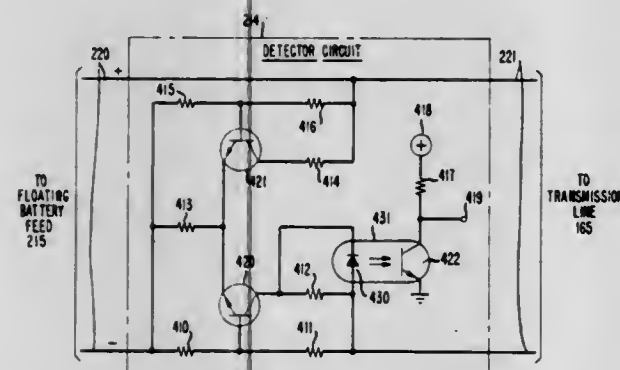
values or storing multiple copies of bits belonging to said prescribed group, said group being prescribed as a function of the overall number (m) of sampling operations which take place within the acoustical word duration, so that the modified channel-time pattern (P11' . . . Pnm') correspond to a standardized plurality (p) of sampling operations, and comparing the modified channel-time pattern (P11' . . . Pnp') with the stored groups of corresponding patterns of comparison signals.

4,423,292

**DETECTOR CIRCUIT FOR COMMUNICATION LINES**  
Gregory J. Turek, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Sep. 30, 1981, Ser. No. 306,943  
Int. Cl.<sup>3</sup> H04M 3/22

U.S. Cl. 179—18 FA

13 Claims



1. A detector circuit for detecting on-hook and off-hook states of a communication line electrically isolated from ground; said circuit comprising:
  - current sensor means electrically isolated from ground and responsive to current in said line for generating a first reference signal;
  - voltage sensor means electrically isolated from ground and responsive to voltage on said line for generating a second reference signal, said reference signals being of like kind; and
  - comparator means electrically isolated from ground for comparing said reference signals to generate a first output signal representative of said on-hook state when the magnitude of one of said reference signals is greater than the magnitude of the other and a second output signal representative of said off-hook state when the magnitude of said one of said reference signals is less than the magnitude of the other.

4,423,293

**MICROPHONE HOLDING DEVICE**  
Masato Murayama, Kawagoe, and Tetsuyuki Manaka, Otonemachi, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

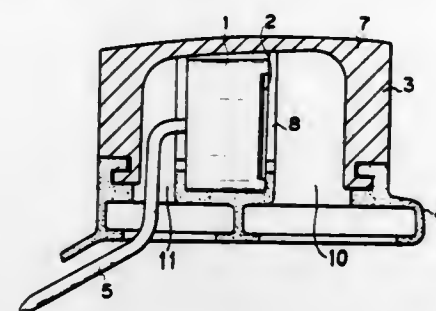
Filed Jun. 12, 1981, Ser. No. 273,136  
Claims priority, application Japan, Jun. 16, 1980, 55-84066[U]  
Int. Cl.<sup>3</sup> H04R 1/28

U.S. Cl. 179—156 R

8 Claims

1. A microphone holding device which comprises:
  - a microphone having a sound collecting portion at one end and another end opposite said sound collecting portion; and
  - a microphone holder for holding said sound collecting portion of said microphone substantially perpendicular to the surface of the adjacent wall of a body in which said microphone is mounted, said microphone holder comprising a casing containing the microphone and having a box-like configuration having an open side with at least 2 openings, said 2 openings communicating with said sound collecting

portion and said other end of said microphone, respectively, thus to keep both said sound collecting portion and



said other end of said microphone in free communication with the outside of the microphone holder.

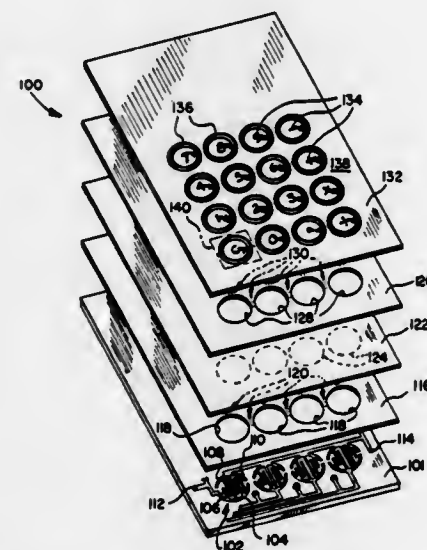
4,423,294

**LAMINATE SWITCH ASSEMBLY HAVING IMPROVED DURABILITY**

Richard J. Walser, and Gary M. Wyant, both of Urbana, Ohio, assignors to The Hall Company, Urbana, Ohio  
Filed Jun. 17, 1982, Ser. No. 389,527  
Int. Cl.<sup>3</sup> H01H 3/12

U.S. Cl. 200—5 A

10 Claims



1. A laminate switch assembly comprising:
  - a printed circuit board having at least one pair of electrical contact areas formed thereon;
  - a tactile dome switch plate having a tensioned tactile dome aligned with each pair of said at least one pair of electrical contact areas on said circuit board and a reinforcing band encircling each tactile dome; and
  - contact means interposed between said circuit board and said switch plate for interconnecting an aligned pair of contact areas upon depression of an associated tensioned tactile dome whereby an electrical connection is completed through said aligned pair of contact areas by depressing said associated tensioned tactile dome and stresses created in said switch plate between said associated tensioned tactile dome and the remainder of said switch plate due to the flexure of said associated tensioned tactile dome are relieved by said reinforcing band which remains substantially stationary compared to the movement of said tactile dome upon depression and release of said associated tensioned tactile dome.

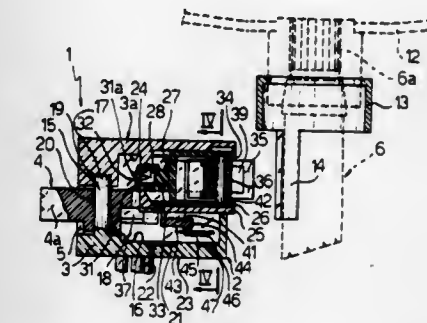
4,423,295

**CONTROL DEVICE FOR OPTICAL AND ACOUSTIC SIGNALERS**

Ugo Contato, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Dec. 14, 1981, Ser. No. 330,398  
Claims priority, application Italy, Dec. 16, 1980, 53812/80[U]  
Int. Cl.<sup>3</sup> H01H 3/16

U.S. Cl. 200—61.27



1. A control apparatus for a plurality of vehicle signaling devices in combination with a vehicle steering assembly and including a rotatable steering wheel, comprising:
  - a. return means associated with said steering wheel and extending therefrom and overlying a portion of said steering assembly length;
  - b. said return means defining generally a circle of operability centered on said steering wheel axis of rotation;
  - c. a housing positioned adjacent said circle of operability and having first and second spaced aligned opposed openings and said second opening being adjacent said circle of operability;
  - d. first and second pivot pin means aligned respectively with said first and said second openings;
  - e. said housing having a base and a plurality of signal contact means associated therewith;
  - f. a control lever pivotally mounted to said first pivot pin means and having a first portion extending into said housing and a second portion external of said housing and being adapted for pivoting along at least a first axis;
  - g. disengageable holding means associated with said housing and cooperating with said control lever for holding said control lever in any one of a plurality of pre-determined positions associated with said plurality of signal contact means;
  - h. said control lever normally being held by said holding means in a first position whereby none of said signaling devices associated with said plurality of signal contact means are activated;
  - i. said control lever first portion being generally fork shaped with first and second fork sections and being adapted for selectively contacting at least one of said plurality of signal contact means for establishing an electrical circuit from an electrical supply means to an associated signaling device for activating said associated signaling device when said control lever is selectively pivoted along said at least one axis;
  - j. first and second cooperating return lever means mounted to said second pivot pin means and being pivotable thereon and each of said return levers having a first portion extending into said housing and a second portion external of said housing;
  - k. each of said return levers cooperating with an associated one of said fork sections when said control lever is pivoted along said at least one axis whereby one of said fork sections engages an associated return lever first position for pivoting said associated return lever second portion into said circle of operability; and,
  - l. rotation of said steering wheel causing one of said return means to engage said second portion of said associated return lever for pivoting said associated return lever and

whereby said associated return lever first portion engages said associated fork section for pivoting said control lever to said first position.

4,423,296

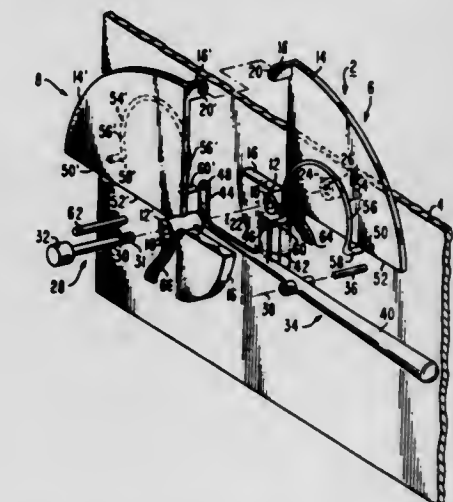
**SHOCK AND VIBRATION RESISTANT ELECTRICAL SWITCH**

Joseph F. McSparran, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 18, 1982, Ser. No. 350,089  
Int. Cl.<sup>3</sup> H01H 3/60

U.S. Cl. 200—67 A

9 Claims



1. An electrical switch comprising:
  - first and second contact elements, each being secured for rotation about a first axis passing through the center of gravity of that element so that said elements tend to remain stationary in the presence of vibration and shock loads applied to said elements in a direction normal to said axis, said elements each including an electrical contact, said elements being positioned so that when rotated about said axis, their respective contacts engage in a closed switch state and disengage in an open switch state; and
  - means for selectively placing the contacts in said closed and open states, said means for selectively placing including spring means attached to said elements, said spring means including a pair of springs and a lever secured for rotation about a second axis parallel to said first axis, each spring being attached to said lever, one of said springs being attached to one of said elements and the other spring being attached to the other of said elements, said springs and lever being positioned so that rotation of said lever about said second axis causes said elements to be rapidly placed in said states.

4,423,297

**STEERING COLUMN SWITCH WITH FLASHER SWITCH**

Werner-Ernst Berginski, Werdohl-Eveking, Fed. Rep. of Germany, assignor to Leopold Kostal GmbH & Co. KG, Luedenscheid, Fed. Rep. of Germany

Filed Apr. 16, 1982, Ser. No. 369,034  
Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121659

Int. Cl.<sup>3</sup> H01H 9/00, 15/00

U.S. Cl. 200—61.54

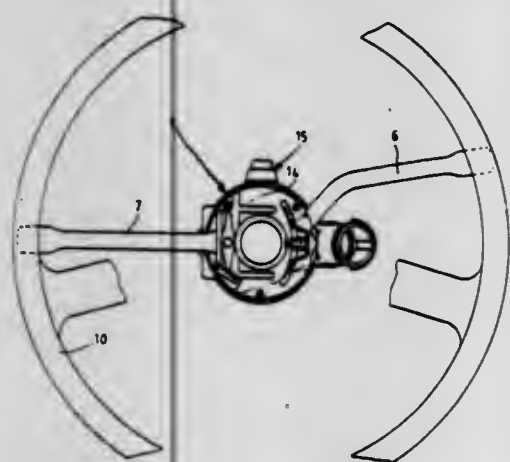
11 Claims

1. In combination with an automobile steering column switch which is disposed about a steering column spindle and has therein a conductor plate in a plane perpendicular to the axis of the steering column spindle, the conductor plate having thereon various electrical circuits which are rendered operative by means of switching levers to control windshield wiper functions, direction light indicator functions and the like of the automobile, a warning flashing switch which fits easily into the



steering column switch and controls the warning flashing light functions of the automobile, comprising:

- a switching slider having an annular portion substantially corresponding to the peripheral contour of said conductor plate and proportioned to be disposed between said conductor plate and the housing of said steering column switch,
- an activating member on the exterior of said housing and coupled to said switching slider for slidably operating said switching slider perpendicular to the plane of said conductor plate,
- said conductor plate having various electrical circuits on the opposite sides thereof and an outer annular portion, a plurality of electrical contacts on said outer annular portion which project on each of the opposite sides of said conductor plate and which are in electrical contact with



- said various electrical circuits for controlling the warning flashing light functions,
- said switching slider having thereon a plurality of contact bridges which upon activation of said switching slider by said activating member contacting one of said electrical contacts on said outer annular portion of said conductor plate to establish the electrical circuits to operate the warning flashing light functions of the automobile,
- at least two of said plurality of contact bridges on said switching slider being non-flexible and rigidly affixed to said switching slider on each of the opposite sides of said conductor plate, and cooperating with said electrical contacts on said annular portion of said conductor plate upon actuation of said switching slider to contact said electrical contacts to establish stop positions for said switching slider.

4,423,298

#### GAS CIRCUIT BREAKER OF RESISTANCE BREAKING TYPE

Masanori Tsukushi, Youichi Ohshita, Kunio Hirasawa, and Takeshi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,741

Claims priority, application Japan, Oct. 20, 1980, 55-145803  
Int. Cl.<sup>3</sup> H01H 33/16

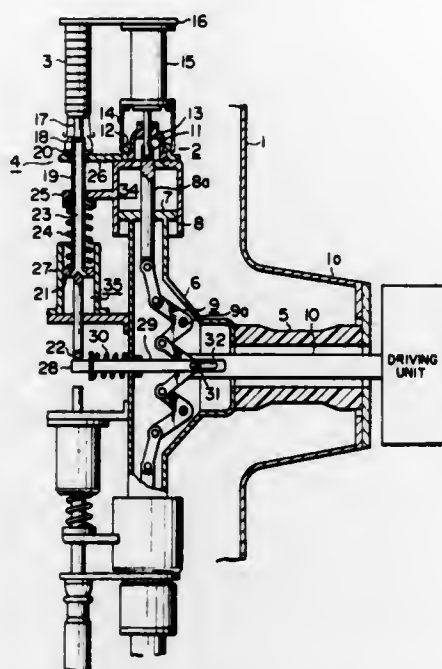
U.S. Cl. 200—144 AP

13 Claims

1. A gas circuit breaker of resistance breaking type comprising:
  - a main breaking unit driven by a drive unit to open and close a circuit;
  - a resistor and a pair of resistance contacts electrically connected in parallel with said main breaking unit, said pair of resistance contacts including a fixed and movable contact;
  - spring means for storing a spring force with an action of said drive unit in driving said main breaking unit to open the circuit;
  - means for coupling said spring means with the movable resistance contact so that said spring means acts, as a

source of a drive force, on said movable contact to open said pair of resistance contacts;

locking means for locking said movable contact in a closed position wherein said pair of resistance contacts are closed;



- releasing means for releasing the locking effected by said locking means after current in said main breaking unit has been cut off; and
- means for transmitting a closing action of said main breaking unit by said drive unit to said movable contact to close said pair of resistance contacts.

4,423,299

#### TOUCH SENSITIVE TRANSPARENT SWITCH ARRAY

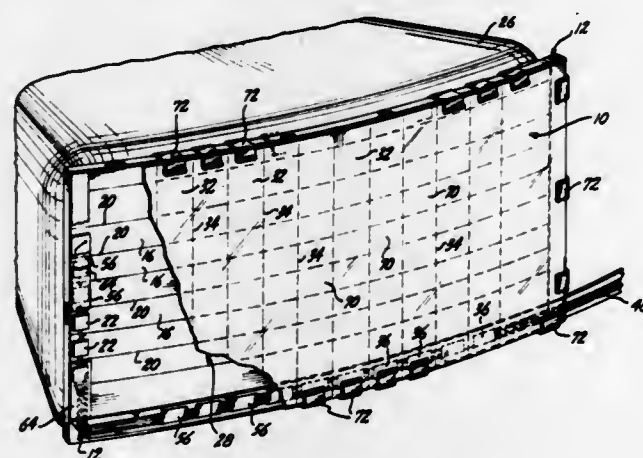
I. Macit Gurul, Seattle, and Gary M. Bang, Edmonds, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Apr. 20, 1981, Ser. No. 255,677

Int. Cl.<sup>3</sup> H01H 9/00, 13/02

U.S. Cl. 210—159 B

27 Claims



1. A transparent switch array comprising:
  - a relatively transparent backplate having a first plurality of substantially parallel conductive strips formed on one surface thereof;
  - a relatively flexible transparent sheet having a second plurality of substantially parallel conductive strips formed on one surface thereof, said flexible sheet and said second plurality of strips being dimensioned and arranged for mounting of said flexible sheet in closely spaced apart, parallel relationship with said transparent backplate with said surface of said flexible sheet including said second plurality of conductive strips facing said surface of said backplate including said first plurality of conductive strips

4,423,301

#### AIR-CARBON ARC CUTTING AND GOUGING

Perry J. Rieppel, Worthington, and Raymond A. Sadanakas, Columbus, both of Ohio, assignors to Arcair Company, Lancaster, Ohio

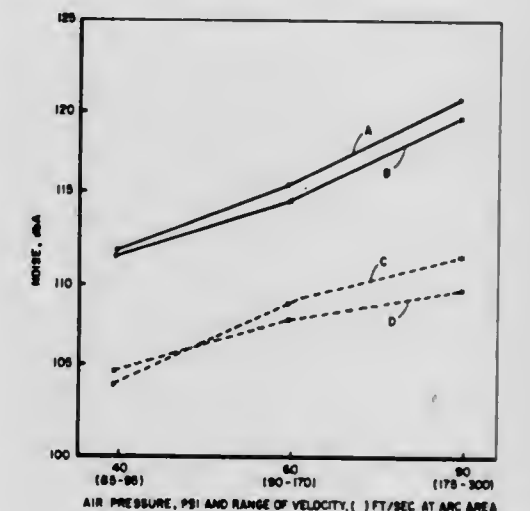
Continuation of Ser. No. 172,795, Jul. 8, 1980, abandoned, which is a continuation of Ser. No. 848,817, Nov. 7, 1977, abandoned.

This application May 26, 1982, Ser. No. 382,443

Int. Cl.<sup>3</sup> B23P 1/06

U.S. Cl. 219—68

1 Claim



A-1/2" DIA. CONVENTIONAL CARBON ELECTRODE  
B-1/4" DIA.  
C-1/2" DIA. CARBON ELECTRODE WITH ADDITION OF NOISE SUPPRESSANT  
D-1/4" DIA.

and with said second plurality of conductive strips being substantially perpendicular to said first plurality of conductive strips, said flexible sheet further including a plurality of bead-like regions formed on said surface of said pliant sheet that include said second plurality of conductive strips and extending outwardly therefrom, said plurality of bead-like regions being arranged in a pattern that positions a first portion of said plurality of bead-like regions between adjacent ones of the conductive strips of said second plurality of conductive strips and positions a second portion of said bead-like regions in alignment with the separation between adjacent ones of said first plurality of conductive strips when said flexible sheet is mounted in said parallel, closely spaced orientation with said backplate; and

means for supporting and maintaining said flexible sheet in said parallel, closely spaced orientation with said surface of said backplate that includes said first plurality of conductive strips, said means for supporting and maintaining said flexible sheet in said parallel, closely spaced orientation with said backplate includes including a flat electrical cable having a plurality of substantially parallel spaced apart conductors extending along one planar surface thereof, said cable being interposed between at least two edge regions of said backplate and said flexible sheet, each of said conductors of said cable being arranged for electrically contacting a conductive strip within one of said first and second pluralities of conductive strips.

4,423,300

#### MANUALLY OPERATED DETENTED SWITCH

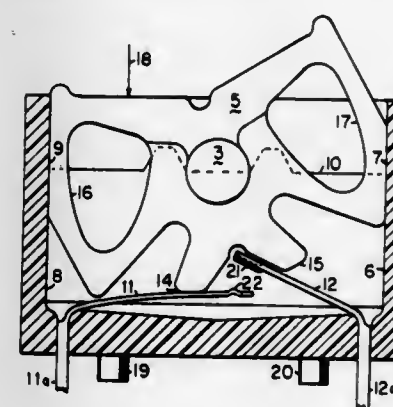
Chesmore, James R., Orange, and Frank J. Bruder, Newport Beach, both of Calif., assignors to EECO Incorporated, Santa Ana, Calif.

Continuation-in-part of Ser. No. 326,795, Dec. 3, 1981, abandoned. This application Feb. 25, 1982, Ser. No. 352,504

Int. Cl.<sup>3</sup> H01H 3/02

U.S. Cl. 200—339

13 Claims



1. An electro-mechanical switch, comprising:
  - (a) a hollow housing (1),
  - (b) a rotor (5) centrally journaled within said housing,
  - (c) a first cantilever spring contact (12) depressible by said rotor,
  - (d) a second cantilever spring contact (11) depressible by said first spring contact,
  - (e) plural, slight deformable rectilinear sides (7,7',9,9') upon said rotor dimensioned in relation to said hollow housing to exclusively force said rotor to occupy plural specific rotational positions, and
  - (f) plural essentially symmetrical mutually-diverging projections (14,15) upon said rotor,
- one said projection (15) to force said spring contacts into mutual mechanical and electrical contact upon said rotor occupying one said specific rotational position, and
- another said projection (14) to force said spring contacts out of mutual mechanical and electrical contact upon said rotor occupying another said specific rotational position.

4,423,302

#### DIGITAL DRIVE APPARATUS FOR EFFECTING CONTROL DISPLACEMENTS IN AN ELECTROEROSIVE MACHINE TOOL

Akihiko Shimizu, Kawasaki, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 23, 1981, Ser. No. 246,415

Claims priority, application Japan, Mar. 27, 1980, 55-38238  
Int. Cl.<sup>3</sup> B23P 1/12

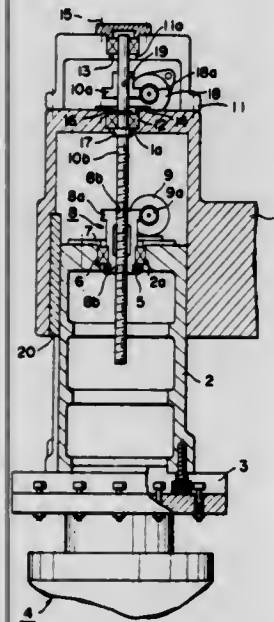
U.S. Cl. 219—69 G

6 Claims

1. A drive apparatus for effecting controlled movements of a movable electrode relative to a counterelectrode along a predetermined axis in an electroerosive machine tool, the apparatus comprising:
  - a fixed member of the machine tool;
  - an axial electrode support for securely supporting said movable electrode, said support being slidably carried by said fixed member so as to be movable longitudinally along said axis in a first direction to advance said movable electrode towards said counterelectrode and in a second direction to retract said movable electrode away from said counterelectrode;
  - a feed screw rotatably carried by said fixed member for rotation about said axis;



means for holding said feed screw while in rotation against longitudinal displacement relative to said fixed member;  
 a feed nut coupled in mating engagement with said feed screw and rotatably carried by said axial electrode support for rotation about said axis;  
 means for holding said feed nut while in rotation against longitudinal displacement relative to said axial electrode support;  
 a first unidirectionally rotatable motor drivingly coupled to one of said feed screw and said feed nut, constituting a first rotational drive member;  
 a second unidirectionally rotatable motor drivingly connected to the other of said feed screw and said feed nut,



constituting a second rotational drive member in mating engagement with said first rotational drive member;  
 a first driver circuit for energizing said first motor with a train of drive pulses to substantially incrementally rotate said first rotational drive member in a predetermined rotary direction, thereby to substantially incrementally move said axial electrode support in said first direction along said predetermined axis; and  
 a second driver circuit for energizing said second motor with a drive power to rotate said second rotational drive member in said rotary direction, thereby to move said axial electrode support in said second direction along said predetermined axis.

4,423,303

# APPARATUS FOR TREATING POWDERY MATERIALS UTILIZING MICROWAVE PLASMA

Masahiko Hirose, and Katsutoshi Nishida, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 5, 1981, Ser. No. 260,755

Claims priority, application Japan, May 6, 1980, 55-58608; Jan. 27, 1981, 56-09661

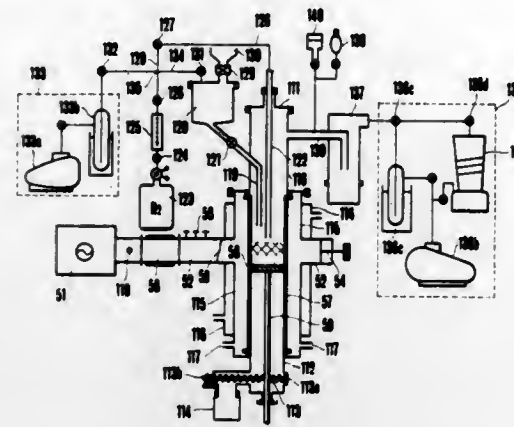
Int. Cl.<sup>3</sup> B23K 9/00, 9/225

U.S. Cl. 219—121 P

7 Claims

1. An apparatus for treating powdery materials utilizing microwave plasma, comprising means for generating a microwave, a waveguide connected with said microwave generating means, a reaction vessel disposed through said waveguide, means for supplying said reaction vessel with a powdery material to be treated, means for supplying said reaction vessel with a reaction gas, and means for exhausting said reaction vessel; wherein said reaction vessel comprises a vertically elongated vessel having an upper area air tightly connected to said exhaust means and a bottom area disposed in said waveguide so that a plasma generating area is formed at the bottom area, said vessel having a central axis and being disposed such that said central axis is oriented substantially in the direction of gravity; and said reaction gas

supplying means includes a gas introducing pipe having an outlet located adjacent said bottom area, and including a



movable plate positioned such that said powdery material is supported in said bottom area whereby said powdery material is blown up and agitated by the plasma.

4,423,304

# PLASMA WELDING TORCH

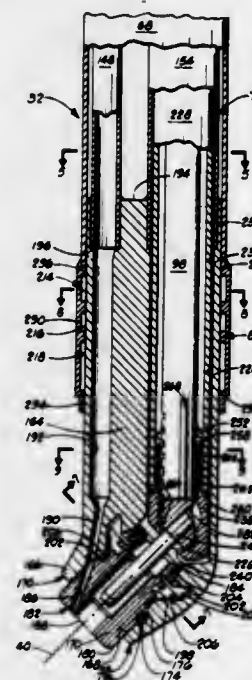
Harold E. Bass, Rte. 1, Box 31F, Washington, Okla. 73093; James L. Bass, 75 Dufault St., Putnam, Conn. 06260; Richard E. Bass, P.O. Box 44, Washington, Okla. 73093; Peter J. Bass, P.O. Box 128, Dilley, Tex. 78017, and Charles E. Bass, 3613 Trinidad, Norman, Okla. 73069

Filed Feb. 20, 1981, Ser. No. 236,141

Int. Cl.<sup>3</sup> B23K 9/00

U.S. Cl. 219—121 PM

29 Claims



1. An improved plasma torch, comprising:  
 an elongated barrel;  
 a tubular first electrode mounted at one end of the barrel, the axis of the first electrode oriented at a selected angle to the axis of the barrel;  
 a rod-like, electrically conducting electrode holder extending axially through the barrel to terminate in an electrode mounting end adjacent one end of the first electrode;  
 means for fixing portions of the electrode holder near said electrode mounting end thereof to the barrel, remaining portions of the electrode holder being slidably supported within the barrel, wherein a bore substantially coaxial with the bore of the first electrode is formed in the electrode holder; and  
 a second electrode having one end thereof shaped to mate with the bore formed in the electrode holder, said one end of the second electrode disposed in the bore in the elec-

trode holder, and the second electrode extending from the electrode holder a preselected distance into the first electrode;

wherein the electrode holder and the second electrode are formed of dissimilar metals, the electrode holder being constructed of a metal softer than the second electrode; wherein a tapered surface is formed on the end of the second electrode disposed within the bore of the electrode holder and said bore has a tapered surface to mate with said tapered surface of the second electrode.

4,423,306

# WELDING CABLE AND EQUIPMENT

Richard W. Fox, Circleville, Utah 84723

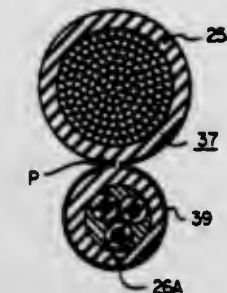
Continuation of Ser. No. 207,949, Nov. 18, 1980, abandoned.

This application Jul. 22, 1982, Ser. No. 400,595

Int. Cl.<sup>3</sup> B23K 9/32

U.S. Cl. 219—137.9

1 Claim



# METHOD AND APPARATUS FOR CONTROLLING ALIGNMENT OF AN ELECTRON BEAM OF A VARIABLE SHAPE

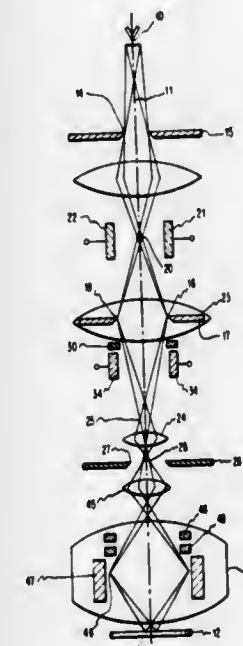
Hans C. Pfeiffer, Ridgefield, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,636

Int. Cl.<sup>3</sup> B23K 15/00

U.S. Cl. 219—121 EU

18 Claims



1. An apparatus for controlling the alignment of a beam of charged particles to a target including:  
 a source of charged particles producing a beam of charged particles along an axis for application to a target;  
 beam forming means to cause formation of a variable shape of the beam for application to the target;  
 aperture means disposed along the axis of the beam in a plane having an image of the source and having a first circular aperture through which the beam passes prior to striking the target, said first aperture having a diameter large enough to not substantially affect the current density distribution of the source image in the plane of said aperture means due to shifting of the source image relative to the axis of the beam;  
 aligning means disposed at a reference location off the axis of the beam in the plane of said aperture means to align the beam at selected times;  
 and alignment means disposed along the axis of the beam to align the beam solely in accordance with said aligning means.

4,423,307

# CONTROL SYSTEM FOR ELECTRIC AUTOMOBILE HEATING APPARATUS

Yasuo Kondo, Okazaki; Masanori Kato, Kariya, and Mitsuru Nakagawa, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

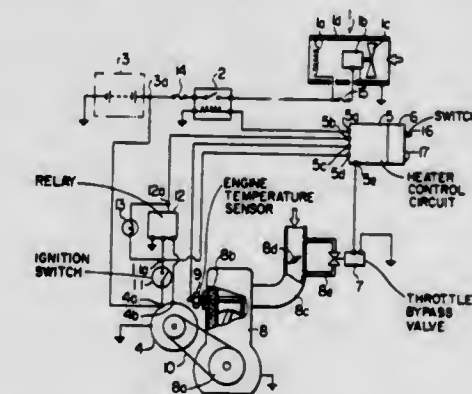
Filed Apr. 24, 1981, Ser. No. 257,118

Claims priority, application Japan, Apr. 29, 1980, 55-56767

Int. Cl.<sup>3</sup> H05B 1/02; B60H 1/02; H02P 9/04

U.S. Cl. 219—202

2 Claims



1. An electric heating apparatus for an automotive vehicle



including an internal combustion engine driving a power generator for charging a battery for supplying power to electrical equipment on the vehicle, and means for supplying an air-fuel mixture to the engine, comprising:

- a temperature sensor for detecting a temperature of the engine;
- a voltage sensor for detecting a voltage produced at a neutral terminal of the power generator rotated in synchronization with the rotational speed of the engine;
- a control circuit responsive to the output signals of said temperature sensor and said voltage sensor for producing a control signal when said temperature sensor detects the temperature of the engine lower than a first predetermined value and said voltage sensor detects said voltage of the power generator higher than a second predetermined value;
- rotational speed control means energized responsive to said control signal to increase the air-fuel mixture supplied to the engine;
- a power supply switch energized responsive to said control signal for causing the power generator and the battery to provide power supply; and
- a warm air generator having an electric heating element energized by the power generator and the battery when said power supply switch is closed.

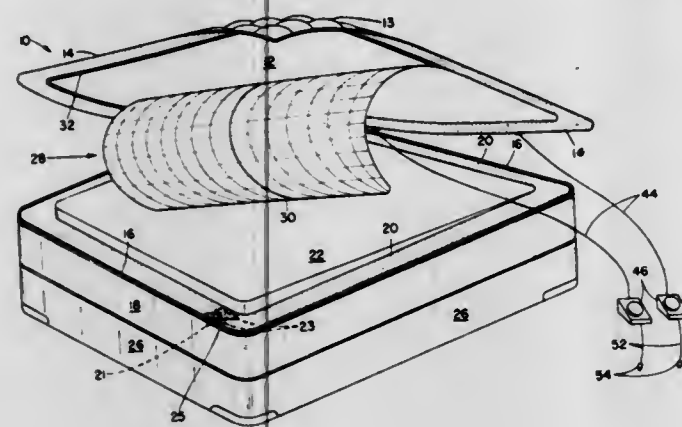
4,423,308

**THERMALLY CONTROLLABLE HEATING MATTRESS**  
Milton A. Callaway, Jackson, Oreg., and Thomas F. Stutzman, Dunwoody, Ga., assignors to Simmons U.S.A. Corporation, Atlanta, Ga.

Filed Jun. 22, 1981, Ser. No. 275,960  
Int. Cl.<sup>3</sup> H05B 3/36

U.S. Cl. 219-217

5 Claims



1. A thermally controllable heating mattress construction, comprising:

- a. a mattress body designed to support a person lying on top thereof;
- b. a removable pillow top formed of a quilted mattress liner being supported on said mattress body, means for removably fastening said pillow top to said mattress body along the peripheral edges thereof; and
- c. a thermal control heating unit including an electrical heating pad liner generally in conformance with the surface of said pillow top, said heating pad liner being removably interposed between the pillow top and mattress body to allow the temperature of the top surface of the mattress to be selectively regulated; and fastener means for removably fastening said heating pad liner to the bottom of said removable pillow top.

4,423,309

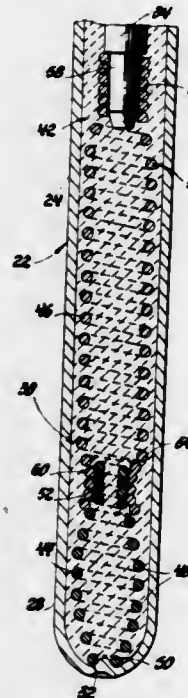
**QUICK HEAT SELF REGULATING ELECTRIC GLOW HEATER**

Michael P. Murphy, Flint; Gary F. Stack, Grand Blanc; James W. Hoppenrath, Flint, and John R. Taylor, Lapeer, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1982, Ser. No. 392,600  
Int. Cl.<sup>3</sup> F23Q 7/22

U.S. Cl. 219-270

8 Claims



1. A self regulating electric resistance glow plug heater for engines or the like and of the type having an elongated electrically conductive tubular sheath having a closed end, a resistance glow coil in the sheath tip near the closed end and a PTC resistance regulating coil in the sheath body remote from the closed end, the coils being connected together at adjacent ends and the glow coil being connected with the sheath tip at the closed end, and electrical conductor means connecting with the regulating coil and the sheath to supply electric current to the coils to generate heat, heat conductive electrical insulation supporting the coils within the sheath and the improvement wherein the coils have spaced heat producing portions and the adjacent ends of the coils form connector portions that are of helical conformation and of reduced diameter relative to the adjacent heat producing portions of their respective coils, said reduced diameter helical connector portions being inserted one inside the other and closely fitted to connect the two coils over extended areas of the connector portions to provide thereby a low resistance, cool operating long life electrical connection between the coils.

4,423,310

**ELECTRICAL STEAM GENERATOR HAVING ADJUSTABLE ELECTRODES FOR AN AIR HUMIDIFIER**  
Allen J. Zerbel, Madison, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Apr. 6, 1981, Ser. No. 251,159  
Int. Cl.<sup>3</sup> H05B 3/60; F22B 1/30

U.S. Cl. 219-285

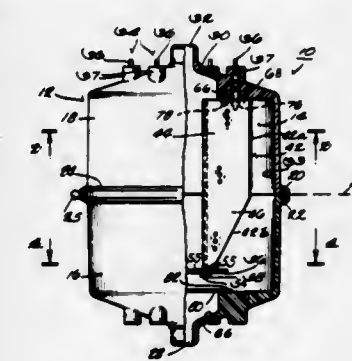
9 Claims

1. An electrical steam generator for an air humidifier comprising

- a generally cylindrical, upright water tank including a top wall having a steam outlet, a bottom wall having a water inlet, and a generally vertical side wall;
- a plurality of circumferentially-spaced electrical terminals extending through the top wall of said tank at substantially equal intervals and having an inner end projecting inwardly beyond the underside of said top wall
- a plurality of electrodes disposed inside said tank, said elec-

trodes having a pair of vertically extending, elongated, generally flat side members which are connected together along an inner edge, which diverge from each other in a direction toward the side wall of said tank and which terminate in an outer edge spaced radially inwardly from the side wall of said tank;

a radially-extending row of radially-spaced internal bosses on the underside of said top wall in conjunction with each of said terminals, each of said internal bosses having a first aperture adapted to receive means for anchoring the upper end of a said electrode to the underside of the top wall of said tank;



a radially-extending row of second apertures in the upper end portion of each of said electrodes, said second apertures being adapted to receive a terminal and being spaced relative to said first apertures such that, when a terminal is positioned in any one of said second apertures, at least one other of said second apertures is in registration with a said first aperture;

means for fastening the upper end of said electrode to the inner end portion of said terminals; and  
means for anchoring the upper end portion of said electrode to the underside of the top wall of said tank via said first and second apertures which are in registration.

4,423,311

**ELECTRIC HEATING APPARATUS FOR DE-ICING PIPES**

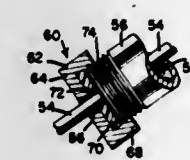
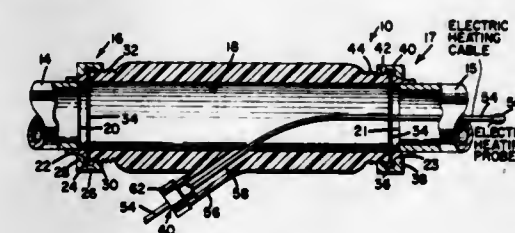
Paul Varney, Sr., Jackson La., Barre, Mass. 01005

Filed Jan. 19, 1981, Ser. No. 226,081

Int. Cl.<sup>3</sup> H05B 3/56, 3/78; E03B 7/14; F16L 53/00

U.S. Cl. 219-306

7 Claims



1. Apparatus for heating liquid-carrying pipes to prevent

freezing of the liquid and thawing of frozen liquid in the pipes, said apparatus comprising:

- (a) a housing having a lateral passageway and a central bore connected to an opening at each end of the housing and to the passageway, each end of the housing being provided with external threads and a fitting for sealingly attaching the housing to the open end of a liquid pipe, so that the bore of the housing is effective to connect the open end of a first pipe to the open end of a second pipe, each of said fittings comprising:
- (1) a sleeve that is attachable to the end of the pipe and has an outwardly extending annular flange,
- (2) a sealing gasket between the annular flange and the end of the housing, and
- (3) a coupling nut provided with internal threads for threading and engaging the external threads of the housing and an inwardly extending annular flange for engaging and outwardly extending flange of the sleeve,
- (b) a sealer valve for sealing the passageway and having an opening with a normally closed penetrable seal of elastomeric material adapted to slidably receive an elongated continuous element and to permit said element to move axially through the valve in a sealed relationship,
- (c) electrical control means being mounted on the exterior of the housing and adapted to receive electrical power, and
- (d) an elongated heating cable having a first and electrically connected to the control means to receive power therefrom and having a second free end slidably insertable through the penetrable seal of the sealer valve through the passageway into the housing bore and then into one of the pipes through the open end thereof, said cable being provided with a heating element for receiving power through the cable from the control means.

4,423,312

**METHOD FOR HEATING PARISONS MADE OF THERMOPLASTIC MATERIAL**

Walter Wiedenfeld, Tannenweg 28, 2000 Hamburg 62, and Wolfgang Reymann, Falckweg 14, 2000 Hamburg 52, both of Fed. Rep. of Germany

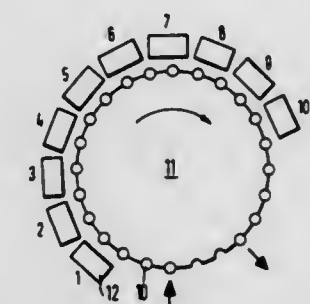
Filed Aug. 19, 1982, Ser. No. 409,660

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135755

Int. Cl.<sup>3</sup> F27B 9/06; H05B 1/00; B29C 17/07

U.S. Cl. 219-388

5 Claims



1. A method for heating parisons made of thermoplastic material to a temperature desired for blow molding comprising the steps of

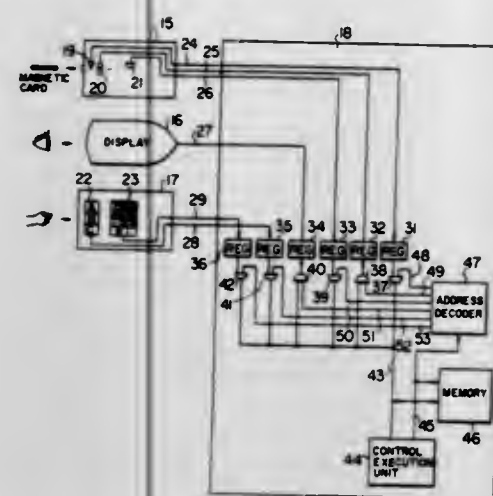
- (a) moving the parisons past a plurality of heating boxes,
- (b) arranging the heating boxes in the conveying direction of said parisons, each heating box including a plurality of infrared radiator sources located horizontally one above the other,
- (c) varying the radiation energy applied to the parisons to provide a temperature profile in the axial direction of said parisons by switching off individually selected radiator sources, and
- (d) feeding all the remaining radiator sources with a voltage resulting in maximum light intensity whereby penetration







processing procedures for processing the transaction in accordance with said one processing procedure; and



if an initial operation relating to other processing procedure than displayed is conducted, proceeding the processing in accordance with said other processing procedure.

#### 4,423,319 COMMUNICATION LINK

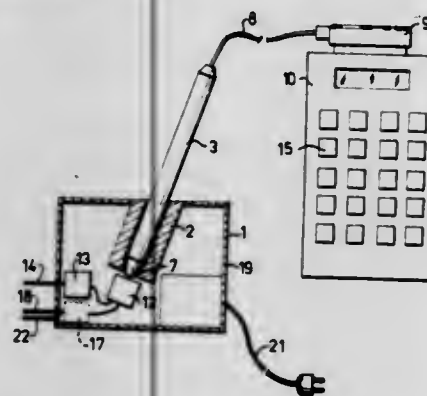
Hans Jacobsen, Täby, Sweden, assignor to Micronic AB, Täby, Sweden

Filed Jan. 13, 1981, Ser. No. 224,842

Int. Cl.<sup>3</sup> G06K 7/10

U.S. Cl. 235-472

2 Claims



1. A communication link for transferring information from a data terminal (10), with connected light pen (3) with a point end (7) which includes a light diode (4) and phototransistor (5) or corresponding means, to a greater computer unit, wherein the communication link (1) includes a light pen holder (2) and an information transferring device, which comprises a transfer phototransistor (11) or the like, and an amplifier (13) to which said phototransistor is connected and said amplifier (13) being adapted to be connected to a greater computer unit or memory unit, said transfer phototransistor (11) being located adjacent said holder (2) whereby said transfer phototransistor (11), when a light pen (3) is inserted in said holder (2), is located close to the point end (7) of the light pen (3), and that the data terminal (10) and light pen (3) in a manner known per se emit light pulses, corresponding to information stored in the data terminal (10), by the light diode (4) of the light pen, which pulses are intended to activate said transfer phototransistor (11) for transferring the pulses via said amplifier further to the greater computer unit by electric signals, said communication link being further characterized in that said information transferring device also includes a transfer light diode (16) located adjacent said transfer phototransistor (11), and a second amplifier (17) to which said transfer light diode (16) is connected and said second amplifier (17) being adapted to be connected to a greater computer unit, said transfer light diode (16) emits light pulses corresponding to instructions to the data terminal (10) arriving from the greater computer unit via said amplifier (17),

and that the phototransistor (5) of the light pen (3) when the light pen is in said holder (2) is arranged to receive light pulses from said transfer light diode (16) and to transfer such pulses to the data terminal (10) via electric signals, where the data terminal (10) is arranged to receive such instructions.

#### 4,423,320

##### ENCODED CARD READER

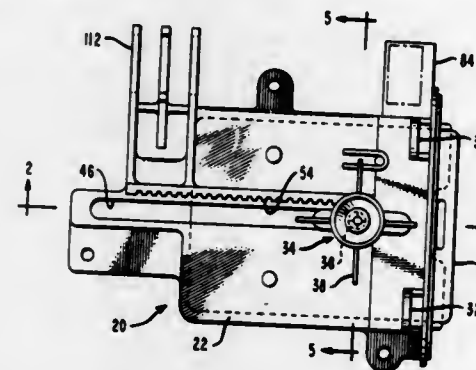
Bruce M. McPherson, Maitland, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 17, 1982, Ser. No. 358,933

Int. Cl.<sup>3</sup> G06K 13/00

U.S. Cl. 235-482

6 Claims



1. An apparatus for reading a record member having data representing indicia comprising:

a first housing assembly having a supporting surface for slidably supporting a record member for movement between a home position and a displaced position and an enclosure member mounted on said supporting surface having a first drive portion;

a second housing assembly slidably mounted on said enclosure member and engaged by a record member positioned on said supporting surface for movement by said record member between a home and displaced position;

a spring member interconnected between the first and second housing assembly and the record member from the displaced position to the home position;

means mounted on said first housing assembly for sensing the indicia of the record member during the movement of the record member from the displaced position to the home position;

and a speed limiting device rotatably mounted on said second housing assembly including a support member rotatably secured to said second housing assembly having a second drive portion engaging said first drive portion and a plurality of vane members extending outwardly therefrom, said support member adapted to be rotated by said first and second drive portions during the movement of said second housing assembly under urging of said spring member whereby the rotation of said vane members limits the movement of said second housing member past said sensing means to a constant speed.

#### 4,423,321

##### CALCULATING SYSTEM

Ira Wilkow, 8500 Boulevard E., North Bergen, N.J. 07047

Filed Aug. 10, 1981, Ser. No. 291,458

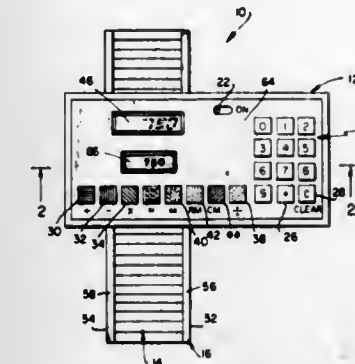
Int. Cl.<sup>3</sup> G09B 7/00

U.S. Cl. 235-489

9 Claims

1. A calculating system for simplified problem solving, the system comprising a user readable set of successive instructions, a columnar array of spaces, the columnar array of spaces being formed on sheet material, the array of spaces being correlated to the instruction set for user entry of data directly thereon pursuant to instructions of the instruction set, a plurality of the spaces including preprinted visible indicia thereon,

the visible indicia being correlated to an algorithmic mathematical function which is related to the data to be user entered upon each of the plurality of spaces in solving a problem, an electronic calculator, the calculator including a plurality of numeral entry keys and a plurality of function keys, each function key including indicia visually associated therewith, the preprinted indicia appearing in selected spaces of the co-



#### 4,423,322

##### SELF DIAGNOSTIC SWITCH CIRCUIT

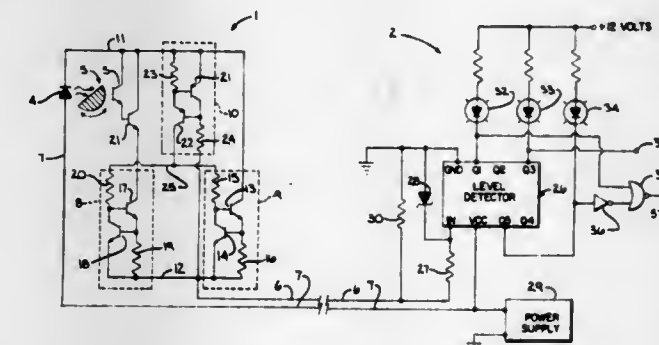
Enoch P. Smith, Greendale, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 24, 1981, Ser. No. 305,121

Int. Cl.<sup>3</sup> G01D 5/34

U.S. Cl. 250-229

3 Claims



1. A switch circuit which comprises:

a power supply connected to provide current through leads; means coupled to the leads for detecting the amount of current delivered by the power supply;

a series circuit connected across said leads and including a light sensor connected in series with a first current drain, the series circuit being operable when light is received at the light sensor to conduct current;

a second current drain connected across the leads and in parallel with the series circuit, the second current drain being operable to conduct a preselected minimum amount of current;

light emitting means connected to conduct current which is supplied by the power supply through the leads and being positioned to emit light on the light sensor;

shutter means positioned to block the light applied to the light sensor when the shutter means is in one operating position and to allow the light to be applied to the light sensor when the shutter means is in a second operating position;

wherein the means for detecting the amount of current delivered by the power supply includes:

first means for providing an indication that the current has

dropped below a level less than that conducted by the second current drain;

second means for providing an indication that the current has risen above a level which is greater than the sum of the currents conducted by the first and second current drains; and

third means for providing an indication that the current has reached a level which is greater than that conducted by the second current drain, but less than the sum of the currents conducted by the first and second current drains.

#### 4,423,323

##### NEUTRON LOGGING METHOD AND APPARATUS FOR DETERMINING A FORMATION CHARACTERISTIC FREE OF ENVIRONMENTAL EFFECTS

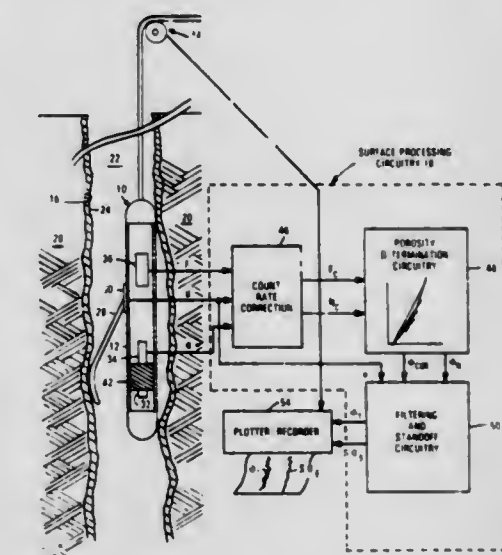
Darwin V. Ellis, Ridgefield, and Charles Flaum, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 9, 1981, Ser. No. 300,418

Int. Cl.<sup>3</sup> G01V 5/00

U.S. Cl. 250-264

49 Claims



1. A method for determining the porosity of a sub-surface geological formation traversed by a borehole comprising the steps of:

a. passing a neutron logging tool through said borehole while irradiating said formation with neutrons, said neutron logging tool including a neutron source and first and second detectors spaced from said source by different distances;

b. generating first and second detector signals indicative of interactions between said neutrons and the nuclei of materials in the vicinity of said detectors;

c. automatically combining said first and second detector signals into a tangible representation of formation porosity inherently free of effects due to tool standoff from said borehole wall without explicitly determining said stand-off.

#### 4,423,324

##### APPARATUS FOR DETECTING NEGATIVE IONS

George C. Stafford, San Jose, Calif., assignor to Finnigan Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 897,150, Apr. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,148, Apr. 22, 1977, abandoned. This application Jul. 23, 1979, Ser. No. 59,961

Int. Cl.<sup>3</sup> B01D 59/44; H01J 27/00

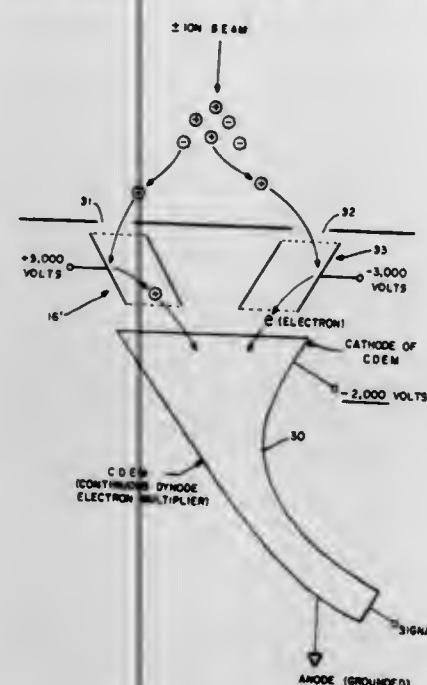
U.S. Cl. 250-281

7 Claims

1. Apparatus for detecting the abundance of negative ions from a source of such ions comprising: conversion means maintained at a high positive voltage for attracting and accelerating only said negative ions whereby the negative ions impact the conversion means with sufficient kinetic energy to



produce a proportional amount of secondary positive ions, and electron multiplier means having an input operated at a negative

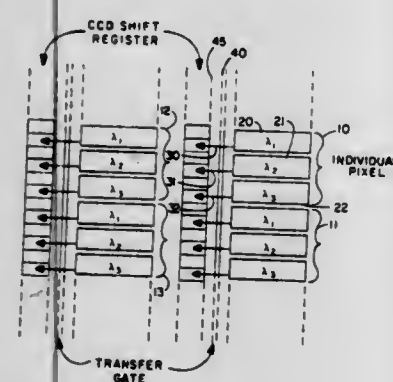


tive potential to attract said secondary positive ions and for providing an output signal indicative of the abundance of said negative ions.

**4,423,325**  
**MULTI-SPECTRAL SCHOTTKY BARRIER INFRARED RADIATION DETECTION ARRAY**  
Norman A. Foss, North Oaks, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 2, 1981, Ser. No. 298,568  
Int. Cl.<sup>3</sup> H01J 31/49; G01T 1/22.  
U.S. Cl. 250—332

10 Claims

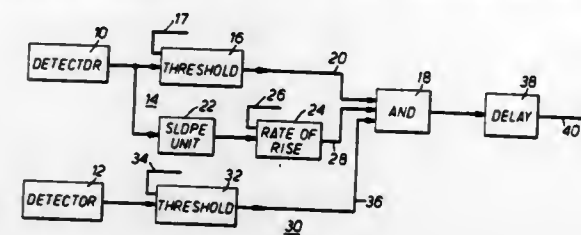


1. An infrared detector array comprising:  
a plurality of pixels for sensing infrared radiation, each pixel comprising a plurality of Schottky barrier detectors, each detector in a pixel having a different barrier height so as to produce an output for each pixel indicative of infrared radiation of a different wavelength.

**4,423,326**  
**FIRE OR EXPLOSION DETECTION**  
David N. Ball, Slough, England, assignor to Gravin Limited, Great Britain  
Filed Dec. 9, 1981, Ser. No. 328,882  
Claims priority, application United Kingdom, Dec. 12, 1980, 8039929

Int. Cl.<sup>3</sup> G01J 1/00  
U.S. Cl. 250—339  
1. A fire and explosion detection system for discriminating between radiation produced by a source of fire or explosion to be detected and radiation produced by a source of fire not to be detected, comprising  
first and second radiation detecting means respectively responsive to radiation in different wavelength bands to

produce first and second electrical signals respectively, and  
output means connected to monitor the first and second electrical signals and operative to produce a fire or explosion



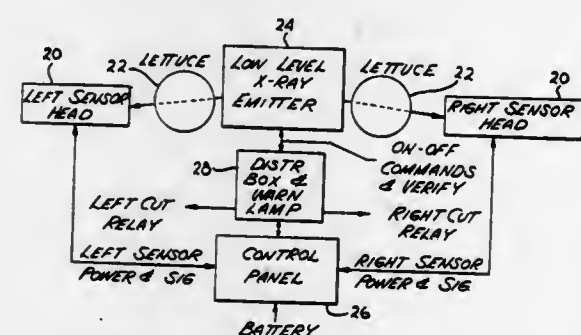
sion indicating output only when, for at least a predetermined period of time, the magnitude of each signal exceeds a respective predetermined value and the rate of rise of at least the said first signal exceeds a predetermined value.

**4,423,327**  
**FOOD STUFF MATURITY SENSING AND INSPECTION APPARATUS**

Richard Alexander, 5333 Sepulveda Blvd., No. 3, Culver City, Calif. 90230

Filed Oct. 10, 1978, Ser. No. 949,944  
Int. Cl.<sup>3</sup> G01N 23/00  
U.S. Cl. 250—358.1

6 Claims



1. A food stuff inspecting system comprising:  
(a) a cadmium 109 source of low level x-ray radiation for directing radiation through produce in an amount inversely exponentially responsive to the density of the food stuff;  
(b) a radiation detector for providing a detector signal responsive to emission incident thereto, said detector being cooperatively disposed with respect to said radiation source to receive emission therefrom passing through the food stuff; and  
(c) signal processing means for processing said detector signal to determine occurrence of a predetermined characteristic in the food stuff, said signal processing means comprising:  
(1) first electrical translation means for receiving said detection signal and outputting a signal responsive thereto;  
(2) a logarithmic amplifier, the input thereof being connected to the output of said electrical translation means, the output of said logarithmic amplifier being the logarithm of the signal output from said electrical translation means;  
(3) second electrical translation means for standardizing the detection signal, the input of said second electrical translation means being connected to the output of said logarithmic amplifier;  
(4) a first comparator having first and second inputs and a comparator output, said first input being connected to the output of said second electrical translation means, the second input being connected to means for produc-

ing an electrical signal responsive to a first state of the food stuff being inspected;

(5) a second comparator having first and second inputs and a comparator output, said first input being connected to the output of said second electrical translation means, the second input being connected to means for producing an electrical signal responsive to a second state of the food stuff being inspected, the comparator outputs of said first and second comparators being connected to one another whereby the connected comparator outputs of said first and second comparators produce a signal output only when the signal output from said second electrical translation means is intermediate the levels of the electrical signals responsive to the first and second states of the food stuff being inspected;  
(6) feedback amplifier means for detecting a change in the polarity of the electrical signal input thereto and producing a linear output signal responsive thereto, said feedback amplifier means having first and second inputs, said first input connected to the output of said second electrical translation means, the linear output signal of said feedback amplifier means being coupled to the second input thereof; and  
(7) pulse means for producing a signal responsive to an acceptable state of the food stuff being inspected, said pulse means being connected to the output of said feedback amplifier and said first and second comparators whereby the output signal of said pulse means is responsive to the output signals of said feedback amplifier and said first and second comparators.

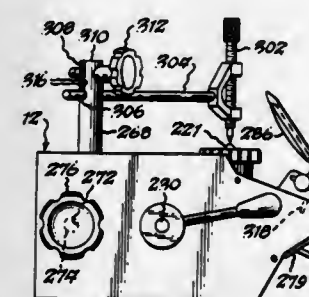
**4,423,328**  
**MEASURING SYSTEM FOR USE IN THE RADIATION MEASUREMENT OF LAYER THICKNESSES AND THE LIKE**

Jerry J. Spongr, Tonawanda; John E. Tiebor, Williamsville, and Boris B. Joffe, Buffalo, all of N.Y., assignors to Twin City International Inc., Amherst, N.Y.

Continuation of Ser. No. 203,873, Nov. 4, 1983, abandoned. This application Aug. 5, 1982, Ser. No. 405,442

Int. Cl.<sup>3</sup> G01N 23/00  
U.S. Cl. 250—358.1

16 Claims



1. A measuring system for use in the radiation measurement of layer thicknesses comprising a stand having means for supporting a workpiece to be measured, a probe body having a radiation source and a radiation detector, said probe body being movable for the measurement of a workpiece in both a first and a second position of orientation of said probe body, support means for removably supporting said probe body on said stand in said first position of orientation for measuring a workpiece supported on said stand and said probe body being removable said stand for use in said second position of orientation for measuring a workpiece supported by said probe body, said probe body being self-supporting in said first position of orientation independently of said stand upon removal from said stand and placement directly on a workpiece or another workpiece supporting surface, and said probe body also being self-supporting on a supporting surface upon removal from said stand and placement in said second position of orientation, said

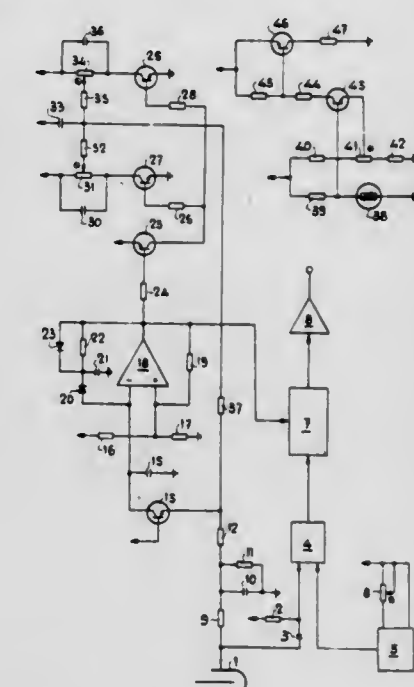
probe body including means to support a workpiece to be measured when in said second position of orientation.

**4,423,329**  
**GAMMA RADIATION DETECTOR PROBE WITH A HALOGEN-QUENCHED GEIGER-MÜLLER TUBE, COMPENSATED FOR DEAD TIME**

Eduardo De Burgos Garcia; A. Javier Goni Unzué; Juan M. Gutierrez Barranco, and Juan A. Pajares Suarez, all of Madrid, Spain, assignors to Junta de Energia Nuclear, Madrid, Spain

Filed Nov. 17, 1980, Ser. No. 207,512  
Int. Cl.<sup>3</sup> G01T 1/18  
U.S. Cl. 250—374

5 Claims



1. A Geiger-Müller (GM) tube gamma radiation probe which compensates for pulse losses due to GM tube dead time and linearizes the count-rate versus exposure-rate response of the tube, said probe comprising:

(a) current-to-frequency converter means for converging the GM tube means current due to radiation into pulses, the frequency of which is dependent on said GM tube current;  
(b) shaping means for shaping the GM tube pulses to radiation incident on the GM tube;  
(c) mixing means for adding or mixing the GM tube pulses with the pulses supplied by said current-to-frequency converter means; and  
(d) logarithmic network feedback means connected to said current-to-frequency converter means, said logarithmic network feedback means including two control means for adjusting the pulse frequency of said current-to-frequency converter means at both low and high exposure rates so that the response of the tube is linearized over its whole measuring range.

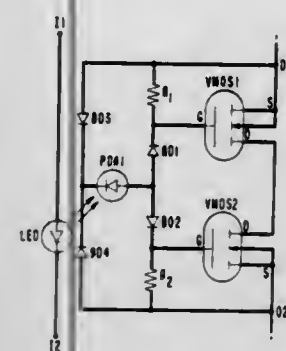
**4,423,330**  
**NORMALLY OFF BILATERAL SWITCH**  
Mahoud A. El Hamamsy, Watchung, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Sep. 24, 1981, Ser. No. 305,131  
Int. Cl.<sup>3</sup> G02B 27/00; H03K 17/687  
U.S. Cl. 250—551

6 Claims

1. A switch comprising a first photodiode array, said array having first and second terminals, a first and a second field effect transistor (FET), each FET having source, gate and drain electrodes, said drain electrodes being commonly connected, first and second diodes, each being connected to said first terminal of said first photodiode array and said first and



second diodes being connected to said gate electrodes of said first and second FETs, respectively, third and fourth diodes each being connected to said second terminal of said first photodiode array and said third and fourth diodes being con-



nected to said source electrodes of said first and second FETs, respectively, and first and second resistances connected between gate and source electrodes of said first and second FETs, respectively.

4,423,331

# METHOD AND APPARATUS FOR INSPECTING SPECIMEN SURFACE

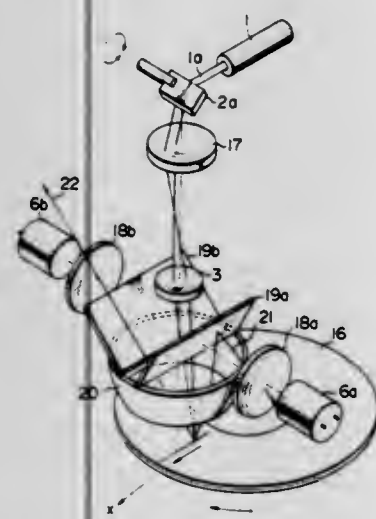
Mitsuyoshi Koizumi; Nobuyuki Akiyama, and Yoshimasa Oshima, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,483

Claims priority, application Japan, Mar. 12, 1980, 55-30396  
Int. Cl.<sup>3</sup> G01N 21/88

U.S. Cl. 250—572

6 Claims



1. An apparatus for inspecting a defect or the like on a surface of a disc having a cutting mark constituted by fine grooves extending in the circular direction of the disc and with random intervals in the radial direction of the disc, the apparatus comprising:

- laser oscillator means for producing a laser beam;
- laser spot irradiation means for irradiating the surface of the disc with the laser beam in the form of a focused laser spot projected substantially perpendicularly to the plane of the disc surface, whereby defects or the like on the surface of the disc cause light of the focused laser spot to be irregularly scattered therefrom;
- scanning means including laser scanning means for scanning the laser spot in the radial direction of the disc and rotation driving means for rotating the disc and for two-dimensionally scanning the surface of the disc with the laser spot;
- photoelectric converter means including a plurality of photoelectric converters;
- optical means for conducting light irregularly scattered by defects or the like other than the cutting mark on the disc along light detecting path means of said plurality of photo-

electric converters, said optical means including a first mirror having a concave inner mirror surface of revolution and disposed with respect to the surface of the disc so as to reflect light irregularly scattered therefrom, a pair of second mirrors associated with said first mirror and disposed symmetrically to each other for deflecting irregularly scattered light reflected by said first mirror which is in a direction other than the radial direction of the disc into the light detecting path means of said plurality of photoelectric converters and for permitting light reflected from the cutting mark to pass out of the light detecting path means of said plurality of photoelectric converters, and a plurality of condenser lenses for focusing light reflected by said pair of second mirrors onto said plurality of photoelectric converters, said plurality of photoelectric converters providing output signals in response to the light detected thereby, and

adding circuit means for adding the output signals of said plurality of photoelectric converters to produce an output signal indicative of the presence or absence of a defect or the like on the surface of the disc.

4,423,332

# PORTABLE SOLID FUEL ELECTRIC POWER PLANT FOR ELECTRICAL POWERED VEHICLES

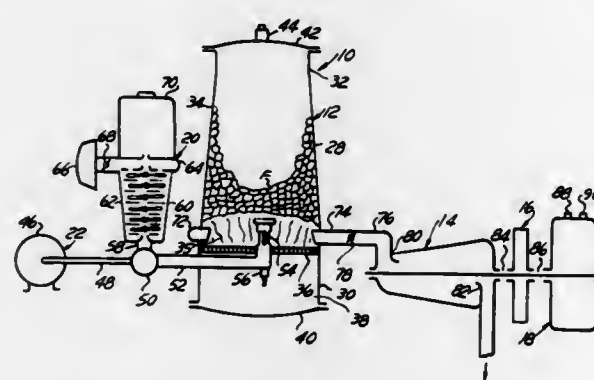
Werner H. Fengler, 23651 Fordson Dr., Dearborn, Mich. 48124

Continuation-in-part of Ser. No. 13,984, Feb. 22, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 214,848

Int. Cl.<sup>3</sup> F02C 3/26; H02P 9/04

U.S. Cl. 290—45

12 Claims



1. A portable slow-burning solid fuel power plant system for a hybrid vehicle, said system comprising:

- combustion receptacle means having a combustion chamber therein adapted to burn and convert pieces of slow-burning solid fuel into a pressurized power gas, said combustion receptacle means having an air inlet and a power gas outlet,
- a power-gas-operated turbine having a power gas inlet portion and an exhaust gas outlet portion and a rotary power output member,
- conduit means for conveying power gas from said outlet of said combustion receptacle means to said inlet portion of said turbine,
- an electrical storage device,
- an alternator having a rotary power input member and electric current output terminals adapted to deliver the electric current generated by said alternator to said electrical storage device in response to its drive by said power-gas-operated turbine,
- a speed reducer operatively connecting said rotary power output member of said turbine to said rotary power input member of said alternator,
- means for selectively supplying a combustible starting fluid to said combustion receptacle means,
- means associated with said combustion receptacle means for controllably igniting said combustible starting fluid, and
- means responsive to the amount of charge contained in said

storage device for supplying air under pressure to said combustion receptacle air inlet whenever said storage device is not in its fully charged condition.

4,423,333

# HORIZONTAL AXIS WIND ENERGY CONVERSION SYSTEM WITH AERODYNAMIC BLADE PITCH CONTROL

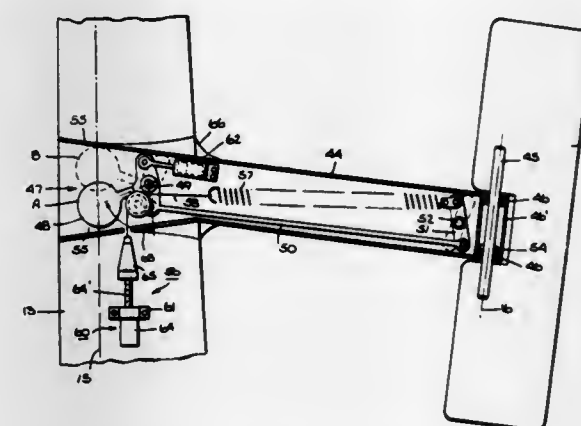
Wendell E. Rossman, 3137 N. 53rd St., Phoenix, Ariz. 84018

Filed Feb. 2, 1982, Ser. No. 344,957

Int. Cl.<sup>3</sup> F03D 7/04

U.S. Cl. 290—44

34 Claims



1. A wind energy conversion system comprising a rotor assembly disposed on a horizontal axis, said rotor assembly including at least one pivotally mounted turbine blade disposed in a radiating manner for rotation about an aerodynamic axis perpendicular to said horizontal axis, and a pitch control vane mounted on said turbine blade for moving said turbine blade into a deliberate angle of attack in relation to a relative wind passing over said blade.

4,423,334

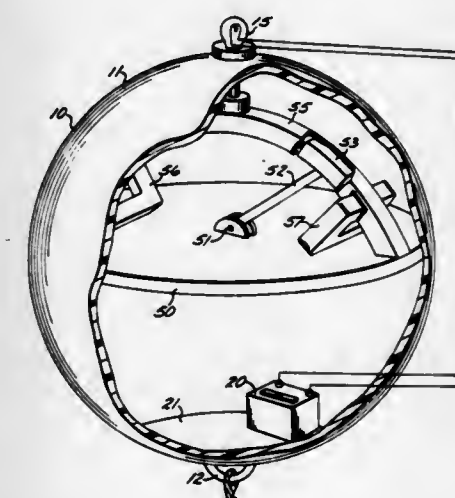
WAVE MOTION ELECTRIC GENERATOR  
Edgar F. Jacobi, 1027 Woodland Pl., Menasha, Wis. 54952, and Robert J. Winkler, 2101 E. 4th St., Ste. 150, Santa Ana, Calif. 92704

Filed Sep. 28, 1979, Ser. No. 79,974

Int. Cl.<sup>3</sup> F03B 13/12

U.S. Cl. 290—53

1 Claim



1. A wave motion powered electrical generator comprising: a substantially spherical hollow buoyant structure having a sealed exterior shell; a ballast weight mounted at a selected point on the interior of said buoyant structure for providing a preferred flotation alignment therefore when deployed on a body of liquid; a support platform disposed on the interior of said buoyant structure on said ballast weight and aligned along a hori-

zontal plane an arcuate pivotal guide mounted on said support platform in a vertical plane relative thereto; a pivoted arm aligned for pivotal articulation in a vertical plane above said platform a weighted head conformed for receipt in said arcuate guide on the free end of said pivotal arm, said head having a substantially arcuate plan form extending as arc segments relative said pivoted arm each said arc segment being respectively provided with a first and second winding connected in a series circuit; a first and second magnetic loop mounted on said arcuate guide proximate the ends thereof, each magnetic loop including an air gap aligned to receive a corresponding one of said arcuate segments of said head according to the pivotal articulation thereof wherein said first or second windings are respectively passed through the corresponding ones of said air gap according to the pivotal motion of said arm; and rectifying means connected to said first and second winding for rectifying the induced currents therein.

4,423,335

# ENERGY CONTROLLER AND METHOD UTILIZING BI-METAL ELEMENTS TO ADJUST THERMOSTAT SETTING AND TO SHED AND RESTORE CONTROLLED LOADS IN PRIORITIZED ORDER

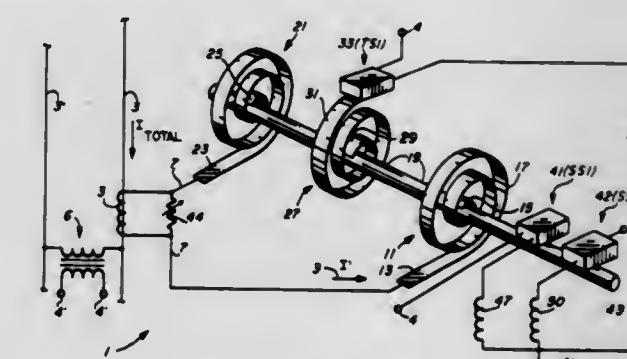
George P. Gurr, Phoenix, Ariz., assignor to Cyborex Laboratories, Inc., Phoenix, Ariz.

Filed Jan. 4, 1982, Ser. No. 336,939

Int. Cl.<sup>3</sup> H02J 3/14

U.S. Cl. 307—31

24 Claims



1. A system for controlling the amount of electrical energy delivered from a power line to an establishment having a plurality of electrical loads, including first and second controlled loads, in order to reduce peak electrical loading by the establishment by avoiding simultaneous operation of said first and second controlled loads, said system comprising in combination:

- (a) means for sensing a quantity related to the amount of power being delivered to said plurality of electrical loads;
- (b) first temperature sensitive means having a portion that deflects in response to a change in the temperature of said first temperature sensitive means caused by a change in said quantity, wherein said first temperature sensitive means includes a first bi-metal coil having a first end portion and a second end portion, said second end portion undergoing rotational deflection relative to said first end portion in response to changes in temperature of said first bi-metal coil;
- (c) means responsive to said sensing means for heating said first temperature sensitive means to a temperature related to the amount of power being delivered to said plurality of electrical loads;
- (d) thermostatic means for switching from one state to another when a temperature of said thermostatic means varies from a level below a first set point temperature to a level above said first set point temperature, said first thermostatic means controlling said first controlled load, wherein said thermostatic means includes a second bi-metal coil having a first end portion and a second end



portion that undergoes rotational deflection relative to said first end portion of said second bi-metal coil in response to changes in the temperature of said second bi-metal coil, said coupling means connecting said second end portion of said first bi-metal coil to said first end portion of said second bi-metal coil, the total amount of rotational deflection of said second end portion of said second bi-metal coil being determined by both an amount of change of temperature of said second bi-metal coil and an amount of change in the total power being delivered to the establishment; and

(e) means coupling said thermostatic means to said portion of said first temperature sensitive means for changing said first set point temperature in response to changes in the amount of power being delivered to said plurality of electrical loads.

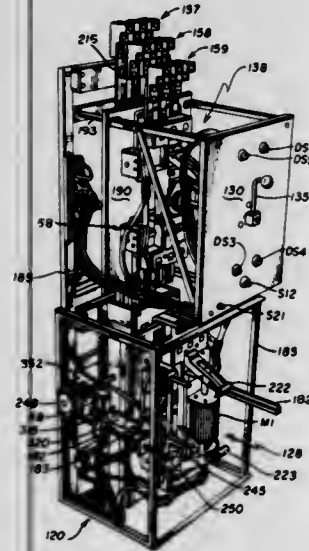
#### 4,423,336 ELECTROMECHANICALLY CONTROLLED AUTOMATIC TRANSFER SWITCH AND BYPASS SWITCH ASSEMBLY

James R. Iverson, Fridley; Ernest L. Tell, and Terry L. Pinotti, both of Mounds View, all of Minn., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed May 17, 1982, Ser. No. 378,642  
Int. Cl.<sup>3</sup> H02J 7/00

U.S. Cl. 307—64

23 Claims



1. An automatic transfer switch and bypass switch assembly for interconnecting a normal source of power or an alternate source of power to a load, comprising:

- a three position motor operated transfer switch having three alternative positions; an open position, a position for connecting the normal source of power to the load, and a position for connecting the alternate source of power to the load;
- a three position manually operated bypass switch for bypassing the automatic transfer switch and alternatively connecting the load to the normal source of power, or to the alternate source of power, or to neither source of power;
- position sensing means for sensing the position of said transfer switch and the position of said bypass switch;
- power sensing means for sensing the availability of both the normal and the emergency sources of power;
- operation sensing means for sensing when said bypass switch is being manually operated to connect the normal source of power to the load or to connect the alternate source of power to the load; and
- automatic means, electromechanically interlocking said transfer switch and said bypass switch and operating in response to said position sensing means, said power sensory means and said operation sensing means, for actuating said transfer switch to disconnect the load from the source of power to which said transfer switch is connect-

ing the load if said bypass switch is manually operated to connect the other source of power to the load.

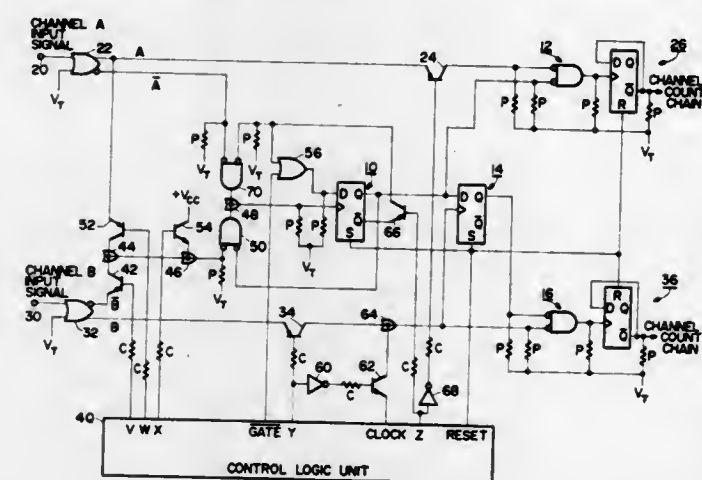
#### 4,423,337 GATE CIRCUIT FOR A UNIVERSAL COUNTER

William G. Wilke, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 13, 1981, Ser. No. 282,368  
Int. Cl.<sup>3</sup> H03K 17/26

U.S. Cl. 307—247 R

4 Claims



1. A gating circuit for an electronic counter, comprising: a first bistable control circuit responsive to an arming signal and a first triggering signal for producing a first enable signal, said first triggering signal being selectable from a first input signal and a second input signal; a first gate circuit responsive to said first enable signal for producing a first count signal; means for applying said first input signal to said first gate circuit; a second bistable control circuit responsive to said first enable signal and a second triggering signal for producing a second enable signal, said second triggering signal being selectable from said second input signal and a clock signal; and a second gate circuit responsive to said second enable signal and said second triggering signal for producing a second count signal.

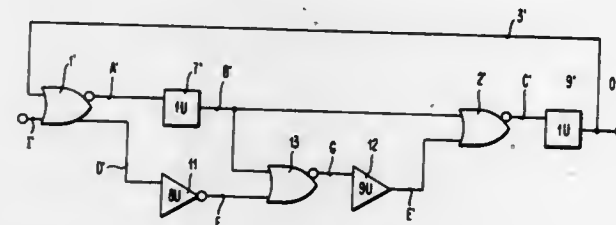
#### 4,423,338 SINGLE SHOT MULTIVIBRATOR HAVING REDUCED RECOVERY TIME

David B. Eardley, Stanfordville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,455  
Int. Cl.<sup>3</sup> H03K 5/159, 3/033

U.S. Cl. 307—273

6 Claims



1. A single shot multivibrator comprising first and second logic circuits, each having two inputs, and at least one output, said first circuit being directly connected to one input of said second circuit and, via a delay circuit, to the other input of said second circuit,

said output of said second circuit being directly connected to an output terminal and to one input of said first circuit, the other input of said first circuit being connected to an input terminal, said delay circuit comprising a number of cascaded delay units, at least two of which are directly connected to said first circuit.

#### 4,423,339 MAJORITY LOGIC GATE

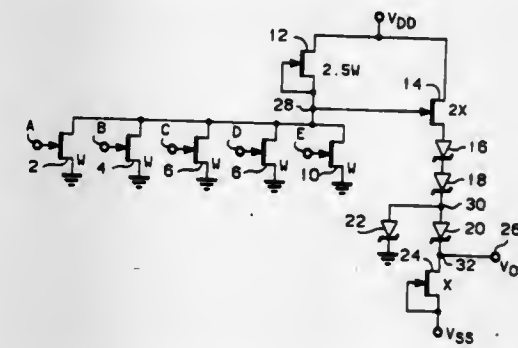
Walter C. Seelbach, Fountain Hills, and Boyd K. Hansen, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 23, 1981, Ser. No. 237,310

Int. Cl.<sup>3</sup> H03K 19/23, 19/092, 19/094, 5/08

U.S. Cl. 307—464

5 Claims



1. A logic gate, comprising: an input stage having an odd number of inputs, said input stage producing a first voltage when a majority of said inputs are coupled to a logical high voltage level and producing a second voltage when a majority of said inputs are coupled to a logical low voltage level, said input stage including, an odd plurality of field effect transistors having a common drain and each having a source coupled to ground, the gate electrode of each of said field effect transistors comprising one of said odd number of inputs, and a load field effect transistor having its source electrode coupled to its gate electrode and to the drain electrodes of said odd plurality of field effect transistors, said load field effect transistor having a drain electrode, coupled to a source of supply voltage, said first and second voltages being produced at the source of said load field effect transistor, each of said odd plurality of field effect transistors having a channel width such that a majority of said odd plurality of field effect transistors must be on to sink all current being sourced by said load field effect transistor;

level shifting means coupled to said input stage for shifting said second and first voltages to produce said logical high and logical low voltages respectively, said level shifting means including,

- a source follower field effect transistor having a gate electrode coupled to the source of said load field effect transistor, a drain electrode coupled to said source of supply voltage and having a source electrode, first, second and third series coupled Schottky diodes, the first of which having an anode coupled to the source of said source follower field effect transistor, and an additional field effect transistor having a source electrode coupled to its gate electrode and to a second source of supply voltage and having a drain electrode coupled to the cathode of said third Schottky diode, said logical high and logical low voltages appearing at the drain electrode of said additional field effect transistor, said source follower field effect transistor being capable of conducting twice as much current as said additional field effect transistor; and an additional Schottky diode having a cathode coupled to ground and an anode coupled to the anode of said third Schottky diode for clamping said logical high voltage

level produced by said level shifting means in response to said second voltage to a predetermined voltage level.

#### 4,423,340 SENSE AMPLIFIER

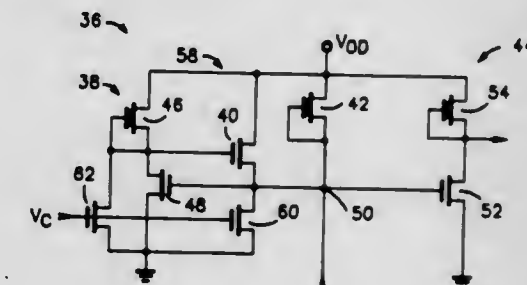
Brian M. Spinks, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1981, Ser. No. 330,350

Int. Cl.<sup>3</sup> H03K 17/30, 17/687; G01R 19/165

U.S. Cl. 307—530

6 Claims



1. A sense amplifier comprising: charging means for charging a node to a first predetermined voltage; a transistor having a control electrode and a first electrode coupled to said node, and second electrode coupled to a second voltage which is different from said first voltage; and a detector means for providing an output signal when the voltage on said node exceeds a third predetermined voltage, the third voltage being intermediate said first and second voltages.

#### 4,423,341 FAST SWITCHING FIELD EFFECT TRANSISTOR DRIVER CIRCUIT

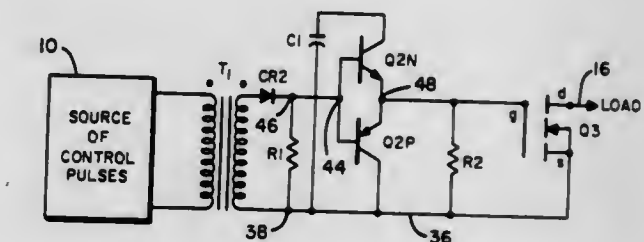
Randolph D. W. Shelly, Rosemere, Canada, assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 2, 1981, Ser. No. 222,032

Int. Cl.<sup>3</sup> H03K 17/687, 17/04

U.S. Cl. 307—570

6 Claims



1. An improved inverter power supply circuit of the type having transformer coupling means including at least primary winding means and secondary winding means, each having first and second terminals; input means coupled to said first and second terminals of said primary winding means for coupling to sources of dc voltages; input switching means coupled to one of said first and second terminals of said primary winding means and said input means for switching current through said primary winding means in response to switching control signals applied thereto, thereby producing an alternating voltage across said primary winding means and said secondary winding means; field effect transistor power switching means having gate means for controlling switching of said field effect transistor means between current conductive operational states, and



non-current conductive operational states in response to signals applied to said gate means;

gate charging circuit means coupled intermediate said secondary winding means and said power switching means for rapidly charging said gate means for causing said field effect transistor means to be rapidly switched to the current conductive state in response to first ones of said control signals received by said input switching means;

gate discharging circuit means coupled intermediate said secondary winding means and said power switching means for rapidly discharging said gate means for causing said field effect transistor means to be rapidly switched to the non-current conductive state in response to second ones of said control signals received by said input switching means; and including

diode means coupled intermediate said secondary winding means and said gate means, for providing a path of current conduction to rapidly charge the capacitance of said gate means for speeding up the switching of said field effect transistor means to the current conductive state;

said gate charging circuit means further including charging switching transistor means coupled intermediate said secondary winding means and said gate means for rapidly charging the capacitance of said gate means when said charging transistor means is switched to the conductive state in response to said input switching means being switched to the current conductive state; wherein the improvement comprises:

capacitor means included in said gate charging circuit means, said capacitor means coupled to said charging switching transistor means for biasing said charging switching transistor means to the current conductive state.

4,423,342

# STEPPING MICROMOTOR CAPABLE OF ROTATION IN BOTH SENSES

Mohamed Mokdad, Bienne, Switzerland, assignor to Omega SA, Bienne, Switzerland

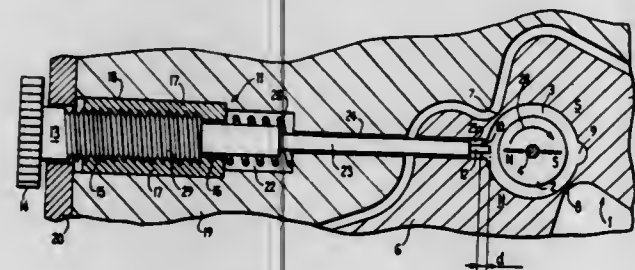
Filed Dec. 14, 1982, Ser. No. 449,806

Claims priority, application Switzerland, Dec. 18, 1981, 8106/81

Int. Cl.<sup>3</sup> H02K 7/10

U.S. Cl. 310-41

7 Claims



1. Rotary stepping micromotor for timepiece use comprising a core of magnetic material, a winding on said core, a stator magnetically coupled to said core and having two pole pieces separated or integrally formed with one another, a magnetized rotor encircled by said pole pieces exhibiting at least one pair of diametrically opposed poles (N-S) a gap separating the pole pieces from the rotor and magneto-mechanical means arranged and adapted to reverse the rotation sense of said rotor wherein said means comprises a magnetic element capable of penetrating said gap in order to modify the stationary position angle of said rotor thereby to reverse the normal rotation sense when electric control pulses are applied to the winding.

4,423,343

# SYNCHRONOUS MOTOR SYSTEM

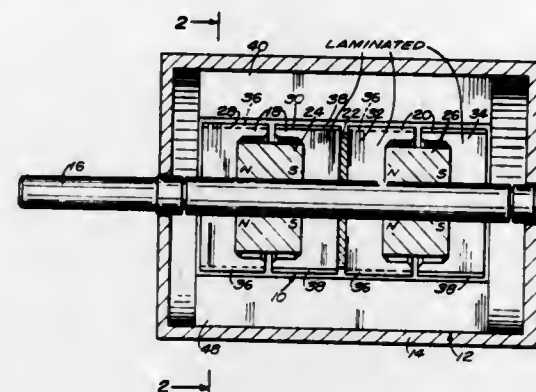
John H. Field, II, Medfield, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Filed Apr. 1, 1981, Ser. No. 249,821

Int. Cl.<sup>3</sup> H02K 37/00

U.S. Cl. 310-49 R

13 Claims



1. A motor system comprising:

a stator and a rotor movable relative to each other about an axis,

said stator having a plurality of radially directed stator poles, said poles having stator teeth arranged in a circle around the axis, said teeth on each pole having a given pitch, the pitch on one pole being the same as the pitch on every other pole,

said rotor having permanently magnetized teeth, a coil on each of said stator poles, and means for energizing the coils,

the number of poles on said stator being sixteen at regular intervals of twenty two and one-half mechanical degrees and each having a plurality of teeth offset from the teeth on the poles ninety degrees therefrom by one full pitch and offset from the teeth on adjacent poles by one-quarter pitch,

said stator poles each having a root toward the outer periphery of said stator and a crown at said teeth, said poles each being narrowed between said root and said crown, said root and said crown having absolute dimensions along the tangential direction and the absolute dimension along the tangential direction of said root and said crown being substantially the same.

4,423,344

# LIQUID COOLED EDDY CURRENT COUPLING HAVING ROTOR EXTENSION RING

Thomas H. Jones, Wauwatosa, Wis., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Feb. 23, 1981, Ser. No. 237,047

Int. Cl.<sup>3</sup> H02K 9/197

U.S. Cl. 310-105

6 Claims

1. A liquid cooled eddy current coupling comprising:

a housing having rotatable input and output shafts;

a generally tubular inductor member mounted on one of said input and output shafts for rotation therewith;

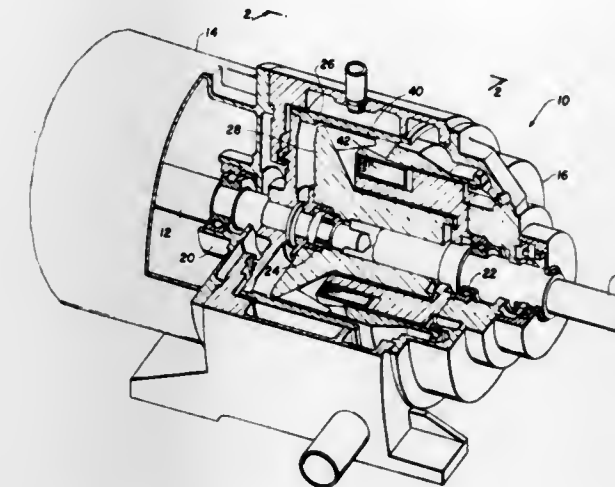
a magnetic rotor member mounted on the other of said input and output shafts for rotation therewith, said rotor member being located within said inductor member and having a plurality of poles aligned with said inductor member and separated therefrom by a circumferential air gap;

an annular field coil positioned with said rotor member, said field coil generating an encircling magnetic flux causing torque transmission between said inductor and rotor members and said input and output shafts;

a coolant inlet for supplying coolant to the interior of said housing along the exterior and above the midpoint of said inductor member;

said rotor member having a tubular extension extending from said aligned portions of said rotor member and in-

ductor member, said extension having an exterior circumferential groove therein forming a channel for receiving and discharging coolant from said inductor and rotor members where said channel is disposed on said extension



such that coolant is prevented from reaching said coil when said rotor is stationary; and a coolant outlet for removing coolant from the interior of said housing.

4,423,345

# MAGNETO FLYWHEEL ASSEMBLY

Mats Nilsson, Åmål, Sweden, assignor to Aktiebolaget Svenska Elektromagneter, Åmål, Sweden

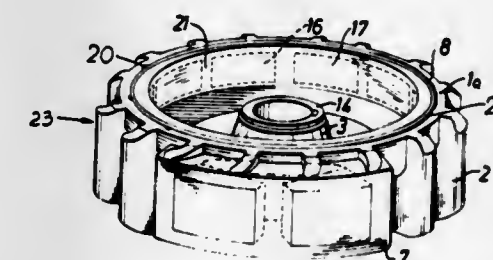
Filed Jan. 22, 1981, Ser. No. 227,470

Claims priority, application Sweden, Jan. 30, 1980, 8000746

Int. Cl.<sup>3</sup> H02K 21/22

U.S. Cl. 310-153

8 Claims



1. A magneto flywheel assembly, comprising:

(a) a rotor having a cylindrical periphery of relatively soft material;

(b) a series of arcuate ceramic magnets fixed on said rotor and arranged in a circle and disposed along said cylindrical periphery, said magnets having a non-uniform radial thickness, said magnets having a first set of radial poles of alternating polarity directed radially away from said cylindrical periphery and arranged cylindrically, and a second set of opposite poles directed toward said cylindrical periphery, there thereby being a variation in spacing between said second set and said periphery; and

(c) a band of deflectable ferromagnetic metal harder than said soft material, and disposed between said magnets and said periphery, said band having a number of surface projections directed toward said periphery, said band having a thickness remote from said projections corresponding to the minimum size of said variation in spacing, and a thickness through said projections corresponding to the maximum size of said variation in spacing;

whereby said cylindrical periphery forces said band to deflect against said variably disposed second set of poles and permits certain of said projections to be radially received at least in part into the softer cylindrical periphery.

4,423,346

# SAFETY DEVICE FOR PREVENTING OVERSPEED

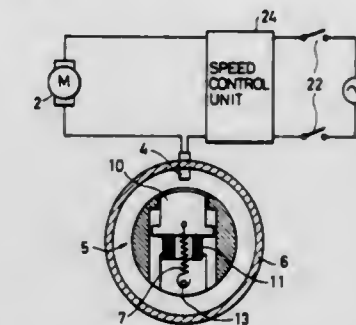
Yuki Nakazawa, Katsuta, Japan, assignor to Hitachi Koki Company, Limited, Tokyo, Japan

Filed May 13, 1981, Ser. No. 263,240

Int. Cl.<sup>3</sup> H02H 5/00

U.S. Cl. 310-68 E

1 Claim



1. A safety device for preventing overspeed for use with a device having a rotary shaft driven by an electric driving mechanism, comprising:

(a) a rotary member arranged to rotate with said rotary shaft;

(b) a feeding path through which electrical power is supplied to said electric driving mechanism, said feeding path being located in the vicinity of said rotary member;

(c) a cutter movably received in a radial bore formed in said rotary member so that said cutter is contactable with said feeding path when protruding outwardly in response to centrifugal force thereon;

(d) a tension spring having one end fixedly supported with respect to said rotary member, and another end connected to said cutter; and

(e) means for biasing said cutter against the tensile force of said tension spring, said means being received in said bore of said rotary member in such a manner that the position in the radial direction of said rotary member is adjustable, the means having a bore at its center so that said tension spring penetrates therethrough;

said outward protrusion of the cutter occurring when centrifugal force on the mass of the cutter exceeds the tensile force of the spring.

4,423,347

# POSITIONING ELEMENT WITH A PIEZO-CERAMIC BODY

Peter Kleinschmidt, Munich; Hans Meixner, Haar, and Valentin Magori, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

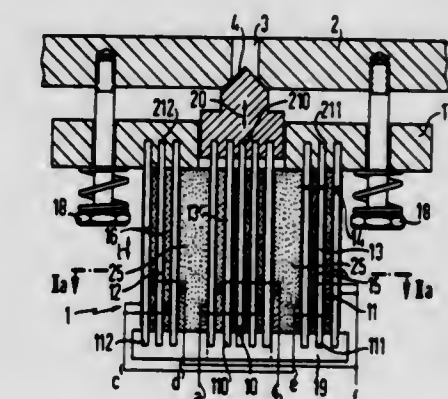
Filed Dec. 8, 1981, Ser. No. 328,618

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048631

Int. Cl.<sup>3</sup> H01V 7/00

U.S. Cl. 310-331

17 Claims



1. An electrically actuated positioning element system, com-



prising: a positioning element formed of two piezo-electrical bodies each formed of a plurality of lamellae provided with electrodes, said lamellae extending in a motion direction of the positioning element between ends of said piezo-electrical bodies; the lamellae being mechanically connected to one another with their principle surfaces parallel to the direction of motion so as to be immobile with respect to one another; a length of the lamellae between the ends of the bodies being at least 5 times as great as a thickness of the individual lamellae and the lamellae all having the same thickness; said piezo-electrical bodies being designed such that upon application of an electrical voltage with a field direction which promotes a polarization of the material of the lamellae, the body to which the electrical voltage is applied is shortened; the two piezo-electrical bodies having approximately a same length and being disposed next to one another; the two bodies being connected to one another at their one ends by a cross arm, and at their other ends one of the bodies having its end active and free to move relative to the end of the other body such that a resultant relative motion occurring between the two body ends not connected by the cross arm may be utilized; means for absorbing a lateral thrust of the bodies; and the two piezo-electrical bodies being electrically connected to one another for reverse phase operation wherein one contracts while the other is in a lengthened condition and vice versa.

4,423,348

# COMBINED HIGH PRESSURE DISCHARGE LAMP AND REFLECTOR ASSEMBLY

Wolfgang Greiler, Unterhaching, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

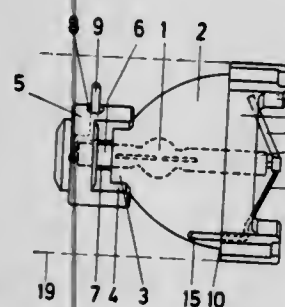
Filed Aug. 28, 1981, Ser. No. 297,359

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033688

Int. Cl.<sup>3</sup> H01J 61/40; F21V 7/20, 29/00

U.S. Cl. 313-113

12 Claims



1. A lamp assembly comprising:
  - a high pressure discharge lamp (1) having a first and a second end (6, 13);
  - a reflector (2) in which the lamp (1) is arranged with its longitudinal axis in the reflector axis, the reflector (2) having a neck (3) at one end and a light emission aperture (10) at the other end thereof;
  - a base (5) made of a temperature resistant electrically insulating material, and having connections to said first lamp end (6) and to the reflector neck (3);
  - an end ring (12) made of a temperature resistant, electrically insulating material, and having a connection to said reflector (2) at said light emission aperture (10);
  - support and connecting means (14, 14', 16) coupled between said second lamp end (13) and said end ring (12) for connecting said second lamp end (13) to said end ring (12) with said second lamp end (13) facing said light emission aperture (10) of said reflector (2);
  - said base (5) and said end ring (12) having shoulders and recesses and said connections between said lamp and said base and end ring defining free vent openings for passage of cooling air;
  - a pair of electrical connection members (9, 15) each respectively associated with said base and with said end ring;

said electrical connection member (9) of at least said base being external of said reflector (2); and

said support and connecting means coupling said second lamp end (13) to said end ring (12) comprising a lead-in wire (14) of said lamp which extends from said second lamp end (13) substantially radially of said light emission aperture to at least one of said reflector (2) and end ring (12), said lead-in wire being connected to said connection member (15) associated with said end ring (12) to electrically interconnect said second lamp end (13) to said connection member (15) associated with said end ring; and a support member (16) connected to support said second lamp end (13) relative to said end ring (12);

said electrical connection members (9, 15) being formed of rigid materials and being rigidly connected to said base (5) and to said end ring (12), respectively, in order to increase the mechanical integrity and electrical security of the assembly; and

said lead-in wire (14) extending along a substantially straight line from said second lamp end (13) directly to said end ring (12), said support member (16) supporting said second lamp end (13) relative to said end ring (12) and retaining said second lamp end (13) in position relative to said end ring (12), and said lead-in wire (14) being connected directly to said connection member (15) associated with said end ring (12).

4,423,349

# GREEN FLUORESCENCE-EMITTING MATERIAL AND A FLUORESCENT LAMP PROVIDED THEREWITH

Shigeharu Nakajima; Keiji Ichinomiya; Koichi Okada; Kaname Tsuchikura, and Minoru Kashiwagi, all of Anan, Japan, assignors to Nichia Denshi Kagaku Co., Ltd., Anan, Japan

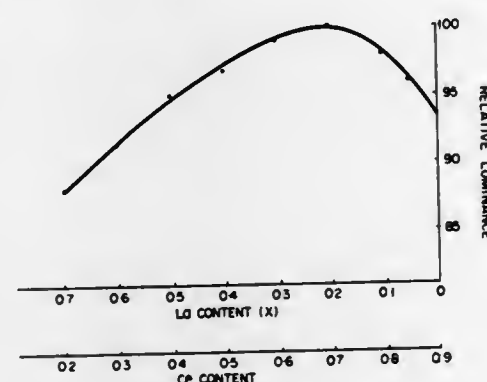
Filed Jul. 1, 1981, Ser. No. 279,561

Claims priority, application Japan, Jul. 16, 1980, 55-97769; Aug. 22, 1980, 55-116220

Int. Cl.<sup>3</sup> H01J 1/63, 63/04

U.S. Cl. 313-487

11 Claims



1. A green light-emitting fluorescent material prepared from terbium activated lanthanum cerium orthophosphate and expressed by formula (I):



(I)

where:

$$\begin{aligned} x+y+z &= 1 \\ 0.05 < x < 0.35 \\ 0.05 < y < 0.3 \\ 0.6 < z < 0.9 \end{aligned}$$

4,423,350

# FLUORESCENT LAMP AND PROCESS FOR FABRICATING THE SAME

Yoshiro Ogata, Ibaraki; Haruo Yamazaki, Moriyama, and Hidezoh Akutsu, Kobe, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

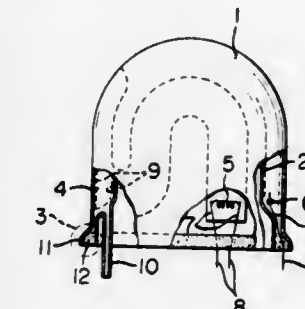
Filed May 14, 1981, Ser. No. 263,575

Claims priority, application Japan, May 14, 1980, 55-64510

Int. Cl.<sup>3</sup> H01J 63/04, 9/00

U.S. Cl. 313-493

8 Claims



1. A fluorescent lamp of the type in which a lamp envelope comprises:

- an outer bulb having generally a spherical or a partially spherical or a cylindrical configuration and an inner bulb inserted into said outer bulb in predetermined nested relationship, said bulbs having adjacent end portions with an opening therebetween;
- either the inner surface of said outer bulb or the outer surface of said inner bulb being formed with a groove which defines a discharge path between said outer and inner bulbs;
- a phosphor formed at least over the wall surfaces of said groove formed on either of the inner surface of the outer bulb or the outer surface of the inner bulb;
- an electrode disposed at each end of said discharge groove; and
- a radiation emitting discharge gas consisting of mercury gas vapor and a rare gas vapor and a rare gas or a rare gas mixture filled in said discharge groove,

wherein

the end portion of at least one of said bulbs is flared away from the adjacent end portion of the other bulb to form an annular space, so that glass frit can be filled in said annular space, whereby the adjacent end portions of said outer and inner bulbs can be gas-tightly sealed together and leadwires which also serve to support the electrodes at the ends of said discharge path and are extended through said annular space between the adjacent end portions of said outer and inner bulbs can also be gas-tightly sealed with said glass frit when the latter is heated and then solidified.

4,423,351

# VACUUM CONTAINER OF RADIATION IMAGE MULTIPLIER TUBE AND METHOD OF MANUFACTURING THE SAME

Fumio Sugimori, Yokohama; Chikae Nishino, Sagami-hara, and Norio Harao, Ayase, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 4, 1981, Ser. No. 260,399

Claims priority, application Japan, May 6, 1980, 55-59710; May 29, 1980, 55-70760

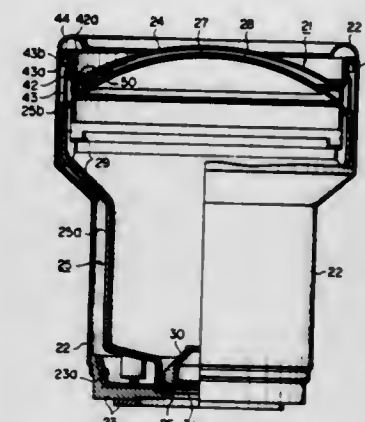
Int. Cl.<sup>3</sup> H01J 31/26, 40/00

U.S. Cl. 313-523

8 Claims

1. A vacuum container of a radiation image multiplier tube comprising a cylindrical body, a radiation input window of Al or an Al alloy provided at one end of the body, an insulation member of glass or ceramic provided at the other end of the body with a portion thereof being employed as an output portion for outputting radiation image multiplied signals, said container including a first ring made of Fe or an Fe alloy constituting a portion of the cylindrical body airtightly con-

nected between the peripheral portion of the radiation input window and the insulator member, and a hot pressure-bonded airtight junction between the first ring and the input window having one or more thin layers of at least one metal selected



4,423,352

# PANEL TYPE DISPLAY APPARATUS

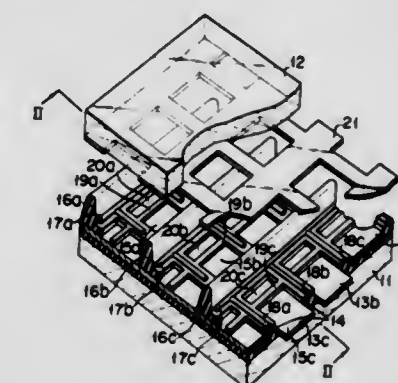
Toshikiyo Miyazaki, Saga; Ushio Miura, Kawasaki, and Masahiro Hatanaka, Tokyo, all of Japan, assignors to Mitani Electronics Industry Corp., Fuchu, Japan

Filed Jul. 2, 1981, Ser. No. 279,756

Int. Cl.<sup>3</sup> H01J 17/49

U.S. Cl. 313-584

3 Claims



1. A panel type display apparatus comprising:
  - a transparent front plate;
  - a back plate facing said front plate at a small distance;
  - said front plate sealed to the back plate and containing a discharge gas therein;
  - a plurality of parallel strip-like cathodes formed on the inner surface of said back plate facing said front plate and extending in a first direction;
  - an insulating rib structure formed on the inner surface of said back plate and having a lattice-like structure extending along lines between adjacent cathodes in said first direction and also along lines extending in a second direction at right angles to said first direction;
  - a plurality of partitioning ribs raised from at least portions of said insulating rib structure extending in said second direction and in contact with said front plate;
  - a plurality of anodes formed to extend along one side of said partitioning ribs; and
  - seed discharge sections each defined in a portion of the cathode surface in each said display element section in the vicinity of the corresponding anode.



4,423,353

**HIGH-PRESSURE SODIUM LAMP**

Yoshiro Ogata, Ibaraki; Haruo Yamazaki, Moriyama; Takashi Ikeda, Takatsuki, and Hidezoh Akutsu, Kobe, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

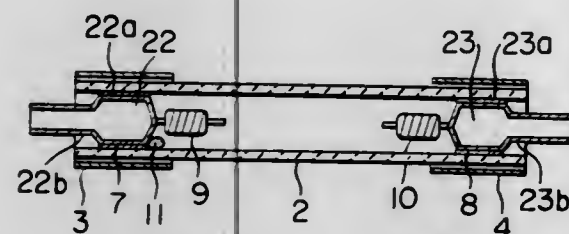
Filed Jun. 10, 1981, Ser. No. 272,178

Claims priority, application Japan, Jun. 17, 1980, 55-82645; Oct. 3, 1980, 55-138969; Jan. 19, 1981, 56-6924

Int. Cl.<sup>3</sup> H01J 61/30, 61/36, 61/073, 61/22

U.S. Cl. 313-631

3 Claims



1. A high-pressure sodium lamp comprising an outer envelope, an arc tube made of transparent alumina containing sodium and supported within the outer envelope, and means for supplying electrical energy to said arc tube through feed-throughs, the improvement which comprises: a single crystal alumina arc tube having cylindrical ends sealed with feed-throughs each having an electrode extending into the arc tube from the inner end thereof, each of said feed-throughs comprises an enlarged-diameter portion having a cylindrical outer wall sealed to the inner cylindrical wall surface of said arc tube and a reduced-diameter portion contiguous and concentric with said enlarged-diameter portion and defining an external annular space between the inner cylindrical wall surface of said arc tube and said feed-through.

4,423,354

**METHOD AND APPARATUS FOR CONTROLLING ELECTRODE VOLTAGE IN ELECTRON BEAM TUBES**

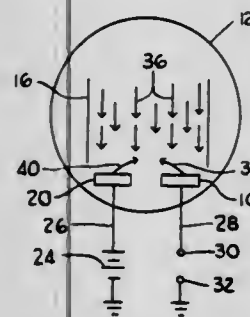
Thomas D. Kegelman, Ridgefield, Conn., assignor to KCR Technology, Inc., East Hartford, Conn.

Filed Dec. 24, 1980, Ser. No. 219,971

Int. Cl.<sup>3</sup> H01J 29/41

U.S. Cl. 315-12 R

25 Claims



1. A method of controlling the voltage on an electrode in an electronic tube device of the electron beam type comprising the steps of:

- providing a controlling electrode in physical proximity to the electrode to be controlled and positioning said controlling electrode so that said controlled and controlling electrodes are scanned substantially simultaneously by the tube electron beam;
- applying a control voltage of predetermined magnitude and polarity to said controlling electrode;
- scanning said controlled and controlling electrodes substantially simultaneously to provide primary and secondary electrons in the region of said electrodes; and
- the magnitudes and polarity of the control voltage being selected to cause an exchange of electrons between said controlled and controlling electrodes during the period of

electron bombardment causing the voltage on said controlled electrode to switch to a desired value.

4,423,355

**ION GENERATING APPARATUS**

Katsuhiro Kageyama, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

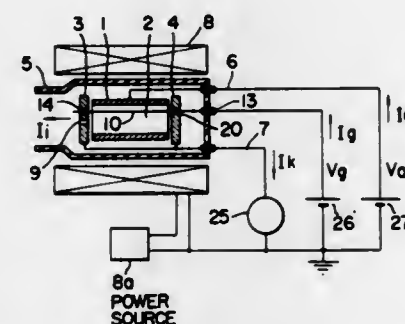
Filed Mar. 19, 1981, Ser. No. 245,534

Claims priority, application Japan, Mar. 26, 1980, 55-37572; Jul. 25, 1980, 55-102216; Jul. 25, 1980, 55-102217; Oct. 9, 1980, 55-141364; Oct. 28, 1980, 55-151016; Nov. 19, 1980, 55-162856; Nov. 19, 1980, 55-162857

Int. Cl.<sup>3</sup> H01J 33/00

U.S. Cl. 315-111.81

30 Claims



1. In an ion generating apparatus of the type comprising a cylindrical vacuum envelope, an anode disposed in said vacuum envelope and provided with a tubular inner hollow portion, a pair of cathodes disposed in said vacuum envelope near both end openings of said anode so as to cover said end openings, means for applying a voltage between said anode and said cathode to create an electric field in said hollow portion, means for creating a magnetic field in said hollow portion in a direction parallel to a central axis of said hollow portion, means for supplying working gas into said hollow portion to establish a cross field discharge, and an evacuating device for creating a predetermined vacuum condition in said vacuum envelope, at least one of said cathodes being provided with a through hole at a central portion thereof, the improvement in which a control electrode is stretched in said hollow portion in parallel spaced relation with respect to the central axis of said hollow portion.

4,423,356

**SELF-SHIFT TYPE GAS DISCHARGE PANEL**

Sei Sato, Akashi; Masayuki Wakitani, Hyogo; Kenichi Oki, Takarazuka; Shoshin Miura, Kobe; Hisashi Yamaguchi, Hyogo; Yoshinori Miyashita, Himeji; Tsutae Shinoda, Akashi; Kazuo Yoshikawa, Kobe; Kurahashi Keizo, Kobe, and Toyoshi Kawada, Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 28, 1982, Ser. No. 383,143

Claims priority, application Japan, Jun. 23, 1981, 56-97745

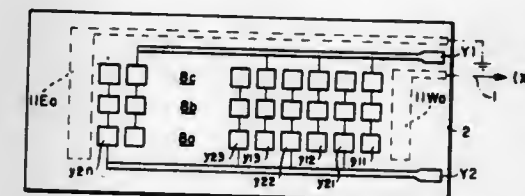
Int. Cl.<sup>3</sup> H01J 65/00; H05B 41/00

U.S. Cl. 315-169.2

15 Claims

1. A self-shift type gas discharge panel comprising: at least one shift channel comprising a regular arrangement of a plurality of shift discharge cells defined between opposing portions of shift electrodes on a pair of substrates separated by a gas discharge space, the shift electrodes being covered with a dielectric layer for charge accumulation and sequentially and regularly connected by respective shift electrode connections to a plurality of buses for providing shift voltages, a corresponding write discharge cell defined between a portion of one of said shift electrodes on one of said substrates and a write electrode located on the other one of said substrates, at one end of each said shift channel, each write electrode being connected to a corresponding write

voltage terminal and covered with said dielectric layer, and at least one charge leak conductive layer provided on at least one of said substrates adjacent at least to the discharge



cells at both ends of each said shift channel, said at least one charge leak conductive layer having a configuration for dissipating abnormal charges caused by the operation of said panel.

4,423,357

**SWITCHABLE PRECISION CURRENT SOURCE**

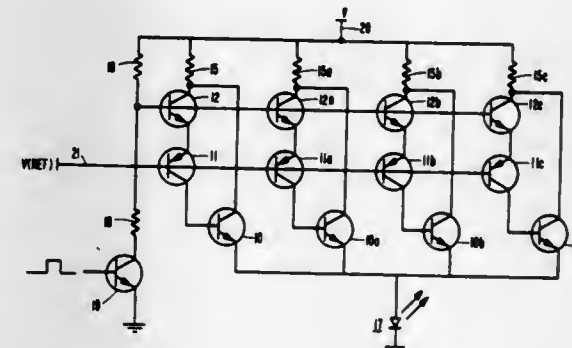
Jeffery A. Engelman, Longmont, and James L. Sanford, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,590

Int. Cl.<sup>3</sup> H03K 17/60

U.S. Cl. 315-307

7 Claims



1. A switchable current source comprising: a load; power source means for supplying current; a reference voltage source means; a switching signal source means; first transistor means coupled between said power source means and said load, having a collector means and an emitter means coupled thereto, respectively; second and third transistor means coupled together in series to conduct in the same direction between said power source means to a base means of said first transistor; means for coupling said reference voltage source means to a base means of said third transistor for regulating the current therethrough; and means for coupling said switching signal source means to a base means of said second transistor means for controlling the current therethrough.

4,423,358

**HORIZONTAL DEFLECTION CIRCUIT WITH LINEARITY CORRECTION**

Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

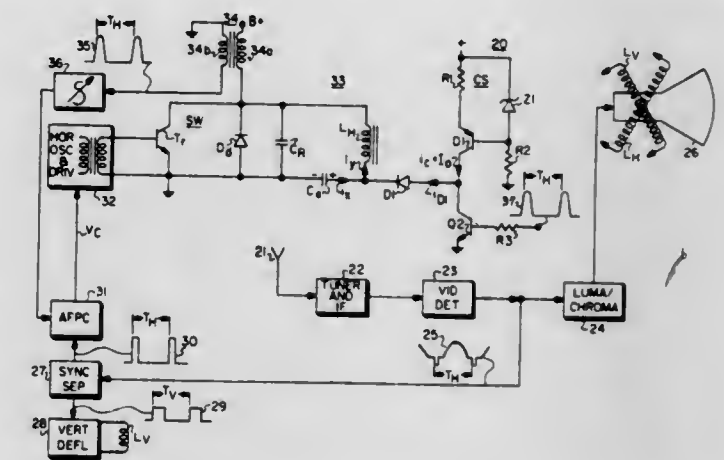
Filed May 28, 1982, Ser. No. 383,055

Claims priority, application United Kingdom, Apr. 23, 1982, 8211832

Int. Cl.<sup>3</sup> H01J 29/56

U.S. Cl. 315-371

7 Claims



1. In a television display system having a cathode ray tube and a deflection yoke associated therewith to generate by means of raster scanning a picture display from the information contained in a composite video signal, a deflection circuit with linearity correction, comprising:

- a deflection winding;
- a trace switch that is periodically switched by a deflection rate signal synchronized with said composite video signal to generate raster scanning current in said deflection winding during a deflection cycle, wherein losses incurred during a deflection cycle tend to change said scanning current to one that would introduce asymmetrical linearity distortion to said picture display;
- a source of retrace pulse voltage;
- a source of correction current including an inductance; and
- switching means including a first rectifier that periodically couples said inductance to said deflection winding during the trace interval of said deflection cycle to conduct current from said inductance to said deflection winding and a second rectifier coupled to said inductance and to said source of retrace pulse voltage to conduct current from said inductance to said retrace pulse voltage source during the retrace interval of said deflection cycle to develop in said scanning current a DC component that flows in a direction that corrects for the introduction of said asymmetrical linearity distortion.

4,423,359

**ELECTRIC MOTOR**

Koosuke Hashimoto, Moriguchi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,611

Claims priority, application Japan, May 13, 1980, 55-63493; Jul. 31, 1980, 55-105269; Aug. 13, 1980, 55-111442; Feb. 2, 1981, 56-16033; Feb. 2, 1981, 56-16034

Int. Cl.<sup>3</sup> B65H 59/38

U.S. Cl. 318-6

22 Claims

1. An electric motor comprising: disk-shaped first rotor means mounted for rotation about an axis, said first rotor means including a magnet; coil means, arranged generally in a plane extending transverse to said axis and axially confronting said magnet, for generating a rotary magnetic field to rotate said first rotor means, thereby to produce a driving force; disk-shaped second rotor means, mounted for rotation about



said axis at an axial side of said coil means opposite from said first rotor means, for forming a magnetic circuit for a magnetic field generated by said magnet, such that said second rotor means is rotatable about said axis independently of said first rotor means; and



connecting means for releasably mechanically connecting said first and second rotor means, such that the rotations thereof are joined.

4,423,360

# DEVICE FOR CONTROLLING THE SYNCHRONISM OF TWO MOTORS

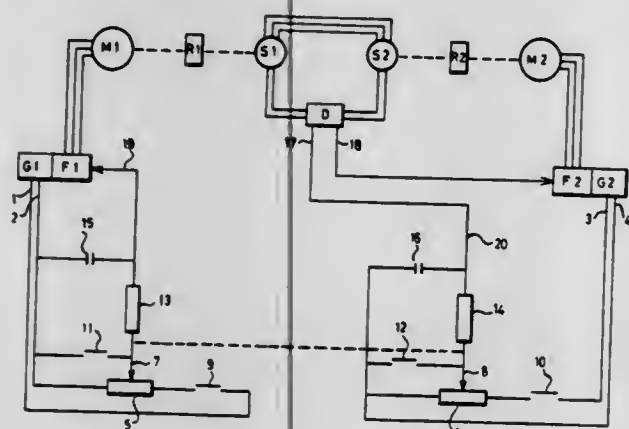
Klaas Pasterkamp, Hulzen, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands  
Filed Apr. 21, 1982, Ser. No. 370,528

Claims priority, application Netherlands, Apr. 28, 1981, 8102072

Int. Cl.<sup>3</sup> H02P 5/50

U.S. Cl. 318—85

5 Claims



1. Synchronizing system for two electric motors each having a feed control means in which a control signal is deduced from the positional difference of both motors by means of a comparator means and this signal is fed to the feed control means of at least one motor in which the motors are asynchronous rotary field motors the output of each motor being connected to a reduction gear the output of each reduction gear being mechanically connected to the rotor of a synchronizer having a rotor and stator, the stators of said synchronizers being connected to a discriminator for generating an output signal, the feed control means of each motor comprising a frequency converter controlled by an input signal, and the said output signal being combined with the input signal of at least one of said frequency converters in such a way that the positional difference of the motors is counteracted.

## 4,423,361 MECHANICAL DRIVE APPARATUS FOR PROVIDING LINEAR MOTION IN RESPONSE TO ELECTRICAL DRIVE SIGNALS

Sven G. V. Stenudd, and Lars-Gunnar M. Stenudd, both of Lidingö, Sweden, assignors to Facit Aktiebolag, Atvidaberg, Sweden

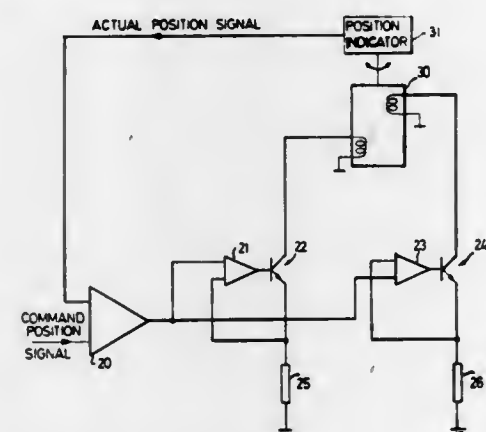
Filed Feb. 23, 1981, Ser. No. 237,034

Claims priority, application Sweden, Feb. 27, 1980, 8001511

Int. Cl.<sup>3</sup> G05B 11/00

U.S. Cl. 318—135

16 Claims



1. A drive apparatus comprising:  
yoke means for forming first and second magnetic gaps, each having a magnetic flux supplied by first and second stator windings;  
a moveable magnetic member having first and second portions disposed in said first and second magnetic gaps, and moveable with respect to said magnetic gaps; said first and second portions having complementary surface areas whereby one increases in size with respect to its respective gap upon motion thereof, and the remainder simultaneously decreases in size with respect to its respective gap; means for supplying complementary electric driving currents to each of said stator windings, one of said currents having a magnitude which increases with increases in an input signal and the remaining of said currents having a magnitude which decreases with increases in said input signal, said currents related whereby when one of said currents is zero, the remaining current has a predetermined magnitude, whereby opposite acting forces are exerted on first and second portions of said moveable member, each of said magnetic gaps in response to a respective stator winding current produce a force which changes quadratically with said current, the sum of said forces produced by said gaps providing a linear movement between said yoke means and said moveable magnetic member.

4,423,362

## ELECTRIC VEHICLE CURRENT REGULATING SYSTEM

Charles E. Konrad, Roanoke, Va., and Robert C. Clark, deceased, late of Roanoke, Va. (by Jean B. Clark, executrix), assignors to General Electric Company, Salem, Va.

Filed May 19, 1982, Ser. No. 379,867

Int. Cl.<sup>3</sup> H02P 5/10

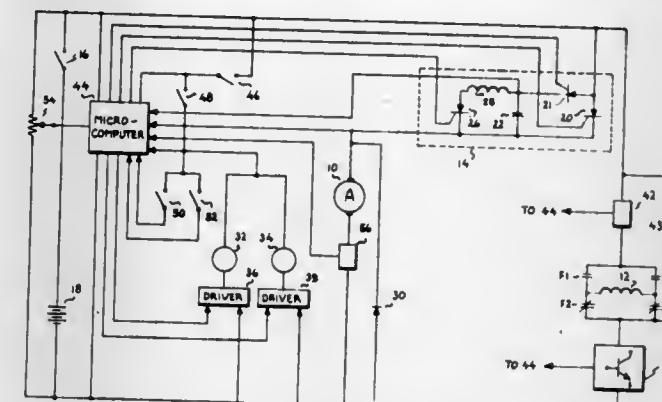
U.S. Cl. 318—139

9 Claims

1. In a control system for a vehicle having an electric traction motor for providing vehicle propulsion power, the control system including a percent conduction time power regulator responsive to a current reference signal to regulate motor current and also including an accelerator for producing a current command signal having a value corresponding to an operator desired value of said current reference signal, the improvement comprising:

(a) means for establishing a first current limit value which varies between a maximum and a minimum value inversely with the percent conduction time of said regulator;

(b) means for establishing a second current limit value which varies between a maximum and a minimum value as an inverse function of the time that the motor current is maintained at the lesser of said first current limit value or such second current limit value;  
(c) means for comparing the current command signal value to the first and second current limit values and for producing said current reference value such that it acquires a



value representative of the lesser of said current command signal value, said first current limit value, or said second current limit value; and

(d) means for applying the current reference value to control the percent conduction time of the power regulator in a manner to minimize any difference between actual motor current magnitude and the magnitude of motor current corresponding to the acquired value of said current reference.

4,423,363

## ELECTRICAL BRAKING TRANSITIONING CONTROL

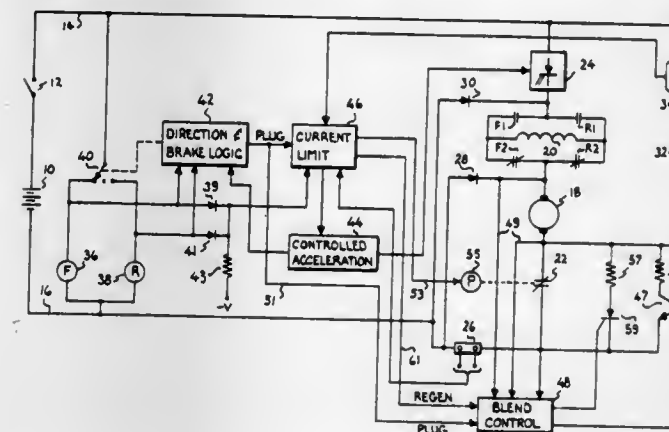
Robert C. Clark; Joe C. Lambert, both of Charlottesville, and Sherrill G. Thomas, Trevilians, all of Va., assignors to General Electric Company, Salem, Va.

Filed Jul. 27, 1981, Ser. No. 288,083

Int. Cl.<sup>3</sup> H02P 3/12

U.S. Cl. 318—375

6 Claims



1. An improved electrical brake blending apparatus for a direct current electric motor power system, the motor having first and second power terminals and including a field winding and an armature, the system including a DC power source connected between a first and second power bus, power contacts for connecting the first terminal of the motor to the first power bus, power regulating means for connecting the second motor terminal to the second power bus, unidirectional conducting means connected between the first terminal of the motor and the second power bus and means for initiating electrical braking of the motor by reversing the relative polarity of the motor field winding and armature and opening the power contacts while the armature is rotating, the improvement comprising:

(a) a first relatively low ohmic value resistance;  
(b) first switching means, said switching means and said

resistance being connected in a series circuit path in parallel with the contacts;

(c) means for momentarily actuating said first switching means upon initial opening of the contacts whereby an alternate current path between said motor and said power supply is provided in order to establish a desired polarity of flux in the motor to enable electrical braking;

(d) a second relatively low ohmic value resistance;

(e) a second switching means;

(f) means for connecting said second resistance and said second switching means in a series circuit path in parallel with the contacts;

(g) means for closing the contacts during electrical braking for converting said system from regenerative to plug braking; and,

(h) means for actuating said second switch means immediately prior to closing the contacts to thereby provide an alternate armature current path to enable relatively smooth transitioning from regenerative to plug braking.

4,423,364

## ELECTRIC MOTOR DAMPER DRIVE WITH BACKUP POWER PACK

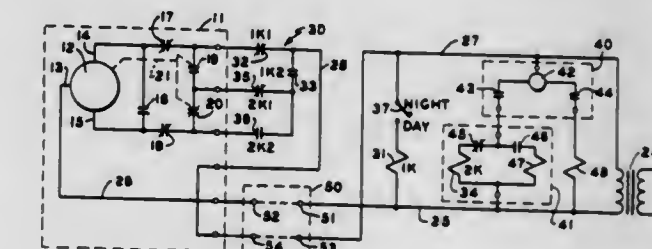
Arlon D. Kompellen, Richfield, and Curtis E. Westley, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1982, Ser. No. 362,590

Int. Cl.<sup>3</sup> H02P 7/18

U.S. Cl. 318—440

17 Claims



1. A condition responsive control system adapted to control condition changing means, comprising:

an air duct for admitting outside air to an air conditioned space;

a reversible electric motor operable in first and second opposite directions in response to electrical energization;

a damper in said air duct actuated by said reversible electric motor for controlling the amount of air admitted through said duct;

a control circuit responsive to a sensed environmental condition in the air conditioned space for selectively supplying electrical power from a primary source to energize said reversible electric motor for operation in the first or second directions depending on the sensed condition; and backup power pack means responsive to the absence of power from the primary power source to supply electrical energization to said reversible electric motor to drive said motor only in the first direction.

4,423,365

## SERVO CONTROL CIRCUIT

James A. Turner, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,859

Int. Cl.<sup>3</sup> G05B 13/00

U.S. Cl. 318—561

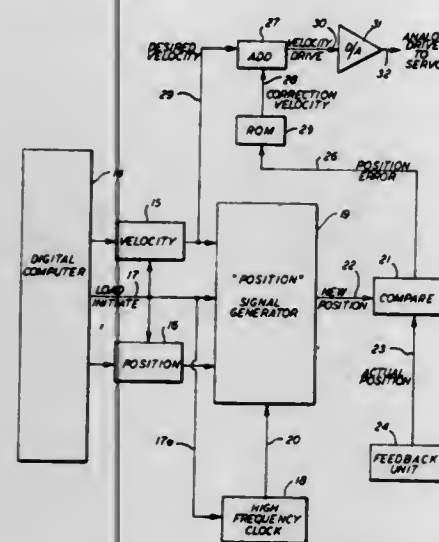
9 Claims

1. In a simulator training apparatus having a plurality of operations controlled in response to digital information from a computer and at least some of said operations having moveable parts connected for movement by an analog servo motor device, a digital control circuit to actuate said analog servo



motor device in response to said digital information, comprising:

means to receive digital information from said digital computer indicative of a new servo position at a predetermined velocity rate, said digital information being pre-timed to correspond with a pre-selected timing rate,



position signal generator means responsive to said pre-timed digital information to generate a predetermined number of position signals intermediate said pre-timed digital information, and

Read-Only-Memory means to produce a correction velocity signal responsive to position signal information input, said digital control circuit being so constructed and arranged that said servo motor device is moved smoothly from an actual present position to said new servo position.

#### 4,423,366 MOTOR DRIVE

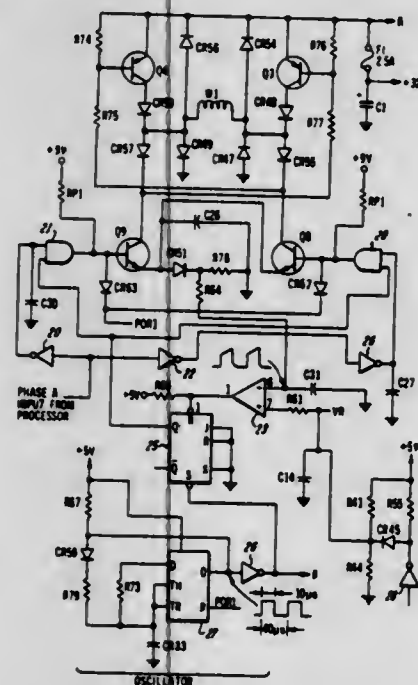
Johannes F. Gottwald, Park Ridge, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 13, 1981, Ser. No. 292,754

Int. Cl.<sup>3</sup> H02K 29/04

U.S. Cl. 318—696

8 Claims



1. A controller for driving a stepper motor winding comprising:

first, second, third and fourth transistors, first, second, third and fourth diodes, said first and second diodes connected in series between said first and second transistors, said third and fourth diodes connected in series between said third and fourth transistors, said winding connected between the junction of said first and second

diode and the junction between the junction of said first and second diode and the junction between said third and fourth diode, a resistor connecting said second and fourth transistors to ground, means for coupling said transistors so that either said first and fourth or said second and third transistors can be turned on at any point in time, and chopper means responsive to the voltage across said resistor for iteratively cutting off said transistors to limit the winding current.

#### 4,423,367 DEVICE FOR DETERMINING THE PARAMETER VALUES FOR STATOR RESISTANCE, PRINCIPAL INDUCTANCE AND LEAKAGE INDUCTANCE OF AN ASYNCHRONOUS MACHINE

Felix Blaschke, and Leonhard Reng, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens AG, Munich, Fed. Rep. of Germany

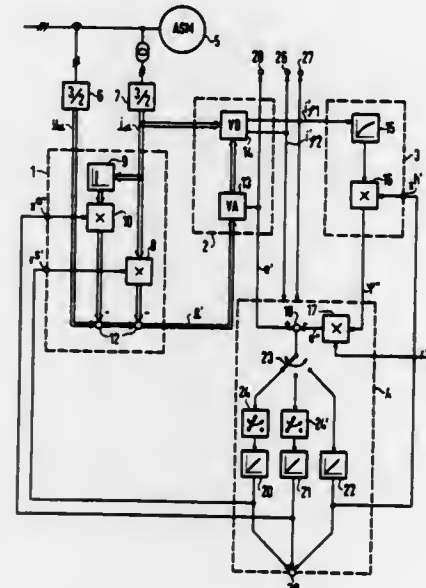
Filed Sep. 8, 1981, Ser. No. 299,780

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034275

Int. Cl.<sup>3</sup> H02P 5/40

U.S. Cl. 318—803

20 Claims



1. Apparatus for determining the actual value of at least one of the stator resistance, the main inductance and the stray inductance parameters of an asynchronous machine having associated operating stator current and stator voltage vectors, from preset values of said parameters, comprising

an EMF-forming circuit coupled to receive signals from said machine corresponding to said stator vectors and designed to develop a first vector signal representative of the EMF and the flux of the machine based on said stator vector signals and said preset values of said stator resistance and said stray inductance parameters;

an arithmetic control circuit coupled to receive said signals from said machine, coupled to receive said first vector signal, designed to develop a control signal representative of a component of the magnetization current of said machine correlative of said preset values, and also designed to develop a derivative signal characteristic of the first vector signal;

an arithmetic model circuit for simulating magnetic field development by the machine, coupled to receive said control signal and designed to develop a model flux signal characteristic of the machine flux correlated to said preset value of said main inductance parameter; and

a control circuit coupled to receive said model flux signal and said derivative signal characteristic of the first vector signal, and providing a comparable signal characteristic of a second vector, said second vector being representative

of an EMF or a flux based on said model flux signal, and comprising a balancing circuit for readjusting the values of said parameters until a balanced condition exists between said derivative signal and said comparable signal.

#### 4,423,368 TURBINE AIR BATTERY CHARGER & POWER UNIT

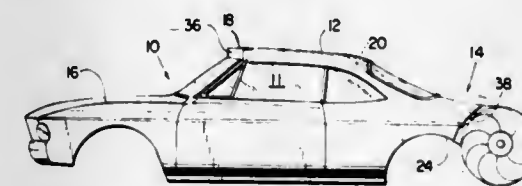
Jean L. Bussiere, 27 E. Bluefield Dr., Manchester, Conn. 06040

Filed Nov. 17, 1980, Ser. No. 140,308

Int. Cl.<sup>3</sup> B60K 1/00

U.S. Cl. 322—35

4 Claims



1. An automobile provided with an electric power generating system comprising:

an automobile body including a passenger compartment, a roof section, two sides and a rear section having two fender wells, one of the wells being adjacent one side of the body and the other of the wells being adjacent the other side of the body, each well defining an opening leading to the exterior of the body, the roof having a forwardmost portion situated forward of the rear section; an air duct extending along the roof section for carrying a flow of air, the duct defining an air inlet located in the forwardmost portion of the roof section and generally facing forward of the automobile to receive air from natural wind and wind dynamically produced by movement of the automobile body through the air, and the duct being divided into two sections rearwardly of the inlet, each section received within and defining an air outlet in each fender well;

electrically generating means supported in the automobile; and

two air turbines each having multiple blades connected in driving relationship to the electricity generating means, one of the turbines being mounted in one fender well of the rear section with a portion of the turbine blades positioned at the air outlet in the one fender well, the other of the turbines being mounted in the other fender well with a portion of the turbine blades positioned at the air outlet in the other fender well whereby the generating means is activated by air currents flowing through the duct and impinging upon the turbine blades.

#### 4,423,369 INTEGRATED VOLTAGE SUPPLY

Allan A. Alaspa, and Robert R. Beutler, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 757,169, Jan. 6, 1977, abandoned, which is a continuation of Ser. No. 577,818, May 15, 1975, abandoned. This application Apr. 11, 1979, Ser. No. 28,948

Int. Cl.<sup>3</sup> G05F 5/00

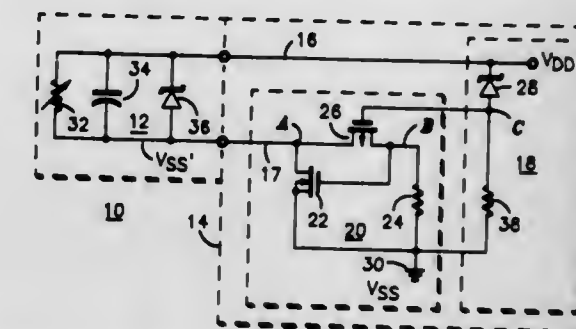
U.S. Cl. 323—303

3 Claims

1. An integrated voltage supply coupled to a first and a second voltage terminal and providing a first and a second output, comprising:

A zener diode having an anode and a cathode, the cathode being coupled to the first voltage terminal; a first resistor coupled between the anode of the zener diode and the second voltage terminal, and forming a node between the first resistor and the anode of the zener diode; a first field effect transistor having a first and a second electrode and a gate electrode, the gate electrode being coupled to the node; a second resistor coupled between the first electrode of the first field effect transistor and the second voltage terminal; and a second field effect transistor having a first

and a second electrode and a gate electrode, the gate electrode being coupled to the first electrode of the first field effect transistor, the first electrode of the second field effect transistor being coupled to the second voltage terminal



terminal, the second electrodes of the first and second field effect transistors being coupled together and forming the second output, and the first voltage terminal also serving as the first output.

#### 4,423,370 CIRCUIT CONFIGURATION FOR GENERATING A D-C OUTPUT VOLTAGE INDEPENDENT OF FLUCTUATIONS OF A D-C SUPPLY VOLTAGE

Wilhelm Wilhelm, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

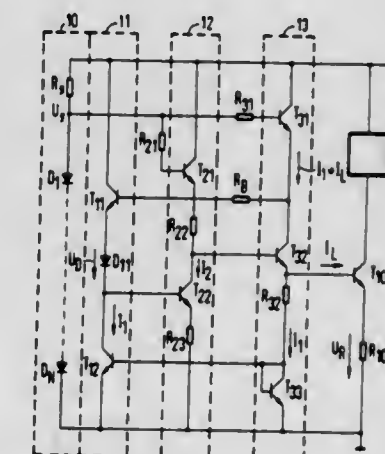
Filed Sep. 8, 1982, Ser. No. 416,060

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1981, 3137451

Int. Cl.<sup>3</sup> G05F 3/20

U.S. Cl. 323—315

6 Claims



1. Circuit for generating a d-c output voltage being independent of fluctuations of a d-c supply voltage, comprising a reference voltage circuit connected to a d-c supply voltage source, said reference voltage circuit including a series circuit of a constant-current source and a potential shift branch, an inverting amplifier being connected to and addressed by said reference voltage circuit, said inverting amplifier having an output circuit including a combination of a plurality of first resistors and at least one first transistor determining the gain of said inverting amplifier, an output driver supplying said d-c output voltage, said output driver being connected to and addressed by said inverting amplifier and said output driver having an output circuit being connected to said potential shift branch of said reference voltage circuit for driving said potential shift branch, said output driver including an emitter follower stage having an output circuit with a second transistor and a second resistor, a voltage stabilizing circuit having a tap carrying a prestabilized voltage and said voltage stabilizing circuit being connected to the d-c supply voltage source, a third resistor connected between said tap and said at least one first transistor in said output circuit of said inverting amplifier,



and a fourth resistor connected between said tap and said second transistor in said emitter follower output circuit of said output driver, said first, second, third and fourth resistors having the same resistance value.

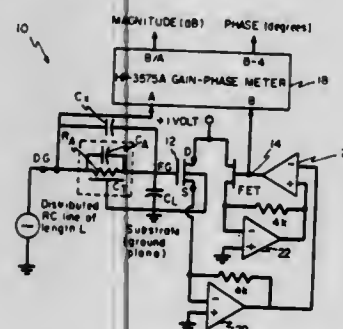
#### 4,423,371 METHODS AND APPARATUS FOR MICRODIELECTROMETRY

Stephen D. Senturia, Boston, and Steven L. Garverick, Acton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 3, 1981, Ser. No. 299,264  
Int. Cl.<sup>3</sup> G01R 27/02

U.S. Cl. 324—61 R

2 Claims



1. A measuring device for measuring the impedance of a material, the device comprising:

(a) a measuring transistor comprising:

- a semiconductor substrate, having formed therein a source region and a drain region, the source and drain regions being situated in the substrate such that a sensitive channel region separates them from each other;
- a gate insulator situated above the sensitive channel region of the substrate;
- a first driven gate situated far enough remote from the channel region so that charge thereon does not directly affect the channel region; and
- a second, floating gate having a plurality of electrically conductive fingers proximate to, but spaced apart from, the first driven gate such that the material under measurement may fill the spaces therebetween, the floating gate being situated so that at least a portion of its electrically conductive area is situated above the gate insulator and sensitive channel region, whereby when a signal is applied to driven gate, the response of the floating gate in permitting current to flow in the channel will be dependent on the impedance of the material, and

(b) a conventional field effect transistor of substantially identical channel dimensions and substrate composition as the measuring transistor, the two transistors being connected in differential configuration and arranged such that their drain currents are constrained to be equal,

(c) means to introduce a time-varying voltage on the driven gate of the measuring transistor, and

(d) means to determine the impedance of the material by comparing the introduced voltage and the gate voltage of the conventional transistor.

#### 4,423,372 INSTRUMENT FOR MONITORING THE RADIATION HAZARD ARISING FROM ELECTRIC AND/OR MAGNETIC RADIO-FREQUENCY FIELDS

Marco Bini, Pistoia; Amleto Ignesti, Florence; Luigi Millanta, Florence; Nicola Rabino, Florence, and Riccardo Vanni, Florence, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Apr. 2, 1981, Ser. No. 250,212

Claims priority, application Italy, Apr. 3, 1980, 9397 A/80  
Int. Cl.<sup>3</sup> G01R 31/02

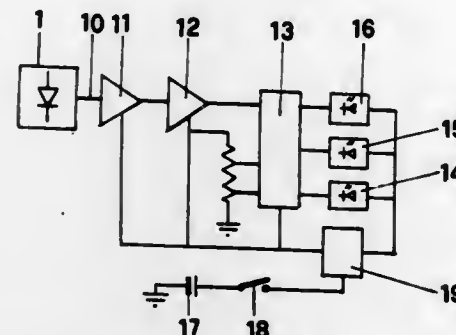
U.S. Cl. 324—72

8 Claims

1. An instrument for signalling the presence of an electric

and/or magnetic radiofrequency field in excess of preset levels, comprising:

a field probe responsive to an electric and/or magnetic field; said field probe including a plurality of field sensors electrically interconnected to provide an output of said field probe, the magnitude of which is a function of the magnitude of the sensed field;



a comparator means for comparing said output of said field probe with preset reference values comprising first and second values and providing a plurality of output signals as a function of said comparisons; and

a plurality of output indicators activated mutually exclusively by said output signals from said comparator to provide an indication indicative of the field sensed by said field probe being below a first value, between said first and a second value, or above said second value.

#### 4,423,373 TEST PROBE

Walter O. LeCroy, Jr., Piermont, N.Y., assignor to LeCroy Research Systems Corporation, Spring Valley, N.Y.

Filed Mar. 16, 1981, Ser. No. 243,993

Int. Cl.<sup>3</sup> G01R 31/02

U.S. Cl. 324—72.5

4 Claims



1. A test probe comprising only two substantially rigid electrically conducting members terminating in respective spaced apart contact portions, which contact portions, when said test probe is in use, simultaneously contact spaced apart areas of a current conducting segment, said two electrically conducting members being electrically insulated from each other and being formed of two fixed opposite, electrically isolated, longitudinal portions of a cylindrical shaft, said opposite longitudinal portions being in face-to-face relationship and separated from each other by a layer of insulating material sandwiched therebetween, and said contact portions being formed of a conically shaped tip of said cylindrical shaft having a contact surface for contacting said current conducting segment, said conically shaped tip being longitudinally separated by said sandwiched layer of insulating material into respective, opposite portions; and insulated handle coupled to said cylindrical shaft at an end portion thereof remote from said conically shaped tip for enabling an operator of said test probe to hold said probe in one hand with both portions of said conically

shaped tip in contact with said current conducting segment; and first and second conducting leads electrically connected to respective ones of said opposite portions of said cylindrical shaft to selectively supply signals to and receive signals from said opposite portions of said cylindrical shaft.

#### 4,423,374 UNBALANCED CURRENT DETECTOR FOR THREE PHASE ELECTRICAL SYSTEM

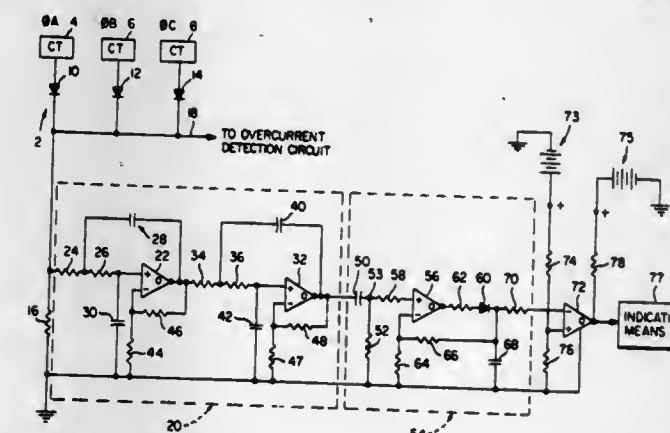
Charles M. Hansen, Jr., Tinton Falls, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 21, 1981, Ser. No. 303,738

Int. Cl.<sup>3</sup> G01R 25/00

U.S. Cl. 324—86

9 Claims



1. For use with a three phase electrical system of the type including a current transformer for each of the three phases, means for rectifying the outputs of the current transformers and a resistor connected to the rectifying means for performing a current vector addition, with a ripple voltage having a particular harmonic content developed across the resistor, apparatus for detecting an unbalanced phase current condition comprising:

means responsive to the ripple voltage for passing the highest value of a selected harmonic of the system nominal frequency without significant attenuation; and means connected to the filter means for detecting when the nominal system harmonics exceed a predetermined threshold commensurate with the unbalanced phase current condition.

#### 4,423,375 SELF-ALIGNED LIGHT LOAD ADJUSTMENT ASSEMBLY FOR INDUCTION METERS

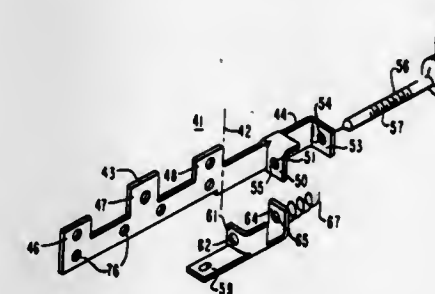
James E. Ramsey, Jr., Raleigh, and Auburn K. Griffin, Jr., Sanford, both of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1981, Ser. No. 272,246

Int. Cl.<sup>3</sup> G01R 11/02

U.S. Cl. 324—137

8 Claims



1. An induction meter including a voltage and a current magnetic section each producing magnetic flux and a rotatable disk driven at a rate responsive to said magnetic flux directed from said magnetic sections into said disk, wherein said voltage magnetic section comprises:

a substantially E-shaped laminated magnetic core having a

center leg terminating at a main pole face and two adjacent legs terminating at coplanar auxiliary pole faces on opposite sides of said main pole faces, said first and last laminae defining a first and a second side, respectively, of said core; a voltage coil wound about said center leg; a voltage shunting member located in magnetic proximity to said first side for providing a magnetic flux shunt path between said pole faces; a nonmagnetic spacer located between said first side and said voltage shunting member and lying in a plane substantially parallel to said first side, a portion of said spacer extending beyond one of said adjacent legs in a direction opposite from said center leg and including means for supporting a screw; a screw carried by said screw support means of said spacer extending portion; a movable tab having a threaded portion cooperating with said screw, said tab being oriented so as to extend over portions of one of said auxiliary pole faces and said main pole face thereby providing an adjustable magnetic flux shunt path.

#### 4,423,376 CONTACT PROBE ASSEMBLY HAVING ROTATABLE CONTACTING PROBE ELEMENTS

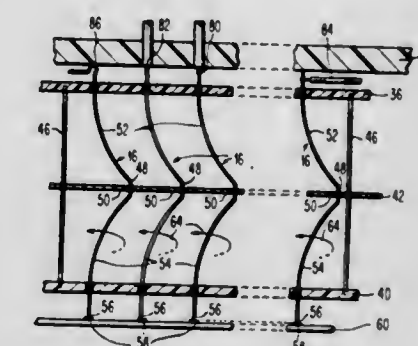
Herbert P. Byrnes, Poughkeepsie, and Richard Wahl, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,818

Int. Cl.<sup>3</sup> G01R 1/06, 31/02

U.S. Cl. 324—158 P

12 Claims



1. An electrical probe assembly comprising a plurality of elongated probe elements formed of conductive and flexible material, each having a length many times its diameter,

spaced upper and lower flat support elements having apertures receiving the ends of said probe elements and maintaining said probe elements in generally parallel arrangement with at least the lower ends in a configuration corresponding to the pad configuration to be contacted, and protruding beyond the lower support element,

a means to simultaneously rotate said probe element wherein said probe elements are each pre-bent with a central portion displaced laterally from the longitudinal axis through the ends,

a flat probe rotating element disposed between said upper and lower support elements, said probe rotating element provided with apertures receiving the central portions of said pre-bent probe elements,

cam surfaces on said probe rotating element, cam followers mounted stationary relative to said upper and lower flat support elements and cooperating with said cam surfaces, said cam surfaces and said cam followers adapted to impart an arcuate movement to said probe rotating element which in turn imparts a rotary movement to said probe elements, and

a means to impart movement to said probe rotating element.

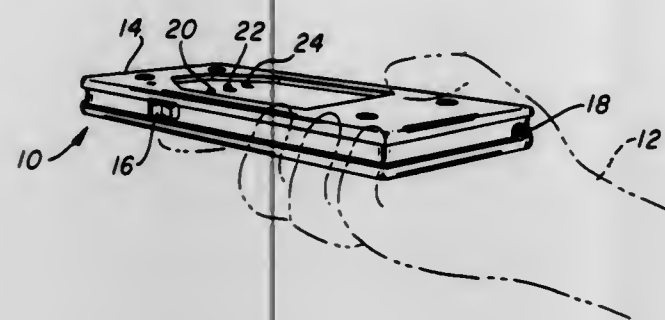


**4,423,377**  
**COMPACT METAL DETECTOR OF THE BALANCED INDUCTION TYPE**  
 Robert J. Podhrasky, Dallas, Tex., assignor to Garrett Electronics, Garland, Tex.

Filed Nov. 12, 1980, Ser. No. 206,182  
 Int. Cl.<sup>3</sup> G01V 3/11, 3/165

U.S. Cl. 324—329

6 Claims



1. A compact metal detector of the balanced induction type comprising:

- a planar assembly having a perimeter, a transmit coil disposed on said assembly enclosing a planar transmit coil area, a receive coil disposed on said planar assembly enclosing a planar receive coil area, said receive coil area being coplanar with the transmit coil area, and said receive coil being disposed adjacent said transmit coil;
- a planar circuit board having a perimeter substantially corresponding to the perimeter of said planar assembly, said planar circuit board disposed parallel and above said planar assembly such that said entire transmit and receive coil areas are covered by said planar circuit board; and
- circuit means including alternating current components which produce a high level oscillating current in response to signals produced in said receive coil and provide said high level oscillating current to a speaker, said components located on said planar circuit board exterior of said receive coil area such that said high level oscillating current does not induce a corresponding high level oscillating current in said receive coil.

4,423,378

**AUTOMOTIVE BATTERY TEST APPARATUS**

Joseph A. Marino, Waukegan, Wis., and Sydney J. Roth, Largo, Fla., assignors to Bear Automotive Service Equipment Company, Milwaukee, Wis.

Filed Dec. 4, 1981, Ser. No. 327,586  
 Int. Cl.<sup>3</sup> G01N 27/46

U.S. Cl. 324—427

12 Claims

1. A battery test apparatus for testing conditions of a storage battery of an internal combustion engine powered vehicle, the battery testing apparatus comprising:

- connection means for connecting the battery test apparatus to positive (+) and negative (-) terminals of the battery;
- means connected to the connection means for providing a first electrical signal representative of measured dynamic internal resistance of the battery;
- means connected to the connection means for providing a second electrical signal representative of measured open circuit voltage of the battery;
- means connected to the connection means for providing a third electrical signal representative of measured voltage of the battery with a predetermined DC load connected between the + and - terminals;
- means for providing a fourth electrical signal representative of measured temperature of the battery;
- means for deriving a value  $R_d$  representative of dynamic internal resistance of the battery based upon the first signal;
- means for deriving a value  $V_{oc}$  representative of tempera-

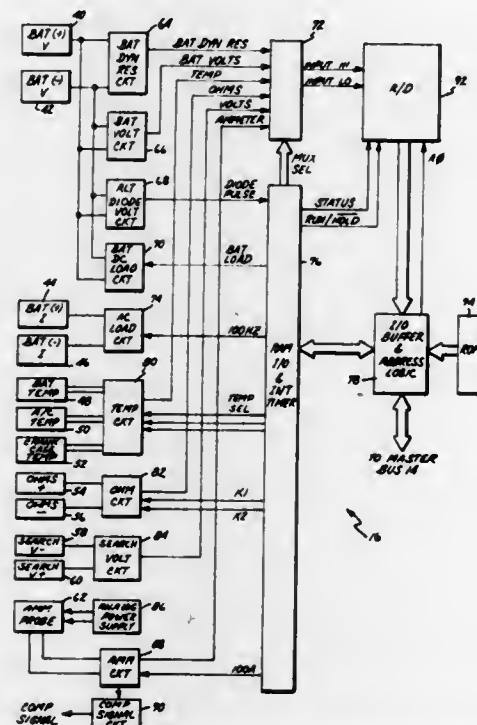
ture corrected open circuit voltage from the second and fourth signals;

means for deriving a value  $P_d$  representative of maximum power transfer from the battery based upon  $V_{oc}$  and  $R_d$ ;

means for deriving a value  $T$  representative of temperature of the battery from the fourth signal;

means for deriving a value  $P_{100\%}$  representative of power rating of the battery at 100% state-of-charge from the values  $T$ ,  $P_d$  and  $V_{oc}$ ;

means for determining a battery rating of the battery based upon  $P_{100\%}$ ;



means for deriving a reference value as a function of the battery rating which represents a predetermined state-of-charge which is less than 100%;

means for deriving a temperature corrected measured voltage value under DC load conditions from the third and fourth signals;

means for comparing the temperature corrected measured value with the reference voltage value; and

means for providing an indication of battery condition based upon the comparison.

4,423,379

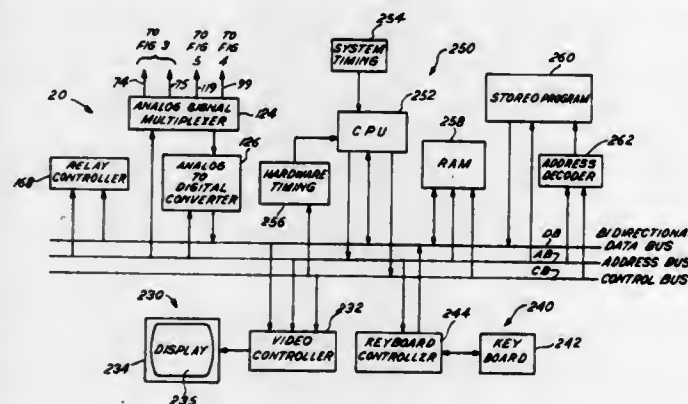
**BATTERY TESTING TECHNIQUES**

William R. Jacobs, Wilmette; Richard A. Karlin, Chicago, both of Ill., and Peter K. Sun, Hong Kong, Hong Kong, assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed Mar. 31, 1981, Ser. No. 249,359  
 Int. Cl.<sup>3</sup> G01N 27/46

U.S. Cl. 324—429

28 Claims



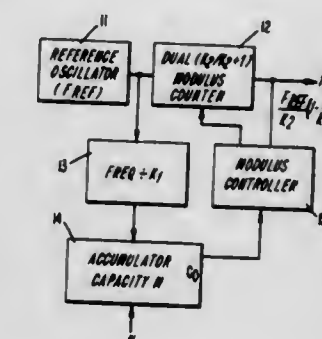
1. In a system for testing a battery having an internal impedance, improved apparatus for determining and displaying the condition of the battery comprising:

**4,423,381**  
**PULSE CONTROL CIRCUIT**  
 Elvin Stepp, Cincinnati, and Gary Claypoole, West Chester, both of Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jan. 16, 1981, Ser. No. 225,721  
 Int. Cl.<sup>3</sup> H03L 7/18

U.S. Cl. 328—14

30 Claims



converter means for generating digital battery parameter values corresponding to parameters of the battery at different points in time;

loading means for placing an electrical load on the battery in response to a load signal;

charging means for charging the battery in response to a charge signal;

display means for indicating the condition of the battery in response to an analysis signal; and

processor means for generating the load signal during part of a first portion of time thereby electrically loading the battery, generating the charge signal during part of a second portion of time following the first portion of time to enable the charging of the battery, generating the load signal during part of a third portion of time following the second portion of time thereby electrically loading the battery, storing a first battery parameter value generated by the converter means during a part of the first portion of time when the load signal is absent and the battery therefore is unloaded, storing a second battery parameter value generated by the converter means during a part of the third portion of time when the load signal is present and the battery therefore is loaded, calculating the condition of the battery based on at least the first and second stored parameter values, and generating an analysis signal, so that the condition of the battery is displayed by the display means.

1. A circuit for deleting cycles from a wave source or for synthesizing a frequency in response to a reference oscillator source comprising a dual modulus counter responsive to the source, said dual modulus counter having first and second states for selectively decreasing the number of cycles of the wave source by first and second factors, respectively, means responsive to the source for reducing the number of cycles of the wave source by a third factor to derive a control signal having an output frequency that is a sub-multiple of the frequency of the source, and means responsive to the control signal for controlling when the dual modulus counter is activated to have the first and second factors as a function of the time of a transition of the control signal, wherein occurrence times of said transitions are determined by the output frequency of the control signal.

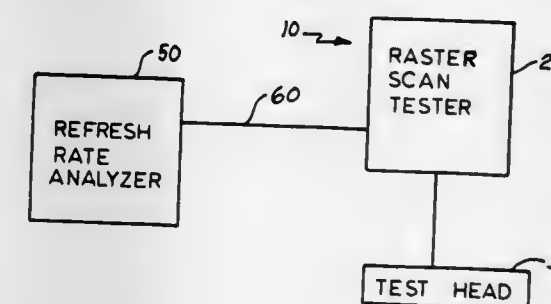
**4,423,380**  
**METHOD OF TESTING A MEMORY BY SCANNING AT INCREASING TIME INTERVALS**

Douglas C. Pileri, Tonawanda, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 26, 1980, Ser. No. 181,471  
 Int. Cl.<sup>3</sup> G01R 33/12, 15/12

U.S. Cl. 324—73 R

1 Claim



1. The method of testing electronic memories comprising the steps of

writing information into all cells in a memory,

after a first interval of time, scanning the memory to determine whether all cells of the memory retain their information,

after a second interval of time, longer than the first interval and beginning at the end of the scan after the first interval of time, resuming scanning the memory to determine whether all cells of the memory retain their information,

after a third interval of time, longer than the second interval and beginning at the end of the scan after the second interval of time, resuming scanning the memory to determine whether all cells of the memory retain their information, and

continuing the scanning of the memory after longer and longer time intervals until one or more cells have lost their information.

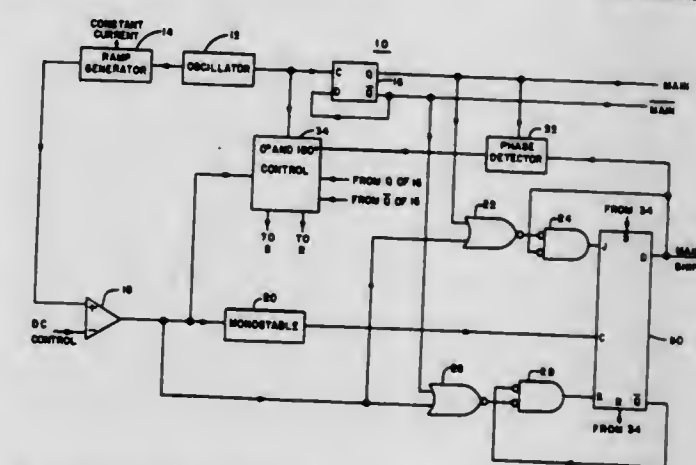
**4,423,382**  
**CIRCUIT FOR GENERATING TWO PERIODIC SIGNALS HAVING A CONTROLLABLE PHASE RELATIONSHIP THEREBETWEEN**

Dustin J. Becker, Lorain, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Aug. 10, 1981, Ser. No. 291,454  
 Int. Cl.<sup>3</sup> H03K 5/153

U.S. Cl. 328—55

10 Claims





- (b) means responsive to said oscillator signal for generating a periodically recurring signal having a ramp waveform said ramp starting each time said first portion of said oscillator signal begins;
- (c) means for comparing said ramp signal to said d.c. control signal said comparison means generating a signal having a first amplitude when said d.c. control signal exceeds said ramp signal and a second amplitude when said ramp signal exceeds said control signal;
- (d) first output means responsive to the beginning of said first portion of said oscillator signal for generating simultaneously one of said periodic output signals and another identical signal having a 180 degree phase relationship thereto; and
- (e) second output means responsive to said signal generated by said comparator means and said signals generated by said first means for generating when said comparator means signal changes from said first amplitude to said second amplitude at least the other of said periodic output signals whereby the phase relationship between said one and said other periodic output signals is controlled as a function of said d.c. control signal to be between zero and 180 degrees.

4,423,383

# PROGRAMMABLE MULTIPLE FREQUENCY RATIO SYNCHRONOUS CLOCK SIGNAL GENERATOR CIRCUIT AND METHOD

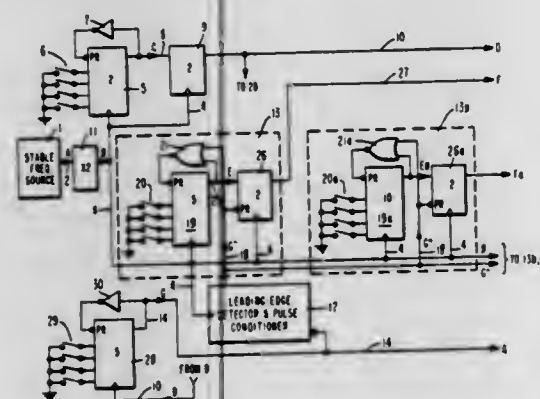
Gordon D. Svendsen, Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 5, 1982, Ser. No. 355,284

Int. Cl.<sup>3</sup> H03K 5/15; H03L 7/00

U.S. Cl. 328—63

9 Claims



1. A circuit for providing synchronous clock signals, each having a selected integral frequency division ratio with respect to a master clock signal frequency, respectively, comprising:
  - a first programmable ratio frequency divider means having an input for receiving said master clock signal and having an output for providing a first clock signal whose frequency is preset by said first divider means to have an integral frequency division ratio with respect to said master clock signal frequency;
  - at least one second programmable ratio frequency divider means each having an input for receiving said master clock signal and an output for providing a second clock signal whose frequency is preset by said second divider means to have an integral frequency division ratio with respect to said master clock signal frequency;
  - a third programmable ratio frequency divider means having an input for receiving said first clock signal and having an output for providing a third clock signal whose frequency is preset by said third divider means to have respective integral frequency division ratios with respect to said first and all said second clock signals, respectively; and
  - a synchronizing means having a first input for receiving said master clock signal and a second input for receiving said third clock signal and providing a synchronizing signal having a frequency corresponding to that of said third clock signal and synchronous therewith, said synchroniz-

ing signal being coupled to periodically preset each said second programmable ratio frequency divider means to obtain synchronization of said respective second clock signals with both said first and third clock signals, respectively.

4,423,384

# ASYNCHRONOUS MULTI-PORT ARBITER

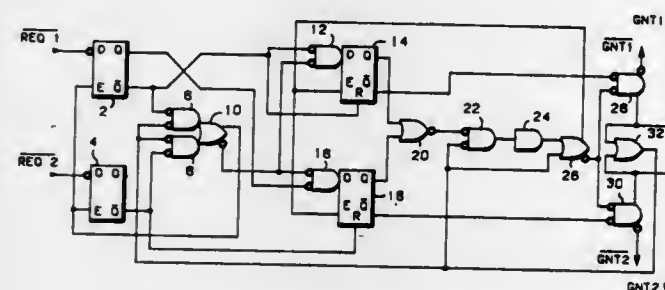
Richard M. DeBock, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1981, Ser. No. 333,151

Int. Cl.<sup>3</sup> H03K 5/26

U.S. Cl. 328—152

8 Claims



1. An arbitration circuit for granting control of a shared resource to one of a plurality of ports based upon a predetermined scheme of priority, comprising:
  - input means for receiving request signals from said plurality of ports;
  - first means for indicating if one of said plurality of ports has been granted control of said resource;
  - second means coupled to said input means and to said first means for latching said request signals in said input means if none of said plurality of ports has control of said resource;
  - third means coupled to said input means and to said second means for generating a priority signal indicative of which port has priority;
  - fourth means coupled to said third means and to said first means for latching the state of said third means; and
  - fifth means coupled to said third and fourth means and having outputs coupled to said first means for generating a resource grant signal for transmission to a requesting port, said second means unlatching said input means when said resource grant signal is generated to permit said request signals to pass through said input means, and said fourth means being responsive to the termination of said priority signal for unlatching said third means.

4,423,385

# CHOPPER-STABILIZED AMPLIFIER

Lee L. Evans, Atherton, Ga., assignor to Intersil, Inc., Cupertino, Calif.

Filed Jun. 10, 1981, Ser. No. 272,362

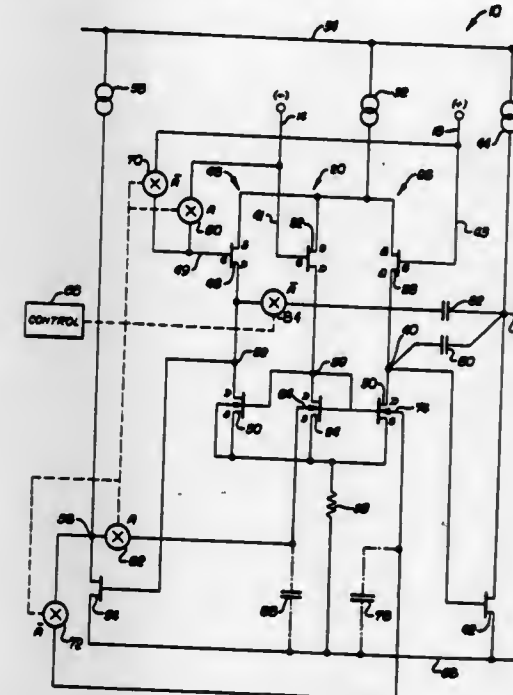
Int. Cl.<sup>3</sup> H03F 1/26, 3/45

U.S. Cl. 330—9

16 Claims

1. An operational amplifier circuit comprising:
  - a first input leg having a first active input element and a first active load element;
  - a second input leg having a second active input element and a second active load element, said first leg and second leg being operably connected as a differential pair;
  - a reference leg having a reference active input element and a reference active load element, said reference leg being operably connected as a differential pair with the first leg and as a differential pair with the second leg;
  - switching means for operably connecting the inputs of the first active input element and the reference active input element together such that an offset between the first leg and the reference leg appears as a voltage change at an

output of the reference active load element, and for operably connecting the output of the reference active load element to an input of the first active load element whereby the voltage at the input of the first active load element will be adjusted to compensate for any offset between the first leg and the reference leg to balance the first leg and reference leg, said switching means also for operably connecting the inputs of the second active input



element and the reference active input element together while operably connecting an output of the reference active load element to an input of the second active load element whereby the voltage at an input of the second active load element will be adjusted to compensate for any offset between the second leg and the reference leg to balance the second leg and the reference leg; whereby the first leg and the second leg will also be balanced with respect to each other.

4,423,386

# MULTISIGNAL AMPLIFICATION

Roger E. J. Gerard, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

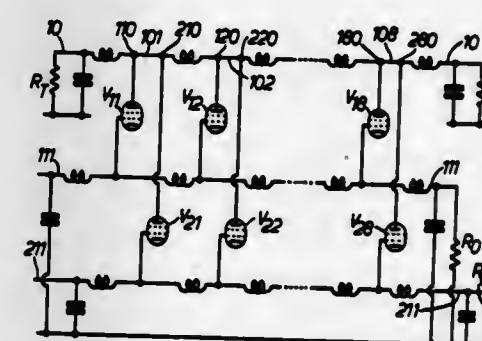
Filed Oct. 27, 1980, Ser. No. 201,264

Claims priority, application United Kingdom, Nov. 7, 1979, 7938628

Int. Cl.<sup>3</sup> H03F 3/60

U.S. Cl. 330—54

7 Claims



1. A modified distributed amplifier comprising:
  - at least two unmodified distributed amplifiers each having a separate input line and a plurality of amplifying elements connected to said separate input line, each said amplifying element having an output and all of said amplifying elements of both said unmodified amplifiers being configured substantially identically to one another, and said separate input lines being arranged to couple independent control

signals to each of said unmodified amplifiers; a common output line connected to the output of each said amplifying element of said at least two unmodified amplifiers, the connection of said common output line to each said amplifying element of a respective one of said unmodified amplifiers being independent of the connections of said common output line to each said amplifying element of the others of said at least two unmodified amplifiers, wherein all the amplifying elements of each said unmodified amplifier are connected in parallel between said common output line and the associated separate input line.

4,423,387

# CURRENT MIRROR ARRANGEMENT

Adrianus Sempel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

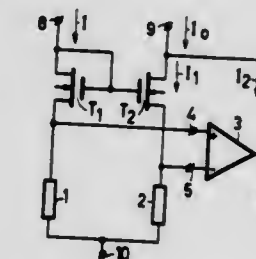
Filed Feb. 17, 1981, Ser. No. 235,219

Claims priority, application Netherlands, Mar. 13, 1980, 8001492

U.S. Cl. 330—85

Int. Cl.<sup>3</sup> H03F 1/34, 3/04

19 Claims



1. A current-source arrangement comprising, a first current circuit coupled between a first terminal and a common terminal, said first circuit comprising at least the main current path of a first semiconductor device connected in series with a first resistor, a second current circuit coupled between a second terminal and the common terminal, said second current circuit comprising at least the main current path of a semiconductor device and a second resistor, the two semiconductor devices being connected in parallel with respect to their drives, an active negative feedback circuit having a differential input and an output, means coupling said differential input between the ends of the first and the second resistor which are remote from the common terminal, and means coupling said output to the second current circuit to provide negative feedback so as to counteract a variation of the voltage across the second resistor relative to the voltage across the first resistor.

4,423,388

# RF AMPLIFIER CIRCUIT EMPLOYING FET DEVICES

Emil J. Crescenzi, Jr.; Walter T. Wilsner, both of Cupertino; Richard W. Oglesbee, Mountain View, all of Calif., and Richard B. Gold, Burlington, Mass., assignors to Watkins-Johnson Company, Palo Alto, Calif.

Filed Oct. 29, 1981, Ser. No. 316,130

Int. Cl.<sup>3</sup> H03F 3/04

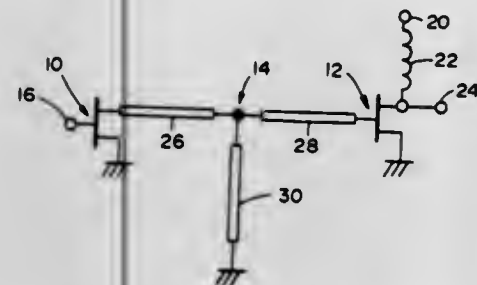
U.S. Cl. 330—277

8 Claims

1. An RF amplifier comprising:
  - a first FET having source, drain, and gate contacts,
  - a second FET having source, drain, and gate contacts,
  - means for applying an input signal to said gate contact of said first FET,
  - means connecting said source of said first FET to a first potential,
  - means connecting said source contact of said second FET to a second potential,
  - means connecting said drain contact of said second FET to a third potential,
  - coupling means for coupling said first FET with said second FET, said coupling means including first and second



serially connected transmission lines connected between said drain contact of said first FET and said gate contact of said second FET, and a third transmission line interconnected to a common terminal of said first and second transmission lines and a fourth potential, and means for extracting an output signal from said drain contact of said second FET,



said RF amplifiers being characterized by said first FET and said second FET being formed in a monolithic semiconductor body with said first transmission line, said second transmission line, and said third transmission line comprising microstrip on a surface of said semiconductor body.

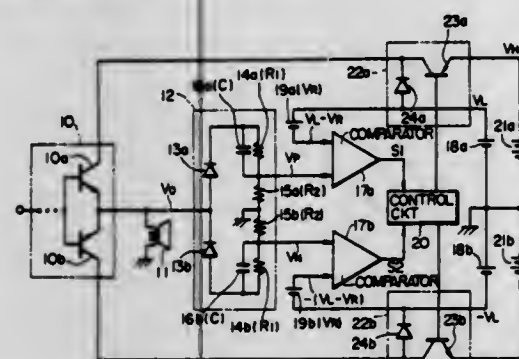
4,423,389

**AMPLIFIER WITH POWER SUPPLY SWITCHING**  
Tatsuo Fushiki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan  
Filed May 6, 1981, Ser. No. 261,050

Claims priority, application Japan, May 21, 1980, 55-67450  
Int. Cl.<sup>3</sup> H03F 3/04

U.S. Cl. 330—297

21 Claims



1. An amplifier of the power supply connection changeover type, comprising:  
a plurality of power supplies having different voltages;  
amplifying means adapted to be supplied with a voltage from the power supplies;  
connection changeover means for selectively connecting one of the power supplies to the amplifying means; and  
comparing means for comparing a reference voltage with a voltage of a signal amplified by said amplifying means, wherein the value of the reference voltage varies in accordance with variations in the voltage of at least a selected one of the power supplies;  
said connection changeover means being controlled based on a result of comparison done by said comparing means.

4,423,390

**SIDE LOCK AVOIDANCE NETWORK FOR PSK DEMODULATOR**  
George W. Waters, Indianapolis, Fla., assignor to Harris Corporation, Melbourne, Fla.

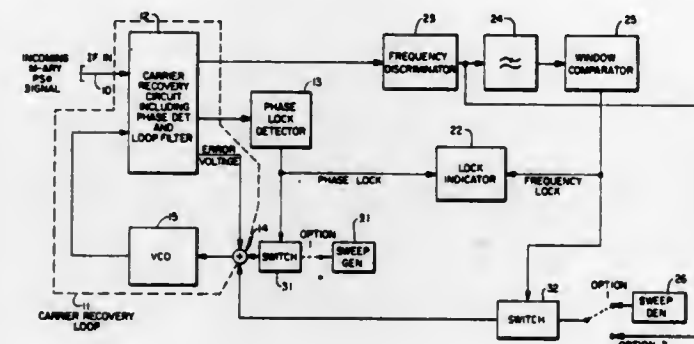
Filed Jan. 9, 1981, Ser. No. 223,574  
Int. Cl.<sup>3</sup> H03L 7/12

U.S. Cl. 331—4

18 Claims

1. An apparatus for preventing a phase-lock loop, including a phase detector and a voltage controlled oscillator, from

achieving sidelock, in response to an input signal including components at a desired lock frequency and a sideband component separated from said desired lock frequency, said loop further including a lock detector coupled to the output of said phase detector, and a sweep voltage generator, the output of said sweep voltage generator being selectively coupled to said voltage controlled oscillator in accordance with the output of said lock detector, comprising:



first means, coupled to the output of said phase detector, for generating an error voltage representative of the degree of separation of the output of said phase detector and a voltage representative of said desired lock frequency; and  
second means, responsive to said error voltage, for coupling a voltage, the magnitude of which varies with time and is exclusive of said sweep voltage generator, as an auxiliary control voltage to said voltage controlled oscillator.

4,423,391

**EQUALIZER CIRCUIT FOR COMMUNICATION SIGNALS**

Peter Ebenhoeh, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

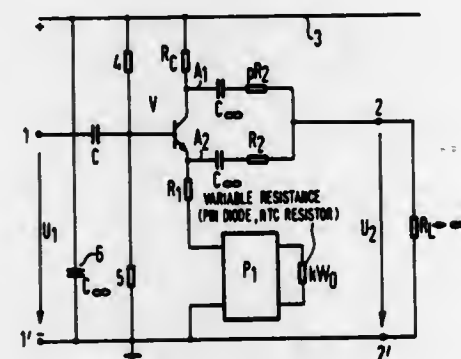
Filed Jul. 20, 1981, Ser. No. 284,657

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033762

Int. Cl.<sup>3</sup> H03H 7/03

U.S. Cl. 333—28 R

9 Claims



1. An active Bode equalizer circuit comprising:  
a circuit input for receiving communication signals and circuit output, including first and second terminals, for emitting anti-phase equalized signals;  
an amplifier including an input connected to said circuit input and first and second outputs;  
a first resistor, forming a first bridge arm, connected between said first output and a supply potential;  
a second resistor, forming a second bridge arm, connected between said first output and said first terminal of said circuit output;  
a third resistor, forming a third bridge arm, connected to said second output and to said first terminal of said circuit output;  
a two-terminal network, forming a fourth bridge arm, connected to a reference potential, said second terminal of

said circuit output also connected to the reference potential,  
said two-terminal network comprising a matched bridged T-section, including first and second ports, and a terminating impedance connected across said second port; and  
a fourth resistor connected in circuit with said second output and said first port of said T-section.

4,423,392

**DUAL-MODE STRIPLINE ANTENNA FEED PERFORMING MULTIPLE ANGULARLY SEPARATED BEAMS IN SPACE**

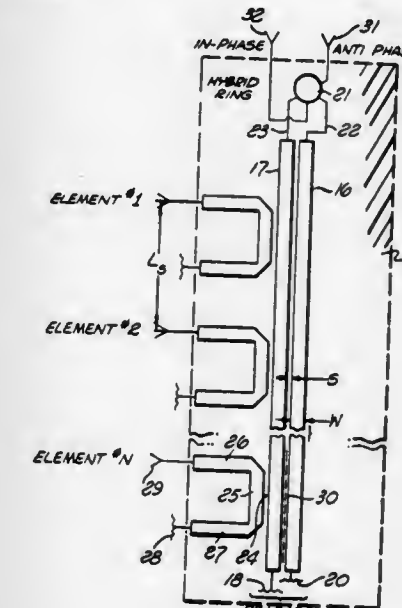
Ronald I. Wolfson, 10966 Beckford Ave., Northridge, Calif. 91326

Filed Nov. 30, 1981, Ser. No. 325,686

Int. Cl.<sup>3</sup> H01P 5/18; H01Q 3/26

U.S. Cl. 333—116

7 Claims

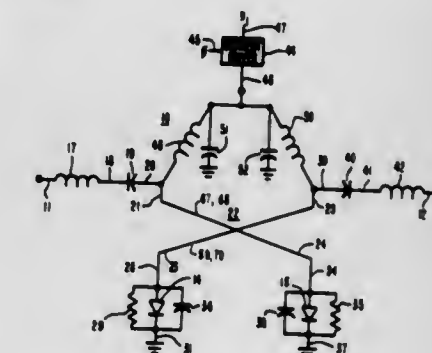


1. An antenna feed having first and second transmit/receive ports and a plurality of antenna element ports for connection to the elements of a linear antenna array to generate at least two angularly separated beams in space therefrom, comprising:  
a length of non-dispersive TEM transmission line having first and second generally parallel, laterally-spaced center conductors associated with a dielectric material and discretely connected to said first and second transmit/receive ports, respectively, the other ends of said center conductors being discretely load terminated;  
first means comprising a phasing device having in-phase and anti-phase ports and third and fourth ports connected to said transmission line first and second transmit/receive ports, respectively, said phasing device being operative to excite said center conductors in-phase to generate an even electric field mode within said transmission line during excitation of said in-phase port and to excite said center conductors in anti-phase relationship to generate an odd electric field mode within said transmission line during excitation of said anti-phase port;

second means comprising a plurality of couplings, one for each of said antenna element ports, said couplings each including a quarter-wave conductor parallel and close coupled to one of said center conductors and a feed strip extending generally perpendicular from one end of each of said coupling strips to a corresponding antenna element port, said coupling strips being load terminated from their other ends.

4,423,393  
**HIGH SPEED OCTAVE BAND PHASE SHIFTER**  
Ronald G. Freitag, Ellicott City, and Jeffrey A. Kruth, Ferndale Township, Anne Arundel County, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
Filed Feb. 4, 1982, Ser. No. 345,839  
Int. Cl.<sup>3</sup> H01P 1/185, 5/12, 5/04  
U.S. Cl. 333—164

10 Claims



1. Apparatus for shifting the phase of microwave signal comprising:  
a coupler operable over a wide bandwidth in frequency and having first through fourth ports,  
said first port adapted for coupling an input microwave signal thereto,  
said fourth port adapted for coupling an output microwave signal therefrom,  
a first diode and first resistor coupled across said second port,  
a second diode and second resistor coupled across said third port,  
means adapted for coupling a bias current to said first and second diodes whereby the diodes are forward biased during a first time interval and reverse biased during a second time interval,  
said first and second resistors having a predetermined resistance to absorb microwave power at said diodes during said second time interval to provide substantially the same insertion loss at said fourth port during said first and second time intervals.

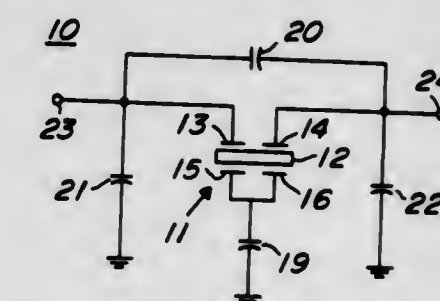
4,423,394  
**MULTIPLE POLE BANDPASS FILTER HAVING MONOLITHIC CRYSTAL ELEMENTS**  
Robert G. Kinsman, Naperville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1977, Ser. No. 803,903

Int. Cl.<sup>3</sup> H03H 9/52, 9/56, 9/60

U.S. Cl. 333—192

12 Claims



1. A filter for providing a symmetrical response about a given center frequency including a piezoelectric resonating element having first and second opposite sides with first and second pairs of electrodes thereon and the electrodes of each pair being on opposite sides of the resonating element, means coupled to the first pair of electrodes for applying signals thereto, means coupled to the second pair of electrodes for



deriving selected signals therefrom, a first capacitor coupled between an electrode of the first pair located on the first side and a common terminal, a second capacitor coupled between an electrode of the second pair of electrodes located on the first side and said common terminal, a third capacitor coupled between the electrodes of the first and second pair of electrodes located on the first side, and a fourth capacitor coupled between both of the first and second electrodes located on the second side and said common terminal, the values of said first, second, third and fourth capacitors being selected to provide said predetermined response.

4,423,395

**SURFACE ACOUSTIC WAVE FILTER**

Kengoro Shirahama, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

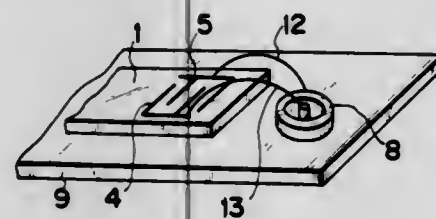
Filed Aug. 5, 1981, Ser. No. 290,383

Claims priority, application Japan, Aug. 7, 1980, 55-107675

Int. Cl.<sup>3</sup> H03H 9/64, 9/05, 9/10

U.S. Cl. 333—193

3 Claims



1. A surface acoustic wave filter comprising: a surface acoustic wave element having a first planar surface with input and output electrodes provided thereon; a metallic board on which said surface acoustic wave element is mounted; at least two coaxial-type connectors each having an associated shell and central electrode and configured with one end of each said shell and the end of its associated electrode lying in an end-defining plane, said connectors disposed to place their respective end-defining planes coplanarly with respect to said first planar surface; a first pair of wires connected between said input electrodes and said shell and central electrode respectively at said one end of one of said coaxial-type connectors, said first pair of wires being disposed in parallel; and a second pair of wires connected between said output electrodes and said shell and central electrode respectively at said one end of another of said coaxial-type connectors, said second pair of wires being disposed in parallel.

4,423,396

**BANDPASS FILTER FOR UHF BAND**

Mitsuo Makimoto, Yokohama, and Sadahiko Yamashita, Sagami-hara, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

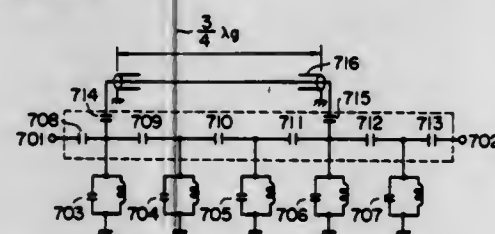
Filed Sep. 29, 1981, Ser. No. 306,855

Claims priority, application Japan, Sep. 30, 1980, 55-137205

Int. Cl.<sup>3</sup> H03H 7/01; H01P 1/203, 7/08

U.S. Cl. 333—204

9 Claims



1. A bandpass filter for UHF band, comprising: (a) a dielectric substrate; (b) a main transmission line having input and output electrodes, said main transmission line being formed of a plurality of striplines formed in line on said dielectric substrate;

trodes, said main transmission line being formed of a plurality of striplines formed in line on said dielectric substrate;

- (c) five or more resonators respectively coupled to said striplines between said input and output electrodes;
- (d) first and second coupling striplines formed on said dielectric substrate, said first coupling stripline being located adjacent to the first stripline which is immediately next to said input electrode, said second coupling stripline being located adjacent to the fourth stripline; and
- (e) a sub transmission line stripline formed on said dielectric substrate and interposed between said first and second coupling striplines.

4,423,397

**DIELECTRIC RESONATOR AND FILTER WITH DIELECTRIC RESONATOR**

Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa; Sadahiro Tamura, both of Kyoto, and Yoji Ito, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

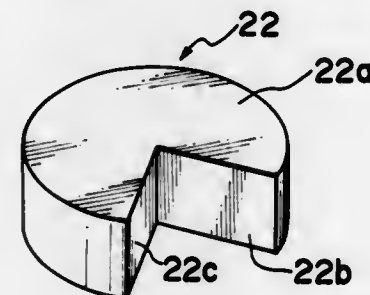
Filed Jun. 25, 1981, Ser. No. 277,389

Claims priority, application Japan, Jun. 30, 1980, 55-89599; Jun. 30, 1980, 55-89600

Int. Cl.<sup>3</sup> H01P 7/10, 1/208, 1/209

U.S. Cl. 333—219

28 Claims



1. A dielectric resonator comprising dielectric member, the geometry of said member corresponding to a body with a section removed therefrom, said body being generally symmetrical about an axis and said section being defined by two planes which intersect along said axis and form an angle greater than 0 degrees.

4,423,398

**INTERNAL BI-METALLIC TEMPERATURE COMPENSATING DEVICE FOR TUNED CAVITIES**

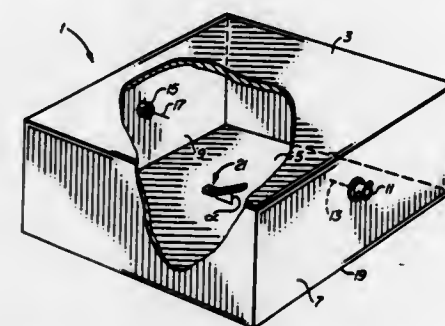
Ronald E. Jachowski, Paradise Valley, Ariz., and Louis E. Brown, Dallas, Tex., assignors to Decibel Products, Inc., Dallas, Tex.

Filed Sep. 28, 1981, Ser. No. 306,077

Int. Cl.<sup>3</sup> H01P 7/04, 7/06, 1/202, 1/207

U.S. Cl. 333—229

11 Claims



1. A tuned cavity device for producing a resonating standing wave pattern therein, said tuned cavity device comprising in combination: (a) a housing having a high conductivity inner surface en-

closing a region in which said standing wave pattern resonates;

- (b) frequency-determining means for determining a resonant frequency of said tuned cavity device, said frequency-determining means having a non-zero thermal expansion coefficient; and
- (c) bi-metallic temperature compensating means disposed in said region and electrically contacting said inner surface for extending from said inner surface into said region, the amount of said extension of said bi-metallic temperature compensating means increasing and decreasing as the temperature of said tuned cavity device decreases and increases, respectively, to compensate for thermal expansion and contraction of said frequency-determining means as a function of temperature of said tuned cavity device, said bi-metallic temperature compensating means including a strip of bi-metallic material having a first portion attached to a portion of said inner surface and a relatively flat second portion inclined at an acute angle relative to said portion of said inner surface, said strip of bi-metallic material bending with variation in temperature.

4,423,399

**ELECTROMAGNETIC CONTACTOR**

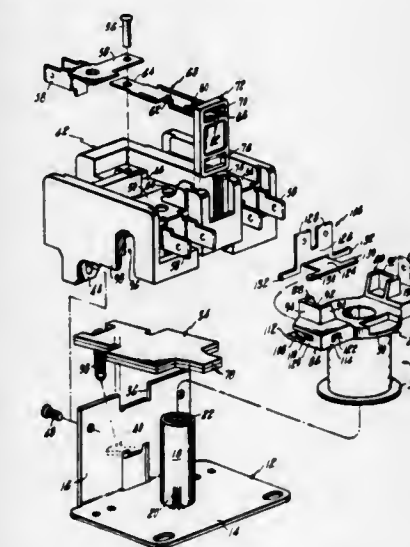
Ronald W. Goodrich, Logansport, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 23, 1982, Ser. No. 371,107

Int. Cl.<sup>3</sup> H01H 45/04

U.S. Cl. 335—202

6 Claims



1. In an electromagnetic contactor of the type comprising an L-shaped frame having a base portion and a leg portion, a coil assembly comprising a bobbin having end flanges and a coil wound about said bobbin between said flanges, a core secured at one end to said base portion and carrying said coil assembly, an armature pivotally mounted on said leg portion for movement toward and away from the other end of said core, a block of insulating material having foot portions secured directly to said leg portion and having a platform portion disposed substantially at right angles to said foot portions to extend over said armature and said coil assembly, a contact spring mounted cantilever fashion on said block and carrying a movable contact, another contact mounted on said block for engagement by said movable contact, and an actuator engaging said contact spring and operable by said armature for flexing said contact spring toward said other contact; cooperating interlocking means on said bobbin and said block for rigidly supporting said platform portion relative to said frame at a location spaced from said foot portions which comprise: a pair of oppositely directed integral support arms extending outwardly beyond opposite sides of said armature and said platform portion; said platform portion including two spaced apart wall members projecting from respective ledge surfaces toward said arms and defining a chamber therebetween; an upstanding projection integrally formed on each of said arms and projecting into said chamber for mating engagement with a corre-

sponding one of said wall members and a respective ledge surface; and locking means on said wall members for providing frictional engagement with said projections when said platform portion is forcibly urged over said projections to bring said projections into mating engagement with said wall members.

4,423,400

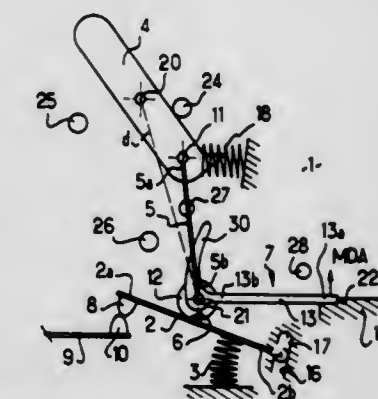
**CONTROL DEVICE TO BE MOUNTED IN A FRAME FOR OPERATING THE DISPLACEMENT OF AN ARM AND USE OF THE DEVICE IN PARTICULAR AS A SWITCH**  
Jean A. E. Marcoz, 93, avenue Albert 1er, 92500 Neuilly Malmalson, France

Filed Jul. 15, 1981, Ser. No. 283,785

Int. Cl.<sup>3</sup> H01H 71/16

U.S. Cl. 337—72

30 Claims



1. In an apparatus including an arm and a control device adapted to be mounted in a frame for controllably operating the displacement of said arm in a plane between at least two positions, including a first off position and a second working position, the improvement wherein said control device comprises:

- a control member mounted for movement in the plane of displacement of the arm between at least two positions including a first inoperative position corresponding to said off position of said arm and a second operative position corresponding to said working position of said arm, a transmission element coupled to said control member and bearing on said arm in freely moving engagement therewith so as to be movable along said arm in the plane of displacement of the arm between at least three positions including a first engaged position wherein the arm is in said working position, a second disengaged position and a third reset position wherein in said second and third positions, the arm is in said off position; and
- a locking device including an integral elongate element having two ends, said locking device mounted for displacement between at least two positions including a first locked position and a second unlocked position, and stop means, one end of said elongate element adapted to bear against said stop means wherein said locking device is in said locked position, the other end of said elongate element being connected to said transmission element, and wherein said locking device is displaced to said locked position when said transmission element is moved toward said third reset position.

4,423,401

**THIN-FILM ELECTROTHERMAL DEVICE**

Robert A. Mueller, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 21, 1982, Ser. No. 400,331

Int. Cl.<sup>3</sup> H01H 61/02

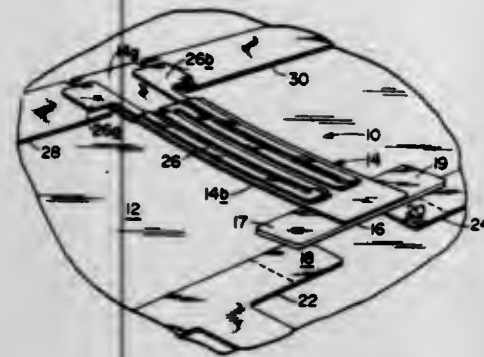
U.S. Cl. 337—107

12 Claims

1. A thin-film electrothermal device, comprising a substrate having an insulative support surface, a first conductive body bonded to said surface,



a resiliently bendable strip of dielectric material overlying said surface and spaced therefrom over a portion of its length,  
a second conductive body secured to said strip and supported thereby for movement toward and away from said



first body by bending of said strip toward and away from said surface, and  
an electrical resistance element bonded to said strip to effect controlled bending of the strip toward and away from said surface in response to the flow of electrical current through said element.

#### 4,423,403 TRANSPARENT CONDUCTIVE FILMS AND METHODS OF PRODUCING SAME

Kiyoshi Miyake, and Naoyuki Miyata, both of Ube, Japan, assignors to Hitachi, Ltd. and Kiyoshi Miyake, both of Tokyo, Japan

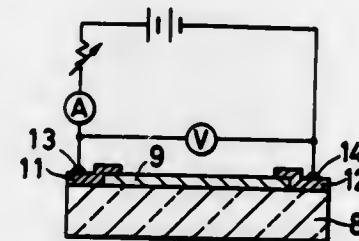
Division of Ser. No. 936,124, Aug. 23, 1978, Pat. No. 4,349,425. This application Apr. 16, 1982, Ser. No. 369,078

Claims priority, application Japan, Sep. 9, 1977, 52-107984; Jul. 7, 1978, 53-81881

Int. Cl.<sup>3</sup> H01L 31/08

U.S. Cl. 338—15

8 Claims



3. A structure comprising a substrate, a transparent film comprising a mixture of  $\text{Cd}_2\text{SnO}_4$  and  $\text{CdSnO}_3$  formed on the surface of said substrate, and an electrode connected to said transparent film.

#### 4,423,404 NON-LINEAR RESISTOR STACK AND ITS METHOD OF ASSEMBLY

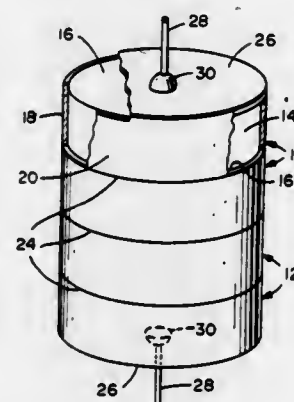
Gary L. Goedde, Racine, and Charles H. Rice, Franksville, both of Wis., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 1, 1982, Ser. No. 344,643

Int. Cl.<sup>3</sup> H01C 7/12

U.S. Cl. 338—21

3 Claims



1. A non-linear resistor assembly, comprising: a plurality of individual voltage dependent, non-linear resistance wafers, each of which has opposite end surfaces to which solder will adhere and an outer circumferential side surface extending between the end surfaces; said wafers being stacked in end-to-end relationship with one another; an outer coating layer covering the entire side surface of each of said wafers, each of said coating layers being formed from a dielectric composition to which soldering substance does not adhere, said composition being able to withstand the temperature of molten solder and the maximum expected voltage level across each wafer without any adverse effects; and hardened soldering substance between the adjacent ends of adjacent wafers for bonding the adjacent wafers together, said coating layer being a lead glass frit composition consisting essentially of the following, by approximate dry weight percent:

lead oxide . . . 59.2%  
silicon dioxide . . . 19.9%  
boron oxide . . . 14.5%  
sodium oxide . . . 6.4%.

#### 4,423,402 TEMPERATURE SENSITIVE CAPSULES

Thomas M. Jackson, and Robert J. Hodges, both of Hertfordshire, England, assignors to ITT Industries, Inc., New York, N.Y.

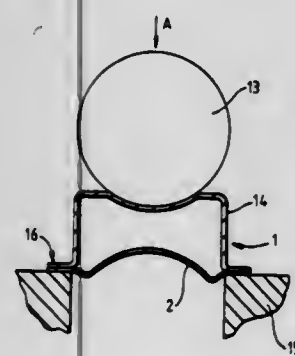
Filed Apr. 26, 1982, Ser. No. 371,674

Claims priority, application United Kingdom, Jul. 21, 1981, 8122394

Int. Cl.<sup>3</sup> H01H 37/36

U.S. Cl. 337—323

10 Claims



1. A capsule, for use as a temperature responsive element, comprising a sealed enclosure containing a liquid or gas, one wall of the enclosure being a bowed disc, wherein when the temperature to which the capsule is subjected passes through a predetermined value the vapour pressure within the enclosure changes in such a way as to cause the bowed disc to change from a concave state to a convex state, or vice versa, and wherein the disc is manufactured from precipitation hardened stainless steel or precipitation hardened beryllium copper.

#### 4,423,405 STARTING RELAY OF THE PTC RESISTOR TYPE IN MOTOCOMPRESSORS FOR REFRIGERATORS

Alfredo Bar, Pavia, Italy, assignor to NECCHI Societa per Azioni, Pavia, Italy

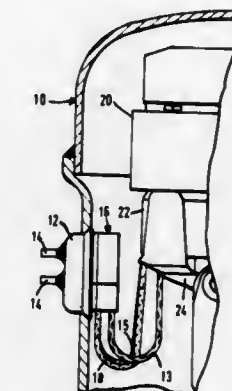
Filed May 11, 1982, Ser. No. 377,051

Claims priority, application Italy, May 20, 1981, 42911 A/81

Int. Cl.<sup>3</sup> H01C 7/02

U.S. Cl. 338—25

1 Claim



1. Starting relay of the resistor type with positive temperature coefficient in motor compressors for refrigerators, comprising a hermetically sealed container, a two-pin electrical connection fastened on the outside of said container, on the inside of said container a collector of three motor feed connectors, pins provided on the hermetic electrical connection fastened on the wall of said container and a disc resistor embodied in the collector positioned between two of the motor feed connectors.

#### 4,423,406 NON-CONTACT TYPE POTENTIOMETER

Eiji Nakano, Sakuramura Namiki, Japan, assignor to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

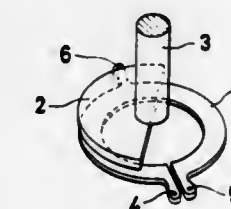
Filed Mar. 2, 1982, Ser. No. 353,972

Claims priority, application Japan, Mar. 31, 1981, 56-47592

Int. Cl.<sup>3</sup> H01L 43/02

U.S. Cl. 338—32 R

18 Claims



1. A non-contact type potentiometer, comprising:  
a first magnetic reluctance element having first means for accepting the application of a standard voltage thereto, and second means for delivering an output voltage therefrom;  
a second magnetic reluctance element having first means for accepting the application of a standard voltage thereto, and second means for delivering an output voltage therefrom;  
said first and second magnetic reluctance elements being angularly offset with respect to each other by means of 90°; and  
permanent magnet means rotatably disposed relative to, yet separated from, said first and second magnetic reluctance elements for applying a magnetic field to said first and second magnetic reluctance elements.

#### 4,423,407 APPARATUS AND METHOD FOR MEASURING THE CONCENTRATION OF GASES

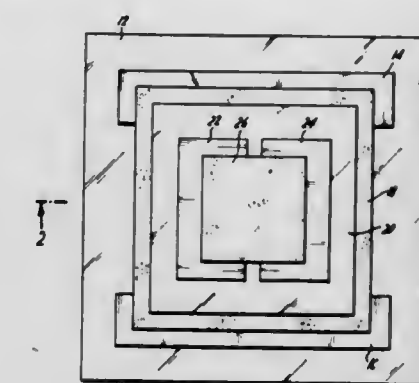
Matthew Zuckerman, Carmel, Calif., assignor to Dart Industries, Inc., Colmar, Pa.

Filed Feb. 27, 1981, Ser. No. 238,768

Int. Cl.<sup>3</sup> H01L 7/00

U.S. Cl. 338—34

16 Claims



1. A gas sensor which is adapted to change electrical resistance in response to the presence of a gas comprising a metal, an oxide of said metal and an inert support material, all said constituents being formed together into a porous mass.

#### 4,423,408 REMOTE DATA GATHERING PANEL

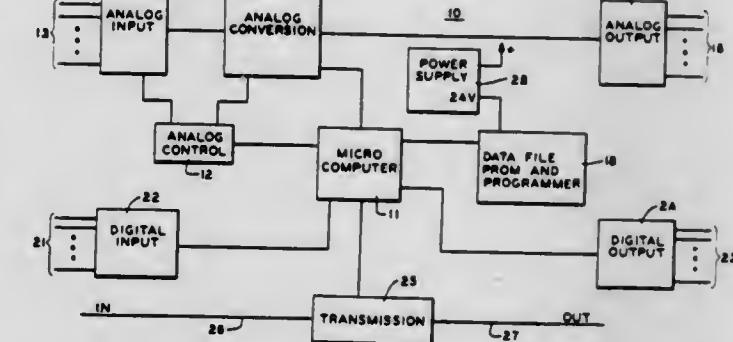
William C. Place, Acton, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 9, 1981, Ser. No. 232,793

Int. Cl.<sup>3</sup> H03K 13/20

U.S. Cl. 340—347 NT

20 Claims



1. A data gathering panel for conversion of analog values into digital values comprising:  
input terminal means adapted to be connected to at least one analog sensor for receiving an analog value;  
memory means for storing a base value and a range value for said at least one analog sensor;  
base means connected to said memory means for applying said base value to said analog value; and  
analog-to-digital conversion means connected to said analog input terminal means, to said base means and to said memory means for converting said analog value into a digital value, said conversion means determining said digital value by utilizing said analog value, said base value and said range value, said analog-to-digital conversion means comprising a hex slope analog-to-digital converter and an integrator, said integrator being charged from a reference level to a level determined by said analog value and then discharged to said reference level, said integrator being charged to a level determined by said base value and being discharged to said reference level, and said integrator being charged to a level determined by said range value and being discharged to said reference level.



4,423,409

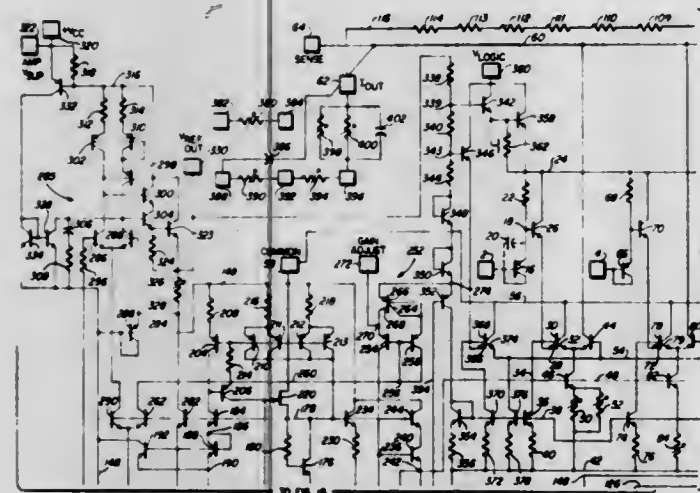
**DIGITAL-TO-ANALOG CONVERTER HAVING SINGLE-ENDED INPUT INTERFACE CIRCUIT**  
 Jimmy R. Naylor, William J. Lillis, and Anthony D. Wang, all of Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Apr. 3, 1981, Ser. No. 250,868

Int. Cl.<sup>3</sup> H03K 13/02

U.S. Cl. 340—347 DA

15 Claims U.S. Cl. 340—525



1. A digital-to-analog converter comprising in combination:
  - a. voltage regulating means for producing a reference voltage;
  - b. current source means responsive to said reference voltage for producing a bit switch current;
  - c. single-ended input means for receiving a first logic signal at an input terminal thereof and performing a level translation operation on said first logic signal to produce a second logic signal at an output terminal thereof, said single-ended input means including:
    - i. a PN semiconductor junction operated in zener breakdown mode and coupled between said input terminal and said output terminal to perform said level translation operation;
    - ii. an input transistor having a base and an emitter, the base of said input transistor being coupled to said input terminal; and
    - iii. an emitter follower transistor having an emitter and a base, the base of said emitter follower transistor being coupled to the emitter of said input transistor, and the emitter of said emitter follower transistor being coupled by said PN semiconductor junction to said output terminal of said single-ended input means; and
  - d. current steering means responsive to said second logic signal for selectively steering said bit switch current through a first conductor if said first logic signal is at a first level or through a second conductor if said first logic signal is at a second level, one of said first and second conductors being an output current conductor of said digital-to-analog converter, said current steering means including first, second, and third terminals, said first terminal being coupled to the output terminal of said single-ended input means for receiving said second logic signal, said second terminal being coupled to a threshold voltage conductor for receiving a substantially fixed threshold voltage therefrom, and said third terminal being coupled to said current source means for conducting said bit switch current.

4,423,410

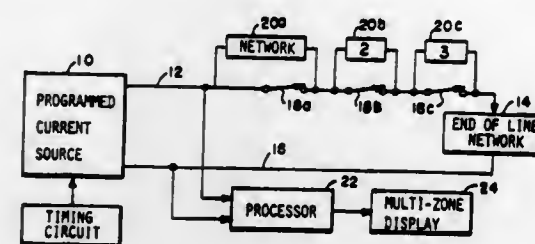
**TWO-WIRE MULTI-ZONE ALARM SYSTEM**  
 Aaron A. Galvin, and Roy L. Harvey, both of Lexington, Mass., assignors to American District Telegraph Company, New York, N.Y.

Division of Ser. No. 951,765, Oct. 16, 1978, Pat. No. 4,359,721.

This application Sep. 2, 1982, Ser. No. 413,987

Int. Cl.<sup>3</sup> G08B 25/00

3 Claims



1. Apparatus for use in a multi-zone alarm system having a two-wire alarm loop, a plurality of alarm sensors in series with the loop, and a processor at a central location coupled to the loop and operative to indicate an alarm condition in response to alarm signals from any of said sensors, comprising:

a current source serially connected to the alarm loop and operative to provide a predetermined current signal in the loop;

a plurality of networks, each connected across a respective alarm sensor and operative in response to its sensor actuation and to a positive magnitude of said loop signal current to provide a signal pulse for transmission in the loop to the central location processor, the signal pulse having a detectable characteristic to denote the identity of the actuated sensor;

circuit means at the central location processor operative in response to signal pulses from any one or more of the networks to provide a signal indication of the zone in which alarm actuation has occurred; and

each of said networks includes an electronic switch in parallel with the associated alarm sensor; a resistor in shunt with the electronic switch and of a value representing the identity of an associated zone; a capacitor in shunt with said resistor and said electronic switch; the capacitor being operative to minimize radio frequency interference and switching transients from triggering the electronic switch.

4,423,411

**IONIZATION TYPE FIRE DETECTOR**

Nicolaas T. van der Walt, Meredale; Bernardus J. Bout, Walkerville, and Timothy J. Newington, Johannesburg, all of South Africa, assignors to Crucible Society Anonyme, Luxembourg, Luxembourg

Continuation of Ser. No. 96,009, Nov. 20, 1979, abandoned. This application Sep. 2, 1981, Ser. No. 298,804

Claims priority, application South Africa, Nov. 20, 1978, 78/6519

Int. Cl.<sup>3</sup> G08B 17/10

U.S. Cl. 340—629

7 Claims

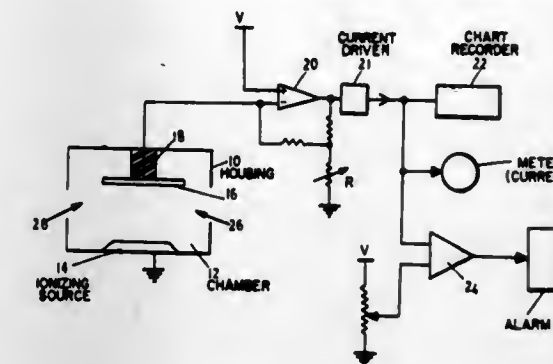
1. An ionization type fire detector which includes a single measuring chamber provided with one or more apertures in the wall of the chamber to permit the circulation of air through the chamber, an electrode mounted on an insulating member inside the chamber, means for maintaining constant a potential difference between the electrode and the chamber, an ionizing source inside the chamber which produces an ionization cur-

DECEMBER 27, 1983

ELECTRICAL

1713

rent which is collected by the electrode, means to collect and amplify the ionization current, and indication means to provide



an indication of a variation with time of the amplified ionization current.

4,423,412

**INDUSTRIAL PROCESS INDICATING/RECORDING APPARATUS USING STEPPING MOTOR DRIVE**

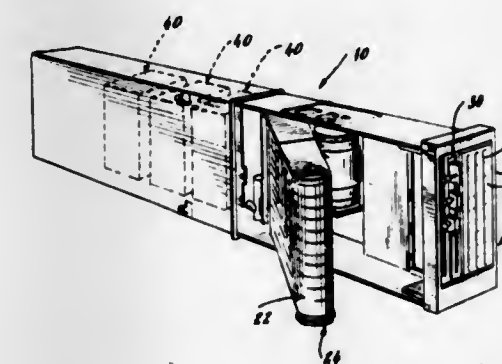
Allan L. Flanagan, Attleboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Sep. 30, 1981, Ser. No. 306,955

Int. Cl.<sup>3</sup> G08B 21/00

U.S. Cl. 340—661

15 Claims



1. In a process instrument of the type having a movable device representing by its position the level of a process condition being monitored and driven by a stepping motor operated by sequential pulses from clock pulse means, feedback means for developing a feedback signal corresponding to the position of said movable device, and deviation means for producing a deviation signal representing the difference between such feedback signal and a measurement signal; apparatus comprising:

dead-band means responsive to said deviation signal for developing a control signal when said deviation signal falls outside of a predetermined dead-band about the position represented by said measurement signal;

first means responsive to the initial development of said control signal for activating said stepping motor to produce a limited corrective action of preset extent tending to return said device to the position represented by said measurement signal; and

second means including timing means responsive to said control signal for activating said stepping motor beyond said preset extent only if said deviation signal is still outside of said dead-band at the end of a predetermined time period following activation of said stepping motor by said first means.

4,423,413

**RADIOCOMMUNICATION SYSTEM IN WHICH A RECEIVING STATION MONITORS A NUMBER OF TRANSMITTERS BY TIME DIVISION**

Herman de Silva, Voorburg, Netherlands, assignor to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie), The Hague, Netherlands

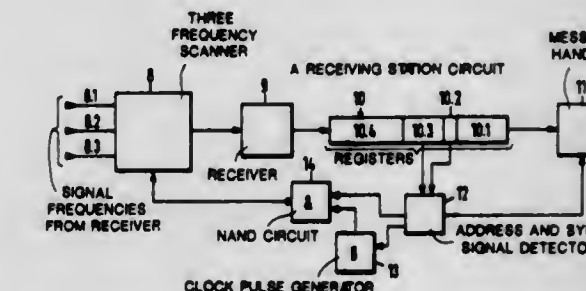
Filed Jun. 22, 1981, Ser. No. 276,021

Claims priority, application Netherlands, Jun. 30, 1980, 8003783

Int. Cl.<sup>3</sup> H04Q 9/00; H04J 3/12; H04B 7/02

U.S. Cl. 340—825.03

3 Claims



1. In a radiocommunication system having a plurality of calling stations and at least one receiving station, and said calling stations having means for transmitting call messages on different frequencies, one corresponding to each calling station for a called receiving station, each of said call messages containing at least an address code for a receiving station, and said receiving station having means for recognizing its address code, the improvement comprising: means in each said calling station for transmitting a call message having a duration  $t$  for  $n$  times with a call message repetition frequency  $r$ , and means in each said receiving station for monitoring, by time division, the different calling frequencies of  $n$  calling station, each for a period  $T = (n-1)/(n+1) \cdot t/r$ .

4,423,414

**SYSTEM AND METHOD FOR NAME-LOOKUP IN A LOCAL AREA NETWORK DATA COMMUNICATION SYSTEM**

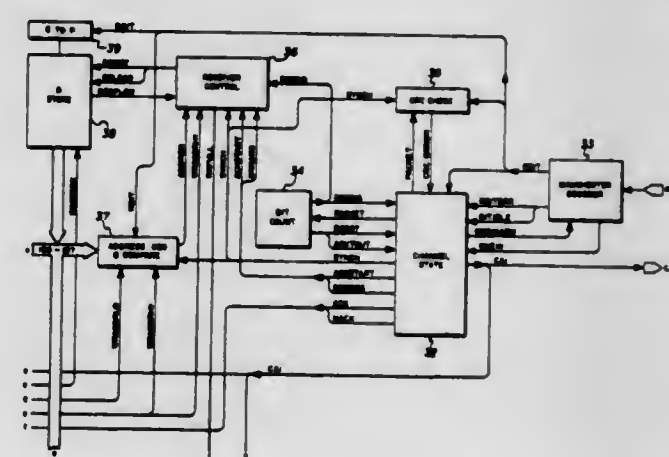
David M. Bryant, Cardiff, Calif.; Ryn C. Corbell, Bridgewater, N.J.; Michael A. Malcolm, Waterloo, Canada, and Donald R. Thompson, San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 27, 1981, Ser. No. 296,878

Int. Cl.<sup>3</sup> H04J 9/00; H04J 3/00

U.S. Cl. 340—825.07

6 Claims



1. A station in a communications network including a communications channel for the transmission of packets of information, and a plurality of stations coupled to said channel, said stations being adapted to implement different processes, said station comprising:

means to receive a process name request from another sta-







4,423,421

**SLOT ARRAY ANTENNA WITH AMPLITUDE TAPER ACROSS A SMALL CIRCULAR APERTURE**

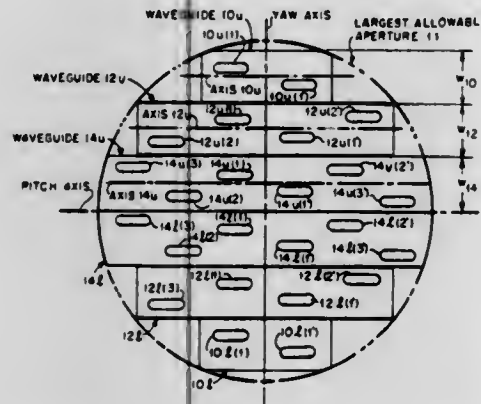
George D. M. Peeler, Chelmsford; Chester J. Hunt, Melrose; Ninalbo G. DaMocogno, Winchester, and Richard J. Conti, Belmont, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 97,246, Nov. 26, 1979, abandoned. This application Dec. 21, 1981, Ser. No. 332,423

Int. Cl.<sup>3</sup> H01Q 13/10

U.S. Cl. 343-771

2 Claims



1. In a linearly polarized slot array antenna having a substantially circular aperture, the ratio between the diameter of such aperture and the wavelength of radio frequency energy at the design frequency of such antenna being in the order of 5:1, the improvement comprising:

- a first plurality of rectangular waveguides, each one of such waveguides having a narrow wall and a broad wall, dimensioned, when juxtaposed with narrow walls abutting, substantially to cover a first half of the circular aperture, the width of the broad wall of each successive one of such waveguides decreasing outwardly from the centrally located one of such waveguides;
- a second plurality of rectangular waveguides similarly covering the second half of the circular aperture; and
- a plurality of radiating slots formed through the broad wall of each one of the rectangular waveguides, such slots being parallel one to another with the center of each different slot lying in a plane of maximum electric field within its corresponding rectangular waveguide.

4,423,422

**DIAGONAL-CONICAL HORN-REFLECTOR ANTENNA**

Charles M. Knop, Lockport, and Edward L. Ostertag, New Lenox, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Filed Aug. 10, 1981, Ser. No. 291,431

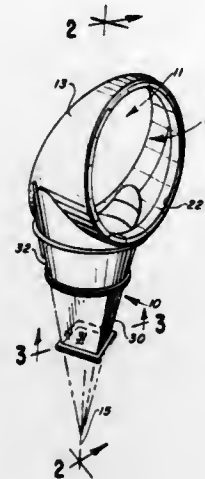
Int. Cl.<sup>3</sup> H01Q 13/02

U.S. Cl. 343-786

8 Claims

1. A horn-reflector microwave antenna comprising a reflector plate which is a section of a paraboloid, a flared feed horn for supplying microwave signals to said reflector plate, said horn having an absorber-lined conical section forming a circular aperture at the wide end, which is the end closer to said reflector plate, and a pyramidal section forming a square aperture at the narrow end, which is the end farther away from said reflector plate, and means for supplying microwave signals to said feed horn

with the electric field extending along a diagonal of said square aperture, the combination of said pyramidal section



and said absorber-lined conical section producing substantially equal patterns in the E and H planes.

4,423,423

**BROAD BANDWIDTH FOLDED DIPOLE ANTENNA**

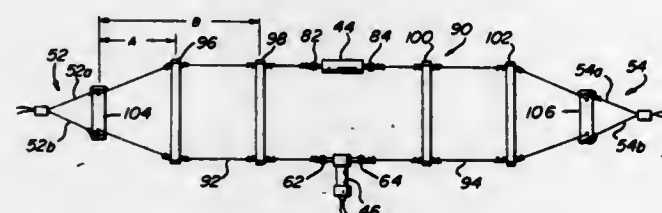
Elmer R. Bush, Bethlehem, Pa., assignor to L. Barker & Williamson, Inc., Bristol, Pa.

Continuation-in-part of Ser. No. 185,451, Sep. 9, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 298,140

Int. Cl.<sup>3</sup> H01Q 9/26

U.S. Cl. 343-803

7 Claims



1. A folded dipole antenna for use in the transmission and reception of radio frequency energy by a radio frequency generator capable of continuous operation over an entire extremely broad bandwidth while maintaining an effective radiated power factor and a voltage standing wave ratio of less than 2:1 for all frequencies over the entire operational bandwidth comprising:

- two conducting wires, each wire folded in spaced parallel relation to itself with like ends of each leg of said conducting wires being positioned in opposition to each other exhibiting an overall length proportional to the entire operational bandwidth;
- load balancing means electrically connecting one set of opposed ends of said wires;
- load matching means electrically connecting the remaining set of opposed ends of said wires by a single feed line to a radio frequency generator;
- said load balancing means and said load matching means requiring no variations of their electrical properties by any external means when tuning the radio frequency generator from one frequency to another frequency over the entire frequency spectrum of the antenna in order to maintain the substantially constant radiating characteristics of said antenna;
- the distal portion of each of the folded legs of the conducting wires tapering inward toward the other folded leg of the same conducting wire to a distance of one-half the spaced parallel distance between said folded legs over the remaining length of the antenna.

4,423,424

**THERMAL HEAD FOR FACSIMILE PRINTER**



4,423,428

## PENCIL HEAD FOR AUTOMATIC DRAWING INSTRUMENT

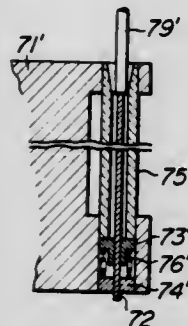
Shigeo Kuwabara, No. 334-6, Fukaya, Ayase City, and Masanori Kamel, No. 937, Shobuzawa, Fujisawa City, both of Japan  
Filed Oct. 27, 1980, Ser. No. 200,781

Claims priority, application Japan, Nov. 27, 1979, 54-163195[U]; Nov. 27, 1979, 54-163196[U]; Dec. 12, 1979, 54-160332

Int. Cl.<sup>3</sup> G01D 15/16; B43L 13/00

U.S. Cl. 346—139 C

2 Claims



1. A pencil head for an automatic drawing instrument wherein a plurality of pencil leads are employed as media for drawing, comprising:

- a pencil head,
- a rotatable pencil lead holding turret,
- means for releasably mounting said turret on said head,
- a plurality of vertical tubular members mounted on said turret, said tubular members being parallel to each other and each adapted to receive a pencil lead therein,
- a plurality of resilient members carried by said turret, there being one resilient member for each tubular member, each resilient member being below the tubular member with which it is associated and being mounted in the turret for limited up-and-down movement, each resilient member having a vertical hole therethrough for grasping a pencil lead extending down through said hole,
- means for individually, directly, and resiliently biasing each of said resilient members upwardly,
- a rotating means,
- an engagement means for engaging said rotating means with said turret for rotation of said turret by said rotating means to selectively dispose one of said tubular members at a drawing position,
- a pencil lead pushing means disposed for up-and-down movement in the tubular member at said drawing position,
- a driving means for moving said pencil lead pushing means downwardly in the tubular member at said drawing position to impose a downward pressure on a pencil lead in said tubular member and for moving said pencil lead pushing means upwardly in said tubular member to relieve said downward pressure.

4,423,429

## WRITING MEDIUM UNIT FOR WRITING OR DRAWING MACHINES

Hans-Dieter Rüssel, Altdorf, Fed. Rep. of Germany, assignor to J.S. Staedtler K.G., Nuremberg, Fed. Rep. of Germany  
Filed Nov. 2, 1981, Ser. No. 317,176

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 8029188[U]

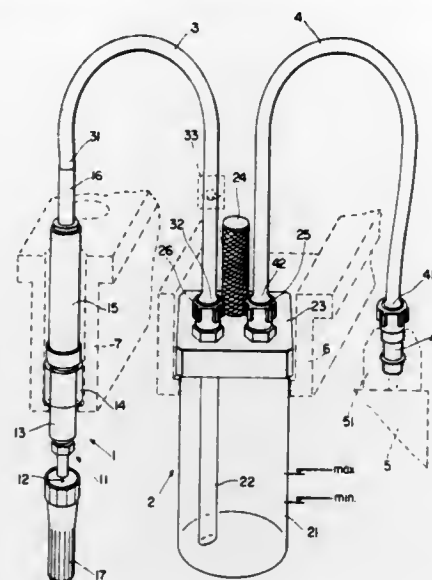
Int. Cl.<sup>3</sup> G01D 15/16

U.S. Cl. 346—140 R

9 Claims

1. In a writing unit for a writing or drawing machine and the like having at least one writing unit head, at least one filling unit and a control unit, flexible writing medium supply tubes interconnecting a said filling unit with a said writing unit head and said control unit, means for detachably connecting said tubes to at least said filling units to facilitate the removal and connection of said units with respect to each other, and a mounting support having an opening therein and located on a

said writing or drawing machine loosely receiving and supporting each said filling unit therein and each said filling unit



extending above and below the opening to permit ready removal of each said filling unit from the machine.

4,423,430

## SUPERCONDUCTIVE LOGIC DEVICE

Shinya Hasuo, and Hideo Suzuki, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

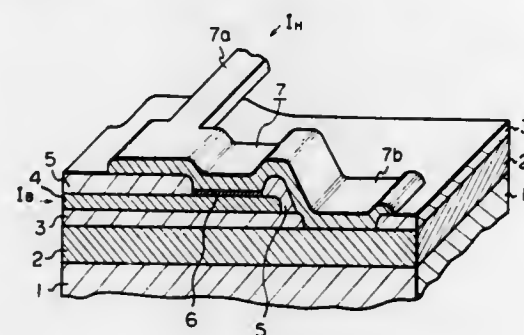
Filed Feb. 20, 1981, Ser. No. 236,579

Claims priority, application Japan, Feb. 20, 1980, 55-20214; Jul. 4, 1980, 55-91371; Jul. 4, 1980, 91372; Jul. 11, 1980, 55-94593; Jul. 15, 1980, 55-96390

Int. Cl.<sup>3</sup> H01L 39/22, 27/12; H03K 3/38

U.S. Cl. 357—5

16 Claims



1. A superconductive logic device comprising:

- a superconductive ground plane;
  - a first insulating layer formed on said superconductive ground plane;
  - a superconductive base electrode, for receiving a bias current, formed on said first insulating layer;
  - second and third insulating layers formed on different portions of said superconductive base electrode, said second insulating layer being thicker than said third insulating layer;
  - a superconductive counter electrode formed on said second and third insulating layers;
  - a first superconductive counter electrode extension extending from said superconductive counter electrode and electrically connected to said superconductive ground plane; and
  - a second superconductive counter electrode extension extending from said superconductive counter electrode and serving as an input terminal for receiving an input signal current;
- at least one Josephson junction being formed, said Josephson junction comprising said superconductive base electrode, said superconductive counter electrode and said third

insulating layer formed therebetween, the input signal current being supplied to said superconductive ground plane through said second superconductive counter electrode extension, said superconductive counter electrode and said first superconductive counter electrode extension, so as to apply a magnetic field to said at least one Josephson junction.

4,423,431

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE PROVIDING A PROTECTION CIRCUIT

Nobuo Sasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

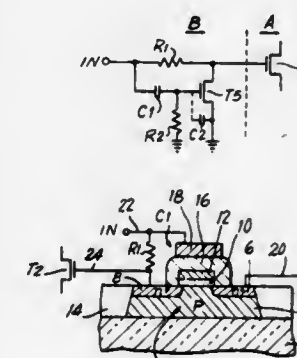
Filed Dec. 24, 1980, Ser. No. 219,893

Claims priority, application Japan, Dec. 24, 1979, 54/167825

Int. Cl.<sup>3</sup> H01L 27/02, 29/78, 29/04

U.S. Cl. 357—41

5 Claims



1. A semiconductor integrated circuit device for protecting an element having an input gate electrode, said device comprising

- a first resistor interposed between an input terminal and the input gate electrode of the element to be protected;
- an MIS type transistor having an input gate electrode drain and source regions, one of said drain and source regions being connected to said input gate electrode of said element and the other of said drain and source regions being connected to ground;
- a capacitor interposed between said input gate electrode of said MIS type transistor and said input terminal; and
- one of a second resistor and a diode being interposed between and connected to said input gate electrode of said MIS type transistor and ground.

4,423,432

## APPARATUS FOR DECODING MULTIPLE INPUT LINES

Roger G. Stewart, Neshaan Station, N.J., and Moshe Mazin, Scotia, N.Y., assignors to RCA Corporation, New York, N.Y.  
Continuation-in-part of Ser. No. 116,204, Jan. 28, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,791

Int. Cl.<sup>3</sup> G11C 11/40; H01L 27/00

U.S. Cl. 357—45

13 Claims

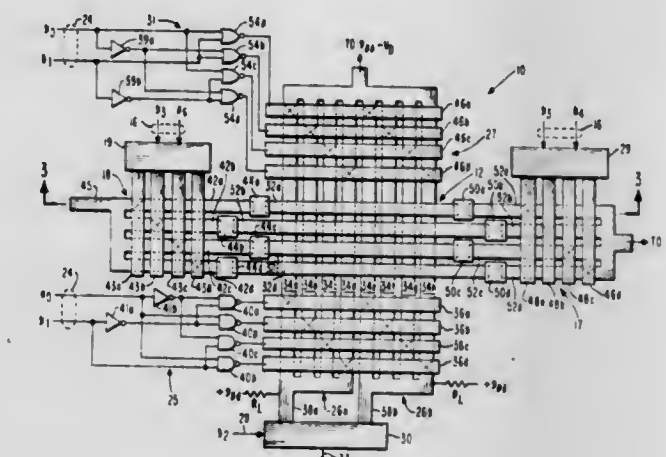
1. Apparatus for selecting from multiple input lines comprising:

- (a) a first plurality of substantially parallel input lines of a first conductivity type;
- (b) a line selector comprising:
  - (i) a second plurality of substantially parallel conductive lines which are substantially perpendicular to said input lines, said second plurality of lines crossing over said input lines and being separated from said input lines by insulators at each intersection where one of said second plurality of lines crosses one of said input lines;
  - (ii) a single MOS transistor formed in each of said input lines in said line selector by reversing the conductivity type of each of said input lines beneath only a single one of said second plurality of substantially parallel lines,

said single one of said second plurality of substantially parallel lines being the gate of said MOS transistor; and  
(iii) at least one output line comprised of the junction of at least two of said input lines on the side of said MOS transistor opposite the side on which said input lines enter said line selector, whereby said line selector can receive said input lines on one side and select particular ones of said input lines for electrical connection to said at least one output line by appropriately biasing said conductive lines, whereby only selected ones of said MOS transistors are turned on thereby decoding said input lines for connection to said at least one output line;

(c) a line deselector comprising:

- (i) a third plurality of substantially parallel conductive lines which are substantially perpendicular to said input lines, said third plurality of lines corresponding in number to said second plurality of lines and crossing over said input lines and being separated from said input lines by insulators at each intersection where one of said third plurality of lines crosses one of said input lines;
- (ii) a single MOS transistor formed in each of said input lines in said line deselector by reversing the conductivity



ity type of each of said input lines beneath only a single one of said second plurality of substantially parallel lines, said single one of said second plurality of substantially parallel lines being the gate of said MOS transistor, said MOS transistor being formed in a like position in the line selector and in the line deselector; and  
(iii) means for connecting a power supply to the junction of said input lines on the side of said MOS transistor opposite the side on which said input lines enter said line deselector, whereby said line deselector can receive said input lines on one side and select particular ones of said input lines for electrical connection to said means for connecting a power line by appropriately biasing said conductive lines, whereby only selected ones of said MOS transistors are turned on thereby decoding said input lines for connection to said means for connecting a power line said selection being such that for each input line only one MOS transistor, either in said line selector or in said line deselector, will be on whereby an input line will be connected either to said at least one output line or to said means for connecting a power supply.



**4,423,433**  
**HIGH-BREAKDOWN-VOLTAGE RESISTANCE**  
**ELEMENT FOR INTEGRATED CIRCUIT WITH A**  
**PLURALITY OF MULTILAYER, OVERLAPPING**  
**ELECTRODES**

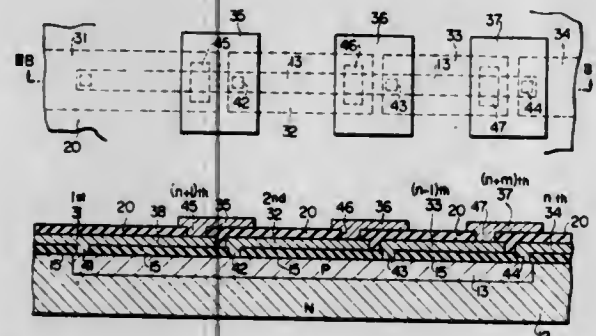
Ichiro Imaizumi, Tokyo; Shikayuki Ochi, Akishima; Masatoshi Kimura, Hachioji; Masayoshi Yoshimura, Hamuramachi; Takashi Yamaguchi, Tachikawa, and Toyomasa Koda, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Filed Jan. 3, 1980, Ser. No. 156,015

Claims priority, application Japan, Jun. 4, 1979, 54-68972

Int. Cl.<sup>3</sup> H01L 27/02

U.S. Cl. 357-51

11 Claims



1. A high-breakdown-voltage resistance element comprising a semiconductor body, an impurity layer disposed in a surface region of said semiconductor body to provide a resistor body, and n first layer electrodes (n: a positive integer) connected to said resistor body through corresponding contact holes in a first insulating film formed on the surface of said semiconductor body, said n first layer electrodes being arranged in such a relation that the 1st electrode of said n first layer electrodes is connected to one end of said resistor body, the 2nd to (n-1)th electrodes of said n first layer electrodes are connected to intermediate portions of said resistor body, and the n-th electrode of said n first layer electrodes is connected to the other end of said resistor body, said n electrodes of said n first layer electrodes being separated from one another by predetermined spaces along said first insulating film so that said n electrodes do not contact one another and so that a plurality of regions of said resistor body are left uncovered by said n first layer electrodes, said resistance element further comprising a second insulating film formed on said 1st to n-th electrodes of said n first layer electrodes, and m second layer electrodes (m: a positive integer smaller than n) comprising (n+1)th electrodes deposited on said second insulating film and connected to selected ones respectively of said 1st to (n-1)th electrodes among said n first layer electrodes, said m second layer electrodes covering said plurality of regions of said resistor body which are uncovered by said n electrodes of said first layer electrodes so that said 1st to (n+m)th electrodes cover a surface region including the entire surface of said resistor body and areas of said semiconductor body adjacent thereto.

**4,423,434**  
**SEMICONDUCTOR DEVICE HAVING TWO OR MORE**  
**SEMICONDUCTOR ELEMENTS WITH PAIRED**  
**CHARACTERISTICS REGULARLY ARRANGED IN A**  
**SEMICONDUCTOR SUBSTRATE**

Shigeru Komatsu, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan  
 Filed Dec. 3, 1980, Ser. No. 212,503

Claims priority, application Japan, Dec. 19, 1979, 54-165390

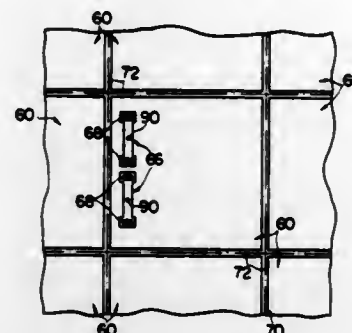
Int. Cl.<sup>3</sup> H01L 27/02, 29/84, 29/04, 23/28

U.S. Cl. 357-51

4 Claims

1. In a semiconductor device, the improvement comprising: a semiconductor substrate; at least two semiconductor elements with paired characteristics disposed equidistantly from an edge of said semiconductor substrate with the same orientation with respect to each other in said semiconductor substrate, wherein said

semiconductor elements are disposed within an area defined by said edge of said semiconductor substrate and by



a line which is separated from said edge by a distance 1.8 times the thickness of said semiconductor substrate or less.

**4,423,435**  
**ASSEMBLY OF AN ELECTRONIC DEVICE ON AN**  
**INSULATIVE SUBSTRATE**

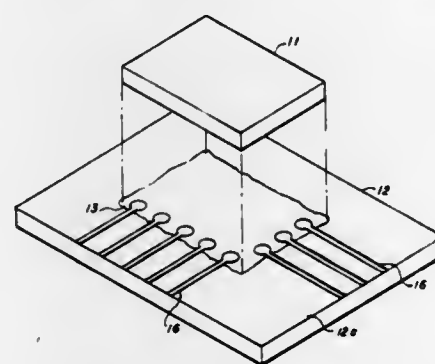
Howard R. Test, II, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1980, Ser. No. 200,740

Int. Cl.<sup>3</sup> H01L 23/48

U.S. Cl. 357-65

10 Claims



1. An electronic device package comprising:

- (a) an insulative substrate having a plurality of electrical conductors on a major surface thereof;
- (b) an electronic device having electrical connector means on a major surface thereof for electrically connecting said electronic device to an external electrical component, said electronic device being mounted on said substrate so that said major surface of said device is in facing relationship with said major surface of said substrate and said electrical connector means is in registration with selected ones of said electrical conductors; and
- (c) a bonding material interposed between said major surfaces for mechanically bonding said electronic device to said substrate, said bonding material further disposed along the perimeter of said electronic device to form a protective seal between said electronic device and said insulative substrate, and said bonding material being substantially electrically conductive only along an axis which is orthogonal to said major surfaces to form an electrically conductive path between said electrical connector means and said electrical conductors.

**4,423,436**  
**IMAGE PICKUP APPARATUS**  
 Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

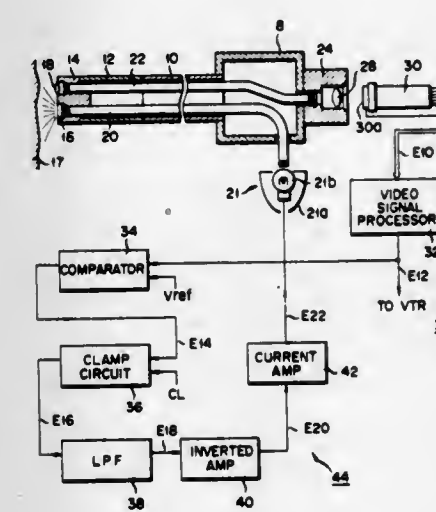
Filed May 4, 1981, Ser. No. 260,299

Claims priority, application Japan, May 9, 1980, 55-61347

Int. Cl.<sup>3</sup> H04N 5/19

U.S. Cl. 358-98

5 Claims



1. An image pickup apparatus which comprises:

- light source means for providing an illumination light;
- an endoscope including illumination means coupled to said light source means for transmitting the illumination light from said light source means to a foreground subject to be illuminated; and image transmission means for sensing an optical image of the foreground subject illuminated by said illumination means and for transmitting the optical image;
- image signal conversion means coupled to said image transmission means of said endoscope for converting the optical image into a video signal;
- clamp means coupled to said image signal conversion means for clamping the black level of said video signal to provide a clamped signal; and
- integrator means coupled to said clamp means and to said light source means for integrating said clamped signal to continuously provide averaged information of said video signal to said light source means to continuously set the amount of illumination light provided by said light source means in accordance with said averaged information;
- said light source means, illumination means, image transmission means, image signal conversion means, clamp means and integrator means jointly comprising an automatic level control loop which is continuously actuated so as to continuously set amount of illumination light in accordance with said averaged information to cause said video signal to be at a substantially constant prescribed level;
- said automatic level control loop further comprising comparator means coupling said image signal conversion means to said clamp means for comparing the level of the video signal with that of a reference potential and for generating an output signal when the video signal reaches a level corresponding to the reference potential; and
- said clamp means clamping said output signal of said comparator means at a prescribed level and at a predetermined timing.

**4,423,437**  
**OPTOELECTRONIC DEVICE FOR VIDEOFREQUENCY**  
**SCANNING OF IMAGES**

Jean L. Beck; Jean F. Le Bars; Yves A. Emmanuelli, and Denis Bargaes, all of Paris, France, assignors to Thomson-CSF, Paris, France

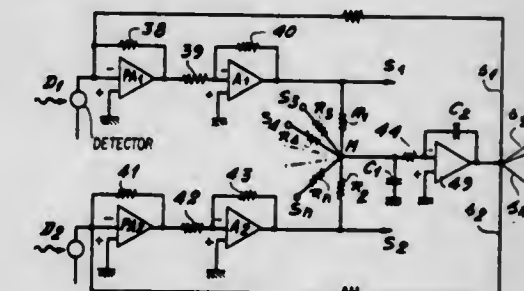
Filed Oct. 14, 1981, Ser. No. 311,407

Claims priority, application France, Oct. 17, 1980, 80 22275

Int. Cl.<sup>3</sup> H04N 7/18

U.S. Cl. 358-113

8 Claims



1. An optoelectronic device for scanning videofrequency images comprising an optical element driven in such a manner as to produce an image scan, an optical element for focusing on a detection system comprising at least one array of detectors, and videofrequency means for processing detailed signals comprising in particular circuits for amplifying the respective detected signals and a correcting unit, wherein each amplifying circuit is connected to the corresponding detector by means of a direct-current coupling and said correcting unit is formed by a so-called occultation device having two states for producing a uniform flux on all the detectors during an initialization stage and in the first state instead of the reception flux corresponding to the videofrequency image and conversely in the second state, and a correction loop comprising:

- a storage memory for storing the values of the signals present at the output of said amplifying circuits when the occultation device is in the first state;
- a first circuit for subtracting respectively said stored values from those present at the output of the respective amplifying circuits in order to compensate for the drift aforesaid;
- a measuring circuit for producing the mean value of the amplified videofrequency signals;
- a second circuit for subtracting said mean value from the signal of each detector.

**4,423,438**  
**PROJECTION TYPE CATHODE RAY TUBE WITH**  
**MASKING MEANS**

Yoshitaka Nakamura, Otsu, Japan, assignor to NEC Kansai, Ltd., Otsu, Japan

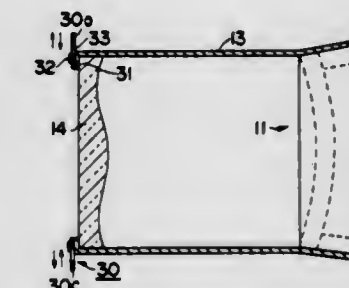
Filed Jan. 11, 1982, Ser. No. 338,205

Claims priority, application Japan, Feb. 26, 1981, 56/27046[U]; Feb. 28, 1981, 56/28668

Int. Cl.<sup>3</sup> H04N 5/74, 9/31

U.S. Cl. 358-231

10 Claims



1. In a projection cathode ray tube including a convex target formed on a face plate, a concave mirror formed on an end plate, said target and said mirror being provided with the same



center of curvature and arrangement to reflect light of an image on said target with said mirror, and a spherical aberration correcting means secured in front of said face plate, the improvement wherein said correcting means comprises a correction lens member for correcting spherical aberration and a masking member in the form of a movable masking ring for removing a reflected light ray by shielding a partial portion of said correction lens member, said movable masking ring having an eccentric aperture and means movably securing said movable masking ring only to a partial predetermined area of said correction lens member so as to improve the resolution of a projected image on a screen.

4,423,439

## FACSIMILE TRANSMITTER

Asao Watanabe, Higashikurume, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

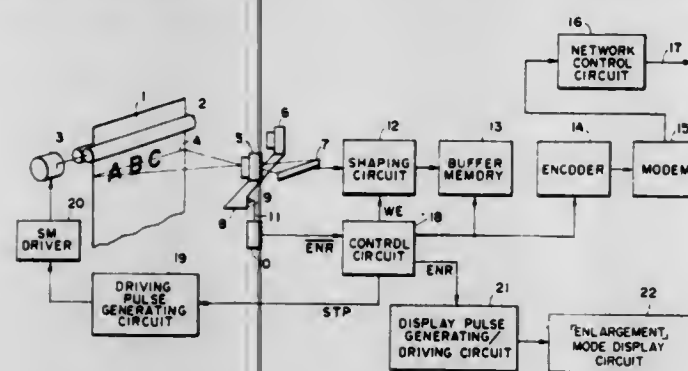
Filed Feb. 18, 1982, Ser. No. 350,060

Claims priority, application Japan, Mar. 3, 1981, 56-29394; Mar. 3, 1981, 56-29395

Int. Cl.<sup>3</sup> H04N 1/24, 1/12

U.S. Cl. 358—287

21 Claims



1. A facsimile transmitter, comprising: image-taking means for scanning image information in an original along a principal scanning direction to convert said information into electric signals; original displacing means for displacing said original in an auxiliary scanning direction substantially perpendicular to said principal scanning direction; image-forming means for focusing an optical image with one of plural image sizes on said image-taking means in order to obtain image signals for an equal-size image or a modified-size image of the information on said original from said image-taking means; image size detecting means for detecting information corresponding to the image size of the optical image focused on said image-taking means upon detection of whether said image-forming means is in one position or is in another position; and control means for controlling the amount of displacement of said original by said original displacing means in response to the detection by said size detecting means.

4,423,440

## CODE SIGNAL READING APPARATUS

Katsuichi Tachi, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 47,765, Jun. 12, 1979, abandoned. This application Sep. 15, 1981, Ser. No. 302,607  
Claims priority, application Japan, Jun. 19, 1978, 53-73979

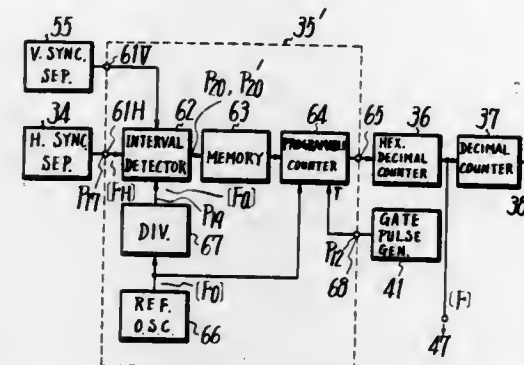
Int. Cl.<sup>3</sup> H04N 5/76

U.S. Cl. 358—335

4 Claims

1. In a code signal reading apparatus for reading a code signal from a video signal reproduced from a recording medium on which said video signal is recorded so as to form one recording track at every field or at every frame with said code signal formed by pulse-modulating a reference clock pulse for indicating an absolute address being inserted in a predetermined interval of a field period, a variable oscillator source

comprising a reference oscillator, a programmable frequency divider connected to the output of said reference oscillator for frequency-dividing the output signal, a time width detector circuit detecting the time width of a specific interval of said reproduced video signal and comprising a first gate receiving horizontal and vertical sync signals, a flip-flop connected to the output of said first gate and producing a pair of out-of-phase signals, a first counter connected to the output of said



4,423,441

## PCM RECORD REPRODUCER

Minoru Ozaki, Amagasaki; Ken Onishi, Kohriyama, and Kunimaro Tanaka, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

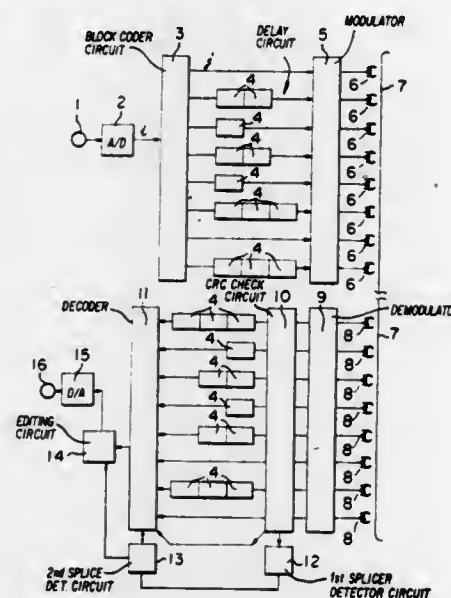
Filed Aug. 28, 1980, Ser. No. 182,055

Claims priority, application Japan, Aug. 30, 1979, 54-111193; Sep. 17, 1979, 54-119525

Int. Cl.<sup>3</sup> G11B 27/02, 5/00

U.S. Cl. 360—13

6 Claims



1. A PCM record reproducer which comprises a coder circuit for forming PCM signals by adding error detection codes to data signals in a predetermined pattern prior to recording on a magnetic tape; a splice detection circuit for determining a splice point of the magnetic tape by finding inconsistency between the detected error detection codes depending upon evaluation of said PCM signals read-out from said magnetic tape in which said PCM signals are recorded; and an editing circuit for editing said PCM signals when the splice point is determined by said splice detector circuit; wherein said coder circuit has a structure for adding two or

more kinds of error detection codes to said data signals; and said splice detector circuit has a structure for determining the splice point of said magnetic tape, at a time indicated by at least one inconsistency of the detected result of two or more kinds of said error detection codes.

4,423,442

## TAPE RECORDER UTILIZING AN INTEGRATED CIRCUIT

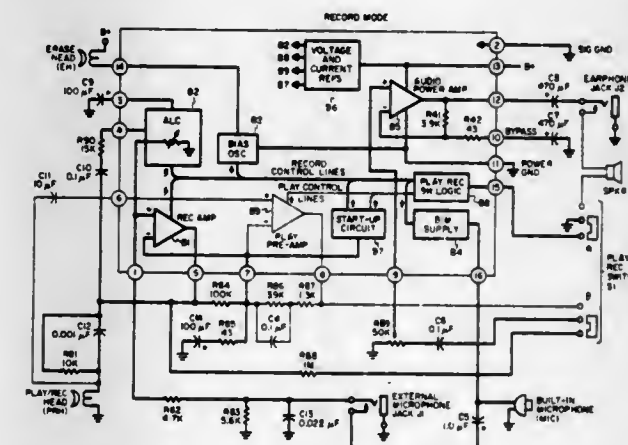
Ricky F. Bitting, N. Syracuse, and Roland M. Marion, Lafayette, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,326

Int. Cl.<sup>3</sup> G11B 5/02

U.S. Cl. 360—68

21 Claims



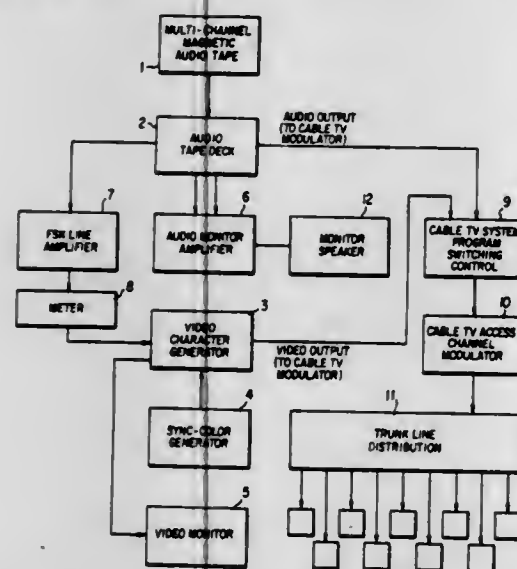


**4,423,444**  
**METHOD FOR RECORDING A MAGNETIC AUDIO TAPE AND APPARATUS FOR GENERATING A TELEVISION SIGNAL FROM THE RECORDED MAGNETIC AUDIO TAPE**

John L. Humphreys, 12048 Greywing Sq., Reston, Va. 22091  
 Filed Jun. 30, 1981, Ser. No. 279,190  
 Int. Cl.<sup>3</sup> G11B 31/00

U.S. Cl. 360—79

9 Claims



1. An apparatus for generating a television signal including a discrete electronic audio signal in synchronization with a discrete electronic video signal comprising:

- a magnetic audio tape having a first track of digital information and a second track of audio information, said first track in synchronization with said second track;
- an audio tape deck means adjacent said tape for reading the first track of digital information and converting the digital information into a corresponding digital electronic signal and for simultaneously reading the second track of audio information and converting the audio information into the discrete electronic audio output; and
- a video character generation means having an input for receiving the digital electronic signal, said video character generation means converting said digital electronic signal into the discrete video signal, said discrete electronic audio output comprising sounds from a human voice and said discrete video signal comprising a visualization in character form of said human voice sounds.

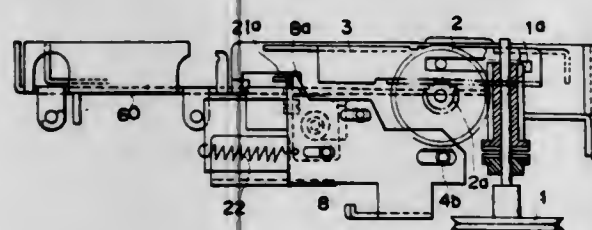
**4,423,445**  
**CLUTCH SYSTEM IN A TAPE PLAYER**

Hiroshi Okada, Kazuki Takai, and Katsumi Yamaguchi, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan  
 Filed May 1, 1981, Ser. No. 259,745

Claims priority, application Japan, May 2, 1980, 55-59858[U]  
 Int. Cl.<sup>3</sup> G11B 5/008

U.S. Cl. 360—96.5

8 Claims



1. A cassette tape playing apparatus, comprising: receiving means for receiving a cassette inserted in said tape playing apparatus; a drive motor; first coupling means for operatively coupling said drive motor to a cassette in said receiving means to effect movement of a tape in the cassette; a tape head supported for movement relative to said receiving means between a first position spaced from a cassette therein and a second

position engaging the tape in a cassette therein; first and second rotors supported for rotation independently of each other about a common axis and supported for relative axial movement between a third position in which said rotors are spaced from each other and a fourth position in which said rotors are located adjacent each other; second coupling means for drivingly coupling said drive motor to said first rotor; cooperating means on said first and second rotors for releasably locking them against relative rotation in said fourth position thereof; an operating member supported for movement between a fifth position and a sixth position; second coupling means operatively coupling said operating member and said tape head for effecting movement of said tape head from said first position to said second position in response to movement of said operating member from said fifth position to said sixth position; first actuating means responsive to said operating member for placing said first and second rotors in said fourth position when said operating member is in said fifth position and in said third position when said operating member is in said sixth position; second actuating means operatively coupling said second rotor to said operating member for effecting movement of said operating member from said fifth position to said sixth position in response to rotation of said second rotor; and switch means for actuating said drive motor in response to insertion of a cassette into said receiving means; whereby when said tape head, said rotors and said operating member are in said first, fourth, and fifth positions, respectively, and a cassette is inserted in said receiving means, said switch means actuates said driving motor which in turn effects rotation of said first and second rotors, causing said operating member to move from said fifth position to said sixth position and to move tape head from said first to said second position, said first actuating means moving said rotors to said third position when said operating member is moved to said sixth position, thereby disengaging said second rotor from said first rotor and drive motor.

**4,423,446**  
**MAGNETIC DATA RECORDING AND READING DEVICE WITH MAGNETIC HEAD POSITIONING MECHANISM**

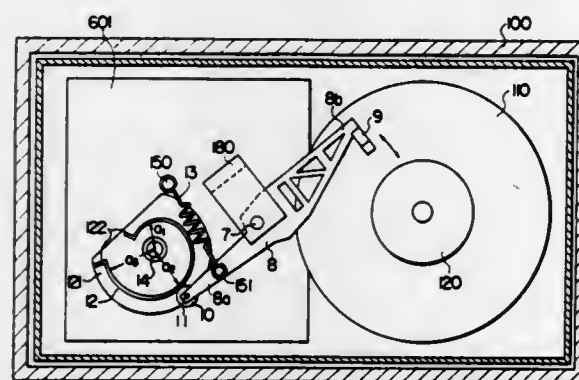
Tuyoshi Takahashi, Odawara; Hiroshi Nishida, Kanagawa, and Toshio Shiono, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,560

Claims priority, application Japan, Mar. 5, 1980, 55-26558  
 Int. Cl.<sup>3</sup> G11B 21/08

U.S. Cl. 360—106

6 Claims



1. A magnetic data recording and reading device for a magnetic disc memory device comprising:

- a magnetic head to be positioned on a magnetic disc for effecting magnetic recording and reading of data, the magnetic disc being arranged to rotate about a first axis;
- a cam rotatable about a second axis which is substantially parallel to said first axis, said cam being provided with a discontinuous spiral outer cam surface terminating in two opposite ends;
- a pivotal arm supporting said magnetic head at one end

thereof and contact means at the opposite end thereof, said contact means being adapted to contact said cam surface; pivot means supporting said pivotal arm at a portion between said one end and said opposite end for pivotal movement of said pivotal arm about a third axis substantially parallel to said first axis; means for biasing said pivotal arm so that said contact means is kept in contact with said cam surface, said contact means being adapted to cooperate with each of the ends of said cam surface for positively limiting excursion of said magnetic head across the magnetic disc; and a motor for rotating said cam about said second axis, whereby rotation of said cam pivotally moves said pivotal arm to thereby move said magnetic head across the magnetic disc.

**4,423,447**  
**HEAD POSITIONING MECHANISM FOR MAGNETIC DISC MEMORY DEVICE**

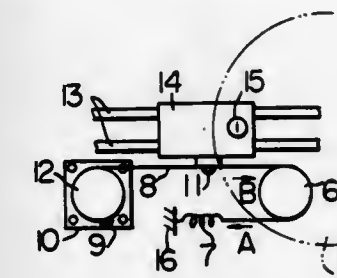
Hiroshi Nishida, Kanagawa; Tuyoshi Takahashi; Toshio Shiono, both of Odawara, and Kiyomitsu Ohtsuka, Atami, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,053

Claims priority, application Japan, Mar. 24, 1980, 55-36108  
 Int. Cl.<sup>3</sup> G11B 5/48, 5/54

U.S. Cl. 360—106

5 Claims



1. A magnetic head positioning mechanism for positioning a magnetic head carried on a carriage at a track on a magnetic disc installed on a base, comprising:

- a carriage for carrying said magnetic head;
- guide rail means for supporting said carriage such that it is rectilinearly movable along said guide rail means;
- a belt partially mounted to said carriage;
- a motor pulley for winding or unwinding a first end portion of said belt;
- a step motor coupled with said motor pulley to drive said motor pulley in forward and reverse directions of rotation;
- a pin fixed to said base in a direction of extension of a second end portion of said belt; and
- pulling means connecting the second end portion of said belt with said pin for applying a rotational torque with a fixed direction to said motor under all conditions in a manner so as to avoid occurrence of an inherent step motor magnetic hysteresis phenomenon, by pulling said first end of said belt in a direction opposite to a winding direction of said motor pulley.

**4,423,448**  
**MULTI-PATH TO DATA FACILITY FOR DISK DRIVE TRANSDUCER ARMS**

Jorgen Frandsen, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 106,847, Dec. 26, 1979, Pat. No. 4,331,990, Division of Ser. No. 85,945, Oct. 18, 1979, abandoned.  
 This application Jun. 4, 1981, Ser. No. 270,653

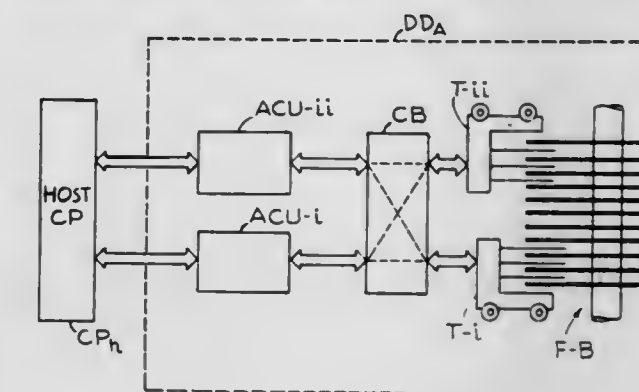
Int. Cl.<sup>3</sup> G11B 5/54, 21/08

U.S. Cl. 360—106

18 Claims

1. An improved disk drive arrangement arranged to be controlled by one or more computer means and including a

disk file, this file being characterized by two or more transducer arrays with each array coupled in a respective electronic data channel to at least part of said computer means via an associated control stage, the improvement therein comprising: cross-bar means coupled between each said transducer means and all of the control stages, and adapted to inter-couple each transducer means with an associated respective control



stage in a first "normal" mode while also being adapted to couple each said transducer means to at least one other control stage in an "emergency mode";

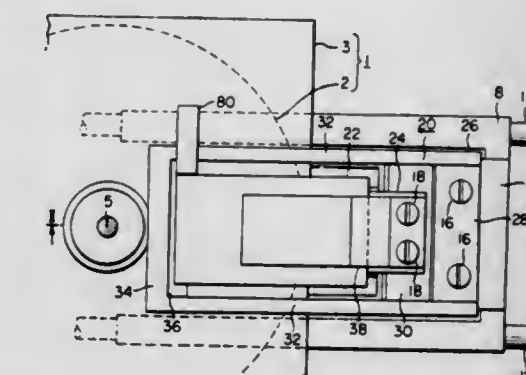
whereby this system is arranged so that if one of the said electronic data channels to the computer means is interrupted it may be reconfigured along an alternate "emergency path" by said cross-bar means, to thus afford a "soft failure" and "alternate path to data" capability in the arrangement.

**4,423,449**  
**MOVABLE MAGNETIC HEAD BLOCK ASSEMBLY FOR A DOUBLE SIDED FLEXIBLE DISK STORAGE DEVICE**

Tadashi Hasegawa, Chigasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
 Filed Aug. 12, 1981, Ser. No. 292,182  
 Claims priority, application Japan, Oct. 9, 1980, 55-141548  
 Int. Cl.<sup>3</sup> G11B 5/54, 5/48

U.S. Cl. 360—106

6 Claims



1. A movable magnetic head block assembly for a double sided flexible magnetic disk storage device comprising:

- an electromagnetic transducer head assembly comprising a pair of mutually opposed magnetic disk contacting surfaces which contact substantially directly opposite portions of the opposite surfaces of said magnetic disk such that a balanced tracking pressure is brought to bear on each side of the disk, at least one of said contacting surfaces including an electromagnetic transducer head operative with the magnetic disk on the adjacent side;
- at least one retractable support arm assembly for respectively retractably supporting said at least one contacting surface including the electromagnetic transducer head, said support arm assembly including a support arm on which said head is resiliently mounted, an anchor member having sufficient rigidity to resist plastic deformation, and flexible leaf spring means mechanically rigidly fixed at one end to said support arm and at the other end to said anchor



member for causing said support arm to be normally urged in the direction towards the surface of said magnetic disk and to be retractable against the pressure of said leaf spring means about a point of flexure in said leaf spring means;

a rigid carriage means movable in a radial direction with respect to said magnetic disk and having a fixed stop thereon against which said support arm abuts when urged towards the surface of said magnetic disk;

said anchor member of said at least one support arm assembly being a separate member from said carriage; and means mechanically rigidly securing said anchor member to said carriage and releasable for permitting adjustment of said anchor member relative to said carriage, whereby the position of the contacting surface supported on said support arm can be adjusted and set at least prior to mechanically rigidly securing said anchor means to said carriage, by adjusting the position of the assembled support arm assembly in relation to the carriage.

4,423,450

# MAGNETIC HEAD AND MULTITRACK TRANSDUCER FOR PERPENDICULAR RECORDING AND METHOD FOR FABRICATING

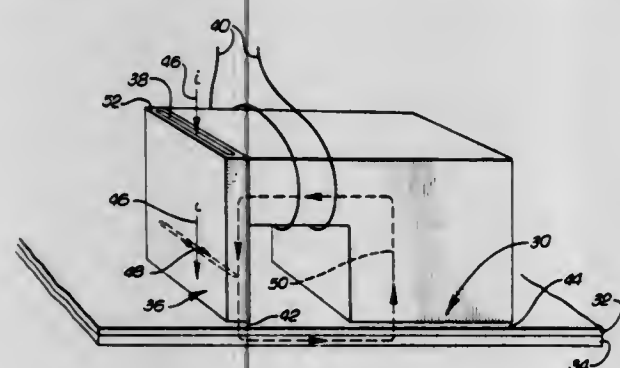
Harold J. Hamilton, Sylmar, Calif., assignor to Censtor Corporation, San Jose, Calif.

Filed May 6, 1981, Ser. No. 260,899

Int. Cl.<sup>3</sup> G11B 5/20

U.S. Cl. 360—111

37 Claims



1. A transducer in cooperative relationship with a magnetic media for writing thereof and reading therefrom comprising: a magnetic path constructed for perpendicular recording and reproduction on and from the magnetic media, said magnetic path being constructed of a magnetic material having a high permeability and a low reluctance which facilitates the efficient passage of magnetic flux through said magnetic path, and

a flux gate means coupled to said magnetic path for selectively creating a magnetic field in said magnetic path during either reading or writing which in effect increases the reluctance of the magnetic path to prevent the effective passage of magnetic flux therethrough whereby said magnetic path for perpendicular recording and reproduction can be closed and opened.

4,423,451

# THIN FILM MAGNETIC HEAD HAVING DISPARATE POLES FOR PULSE ASYMMETRY COMPENSATION

Chao S. Chi, Shrewsbury, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,208

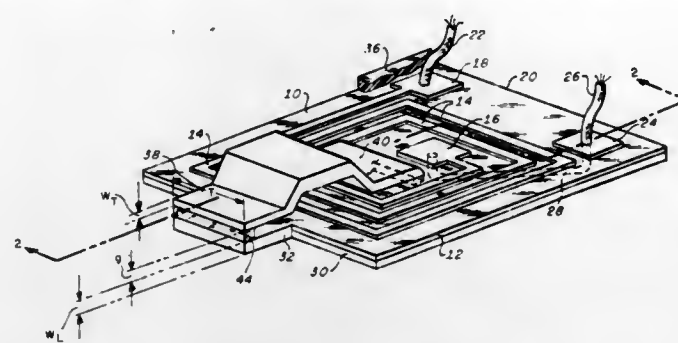
Int. Cl.<sup>3</sup> G11B 5/12, 5/27, 5/28, 5/30

U.S. Cl. 360—125

8 Claims

1. A thin film transducer for magnetically recording on a recording medium, comprising a substrate of soft magnetic material, said substrate further comprising first and second thin-film non-saturated pole members, spaced apart from each other to define a gap therebetween and coupled to inductive coil means for magnetically coupling a signal to said pole

members, each pole member having a surface, in use, disposed adjacent said recording medium, said pole surfaces having a spatial disparity with respect to each other and with respect to



said recording medium, so constructed and arranged to substantially compensate for nonlinear recording properties of said medium.

4,423,452

# MAGNETIC RECORDING MEDIUM

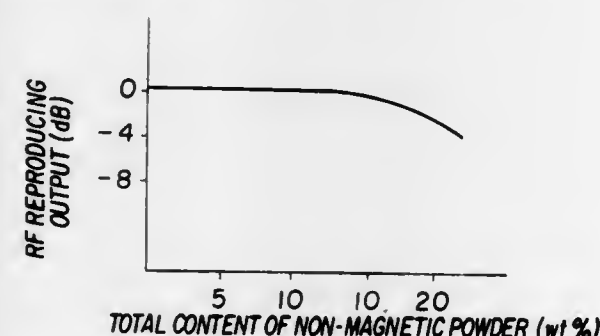
Norifumi Kajimoto, Yoshio Kawakami, and Kinji Sasaki, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,397

Int. Cl.<sup>3</sup> G11B 5/62

U.S. Cl. 360—131

5 Claims



1. A magnetic recording medium which comprises a substrate coated with a magnetic layer comprising a magnetic powder and a fine titanium oxide powder having a particle diameter of at least 0.4μ and at least one other fine hard non-magnetic powder.

4,423,453

# MAGNETIC RECORDING MEDIUM

Hiroshi Kawahara, Hitoshi Azegami, and Eiji Horigome, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

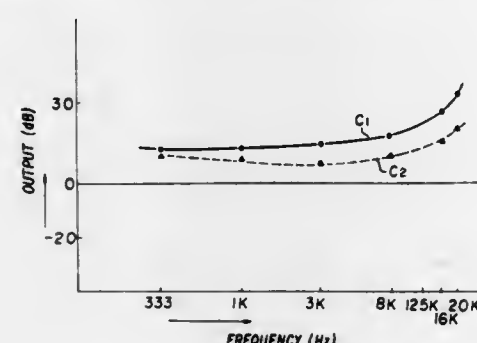
Filed Jul. 13, 1981, Ser. No. 283,099

Claims priority, application Japan, Jul. 31, 1980, 55-105657

Int. Cl.<sup>3</sup> G11B 23/00; B32B 7/02

U.S. Cl. 360—131

2 Claims



1. In a magnetic recording medium having two coated mag-

netic layers of a first magnetic layer and a second magnetic layer on a non-magnetic substrate, an improvement characterized in that said first magnetic layer has a coercive force of 400 to 590 Oe and a thickness of 2.1 to 2.8μ and said second magnetic layer has a coercive force of 590 to 800 Oe and a thickness of at least 2.1μ.

4,423,454

# MAGNETIC RECORDING DISK

Peter Felleisen, Lampertheim; Dieter Mayer, Ludwigshafen; Eberhard Koester, Frankenthal; Friedrich Domas, Altlusheim, and Paul Deigner, Willstaett, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

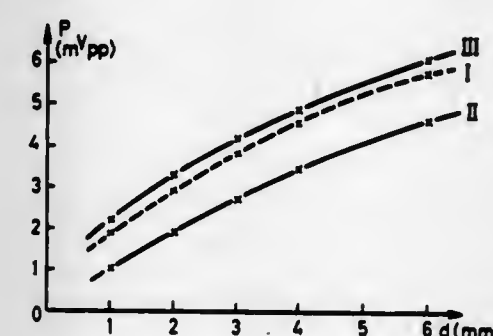
Filed Jun. 26, 1980, Ser. No. 163,400

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928096

Int. Cl.<sup>3</sup> G11B 5/70, 5/82

U.S. Cl. 360—135

3 Claims



1. A magnetic recording disk comprising a non-magnetic substrate and at least two firmly adhering magnetizable layers applied to one or both sides thereof, wherein the layer located directly on the substrate is magnetically isotropic and exhibits a random orientation with no magnetic preferred direction, whilst the second layer exhibits orientation of the anisotropic magnetic particles parallel to the substrate and parallel to the envisaged recording direction, such that relatively low frequency signals are magnetically, longitudinally stored predominantly within the isotropic layer whereas relatively high frequency signals are magnetically, longitudinally stored predominantly within the anisotropic layer.

4,423,455

# TAPE COUNTER FOR MULTISPEED TAPE RECORDER/PLAYER

Norio Fukuoka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 290,875

Claims priority, application Japan, Aug. 22, 1980, 55-118772[U]

Int. Cl.<sup>3</sup> G11B 27/34

U.S. Cl. 360—137

8 Claims

1. A tape counter for a multispeed tape recorder/player, comprising:

tape transport means for transporting a tape at at least two different tape speeds;

tape speed selecting means coupled to said tape transport means for selecting one of said at least two different tape speeds;

tape running detecting means coupled to said tape transport means and to said tape speed selecting means for providing count signals with the running of said tape, the frequency of said count signals being changed at a rate corresponding to a tape speed selected by said tape speed selecting means, whereby the repetitive number of said count signals supplied during a time period that said tape runs for a given period of time is substantially constant irrespective of the tape speed selected by said tape speed selecting means;

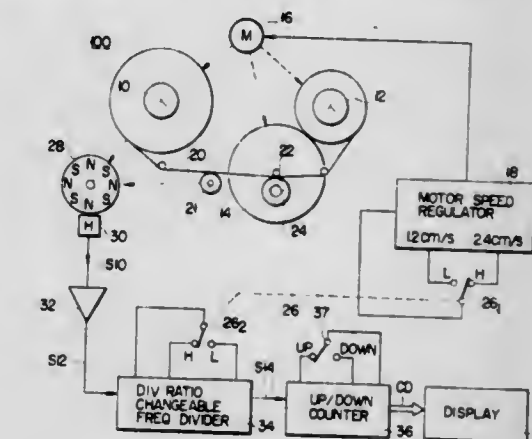
said tape running detecting means including:

a detector for generating first signals indicating the running of said tape;

a variable frequency converter coupled to said detector, for frequency converting said first signals;

one of at least two given frequency converting rates for thereby providing said count signals; and

a converting ratio designating switch coupled to said tape



speed selecting means and to said frequency converter for designating one of said given frequency converting rates of said frequency converter responsive to the tape speed selected by said tape speed selecting means;

counter means coupled to said frequency converter of said tape running detecting means for counting said count signals to provide count data; and

display means coupled to said counter means for displaying information corresponding to said count data.

4,423,456

# BATTERY REVERSAL PROTECTION

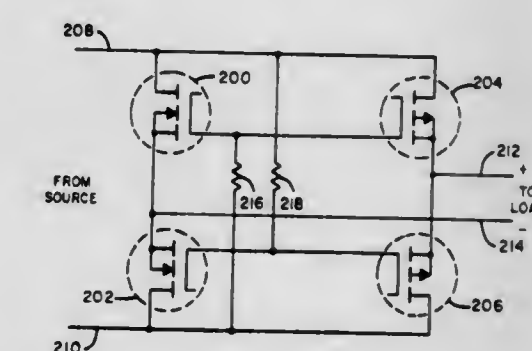
Gary A. Zaidenweber, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 13, 1981, Ser. No. 321,037

Int. Cl.<sup>3</sup> H02H 9/00

U.S. Cl. 361—77

1 Claim



1. A polarity reversal protection circuit connectable between a pair of source lines and a pair of load lines comprising: first and second field-effect transistors of a first channel type having their source-drain paths connected in series across said source lines; and,

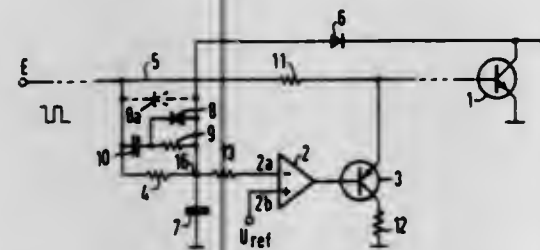
third and fourth field-effect transistors of a second channel type having their source-drain paths connected in series across said source lines and in parallel with the source-drain paths of said first and second transistors; and,

wherein the gate electrodes of said first and third transistors are directly coupled together and to only one of said source lines and the gate electrodes of said second and fourth transistors are directly coupled together and to only the other of said source lines; and,

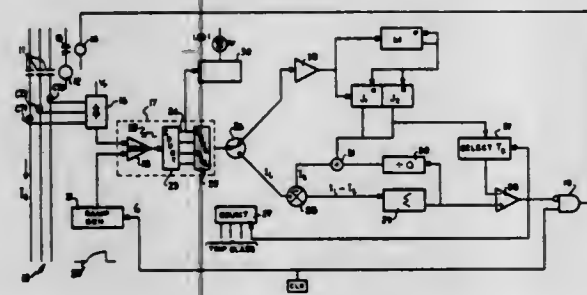
one of said load lines is connected to the junction point of the drains of said first and second transistors; and,



## 2 Claims

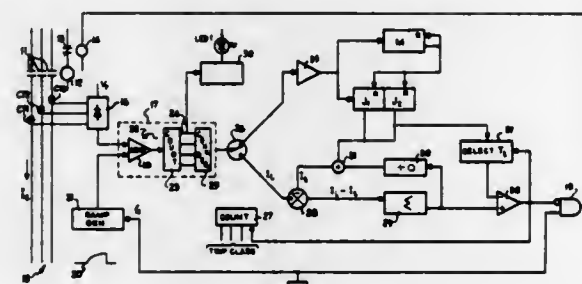


## 20 Claims



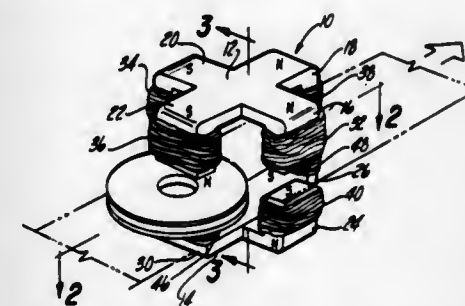
a plurality of current transformer means for producing cur-

## 11 Claims

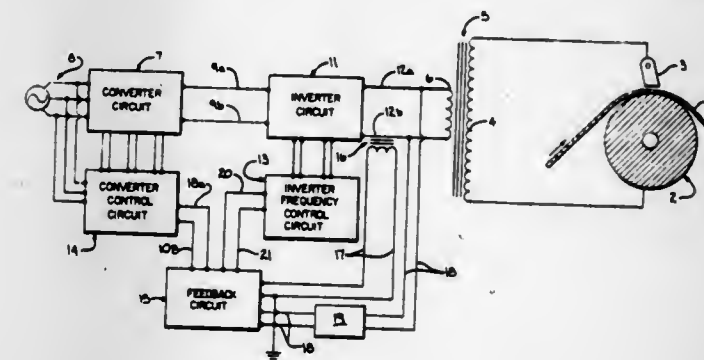


**trip signal means for producing a trip signal when the value of the accumulated signals attains a TRIP threshold value.**

## 9 Claims

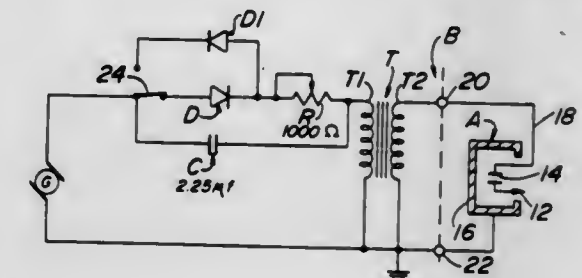


#### 4 Claims

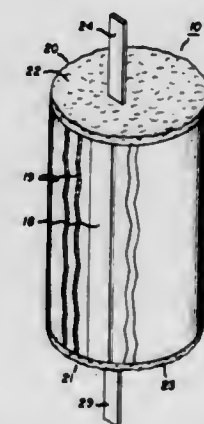


voltage and current supplied to the corona treatment system and being operable in response thereto to generate

## 11 Claims



### 8 Claims



1. In an electrical capacitor comprising an array of dielectric strips with metallized electrodes thereon, said strips being arranged in contiguous layer relationship with alternate metal electrodes and dielectric layers, said strips having a predetermined length and arranged in offset relationship so that alternate metallized layers are evenly exposed at each end of the array, and a resistor positioned adjacent a dielectric strip in layer relationship thereto with the ends of said resistor extending at least to about the ends of said array, and a scooped metal layer at each end of said array to simultaneously connect



one end of said resistor and one electrode of said capacitor at each end of said array.

#### 4,423,464 VARIABLE CAPACITANCE TYPE PUSH-BUTTON SWITCH

Ryutaro Tamura, and Yasushi Endo, both of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

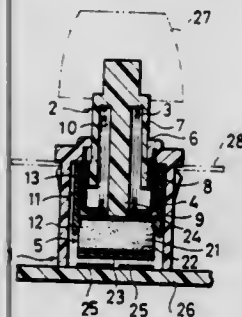
Filed Apr. 13, 1981, Ser. No. 253,588

Claims priority, application Japan, Apr. 16, 1980, 55-49826

Int. Cl.<sup>3</sup> H01G 5/01

U.S. Cl. 361—288

13 Claims



1. In a variable capacitance type push-button switch comprising a case made of an insulating material; an insulating substrate held to said case and carrying stationary electrodes; a key stem movable vertically within said case; and a movable member carried by the lower end of said key stem; the improvement wherein said movable member includes a holding member made of an elastic material of high compressibility and having a lower surface substantially convex in section, a movable electrode made of an electrically conductive and flexible material held to said lower surface of said holding member, and a dielectric film carried by said movable electrode and comprised of a synthetic resin of a fluoride type having a relative permittivity of at least eight; and means for depressing said key stem to bring said movable member into engagement with said substrate to deform said lower surface into a more planar configuration and press said dielectric film into pressed contact with said stationary electrodes.

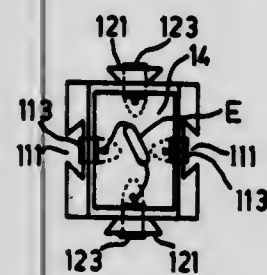
4,423,465  
COMBINATION ELECTRONIC CIRCUIT ELEMENT WITH MULTIDIRECTIONALLY ADJUSTABLE JOINTS  
Weng Teng-Ching, 2nd Fl., No. 13, Alley 3, La. 103, Hsiu Feng St., Chung Ho City, Taipei Hsien, and Yang Chi-Ming, 3rd Fl., No. 5, La. 29, Fu Hsing Rd., Hsin Tien City, Taipei Hsien, both of Taiwan

Filed Sep. 30, 1981, Ser. No. 307,310

Int. Cl.<sup>3</sup> H05K 7/10

U.S. Cl. 361—394

2 Claims



1. A circuit kit comprising a plurality of interconnectible circuit elements, each element comprising a hollow cube formed of plastic and defining six sides which comprise three pairs of mutually opposite sides, a first of said pairs of sides each having a recess with a narrow opening and a wide bottom and being open-ended, a second of said pairs of sides each having a projection of reverse cone-shape extending outwardly from the center of said second pair of sides such that an outer end of said projection is of larger diameter than an inner end thereof, a third of said pairs of sides each having a remov-

able cover providing access to the interior of said element, a first metal contact plate disposed along said bottom of each of said recesses and including prong means extending into the interior of said element, a second metal contact plate disposed on said outer end of said projection and including prong means extending into the interior of said element, and electrical component means disposed within the interior of said element and electrically connected to said prong means of said first and second metal plates, said projections being sized for slidable endwise insertion into said open-ended recesses of another said element to make electrical contact between said first and second metal plates of said recess and said projection, said reverse cone-shaped projection and said recess being relatively rotatable about the longitudinal axis of said reverse cone-shaped projection to enable said elements to be mutually adjusted while in an interconnected condition.

#### 4,423,466 SUPPORTS FOR TELEPHONE JACKS AND CIRCUIT BOARDS INCORPORATING SUCH SUPPORTS

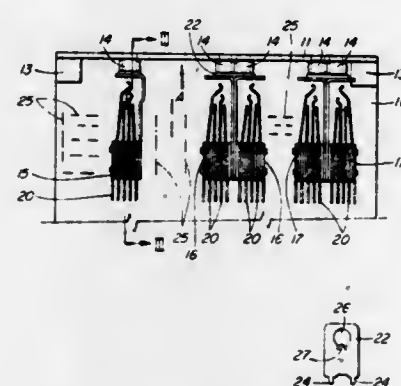
Roger Beun, Dunrobin, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 8, 1982, Ser. No. 356,199

Int. Cl.<sup>3</sup> H05K 7/02

U.S. Cl. 361—400

11 Claims



1. A support for supporting a front end of an electrical jack on a circuit board, comprising:  
a thin, flat, plate-like metal member having at least one aperture thereon, the aperture of a dimension to be a sliding fit on a tubular extension at the front end of a jack;  
a deformable tongue extending radially inward into said aperture;  
at least two legs extending from a lower edge of the plate-like member, said legs positioned for passage through holes in the circuit board.

#### 4,423,467 CONNECTION ARRAY FOR INTERCONNECTING HERMETIC CHIP CARRIERS TO PRINTED CIRCUIT BOARDS USING PLATED-UP PILLARS

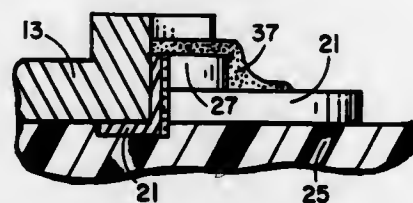
Joseph M. Shaheen, La Habra, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 15, 1980, Ser. No. 216,745

Int. Cl.<sup>3</sup> H05K 1/18

U.S. Cl. 361—403

2 Claims



1. A connection array for establishing a plurality of electrical connections between circuit pads of a circuit board support and contacts of a hermetically sealed chip carrier housing wherein said contacts comprise semicircular vertical indenta-

tions in the housing horizontal edge periphery, each indentation having a conductive layer therein, comprising, in combination:

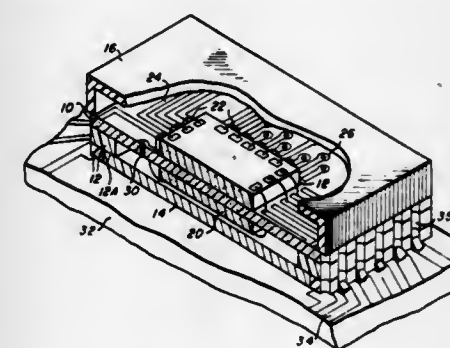
a plurality of pillars extending vertically above said circuit board support in an array respectively corresponding to said indentations;  
said pillars being carried by different pads of said support, respectively;  
said pillars having horizontal dimensions to permit entry partly into said indentations and collectively to position and mechanically locate said chip carrier housing;  
solder between said pillars and said conductive layers establishing electrical connections therebetween free of shear stress as a result of different coefficients of expansion of the circuit board and chip carrier housing; and,  
said solder being visible in said indentations and externally of said pillars for inspection and cleaning.

4,423,468  
DUAL ELECTRONIC COMPONENT ASSEMBLY  
Donald F. Gatto, Sunrise, and Juan Milcunas, Ft. Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.  
Continuation of Ser. No. 192,590, Oct. 1, 1980, abandoned. This application May 4, 1982, Ser. No. 374,667

Int. Cl.<sup>3</sup> H05K 7/06, 1/14

U.S. Cl. 361—404

2 Claims



1. An electronic circuit assembly comprising:  
an insulating base member having a plurality of through-holes adjacent a central area;  
a first plurality of conductive areas on at least one major surface of the base member and each extending from adjacent the perimeter of said central area to an edge of the member;  
a second plurality of conductive areas each extending from the perimeter of said central area on one major surface of the base member to and through one of said through-holes to the perimeter of the central area on the other of the major surfaces;  
a first semiconductor component affixed to the central area on one major surface of the base member and including conductive portions;  
a second semiconductor component affixed to the central area on the other major surface of the base member and including conductive portions;  
wire bonds for connecting the conductive portions of the first and second semiconductor components to conductive areas on the respective major surfaces of the base member;  
an insulating frame member having a bottom side attached to one major surface of the base member and having essentially the same outer dimensions, having a central aperture dimensioned to expose the first semiconductor component and the associated wire bonds;  
a third plurality of conductive areas on the edges of the insulating members and adapted to couple to ones of the first plurality of conductive areas, each of the third plurality of areas extending onto the top side of the frame member;  
a first insulating cover means sealingly attached to the second surface of the base member and having a central

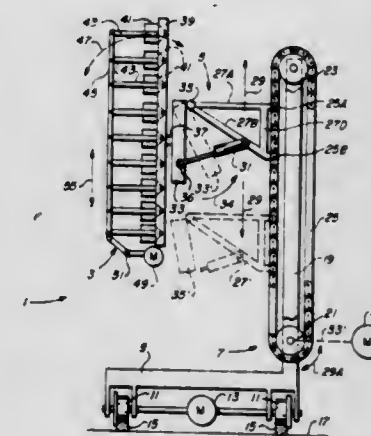
recess for enclosing the second semiconductor component and the wire bonds attached thereto; and  
a second cover means dimensioned to be sealingly attached within a portion of the central aperture of the frame member.

4,423,469  
SOLAR SIMULATOR AND METHOD  
Gene A. Zerlaut; William T. Dokos; William J. Putman, all of Phoenix, and Russell K. Skousen, Chandler, all of Ariz., assignors to DSET Laboratories, Inc., Phoenix, Ariz.  
Filed Jul. 21, 1981, Ser. No. 285,493

Int. Cl.<sup>3</sup> F21V 9/02

U.S. Cl. 362—2

13 Claims



1. A solar simulator for producing a radiation spectrum that is similar to the solar spectrum, said solar simulator comprising in combination:

(a) a plurality of spaced solar lamps that each produce a spectrum similar to the solar spectrum, each of said solar lamps having a direction axis along which light emitted by that solar lamp travels;  
(b) an array frame for supporting said plurality of solar lamps, said solar lamps being arranged to form a lamp array;  
(c) a plurality of lamp support means pivotally connected to said array frame for supporting said plurality of lamps in a plurality of predetermined orientations relative to a plane of said array frame;  
(d) lamp orientation maintaining means connected to said lamp support means for controllably, continually maintaining the orientations of said lamps so that the direction axes of said respective lamps are parallel to each other;  
(e) array frame support means pivotally connected to said array frame for supporting said array frame in a predetermined orientation so that the plane of said array frame is parallel to a light-receiving surface of an object to be tested;  
(f) vertical positioning means for raising said lamp array to a predetermined elevation relative to said object; and  
(g) horizontal positioning means for horizontally moving said lamp array to a predetermined lateral position relative to said object,  
said predetermined elevation, said predetermined lateral position, and said plurality of predetermined orientations having values that cause the intensity of light received from said lamps on the surface of said object to be uniform, to have a predetermined intensity, and to have a predetermined angle of incidence to the surface of said object.



4,423,470

**LENS BARREL SUITABLE FOR FLASH PHOTOGRAPHY**  
Hideshi Naito, Tokyo; Hideyo Nozawa, Ohmiya, and Kazuyuki Kazami, Tokyo, all of Japan, assignors to Nippon Kogaku K. K., Japan

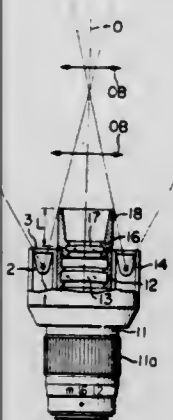
Filed Aug. 26, 1981, Ser. No. 296,323

Claims priority, application Japan, Aug. 29, 1980, 55/121798[U]

Int. Cl.<sup>3</sup> G03B 15/02

U.S. Cl. 362—17

5 Claims



1. In an apparatus including, in combination, a lens barrel having photographic lens means and a stop, and flashlight-emitting means which is mounted at an outer peripheral portion of said lens barrel and produces flashlight for illuminating a subject to be photographed, the improvement for very proximate photography in which the subject is positioned at a short film-to-subject distance and is illuminated by said flashlight to effect phototaking via said lens barrel, comprising:

light-intercepting means for intercepting a part of the flashlight emitted from said flashlight-emitting means and directed to the optical axis of said lens means, the light-intercepting means being positioned so as to enlarge an area that provides little illumination by said flashlight of said subject to be photographed, the area being defined by both said lens barrel and the illumination pattern of said flashlight; said light-intercepting means being interposed in the path of the flashlight so that it is effective during said very proximate photography.

4,423,471

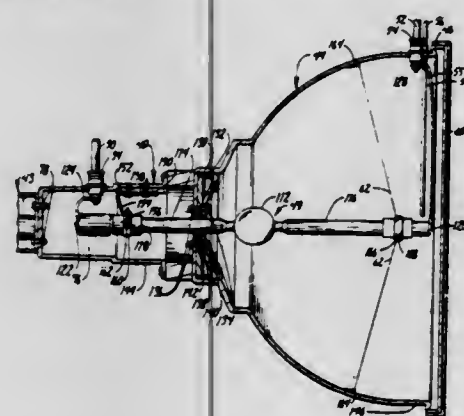
**MOBILE LIGHTING FIXTURE, METHOD AND BOOM**  
Myron K. Gordis; James L. Drost, both of Oskaloosa, and Bryan L. Mydosh, Given, all of Iowa, assignors to Mycro-Group Company, Oskaloosa, Iowa

Filed Sep. 15, 1982, Ser. No. 418,452

Int. Cl.<sup>3</sup> F21V 33/00

U.S. Cl. 362—96

16 Claims



1. A lighting fixture, comprising:

(a) a hemispherical hollow reflector having a rear apex end and a front end;

(b) a socket having one open end for reception of a lamp,

said socket being connected to said apex end of said reflector;

(c) a high wattage metal halide arc lamp, having front and rear ends, with said rear end being received in said open end of said socket;

(d) a vertically and horizontally adjustable mounting elbow attached to one end of said socket, and also attached to a fixture holder,

(e) said lamp being positioned longitudinally along the axis of said socket for maximum beam reflection efficiency;

(f) shock dampening mounting means to mount said lamp in said socket and

(g) a pressurized air system associated with said fixture for cooling the first and second ends of said lamp during operation.

4,423,472

**PORTABLE BARGE LIGHTS**

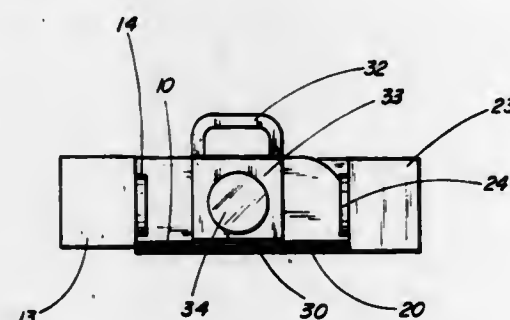
Raymond H. Duthu, P.O. Box 1007, Marrero, La. 70072

Filed Jun. 14, 1982, Ser. No. 388,496

Int. Cl.<sup>3</sup> F21V 21/00

U.S. Cl. 362—184

10 Claims



1. A three unit portable navigation light system for a marine vessel, comprising:

a totally self-contained port sidelight having a portable power source, an associated lamp, and an enclosure having a bottom edge and two side edges housing said power source and said associated lamp, at least one activating means associated with said lamp for switching said lamp, a red lens mounted on said enclosure over said lamp, a base extending horizontally out from the bottom edge of the side of said enclosure and away from the surface of said enclosure on which is mounted said lens, a screen extending from a side edge of said enclosure perpendicular to said base and fixedly attached to the edge of said base and extending out away from the surface of said enclosure on which is mounted said lens, a carrying handle attached to said screen and a securing means attached to said base for removably securing the base to the marine vessel;

a totally self-contained starboard sidelight, said port and said starboard sidelights being removably nestable together one upon the base of the other, said starboard sidelight having a portable power source, an associated lamp, and an enclosure having a bottom edge and two side edges housing said power source and said associated lamp, at least one activating means associated with said lamp for switching said lamp, a green lens mounted on said enclosure over said lamp, a base extending horizontally out from the bottom edge of the side of said enclosure on which is mounted said lens, a screen extending from a side edge of said enclosure perpendicular to said base and fixedly attached to the edge of said base and extending out away from the surface of said enclosure on which is mounted said lens, a carrying handle attached to said screen and coinciding in position to the handle on said port sidelight when said sidelights are nested together, and securing means attached to said base for removably securing the base to the marine vessel; and

a totally self-contained yellow light removably nestable upon the base of one of said sidelights, said yellow light

having a portable power source, an associated lamp, and an enclosure having a bottom edge and two side edges housing said power source and said associated lamp, at least one activating means for switching said lamp, a yellow lens mounted on said enclosure over said lamp, a base extending horizontally out from the bottom edge of the side of said enclosure and extending out away from the surface on which is mounted said lens, two, opposed screens extending from the side edges of said enclosure perpendicular to said base and fixedly attached to the side edges of said base and extending out away from the surface of said enclosure on which is mounted said lens, a carrying handle attached to said enclosure and coinciding in position to the handles on said port and starboard sidelights when the three lights are nested together, and securing means attached to said base for removably securing the base to the marine vessel.

4,423,473

**SAFETY LIGHT OR THE LIKE**

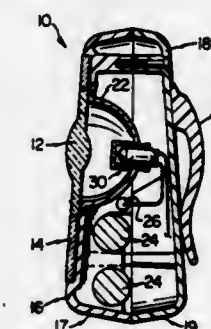
J. Darrell Kirkley, Dallas, Tex., assignor to Jog-O-Lite, Inc., Dallas, Tex.

Filed Sep. 29, 1982, Ser. No. 428,112

Int. Cl.<sup>3</sup> F21L 7/00

U.S. Cl. 362—186

13 Claims



1. A safety light for athletes or the like to be recognized by oncoming vehicles comprising:

(a) housing including a first lens member disposed therein and adapted to contain battery means;

(b) light generating means contained within said housing for generating intermittent bursts of light;

(c) first reflector means located within said housing and positioned for directing light generated by said light generating means through said first lens member; and,

(d) second reflector means mounted on the outer surface of said housing for reflecting light from oncoming vehicles.

4,423,474

**MINE LAMP**

Martin Hamacher, Westerholter Str. 791, 4352 Herten, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,421

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007972

Int. Cl.<sup>3</sup> F21S 3/00; F21V 15/00, 17/00

U.S. Cl. 362—223

12 Claims

1. A lamp comprising:

a support;

a flat base plate having an outer edge and a forwardly directed face, said outer edge being formed with an annular abutment surface lying in a plane generally parallel to and offset backwardly from said face and an annular outwardly directed guide surface inclined at an obtuse angle to said abutment surface;

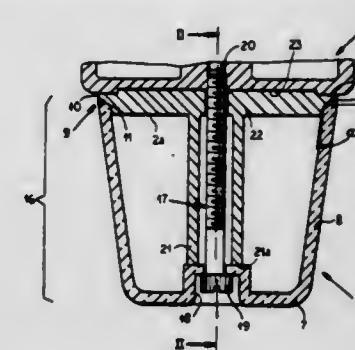
a light tube;

means for releasably supporting said tube on said base plate within said edge and in front of said face;

a concave, at least partially transparent, and at least limitedly elastically deformable cover having an end wall generally parallel to and offset forwardly of said face and a continu-

ous annular side wall extending backwardly from and at said obtuse angle to said end wall and having an annular rear edge formed with an annular and generally planar surface engaging backwardly against said abutment surface and an annular retaining surface engaging inwardly against said guide surface;

means including interengaging formations on said retaining



and guide surfaces for elastically retaining said cover in place on said base plate with said rear edge in annular all-around contact with said outer edge; and means for releasably securing said plate to said support with said face directed forwardly away from said support and including at least one screw having a head bearing against said cover at said end wall thereof and a shank passing through said base plate and threaded into said support.

4,423,475

**MULTI-CHAMBER LAMP FOR VEHICLES**

Richard Bürtl, Lippstadt, Fed. Rep. of Germany, assignor to Westfälische Metall Industrie KG Hueck &amp; Co., Lippstadt, Fed. Rep. of Germany

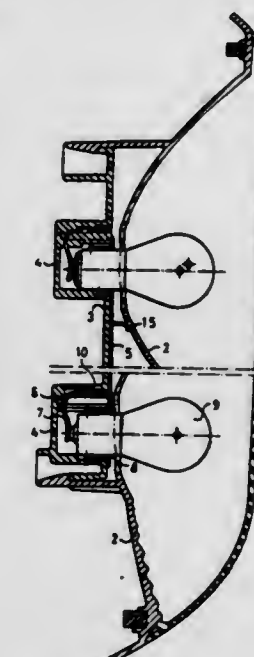
Filed Feb. 12, 1982, Ser. No. 348,394

Claims priority, application European Pat. Off., Mar. 19, 1981, 81102053.6

Int. Cl.<sup>3</sup> F21V 21/00

U.S. Cl. 362—249

2 Claims



1. Multi-compartment lamp for vehicles comprising; a one-piece sheet-metal lamp holder; sockets having openings for bulbs and having bodies surrounding a base and molded in one-piece with the holder or reflector body or with a rear-beam mask; at least one nominal expansion site comprising a punched-out U-shaped path between the sockets, said sockets being widely separated; said U-shaped path having two parallel legs oriented along the direction of the desired lamp-holder expansion; said legs having a connecting area therebetween



which is bent out of the plane of the lamp holder at an angle of substantially 90°, said expansion site being formed by a path being bent around an edge dependent on the strength of the sheet metal so that widening of the path increasing negligibly bending moment arising in adjustment of distance between openings for bulbs in the lamp holder, said expansion site having a substantially large cross-section relative to substantially low bending moment.

4,423,476

### D.C. BLOCKING OSCILLATOR CHARGING DEVICE FOR ELECTRIC VEHICLES

Erhard Neumann, Rudersberg-Schleithach, Fed. Rep. of Germany, assignor to Deutsche Automobilgesellschaft mbH, Fed. Rep. of Germany

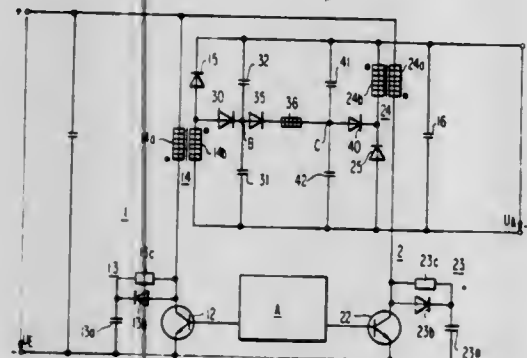
Filed Mar. 12, 1981, Ser. No. 243,197

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009359

Int. Cl.<sup>3</sup> H02M 3/335

U.S. Cl. 363—20

12 Claims



1. A charging device, particularly a vehicle-bound charging device for charging the traction batteries of an electric vehicle from the a.c. current mains comprising:

a converter module;

comprising at least two d.c. blocking converters, each converter including a controlled power transistor, a cutoff relief circuit, and a power transformer, wherein the secondary winding is connected in series with a rectifier diode, and a smoothing capacitor is connected in parallel to this series circuit,

the power transistors of each converter are activated by a control circuit in the push-pull mode with a phase shift of 180°, and

the parallel-connected secondary sides of the two blocking converters are connected in such a way that the one secondary winding, on the one hand, is connected to the negative output terminal and, on the other hand, via the one rectifier diode to the positive output terminal;

the other secondary winding is connected, on the one hand, to the positive output terminal and, on the other hand, via the other rectifier diode to the negative output terminal; a first diode is connected as the relief circuit on the secondary side from the junction point of the one secondary winding with the one rectifier diode to a first point, from the latter a second diode is connected in series with a choke to a second point, and from the latter a third diode is connected to the junction point of the other secondary winding with the other rectifier diode,

wherein all diodes on the secondary side are poled in such a way that they are current-conductive away from one secondary winding and/or toward the other secondary winding, and

wherein respectively one capacitor is connected between said first point and the positive output terminal and between said second point and the negative output terminal; and that a smoothing capacitor common to all is provided between the output terminals.

### 4,423,477 RECTIFIER CONTROLLER

George P. Gurr, Dunwoody, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Continuation of Ser. No. 54,025, Jul. 2, 1979, Pat. No. 4,346,432.

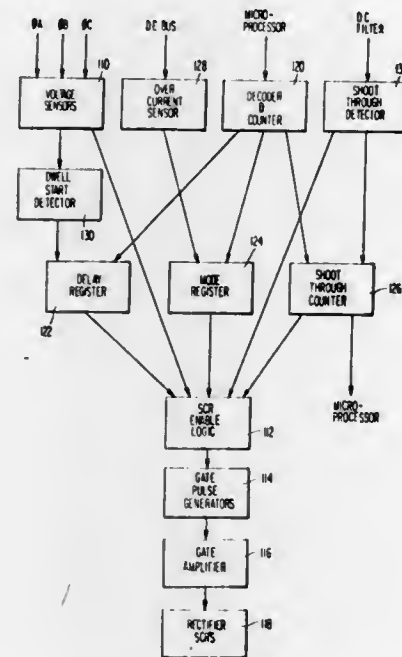
This application Jan. 4, 1982, Ser. No. 336,833

The portion of the term of this patent subsequent to Aug. 24, 1997, has been disclaimed.

Int. Cl.<sup>3</sup> H02H 7/127; H02P 13/24

U.S. Cl. 363—54

17 Claims



1. A controller for a rectifier of first, second and third phase alternating current voltage signals for supplying a controlled direct current voltage to a load, said rectifier including three pairs of solid state gate controlled rectifying devices connected in a bridge configuration to a common output bus, each of said pair of devices connected to receive one of said first, second or third phase voltage signals to rectify both the positive half and negative half of the respective applied voltage signal, which comprises:

means for detecting comprising voltage detection means for receiving said first, second and third voltage signals and for providing outputs when respective ones of said voltage signals are greater than ones of the other said voltage signals; and

means for providing gate control signals comprising logic means responsive to comparator means responsive to said voltage signals for generating a dwell output signal each time any pair of said voltage signals is equal, and responsive to said outputs for providing a first set of gate control signals for indicating which of said voltage signals are most positive at any point in time and for providing a second set of gate control signals for indicating which of said voltage signals are most negative at any point in time, said first set of gate control signals connected to be applied to the gates of one of said devices in each pair, and said second set of gate control signals connected to be applied to the gates of the other of said devices in each pair.

4,423,478

### PHASE CONTROLLED REGULATED POWER SUPPLY

Randolph A. Bullock, Rochester, and Lawrence J. Mason, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 285,236

Int. Cl.<sup>3</sup> G05F 1/64

U.S. Cl. 363—89

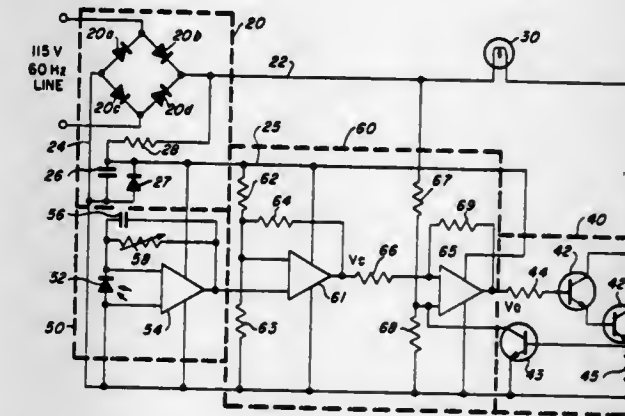
4 Claims

1. A phase-controlled power supply circuit for providing regulated dc power to a radiant energy-producing load, said power supply circuit adapted to compensate for the effects of

rapid power fluctuations in the ac input line source, said circuit comprising:

rectifier means for converting ac input voltage to full wave rectified dc voltage,

means for generating a first output signal  $V_c$  representative of the radiant energy emanating from said load, said generating means including a photosensing device which generates a current proportional to the radiant energy from the load impinging thereon, a first amplifier for converting said current into a voltage output  $V_2$  and a second amplifier for amplifying output  $V_2$  to generate output signal  $V_o$ ,



means for comparing output  $V_c$  with a portion of the rectified dc voltage to produce a second output  $V_o$ , said comparing means comprising a third amplifier means for comparing the signal  $V_o$  received at the negative input of said third amplifier with a portion of the rectified dc voltage received at the positive input of said third amplifier, and a transistor switching circuit coupled between said comparing means and said load, said switching circuit being adapted to be turned on and off at a rate determined by the rate of change of the level of signal  $V_o$ , whereby the load is turned on and off at a rate consistent with the switching circuit.

4,423,479

### CACHE/DISK SUBSYSTEM WITH ACQUIRE WRITE COMMAND

Merlin L. Hanson, Arden Hills; Robert E. Swenson, Mendota Heights, and Anthony R. Talarczyk, Montgomery, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 207,154

Int. Cl.<sup>3</sup> G06F 13/02

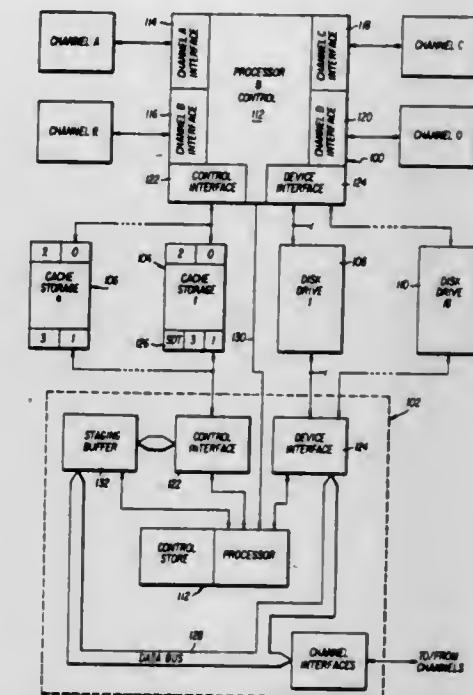
U.S. Cl. 364—200

5 Claims

1. In a cache/disk subsystem including a host processor, a disk drive device for driving a disk, a cache store for storing segments of data which are copies of segments of data which have been read from, or are to be written to disk space on said disk, and a storage control unit for controlling the transfer of data between said host processor, said disk and said cache store in response to commands specifying a function and disk data addressing information specifying the disk space at which said function is to be performed, said storage control unit being responsive to a normal write command from said host processor for staging data from the specified disk space to said cache store and overlaying it with data from said host processor if less than all of the data from the specified disk space is resident in said cache store, the improvement comprising:

control means in said storage control unit, responsive to an acquire write command from said host processor indicating that the addressing information in the acquire write command specifies disk space not previously written to,

for inhibiting the staging of data from said specified disk space to said cache store, and;



further means responsive to said acquire write command for transferring data from said host processor through said storage control unit to said cache store.

4,423,480

### BUFFERED PERIPHERAL SYSTEM WITH PRIORITY QUEUE AND PREPARATION FOR SIGNAL TRANSFER IN OVERLAPPED OPERATIONS

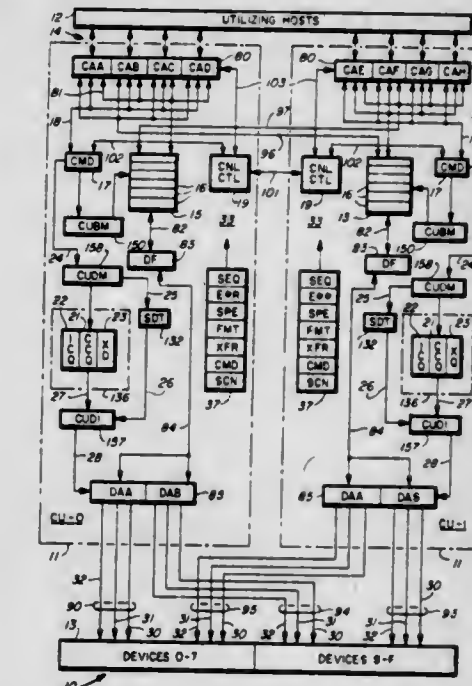
Wayne J. Bauer, Longmont; William C. Dodt, Broomfield, both of Colo.; Charles R. Kirkpatrick, Tucson, Ariz.; Ted A. Rehage, Longmont, Colo.; Francis L. Robinson, Tucson, Ariz., and William K. Taylor, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,323

Int. Cl.<sup>3</sup> G06F 3/00

U.S. Cl. 364—200

14 Claims



1. Interconnection means for connecting a control unit to a plurality of controlled devices, including the combination of: first bidirectional-connection means for coupling said control unit to said controlled devices including a data path means for transferring data signals and timing path means



for timing such transfer of data signals over said data path means;

second bidirectional-connection means for coupling said control unit to said controlled devices including separate circuit means in each said controlled device and said control unit for bidirectionally transferring multiple tag signals between said control unit and said controlled devices for selecting a one of said controlled devices to transfer data signals over said data path means; respective ones of said tag signals signifying status signals, first connection command signals and data signals being transferred over said data path means, and being coupled to said first bidirectional-connection means data path means via each of said separate circuit means in each said controlled device and said control unit;

third bidirectional-connection means for coupling said control unit to said controlled devices and being independent of said first and second bidirectional-connection means, command conducting means in said third bidirectional-connection means for carrying command signals having address signals from said control unit to a one of said controlled devices indicated by said address signals; and third-connection circuit means in each of said controlled devices electrically connected to said command conducting means and being respectively responsive to a one of said address signals signifying a respective one of said controlled devices to decode said third bidirectional-connection command signals, further means in each of said controlled devices electrically connected to said third-connection circuit means for being responsive to first and second ones of said decoded third bidirectional-connection command signals to respectively actuate such respective controlled device to respectively prepare for receipt of predetermined first and second connection command signals or to deactivate said controlled device whereby signal transfers over said first and second connection means are prepared for response by said controlled device to respective ones of said third bidirectional-connection means carried command signals.

4,423,481

# NUMERICALLY CONTROLLED METHOD OF MACHINING CAMS AND OTHER PARTS

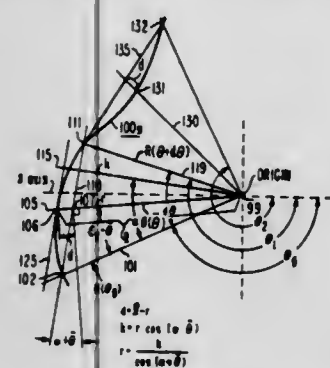
Keith S. Reid-Green, and William Z. Marder, both of Pennington, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 26, 1981, Ser. No. 266,985

Int. Cl.<sup>3</sup> G06F 15/46; G05B 19/41

U.S. Cl. 364-474

6 Claims



1. In a system having prime moving means for controlling the relative position of a working surface and a cutting edge so that said cutting edge approximates a path with respect to said working surface definable by a mathematical expression, a method of moving said cutting edge relative to said working surface in a series of successive straight line segments each of which lies between a pair of first and second points on said definable path with the second point of each pair being the first point of the next pair and comprising the steps of:

determining the coordinates for said first and second points for each successive straight line segment with each successive straight line segment having the same maximum dis-

tance  $d \pm \Delta d$  from said definable path measured along a line extending from a common reference and between said pair of first and second points, and intersecting said definable path at a given point with the tangent to said definable path at said given point defining a line to which the said each successive line segment is parallel, and where  $\Delta d$  is a predetermined tolerance;

generating prime moving means control signals in response to and in accordance with said determined coordinates; energizing said prime moving means in accordance with said control signals to move said cutting edge with respect to said working surface successively along the said straight line segments.

4,423,482

# FIFO REGISTER WITH INDEPENDENT CLOCKING MEANS

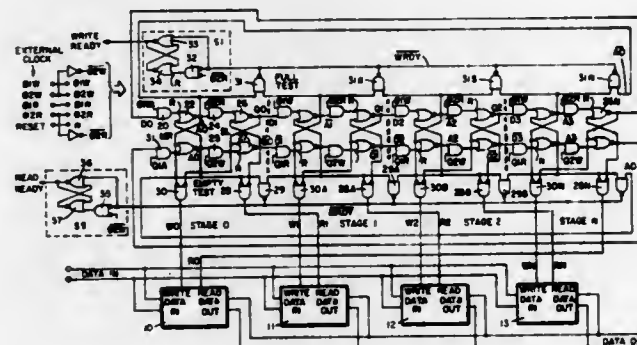
Arthur K. Hargrove, Irvine, and Ronald L. Brown, Fountain Valley, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,791

Int. Cl.<sup>3</sup> G06F 5/06

U.S. Cl. 364-200

18 Claims



1. A register circuit for interfacing between two data processors which may have different operating speeds, comprising, a plurality of independently clocked stages which can store binary signals therein, clock means connected to each of said stages in order to activate said stages at prescribed times, initializing means for supplying a pulse to each of said stages for simultaneously setting all of said stages to prescribed conditions with at least one of said stages set to a different condition than all of the other stages, testing means for continuously determining the conditions in said stages and supplying control signals to said data processors to control the operation thereof relative to said register circuit, synchronizer means connected to said testing means for selectively permitting said stages to be operated only at specified times, register means controlled by said stages to selectively pass data between said data processors through said register means, and data bus means connected to said register means to receive or supply data in accordance with the conditions of said register means.

4,423,483

# DATA PROCESSOR USING A READ ONLY MEMORY FOR SELECTING A PART OF A REGISTER INTO WHICH DATA IS WRITTEN

Steven A. Tague, Billerica, and Virendra S. Negi, Pepperell, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 24, 1980, Ser. No. 220,219

Int. Cl.<sup>3</sup> G06F 7/50

U.S. Cl. 364-200

8 Claims

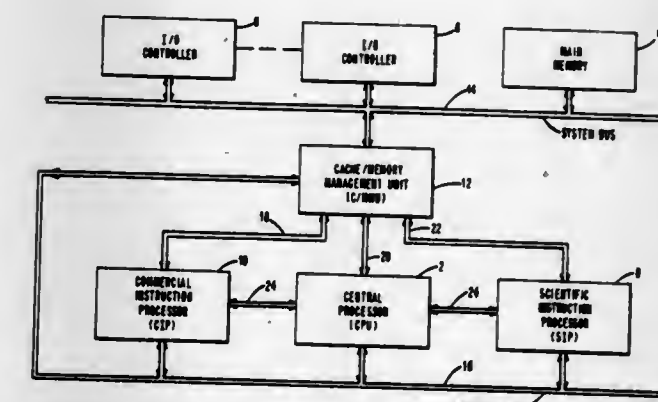
1. A data processing system including a commercial instruc-

tion processor for executing decimal arithmetic instructions, a main memory for storing operands and said decimal numeric instructions including descriptors for describing the characteristics of said operands, said commercial instruction processor including apparatus, responsive to said decimal arithmetic instructions including said descriptors for writing decimal information of said operands in selected positions of a register comprising:

first means responsive to said decimal arithmetic instructions for generating a plurality of control signals;

second means responsive to said descriptors for generating a type signal in a first state indicative of a packed decimal operand and said type signal in a second state indicative of a string decimal operand, and generating position signals indicative of one of said selected digit positions of said register;

third means coupled to said first and said second means and responsive to said plurality of control signals and said type signal for generating a plurality of write control signals; and



fourth means coupled to said second and said third means and responsive to said position signals and said plurality of write control signals for generating a plurality of write signals, wherein said register is coupled to said fourth means and responsive to said plurality of write signals for selecting said digit positions for writing a byte of said decimal information of said string decimal operand and for writing a decimal digit of said decimal information of said packed decimal operand, and wherein said third means includes:

logic means responsive to said plurality of control signals for generating an enable signal; and

a multiplexer responsive to said plurality of control signals and said enable signal in a second state for selecting said type signal in said first state for generating a first of said plurality of write control signals in a second state and a second of said plurality of write control signals in a first state, and selecting said type signal in said second state for generating said first write signal in a first state and said second write signal in a second state.

4,423,484

# IRRIGATION CONTROL SYSTEM

William H. Hamilton, 131 SW. 156th St., Seattle, Wash. 98166

Filed Mar. 30, 1981, Ser. No. 248,704

Int. Cl.<sup>3</sup> G06F 15/46; G05D 7/06

U.S. Cl. 364-420

11 Claims

1. An irrigation control system comprising:

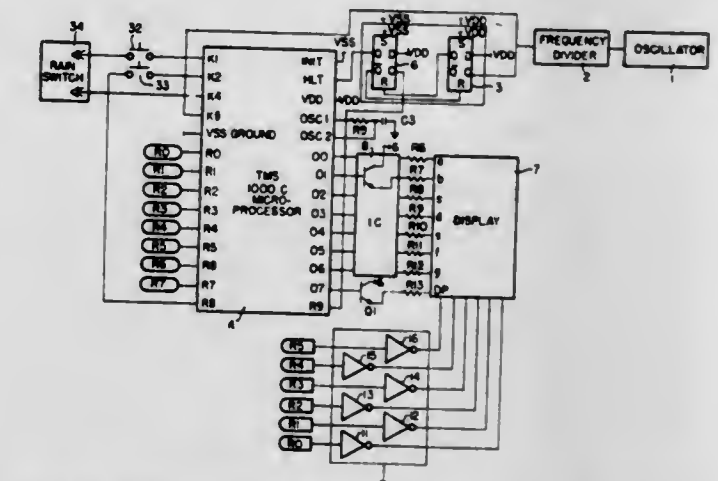
clock means for producing a clock output signal at predetermined time intervals;

resettable switch means connected to said clock means for producing an actuating signal in response to said clock output signal;

computing means for processing an input signal and producing an output signal for controlling an irrigation cycle;

said computing means having a halt input connected to said switch means for receiving said actuating signal

therefrom to actuate said computing means from a powered quiescent condition to perform a predetermined logic sequence, said switch means including a first type D flip-flop having a clock terminal connected to said clock means to receive said clock output signal therefrom and a second D flip-flop having a reset terminal connected to a Q output of said first flip-flop, the Q output of said second



flip-flop being connected to said halt input, whereby said clock output signal results in application of an actuating signal to said input for actuating said computing means; and

valve means connected to said computing means and controlled thereby for regulating fluid flow for said irrigation cycle.

4,423,485

# ELECTRIC CONTROL APPARATUS FOR FUEL INJECTION PUMPS

Hiroshi Sami, Numazu; Osamu Ito, Toyota; Shizuo Kawai, Kariya; Nobuhito Hobo, Inuyama; Teruo Nishio, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

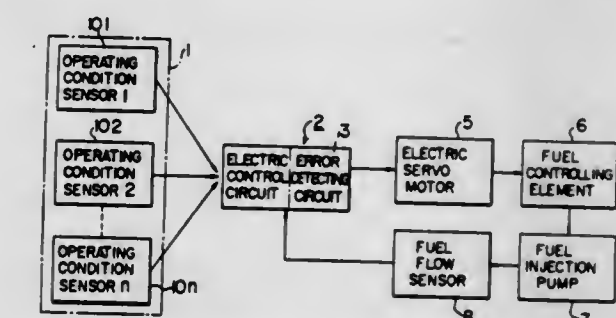
Filed Apr. 1, 1981, Ser. No. 249,866

Claims priority, application Japan, Apr. 4, 1980, 55-44967

Int. Cl.<sup>3</sup> F02M 39/00; F02D 5/02

U.S. Cl. 364-431.05

6 Claims



1. An electric control apparatus for fuel injection pumps of an internal combustion engine comprising:

a fuel injection pump;

fuel flow sensor means for generating a fuel flow signal indicative of a net quantity of fuel flow supplied to said fuel injection pump;

operating condition sensor means for detecting operating condition parameters of said engine and generating detection signals;

servo means for actuating a fuel injection quantity controlling element of said fuel injection pump which controls the quantity of fuel injected by said fuel injection pump;

electric control circuit means including means for computing an actual fuel injection quantity and generating an

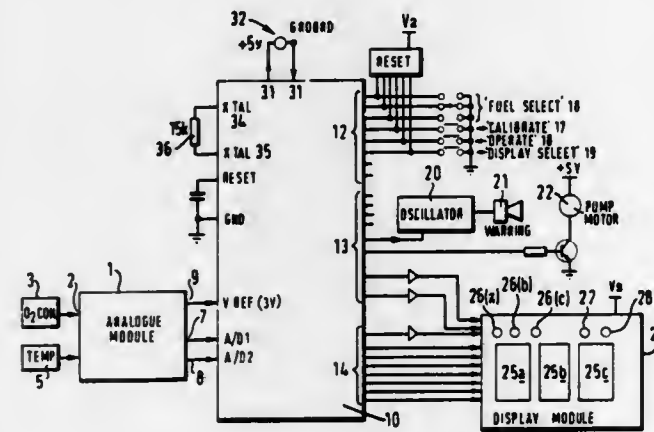


actual fuel injection quantity indicative signal, means for computing a desired fuel injection quantity in accordance with the fuel flow signal from said fuel flow sensor means and the detection signals from said operating condition sensor means and generating a desired fuel injection quantity indicative signal, means for receiving the actual fuel injection quantity indicative signal and said desired fuel injection quantity indicative signal, detecting a difference between both signals and generating an error signal corresponding to the difference, and a drive circuit responsive to the error signal to energize said servo means and thereby to actuate said fuel injection quantity controlling element of said fuel injection pump, thereby controlling the actual fuel injection quantity at said desired fuel injection quantity; and

feedback means for generating a feedback signal in proportion to a differentiation of an actuation output of said servo means and algebraically adding the feedback signal to the desired fuel injection quantity indicative signal received by said error signal generating means.

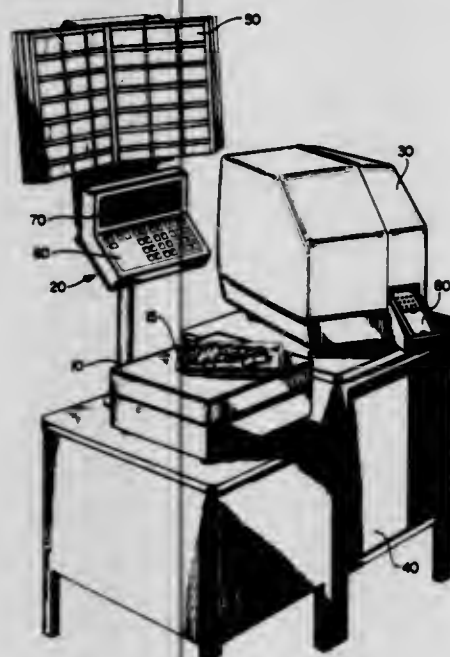
**4,423,487**  
**APPARATUS FOR MEASURING THE EFFICIENCY OF COMBUSTION APPLIANCES**  
Howard A. Buckenham, Brentwood; Hugh V. Feldman; Paul Gotley, both of Harlow, and Richard Young, High Wycombe, all of England, assignors to Neotronics Limited, Takeley, England

Filed Nov. 20, 1980, Ser. No. 208,693  
Claims priority, application United Kingdom, Nov. 23, 1979, 7940671; Oct. 22, 1980, 8034110  
Int. Cl.<sup>3</sup> G06F 15/20; G01D 21/02; F23N 5/24  
U.S. Cl. 364-551 23 Claims



**4,423,486**  
**COMMODITY DISPLAY FOR WEIGHING SCALE**  
George J. Berner, Xenia, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Apr. 30, 1981, Ser. No. 258,965  
Int. Cl.<sup>3</sup> G06K 15/02  
U.S. Cl. 364-466 9 Claims



1. A combined weighing scale and label printer for weighing a packaged commodity, printing an adhesive label with information regarding the weight, unit price and total value of the commodity and delivering the printed label printed side down for application to the package including a keyboard for entering a code corresponding to the name of the packaged commodity; visual display means responsive to a keyboard entry for displaying a human-readable verification of the commodity name prior to printing a first label for said commodity; and means for computing the total value of the packaged and weighed commodity, and in response thereto, printing such total value along with the weight, unit price and commodity name on a label for application to said package.

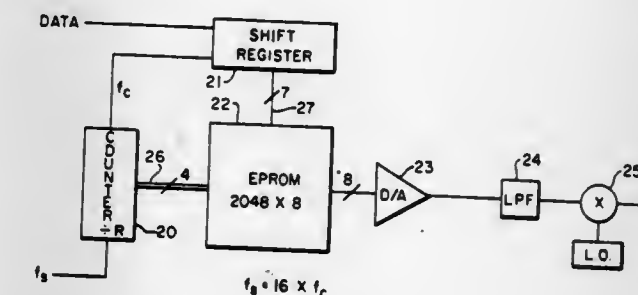
7. Apparatus for measuring the degree of efficiency of a combustion appliance comprising a first sensor for producing an output signal which varies with the concentration of a constituent gas of the exhaust gases of the appliance, a second sensor for producing an output signal which varies with the temperature of the exhaust gases, and computation means adapted to receive the sensor output signals and operable on instruction for deriving therefrom measurement values representing the concentration of said constituent gas and the temperature of the exhaust gases and for applying these measurement values in the computation of a predetermined formula relating the degree of combustion efficiency to the temperature of the exhaust gases, and the concentration of said constituent gas for providing an output signal indicative of the combustion efficiency of the appliance; the computation means is also operable to calibrate at least one of the sensor output signal from a test measurement made with that sensor, and wherein the computation means is operable in response to a calibrate instruction for deriving from the output signal produced by at least one of the sensors during a test measurement of a known value, calibration information regarding that sensor, and for automatically calibrating the sensor output signal applying said calibration information to introduce a calibration correction when deriving measurement values from the sensor output signal produced during a subsequent measurement or measurements taken with the sensor; the computation means in carrying out a said test measurement of the said constituent gas concentration of ambient air or other test gas, automatically sampling the value of the output signal of the first sensor, comparing its value with that of a stored value representing the estimated value of the sensor output signal for the nominal or known concentration of said constituent gas in the test gas, and if the difference between the compared values is above a predetermined limit, repeating the comparison after a predetermined interval, until the difference between the compared values falls within the limit.

**4,423,488**  
**DIGITAL FILTER EMPLOYING PROM FOR STORING POSITIVE AND NEGATIVE IMPULSE RESPONSE VALUES**

David K. Campbell, Melbourne Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.  
Filed Jan. 9, 1981, Ser. No. 223,572  
Int. Cl.<sup>3</sup> G06F 15/31

U.S. Cl. 364-724

7 Claims



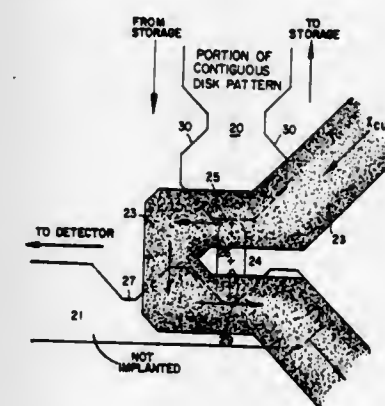
1. A digital filter comprising:  
first means for receiving and storing sequential values of an input binary data signal;  
second means coupled to said first means for producing a first clock signal in response to which said first means stores sequential values of said input binary data signal;  
third means for storing a plurality of filter output signal values each of which is representative of the sum of the values of individual positive and negative impulse response characteristics of a prescribed filter function for the sequential values of said input binary data signal stored by said first means, at each of a plurality of sampling points, over the signal value span stored thereby; and  
fourth means, coupled between said third means and said first and second means, for addressing said third means in accordance with the contents of said first and second means and thereby causing said third means to produce filter output signal values stored therein.

**4,423,489**  
**REPLICATOR FOR ION-IMPLANTED BUBBLE DOMAIN DEVICES USING STRETCHING ACTION OF CHARGED WALL**

Bruce E. MacNeal, Fullerton, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.  
Filed May 14, 1981, Ser. No. 263,659  
Int. Cl.<sup>3</sup> G11C 19/08

U.S. Cl. 365-12

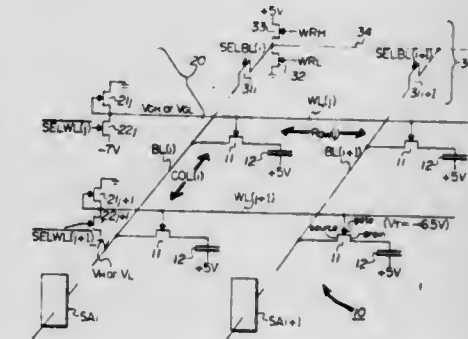
8 Claims



1. A magnetic bubble domain device comprising:  
a planar layer of magnetic material in which magnetic bubble domains can be propagated;  
a first bubble domain guide structure coupled to said layer and defining a first bubble domain propagation path for guiding the movement of said bubble domains in said layer in response to a cyclical change in the orientation of a re-orienting magnetic field within the plane of said layer;  
a second bubble domain guide structure coupled to said

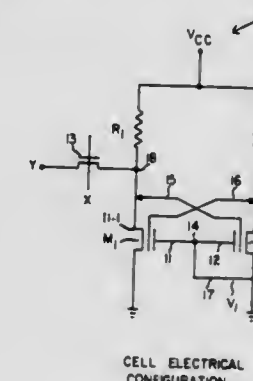
layer, and defining a second propagation path for guiding the movement of said bubble domains in said layer in response to the cyclical change in orientation of said reorienting magnetic field in the plane of said layer;  
a replicate bubble domain guide structure coupled to said layer and functioning to replicate a bubble domain traveling along said first bubble propagation path onto said second bubble propagation path in response to an activating signal, characterized in that said replicate guide structure includes two spaced apart attractive positions for stretching a bubble domain in response to the charged wall movement, and conductor means disposed between said positions functioning to sever said stretched bubble domain in response to said activating signal.

**4,423,490**  
**JFET DYNAMIC MEMORY**  
Bruce B. Roesner, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.  
Filed Oct. 27, 1980, Ser. No. 200,997  
Int. Cl.<sup>3</sup> G11C 11/40  
U.S. Cl. 365-149 11 Claims



11. A non-punchthrough type of dynamic random access memory having junction field effect transistors as the transfer gates for the memory cells; each of said transistors having a negative threshold  $V_T$  and means for generating voltages  $V_{GH}$  and  $V_{GL}$  directly on the gate of one of said junction field effect transistors to respectively select and deselect a memory cell, and for generating voltages  $V_H$  and  $V_L$  on the source of said one transistor representing information to store those voltages in a selected cell wherein  $V_{GH} - V_T > V_H$ ,  $V_{GL} - V_T < V_L$  and  $V_L > V_{GH}$  so that current flows between said source and drain but not through said transistor's gate.

**4,423,491**  
**SELF-REFRESHING MEMORY CELL**  
Andrew C. Tickle, Los Altos, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.  
Filed Nov. 23, 1981, Ser. No. 324,343  
Int. Cl.<sup>3</sup> G11C 11/40  
U.S. Cl. 365-154 4 Claims



1. A memory cell comprising:

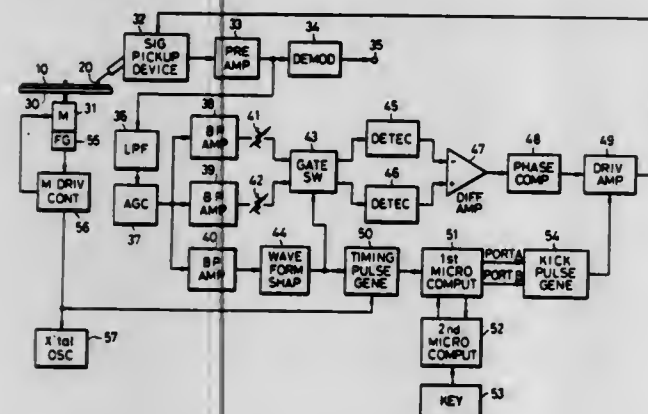






one reference signal recorded at a predetermined position on each track turn of said rotary recording medium, said reproducing apparatus comprising:

- a reproducing transducer means comprising a reproducing element for reproducing signals from tracks on said rotary recording medium and kicking means for kicking said reproducing element to an adjacent track in response to a kick pulse;
- timing pulse generating means for generating timing pulses according to the reproduced reference signal, a number of the generated timing pulses being equal to a maximum number of kicking positions for one track turn of said rotary recording medium;
- mode setting means for manually setting an operating mode of said reproducing apparatus to one of special reproduction modes;



first judging means for judging the mode of said reproducing apparatus according to the mode set by said mode setting means;

second judging means coupled to said timing pulse generating means and said first judging means, for judging whether a kick pulse is to be generated within an interval in correspondence with a subsequent timing pulse and for producing pulse signals according to a judgment result obtained during an interval in correspondence with a preceding timing pulse, with respect to each of said timing pulses from said timing pulse generating means according to the judgment result from said first judging means; and kick pulse generating means for generating kick pulses in accordance with the pulse signals supplied from said second judging means, said kick pulses being supplied to said reproducing transducer to kick said reproducing element according to the set special reproduction mode of said reproducing apparatus.

4,423,498

# CONTROL APPARATUS FOR A RECORDING MEDIUM DRIVE MOTOR IN A DIGITAL INFORMATION REPRODUCING APPARATUS

Hiroaki Kimura, Yokohama; Shin-ichi Ohashi, Chigasaki, and Keizo Nishimura, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 311,048

Claims priority, application Japan, Oct. 13, 1980, 55-142088; Oct. 13, 1980, 55-142094

Int. Cl.<sup>3</sup> G11B 19/24

U.S. Cl. 369-47

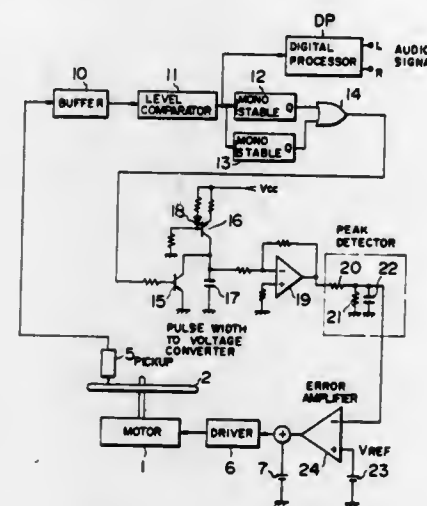
12 Claims

1. A control apparatus for a recording medium drive motor in a digital information reproducing apparatus comprising:

- (a) pickup means for reproducing a digital signal from said recording medium having a digital information recorded thereon in the form of a signal sequence modulated with a predetermined plural number of pulse widths;
- (b) transition point detection means for detecting rising edges and falling edges of the reproduced digital signal to detect signal transition points;
- (c) counter means responsive to the output from said transi-

tion point detection means for counting a length of an input pulse width;

- (d) first latch means for reading in the content of said counter means and holding a count corresponding to a maximum pulse width of the input pulse widths;
- (e) compare means for comparing input value and output value of said first latch means and loading the content of said counter means to said first latch means when the input value from said counter means is larger than the output value of said first latch means;



- (f) second latch means adapted to receive the content of said first latch means and holding a maximum count of the counts in said counter means in a predetermined period;
- (g) clock rate error signal generating means for comparing the output of said second latch means with a reference value corresponding to a predetermined maximum pulse width to produce an error signal for the clock rate; and
- (h) drive means responsive to the output of said clock rate error signal generating means for producing a drive output to drive said recording medium drive motor.

4,423,499

# PICKUP ADJUSTING EQUIPMENT

Karl Peschel, Vienna, Austria, assignor to AKG Akustische u.Kino-Geräte Gesellschaft m.b.H., Austria

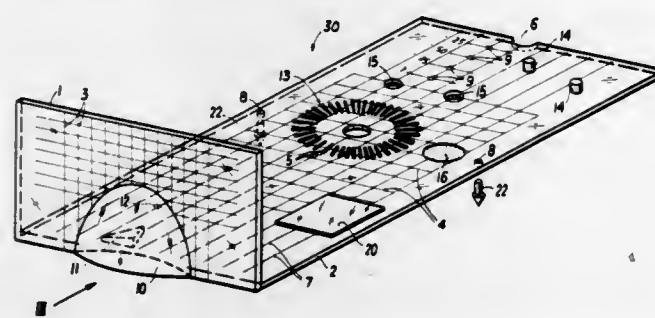
Filed Aug. 7, 1981, Ser. No. 291,121

Claims priority, application Austria, Nov. 8, 1980, 4118/80

Int. Cl.<sup>3</sup> G11B 3/10

U.S. Cl. 369-55

14 Claims



1. A device for adjusting a pickup carrying a stylus and a pickup arm of a record player, of the type adapted to be received on a turntable of the record player, which turntable includes a spindle, comprising:

- a structure having a first plain surface part adapted to lie on the turntable and a second plain surface part so connected to said first plain surface part to form an L-shaped structure, with said second plain part adapted to extend up from the turntable;
- a contact point on said first plain surface part for receiving the stylus, said first plain surface part being longer than said second plain surface part; and

orienting means on said structure for comparing the position of the pickup and the pickup arm relative thereto when the stylus is received on contact point, said orienting means comprising parallel lines on said first and second plain surface parts with said second plain surface part being made of transparent material so that the stylus on the contact point can be viewed and aligned through said second plain surface part;

said longer first plain surface part having an edge opposite said second plain surface part with a recess at a center of said edge for engaging against the turntable spindle when the first plain surface part is on the turntable for adjusting the pickup.

4,423,500

# STYLUS LIFTING/LOWERING ACTUATOR WITH AIR DAMPING

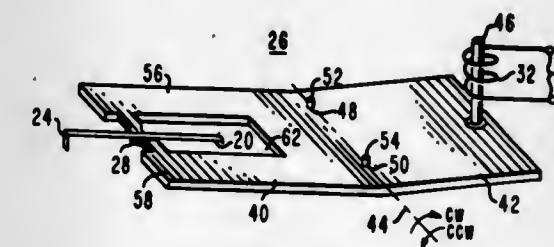
Anil R. Dholakia, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,120

Int. Cl.<sup>3</sup> G11B 17/06

U.S. Cl. 369-230

11 Claims



1. In a playback system for recovering prerecorded information from a record, said record being rotatably supported on a turntable, said system including a support member and a stylus arm having a pickup stylus mounted at one end of said arm, said arm being secured at the other end to said support member, the apparatus comprising:

a frame having first and second flat portions, said first portion lying in a first plane and said second portion lying in a second plane at an angle to said first plane; means connected to said first portion and adapted to receive said stylus arm;

coupling means coupled to the intersection of said first and second portions for forming a pivot axis for allowing rotational motion of said frame about said axis, said coupling means being arranged relative to said support member with said rotational axis arranged so that one of said first and second flat portions lies substantially flat against said support member at the extreme of rotation of said frame in a manner tending to create a vacuum between said support member and said first flat portion, and pressure between said support member and said second flat portion for a first direction of rotation of said frame, and tending to create pressure and vacuum between said support member and said first and second flat portions, respectively, for a second direction of rotation; and means for effecting rotational motion of said frame whereby said pressure and vacuum tend to damp the rotation.

4,423,501

# PHONOGRAPH TONE ARM SUSPENSION

Thomas L. Cadawan, 92 Onedia Ave., Staten Island, N.Y. 10301

Filed Apr. 23, 1981, Ser. No. 257,943

Int. Cl.<sup>3</sup> G11B 17/02

U.S. Cl. 369-253

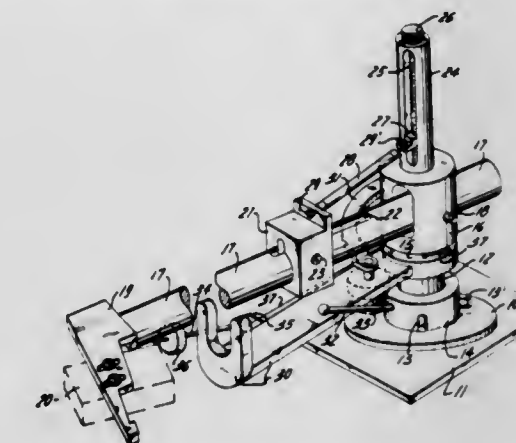
6 Claims

1. A suspension system for a phonograph tone arm which is operable to carry a pick-up cartridge and is pivotally mounted on a base for rotational movement about vertical and horizontal axes, the system comprising

- (a) first attachment means mechanically linked to said tone

arm and providing a plurality of attachment positions along a portion of a first line, each attachment position being operable upon application of a sufficient supporting force to counterbalance the rotational displacement under the influence of gravity of the tone arm within the plane of its rotational movement about its horizontal axis;

(b) second attachment means operable to provide a plurality of attachment positions along a portion of a second line which second line lies in said plane of the tone arms' rotation but is transverse to said first line;



- (c) support means for said second attachment means; and
- (d) an elongated resilient member diagonally attached between said first and second attachment means for tensile support of said tone arm, the effective mechanical compliance exhibited by the resilient member with respect to rotational movement of the tone arm and any pick-up cartridge associated therewith being dependent upon the relative positions of said first and second attachment means on said first and second lines.

4,423,502

# RECORD CARRIER HAVING AN OPTICALLY READABLE INFORMATION STRUCTURE

Jan G. Dil, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

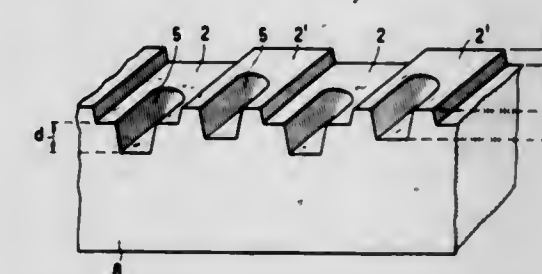
Filed Sep. 11, 1981, Ser. No. 301,155

Claims priority, application Netherlands, Jan. 12, 1981, 8100098

Int. Cl.<sup>3</sup> G11B 7/24

U.S. Cl. 369-275

12 Claims



1. A record carrier comprising a planar substrate provided with an information structure having a plurality of elongated, generally parallel tracks, at least a portion of each track having a plurality of information areas which are spaced apart in the track direction by intermediate areas, said information areas in all of said portions being of the same type and differing in the same way from said intermediate areas such that when said portions are scanned by a read beam of radiation focussed to a spot thereon, said information and intermediate areas modulate the radiation in accordance with information stored therein, the portions of adjacent tracks which also are adjacent each other in a direction transverse to the track direction being disposed in different planes which are parallel to the plane of said substrate and are spaced from each other in a direction



normal thereto by an effective distance which is a fraction of the effective wavelength of the radiation with which the information is to be read such as to reduce crosstalk between said adjacent portions during readout of the information.

4,423,503

# MAGNETICALLY RECORDABLE LABEL FOR MECHANICALLY-DEFINED INFORMATION BEARING DISCS

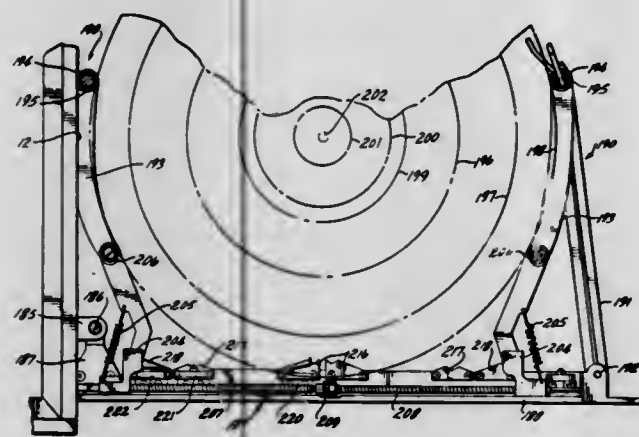
Robert G. Cheeseboro, 3650 Somerset Dr., Los Angeles, Calif. 90016

Division of Ser. No. 164,922, Jul. 1, 1980, Pat. No. 4,302,832, which is a division of Ser. No. 951,563, Oct. 16, 1978, Pat. No. 4,222,574, which is a division of Ser. No. 778,027, Mar. 16, 1977, Pat. No. 4,121,836. This application Nov. 19, 1981, Ser. No. 322,948

Int. Cl.<sup>3</sup> G11B 3/68

U.S. Cl. 369—290

8 Claims



1. A method for controlling the playback of a record disc in a record player, such a record disc comprising a central portion and an annular portion surrounding the central portion, the annular portion containing recorded material for playback by the record player, the method comprising:

providing a band of machine readable medium on the central portion of the record disc; and

encoding playback instructions on the band which are descriptive of the location and length of at least one passage of recorded material on the annular portion, such playback instructions when received by the record player in use of the record directing the sequence of play of the passages by the player.

4,423,504

# HEIGHT POSITION ADJUSTING DEVICE FOR A REPRODUCING TRANSDUCER IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Takashi Saito, Ayase, and Hiroshi Kumei, Yamato, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 4, 1981, Ser. No. 289,930

Claims priority, application Japan, Aug. 6, 1980, 55-107928; Aug. 6, 1980, 55-111330[U]

Int. Cl.<sup>3</sup> G11B 3/10, 21/24

U.S. Cl. 369—292

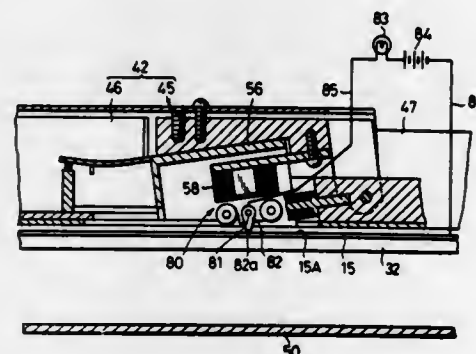
1 Claim

1. A height position adjusting device for a reproducing transducer means used in connection with a rotary recording medium reproducing apparatus, said transducer means reproducing an information signal recorded on a rotary recording medium and comprising a pickup cartridge said reproducing apparatus comprising means for transferring the transducer means in the radial direction across said rotary recording medium, said height position adjusting device comprising: guide means in said reproducing apparatus; carriage means for supporting said reproducing transducer means, said carriage moving along said guide means of

said reproducing apparatus; said carriage having a basepart and

height position adjusting means for adjusting the height position of said reproducing transducer means with respect to said rotary recording medium, by varying the height position of said carriage with respect to said guide means,

said height position adjusting means comprising an arm having one end pivotally supported by said basepart of said carriage, adjusting screw means for adjusting a distance between said arm and the base part of said carriage, and a roller making contact with said guide means;



detecting means responsive to said height position adjusting means for detecting that said carriage has been adjusted to a predetermined height position with respect to said rotary recording medium,

said detection means comprising a reference member and a contact member which makes electrical contact with said reference member when said carriage reaches a predetermined height position,

said contact member being provided within a dummy pickup cartridge in a freely rotatable manner, and said contact member hanging downwardly due to its own weight, said dummy cartridge replacing said pickup cartridge of said reproducing transducer means upon height position adjustment of said reproducing transducer means.

4,423,505

# CUED ADAPTIVE CANCELLER

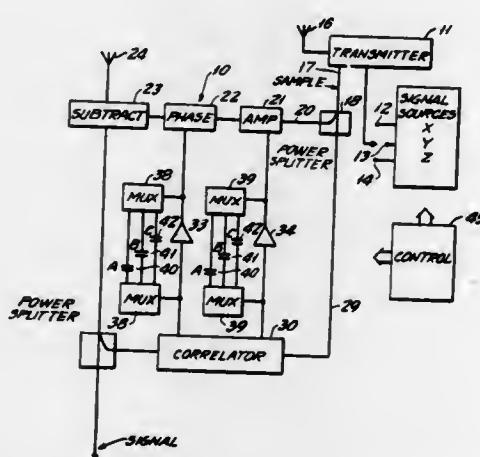
John H. Greig, Massapequa, N.Y., assignor to Loral Corp., Yonkers, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,867

Int. Cl.<sup>3</sup> H04B 1/56

U.S. Cl. 370—32

3 Claims



1. A cued adaptive canceller for use in conjunction with a radio receiver and a radio transmitter simultaneously operated in close proximity for cancelling reception of transmitted signals comprising: a cancelling loop including a connection to said transmitter to input sample transmitted signals, a phase control an amplitude control and a subtractor; said subtractor connected to an input to said receiver, and a cross correlator

having an input of received signals; first and second filters interconnecting the output of said cross correlator and said phase control and said amplitude control, respectively; a parameter multiplexer connected in parallel with each of said filters, and a plurality of capacitors each selectively interconnected in parallel with a respective filter by operation of one of said multiplexers; and control means for governing operation of said multiplexers.

4,423,506

# WIRE DATA TRANSMISSION SYSTEM

Kikuo Kawasaki; Tomomi Sano, and Kazuo Yoshida, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

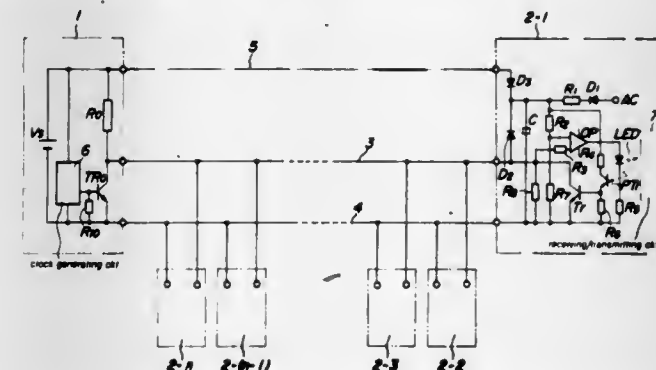
Filed Apr. 29, 1981, Ser. No. 253,838

Claims priority, application Japan, Aug. 29, 1979, 54-109019

Int. Cl.<sup>3</sup> H04J 3/02; H04L 25/02

U.S. Cl. 370—85

11 Claims



1. A wire data collection system having a master station and a plurality of slave stations which are connected in common to said master station by a pair of signal lines, said wire data collection system comprising:

in said master station,

a power source for applying a DC voltage to one of said pair of signal lines via a resistor;

a first data transmission means for short-circuiting said pair of signal lines in accordance with a predetermined period in response to data from said master station to pulse-width encode said data from said master station by said short-circuiting so as to transmit an address signal designating one of said plurality of slave stations, and for subsequently transmitting a response clock pulse having said predetermined period to each of said plurality of slave stations; and

a first data reception means for detecting the change of a pulse width of a DC voltage on said one signal line when said response clock pulse is transmitted to receive data from the slave station designated by said address signal; and

in each of said plurality of slave stations,

means for detecting a change of a pulse width of a DC voltage across said pair of signal lines to identify said address signal;

a second data transmission means for short-circuiting said pair of signal lines in synchronism with said response clock pulse when the slave station is designated by said address signal to encode said data from said slave station as a change of the pulse width of said response clock pulse so that said data from the designated slave station is transmitted to said master station.

4,423,507

# COMMUNICATIONS SYSTEM FOR INTERCONNECTING A PLURALITY OF ASYNCHRONOUS DATA PROCESSING TERMINALS

Renoulin Roger, 29, rue Jean Mailleux, Thorignac/Villaine, 35510 Cesson, and Jean Y. Le Brun, 34, Boulevard Clemenceau, 35100 Rennes, both of France

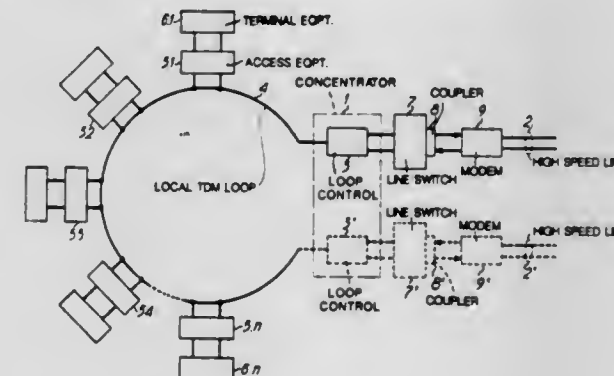
Filed Mar. 16, 1981, Ser. No. 244,066

Claims priority, application France, Mar. 20, 1980, 80 06774

Int. Cl.<sup>3</sup> H04J 3/16, 6/00

U.S. Cl. 370—89

2 Claims



1. A communication system for connecting many asynchronous data processing terminals which are operating at different speeds to a high speed switching and communication network; said system comprising central control circuit means associated with microprocessor means and a plurality of secondary control circuit means; each of said secondary control circuit means being associated with a terminal which is connected to the central control circuit means by a telephone line; the central control circuit means being coupled via a high speed transmission link to the high speed switching and communication center by coupler means and line switch means; means responsive to the microprocessor means for controlling operation of said line switch means; the central control circuit means having central switching means which are capable of taking either a transmitting state or a receiving state; each secondary control circuit means also being able to assume either a receiving state or a transmitting state, means for synchronizing the central control circuit means and the secondary control circuit means for transmitting a sync burst; means for transmitting and receiving bytes of information one-by-one; the central control circuit means is also having addressing means for transmitting an address byte for selecting the secondary control circuit means which is to be interrogated; each of said secondary control circuit means having an address identification circuit means; the central control circuit means having a central sequencing unit means for:

- (1) operating the switching means of the central control circuit to the transmitting state at the beginning of each interrogation sequence,
- (2) coupling the synchronization means to the line by way of the said switching means,
- (3) operating the addressing means,
- (4) operating the byte transmission means,
- (5) switching the switching means to the receiving state, and
- (6) coupling the synchronization means to the line; each of said secondary control circuit means having a secondary sequencing unit for:
  - (a) switching the switching means of the secondary control circuit means between two interrogation sequences to the receiving mode,
  - (b) coupling the synchronization means to the line by way of said switching means,
  - (c) activating the secondary interrogation means in response to the sync burst to couple the address identification circuit to the line means (i) responsive to a negative addressing of a line for causing the isolation of said switching means from the line, and (ii) responsive to a



- positive addressing of the line for activating a secondary ordering unit to link the byte receiving means to the line; means responsive to the ordering unit for:
- (1) placing the switching means in the transmitting state,
  - (2) coupling the synchronization means of the secondary control circuit means to the line,
  - (3) coupling the byte transmitting means to the line,
  - (4) switching the switching means to the receiving mode; and
  - (5) means responsive to the synchronization means of the central control circuit means for coupling the byte receiving means to the line in response to the reception of the sync burst from the secondary control circuit means.

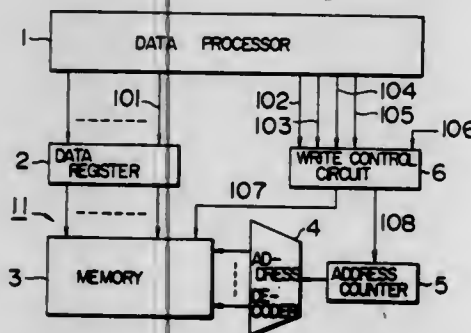
4,423,508

## LOGIC TRACING APPARATUS

Keniti Shiozaki, and Hazuo Hibi, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
 Filed Sep. 18, 1981, Ser. No. 303,525  
 Claims priority, application Japan, Sep. 19, 1980, 55-129346  
 Int. Cl.<sup>3</sup> G06F 11/10

U.S. Cl. 371-16

3 Claims



1. A logic tracing apparatus having a memory for successively storing hardware status information relating to operation of a data processor during execution of a test program by the data processor, said data processor including means for generating a stop signal on or before the start of a comparison routine in the test program for comparing a result of execution of the test program with a predetermined result, a hold signal when an erroneous operation is detected by the execution of the result comparison routine and a start signal when said data processor restarts the operation thereof after the execution of the result comparison routine, said logic tracing apparatus comprising:

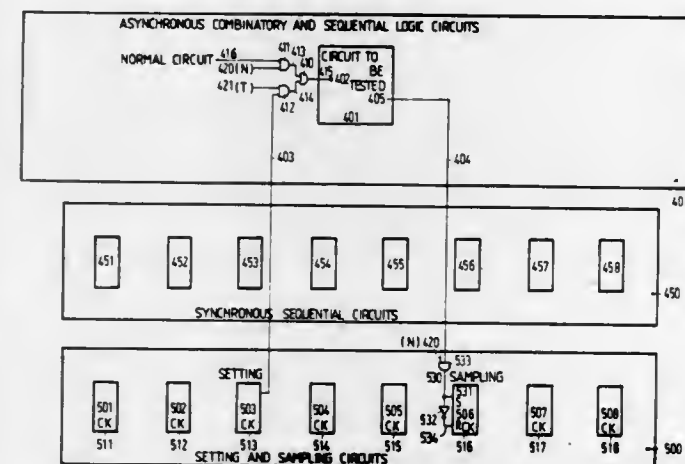
- (a) data register means connected between said data processor and said memory for temporarily storing the hardware status information successively outputted from the data processor prior to the storing of said information in said memory;
- (b) addressing means connected to said memory for applying an address to said memory at which the information within said data register means is to be stored in said memory; and
- (c) control means connected to said data processor, said addressing means and said memory for generating a write enable signal to effect the storing of data from said data register means into said memory at the address specified by said addressing means, and including means for preventing the storing operation of the hardware status information from the data register into said memory in response to either one of said stop signal or said hold signal or both, said control means including means for allowing the storing operation of said information into said memory in response to said start signal when no hold signal is received, while preventing the storing operation of said information even in response to said start signal when said hold signal has been received.

4,423,509  
 METHOD OF TESTING A LOGIC SYSTEM AND A LOGIC SYSTEM FOR PUTTING THE METHOD INTO PRACTICE

M. Henri Feissel, Paris, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France  
 Continuation of Ser. No. 61,006, Jul. 26, 1979, abandoned. This application May 26, 1981, Ser. No. 267,347  
 Claims priority, application France, Jul. 27, 1978, 78 22228  
 Int. Cl.<sup>3</sup> G06F 11/22

U.S. Cl. 371-25

22 Claims



1. In combination with a logic system of the type having a combinational network and at least one synchronous logic circuit connected to particular points in said combinational network, the combinational network also having intermediate points not directly connected to the synchronous logic circuit and not directly accessible from the exterior of said logic system, a testing system comprising:

- at least one flip-flop;
  - an externally accessible input line;
  - selective gating circuitry connected to said one flip-flop and arranged, when enabled in a series mode, to effectively connect a flip-flop input to said externally accessible input line such that when a signal is applied to said accessible input line and said flip-flop is clocked a particular logic state is loaded into said flip-flop; and
  - said selective gating circuitry being further arranged, when enabled in a setting test mode, to effectively connect a flip-flop output to one of said intermediate points in said logic system;
- said testing system thereby permitting a particular logic state to be serially fed in and applied to said one of said intermediate points.

4,423,510

## LASER TUBE DESIGN INCORPORATING LOW INDUCTANCE CAPACITOR

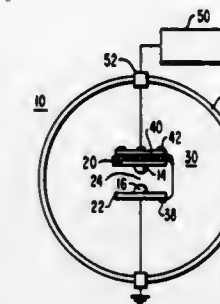
John L. Pack; Roy K. Williams, both of Murrysville, and Chi-Sheng Liu, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.  
 Continuation-in-part of Ser. No. 67,250, Aug. 17, 1979, abandoned. This application Nov. 18, 1981, Ser. No. 322,620  
 Int. Cl.<sup>3</sup> H01S 3/097

U.S. Cl. 372-82

5 Claims

1. In a metal halide laser apparatus including spaced-apart electrode means positioned within a laser housing containing a metal halide laser medium and defining a laser discharge region therebetween, and electrical excitation means operatively connected to said electrode means for exciting said metal halide laser medium by electrical discharge to produce a laser radiation output from appropriate laser optics associated with said laser housing, the improvement for improving laser operation by minimizing the inductance of the laser assembly, said improvement comprising:

a capacitor means positioned within said laser tube housing and connected to said spaced-apart electrode means and extending approximately the entire length of said electrode means to minimize the inductance of the laser apparatus, said capacitor means consisting of alternate layers of metal and dielectric insulator, said metal and dielectric insulator being



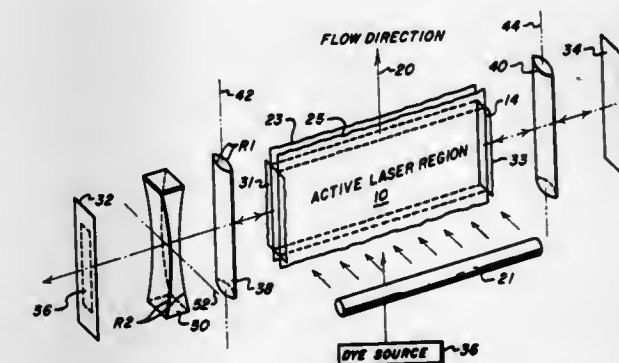
materials capable of withstanding the chemically corrosive gas environment of said metal halide laser medium at elevated temperatures, said metal being selected from a group consisting of gold, platinum, graphite and stainless steel, and said dielectric insulator being selected from a group consisting of a polyimide film and quartz.

4,423,511

UNSTABLE WAVEGUIDE LASER RESONATOR  
 Richard G. Morton, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.  
 Filed Apr. 16, 1981, Ser. No. 254,643  
 Int. Cl.<sup>3</sup> H01S 3/08

U.S. Cl. 372-95

16 Claims



1. A system of cavity components for use in a laser comprising:

- an active laseable medium having an optical axis passing through said laseable medium;
- said laseable medium having a thin dimension orthogonal to said optical axis and extending a predetermined distance along said optical axis;
- said thin dimension being of a size to generally favor the propagation of waves therethrough whereby said medium acts as a waveguide;
- means for reflecting laser radiation of said medium repeatedly through said medium; and
- a negative lens having foci lying along a line in the direction of said thin dimension, said lens being positioned between said reflecting means and said medium for diverting in said thick dimension beams travelling through said medium during each pass so that with each subsequent pass, each beam is displaced from its position in a previous pass for providing beam walking which results in optical coupling of separated portions of said medium together, whereby laser radiation from said medium has a divergence characteristic of the cross-sectional area of said medium transverse to said optical axis as opposed to a divergence characteristic of plural bands of radiation.

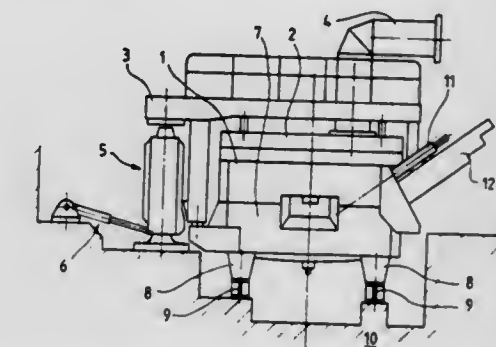
4,423,512

## PLASMA MELTING FURNACE

Walter Lugscheider, Linz; Ernst Riegler, Enns, and Ernst Zajicek, Ottensheim, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria  
 Filed Jan. 4, 1982, Ser. No. 336,899  
 Claims priority, application Austria, Jan. 8, 1981, 31/81  
 Int. Cl.<sup>3</sup> H05H 1/00

U.S. Cl. 373-22

10 Claims



1. In a plasma melting furnace of the type including a water-cooled bottom electrode made of copper, a temperature probe connected to said bottom electrode, and a wearing part of steel for covering said bottom electrode in the bottom of said plasma melting furnace, at least one counter electrode being arranged at a distance above said wearing part and adapted to form a plasma jet, the improvement comprising a metal layer provided between said bottom electrode and said wearing part, said metal layer being composed of a metal having a low thermal conductivity and a low melting point, as compared to copper, as well as a high melting enthalpy.

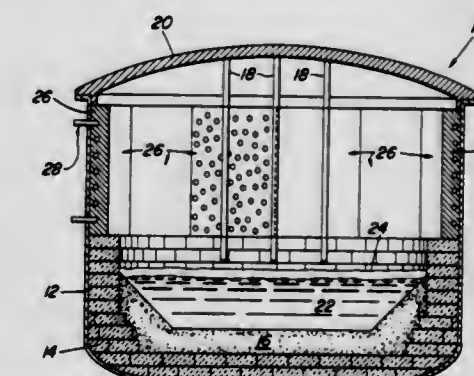
4,423,513

FURNACE PANEL FOR USE IN AN ARC FURNACE  
 James E. De Long, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 28, 1982, Ser. No. 393,007  
 Int. Cl.<sup>3</sup> F27D 1/12

U.S. Cl. 373-76

2 Claims



1. A furnace panel for use in an arc furnace comprising:

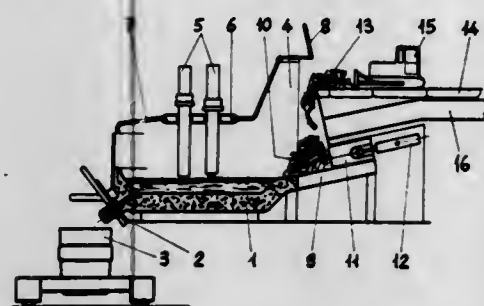
- (a) a cast iron block having an inner and an outer surface and which encloses cooling coils between said surfaces, said block having at least one anchoring member projecting outward from said outer surface for retaining said block to a wall of said furnace; and
- (b) steel bars fully embedded in said block and having a plurality of steel studs projecting outward therefrom which extend at least twenty-five percent of their length beyond said inner surface of said block, said studs having a profile which enhances containment of molten slag against said inner surface of said block during furnace operation to prolong the life of said block.



**4,423,514**  
**CONTINUOUSLY FED ELECTRIC FURNACE FOR MELTING SCRAP IRON**  
 Jean Davene, Villars, France, assignor to Clesid S. A., Saint-Chamond, France

Filed Nov. 30, 1981, Ser. No. 325,951  
 Claims priority, application France, Jan. 20, 1981, 81 00996  
 Int. Cl.<sup>3</sup> F27D 3/04  
 U.S. Cl. 373—79

3 Claims

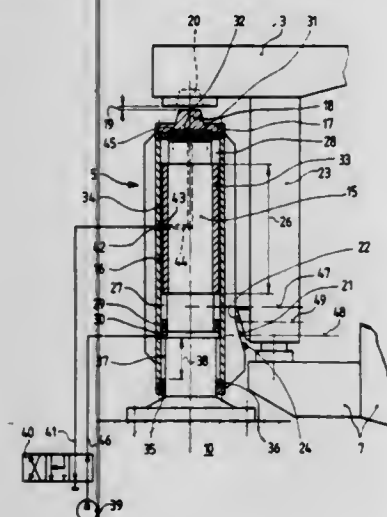


1. Electric melting furnace with continuous feeding and hearth fixed in position, comprising
  - (a) an inner chamber comprising an area directly above said hearth and a contiguous storage space (4) open to and lateral to said space and above the level of said hearth (1), said space being arranged for the storage of a large quantity of large size scrap iron;
  - (b) a pusher (11) located at the bottom of said storage space for pushing the base of a pile (10) of scrap iron stored in said space towards said hearth; and
  - (c) an opening (8) of the trap or door type at the upper part of said storage space for the selective feeding of cold scrap iron (13, 131) therethrough;
  - (d) said storage space being connected to a conduit for exhausting the fumes of said furnace so that said fumes are caused to pass through the latter.

**4,423,515**  
**ELECTRIC FURNACE**  
 Ernst Riegler, Enns, and Ernst Zajicek, Ottensheim, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 4, 1982, Ser. No. 336,896  
 Claims priority, application Austria, Jan. 8, 1981, 30/81  
 Int. Cl.<sup>3</sup> F27D 1/18  
 U.S. Cl. 373—81

8 Claims



1. In a lifting means for raising and lowering a furnace cover of an electric furnace, such as an electric arc furnace, a plasma melting furnace and the like, of the type including a base and a cover carrying structure carrying said furnace cover, said cover lifting means including a king post supported on said base, a sleeve surrounding said king post and adapted to be raised and lowered hydraulically relative to said king post for engagement with said cover carrying structure, and a cap

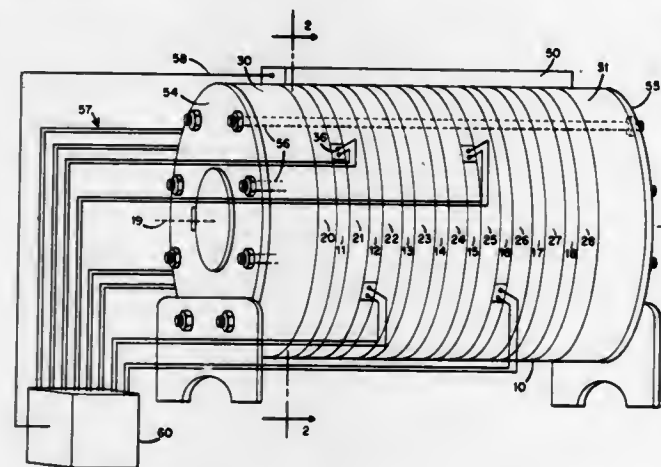
provided on said sleeve on its upper end, the improvement comprising

- a front face on said king post said front face and said cap defining a cylindrical space therebetween,
- means for supplying an hydraulic medium to said cylindrical space to raise said sleeve relative to said king post thereby to raise said furnace cover,
- a collar provided on said king post,
- a first annular space between said collar and the inner wall of said sleeve,
- means for supplying an hydraulic medium to said first annular space to lower said sleeve thereby to lower said furnace cover,
- an upper bearing bush and a lower bearing bush arranged between said king post and said sleeve defining a second annular space extending therebetween, and
- a bore in said king post connecting said second annular space with said cylindrical space between said front face and said cap.

**4,423,516**  
**DYNAMIC GRADIENT FURNACE WITH CONTROLLED HEAT DISSIPATION**  
 Robert H. Mellen, Sr., P.O. Box 535, New London, N.H. 03257

Filed Mar. 22, 1982, Ser. No. 360,327  
 Int. Cl.<sup>3</sup> F27B 5/00  
 U.S. Cl. 373—111

6 Claims

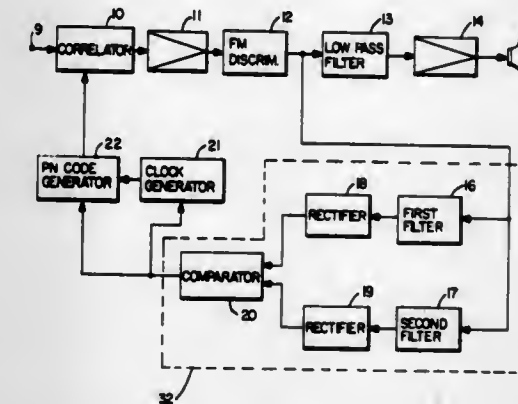


1. A furnace having an interior space extending along an axis and a series of heating elements each oriented normal to said axis and extending around said space for providing controllable temperature gradients in said space comprising:
  - (a) A plurality of thermally conductive annuli;
  - (b) A plurality of thermally insulating layers separating said annuli and having central apertures defining said interior space;
  - (c) A plurality of heating elements, each sandwiched between two of said insulating layers and thermally coupled to a respective one of said annuli;
  - (d) Securing means securing said annuli, layers and elements together to enclose said interior space; and,
  - (e) Control means controllably connecting each of said elements to a source of energy.

**4,423,517**  
**CODE SEQUENCE SYNCHRONIZATION SYSTEM FOR SPREAD SPECTRUM COMMUNICATION RECEIVER**  
 Tsuneo Danno, Moriguchi; Masashi Kanno, Katano, and Ei-chiro Murata, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 19, 1981, Ser. No. 226,472  
 Claims priority, application Japan, Jan. 21, 1980, 55-6212  
 Int. Cl.<sup>3</sup> H04K 1/04  
 U.S. Cl. 375—1

2 Claims



1. A spread spectrum receiver for receiving a spread spectrum signal, comprising:
  - a correlating means for correlating a pseudonoise code with a received signal spectrum signal so as to collapse the spread spectrum of the received signal;
  - a demodulating means coupled to said correlating means for demodulating the thus collapsed received signal;
  - a detecting means coupled to said demodulating means for detecting synchronization between said pseudonoise code and said demodulated collapsed received signal;
  - a clock pulse generating means coupled to said detecting means for generating a clock pulse which is the same as that of said received signal when said pseudonoise code and said demodulated received signal are synchronized with each other, and which has a clock rate which has a small offset from that of said demodulated received signal so as to search the synchronization when said pseudonoise code and said demodulated received signal are out of synchronization with each other; and
  - a pseudonoise code generating means coupled to said detecting means and also coupled to and driven by said clock pulse generating means for generating said pseudonoise code so as to restore the relative position between said pseudonoise code and a pseudonoise code of said demodulated received signal at least before a time that the synchronization has been detected by said detecting means; wherein said detecting means comprises: a first filter for extracting a noise component from the output of said demodulating means in order to ensure the detecting of said synchronization; and wherein said detecting means further comprises: a second filter for extracting a pilot signal component from the output of said demodulating means, and a comparator for comparing said noise component with said pilot signal component in order to ensure the detecting of said synchronization.

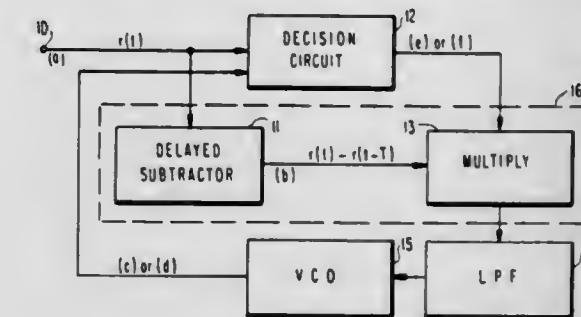
**4,423,518**  
**TIMING RECOVERY CIRCUIT**  
 Botaro Hiroaki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,408  
 Claims priority, application Japan, May 19, 1981, 56-74301; May 19, 1981, 56-74302  
 Int. Cl.<sup>3</sup> H04L 7/02  
 U.S. Cl. 375—20

7 Claims

3. A timing recovery circuit for a receiver for receiving pulse-amplitude-modulated (PAM) signals, said recovery circuit comprising: delayed difference means for generating a

delayed difference signal corresponding to the differences between a received PAM signal and a delayed version of said received PAM signal; control means for generating a control signal from said delayed difference signal in accordance with a decision signal; timing signal generating means for generating

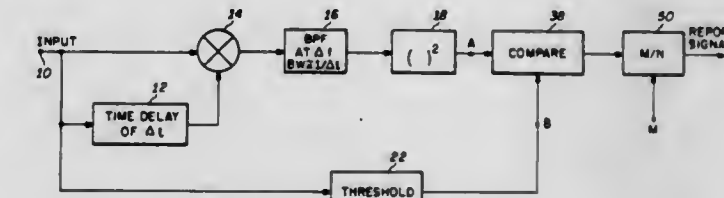


a timing signal having a frequency determined in accordance with the average value of the output of said control means; and decision means for comparing said reception signal to a threshold level at time instants determined by said timing signal and generating said decision signal in accordance with said comparisons.

**4,423,519**  
**APPARATUS AND METHOD FOR DETECTING THE ONSET OF A FREQUENCY SHIFT KEYED SIGNAL**  
 Clarence L. Bennett, Jr., Groton, and Robert Price, Lexington, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 20, 1982, Ser. No. 340,941  
 Int. Cl.<sup>3</sup> H03D 3/06  
 U.S. Cl. 375—80

50 Claims



26. An apparatus for detecting the presence in an incoming signal of a frequency shift keyed signal of known shift frequency, key rate, and key period that comprises
  - (a) first means for time delaying the incoming signal by a first time interval and for providing a first time delayed signal;
  - (b) first means for multiplying the incoming signal by the first time delayed signal to produce a first product;
  - (c) first means for filtering the first product to pass a first filtered signal of frequency substantially equal to the shift frequency;
  - (d) means for producing a threshold signal in response to the incoming signal;
  - (e) means for producing a report signal when the first filtered signal exceeds the threshold signal.

**4,423,520**  
**QUANTIZATION CIRCUIT FOR IMAGE DATA TRANSMISSION SYSTEM**  
 Tomio Murayama; Kenji Koguchi, both of Kanagawa; Shigehumi Takenchi, and Kazumi Tsukioka, both of Nagano, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

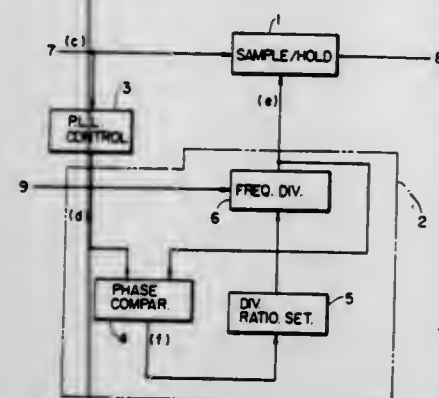
Filed Dec. 17, 1980, Ser. No. 217,303  
 Claims priority, application Japan, Dec. 18, 1979, 54-163596  
 Int. Cl.<sup>3</sup> H03L 7/06  
 U.S. Cl. 375—95

6 Claims

1. A signal receiver quantization circuit for an image data transmission device in which an input signal which is quantized



and transmitted by a signal transmissions side is quantized in a signal receiver comprising: a digital PLL circuit; a sampling clock producing an output signal; a PLL control circuit for detecting transition times of an input received signal; said digital PLL circuit being controlled in accordance with an



output signal of said PLL control circuit; and means for sampling said input signal in response to said sampling clock output signal of said digital PLL circuit, said sampling clock output signal is produced as a direct function of the previous transition pulse period such that

$$e_n - d_n = t_{n-1}$$

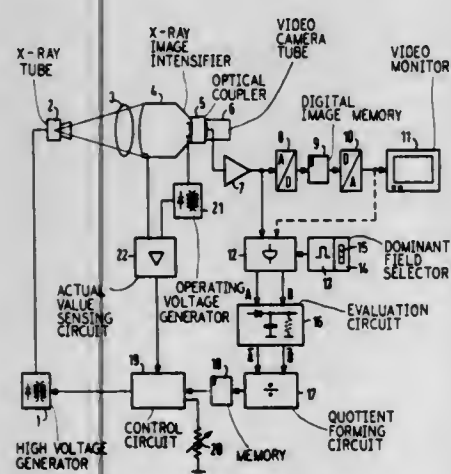
where  $e_n$  is said sample pulse,  $d_n$  is said transition pulse and  $t_{n-1}$  is the previous transition pulse period.

**4,423,521**  
**DIAGNOSTIC X-RAY INSTALLATION COMPRISING A CONTROL LOOP FOR THE EXPOSURE CONTROL**  
Joerg Haendle, Erlangen, and Wolfgang Maass, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany  
Filed Jan. 28, 1982, Ser. No. 343,535

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1981, 3106627

Int. Cl. <sup>3</sup> G03B 41/16  
U.S. Cl. 378—108

10 Claims



1. A diagnostic X-ray installation comprising an X-ray tube, an image intensifier television chain which includes an X-ray image intensifier (4), an optical coupler (5), a camera tube (6), a video amplifier (7), and a monitor (11), and comprising a

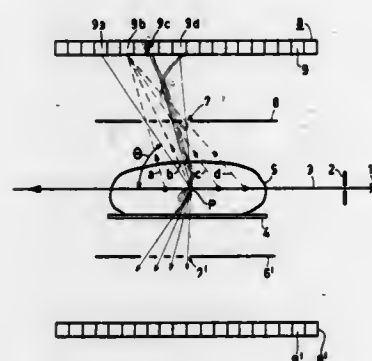
control circuit for exposure control which includes a control circuit (19) for the formation of a control voltage for controlling the dose rate of the X-ray tube, a setpoint value transmitter (20) for supplying a setpoint value signal, and circuit means (12 through 18) comprising an evaluation circuit (16) and a device (12 through 15) for blanking out portions of the video signal to supply an output signal for representing a dominant field, characterized in that an actual value transmitter (22) is present which supplies to the control circuit (19) an actual value signal corresponding to the mean image intensity, and that, in the control circuit (19), the actual value signal, the setpoint value signal, and the output signal of the circuit means (12 through 18) are superimposed to form a resultant correction value.

**4,423,522**  
**DEVICE FOR THE IMAGING OF BODY LAYERS BY MEANS OF MONOENERGIC RADIATION**  
Geoffrey Harding, Halstenbek, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed Jun. 15, 1981, Ser. No. 273,547

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023263

Int. Cl. <sup>3</sup> G01N 23/20  
U.S. Cl. 378—87

4 Claims



1. A device for determining the internal structure of a body, comprising:

radiation source means which generate a narrow monoenergetic primary beam of radiation which penetrates the body; diaphragm means disposed adjacent the path of the primary beam which define a plurality of adjacent, parallel, longitudinal slits which extend in a direction transverse to the primary beam;

detector means which extend transverse to the direction of the slits and which comprise a plurality of separate detectors which detect scatter radiation, which radiation is produced in the body by the primary beam and has passed through the slits, and which produce energy-dependent detector signals in response thereto;

energy discrimination means which process the detector signals from each detector to produce separate discriminator output signals for each of a plurality of scatter radiation energies detected thereby;

selector means which sum signals in preselected groups of the discriminator output signals each group being selected to contain signals produced by scatter radiation which originates in a separate region of the primary radiation beam; and

means which display the summed signals as a representation of the internal body structure.

## DESIGNS

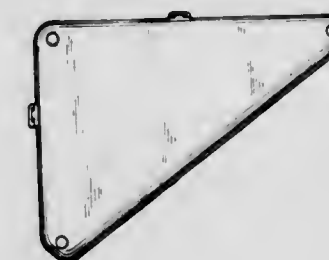
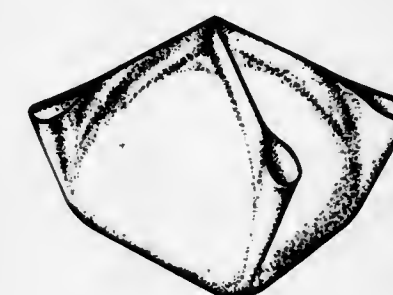
DECEMBER 27, 1983

**271,914**  
**JAPANESE SHAO-MAI**  
Koki Uno, Tokyo, Japan, assignor to 501 Kyotaru Co., Ltd., Tokyo, Japan  
Filed Jan. 2, 1981, Ser. No. 222,166  
Term of patent 14 years  
Int. Cl. D01—01

U.S. Cl. D1—2

**271,916**  
**AUTOMOBILE TOOL KIT CONTAINER**  
Adolf Koch, Waiblingen-Neustadt, Fed. Rep. of Germany, assignor to Autohaus Lorinser GmbH & Co, Waiblingen, Fed. Rep. of Germany  
Filed Jul. 15, 1981, Ser. No. 283,680  
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 844  
Term of patent 14 years  
Int. Cl. D3—02

U.S. Cl. D3—40

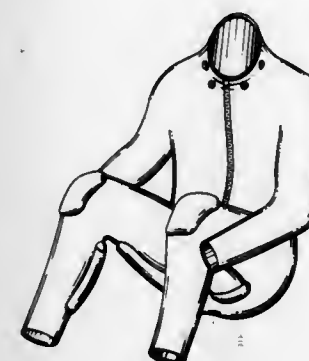


**271,915**  
**WET SUIT OR SIMILAR ARTICLE**  
Jan I. H. Bengtson, Pl. 6715, 430 41 Kullavik, Sweden  
Filed Nov. 5, 1980, Ser. No. 204,157  
Claims priority, application Sweden, May 6, 1980, 80-0927  
Term of patent 14 years  
Int. Cl. D2—02

U.S. Cl. D2—29

**271,917**  
**COMBINED TRAVEL BAG FOR CHILDRENS' TOYS AND LAP DESK**  
Vicki C. Magis, 7235 Duncourtney Dr., Atlanta, Ga. 30328  
Filed Feb. 11, 1982, Ser. No. 348,135  
Term of patent 14 years  
Int. Cl. D3—01

U.S. Cl. D3—40

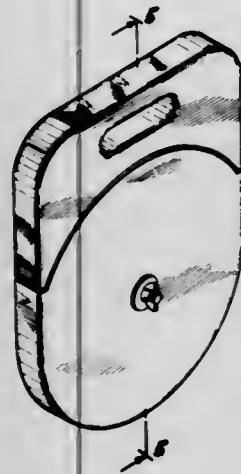




271,918

**CARRYING CASE FOR A CIRCULAR SAW BLADE**  
Mike H. Ramirez, 11555 Baylor Dr., Norwalk, Calif. 90650  
Filed Aug. 17, 1981, Ser. No. 293,542  
Term of patent 14 years  
Int. Cl. D3—02

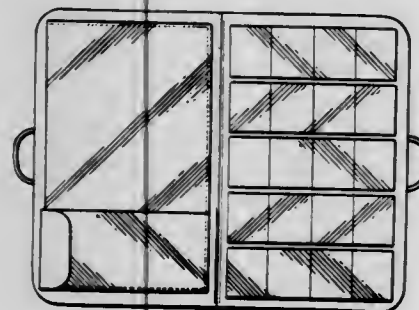
U.S. Cl. D3—73



271,919

**FOLDABLE DISPLAY CASE**  
Mary E. Duffy, 1210 Main St., Natchez, Miss. 39120  
Filed Feb. 27, 1981, Ser. No. 238,674  
Term of patent 14 years  
Int. Cl. D3—02

U.S. Cl. D3—74



271,920

**GROUND INSERTED SUPPORT STAND FOR A GOLF BAG**  
Edward F. Sanker, 319 Beech Ave., Wyoming, Ohio 45215  
Filed Oct. 23, 1981, Ser. No. 314,187  
Term of patent 14 years  
Int. Cl. D6—99

U.S. Cl. D6—28

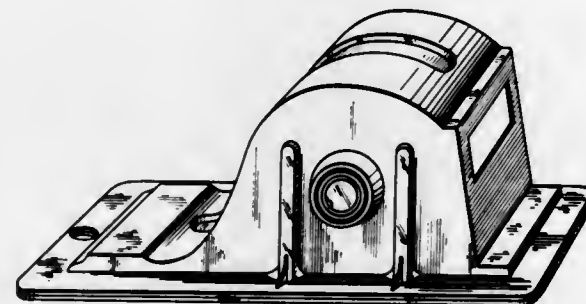


271,921

**SOAP TAPE DISPENSER**  
Byung E. Yoo, #616-5, Daemyung-dong, Nam-ku, Daegu-si, Rep. of Korea  
Filed Oct. 21, 1981, Ser. No. 313,485  
Claims priority, application Rep. of Korea, Jun. 12, 1981, 81-4745

Term of patent 14 years  
Int. Cl. D23—02

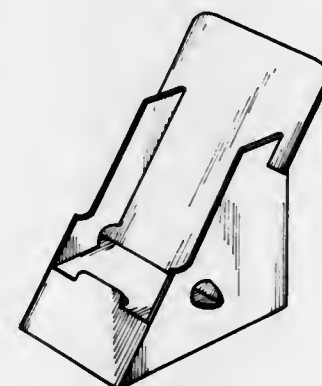
U.S. Cl. D6—95



271,922

**DISPLAY HOLDER**  
John L. M. Branagan, Victoria, Australia, assignor to Beatrice Publishing Pty. Ltd., Victoria, Australia  
Filed Dec. 16, 1980, Ser. No. 216,807  
Term of patent 14 years  
Int. Cl. D20—02; D6—04

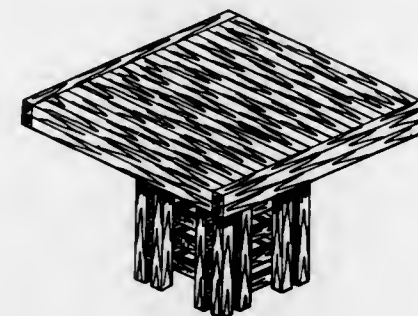
U.S. Cl. D6—140



271,923

**TABLE**  
Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577  
Filed Apr. 23, 1981, Ser. No. 256,793  
Term of patent 14 years  
Int. Cl. D6—03

U.S. Cl. D6—177

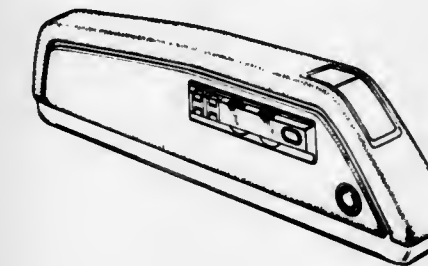


271,924

**ARM REST WITH AUDIO CONTROL PANEL**  
Teruyuki Nishimoto, Hirakata, and Akio Ohno, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 6, 1981, Ser. No. 309,133  
Claims priority, application Japan, Apr. 8, 1981, 56-15036  
Term of patent 14 years  
Int. Cl. D6—06

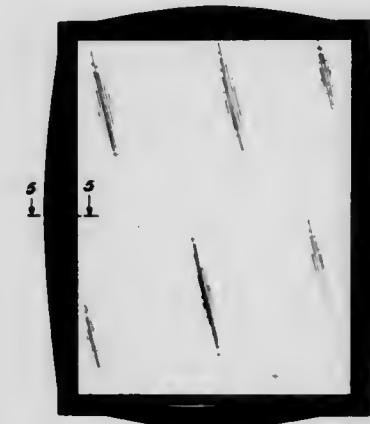
U.S. Cl. D6—194



271,926

**PICTURE FRAME**  
Donald K. Sultan, 54 Leonard St., New York, N.Y. 10013  
Filed May 4, 1981, Ser. No. 260,109  
Term of patent 14 years  
Int. Cl. D6—07

U.S. Cl. D6—244

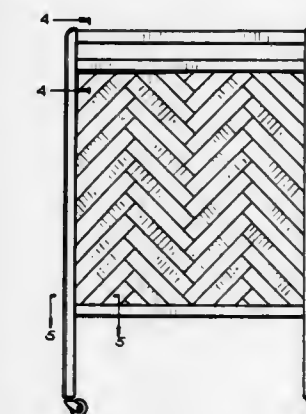


271,925

**CRIB FOOTBOARD**  
Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,358  
The portion of the term of this patent subsequent to Jul. 19, 1997, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D6—06

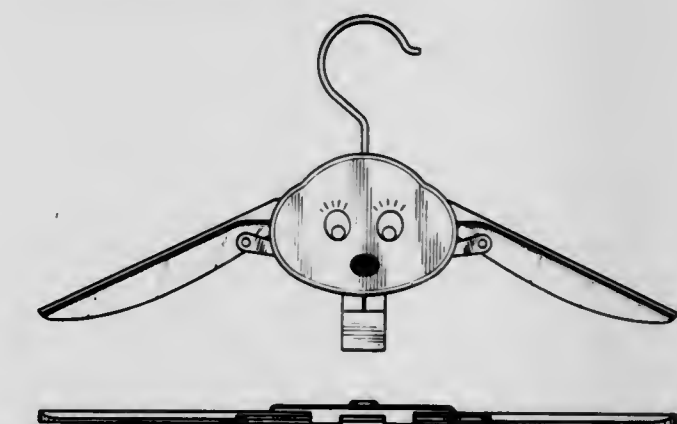
U.S. Cl. D6—198



271,927

**FOLDING GARMENT HANGER**  
Noel M. Payant, 214 E. Pleasant, Taylorville, Ill. 62568  
Filed Aug. 5, 1981, Ser. No. 290,368  
Term of patent 14 years  
Int. Cl. D6—08

U.S. Cl. D6—250



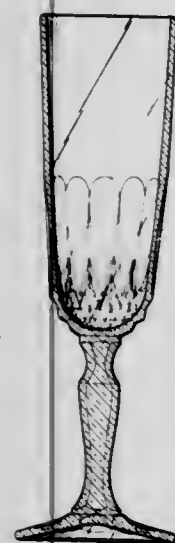


271,928

## GOBLET OR SIMILAR ARTICLE

Henri Prieur, Reims, France, assignor to Societe Francaise des  
Verreries Mecaniques Champenoises, Reims, France  
Filed Jul. 31, 1981, Ser. No. 288,863  
Claims priority, application France, Mar. 3, 1981, 81 51  
Term of patent 14 years  
Int. Cl. D07-01

U.S. Cl. D7-13



271,929

## PLATE OR THE LIKE

Candace M. Faber, Corning, N.Y., and Loretta H. Moskal, Glen  
Riddle, Pa., assignors to Corning Glass Works, Corning, N.Y.  
Filed Sep. 8, 1981, Ser. No. 299,802  
Term of patent 14 years  
Int. Cl. D7-01

U.S. Cl. D7-24



271,930

## PLATE OR THE LIKE

Donna M. Miska, Horseheads, N.Y., assignor to Corning Glass  
Works, Corning, N.Y.  
Filed Aug. 31, 1981, Ser. No. 297,702  
Term of patent 14 years  
Int. Cl. D07-01

U.S. Cl. D7-34



271,931

## PLATE OR THE LIKE

Candace M. Faber, Corning, N.Y., assignor to Corning Glass  
Works, Corning, N.Y.  
Filed Aug. 3, 1981, Ser. No. 289,262  
Term of patent 14 years  
Int. Cl. D07-01

U.S. Cl. D7-36



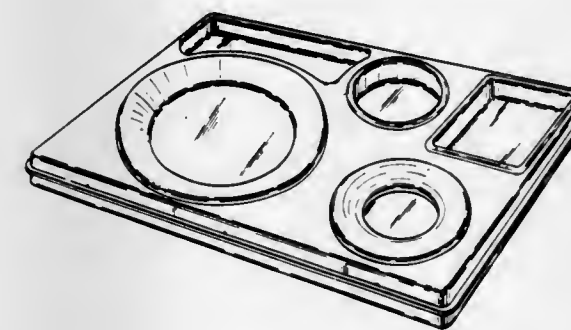
271,932

## FOOD TRAY

James M. V. Mosley, Hartford House, Occupation Rd., Lindley,  
Huddersfield, West Yorkshire, England  
Filed Sep. 14, 1981, Ser. No. 301,857  
Claims priority, application United Kingdom, Mar. 23, 1981,  
999581

Term of patent 14 years  
Int. Cl. D07-99

U.S. Cl. D7-38



271,934

## TRANSFER SURFACE OR THE LIKE FOR CULINARY WARE

Candace M. Faber, Corning, N.Y., and Loretta H. Moskal, Glen  
Riddle, Pa., assignors to Corning Glass Works, Corning, N.Y.  
Filed Sep. 8, 1981, Ser. No. 299,803  
Term of patent 14 years  
Int. Cl. D7-01

U.S. Cl. D7-39



271,933

## TRANSFER SURFACE OR THE LIKE FOR CULINARY WARE

Donna M. Miska, Horseheads, N.Y., assignor to Corning Glass  
Works, Corning, N.Y.  
Filed Aug. 31, 1981, Ser. No. 297,961  
Term of patent 14 years  
Int. Cl. D07-01

U.S. Cl. D7-39



271,935

## OUTDOOR COOKING APPLIANCE FOR USE WITH A GAS CONTAINER

Curtis G. Conner, 618 First St., #102, Humble, Tex. 77338  
Filed Feb. 17, 1981, Ser. No. 235,121  
Term of patent 14 years  
Int. Cl. D7-04

U.S. Cl. D7-332





271,936  
FIREPLACE TOOL

Tulla J. Fyffe, 543 E. Country Line Rd., and Sandra L. Hicks, 1287 E. County Line Rd., both of Springfield, Ohio 45502  
Filed Jan. 8, 1981, Ser. No. 223,459  
Term of patent 14 years  
Int. Cl. D8-05

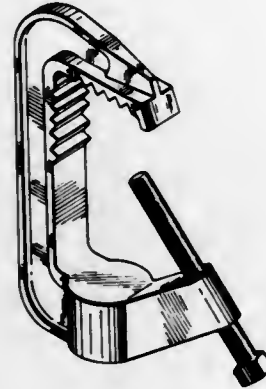
U.S. Cl. D8-14



271,939  
C-CLAMP

William D. Little, P.O. Box 20211, Dallas, Tex. 75220  
Filed Jul. 24, 1981, Ser. No. 286,384  
Term of patent 14 years  
Int. Cl. D8-05

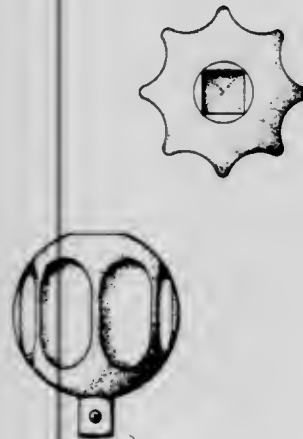
U.S. Cl. D8-73



271,937  
TOOL HANDLE

Marvin Combs, 2327 Mayhew Dr., Indianapolis, Ind. 46227  
Filed Feb. 2, 1981, Ser. No. 230,644  
Term of patent 14 years  
Int. Cl. D8-05

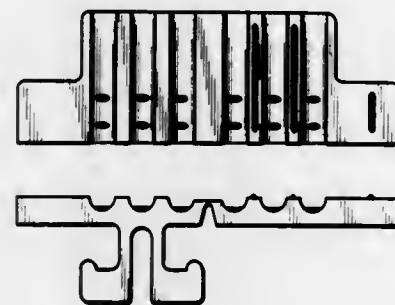
U.S. Cl. D8-25



271,940  
COMBINED SPACER AND FOLDABLE LOCK FOR WIRES OR THE LIKE

Rudolph E. Muench, Shelby, N.C., assignor to Fasco Controls Corporation, Shelby, N.C.  
Filed Sep. 24, 1981, Ser. No. 305,273  
Term of patent 14 years  
Int. Cl. D8-08

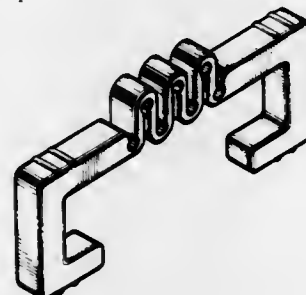
U.S. Cl. D8-356



271,941  
SKI CLIP

David E. Calapp, 4056 - 172nd Pl. SE., Bellevue, Wash. 98008  
Filed Oct. 13, 1981, Ser. No. 310,514  
Term of patent 14 years  
Int. Cl. D8-08

U.S. Cl. D8-395



271,938

ORNAMENTAL DESIGN FOR A SOLDER EXTRACTOR  
Frank Sylvia, Columbia, Md., assignor to Pace Incorporated, Laurel, Md.

Filed Jun. 26, 1981, Ser. No. 277,851  
Term of patent 14 years  
Int. Cl. D8-05

U.S. Cl. D8-30



271,942

CONTAINER FOR FOODSTUFFS

Neil V. H. Goldman, London, England, assignor to Frank Coleman (Luton) Limited, Flitwick, England  
Filed Sep. 3, 1981, Ser. No. 299,239  
Claims priority, application United Kingdom, Mar. 9, 1981, 81-999,308; Mar. 9, 1981, 81-999,309  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-414

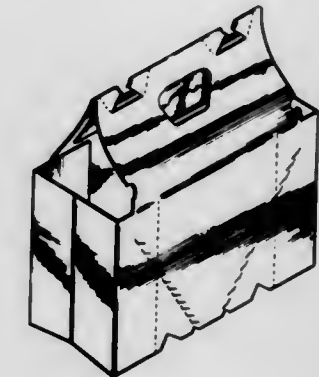


271,944

ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio  
Filed Aug. 28, 1981, Ser. No. 297,151  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-416

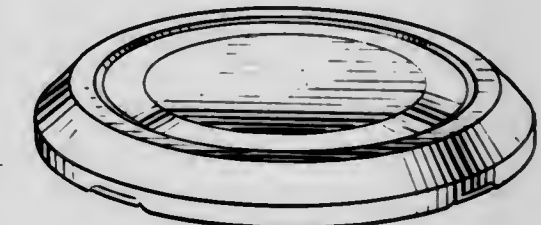


271,945

CLOSURE CAP OR THE LIKE

Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio  
Filed Jul. 2, 1981, Ser. No. 279,768  
Term of patent 14 years  
Int. Cl. D9-07

U.S. Cl. D9-452

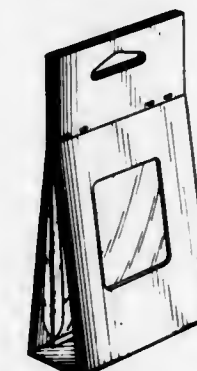


271,943

COMBINED PACKAGING AND DISPLAY CONTAINER  
Theodore W. Beise, Villa Park, and Howard J. Rasmussen, Fox River Grove, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Dec. 15, 1980, Ser. No. 216,262  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-415



271,946

WRISTWATCH

Toshiyuki Dobashi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Sep. 16, 1981, Ser. No. 302,728  
Claims priority, application Japan, Mar. 17, 1981, 56-11073  
Term of patent 14 years  
Int. Cl. D10-02

U.S. Cl. D10-38



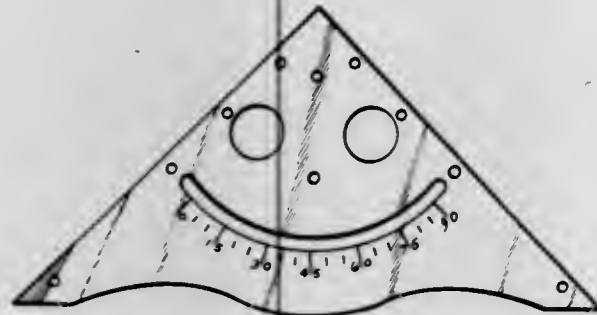


271,947  
SHEAR GAGE

Paul J. Rakoczy, 28810 Village La., Farmington Hills, Mich. 48024

Filed Oct. 8, 1981, Ser. No. 309,554  
Term of patent 14 years  
Int. Cl. D10-04

U.S. Cl. D10-62

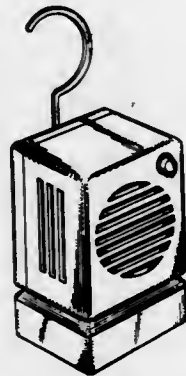


271,949  
SMOKE DETECTOR

Louis J. DeChristopher, 69511 Iberia Ct., Rancho Mirage, Calif. 92270

Filed May 29, 1981, Ser. No. 268,581  
Term of patent 14 years  
Int. Cl. D10-05

U.S. Cl. D10-106



271,948

AMPERE-VOLT-WATTMETER OR THE LIKE

Takeo Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,593  
Claims priority, application Japan, Nov. 20, 1980, 55-48270  
Term of patent 14 years  
Int. Cl. D10-04

U.S. Cl. D10-79



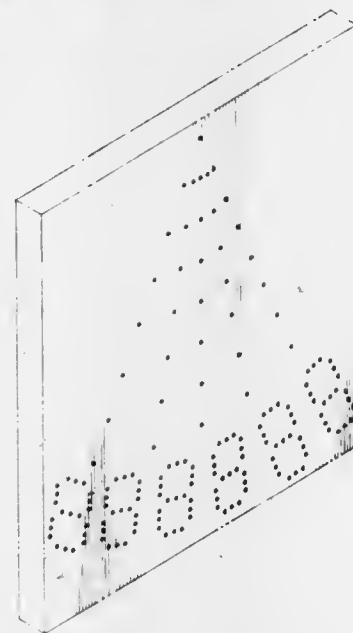
271,950

ILLUMINATED DIGITAL READOUT SIMULATED  
PENDULUM DISPLAY FOR A TIMEPIECE

Merwyn E. Moore, P.O. Box 2061, Rapid City, S. Dak. 57709

Filed Feb. 24, 1981, Ser. No. 237,756  
Term of patent 14 years  
Int. Cl. D10-07

U.S. Cl. D10-130



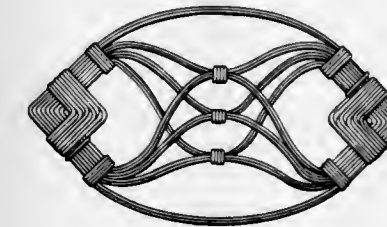
271,951

WIRE BRACELET

Lourinzo Lee, 839 W. 83rd, Chicago, Ill. 60620

Filed Oct. 18, 1979, Ser. No. 69,229  
Term of patent 14 years  
Int. Cl. D11-01

U.S. Cl. D11-4



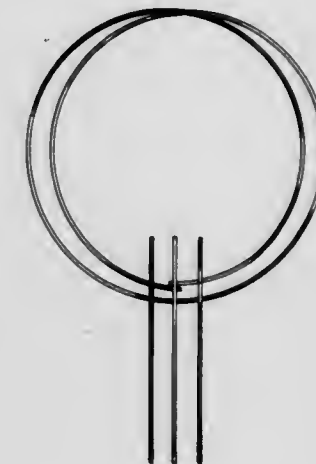
271,953

WIRE FORM FLOWER ARRANGEMENT FRAME  
DESIGN

Roderic M. Koch, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.

Filed Jun. 1, 1981, Ser. No. 268,698  
Term of patent 14 years  
Int. Cl. D11-02; D8-99

U.S. Cl. D11-143

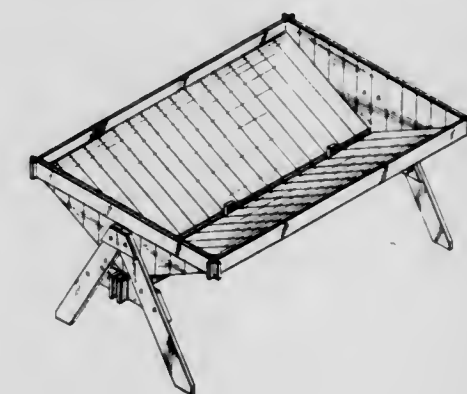


271,954  
PLANTER

Andrew M. Neil, 3 Cancell Rd., London, England

Filed Aug. 3, 1981, Ser. No. 289,704  
Claims priority, application United Kingdom, Feb. 10, 1981, 81998837

Term of patent 14 years  
Int. Cl. D11-02; D6-06; D30-03  
U.S. Cl. D11-156



271,952

EARRING

Arthur A. Altman, 65-41 Wethrole St., Forest Hills, N.Y. 11374

Filed Mar. 12, 1982, Ser. No. 357,792  
Term of patent 14 years  
Int. Cl. D11-01

U.S. Cl. D11-78

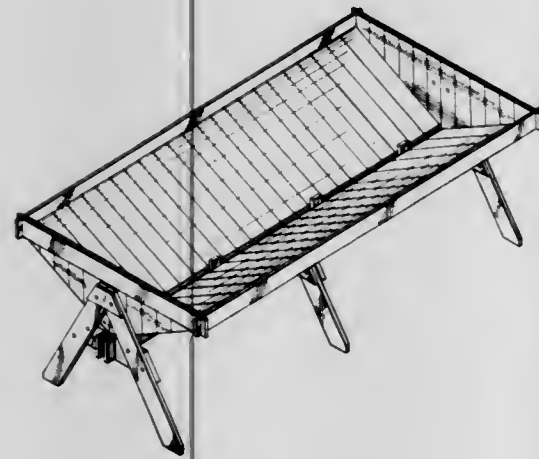




271,955  
PLANTER

Andrew M. Neil, 3 Cancell Rd., London, England  
Filed Aug. 3, 1981, Ser. No. 289,705  
Claims priority, application United Kingdom, Feb. 10, 1981,  
998838

Term of patent 14 years  
Int. Cl. D11-02; D6-06; D30-03  
U.S. Cl. D11-156

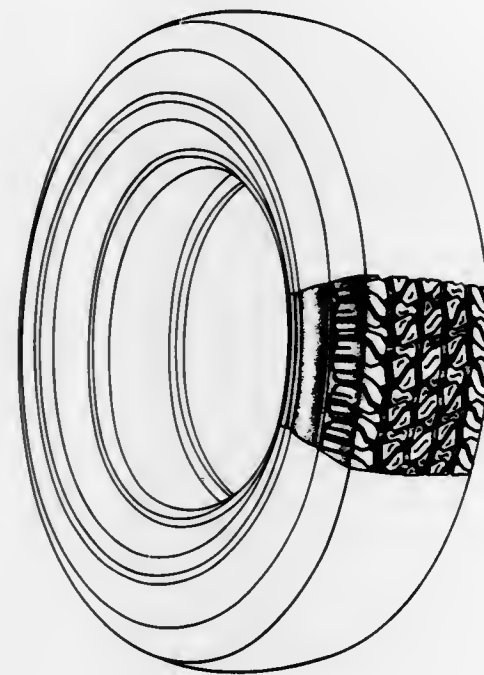


271,957  
TIRE

Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie  
Generale des Etablissements Michelin, Clermont-Ferrand,  
France

Filed Jan. 5, 1982, Ser. No. 337,253  
Term of patent 14 years  
Int. Cl. D12-15

U.S. Cl. D12-147

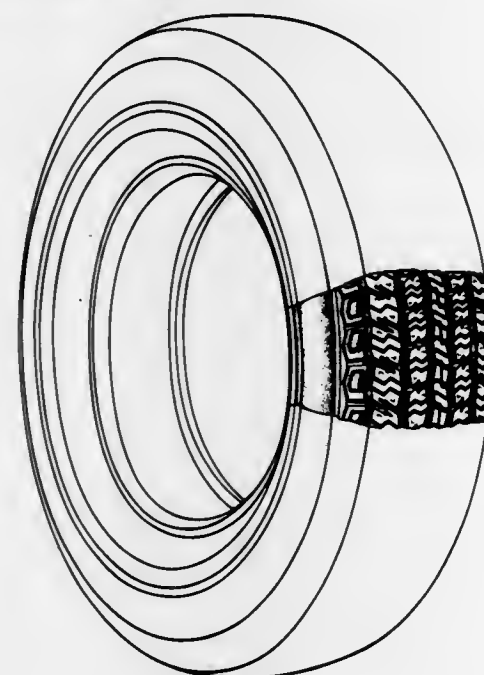


271,958  
TIRE

Jean-Philippe Gorez, Greenville, S.C. assignor to Compagnie  
Generale des Etablissements Michelin, Clermont-Ferrand,  
France

Filed Jan. 5, 1982, Ser. No. 337,254  
Term of patent 14 years  
Int. Cl. D12-15

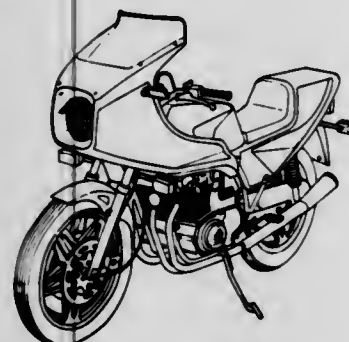
U.S. Cl. D12-147



271,956  
MOTORCYCLE

Minoru Morioka, Kawagoe; Mamoru Matsui, Tokyo, and Mi-  
chihiko Yasuda, Fujimi, all of Japan, assignors to Honda  
Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Sep. 16, 1980, Ser. No. 187,983  
Claims priority, application Japan, Mar. 19, 1980, 55-10933

Term of patent 14 years  
Int. Cl. D12-11  
U.S. Cl. D12-110

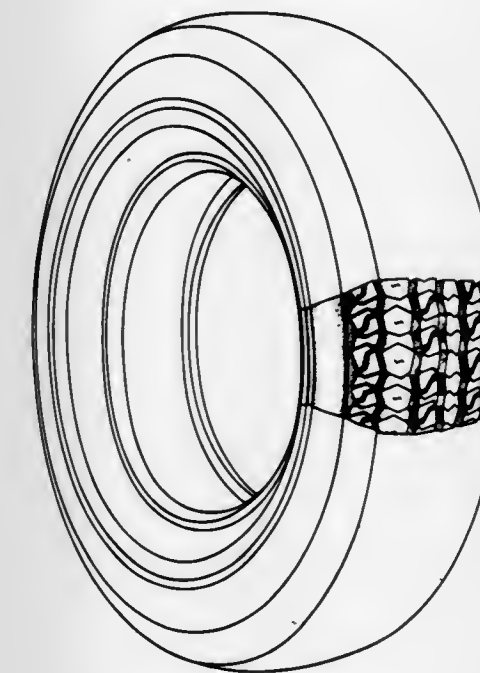


271,959  
TIRE

Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie  
Generale des Etablissements Michelin, Clermont-Ferrand,  
France

Filed Jan. 5, 1982, Ser. No. 337,309  
Term of patent 14 years  
Int. Cl. D12-15

U.S. Cl. D12-147

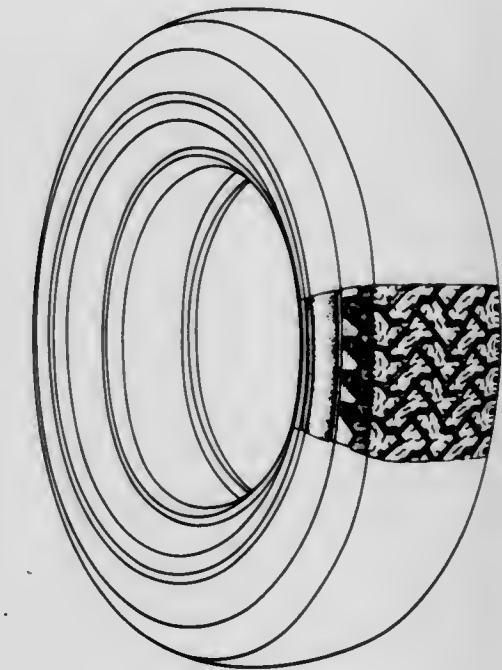


271,961  
TIRE

Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie  
Generale des Etablissements Michelin, Clermont-Ferrand,  
France

Filed Jan. 5, 1982, Ser. No. 337,307  
Term of patent 14 years  
Int. Cl. D12-15

U.S. Cl. D12-151

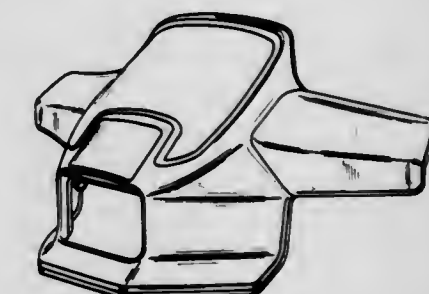


271,962

FRONT SHIELD FOR A MOTOR VEHICLE  
Jun Ito, Tokyo, Japan, assignor to Honda Giken Kogyo Kabu-  
shiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,507  
Claims priority, application Japan, Dec. 26, 1980, 55-54961  
Term of patent 14 years  
Int. Cl. D12-11

U.S. Cl. D12-182

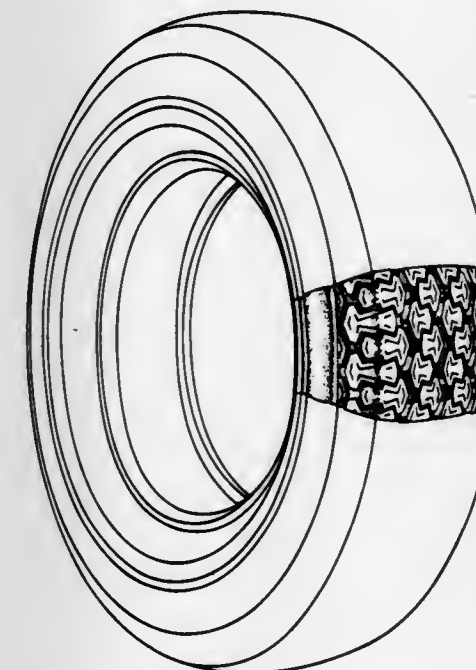


271,960  
TIRE

Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie  
Generale des Etablissements Michelin, Clermont-Ferrand,  
France

Filed Jan. 5, 1982, Ser. No. 337,310  
Term of patent 14 years  
Int. Cl. D12-15

U.S. Cl. D12-147

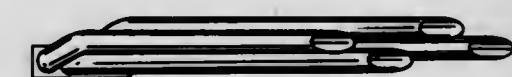


271,963

MULTIPLE-TUBED EXHAUST UNIT FOR  
AUTOMOTIVE VEHICLES  
Frank E. Perkins, 2401 S. Grand Ave. East, Springfield, Ill.  
62703

Filed Sep. 2, 1981, Ser. No. 298,913  
Term of patent 14 years  
Int. Cl. D12-16

U.S. Cl. D12-194





271,964  
MOTOR BOAT

James E. Judd, Box 307, Lancaster, Mo. 63548  
Filed Nov. 23, 1981, Ser. No. 323,969  
Term of patent 14 years  
Int. Cl. D12-06

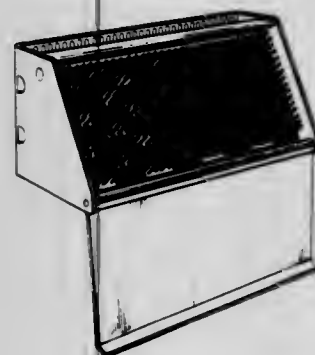
U.S. Cl. D12-307



271,965  
TELEPHONE TERMINAL BLOCK OR SIMILAR  
ARTICLE

Thomas A. Hollfelder, 6 Mulberry Rd., Huntington, N.Y. 11743  
Filed Mar. 6, 1981, Ser. No. 241,029  
Term of patent 14 years  
Int. Cl. D13-03

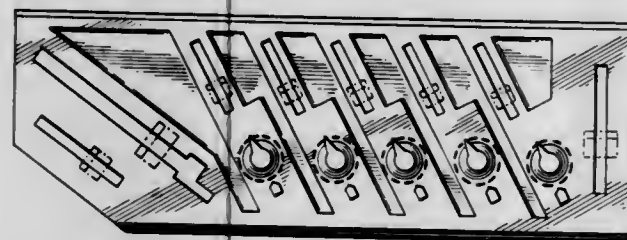
U.S. Cl. D13-24



271,966  
CONTROL CONSOLE

William J. Brown, Naperville; Ramon C. Kohler, Montgomery,  
and John M. Parks, Peoria, all of Ill., assignors to Caterpillar  
Tractor Co., Peoria, Ill.  
Filed Oct. 14, 1980, Ser. No. 196,895  
Term of patent 14 years  
Int. Cl. D13-63

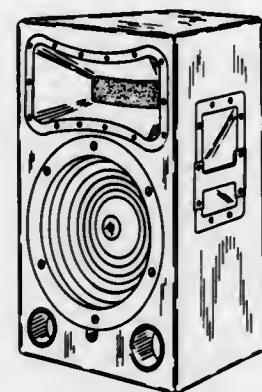
U.S. Cl. D13-32



271,967  
LOUDSPEAKER

John D. Meyer, 1531 Posen Ave., Albany, Calif. 94706, and  
Alexander Yuill-Thornton II, 208 Cardinal Rd., Mill Valley,  
Calif. 94941  
Filed May 27, 1981, Ser. No. 267,640  
Term of patent 14 years  
Int. Cl. D14-01

U.S. Cl. D14-34

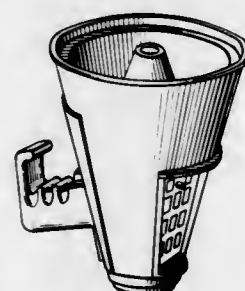


271,968  
MEGAPHONE

Marc H. Segal, 154 W. 70th St., New York, N.Y. 10023; Sey-  
mour Cohen, 1554 Holiday Park Dr., Wantagh, N.Y. 11793,  
and Sayre Swartztrauber, 301 E. 79th St., New York, N.Y.  
10021

Filed Jul. 1, 1981, Ser. No. 279,667  
Term of patent 14 years  
Int. Cl. D14-01

U.S. Cl. D14-35

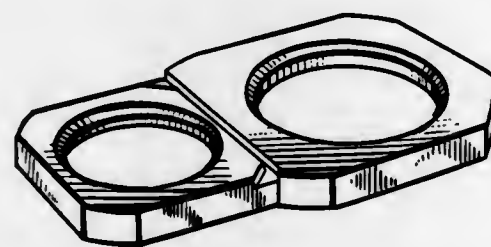


271,969  
SPEAKER COVER

Jack R. Saidel, Flossmoor, Ill., assignor to Electronic Industries,  
Inc., Harvey, Ill.

Filed Jul. 21, 1980, Ser. No. 170,516  
Term of patent 14 years  
Int. Cl. D14-01

U.S. Cl. D14-37



271,970  
TELECOMMUNICATIONS INTERCONNECTION  
ENCLOSURE

Benne Velsher, Nepean, and Brian T. Osborne, Kanata, both of  
Canada, assignors to Northern Telecom Limited, Montreal,  
Canada

Filed Aug. 21, 1981, Ser. No. 294,935  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-52

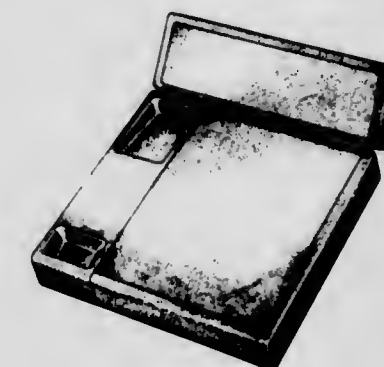


271,972  
TELEPHONE STAND

Donald M. Genaro, Haworth; John Kowalik, Jr., Freehold, both  
of N.J.; John N. McGarvey, Drexel Hill, Pa.; Gordon E.  
Sylvester, Jamaica, N.Y., and Daniel W. Tyler, Middletown,  
N.J., assignors to Bell Telephone Laboratories, Incorporated,  
Murray Hill, N.J.

Filed Oct. 5, 1981, Ser. No. 308,506  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-60



271,973  
WALL TELEPHONE BASE HOUSING

George M. Janda, Wheaton, Ill., assignor to GTE Automatic  
Electric Labs Inc., Northlake, Ill.

Filed Oct. 1, 1981, Ser. No. 307,476  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-61

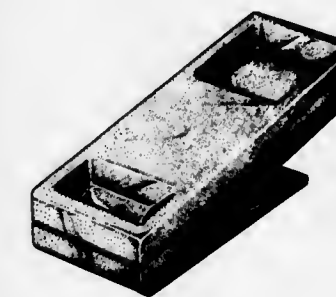


271,971  
TELEPHONE STAND OR SIMILAR ARTICLE

Donald M. Genaro, Haworth; Carl W. Gomes, II, Ocean, both of  
N.J.; John N. McGarvey, Drexel Hill, Pa.; Gordon E. Sylves-  
ter, Jamaica, N.Y., and Joseph E. Tatarski, Point Pleasant,  
N.J., assignors to Bell Telephone Laboratories, Incorporated,  
Murray Hill, N.J.

Filed Oct. 5, 1981, Ser. No. 308,505  
Term of patent 14 years  
Int. Cl. D14-03

U.S. Cl. D14-60





271,974

## TELEVISION RECEIVER

Akira Takahashi, Tokyo; Noritaka Segawa, Koganei, and Takeichi Obata, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

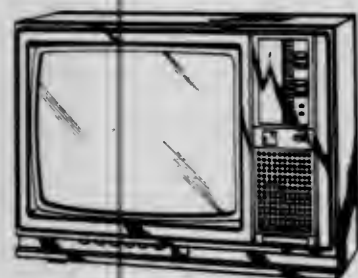
Filed Aug. 31, 1981, Ser. No. 297,570

Claims priority, application Japan, Mar. 18, 1981, 56-10876

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-80



271,975

## TERMINAL OUTPUT PRINTER

Robert E. Steinbugler, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1981, Ser. No. 267,110

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D14-111



271,976

## PISTON VACUUM PUMP

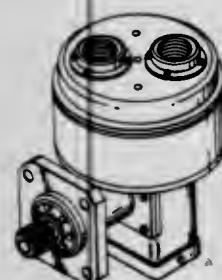
Forest G. Brown, Valley Center, Kans., assignor to Sigma Tek, Wichita, Kans.

Filed Dec. 31, 1981, Ser. No. 336,368

Term of patent 14 years

Int. Cl. D15-02

U.S. Cl. D15-7



271,977

## MASTER COLLET FOR MACHINE TOOLS

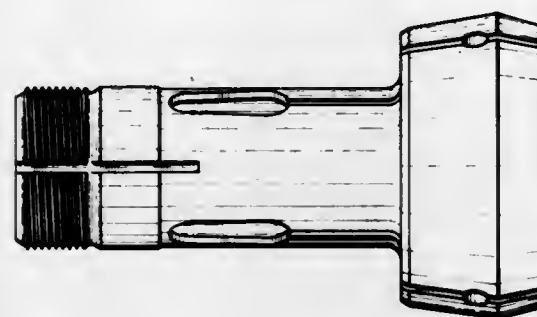
William R. Baker, Pine City, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Sep. 15, 1981, Ser. No. 302,384

Term of patent 14 years

Int. Cl. D15-09

U.S. Cl. D15-140



271,978

## CRANK DISC FOR A HIGH REFUSE WET WASHING COAL JIG

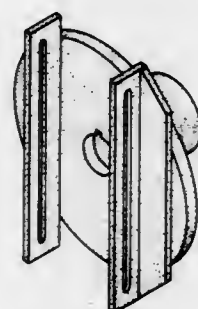
Wilbur W. Bagby, Birmingham, Ala., assignor to Bagby Engineering Co., Birmingham, Ala.

Filed Sep. 22, 1980, Ser. No. 189,636

Term of patent 14 years

Int. Cl. D15-99

U.S. Cl. D15-147



271,979

## PROCESSOR FOR FILM PRINTS

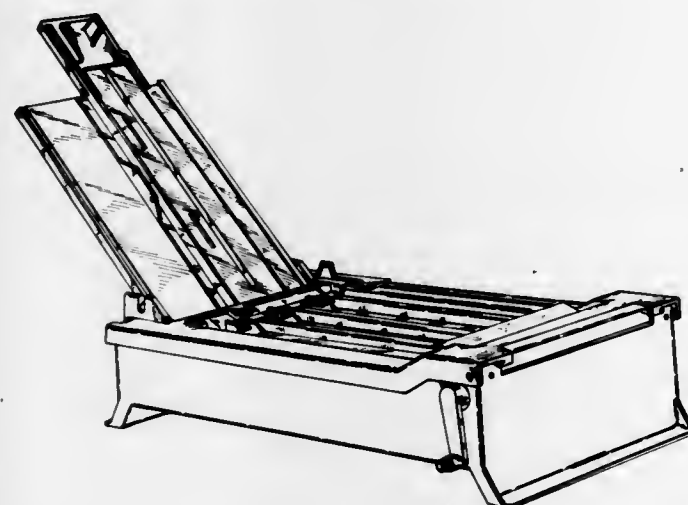
Ralph M. Vigna, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 21, 1981, Ser. No. 265,753

Term of patent 14 years

Int. Cl. D16-04

U.S. Cl. D16-33



271,980

## X-RAY DEVELOPING TANK

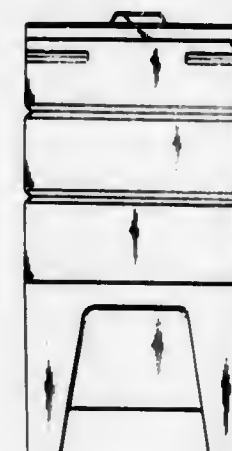
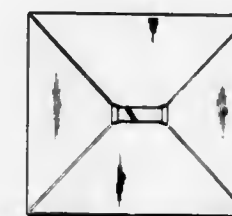
Roderique S. Gemmill, Davie, Fla., assignor to Radiation Concepts, Inc., Davie, Fla.

Filed Aug. 20, 1981, Ser. No. 294,535

Term of patent 14 years

Int. Cl. D16-04

U.S. Cl. D16-35



271,982

## VENDING MACHINE

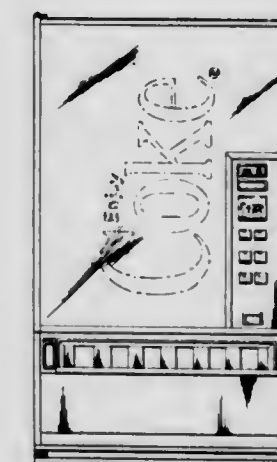
G. Merle Bachmann, Stone Mountain; Charles L. Davis, and Annis R. Morgan, Jr., both of Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 236,182, Feb. 20, 1981, Pat. No. Des. 266,337. This application Jul. 22, 1982, Ser. No. 400,854

Term of patent 14 years

Int. Cl. D20-01

U.S. Cl. D20-5



271,983

## VENDING MACHINE

G. Merle Bachmann, Stone Mountain; Charles L. Davis, and Annis R. Morgan, Jr., both of Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 236,181, Feb. 20, 1981, Pat. No. 267,498.

This application Jul. 22, 1982, Ser. No. 400,863

Term of patent 14 years

Int. Cl. D20-01

U.S. Cl. D20-5



271,981

## NOTEPAPER PAD HOLDER

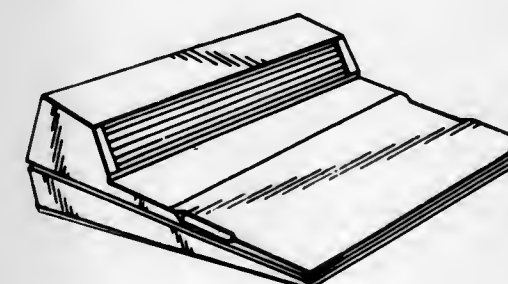
Walter C. Pearson, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Aug. 3, 1981, Ser. No. 289,773

Term of patent 14 years

Int. Cl. D19-02

U.S. Cl. D19-86





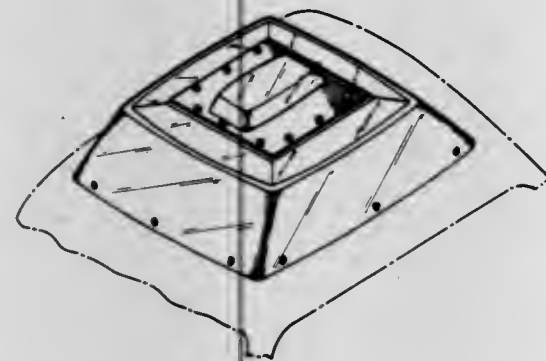
271,984

**TAXICAB ADVERTISING SIGN**

Jules Nelson, Philadelphia; Jimmie Walker, Audobon; Joseph J. Rossi, Philadelphia, and Samuel S. Leotta, Conshohocken, all of Pa., assignors to American Mobile Advertising Corp., Philadelphia, Pa.

Filed Aug. 31, 1981, Ser. No. 297,698  
Term of patent 14 years  
Int. Cl. D20—03

U.S. Cl. D20—10



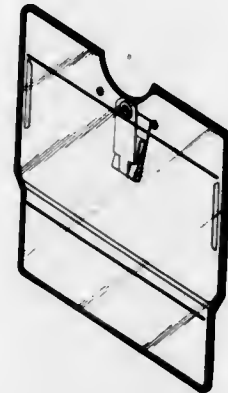
271,986

**TWO POCKET IDENTIFICATION BADGE HOLDER**

Dana C. Belser, P.O. Box 2306, Rockville, Md. 20852  
Filed Mar. 5, 1982, Ser. No. 355,048

Term of patent 14 years  
Int. Cl. D20—99

U.S. Cl. D20—27



271,987

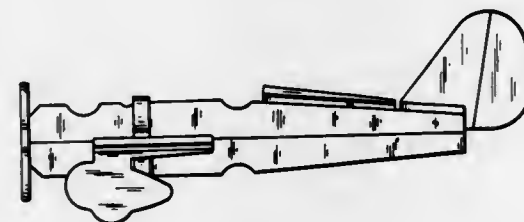
**TOY AIRPLANE**

Richard F. House, St. Charles, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Dec. 14, 1981, Ser. No. 330,088  
Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D21—89



271,985

**FOLD-OVER TWIN POCKET IDENTIFICATION BADGE HOLDER**

Dana C. Belser, P.O. Box 2306, Rockville, Md. 20852  
Filed Mar. 5, 1982, Ser. No. 355,046

Term of patent 14 years  
Int. Cl. D20—99

U.S. Cl. D20—27



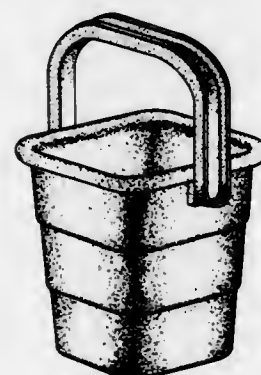
271,988

**BEACH PAIL**

Marc Rivollet, Oyonnax, France, assignor to Etablissements Fernand Berchet, France

Filed Jun. 8, 1981, Ser. No. 271,193  
Claims priority, application France, Dec. 8, 1980, 803787  
Term of patent 14 years  
Int. Cl. D21—01

U.S. Cl. D21—120



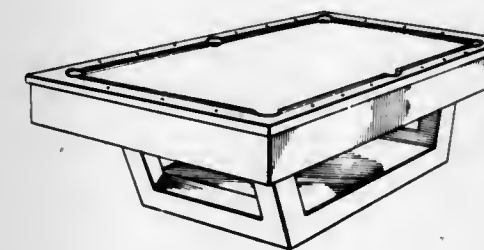
271,989

**POOL TABLE**

Antonin Painchaud, Longueuil, and Jean-Marc Painchaud, Ste-Julie, both of Canada, assignors to Beton Sports Canada Inc., St. Bruno, Canada

Filed Aug. 18, 1981, Ser. No. 293,860  
Term of patent 14 years  
Int. Cl. D21—01

U.S. Cl. D21—232



271,990

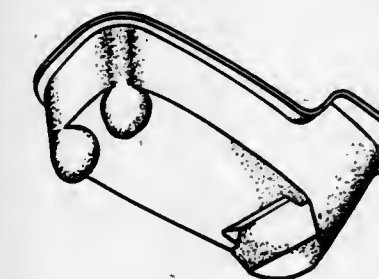
**BABY BATH**

John H. Lyne, Strathfieldsaye, Australia, assignor to Arthur W. Pulfer, Victoria, Australia

Filed Oct. 21, 1981, Ser. No. 313,497

Claims priority, application Australia, Sep. 17, 1981, 85-261  
Term of patent 14 years  
Int. Cl. D23—02

U.S. Cl. D23—52



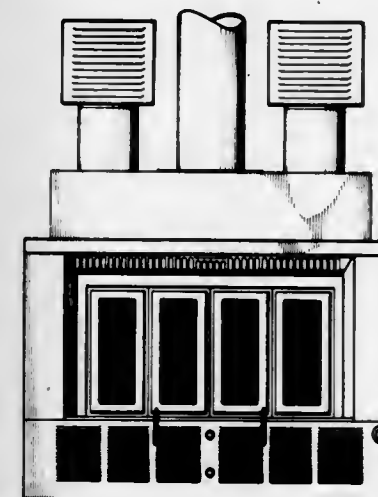
271,991

**HIGH EFFICIENCY STOVE AND ZERO-CLEARANCE FIREPLACE INSERT**

Albert B. Chamberlain, Stone Mountain, Ga., assignor to Atlanta Stove Works, Inc., Atlanta, Ga.

Filed May 15, 1981, Ser. No. 263,976  
Term of patent 14 years  
Int. Cl. D23—03

U.S. Cl. D23—94



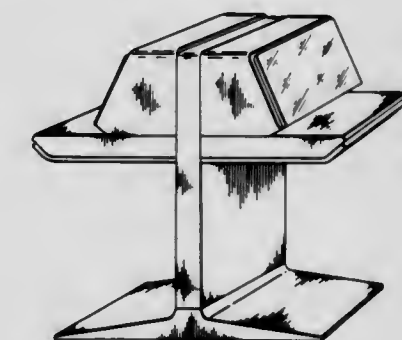
271,992

**DENTAL TREATMENT CABINET**

Carl W. Voltz, Lindenfels, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.

Filed May 13, 1981, Ser. No. 263,230  
Term of patent 14 years  
Int. Cl. D24—01

U.S. Cl. D24—4



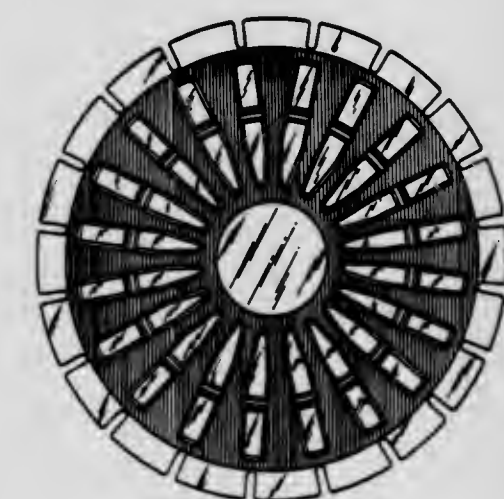
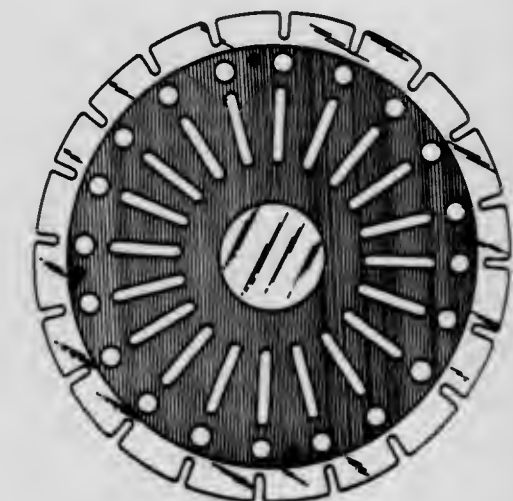
271,993

**CUVETTE ARRAY**

Peter J. Swartz, 33 Pine Ave., Randolph, Mass. 02368  
Filed May 22, 1981, Ser. No. 266,371

Term of patent 14 years  
Int. Cl. D24—99

U.S. Cl. D24—17





271,994

**CIRCULAR ANASTOMOSIS SURGICAL STAPLER**

Douglas G. Nollis, New Canaan; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

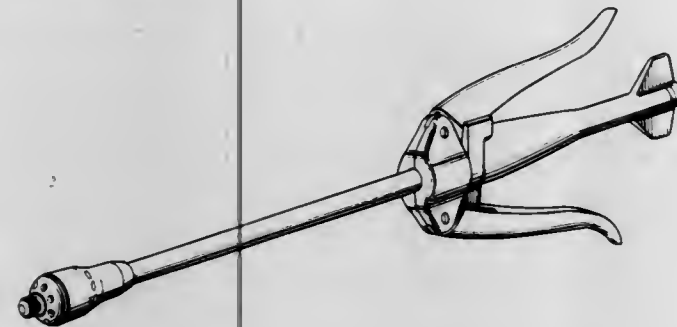
Filed Jun. 3, 1981, Ser. No. 270,276

Claims priority, application Canada, May 20, 1981, 20-05-81-1

Term of patent 14 years

Int. Cl. D24—02

U.S. Cl. D24—26



271,995

**COMBINED HYDROTHERAPY SPA AND SWIMMING POOL**

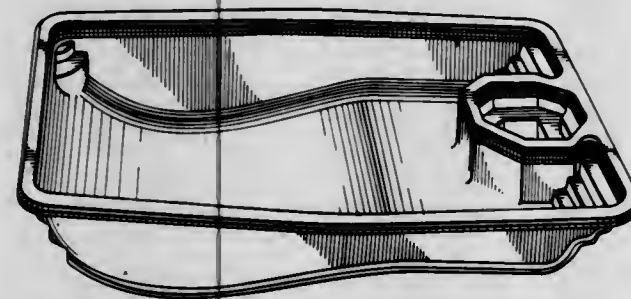
Lino Z. Topete, 1845 E. San Antonio St., San Jose, Calif. 95116

Filed Aug. 18, 1980, Ser. No. 179,116

Term of patent 14 years

Int. Cl. D24—01; D23—02; D25—99

U.S. Cl. D24—38



271,996

**COMPACT FLUORESCENT LAMP**

Masumi Nanba, Funabashi; Yoshio Kojima, Yokohama, and Nobuhiro Umehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1981, Ser. No. 333,657

Claims priority, application Japan, Jun. 24, 1981, 56-27286

Term of patent 14 years

Int. Cl. D26—04

U.S. Cl. D26—3



271,997

**COMPACT FLUORESCENT LAMP**

Taketo Kamei; Kimio Osada, both of Yokosuka; Masumi Nanba, Funabashi; Nobuhiro Umehara, Tokyo, and Yoshio Kojima, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1981, Ser. No. 333,658

Claims priority, application Japan, Sep. 21, 1981, 56-41485

Term of patent 14 years

Int. Cl. D26—04

U.S. Cl. D26—3



271,998

**COMPACT FLUORESCENT LAMP**

Masumi Nanba, Funabashi; Yoshio Kojima, Yokohama, and Nobuhiro Umehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1981, Ser. No. 333,659

Claims priority, application Japan, Jun. 24, 1981, 56-27289

Term of patent 14 years

Int. Cl. D26—04

U.S. Cl. D26—3



271,999

**COMPACT FLUORESCENT LAMP**

Masumi Nanba, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1981, Ser. No. 333,890

Term of patent 14 years

Int. Cl. D26—04

U.S. Cl. D26—3



272,000

**COMPACT FLUORESCENT LAMP**

Masumi Nanba, Funabashi; Yoshio Kojima, Yokohama, and Nobuhiro Umehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1981, Ser. No. 333,894

Claims priority, application Japan, Jun. 24, 1981, 56-27285

Term of patent 14 years

Int. Cl. D26—04

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272,001

**COMPACT FLUORESCENT LAMP**

Masumi Nanba, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1981, Ser. No. 333,904

Term of patent 14 years

Int. Cl. D26—04

U.S. Cl. D26—3



272,002

**COMPACT FLUORESCENT LAMP**

Nobuhiro Umehara, Tokyo; Yoshio Kojima, Yokohama, and Masumi Nanba, Funabashi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1981, Ser. No. 333,906

Claims priority, application Japan, Jul. 23, 1981, 56-32307

Term of patent 14 years

Int. Cl. D26—04

U.S. Cl. D26—3



272,003

**LIGHTING FIXTURE**

Michael T. Jankowski, Stiphout, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,809

Claims priority, application Benelux, Mar. 17, 1981, 55570-02

Term of patent 14 years

Int. Cl. D26—05

U.S. Cl. D26—63



272,004

**LAMP BASE**

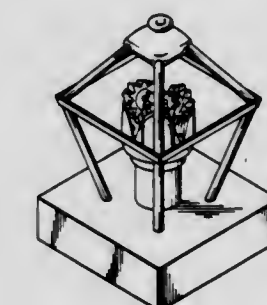
William E. Martin, P.O. Box 5521, Abilene, Tex. 79604, and Lyana J. Lance, 2025 Lowden, Abilene, Tex. 79603

Filed Apr. 3, 1981, Ser. No. 250,542

Term of patent 14 years

Int. Cl. D26—05

U.S. Cl. D26—94





272,005  
LIGHTER

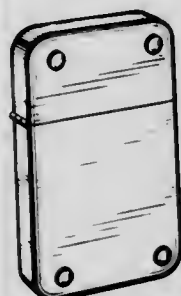
Franz A. Stützer, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,685

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 5MR-10328

Term of patent 14 years  
Int. Cl. D27-05

U.S. Cl. D27-36

272,006  
PERFUME DISPENSER PACKAGE

Reinold Geiger, Neuilly, France, assignor to AMS Ateliers de Moulage Spécialisé, France

Filed Feb. 4, 1981, Ser. No. 231,033

Claims priority, application France, Aug. 6, 1980, 802,572

Term of patent 14 years  
Int. Cl. D28-03

U.S. Cl. D28-5

272,007  
VANITY MIRROR

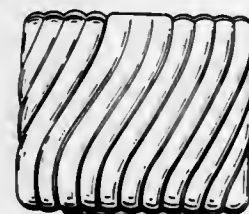
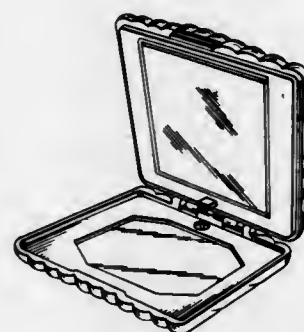
Kwok K. Cheung, Kwai Chung, Hong Kong, assignor to Wing Kiu Tong and King Sing Tong, both of Kwai Chung, Hong Kong, a part interest

Filed Nov. 10, 1981, Ser. No. 320,119

Claims priority, application United Kingdom, Jul. 14, 1981, 1 001 453

Term of patent 14 years  
Int. Cl. D28-03

U.S. Cl. D28-83

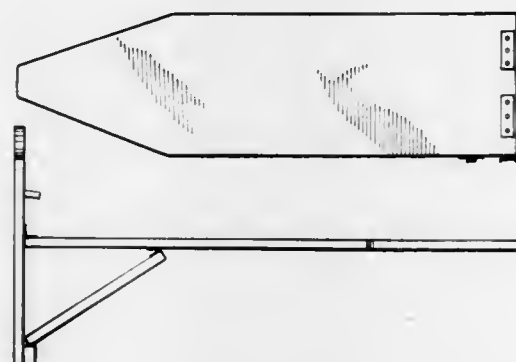
272,008  
WALL MOUNTED FOLDING IRONING BOARD

Walker L. Flory, 1108 Darby St., Orange, Calif. 92665

Filed Aug. 21, 1980, Ser. No. 180,017

Term of patent 14 years  
Int. Cl. D7-05

U.S. Cl. D32-66



## LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF DECEMBER, 1983

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 Arzoumanian, Aram S.; Hieber, Heinz W.; Nojiri, Howard H.; and Hart, Jimmie L., to Dataproducts Corporation. Solenoid-type hammer assembly for impact printer, 4,422,784, Cl. 400-144.200.  
 Arzoumanidis, Gregory G.; and Lee, Sam S., to Standard Oil Company (Indiana). Activation of complexed reduced titanium halide olefin polymerization catalyst with haloalkylchlorosilanes, 4,422,956, Cl. 502-158.000.

- Asahi Kasei Kogyo Kabushiki Kaisha: See—  
 Fukawa, Isaburo; Satake, Kunio; Yamada, Tsuyoshi; Hayakawa, Kiyoshi; and Sato, Yasushi, 4,423,190, Cl. 525-98.000.  
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 Aspinwall, Ronald A., to Vickers, Incorporated. Variable gain servo controlled directional valve, 4,422,475, Cl. 137-630.150.  
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 Aviation Electric Ltd.: See—  
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 Hutchings, Thomas J.; and Babcock, Gary D., 4,422,762, Cl. 356-350.000.  
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 Babiol, Pierre, to Societe Nouvelle de Bouchons Plastiques. Nestable pouring spout assemblies, 4,422,563, Cl. 222-153.000.  
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 Gusack, James A.; Bird, David O.; Thomm, Ernest C.; and Reitz, William A., 4,422,224, Cl. 28-272.000.  
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 Baetje, Kenneth J., to Midwest Cut Stone Co. Anchor pocket system for cut stone trim and the like, 4,422,275, Cl. 52-509.000.  
 Baglin, Elizabeth G.; and Gomes, John M., to United States of America, Interior. Selective recovery of base metals and precious metals from ores, 4,423,011, Cl. 423-22.000.  
 Bagnier, Carl; and Wildman, Arthur S., to Merck & Co., Inc. Process for the whole broth extraction of avermectin, 4,423,211, Cl. 536-16.900.  
 Bailey, David F.; Gilmore, Merle L.; Ganucheau, Charles J., Jr.; and Clow, Gary W., to Motorola, Inc. Decoder for transmitted message deactivation code, 4,423,416, Cl. 340-825.520.  
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 Goans, Kip B., 4,422,503, Cl. 166-53.000.  
 Baker, Don R., to Stauffer Chemical Company. Benzodioxane herbicides, 4,423,237, Cl. 549-362.000.  
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 Bar, Alfredo, to NECCHI Societa per Azioni. Starting relay of the PTC resistor type in motocompressors for refrigerators, 4,423,405, Cl. 338-25.000.

Bar-Ilan, Amiran: See—  
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Bar, Rami. Polymeric films for use in agriculture, 4,423,164, Cl. 523-135.000.

Baranczuk, Richard J., to Brune, Peter S., a part interest. Process for preparation of control for use in estrogen receptor tests, 4,423,151, Cl. 436-8.000.

Bardo, Charles J.; and Green, Andrew, to Ceramic Cooling Tower Company. Fiberglass reinforced cooling tower, 4,422,983, Cl. 261-24.000.

Bargues, Denis: See—  
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Barrett, Joseph A., to ICI Americas Inc. Igniter with static discharge element and ferrite sleeve, 4,422,381, Cl. 102-202.200.

Barrette, Richard P. Packaging fastener, 4,422,217, Cl. 24-16.00R.

Barsa, Edward A.; and Onder, Kemal, to Upjohn Company, The. Amorphous copolyamide from lactam, dicarboxylic acid and bisimidazole, 4,423,204, Cl. 528-323.000.

Barli, Richard, to Westfälische Metall Industrie KG Hueck & Co. Multi-chamber lamp for vehicles, 4,423,475, Cl. 362-249.000.

Bartman, Benjamin, to Rohm and Haas Company. Pressure sensitive hot melt adhesives, 4,423,182, Cl. 524-367.000.

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 Boffelli, Pier C., 4,422,352, Cl. 74-813.00L.

Baschang, Gerhard; Hartmann, Albert; Wacker, Oskar; and Tarcsey, Lajos, to Ciba-Geigy Corporation. Phosphoryl compounds, pharmaceutical preparations containing such compounds, and their use, 4,423,038, Cl. 424-177.000.

BASF Aktiengesellschaft: See—  
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Brandstetter, Franz; Echte, Adolf; Hambrecht, Juergen; Illers, Karl H.; and Priebe, Edmund, 4,423,187, Cl. 525-68.000.

Felleisen, Peter; Mayer, Dieter; Koester, Eberhard; Domas, Friedrich; and Deigner, Paul, 4,423,454, Cl. 360-135.000.

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Merger, Franz; and Schroff, Ludwig, deceased, 4,423,247, Cl. 564-391.000.

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 Bass, Harold E.; Bass, James L.; Bass, Richard E.; Bass, Peter J.; and Bass, Charles E., 4,423,304, Cl. 219-121.0PM.

Bass, Harold E.; Bass, James L.; Bass, Richard E.; Bass, Peter J.; and Bass, Charles E., 4,423,304, Cl. 219-121.0PM.

Bass, Peter J.: See—  
 Bass, Harold E.; Bass, James L.; Bass, Richard E.; Bass, Peter J.; and Bass, Charles E., 4,423,304, Cl. 219-121.0PM.

Bass, Harold E.; Bass, James L.; Bass, Richard E.; Bass, Peter J.; and Bass, Charles E., 4,423,304, Cl. 219-121.0PM.

Basu, Samar, to Bell Telephone Laboratories, Incorporated. Ambient temperature rechargeable battery, 4,423,125, Cl. 429-194.000.

Bataille, Jean R.; and Charollais Bataille, Nicole J. J. System for keeping the foot and the leg in position, 4,422,248, Cl. 36-121.000.

Batistoni, Michel, to Framatome. Making of steam generator water boxes, 4,422,499, Cl. 165-71.000.

Battelle Memorial Institute: See—  
 Wielonski, Roy F.; and Beale, Harry A., 4,422,915, Cl. 204-165.000.

Batz, Hans-Georg; Albert, Winfried; Lenz, Helmut; Linke, Hans-Ralf; and Stahler, Fritz, to Boehringer Mannheim GmbH. Process for the preparation of reactive, couplable derivatives of the thyroid hormones, 4,423,227, Cl. 548-406.000.



Bauer, Barney J.: See—  
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Bauer, Barney J.; and George, Richard D., 4,422,687, Cl.  
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Bauer, Wayne J.; Dodi, William C.; Kirkpatrick, Charles R.; Rehage,  
Ted A.; Robinson, Francis L.; and Taylor, William K., to International  
Business Machines Corporation. Buffered peripheral system  
with priority queue and preparation for signal transfer in overlapped  
operations. 4,423,480, Cl. 364-200.000.

Bauernfeind, John; Carnahan, Russell W.; Lodal, Norman; and  
Vazquez, Domingo, to Kraft, Inc. Method for manufacturing quick  
cooking pasta products. 4,423,082, Cl. 426-557.000.

Baumgartner, Friedrich; Romar, Alfred; and Rigles, Albert, to  
Veitscher Magnesitwerke-Actien-Gesellschaft. Apparatus for repairing  
a refractory furnace lining. 4,422,626, Cl. 266-281.000.

Baumgartner, Rolf, to Rolf Baumgartner AG. Mixing apparatus.  
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Baxter, Kenneth D.: See—  
Espiritu Santo, Eugenio; and Baxter, Kenneth D., 4,422,341, Cl.  
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Baxter Travenol Laboratories, Inc.: See—  
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Wood-  
worth, Archie G., 4,423,005, Cl. 422-61.000.

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stuffs. 4,422,969, Cl. 260-152.000.

Beecken, Hermann, to Bayer Aktiengesellschaft. Cationic styryl dye-  
stuffs. 4,422,969, Cl. 260-152.000.

Behn, Reinhard; and Kaufman, Kurt, to Siemens Aktiengesellschaft.  
Apparatus for manufacturing metal layers and glow polymer layers

which are superimposed and arranged laterally offset relative to one  
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Behr, Fred E., to Minnesota Mining and Manufacturing Company.  
Cyclic perfluoroaliphatic-disulfonic acid anhydrides and sulfonamide  
derivatives thereof. 4,423,197, Cl. 526-220.000.

Behrenz, Wolfgang: See—  
Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hammann,  
Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,423,066,  
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Bell Telephone Laboratories, Incorporated: See—  
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Becker, Edward W.; Harville, Paul R.; and MacLeod, Glen E.,  
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El Hamamsy, Mahoud A., 4,423,330, Cl. 250-551.000.

MacChesney, John B.; O'Connor, Paul B.; and Sullivan, Miles V.,  
4,422,898, Cl. 156-655.000.

Turek, Gregory J., 4,423,292, Cl. 179-18.0FA.

Bell, Weldon K.; and Chang, Clarence D., to Mobil Oil Corporation.  
Dimethyl ether synthesis catalyst. 4,423,155, Cl. 502-38.000.

Bellus, Daniel: See—  
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Dan-  
iel, 4,423,231, Cl. 548-451.000.

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Bender Machine Works, Inc.: See—  
Schmid, Roly A., 4,422,831, Cl. 417-63.000.

Bendix Corporation, The: See—  
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Hansen, Charles M., Jr., 4,423,374, Cl. 324-86.000.

Luscomb, Douglas A., 4,422,424, Cl. 123-447.000.

Ohnesorge, David H.; and Antonazzi, Frank J., 4,422,335, Cl.  
73-724.000.

Benneche, Tore; Gacek, Mikkel J.; and Undheim, Kjell, to Nyegaard &  
Co. A/S. Pyrimidine-2-sulphides and their S-oxides for use in medicine  
and methods of use thereof, pharmaceutical compositions containing  
them, processes for their preparation and per se novel sulphides  
and S-oxides. 4,423,047, Cl. 424-251.000.

Bennett, Clarence L., Jr.; and Price, Robert, to Sperry Corporation.  
Apparatus and method for detecting the onset of a frequency shift  
keyed signal. 4,423,519, Cl. 375-80.000.

Benoit, Pierre; Pellaux, Jean-Paul; Widmer, Gilbert; Kerlnevech,  
Betty; and Coche, Andre, to Cables Cortail S.A. Ellipsoidal  
optical coupling device. 4,422,714, Cl. 350-96.150.

Berezowski, Jaroslaw; and Feinman, Harvey M., to Sealectro Corpora-  
tion. Micro card reader. 4,423,317, Cl. 235-458.000.

Bergeron, Gary A., to Talos Systems, Inc. Apparatus and method for  
determining the position of a driven coil within a grid of spaced  
conductors. 4,423,286, Cl. 178-19.000.

Berginski, Werner-Ernst, to Leopold Kostal GmbH & Co. KG. Steering  
column switch with flasher switch. 4,423,297, Cl. 200-61.540.

Bergsand, Arne; and Marsland, Henryk, to Goteborgs Maskinkonsult  
Aktiebolag. Installation for internal cleaning of tubes. 4,422,210, Cl.  
15-302.000.

Bergvall, Bengt A., to Husqvarna Aktiebolag. Sewing guide of a seam  
pattern sewing machine. 4,422,394, Cl. 112-158.00F.

Berisch, Volker: See—  
Schopper, Bernd; and Berisch, Volker, 4,422,694, Cl. 303-84.00A.

Bernard Strutt Agencies Limited: See—  
Mattingly, Denis A. E., 4,422,935, Cl. 210-223.000.

Bernardoni, Luigi, to Alfa Romeo S.p.A. Intake duct fitted with non-  
return valve means. 4,422,416, Cl. 123-52.0MF.

Berner, George J., to Hobart Corporation. Commodity display for  
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Hahn, Robert E.; Jones, Thomas R.; and Berning, Peter H.,  
4,422,721, Cl. 350-164.000.

Berntell, John O., to Mechanical Technology Incorporated. Hot gas  
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Berrange, Aubrey R. Compactor. 4,422,795, Cl. 404-124.000.

Berry, Richard C.: See—  
Greenman, Norman L.; Berry, Richard C.; Tracy, Douglas H.;  
Amio, Bruce M.; Lunt, Michael S.; and Otto, Jeffrey B.,  
4,423,109, Cl. 428-288.000.

Berthold, Heinz, to Brueninghaus Hydraulik GmbH. Axial piston  
machine having inclined axis construction with swivel carriage and  
adjusting arrangement. 4,422,367, Cl. 91-484.000.

Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., to  
Standard Oil Company (Indiana). Process for removing sulfur oxides  
from a gas. 4,423,019, Cl. 423-244.000.

Bessot, Jean-Jacques; and Bourdon, Bernard, to Compagnie Industrielle  
des Telecommunications Cit-Alcatel. Apparatus for chemically acti-  
vated deposition in a plasma. 4,422,407, Cl. 118-723.000.

Beun, Roger, to Northern Telecom Limited. Supports for telephone  
jacks and circuit boards incorporating such supports. 4,423,466, Cl.  
361-400.000.

Beutler, Robert R.: See—  
Alspa, Allan A.; and Beutler, Robert R., 4,423,369, Cl.  
323-303.000.

BFG Glassgroup: See—  
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Bichet, Lucien, to Anver. Machines for bending footwear counters.  
4,422,198, Cl. 12-54.300.

Bier, Wilhelm: See—  
Becker, Erwin-Willy; Ehrfeld, Wolfgang; Krieg, Gunther; and  
Bier, Wilhelm, 4,422,905, Cl. 204-9.000.

Bini, Marco; Ignesti, Amleto; Millanta, Luigi; Rubino, Nicola; and  
Vanni, Riccardo, to Consiglio Nazionale Delle Ricerche. Instrument  
for monitoring the radiation hazard arising from electric and/or  
magnetic radio-frequency fields. 4,423,372, Cl. 324-72.000.

Binsack, Rudolf: See—  
Arlt, Klaus-Peter; Binsack, Rudolf; Grigo, Ulrich; and Neuray,  
Dieter, 4,423,196, Cl. 526-72.000.

Grigo, Ulrich; Fahnler, Friedrich; and Binsack, Rudolf, 4,423,186,  
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Bird, David O.: See—  
Gusack, James A.; Bird, David O.; Thomm, Ernest C.; and Reitz,  
William A., 4,422,224, Cl. 28-272.000.

Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gord-  
hanbhai N.; Poncha, Rustom P.; Skovinski, Adam L.; and Lesco,  
James M., to Allied Corporation. Pretreatment of plastic materials for  
metal plating. 4,422,907, Cl. 204-38.00B.

Birkner, Rainer: See—  
Goerner, Klaus; Dietze, Manfred; and Birkner, Rainer, 4,422,566,  
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Birnholtz, Jean, to Ultra-precision, S.A. Support device for integrated  
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Bitting, Ricky F.; and Marion, Roland M., to General Electric Com-  
pany. Tape recorder utilizing an integrated circuit. 4,423,442, Cl.  
360-68.000.

Bittler, Knut: See—  
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Black Clawson Company, The: See—  
Nowisch, Heinz K., 4,422,588, Cl. 242-56.300.

Tetro, Richard S., 4,422,586, Cl. 242-56.00R.

Black & Decker Inc.: See—  
Brathwaite, John D.; King, Derrick O.; and Williams, Sidney J.,  
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Black, Robert S.: See—  
Williams, Carl L., Jr.; Black, Robert S.; and Payne, Larry R.,  
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Blackford, John E.; Kelly, John J.; and Baker, Philip A., to Lucas  
Industries Limited. Pipe couplings. 4,422,673, Cl. 285-23.000.

Blanchard, Alan, to United Kingdom Atomic Energy Authority. Fluid  
control devices. 4,422,476, Cl. 137-810.000.

Blaschke, Felix; and Reng, Leonhard, to Siemens AG. Device for  
determining the parameter values for stator resistance, principal  
inductance and leakage inductance of an asynchronous machine.  
4,423,367, Cl. 318-803.000.

Bledsoe, Billy M. Insulating shade device. 4,422,492, Cl. 160-84.00R.

Blenkinsop, Paul A.: See—  
Neal, Donald F.; and Blenkinsop, Paul A., 4,422,887, Cl.  
148-133.000.

Blizzard, John D., to Dow Corning Corporation. Silicone-organic  
coating compositions. 4,423,095, Cl. 427-387.000.

Board of Regents, The University of Texas System: See—  
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Boehn, Hugo: See—  
Roos, Hans; Boehn, Hugo; Bittler, Knut; and Schlaefel, Dieter,  
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Boehringer Mannheim GmbH: See—  
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Ralf; and Stahler, Fritz, 4,423,227, Cl. 548-406.000.

Boeing Company, The: See—  
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4,422,501, Cl. 165-104.260.

Pinson, George T., 4,422,427, Cl. 123-478.000.

Boffelli, Pier C., to Baruffaldi Frizioni S.p.A. Apparatus for rotating in  
either direction a turret that carries plural tool holders. 4,422,352, Cl.  
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Bofors Nobel, Incorporated: See—  
Cousino, James L.; Nalewick, James A.; and Hills, Blair H.,  
4,422,940, Cl. 210-631.000.

Bogdany, John, to General Tire & Rubber Company, The. Patternized  
coating. 4,423,103, Cl. 428-95.000.

Bohner, Beat; Rempfler, Hermann; and Schurter, Rolf, to Ciba-Geigy  
Corporation. Herbicidally active unsaturated esters of halogenated  
 $\alpha$ -(4-pyridyl-2'-oxy)-phenoxy-propionic acids. 4,422,867, Cl.  
71-094.000.

Bollenbeck, Peter H.: See—  
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Bombardier-Rotax Gesellschaft m.b.H.: See—  
Obermayer, Alfred, 4,422,417, Cl. 123-185.0BA.

Bonfilio, Paul F.; and Stobe, Richard. Modular chassis and body for  
motor vehicles. 4,422,685, Cl. 296-197.000.

Bonin, John H.; Meyer, John W.; and Daniel, Arnold D., Jr., to Lock-  
heed Missiles & Space Co., Inc. Coal pump. 4,422,809, Cl. 406-98.000.

Bonvoisin, Jacques, to Compagnie Internationale des Pieux Armes  
Frankignoul. Process for construction of an underground structure  
and the structure thus obtained. 4,422,798, Cl. 405-132.000.

Boosen, Karl-Josef: See—  
Duc, Laurent; Boosen, Karl-Josef; and Marrel, Jean-Francois,  
4,423,217, Cl. 544-267.000.

Bordelon, Kent J.; Eschenbacher, Robert C.; and Bridendall, William  
H., to Olin Corporation. Spray drying apparatus for available chlo-  
rine-containing compounds. 4,422,900, Cl. 159-48.100.

Borders, Ernest D., to Applied Products, Inc. Ground level dump unit.  
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Borg-Warner Corporation: See—  
Braybrook, Kenneth A., 4,422,231, Cl. 29-509.000.

Bories, David: See—  
Walker, Ralph; and Bories, David, 4,422,409, Cl. 119-51.110.

Boring, Douglas J., to Conair, Inc. Apparatus for transporting pneu-  
matically suspended particulates from a source to a plurality of receivers.  
4,422,810, Cl. 406-156.000.

Boston Edison Company: See—  
Ruscitto, Robert A., 4,422,679, Cl. 292-307.00R.

Boström, Theodore. Dipless metallizing apparatus. 4,422,403, Cl.  
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Boswell, Fred A. Controlled wind motor. 4,422,825, Cl. 416-132.00B.

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van der Walt, Nicolaas T.; Bout, Bernardus J.; and Newington,  
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Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., to  
Black & Decker Inc. Apparatus for feeding a liquid to an applicator.  
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and Pribe, Edmund, to BASF Aktiengesellschaft. Thermoplastic  
molding materials. 4,423,187, Cl. 525-68.000.

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Kahlcke, Hartwig, 4,422,343, Cl. 74-16.000.

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- Brown, Ronald L.: See—  
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- Bruckner Apparatur GmbH: See—  
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- Brueninghaus Hydraulik GmbH: See—  
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- Bryant, Robert J., to Sterling Drug Inc. Process for substitution of aromatic organic compounds. 4,422,955, Cl. 502-169.000.
- Buchanan, William T. Sump drain system. 4,422,829, Cl. 417-40.000.
- Buckingham, Howard A.; Feldman, Hugh V.; Gotley, Paul; and Young, Richard, to Neotronics Limited. Apparatus for measuring the efficiency of combustion appliances. 4,423,487, Cl. 364-551.000.
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- Bullock, Randolph A.; and Mason, Lawrence J., to Xerox Corporation. Phase controlled regulated power supply. 4,423,478, Cl. 363-89.000.
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- Burr-Brown Research Corporation: See—  
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- Burrington, J. D.: See—  
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- Roesner, Bruce B., 4,423,490, Cl. 365-149.000.
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- Bush, Edward A. Pool ball holder and spotting device. 4,422,637, Cl. 273-22.000.
- Bush, Elmer R., to L. Barker & Williamson, Inc. Broad bandwidth folded dipole antenna. 4,423,423, Cl. 343-803.000.
- Bussemeier, Bernd; Cornils, Boy; and Frohning, Carl-Dieter, to Ruhrchemie Aktiengesellschaft. Process for preparing unsaturated hydrocarbons. 4,423,156, Cl. 518-717.000.
- Bussiere, Guy: See—  
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- Bussiere, Jean L. Turbine air battery charger & power unit. 4,423,368, Cl. 322-35.000.
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- Bux, Paul M.; Marshall, James F.; and Smith, Paul A., Jr., to United Technologies Corporation. Blade root seal. 4,422,827, Cl. 416-193.00A.
- Byrnes, Herbert P.; and Wahl, Richard, to International Business Machines Corporation. Contact probe assembly having rotatable contacting probe elements. 4,423,376, Cl. 324-158.00P.
- C-I-L Inc.: See—  
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- Cables Cortaillo S.A.: See—  
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- Caboche, Jean-Jacques: See—  
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- Cabot Corporation: See—  
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- Cadawas, Thomas L. Phonograph tone arm suspension. 4,423,501, Cl. 369-253.000.
- Calkins, Dennis E.: See—  
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- Callaway, Milton A.; and Stutzman, Thomas F., to Simmons U.S.A. Corporation. Thermally controllable heating mattress. 4,423,308, Cl. 219-217.000.
- Campbell, David K., to Harris Corporation. Digital filter employing PROM for storing positive and negative impulse response values. 4,423,488, Cl. 364-724.000.
- Campbell, Gary L., to Deere & Company. Connecting rod. 4,422,348, Cl. 74-579.00E.
- Campbell, Willis R.; and Eggers, Edward T., to Sperry Corporation. Baling machine with air spring means for maintaining apron tension. 4,422,374, Cl. 100-88.000.
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- Kawai, Tohru; and Sumi, Akiyasu, 4,422,740, Cl. 354-25.000.
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- Kondo, Hideyo; and Touma, Hitoshi, 4,423,132, Cl. 430-67.000.
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- Uchidoi, Masanori; and Urushihara, Kazunobu, 4,422,747, Cl. 354-458.000.
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- Carl Hasse & Wrede GmbH: See—  
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- Carlson, John A., to Sterling Drug Inc. Antibacterial and antiprotozoal 1-methyl-5-nitro-2-(2-phenylvinyl)imidazoles. 4,423,046, Cl. 424-248.400.
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- Carter, Barry E. Device for improving piano tone quality. 4,422,360, Cl. 84-1.110.
- Caruso, Paul J., to Union Carbide Corporation. Herbicidal composition. 4,423,241, Cl. 560-35.000.

- Casacci, Severin; and Jarriand, Paul, to Neyrpic. Propeller runner having swivelling blades for turbines. 4,422,826, Cl. 416-157.00R.
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- Casio Computer Co., Ltd.: See—  
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- Caterpillar Tractor Co.: See—  
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- Central Soya Company, Inc.: See—  
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- Cetus Corporation: See—  
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- Champion International Corporation: See—  
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- Charles Machine Works, Inc.: See—  
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- Cheeseboro, Robert G. Magnetically recordable label for mechanically-defined information bearing discs. 4,423,503, Cl. 369-290.000.
- Cheesman, Barbara E.; and Alikhan, Raza, to Ritmed Limited. Surgical sponge counter and blood loss determination system. 4,422,548, Cl. 206-370.000.
- Chemical Systems, Inc.: See—  
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- Chesmore, James R.; and Bruder, Frank J., to EECO Incorporated. Manually operated detented switch. 4,423,300, Cl. 200-339.000.
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- Chiao, Samuel Y.: See—  
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- Chiba, Masakazu; Kuwakado, Satoshi; Takei, Toshihiro; Tsuge, Noboru; and Shimogawa, Toshiaki, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt tensioning device. 4,422,669, Cl. 280-806.000.
- Chiba, Takehisa: See—  
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- Choate, Kenneth P., to Robin Shipyard (PTE.) Ltd. Leg load distribution and locking arrangement for jack-up type mobile offshore platform. 4,422,802, Cl. 405-198.000.
- Choe, Eui W., to Celanese Corporation. Process for the production of high molecular weight para ordered aromatic heterocyclic polymer. 4,423,202, Cl. 528-179.000.
- Chojnowski, Edward M.: See—  
Kaltz, Milton C.; Chojnowski, Edward M.; Garascia, David C.; Bauer, Barney J.; and George, Richard D., 4,422,687, Cl. 296-221.000.
- Chou, Tai-Sheng: See—  
Chu, Yung-Feng; Chou, Tai-Sheng; and Chester, Arthur W., 4,423,265, Cl. 585-322.000.
- Christ, Alfred; Lehmann, Rolf; and Schlatter, Beat, to Escher Wyss Limited. Roller with a roller surface which is to be heated or cooled. 4,422,318, Cl. 72-200.000.
- Christe, Karl O.; and Schack, Carl J., to United States of America, Air Force. Method for introducing fluorine into an aromatic ring. 4,423,260, Cl. 570-147.000.
- Christenbery, Frederick L., to International Shoe Machine Corporation. Workpiece transporting mechanism. 4,422,197, Cl. 12-1.00A.
- Christensen, Gordon D.; and Donaher, Charles J., to Thomas & Betts Corporation. Electrical connector for use with multi-pin arrays. 4,422,703, Cl. 339-74.00R.
- Chryst, Milton R. Apparatus for recovering rubber from rubber tires. 4,422,581, Cl. 241-66.000.
- Chu, Yung-Feng; Chou, Tai-Sheng; and Chester, Arthur W., to Mobil Oil Corporation. Process for snygas conversions to liquid hydrocarbon products. 4,423,265, Cl. 585-322.000.



- Ciba-Geigy Corporation: See—  
 Baschang, Gerhard; Hartmann, Albert; Wacker, Oskar; and Tarsay, Lajos, 4,423,038, Cl. 424-177.000.  
 Bohner, Beat; Rempfler, Hermann; and Schurter, Rolf, 4,422,867, Cl. 71-094.000.  
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 Ledouble, Jean-Pierre; and Tschopp, Markus, 4,423,220, Cl. 546-22.000.  
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 Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,423,231, Cl. 548-451.000.  
 Cichanowski, Stanley W., to General Electric Company. Polyglycol dielectric capacitor fluid, 4,422,962, Cl. 252-578.000.  
 Cincinnati Electronics Corporation: See—  
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 Clark, Jean B., executrix: See—  
 Konrad, Charles E.; and Clark, Robert C., deceased, 4,423,362, Cl. 318-139.000.  
 Clark, Keith H., to United States of America, National Aeronautics and Space Administration. Clamp-mount device, 4,422,609, Cl. 248-228.000.  
 Clark, Robert C.; Lambert, Joe C.; and Thomas, Sherrill G., to General Electric Company. Electrical braking transitioning control, 4,423,363, Cl. 318-375.000.  
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 Clinton, Albert J., deceased (by American Fletcher National Bank and Trust Company, Administrator); and O'Doherty, George O. P., to Eli Lilly and Company. Naphthalenamine insecticides, 4,423,065, Cl. 424-304.000.  
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 Lake, John M.; and Payne, Robert C., 4,422,410, Cl. 122-4.00D.  
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 Cole, William E. Method and apparatus for infection molding brushes, 4,422,986, Cl. 264-39.000.  
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 Hayes, Harry; and Ahmed, Munir A., 4,423,030, Cl. 424-58.000.  
 Collin, Pierre K. Shiftable block puzzle, 4,422,641, Cl. 273-153.00S.  
 Collins, Kenneth L., to Atlantic Richfield Company. Method for gasifying subterranean coal deposits, 4,422,505, Cl. 166-256.000.  
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 Feissel, M. Henri, 4,423,509, Cl. 371-25.000.  
 Conair, Inc.: See—  
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 Condon Engineering & Manufacturing, Inc.: See—  
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 Connecticut Aircraft Corp.: See—  
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 Connolly, James D. Static screen, 4,422,937, Cl. 210-409.000.  
 Conoco Inc.: See—  
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 Bini, Marco; Ignesti, Amleto; Millanta, Luigi; Rubino, Nicola; and Vanni, Riccardo, 4,423,372, Cl. 324-72.000.  
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 Cooper, Wilbur H. Lock for a fuel line valve, 4,422,314, Cl. 70-242.000.  
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 Bryant, David M.; Corbeil, Ryn C.; Malcolm, Michael A.; and Thompson, Donald R., 4,423,414, Cl. 340-825.070.  
 Corbett, Peter J.; and Aschwanden, Martin G., to Dow Chemical Company, The. Thickened paper coating composition, 4,423,118, Cl. 428-514.000.  
 Cordani, Eugene J.; Hammonds, James C.; and Vorwerk, Frederick E., to ACF Industries, Incorporated. Hand brake mechanism including force dividing assembly, 4,422,532, Cl. 188-47.000.  
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 Cousino, James L.; Nalewick, James A.; and Hills, Blair H., to Bofors Nobel, Incorporated. Method of neutralizing and detoxifying wastes containing organic compounds, 4,422,940, Cl. 210-631.000.  
 Couture, Joseph E. G.; and Twardawa, Philip A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Peripheral burning incendiary device, 4,422,383, Cl. 102-364.000.  
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- CPC International Inc.: See—  
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 da Silva, Herman, to Staat der Nederlanden (Staatsbedrijf der Post-erijen, Telegrafie en Telefonie). Radiocommunication system in which a receiving station monitors a number of transmitters by time division, 4,423,413, Cl. 340-825.030.  
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 Dearlove, Thomas J.; Gray, Richard K.; and Atkins, Richard P., to General Motors Corporation. Durable cast epoxy tooling composition, 4,423,094, Cl. 427-386.000.  
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- Dettmers, Michael; Weirich, Walter; and Peters, Bernd, to Gewerkschaft Eisenhütte Westfalen. Mine roof supports. 4,422,807, Cl. 405-296.000.
- Deutsche Automobilgesellschaft mbH: See—  
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- Devos, Francis; Delobean, Didier; Caboche, Jean-Jacques; Lemay, Patrick; and Huchette, Michel, to Roquette Freres. Installation and process for the continuous separation of mixtures of sugars and/or of polyols by selective adsorption. 4,422,881, Cl. 127-46.100.
- Devos, Francis; Bussiere, Guy; and Huchette, Michel, to Roquette Freres. Process for hard coating with sorbitol and products obtained thereby. 4,423,086, Cl. 427-3.000.
- Dey, Arabinda N., to DuPont Inc. Lithium-metal chromate organic electrolyte cell and method for cathode. 4,423,124, Cl. 429-194.000.
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- Diamond, Michael K. Dental instrument and method for positioning a lingual orthodontic bracket. 4,422,849, Cl. 433-3.000.
- Dieckotter, Friedrich W., to Henkel KGaA. Calcined  $\alpha$ -alumina filter aids. 4,422,946, Cl. 210-777.000.
- Dierberger, James A.; Ackermann, William; and Fine, Arthur D., to United Technologies Corporation. Prestressed combustor liner for gas turbine engine. 4,422,500, Cl. 60-757.000.
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- DiGiulio, Adolph V., to Atlantic Richfield Company. Process for forming anti-lumping and fast-cool vinyl aromatic expandable polymer particles. 4,423,160, Cl. 521-59.000.
- Dil, Jan G., to U.S. Philips Corporation. Record carrier having an optically readable information structure. 4,423,502, Cl. 369-275.000.
- Dillastone, Alan; and Delstange, Genevieve B., to Colgate-Palmolive Company. Article for clothes conditioning and method of making same. 4,423,105, Cl. 428-198.000.
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- Disko, Harry: See—  
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- Fiat Allis North America, Inc.: See—  
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- Fiat Auto S.p.A.: See—  
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- Fiberflex Products, Inc.: See—  
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- Fichtel & Sachs AG: See—  
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- Field, John H., II, to Sigma Instruments, Inc. Synchronous motor system. 4,423,343, Cl. 310-49.00R.
- Fine, Arthur D.: See—  
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- Finner, Marshall F.; and Singh, Shiw S., to Wisconsin Alumni Research Foundation. Apparatus for testing grains for resistance to damage. 4,422,319, Cl. 73-12.000.
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- Fisch, Nathaniel J., to United States of America, Energy. System and method for generating current by selective minority species heating. 4,423,001, Cl. 376-123.000.
- Fischell, Robert E., to United States of America, Navy. Low susceptibility proof mass for a single axis drag compensation system. 4,422,330, Cl. 73-517.00R.
- Fitch, Anthony R. L.: See—  
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- Flakt Aktiebolag: See—  
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- Flanagan, Allan L., to Foxboro Company, The. Industrial process indicating/recording apparatus using stepping motor drive. 4,423,412, Cl. 340-661.000.
- Flaum, Charles: See—  
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- Fleischack, Albert C., administrator: See—  
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- Flemons, Ralph S.: See—  
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- Fletcher, Leslie S. Novelty educational puzzle apparatus. 4,422,642, Cl. 273-157.00R.
- Flock, John W.; Matson, Stephen L.; and Bollenbeck, Peter H., to General Electric Company. Process for recovery of solid thermoplastic resins from solutions thereof in organic solvents. 4,423,207, Cl. 528-499.000.
- Flowtec AG: See—  
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- FMC Corporation: See—  
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- Henriksen, Arthur J.; Thiel, Klaus F.; and Peterson, Carl F., 4,422,390, Cl. 110-341.000.
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- Ford Motor Company: See—  
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- Holubka, Joseph W., 4,423,171, Cl. 523-454.000.
- Ling, Ching-Chung, 4,422,535, Cl. 192-3.280.
- Stocker, Raymond, 4,422,242, Cl. 33-181.0AT.
- Forquer, William F., to Security Shutter Corp. Support members and gear drive for shutter and awning devices. 4,422,493, Cl. 160-133.000.
- Foss, Norman A., to Honeywell Inc. Multi-spectral Schottky barrier infrared radiation detection array. 4,423,325, Cl. 250-332.000.
- Fox, Michael: See—  
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- Fox, Richard E., to Appleton Papers Inc. Reusable projection transparency. 4,423,116, Cl. 428-411.000.
- Fox, Richard W. Welding cable and equipment. 4,423,306, Cl. 219-137.900.
- Foxboro Company, The: See—  
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- Fr. Kammerer GmbH: See—  
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- Wiart, Albert; Defauchaux, Jacques; Pasqualini, Gilbert; and Martin, Jean, 4,423,002, Cl. 376-227.000.
- Frandsen, Jorgen, to Burroughs Corporation. Multi-path to data facility for disk drive transducer arms. 4,423,448, Cl. 360-106.000.
- Frank, Martin B.: See—  
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- Frank, Simon, to Swiss Aluminium Ltd. Device for supporting a moveable seat, for example in a motor vehicle. 4,422,612, Cl. 248-430.000.
- Franklin Institute, The: See—  
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- Franklin, James L.; Shannon, Roger L.; and Watkins, Dale F., to Boeing Company, The. External artery heat pipe. 4,422,501, Cl. 165-104.260.
- Franklin, Lindsay J. Gas hydrates drilling procedure. 4,422,513, Cl. 175-17.000.
- Franz, Gutmann; and Sieber, Peter, to Platson AG Kunststoffwerke Hans Frei & Sohne. Warming jug. 4,422,442, Cl. 126-390.000.
- Frazier, David C.: See—  
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- Free Flow, Inc.: See—  
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- Freeman, Billy P.: See—  
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- Freeman Chemical Corporation: See—  
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- Freitag, Ronald G.; and Kruth, Jeffrey A., to Westinghouse Electric Corp. High speed octave band phase shifter. 4,423,393, Cl. 333-164.000.
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- Frey, Bernhard, to Hydrowatt Systems Limited. Cylinder-piston arrangement. 4,422,368, Cl. 92-105.000.
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- Fromel, Norbert: See—  
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- Frommelt, Sylvan J., to Frommelt Industries, Inc. Dockboard seal. 4,422,199, Cl. 14-71.100.
- Frommer, Joseph C. Photo-electric particle sensing system. 4,422,761, Cl. 356-338.000.
- Fry, Frank R., to Hercules Incorporated. Asphalt compositions. 4,422,878, Cl. 106-219.000.
- Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hamann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with perfluorobenzyl 2,2-dimethyl-3-vinyl-cyclopropane carboxylates. 4,423,066, Cl. 424-305.000.
- Fuji Electric Co., Ltd.: See—  
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- Fuji Jukogyo Kabushiki Kaisha: See—  
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- Fuji Photo Film Co., Ltd.: See—  
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- Sekiya, Masayoshi; Yabe, Masao; Suzuki, Tamotsu; Ochiai, Takeji; and Tatsuta, Sumitaka, 4,423,089, Cl. 427-171.000.
- Fuji Photo Optical Co., Ltd.: See—  
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- Fuji Xerox Co., Ltd.: See—  
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- Fujihiro, Sane; and Matuda, Sigeyaki, to Toko Kogyo Co., Ltd. Panel fitting device. 4,422,278, Cl. 52-714.000.
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- Fujii, Tadashi: See—  
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- Fujikake, Kenji: See—  
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- Fujikura Rubber Ltd.: See—  
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- Fujimura, Shuzo, to Fujitsu Limited. Method of manufacturing a semiconductor device. 4,423,127, Cl. 430-22.000.
- Fujisawa Pharmaceutical Co., Ltd.: See—  
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- Fujita, Koichi: See—  
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- Fujitsu Limited: See—  
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- Sasaki, Nobuo, 4,423,431, Cl. 357-41.000.
- Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, 4,423,356, Cl. 315-169.200.
- Yoshida, Masanobu, 4,423,492, Cl. 365-226.000.
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- Fukase, Hisahiko: See—  
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- Fukawa, Isaburo; Satake, Kunio; Yamada, Tsuyoshi; Hayakawa, Kiyoshi; and Sato, Yasushi, to Asahi Kasei Kogyo Kabushiki Kaisha. Block copolymer mixture of conjugated diene and vinyl aromatic hydrocarbon. 4,423,190, Cl. 525-98.000.
- Fukaya, Chikara: See—  
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- Fukuoka, Yoshikazu: See—  
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- Funada, Fumiaki: See—  
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- Futagi, Masaaki: See—  
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- G.R.S. International Inc.: See—  
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- Gall, Adam F.; and McJunkin, Howard P., Jr., to McJunkin Corporation. Orifice fitting for a gas pressure differential-measuring system. 4,422,339, Cl. 73-861.610.
- Gallagher, James A.: See—  
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- Gallis, Anthony J., to Harsco Corporation. Edge joist. 4,422,617, Cl. 249-19.000.
- Galvin, Aaron A.; and Harvey, Roy L., to American District Telegraph Company. Two-wire multi-zone alarm system. 4,423,410, Cl. 340-525.000.
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- Ganster, Otto; and Barnes, James M., to Bayer Aktiengesellschaft. Process for the production of polyurethane urea products. 4,423,200, Cl. 528-67.000.
- Ganuchau, Charles J., Jr.: See—  
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- Garascia, David C.: See—  
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- Gatto, Donald F.; and Milcunas, Juan, to Motorola, Inc. Dual electronic component assembly. 4,423,468, Cl. 361-404.000.
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- Geible, Harry F. Paint stirrer. 4,422,770, Cl. 366-248.000.
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Glumac, George. Electrode. 4,422,461, Cl. 128-798.000.

Goans, Kip B., to Baker Cac, Inc. Control line blow out preventer. 4,422,503, Cl. 166-53.000.

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Groginsky, Charles M.: See—  
Orlowski, Ronald C.; Groginsky, Charles M.; and Seyler, Jay K., 4,422,967, Cl. 260-112.50T.

Grosch, Wayne A. Pump for a reverse circulation rotary drilling rig. 4,422,514, Cl. 175-213.000.

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Geirhos, Werner; and Dietmayer, Josef, 4,422,480, Cl. 139-66.00R.

Grosskopf, Peter V. Cold storage element, mounting assembly and air control slats therefor. 4,422,305, Cl. 62-430.000.

Grosvenor, Ronald L.; and Fox, Michael, to IMI Marston Limited. Fuel tank component. 4,422,561, Cl. 220-461.000.

Groves, Kenneth W.; and Lea, John D., to Sperry Corporation. Beam steerable sonar array. 4,423,494, Cl. 367-123.000.

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Kirsch, Jerome; and Markow, Edward, 4,422,820, Cl. 415-4.000.

Grunig, Kurt, to Jos. Habegger, AG. Hollow rotary clamping apparatus. 4,422,654, Cl. 279-4.000.

Guagliardo, Matthew, to Inmont. Dimer acid based polyurethane coating compositions. 4,423,179, Cl. 524-539.000.

Guest Industries, Inc.: See—  
Guest, William H., 4,422,819, Cl. 414-724.000.

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Gundling, Manfred: See—  
Fabian, Peter; Gundling, Manfred; and Rossler, Peter, 4,422,919, Cl. 204-270.000.

Gurol, I. Macit; and Bang, Gary M., to John Fluke Mfg. Co., Inc. Touch sensitive transparent switch array. 4,423,299, Cl. 210-159.00B.

Gurr, George P., to Cyborex Laboratories, Inc. Energy controller and method utilizing bi-metal elements to adjust thermostat setting and to shed and restore controlled loads in prioritized order. 4,423,335, Cl. 307-31.000.

Gurr, George P., to Sangamo Weston, Inc. Rectifier controller. 4,423,477, Cl. 363-54.000.

Gusack, James A.; Bird, David O.; Thomm, Ernest C.; and Reitz, William A., to Badische Corporation. Apparatus for interlacing multifilament yarn. 4,422,224, Cl. 28-272.000.

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Guthrie, George L. Tear bar for a printer. 4,422,787, Cl. 400-621.000.

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De Burgos Garcia, Eduardo; Goni Unzue, A. Javier; Gutierrez Barranco, Juan M.; and Pajares Suarez, Juan A., 4,423,329, Cl. 250-374.000.

Guyon, James G.: See—  
Brady, Robert T.; and Guyon, James G., 4,422,387, Cl. 110-173.00R.

Haaf, William R., to General Electric Company. Compositions of a polyphenylene ether resin, low molecular weight polystyrene and a block copolymer. 4,423,189, Cl. 525-92.000.

Haas, Peter: See—  
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Haavik, Harold K., to Nash Engineering Company, The. Liquid ring pump with vanes in liquid ring. 4,422,832, Cl. 417-68.000.

Habdas, Edward P.; Aaron, Jon D.; and Whitten, Timothy H., to UOP Inc. Method for producing high temperature electrical connection. 4,422,233, Cl. 29-570.000.

Hackett, Adeline J.: See—  
Stampfer, Martha R.; Smith, Helene S.; and Hackett, Adeline J., 4,423,145, Cl. 435-32.000.

Haddad, James H.: See—  
Daviduk, Nicholas; and Haddad, James H., 4,423,274, Cl. 585-640.000.

Haendle, Joerg; and Maass, Wolfgang, to Siemens Aktiengesellschaft. Diagnostic X-ray installation comprising a control loop for the exposure control. 4,423,521, Cl. 378-108.000.

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Haga, Tomoyuki, to Shiseido Company, Ltd. Nail file and method for producing the same. 4,422,465, Cl. 132-76.400.

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Shepherd, Nigel R. C.; and Preece, Graham M., 4,422,580, Cl. 241-46.110.

Haines, Robert L. Fixed cloth speed inspection machine. 4,422,223, Cl. 26-70.000.

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Hall Company, The: See—  
Walser, Richard J.; and Wyant, Gary M., 4,423,294, Cl. 200-5.00A.

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Beck, Harold K., 4,422,506, Cl. 166-324.000.

Hamabe, Takafumi, to Matsushita Electric Works, Ltd. Massaging apparatus. 4,422,449, Cl. 128-44.000.

Hamabe, Takafumi: See—  
Sugal, Haruo; Hamabe, Takafumi; Yamamura, Yukio; Otuka, Shinpei; and Moriaki, Hiroshi, 4,422,448, Cl. 128-44.000.

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Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,422,353, Cl. 74-858.000.

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Hambrecht, Juergen: See—  
Brandstetter, Franz; Echte, Adolf; Hambrecht, Juergen; Illers, Karl H.; and Pribe, Edmund, 4,423,187, Cl. 525-68.000.

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- Hamilton, William H. Irrigation control system. 4,423,484, Cl. 364-420.000.
- Hammann, Ingeborg: See—  
Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,423,066, Cl. 424-305.000.
- Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,423,058, Cl. 424-273.00P.
- Hammerschlag, Peter G. Bag-positioned hinged seals for air cushion vehicles. 4,422,517, Cl. 180-127.000.
- Hammond, Charles W.: See—  
Nelson, John E.; Hammond, Charles W.; Huston, Rolland E.; and Helton, Michael R., 4,422,882, Cl. 134-22.180.
- Hammond, Dean C., Jr.; and Vickers, Paul T., to General Motors Corporation. Method of making wall-flow monolith filter. 4,423,090, Cl. 427-181.000.
- Hammond, Michael J.; and Kilic, Sidika, to Energy Development Associates, Inc. Metal halogen battery construction with combustion arrester to prevent self propagation of hydrogen-halogen reactions. 4,423,121, Cl. 429-19.000.
- Hammonds, James C.: See—  
Cordani, Eugene J.; Hammonds, James C.; and Vorwerk, Frederick E., 4,422,532, Cl. 188-47.000.
- Hamori, Tamas: See—  
Korosi, Jenő; Lang, Tibor; Andrasi, Ferenc; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Singer, Eleonora; and Moravcsik, Imre, 4,423,044, Cl. 424-244.000.
- Hamunen, Antti, to OY Kaukas AB. Process for the purification of  $\beta$ -sitosterol isolated from the unsaponifiables in crude soap from the sulphate cellulose process. 4,422,974, Cl. 260-397.250.
- Hanacek, William A.: See—  
Armstrong, Errol C.; Hanacek, William A.; Hermann, Paul F.; and Kennedy, Thorburn S., 4,422,990, Cl. 264-45.300.
- Hannah, William M. Kicking apparatus. 4,422,249, Cl. 36-133.000.
- Hansen, Boyd K.: See—  
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- Hansen, Charles M., Jr., to Bendix Corporation. The. Unbalanced current detector for three phase electrical system. 4,423,374, Cl. 324-86.000.
- Hanson, Merlin L.; Swenson, Robert E.; and Talarczyk, Anthony R., to Sperry Corporation. Cache/disk subsystem with acquire write command. 4,423,479, Cl. 364-200.000.
- Haoli, Choh, to University of California, The Regents of the.  $\beta$ -Endorphin analogs. 4,422,968, Cl. 260-112.50E.
- Hara, Hajime: See—  
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- Otsuki, Yutaka; Araki, Yoshihiko; Omika, Hiroyoshi; Hara, Hajime; and Aoyama, Kazuo, 4,423,172, Cl. 523-454.000.
- Harada, Masatoshi: See—  
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- Harao, Norio: See—  
Sugimori, Fumio; Nishino, Chikae; and Harao, Norio, 4,423,351, Cl. 313-523.000.
- Harashima, Kiyoshi: See—  
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,422,816, Cl. 414-381.000.
- Harcuba, Siegfried, to Glasfabriken-Ausruestergesellschaft m.b.H. Apparatus for coating of glass. 4,422,404, Cl. 118-315.000.
- Hardesty, Donald E.; and McCullough, Glenn R., to Shell Oil Company. Process for feeding slurry-pressurized and solvent-dewatered coal into a pressurized zone. 4,422,246, Cl. 34-9.000.
- Harding, Geoffrey, to U.S. Philips Corporation. Device for the imaging of body layers by means of monoenergetic radiation. 4,423,522, Cl. 378-87.000.
- Hardman, H. F.: See—  
Grasselli, R. K.; Burrington, J. D.; Pesa, F. A.; and Hardman, H. F., 4,422,980, Cl. 260-465.80D.
- Hardman, Harley F.: See—  
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- Hardy, George W.: See—  
Wilkinson, Samuel; Hardy, George W.; and Wigglesworth, Roger, 4,423,242, Cl. 560-41.000.
- Hargreaves, Rodney B.: See—  
Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian, 4,423,045, Cl. 424-246.000.
- Hargrove, Arthur K.; and Brown, Ronald L., to Sperry Corporation. FIFO Register with independent clocking means. 4,423,482, Cl. 364-200.000.
- Harigaya, Isao: See—  
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuchi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,422,741, Cl. 354-403.000.
- Harlan Material Handling Corporation: See—  
Kaplan, James H.; and Lissauer, Joel S., 4,422,656, Cl. 280-3.000.
- Harpell, Gary A.: See—  
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovinski, Adam L.; and Lescio, James M., 4,422,907, Cl. 204-38.00B.
- Harper, Lee R.; Obetz, Judith E.; and Steinmetz, William H., to Du Pont de Nemours, E. I., and Company. Water-borne coating compo-
- sition made from epoxy resin, first polymeric acid, tertiary amine and second polymeric acid. 4,423,165, Cl. 523-409.000.
- Harris Corporation: See—  
Campbell, David K., 4,423,488, Cl. 364-724.000.
- Trentman, John L., 4,422,630, Cl. 270-53.000.
- Waters, George W., 4,423,390, Cl. 331-4.000.
- Harris Graphics Corporation: See—  
Wertheiser, James S., 4,422,549, Cl. 206-386.000.
- Harris, Steven D.; and Wolfe, Joseph I., to Eaton Corporation. Method of making an electro-optical display. 4,422,726, Cl. 350-331.00R.
- Harris, William S., to Roly-Door Sales Company of Rochester, Inc. Safety gate assembly. 4,422,264, Cl. 49-121.000.
- Harrison, Gary E.: See—  
Green, William L.; Calkins, Dennis E.; Harrison, Gary E.; and Wilkins, Jesse R., 4,422,799, Cl. 405-158.000.
- Harsco Corporation: See—  
Gallis, Anthony J., 4,422,617, Cl. 249-19.000.
- Harshaw Chemical Company, The: See—  
Little, Frank, 4,422,774, Cl. 366-347.000.
- Little, Frank, 4,422,817, Cl. 414-421.000.
- Hart, Jimmie L.: See—  
Arzoumanian, Aram S.; Hieber, Heinz W.; Nojiri, Howard H.; and Hart, Jimmie L., 4,422,784, Cl. 400-144.200.
- Hartmann, Albert: See—  
Baschang, Gerhard; Hartmann, Albert; Wacker, Oskar; and Tarcay, Lajos, 4,423,038, Cl. 424-177.000.
- Hartmann, Armin: See—  
Hums, Dieter; Hartmann, Armin; Lippe, Klaus F.; and Wetzig, Werner, 4,422,989, Cl. 264-42.000.
- Harvey Hubbell Incorporated: See—  
Klein, L. E., 4,422,472, Cl. 137-614.060.
- Harvey, Roy L.: See—  
Galvin, Aaron A.; and Harvey, Roy L., 4,423,410, Cl. 340-525.000.
- Harville, Paul R.: See—  
Becker, Edward W.; Harville, Paul R.; and MacLeod, Glen E., 4,422,235, Cl. 29-749.000.
- Hasegawa, Akira; Shimizu, Ippei; Kaneko Toshio; and Miyake, Sumio, to Jujo Paper Co., Ltd. Color developing sheet for pressure-sensitive recording sheet. 4,422,670, Cl. 282-27.500.
- Hasegawa, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Movable magnetic head block assembly for a double sided flexible disk storage device. 4,423,449, Cl. 360-106.000.
- Hasegawa, Yoji: See—  
Dozono, Kichihiko; and Hasegawa, Yoji, 4,422,431, Cl. 123-568.000.
- Hashimoto, Koosuke, to Mitsubishi Denki Kabushiki Kaisha. Electric motor. 4,423,359, Cl. 318-6.000.
- Hastie, William F.: See—  
Watt, Robert H.; Ladd, Richard H.; and Wright, Walter S., deceased, 4,422,301, Cl. 62-54.000.
- Hasuo, Shinya; and Suzuki, Hideo, to Fujitsu Limited. Superconductive logic device. 4,423,430, Cl. 357-5.000.
- Hatanaka, Masahiro: See—  
Miyazaki, Toshiyuki; Miura, Ushio; and Hatanaka, Masahiro, 4,423,352, Cl. 313-584.000.
- Hatanaka, Misao, to Kajima Kensetsu Kabushiki Kaisha; and Nippon Sangyo Kikai Kabushiki Kaisha. Apparatus for treating waste water. 4,422,930, Cl. 210-150.000.
- Hattori, Shinichiro, to Olympus Optical Co., Ltd. Safety device for medical treatment system. 4,422,457, Cl. 128-303.100.
- Haven, Richard E.; and Suh, Nam P., to Massachusetts Institute of Technology. High frequency electric field curing of polymeric composites. 4,423,191, Cl. 525-169.000.
- Haws, Ronnie E.: See—  
Wittman, Robert H.; Adkins, David E.; and Haws, Ronnie E., 4,422,477, Cl. 138-89.000.
- Hayakawa, Kiyoshi: See—  
Fukawa, Isaburo; Satake, Kunio; Yamada, Tsuyoshi; Hayakawa, Kiyoshi; and Sato, Yasushi, 4,423,190, Cl. 525-98.000.
- Hayakawa, Yohichi: See—  
Matsumoto, Gohichi; and Hayakawa, Yohichi, 4,422,349, Cl. 74-665.0GE.
- Hayama, Masashi: See—  
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- Hayasaka, Tadao: See—  
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- Hayashigawa, Lawrence; and McFadden, Bertram W., to United States of America, Navy. Isometric grip bending beam control. 4,422,851, Cl. 434-45.000.
- Hayes, Harry; and Ahmed, Munir A., to Colgate-Palmolive Company. Flavored aqueous oral composition. 4,423,030, Cl. 424-58.000.
- Hayfield, Peter C. S., to IMI Marston Limited. Electrode material, electrode and electrochemical cell. 4,422,917, Cl. 204-196.000.
- Haynes, Taylor H. Medical suturing device. 4,422,567, Cl. 227-19.000.
- Hazen Research Incorporated: See—  
Reynolds, James E.; and Lombardo, Nicholas J., 4,423,012, Cl. 423-49.000.
- Heady, Robert E., to CPC International Inc. Preparation of high fructose syrups from sucrose. 4,423,150, Cl. 435-193.000.
- Heath Company: See—  
Krenz, Horst M., 4,422,700, Cl. 339-14.00R.

- Hedrick, Virginia L. Apparatus for quilting. 4,422,251, Cl. 38-102.200.
- Heiber, Sonia J.: See—  
Mueller, Karl F.; and Heiber, Sonia J., 4,423,099, Cl. 428-35.000.
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Tsao, Jung-Hsien; and Hein, Paul R., 4,422,914, Cl. 204-159.190.
- Heinemann, Ulrich: See—  
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- Helmac Products Corporation: See—  
McKay, Nicholas D., 4,422,201, Cl. 15-104.00A.
- Helton, Charles J., III: See—  
Costello, William D.; Helton, Charles J., III; and Frank, Martin B., 4,422,660, Cl. 280-242.0WC.
- Helton, Michael R.: See—  
Nelson, John E.; Hammond, Charles W.; Huston, Rolland E.; and Helton, Michael R., 4,422,882, Cl. 134-22.180.
- Hendriks, Ivo G. M.: See—  
Lieken, J. Alfons F.; and Hendriks, Ivo G. M., 4,422,215, Cl. 17-1.00R.
- Henkel Corporation: See—  
Peermann, Dwight E.; and Rogier, Edgar R., 4,423,162, Cl. 521-164.000.
- Henkel KGaA: See—  
Dieckotter, Friedrich W., 4,422,946, Cl. 210-777.000.
- Henriksen, Arthur J.; Thiel, Klaus F.; and Peterson, Carl F., to FMC Corporation. Process and apparatus for collection of gases and particulates in a furnace feed system. 4,422,390, Cl. 110-341.000.
- Henz, Robert W., Sr.: See—  
Hull, Harvey C.; and Henz, Robert W., Sr., 4,422,358, Cl. 83-356.300.
- Hercules Incorporated: See—  
Fry, Frank R., 4,422,878, Cl. 106-219.000.
- Herdeg, Donald F.: See—  
Johnson, Herbert; Elliott, Richard M.; Herdeg, Donald F.; and Peck, Alan M., 4,422,393, Cl. 112-121.500.
- Hermann, Paul F.: See—  
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- Herz, Arthur H., to Eastman Kodak Company. Silver halide emulsions containing aromatic latent image stabilizing compounds. 4,423,140, Cl. 430-445.000.
- Hession Corporation: See—  
Gaeddert, Melvin V., 4,422,373, Cl. 100-88.000.
- Hewlett-Packard Company: See—  
Duc, Laurent; Boosen, Karl-Josef; and Marrel, Jean-Francois, 4,423,217, Cl. 544-267.000.
- Hibi, Hazuo: See—  
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- Hicks, Darrell D., to Celanese Corporation. Co-reactive urethane surfactants and stable aqueous epoxy dispersions. 4,423,201, Cl. 528-76.000.
- Hieber, Heinz W.: See—  
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- Higley, David P.: See—  
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- Higuchi, Takeshi; Yoshikawa, Kazuo; and Buto, Hideo, to Fuji Photo Optical Co., Ltd. Color separation optical system for color television camera. 4,422,722, Cl. 350-173.000.
- Hilden, Magdalena M.: See—  
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- Hilfman, Lee: See—  
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- Hill, Michael L.: See—  
Class, Walter H.; Hurwitz, Steven D.; Hill, Michael L.; and Hutt, Marvin K., 4,422,896, Cl. 156-643.000.
- Hilliard, Steven F.; to Lam, Roger C., a part interest. Wheeled carrier. 4,422,658, Cl. 280-47.400.
- Hills, Blair H.: See—  
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- Himmele, Walter: See—  
Becker, Rainer; Jahn, Dieter; Rohr, Wolfgang; Himmele, Walter; Siegel, Harro; and Wuerzer, Bruno, 4,422,864, Cl. 71-88.000.
- Hinnant, William M. Boat transportation and launching means. 4,422,665, Cl. 280-414.200.
- Hinnenkamp, James A.; and Walatka, Vernon V., Jr., to National Distillers and Chemical Corporation. Crystalline metal silicate compositions. 4,423,020, Cl. 423-277.000.
- Hintsch, Otto, to Sulzer Brothers Limited. Guide tooth for a weaving machine. 4,422,482, Cl. 139-188.00R.
- Hirano, Yasutaka: See—  
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- Hirasawa, Kunio: See—  
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- Hiroaki, Botaro, to Nippon Electric Co., Ltd. Timing recovery circuit. 4,423,518, Cl. 375-20.000.
- Hirose, Masahiko; and Nishida, Katsutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for treating powdery materials utilizing microwave plasma. 4,423,303, Cl. 219-121.00P.
- Hirschberg, Eugene H.: See—  
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,423,019, Cl. 423-244.000.
- Hirschey, Darel A. Catalytic firebox. 4,422,437, Cl. 126-77.000.
- Hitachi Koki Company, Limited: See—  
Nakazawa, Yuki, 4,423,346, Cl. 310-68.00E.
- Hitachi, Ltd.: See—  
Gotou, Kanzen, 4,423,318, Cl. 235-379.000.
- Imaizumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.
- Kimura, Hiroyuki; Ohashi, Shin-ichi; and Nishimura, Keizo, 4,423,498, Cl. 369-47.000.
- Koizumi, Mitsuyoshi; Akiyama, Nobuyuki; and Oshima, Yoshimasa, 4,423,331, Cl. 250-572.000.
- Miyake, Kiyoshi; and Miyata, Naoyuki, 4,423,403, Cl. 338-15.000.
- Nishida, Hiroshi; Takahashi, Toshiyuki; Shiono, Toshio; and Ohtsuka, Kiyomitsu, 4,423,447, Cl. 360-106.000.
- Shiozaki, Keniti; and Hibi, Hazuo, 4,423,508, Cl. 371-16.000.
- Takahashi, Toshiyuki; Nishida, Hiroshi; and Shiono, Toshio, 4,423,446, Cl. 360-106.000.
- Tsukushi, Masanori; Ohshita, Youichi; Hirasawa, Kunio; and Takahashi, Takeshi, 4,423,298, Cl. 200-144.0AP.
- Hitachi Powdered Metals Co., Ltd.: See—  
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- Hobart Corporation: See—  
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- Roeger, Carl R.; Miller, William D.; and Goodin, Charles R., 4,422,582, Cl. 241-82.500.
- Hobo, Nobuhito: See—  
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- Hochtemperatur-Reaktorbau GmbH: See—  
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- Hodges, Robert J.: See—  
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- Hodgson, Emory R., Jr.; and Rester, Darryl C., to Dynamics Corporation of America. Narrow-base terracing plow. 4,422,512, Cl. 172-454.000.
- Hoechst Aktiengesellschaft: See—  
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- Mohr, Reinhard; and Neeb, Rudolf, 4,423,226, Cl. 548-402.000.
- Hoeks, Harold L.; and Robinson, Donald D. Tablet splitting device. 4,422,553, Cl. 206-528.000.
- Hoelderich, Wolfgang; Moss, Wolf D.; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Preparation of olefins from methanol and/or dimethyl ether. 4,423,273, Cl. 585-640.000.
- Hoezee, Doug, to Gerber Products Company. Food extruder. 4,422,372, Cl. 99-353.000.
- Hoffman Controls Corp.: See—  
Bowman, William W., 4,422,571, Cl. 236-49.000.
- Hoffman, Ernst R. Off-set printing ink consumption prediction. 4,422,765, Cl. 356-432.000.
- Hoffmann, Alexander: See—  
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- Hoffmann-La Roche Inc.: See—  
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- Hogg, James W., to Anchor Wire Corporation of Tennessee. Panel hanger. 4,422,608, Cl. 248-205.00A.
- Hohman, Charles M.: See—  
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- Holahan, Edward T.; and Disko, Harry, to Marvin Glass & Associates. Board game apparatus. 4,422,644, Cl. 273-249.000.
- Holliday, William H., to Reynolds Metals Company. Insulated panel. 4,422,274, Cl. 52-410.000.
- Holman, Daniel G.; and Ersek, Robert A. Photographic accessory. 4,422,759, Cl. 356-243.000.
- Holmes, Joel P.: See—  
Roy, John W., Jr.; Arbie, Melvin J.; and Holmes, Joel P., 4,423,015, Cl. 423-167.000.
- Holthuisen, Arnoldus G., to Metaalwarenfabriek Venlo B.V. Mixing apparatus for two flowing liquids. 4,422,769, Cl. 366-178.000.
- Holubka, Joseph W., to Ford Motor Company. Tertiary alcohol-diblocked diisocyanate diurea oligomers and coating compositions comprising same. 4,423,171, Cl. 523-454.000.
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- Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,423,058, Cl. 424-273.00P.
- Hon Corporation: See—  
Hon, David T., 4,422,663, Cl. 280-278.000.
- Hon, David T., to Hon Corporation. Foldable and portable vehicle. 4,422,663, Cl. 280-278.000.



- Honda Giken Kogyo Kabushiki Kaisha: See—  
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Place, William C., 4,423,408, Cl. 340-347.0NT.  
Honeywell Information Systems Inc.: See—  
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Hoppenrath, James W.: See—  
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Horie, Seiji; Nakano, Junji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive hydrazone materials, 4,423,130, Cl. 430-59.000.  
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Hoshino, Osamu; Ito, Michio; and Takeuchi, Akihiko, to Canon Kabushiki Kaisha. Developing apparatus, 4,422,749, Cl. 355-3.0DD.  
Hoshino, Yasunari, to Nissan Motor Company, Limited. Closed cycle in-line double-acting hot gas engine, 4,422,292, Cl. 60-525.000.  
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Hospital for Sick Children, The: See—  
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Houk, LeRoy E., to Babcock & Wilcox Company, The. Stamping apparatus having magnetic supporting means, 4,422,783, Cl. 400-128.000.  
Howard, James K.; and Srikrishnan, Kris V., to International Business Machines Corporation. Thin film capacitor with a dual bottom electrode structure, 4,423,087, Cl. 427-79.000.  
Howarth, Roy E., to Mechanical Technology Incorporated. Stirling engine piston ring, 4,422,649, Cl. 277-75.000.  
Huang, Chuan-Chih. Safety toilet seat, 4,422,190, Cl. 4-420.300.  
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Fungicidal N-(pyrrolidinocetyl)-anilines, 4,423,059, Cl. 424-274.000.  
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Hunt, Vicki L., to Ron-Vik, Incorporated. Flower pot holder, 4,422,610, Cl. 248-311.200.  
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Imazumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, to Hitachi, Ltd. High-breakdown-voltage resistance element for integrated circuit with a plurality of multilayer, overlapping electrodes, 4,423,433, Cl. 357-51.000.  
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- Jackisch, Philip F., to Ethyl Corporation. Preparation of dibromostyrene. 4,423,262, Cl. 510-193.000.
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- Jackson, David E., to Nalco Chemical Company. Method for protecting porous ceramic building materials exposed to weathering. 4,423,096, Cl. 427-397.700.
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- Jacobi, Edgar F.; and Winkler, Robert J. Wave motion electric generator. 4,423,334, Cl. 290-53.000.
- Jacobs, Keith R., to Kirk, Linton James. Racking. 4,422,555, Cl. 211-74.000.
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- Jacobs, William R.; Karlin, Richard A.; and Sun, Peter K., to Sun Electric Corporation. Battery testing techniques. 4,423,379, Cl. 324-429.000.
- Jacobsen, Hans, to Micronic AB. Communication link. 4,423,319, Cl. 235-472.000.
- Jacquet, Bernard; and Lang, Gerard, to L'Oreal. Hair dyeing compositions containing quaternized polymer. 4,422,853, Cl. 8-406.000.
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- James River-Dixie/Northern, Inc.: See—  
Pawlowski, Thomas D., 4,422,551, Cl. 206-461.000.
- Jammot, Fernand: See—  
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- Janiga, Eugene R., to Masonite Corporation. Lignosulfonate-phenol-formaldehyde resin binder. 4,423,173, Cl. 524-14.000.
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- Jaworski, William R., to Jope Manufacturing Company Inc. Hydrotherapy jet for tubs, spas or pools. 4,422,191, Cl. 4-496.000.
- Jefferson, John R., to Lucas Industries Limited. Fuel injection pump. 4,422,425, Cl. 123-450.000.
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- Jezbera, Val K., to Dataproducts Corporation. Print hammer and coil assembly. 4,422,377, Cl. 101-93.290.
- Joffe, Boris B.: See—  
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- Jog-O-Lite, Inc.: See—  
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- Johansen, Steinar, to Maisto Wireservice A/S. Method and apparatus for lubricating steel cable. 4,422,529, Cl. 184-15.00R.
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- John Fluke Mfg. Co., Inc.: See—  
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- Johnson & Johnson: See—  
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- Johnson & Johnson Products, Inc.: See—  
Cum, Charles E.; and Felty, Lanny G., 4,423,041, Cl. 424-184.000.
- Johnson, Russell W.: See—  
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- Johnson, Thomas H., to Shell Oil Company. Olefin isomerization process. 4,423,276, Cl. 385-665.000.
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- Jones, Geraint; Preston, John; and Thomson, David S., to Imperial Chemical Industries Limited. Esters. 4,423,070, Cl. 424-311.000.
- Jones, Thomas H., to Litton Industrial Products, Inc. Liquid cooled eddy current coupling having rotor extension ring. 4,423,344, Cl. 310-105.000.
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- Jorgenson, Gordon K., to C-I-L Inc. Borehole charging method including toroidal transformer cores. 4,422,380, Cl. 102-313.000.
- Josefsson, Bertil, to NPI New Products Investment AB. Apparatus for the forming of hair. 4,422,464, Cl. 132-9.000.
- Joseph B. Stinson Co.: See—  
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- Jos. Habegger, AG: See—  
Grunig, Kurt, 4,422,654, Cl. 279-4.000.
- Joyce, James J.: See—  
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- Juguin, Bernard; Cosyns, Jean; and Miquel, Jean, to Institut Francais du Petrole. Process for the joint production of highly pure 1-butene and premium gasoline from a C<sub>4</sub> olefinic cut. 4,423,264, Cl. 585-255.000.
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- Jujo Paper Co., Ltd.: See—  
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- Kadoory, Shlomo J., to Revlon, Inc. Cosmetic dispenser and dispenser. 4,422,545, Cl. 206-45.340.
- Kaeding, Jeanne E.: See—  
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- Kageyama, Katsuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Ion generating apparatus. 4,423,355, Cl. 315-111.810.
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- Kaiser, Charlie J., to RCA Corporation. Substrate for optical recording media and information records. 4,423,427, Cl. 346-135.100.
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- Kaiser, Wolfgang: See—  
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- Kajimoto, Norifumi; Kawakami, Yoshio; and Sasaki, Kinji, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,423,452, Cl. 360-131.000.
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- Kalamchi, Ali. Spinal compression and distraction instrumentation. 4,422,451, Cl. 128-69.000.
- Kalberer, Felix. Device for the removal of heat from waste water. 4,422,932, Cl. 210-186.000.
- Kalinowski, Robert E.; and Vincent, Gary A., to Dow Corning Corporation. Method for durable press finish using formaldehyde-free organosilicon compositions and textile therefrom. 4,423,108, Cl. 428-266.000.
- Kaltz, Milton C.; Chojnowski, Edward M.; Garascia, David C.; Bauer, Barney J.; and George, Richard D., to American Sunroof Corporation. Sliding roof panel assembly. 4,422,687, Cl. 296-221.000.
- Kamei, Masanori: See—  
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- Kameoka, Michitada, to Honda Giken Kogyo Kabushiki Kaisha. Latching device for a detachably attachable roof panel in a vehicle. 4,422,688, Cl. 296-224.000.

- Kaminski, Joanne M.; Bauer, Ludwig; and Zaneveld, Lourens, to University of Illinois Foundation. Contraceptive method. 4,423,069, Cl. 424-310.000.
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- Kanou, Noboru: See—  
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- Kanzaki Paper Manufacturing Co., Ltd.: See—  
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- Kaplan, James H.; and Lissauer, Joel S., to Harlan Material Handling Corporation. Apparatus for manual rotation of motor vehicle driving wheels through propeller shaft and differential. 4,422,656, Cl. 280-3.000.
- Kaplan, Steve E. Moulding duct. 4,423,284, Cl. 174-101.000.
- Kaplin, Edward J.: See—  
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- Kaplon, David A.: See—  
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- Karl Lautenschlager KG: See—  
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- Karlin, Richard A.: See—  
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- Karnofsky, George B., to Dravo Corporation. Apparatus for the continuous solvent extraction of bitumen from oil-bearing sand. 4,422,901, Cl. 196-14.520.
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- Kasai, Shigeo, to Amada Company, Limited. Clamping apparatus. 4,422,628, Cl. 269-71.000.
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- Kasper, Alan H., to Allied Corporation. Cable strain relief for an electrical connector. 4,422,705, Cl. 339-103.00M.
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- Kataoka, Mitsugi: See—  
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- Kato, Hiroshi; and Numata, Masanori, to Amano Corporation. Time recorder. 4,423,315, Cl. 235-377.000.
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- Katz, Lawrence E., to Olin Corporation. Selected trichloroacetamides. 4,423,246, Cl. 564-102.000.
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- Kawada, Toyoshi: See—  
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- Kawarata, Kotaro: See—  
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- Kawasaki Jukogyo Kabushiki Kaisha: See—  
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- Kawasaki Steel Corporation: See—  
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- Kegelman, Thomas D., to KCR Technology, Inc. Method and apparatus for controlling electrode voltage in electron beam tubes. 4,423,354, Cl. 315-12.00R.
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- Kennedy, Thorburn S.: See—  
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- Kent, Eric G., to Polysar Limited. Polyethylene-polybutadiene blend. 4,423,181, Cl. 524-425.000.
- Kepiro, Joseph. Buckle. 4,422,219, Cl. 24-176.000.
- Kerfoot, O. C.: See—  
Yang, Kang; Reedy, James D.; McGuire, S. E.; and Kerfoot, O. C., 4,423,278, Cl. 585-823.000.
- Kerk, Klaus: See—  
Mueller, Dieter; Lobig, Inge; and Kerk, Klaus, 4,422,268, Cl. 52-86.000.
- Kerlennovich, Betty: See—  
Benoit, Pierre; Pellaux, Jean-Paul; Widmer, Gilbert; Kerlennovich, Betty; and Coche, Andre, 4,422,714, Cl. 350-96.150.
- Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung: See—  
Becker, Erwin-Willy; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,422,905, Cl. 204-9.000.
- Kharkhuta, Nikolai Y.: See—  
Shestopalov, Alexandr A.; Denikin, Ernst I.; Kharkhuta, Nikolai Y.; Vasiliev, Alexandr A.; and Okunev, Vyacheslav I., 4,422,778, Cl. 374-135.000.
- Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Cladded spherical lens having uneven refractive index. 4,422,733, Cl. 350-413.000.
- Kikuta, Masaaki: See—  
Otsuka, Hidehiro; Oda, Takaaki; Sato, Fumiyoshi; and Kikuta, Masaaki, 4,422,724, Cl. 350-307.000.
- Kilic, Sidika: See—  
Hammond, Michael J.; and Kilic, Sidika, 4,423,121, Cl. 429-19.000.
- Kimura, Hiroshi: See—  
Minami, Shunji; and Kimura, Hiroshi, 4,422,295, Cl. 60-605.000.
- Kimura, Hiroyuki; Ohashi, Shin-ichi; and Nishimura, Keizo, to Hitachi, Ltd. Control apparatus for a recording medium drive motor in a digital information reproducing apparatus. 4,423,498, Cl. 369-47.000.
- Kimura, Kenji, to Olympus Optical Co., Ltd. Image pickup apparatus. 4,423,436, Cl. 358-98.000.
- Kimura, Masatoshi: See—  
Imazumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.
- Kimura, Ryoji: See—  
Minagawa, Motonobu; Kubota, Naohiro; and Kimura, Ryoji, 4,423,174, Cl. 524-99.000.



- Kimura, Tomohiko: See—  
Araki, Kazuhiko; Ao, Hideki; Aihara, Kenichi; and Kimura, Tomohiko, 4,423,052, Cl. 424-266.000.
- King, Derrick O.: See—  
Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., 4,422,788, Cl. 401-188.00R.
- Kinoshita, Takao: See—  
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuchi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,422,741, Cl. 354-403.000.
- Kinsman, Robert G., to Motorola, Inc. Multiple pole bandpass filter having monolithic crystal elements, 4,423,394, Cl. 333-192.000.
- Kioritz Corporation: See—  
Kuwano, Michiyasu, 4,422,523, Cl. 181-211.000.
- Kirk, Linton James: See—  
Jacobs, Keith R., 4,422,555, Cl. 211-74.000.
- Kirkley, J. Darrell, to Jog-O-Lite, Inc. Safety light or the like, 4,423,473, Cl. 362-186.000.
- Kirkpatrick, Charles R.: See—  
Bauer, Wayne J.; Dodd, William C.; Kirkpatrick, Charles R.; Rehage, Ted A.; Robinson, Francis L.; and Taylor, William K., 4,423,480, Cl. 364-200.000.
- Kirsch, Jerome; and Markow, Edward, to Grumman Aerospace Corporation. Spoiler for fluid turbine diffuser, 4,422,820, Cl. 415-4.000.
- Kitamura, Nobuyoshi; Ito, Nobuo; and Takeuchi, Koji, to Ajinomoto Company Incorporated. Halogen-containing resin compositions stabilized by methionine diketopiperazine, 4,423,175, Cl. 524-100.000.
- Kitamura, Takashi, to Canon Kabushiki Kaisha. Beam recording apparatus, 4,423,426, Cl. 344-108.000.
- Kitsuda, Minoru. Liftable driver's seat for automobiles, 4,422,611, Cl. 248-421.000.
- Kiyoshi Miyake: See—  
Miyake, Kiyoshi; and Miyata, Naoyuki, 4,423,403, Cl. 338-15.000.
- Kjeldsen, William R.: See—  
Thomas, Richard D., and Kjeldsen, William R., 4,422,316, Cl. 70-456.00R.
- Klein, Ernst: See—  
Scholz, Heinz; Schnitker, Wolfgang; and Klein, Ernst, 4,422,910, Cl. 204-96.000.
- Klein, Heinz H., to Dr. Boy GmbH. Hydraulic actuating and locking device, 4,422,294, Cl. 60-565.000.
- Klein, L. E., to Harvey Hubbell Incorporated. Pump basin valve and slip joint, 4,422,472, Cl. 137-614.060.
- Kleinknecht, Hans P., to RCA Corporation. Automatic photomask alignment system for projection printing, 4,422,763, Cl. 356-356.000.
- Kleinschmidt, Peter; Meixner, Hans; and Magori, Valentin, to Siemens Aktiengesellschaft. Positioning element with a piezo-ceramic body, 4,423,347, Cl. 310-331.000.
- Klijanowicz, James E.; and Kovacs, Csaba A., to Eastman Kodak Company. Color-forming carboxamidonaphthalene dye precursor and carboximide dye in photographic material and process, 4,423,126, Cl. 430-9.000.
- Kline, Leo. Growth promoting compositions for *Lactobacillus sanfrancisco* and method of preparation, 4,423,079, Cl. 426-20.000.
- Kling, John E.: See—  
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,423,005, Cl. 422-61.000.
- Klose, Odo, to Prasenta KG Weber & Co. Key holder, 4,422,315, Cl. 70-456.00R.
- Kloster, Kenneth D. Shock absorber shroud cutting tool, 4,422,238, Cl. 30-101.000.
- Klotz, Helmut: See—  
Dinger, Hans; and Klotz, Helmut, 4,422,296, Cl. 60-606.000.
- Knecht Filterwerke GmbH: See—  
Gebert, Hans; Löffelhardt, Manfred; and Obernosterer, Gerhard, 4,422,790, Cl. 403-11.000.
- Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. Composition of matter and process, 4,423,146, Cl. 435-55.000.
- Knop, Charles M.; and Ostertag, Edward L., to Andrew Corporation. Diagonal-conical horn-reflector antenna, 4,423,422, Cl. 343-786.000.
- Knox, Kenneth L., Sr. Variation of fuel vaporizer for internal combustion engine, 4,422,432, Cl. 123-592.000.
- Kobayashi, Jiro: See—  
Abe, Nobutoshi; Kakizaki, Yukio; and Kobayashi, Jiro, 4,422,547, Cl. 206-328.000.
- Kobayashi, Masami. Process for direct gold plating of stainless steel, 4,422,906, Cl. 204-34.000.
- Kobayashi, Nobuyuki: See—  
Komoda, Norio; Kobayashi, Nobuyuki; Itoh, Hiroshi; Nishimura, Yozi; and Obara, Shigenobu, 4,422,497, Cl. 165-23.000.
- Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing phenyl-[3,3,3-trifluoropropyl]phenyl]methane, 4,423,259, Cl. 570-144.000.
- Koda, Toyomasa: See—  
Imaizumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.
- Kodama, Katsuo: See—  
Iwawaki, Akira; Horiuchi, Eiji; Shinya, Sadahiko; Kojima, Kinshiro; Kodama, Katsuo; Kawarata, Kotaro; and Fukase, Hisahiko, 4,422,838, Cl. 425-376.00A.
- Kodama, Masayuki; and Makishima, Sadao, to Fuji Kugokyo Kabushiki Kaisha. Transmission apparatus for four-wheel drive motor vehicle, 4,422,520, Cl. 180-247.000.
- Koenig, Herbert G.; and Koenig, Margaret E. Needle threading device, 4,422,564, Cl. 223-99.000.
- Koenig, Margaret E.: See—  
Koenig, Herbert G.; and Koenig, Margaret E., 4,422,564, Cl. 223-99.000.
- Koester, Eberhard: See—  
Felleisen, Peter; Mayer, Dieter; Koester, Eberhard; Doms, Friedrich; and Deigner, Paul, 4,423,454, Cl. 360-135.000.
- Koguchi, Kenji: See—  
Murayama, Tomio; Koguchi, Kenji; Takeuchi, Shigehumi; and Tsukioka, Kazumi, 4,423,520, Cl. 375-95.000.
- Koike, Norio; Takahara, Takeshi; Shirakawa, Yasuhiro; and Ikari, Kunihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of making picture tube fluorescent screen, 4,423,128, Cl. 430-28.000.
- Koizumi, Mitsuyoshi; Akiyama, Nobuyuki; and Oshima, Yoshimasa, to Hitachi, Ltd. Method and apparatus for inspecting specimen surface, 4,423,331, Cl. 250-572.000.
- Kojima, Kinshiro: See—  
Iwawaki, Akira; Horiuchi, Eiji; Shinya, Sadahiko; Kojima, Kinshiro; Kodama, Katsuo; Kawarata, Kotaro; and Fukase, Hisahiko, 4,422,838, Cl. 425-376.00A.
- Kojima, Tetsukiko: See—  
Sugimori, Shigeru; Kojima, Tetsukiko; and Tsuji, Masakazu, 4,422,951, Cl. 252-299.630.
- Kokusai Denshin Denwa Kabushiki Kaisha: See—  
Nakagome, Yukio; Amano, Kitsuaro; Nakai, Taiichiro; Niino, Yasuhiko; Ejiri, Yoshihiro; Yamamoto, Hitoshi; and Yamazaki, Yoshihiko, 4,422,718, Cl. 350-96.230.
- Kolb, Gunter: See—  
Lobach, Wilfried; Haas, Peter; Kolb, Gunter; Sackmann, Guter; and Probst, Joachim, 4,423,194, Cl. 525-327.600.
- Kolodzey, Jurgen; Schoening, Josef; Schwiens, Hans-Georg; and Stracke, Wilfried, to Hochtemperatur-Reaktorbau GmbH. Differential pressure flowmeter for a gas cooled high temperature reactor blower, 4,422,340, Cl. 73-861.630.
- Komatsu, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device having two or more semiconductor elements with paired characteristics regularly arranged in a semiconductor substrate, 4,423,434, Cl. 357-51.000.
- Komine, Kikuji: See—  
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumis; and Naito, Tsutomu, 4,422,924, Cl. 208-33.000.
- Komiya, Yutaka; and Takada, Koichi, to Canon Kabushiki Kaisha. Original feed control unit, 4,422,751, Cl. 355-14.05H.
- Komoda, Norio; Kobayashi, Nobuyuki; Itoh, Hiroshi; Nishimura, Yozi; and Obara, Shigenobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device of controlling the idling speed of an engine, 4,422,497, Cl. 165-23.000.
- Kompelien, Arlon D.; and Westley, Curtis E., to Honeywell Inc. Electric motor damper drive with backup power pack, 4,423,364, Cl. 318-440.000.
- Kondo, Hideyo; and Touma, Hitoshi, to Canon Kabushiki Kaisha. Electrostatic image holder having insulating overlayer of fluorinated surfactant, 4,423,132, Cl. 430-67.000.
- Kondo, Yasuo; Kato, Masanori; and Nakagawa, Mitsuru, to Nippon Soken, Inc. Control system for electric automobile heating apparatus, 4,423,307, Cl. 219-202.000.
- Kondou, Tamaiti: See—  
Ohtomi, Sadayuki; Hirano, Yasutaka; Tangiku, Iturou; and Kondou, Tamaiti, 4,422,531, Cl. 187-20.000.
- Konishiroku Photo Industry Co., Ltd.: See—  
Abe, Shunichi; and Akiyama, Mitsuo, 4,422,756, Cl. 355-57.000.
- Kawata, Shun, 4,422,750, Cl. 355-3.0DD.
- Sugizaki, Tsugio, 4,422,631, Cl. 271-9.000.
- Konrad, Charles E.; and Clark, Robert C., deceased (by Clark, Jean B., executrix), to General Electric Company. Electric vehicle current regulating system, 4,423,362, Cl. 318-139.000.
- Kopich, Leonard F., to General Motors Corporation. Seat position control mechanism, 4,422,690, Cl. 297-341.000.
- Kopolow, Stephen L.; and Chatterjee, Pronoy K., to Personal Products Company. Synthetic superabsorbent fibers, 4,423,184, Cl. 525-57.000.
- Koppers Company, Inc.: See—  
Doerge, Herman P., 4,423,163, Cl. 521-181.000.
- Leston, Gerd, 4,423,253, Cl. 568-756.000.
- Koreicho, Wladimir: See—  
Chavany, Jean C.; and Koreicho, Wladimir, 4,422,601, Cl. 244-3.130.
- Kornylak, Andrew T., to Kornylak Corporation. Fluid film continuous processing method and apparatus, 4,422,988, Cl. 264-40.300.
- Kornylak Corporation: See—  
Kornylak, Andrew T., 4,422,988, Cl. 264-40.300.
- Korosi, Jeno; Lang, Tibor; Andras, Ferenc; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, to Egyt Gyogyszervegyeszeti Gyar, 3,4-Dihydro-5H-2,3-benzodiazepine derivatives and pharmaceutical use thereof, 4,423,044, Cl. 424-244.000.
- Kosowski, Zenon V.: See—  
Smith, Donald L.; Kosowski, Zenon V.; and Marks, Robert R., Jr., 4,422,342, Cl. 73-863.430.
- Koszytorz, Gunther, to Siemens Aktiengesellschaft. Housed contact arrangement for a tubular lamp, 4,422,712, Cl. 339-255.00R.
- Kotani, Kikuo: See—  
Nakagawa, Nobuaki; Kotani, Kikuo; Katsuragi, Shigeo; Morita, Kaoru; Ohya, Kunio; and Noda, Toshiharu, 4,423,034, Cl. 424-85.000.

- Koulbanis, Constantin; Ser, Jean-Claude; and N'Guyen, Quang L., to L'Oreal. Emulsions of the water-in-oil type useable as cosmetic supports or pharmaceutical excipients, 4,422,952, Cl. 252-309.000.
- Kovacs, Csaba A.: See—  
Kiljanowicz, James E.; and Kovacs, Csaba A., 4,423,126, Cl. 430-9.000.
- Kovalenko, Vitaly I.: See—  
Nikolaev, Nikolai I.; Tereschenko, Lev A.; Yakovlev, Arian M.; Kovalenko, Vitaly I.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K., 4,422,876, Cl. 106-104.000.
- Kowalczyk, Dennis C.; Brickleyer, Bruce A.; and Svoboda, Joseph J., to Pittsburg & Midway Coal Mining Co., The. Process for removing polymer-forming impurities from naphtha fraction, 4,422,927, Cl. 208-211.000.
- Kozaki, Shuichi; Funada, Fumiaki; Minezaki, Shigehiro; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Liquid crystal display device and the manufacturing method thereof, 4,422,730, Cl. 350-339.00R.
- Kozuka, Michihiro; and Tonokura, Masayuki, to Tomy Kogyo Co., Inc. Toy capable of pivotal movement on a support surface, 4,422,261, Cl. 46-104.000.
- Kraemer, John F.: See—  
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,422,496, Cl. 164-528.000.
- Kraft, Inc.: See—  
Bauernfeind, John; Carnahan, Russell W.; Lodal, Norman; and Vazquez, Domingo, 4,423,082, Cl. 426-557.000.
- Krajewski, Zdzislaw A. A., to Bayly Engineering Limited. Cancellation of group delay error by dual speed of rotation, 4,423,420, Cl. 343-400.000.
- Kraus, Charles E., to Exclermatic Inc. Traction roller transmission, 4,422,351, Cl. 74-798.000.
- Krauss-Maffei Aktiengesellschaft: See—  
Seit, Horst, 4,422,696, Cl. 305-28.000.
- Kravath, Ricard E. Partitioning device and method for pools, 4,422,193, Cl. 4-505.000.
- Kravath, Richard E., to Montefiore Hospital and Medical Center, Inc. Method and apparatus for detecting respiratory distress, 4,422,458, Cl. 128-671.000.
- Krenz, Horst M., to Heath Company. Grounded multi-pin connector for shielded flat cable, 4,422,700, Cl. 339-14.00R.
- Krieg, Gunther: See—  
Becker, Erwin-Willy; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,422,905, Cl. 204-9.000.
- Krock, Friedrich W.; and Neef, Rutger, to Bayer Aktiengesellschaft. Process for the preparation of 1,4-diamino-2,3-dicyano-anthraquinone, 4,422,973, Cl. 260-382.000.
- Krueger, Donald G.: See—  
Dashner, Merwin J.; Diring, James A.; and Krueger, Donald G., 4,422,584, Cl. 242-55.300.
- Schultz, Arthur N.; Diring, James A.; and Krueger, Donald G., 4,422,585, Cl. 242-55.330.
- Krumm, Klaus-Dieter, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch, especially for motor vehicles, 4,422,538, Cl. 192-70.140.
- Kruth, Jeffrey A.: See—  
Freitag, Ronald G.; and Kruth, Jeffrey A., 4,423,393, Cl. 333-164.000.
- Kubota, Naohiro: See—  
Minagawa, Motonobu; Kubota, Naohiro; and Kimura, Ryoji, 4,423,174, Cl. 524-99.000.
- Kulesh, Vladimir P.: See—  
Gribanov, Dmitry D.; Kulesh, Vladimir P.; Martynov, Apollinary K.; Orlov, Anatoly A.; Sidorov, Alexandr I.; Fonov, Sergei D.; and Stepanov, Arkady V., 4,422,737, Cl. 352-39.000.
- Kulicic and Soffa Industries, Inc.: See—  
Elles, Richard J.; Ely, Razon; and Vilenski, Dan, 4,422,568, Cl. 228-111.000.
- Kulprathipanja, Santi, to UOP Inc. Separation of bi-alkyl substituted monocyclic aromatic isomers with pyrolyzed adsorbent, 4,423,279, Cl. 585-828.000.
- Kumadaki, Itsumaro: See—  
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,423,259, Cl. 570-144.000.
- Kumei, Hiroshi: See—  
Saito, Takashi; and Kumei, Hiroshi, 4,423,504, Cl. 369-292.000.
- Kunz, Walter: See—  
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,423,059, Cl. 424-274.000.
- Kurahashi Keizo: See—  
Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, 4,423,356, Cl. 315-169.200.
- Kurata, Chikatoshi: See—  
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuhio; Kurata, Chikatoshi; and Fujii, Kenichi, 4,422,391, Cl. 110-347.000.
- Kureha Kagaku Kogyo Kabushiki Kaisha: See—  
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,423,259, Cl. 570-144.000.
- Kuroda, Hiroshi; Fukuoka, Yoshikazu; Naemura, Hiroshi; and Shihomura, Takayoshi, to Nippon Kokan Kabushiki Kaisha. Apparatus for cooling steel strips to effect continuous annealing, 4,422,623, Cl. 266-109.000.
- Kuroda, Masayuki: See—  
Saito, Eiji; Aizawa, Shoji; Mitsui, Michio; Miyata, Tomohiko; and Kuroda, Masayuki, 4,422,576, Cl. 239-693.000.
- Kurtz, Bruce E.: See—  
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovinski, Adam L.; and Lesco, James M., 4,422,907, Cl. 204-38.00B.
- Kurzke, Herbert, to Vepa Aktiengesellschaft. Apparatus for depositing a moving fiber strand as folded loops, 4,422,225, Cl. 28-289.000.
- Kuttel, Brian W., to TransFRESH Corporation. Transportation of perishable products, 4,422,304, Cl. 62-78.000.
- Kuwabara, Shigeo; and Kamei, Masanori. Pencil head for automatic drawing instrument, 4,423,428, Cl. 346-139.00C.
- Kuwakado, Satoshi: See—  
Chiba, Masakazu; Kuwakado, Satoshi; Takei, Toshihiro; Tsuge, Noboru; and Shimogawa, Toshiaki, 4,422,669, Cl. 280-806.000.
- Kuwano, Michiyasu, to Kioritz Corporation. Exhaust muffler cover, 4,422,523, Cl. 181-211.000.
- L. Barker & Williamson, Inc.: See—  
Bush, Elmer R., 4,423,423, Cl. 343-803.000.
- Labarre, Ernest D.: See—  
Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., 4,422,240, Cl. 30-254.000.
- Laboratoires Jacques Logeais: See—  
Maillard, Jacques G.; Delaunay, Perre P. A.; and Legeoi, Jacky M. G., 4,423,056, Cl. 424-270.000.
- Lacasse, Ernest: See—  
Lacroix, Paul H.; and Lacasse, Ernest, 4,422,488, Cl. 144-368.000.
- Lacroix, Paul H.; and Lacasse, Ernest, to Centre de Recherche Industrielle du Quebec. Machine for producing drawer-sides, 4,422,488, Cl. 144-368.000.
- Ladd, Richard H.: See—  
Watt, Robert H.; Ladd, Richard H.; and Wright, Walter S., deceased, 4,422,301, Cl. 62-54.000.
- LaGrange, Nyle D.; and Deters, Elmer M., to Marley/Wylain Company, The. Submersible pump check valve, 4,422,469, Cl. 137-315.000.
- Laiteries Hubert Triballat: See—  
Salmon, Michel, 4,423,081, Cl. 426-271.000.
- LaJet Energy Company: See—  
Williams, Carl L., Jr.; Black, Robert S.; and Payne, Larry R., 4,422,723, Cl. 350-295.000.
- Lake, John M.; and Payne, Robert C., to Coal Industry (Patents) Limited. Domestic combustion appliances, 4,422,410, Cl. 122-4.00D.
- Laki, Koloman, to National Foundation for Cancer Research, Inc. 1-Branched-alkyl-3-(2-haloethyl)-3-nitrosoureas as novel antitumor agents, 4,423,076, Cl. 424-322.000.
- Lam, Roger C.: See—  
Hilliard, Steven F., 4,422,658, Cl. 280-47.400.
- Lambert, Joe C.: See—  
Clark, Robert C.; Lambert, Joe C.; and Thomas, Sherrill G., 4,423,363, Cl. 318-375.000.
- Lampelzammer, Helga: See—  
Huhn, Karl; Lampelzammer, Helga; and Kaiser, Wolfgang, 4,423,092, Cl. 427-316.000.
- Lancaster, Janet M.: See—  
Atkinson, Alan W.; and Lancaster, Janet M., 4,422,894, Cl. 156-62.200.
- Landi, Curtis L.; and Wilson, Susan L. Protective body shield, 4,422,183, Cl. 2-2.000.
- Landis, H. Richard, to Landis Plastics Inc. Molded container with snap-on closure, 4,422,559, Cl. 220-306.000.
- Landis Plastics Inc.: See—  
Landis, H. Richard, 4,422,559, Cl. 220-306.000.
- Lang, Gerard: See—  
Jacquet, Bernard; and Lang, Gerard, 4,422,853, Cl. 8-406.000.
- Lang, Tibor: See—  
Korosi, Jeno; Lang, Tibor; Andras, Ferenc; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, 4,423,044, Cl. 424-244.000.
- Langdon, Freddie J.: See—  
Earhart, Jack R.; Langdon, Freddie J.; and Johnson, John K., 4,422,771, Cl. 366-251.000.
- Langenegger, Urs: See—  
Rutsche, Wendolin; and Langenegger, Urs, 4,422,385, Cl. 108-153.000.
- Langton, Roy, to Aviation Electric Ltd. Fuel control apparatus for a gas turbine engine, 4,422,289, Cl. 60-39.281.
- Lantzsche, Reinhard; Dltgens, Klaus; Heinemann, Ulrich; Thomas, Rudolf; and Weber, Erhard, to Bayer Aktiengesellschaft. Process for the preparation of pyrazole, 4,423,225, Cl. 548-373.000.
- Lapointe, Leopold; and Pelletier, Donat, to G.R.S. International Inc. Modular, self supporting flight of stairs, 4,422,270, Cl. 52-182.000.
- Lapp, Michael L. Matchlock convertor, 4,422,255, Cl. 42-69.00R.
- Laroche, Sylvain. Animal excrement picker, 4,422,681, Cl. 294-1.0BA.
- Larsen, Eric R.; and Ecker, Ernest L., to Dow Chemical Company, The. Process for the production of 1,1,2-trichloro-2,2-difluoroethane, 4,422,913, Cl. 204-158.0HA.
- Larsen, Mogens D. Apparatus for advancing a predetermined length of strip-shaped material, 4,422,357, Cl. 83-210.000.
- Larson, Ted. Garment attachment including openable enclosure, 4,422,306, Cl. 63-1.00R.
- Laurin, Dean G.: See—  
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,423,005, Cl. 422-61.000.
- Lausberg, Helmut; and Pommerenberg, Karl-Werner, to M.A.N. Maschinenfabrik Augsburg Nurnberg Aktiengesellschaft. Universal joint



- construction for use in anchoring a surface platform to a sea bed. 4,422,791, Cl. 403-39.000.
- Lautenschlager, Gerhard: See—  
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Del Principe, Robert M.; and Oliphant, Peter A., 4,422,639, Cl. 273-94.000.  
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Deforeit, Christian J., 4,422,363, Cl. 84-1.260.  
Mattingly, Denis A. E., to Bernard Strutt Agencies Limited. Apparatus for magnetic treatment of water of other liquids. 4,422,935, Cl. 210-223.000.  
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Maucher, Hans; Zanner, Georg; and Repa, Otto, to Carl Walther GmbH. Adjustable cheek-piece for a shoulder firearm. 4,422,256, Cl. 42-73.000.  
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Maurel, Pierre, to Aluminium Pechiney. Process for the selective removal of arsenic in the course of the oxidizing attack by means of a carbonated liquor on a uraniferous ore containing same. 4,423,010, Cl. 423-15.000.  
Maurel, Pierre; and Nicolas, Francois, to Aluminium Pechiney. Process for the purification of solutions containing alkali metal carbonate, sulphate, hydroxide or possibly hydrogen carbonate, and one at least of the metals vanadium, uranium and molybdenum. 4,423,013, Cl. 423-55.000.  
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with novel pyrazol-4-yl N-alkyl-carbamates. 4,423,058, Cl. 424-273.00P.  
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McAlpine, James B.; and Carney, Ronald E., to Abbott Laboratories. Intermediates for the preparation of 3-demethoxyfartimicins. 4,423,210, Cl. 536-16.100.  
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Johnson, David E.; McCall, Kenneth E.; and Coughlin, William J., 4,422,384, Cl. 105-29.00R.  
McClure, Don W., to Rockwell International Corporation. Simulated wire wheel trim for automobile wheels. 4,422,692, Cl. 301-37.0SS.  
McCombie, Stuart W., to Schering Corporation. 6-Substituted-hydrocarbon-2-(substituted-thio)penem-3-carboxylic acids. 4,423,055, Cl. 424-270.000.  
McCrory, Roy E. Carrousel wildfowl decoy. 4,422,257, Cl. 43-3.000.  
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Hardesty, Donald E.; and McCullough, Glenn R., 4,422,246, Cl. 34-9.000.  
McCurdy, Gerald D., to Coe Manufacturing Company, The. Multi-dog log carriage. 4,422,487, Cl. 144-245.00R.  
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Green, William L.; Calkins, Dennis E.; Harrison, Gary E.; and Wilkins, Jesse R., 4,422,799, Cl. 405-158.000.  
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McGee, William R., to Consolidated Technology Corporation. Apparatus and method for safely purifying hydrogen gas. 4,422,859, Cl. 55-16.000.  
McGlothlin, Quentin T.; and O'Brien, Barry M., to Exxon Research & Engineering Co. Silica flotation collectors derived from isononyl alcohol. 4,422,928, Cl. 209-166.000.  
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McGuire, S. E.: See—  
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McJunkin, Howard P., Jr.: See—  
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McKay, Nicholas D., to Helmac Products Corporation. Lint remover. 4,422,201, Cl. 15-104.00A.  
McKee, James E. Fluid operated diaphragm pump with fluid timing control and control circuit manifold mounted on pump body. 4,422,835, Cl. 417-401.000.  
McKelvey, Harold E., to Shatterproof Glass Corporation. Magnetron cathode sputtering apparatus. 4,422,916, Cl. 204-192.00R.  
McManus, Henry E. Flexible reflector assembly for bicycles and the like. 4,422,615, Cl. 248-475.00R.  
McMillen, Graham T.: See—  
Moorby, Donald G.; McMillen, Graham T.; and Flemons, Ralph S., 4,422,320, Cl. 73-12.000.  
McPherson, Bruce M., to NCR Corporation. Encoded card reader. 4,423,320, Cl. 235-482.000.  
McQueen, Sidney J. Safety mechanism for firearms. 4,422,254, Cl. 42-1.00Y.

- McQuillan, Charles M.: See—  
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Temple, Davis L., Jr., 4,423,049, Cl. 424-251.000.  
Mechanical Technology Incorporated: See—  
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Howarth, Roy B., 4,422,649, Cl. 277-75.000.  
Medical Specialties, Inc.: See—  
English, Paul R., 4,422,454, Cl. 128-134.000.  
Medtronic, Inc.: See—  
Zaidenweber, Gary A., 4,423,456, Cl. 361-77.000.  
Meeker, David M., to Champion International Corporation. Mark locator and method of using same. 4,422,241, Cl. 33-1.0BB.  
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Melby, Earl G.; Cocain, Harry W.; and Fabris, Hubert J., to General Tire & Rubber Company. The Dehydrochlorination of vinyl chloride resins followed by graft copolymerization with copolymerizable monomers. 4,423,193, Cl. 525-256.000.  
Mellen, Robert H., Sr. Dynamic gradient furnace with controlled heat dissipation. 4,423,516, Cl. 373-111.000.  
Mercer, Roger W., II. Prosthetic horseshoe. 4,422,509, Cl. 168-4.000.  
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Mrozik, Helmut H., 4,423,209, Cl. 536-7.100.  
Rooney, Clarence S.; Williams, Haydn W. R.; Gragoe, Edward J., Jr.; and Patchett, Arthur A., 4,423,063, Cl. 424-278.000.  
Merger, Franz; and Schroff, Ludwig, deceased (by Schroff, Meinie Thea, heiress), to BASF Aktiengesellschaft. Manufacture of alkylarylamines and alkylarylamines. 4,423,247, Cl. 564-391.000.  
Merrell Torau de et Compagnie: See—  
Gerhart, Fritz; and Van Dorsselaer, Viviane, 4,423,073, Cl. 424-314.000.  
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Messerschmitt-Boelkow-Blohm GmbH: See—  
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Messick, John R.; Ackley, William R.; and Moon, George D., Jr., to Raphael Katzen Associates International Inc. Anhydrous ethanol distillation method and apparatus. 4,422,903, Cl. 203-19.000.  
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Turiot, Andre, 4,422,602, Cl. 244-102.00R.  
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Meyman, Usher. Rotary machine with peripherally contacting rotors and end face sealing plate. 4,422,836, Cl. 418-56.000.  
Michel, Rudolph H., to Du Pont de Nemours, E. I., and Company. Extruder process for preparation of carbon fiber reinforced fluoropolymer compositions. 4,422,992, Cl. 264-108.000.  
Micro Motion, Inc.: See—  
Smith, James E., 4,422,338, Cl. 73-861.380.  
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Miyakawa, Seiichi; Midorikawa, Akira; Aniyama, Kenzo; and Tatsumi, Susumu, 4,423,134, Cl. 430-103.000.  
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Miller, David L. W.; and Freeman, Billy P., to Free Flow, Inc. Pneumatic transfer system and a fluid flow control device therefor. 4,422,833, Cl. 417-183.000.  
Miller, Stephen J., to Chevron Research Company. Low pressure oligomerization of gaseous olefins. 4,423,268, Cl. 585-533.000.  
Miller, Stephen J., to Chevron Research Company. Oligomerization of gaseous olefins. 4,423,269, Cl. 585-533.000.  
Miller, Wendell R., to Quantum Systems Corporation. Backwashing-type filtering apparatus. 4,422,938, Cl. 210-411.000.

- Miller, William D.: See—  
Roeger, Carl R.; Miller, William D.; and Goodin, Charles R., 4,422,582, Cl. 241-82.500.  
Milleron, Norman. Rotating fiber array molecular driver and molecular momentum transfer device constructed therewith. 4,422,822, Cl. 415-90.000.  
Milliman, Keith, to Coleman Company, Inc., The. Projectile loader and detent assembly for guns. 4,422,433, Cl. 124-74.000.  
Minagawa, Motonobu; Kubota, Naohiro; and Kimura, Ryoji, to Adeka Argus Chemical Co., Ltd. Synthetic resin compositions containing 2,2,6,6-tetramethyl piperidyl ethers. 4,423,174, Cl. 524-99.000.  
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Minezaki, Shigehiro: See—  
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Minnesota Mining and Manufacturing Company: See—  
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Mitsubishi Denki Kabushiki Kaisha: See—  
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Ohtomi, Sadayuki; Hirano, Yasutaka; Tangiku, Iturou; and Kondou, Tamaiti, 4,422,531, Cl. 187-20.000.  
Ozaki, Minoru; Onishi, Ken; and Tanaka, Kunimaro, 4,423,441, Cl. 360-13.000.  
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Miura, Shoshin: See—  
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Miyakawa, Seiichi; Midorikawa, Akira; Aniyama, Kenzo; and Tatsumi, Susumu, to Ricoh Company, Ltd. Developing unit for electrophotography. 4,423,134, Cl. 430-103.000.  
Miyake, Kiyoshi; and Miyata, Naoyuki, to Hitachi, Ltd.; and Kiyoshi Miyake. Transparent conductive films and methods of producing same. 4,423,403, Cl. 338-15.000.  
Miyake, Sumio: See—  
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Miyamoto, Kazuaki: See—  
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- Miyamoto, Minoru: See—  
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- Miyamoto, Osamu: See—  
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- Miyashita, Yoshinori: See—  
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- Miyata, Naoyuki: See—  
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- Miyata, Tomohiko: See—  
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- Miyazaki, Kazuo; Hara, Hajime; Teramoto, Kojiro; Horii, Hideo; Oshimi, Humaki; and Araki, Yoshihiko, to Nippon Petrochemicals Company, Limited. Method for purifying an epoxidation product. 4,423,239, Cl. 549-341.000.
- Miyazaki, Toshiyuki; Miura, Ushio; and Hatanaka, Masahiro, to Mitani Electronics Industry Corp. Panel type display apparatus. 4,423,352, Cl. 313-584.000.
- Moba Holding Barneveld B.V.: See—  
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- Mobil Oil Corporation: See—  
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- Chu, Yung-Feng; Chou, Tai-Sheng; and Chester, Arthur W., 4,423,263, Cl. 585-322.000.
- Daviduk, Nicholas; and Haddad, James H., 4,423,274, Cl. 585-640.000.
- Dessau, Ralph M., 4,423,280, Cl. 585-829.000.
- Forbus, Nancy P.; and Wu, Margaret M., 4,423,272, Cl. 585-640.000.
- Gerwick, Ben C., Jr.; Price, Edward B.; and Taylor, Thomas P., 4,422,804, Cl. 405-210.000.
- Rollmann, Louis D.; and Valyocsk, Ernest W., 4,423,021, Cl. 423-333.000.
- Yan, Tsoung-Yuan, 4,423,008, Cl. 423-7.000.
- Young, Lewis B., 4,423,266, Cl. 585-481.000.
- Mochida, Haruo, to Nissan Motor Company, Limited. Safe remote-control door opening-and-closing device for an automotive vehicle. 4,422,521, Cl. 180-271.000.
- Modica, Frank S.: See—  
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,423,019, Cl. 423-244.000.
- Moeller, Frank, to Rees, John Douglas. Piston and cylinder arrangement including means to vary the compression ratio. 4,422,414, Cl. 123-48.00B.
- Moesser, Lovere A.: See—  
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- Mohr, Reinhard; and Neeb, Rudolf, to Hoechst Aktiengesellschaft. Zinc chloride complex compounds. 4,423,226, Cl. 548-402.000.
- Mokdad, Mohamed, to Omega SA. Stepping micromotor capable of rotation in both senses. 4,423,342, Cl. 310-41.000.
- Molby, Lloyd A. Scraper type vehicle. 4,422,818, Cl. 414-712.000.
- Monnet, Bernard, to Post-A-Mousson S.A. Apparatus for injecting plastics and elastomers. 4,422,842, Cl. 425-561.000.
- Mons, Claude M.; Pernot, Michel J.; and Spinat, Roland R., to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation "S.N.E.C.M.A.". Abradable seal and its method of production. 4,423,097, Cl. 427-423.000.
- Monsanto Company: See—  
D'Amico, John J., 4,422,865, Cl. 71-90.000.
- Lester, J. Harvey, Jr.; and Danly, Donald E., 4,423,018, Cl. 423-243.000.
- Olive, Salvador; and Olive, Gisela, 4,423,113, Cl. 428-389.000.
- Renshaw, James T., 4,423,178, Cl. 524-287.000.
- Montefiore Hospital and Medical Center, Inc.: See—  
Kravath, Richard E., 4,422,458, Cl. 128-671.000.
- Moon, George D., Jr.: See—  
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- Moorby, Donald G.; McMillen, Graham T.; and Flemons, Ralph S., to Canadian General Electric Company Limited. Wedge tightness measuring device. 4,422,320, Cl. 73-12.000.
- Moore, Boyd B. Protective clamp assembly. 4,422,504, Cl. 166-241.000.
- Moore Company, Inc.: See—  
Moore, Junius T., 4,422,556, Cl. 211-119.000.
- Moore, James E.: See—  
Crivello, James V.; and Moore, James E., 4,423,136, Cl. 430-281.000.
- Moore, Junius T., to Moore Company, Inc., The. Receptacles for overhead storage systems. 4,422,556, Cl. 211-119.000.
- Moore, Robert R.: See—  
Strutton, Bernice M.; and Moore, Robert R., 4,422,188, Cl. 4-144.400.
- Moravcsik, Imre: See—  
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- Morgan, Frederick R., to Radiant Tube Systems Limited. Heating system. 4,422,573, Cl. 237-70.000.
- Morgan, George W., to Suncor, Inc. Means for increasing the efficiency of an ice disaggregation system. 4,422,399, Cl. 114-42.000.
- Morgan, Robert H.: See—  
Charney, Joseph C.; Goodman, Phillip M.; and Morgan, Robert H., 4,422,789, Cl. 401-218.000.
- Morganti, Luigi. Roller press. 4,422,375, Cl. 100-210.000.
- Mori, Shigeki: See—  
Yamamoto, Ryuichi; Takagi, Akinobu; Kataita, Masafumi; Obata, Kenji; and Mori, Shigeki, 4,422,976, Cl. 260-453.0PH.
- Moriarty, Thomas C.; and Geiger, William J., to PPG Industries, Inc. Ungelled polyepoxide-polyoxyalkylenepolyamine resins, aqueous dispersions thereof, and their use in cationic electrodeposition. 4,423,166, Cl. 523-414.000.
- Morikawa, Takitaro: See—  
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- Morimoto, Yoshiro: See—  
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- Morimoto, Yoshitaka; Shiga, Tomiji; and Ushirogawa, Akio, to Nippon Electric Co., Ltd. Optical fiber connector. 4,422,716, Cl. 350-96.210.
- Morishita Jintan Co., Ltd.: See—  
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- Morishita, Takashi; Sunohara, Hideki; and Sonoi, Shinsuke, to Morishita Jintan Co., Ltd. Method and apparatus for encapsulation of a liquid or meltable solid material. 4,422,985, Cl. 264-4.400.
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- Moriwaki, Hiroshi: See—  
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- Moss, Robert R. Game call having blades of differing height. 4,422,262, Cl. 46-189.000.
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- Bailey, David F.; Gilmore, Merle L.; Ganucheau, Charles J., Jr.; and Clow, Gary W., 4,423,416, Cl. 340-825.520.
- DeBock, Richard M., 4,423,384, Cl. 328-152.000.
- Gatto, Donald F.; and Milcunas, Juan, 4,423,468, Cl. 361-404.000.
- Kinsman, Robert G., 4,423,394, Cl. 333-192.000.
- Seelbach, Walter C.; and Hansen, Boyd K., 4,423,339, Cl. 307-464.000.
- Spinks, Brian M., 4,423,340, Cl. 307-530.000.
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- Mueller, Robert A., to Tektronix, Inc. Thin-film electrothermal device. 4,423,401, Cl. 337-107.000.
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- Murata, Eiichiro: See—  
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- Murata Manufacturing Co., Ltd.: See—  
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- Murayama, Masato; and Manaka, Tetsuyuki, to Clarion Co., Ltd. Microphone holding device. 4,423,293, Cl. 179-156.00R.
- Murayama, Tomio; Koguchi, Kenji; Takeuchi, Shigehumi; and Tsukio, Kazumi, to Fuji Xerox Co., Ltd. Quantization circuit for image data transmission system. 4,423,520, Cl. 375-95.000.
- Murphy, Michael P.; Stack, Gary F.; Hoppenrath, James W.; and Taylor, John R., to General Motors Corporation. Quick heat self regulating electric glow heater. 4,423,309, Cl. 219-270.000.
- Murrell, Lawrence L.: See—  
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- Murrin, Frederick L.: See—  
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- Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., to Baxter Travenol Laboratories, Inc. Determining quantitative degree of ethylene oxide exposure in sterilization processes. 4,423,005, Cl. 422-61.000.
- Murui, Yukio; and Saitoh, Masaaki, to Shiseido Company, Ltd. Eye makeup preparation. 4,423,031, Cl. 424-63.000.
- Musha, Tohru; Kato, Kiichi; and Ito, Kenichi, to Olympus Optical Co., Ltd. Method and apparatus for recording optically an information signal on a record medium along tracks. 4,423,495, Cl. 369-45.000.
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- Mycro-Group Company: See—  
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- Mydosh, Bryan L.: See—  
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- Myers, Noreen. Insect protective garment. 4,422,184, Cl. 2-4.000.
- Myers, William H., to Ethyl Corporation. Olefin conversion. 4,423,275, Cl. 585-645.000.
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- Nagata, Hideo: See—  
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- Naiman, Michael I.: See—  
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- Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, to Elecompack Company Ltd. Shiftable article storage device. 4,422,816, Cl. 414-331.000.
- Naito, Hideshi; Nozawa, Hideyo; and Kazami, Kazuyuki, to Nippon Kogaku K. K. Lens barrel suitable for flash photography. 4,423,470, Cl. 362-17.000.
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- Naito, Youichiro: See—  
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- Nakamura, Norihiko, to Rhythm Watch Co., Ltd. Time correcting device for time signalling timepiece. 4,422,777, Cl. 368-185.000.
- Nakamura, Yoshitaka, to NEC Kansai, Ltd. Projection type cathode ray tube with masking means. 4,423,438, Cl. 358-231.000.
- Nakanishi, Eiji: See—  
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- Nakano, Eiji, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Non-contact type potentiometer. 4,423,406, Cl. 338-32.00R.
- Nakano, Junji: See—  
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- Nakashima, Yutaka: See—  
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- Nakata, Tohru; Endo, Hiroyuki; Harada, Masatoshi; Hayasaka, Tadao; and Miyamoto, Osamu, to Hitachi Powdered Metals Co., Ltd. Ferro-sintered alloys. 4,422,875, Cl. 75-243.000.
- Nakata, Yasushi: See—  
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- Nakazawa, Yuki, to Hitachi Koki Company, Limited. Safety device for preventing overspeed. 4,423,346, Cl. 310-68.00E.
- Nalco Chemical Company: See—  
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- Selvarajan, Radhakrishnan; Ballweber, Edward G.; and Slovinsky, Manuel, 4,422,944, Cl. 210-736.000.
- Nalewick, James A.: See—  
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- Narkon, Norman W.: See—  
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- National Distillers and Chemical Corporation: See—  
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- National Foundation for Cancer Research, Inc.: See—  
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- Welebir, Andrew J., 4,423,236, Cl. 549-320.000.
- National Research Development Corporation: See—  
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- Swinbanks, Malcolm A., 4,423,289, Cl. 381-71.000.
- National School Studios, Inc.: See—  
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- Naumann, Klaus: See—  
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- Navin, Robert F.; and Prom, James R., to Freeman Chemical Corporation. Method for making coated molded articles. 4,422,996, Cl. 264-255.000.
- Naylor, Jimmy R.; Lillis, William J.; and Wang, Anthony D., to Burr-Brown Research Corporation. Digital-to-analog converter having single-ended input interface circuit. 4,423,409, Cl. 340-347.0DA.
- NCR Corporation: See—  
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- McPherson, Bruce M., 4,423,320, Cl. 235-482.000.
- Neal, Charles H.: See—  
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- Neal, Donald F.; and Blenkinsop, Paul A., to IMI Kynoch Limited. Heat treatment. 4,422,887, Cl. 148-133.000.
- Nebu, Hideaki, to Honda Giken Kogyo Kabushiki Kaisha. Rear fender structure for motorcycles. 4,422,659, Cl. 280-152.100.
- NEC Kansai, Ltd.: See—  
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- NECCHI Societa per Azioni: See—  
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- Neeb, Rudolf: See—  
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- Neeff, Charles W. Centrifugal casting of contact lenses. 4,422,984, Cl. 264-2.100.
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- Nefzger, Rolf: See—  
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- Negi, Virendra S.: See—  
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- Neideman, Saul L.: See—  
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- Nelson, John E.; Hammond, Charles W.; Huston, Roland E.; and Helton, Michael R., to Babcock & Wilcox Company, The. Pulsed liquid jet-type cleaning of highly heated surfaces. 4,422,882, Cl. 134-22.180.
- Nelson Research & Development Company: See—  
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- Rajadhyaksha, Vithal J., 4,423,040, Cl. 424-180.000.



- Nemoto, Nobuo, to Aderans Co., Ltd. Method for producing work-bench for a wig. 4,422,830, Cl. 29-434.000.
- Neotronics Limited: See—  
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- Neuhouser, Don E., to Power Distribution Products, Inc. Electrical connector plug with receptacle assembly. 4,422,706, Cl. 339-107.000.
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- Neumann, Erhard, to Deutsche Automobilgesellschaft mbH. d.c. Blocking oscillator charging device for electric vehicles. 4,423,476, Cl. 363-20.000.
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- Neyptic: See—  
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- N'Guyen, Quang L.: See—  
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- Nichia Denshi Kagaku Co., Ltd.: See—  
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- Nikolaev, Nikolai I.; Tereshchenko, Lev A.; Yakovlev, Arian M.; Kovalenko, Vitaly I.; Terevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K. Method for preparing plugging material. 4,422,876, Cl. 106-104.000.
- Nilsson, Mats, to Aktiebolaget Svenska Elektromagneter. Magneto flywheel assembly. 4,423,345, Cl. 310-153.000.
- Nilsson, Nils-Joel E.: See—  
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- Nippon Electric Co., Ltd.: See—  
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- Nippon Gakki Seizo Kabushiki Kaisha: See—  
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- Meguro, Hiroshi; and Okabe, Nobuo, 4,422,746, Cl. 354-195.120.
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- Nippon Soken, Inc.: See—  
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- Kondo, Yasuo; Kato, Masanori; and Nakagawa, Mitsuru, 4,423,307, Cl. 219-202.000.
- Tanaka, Hiroaki; and Akita, Shigeyuki, 4,423,417, Cl. 340-870.370.
- Nippon Tungsten Co., Ltd.: See—  
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- Nippon Zeon Co., Ltd.: See—  
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- Yamamoto, Haruhisa; and Yoneyama, Nobuaki, 4,423,281, Cl. 585-626.000.
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- Nishida, Hiroshi; Takahashi, Tuiyoshi; Shiono, Toshio; and Ohtsuka, Kiyomitsu, to Hitachi, Ltd. Head positioning mechanism for magnetic disc memory device. 4,423,447, Cl. 360-106.000.
- Nishida, Hiroshi: See—  
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- Nishida, Katsutoshi: See—  
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- Nishikawa, Masao: See—  
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- Nishikawa, Masumi, to Aisin Seiki Kabushiki Kaisha. Tilttable steering mechanism. 4,422,346, Cl. 74-493.000.
- Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Ito, Yoji, to Murata Manufacturing Co., Ltd. Dielectric resonator and filter with dielectric resonator. 4,423,397, Cl. 333-219.000.
- Nishimura, Keizo: See—  
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- Nishimura, Tomio; Yoshino, Hiraku; Takao, Kosei; and Masumoto, Yuuji, to Nippon Tungsten Co., Ltd. Golden sintered alloy for ornamental purpose. 4,422,874, Cl. 75-238.000.
- Nishimura, Yozi: See—  
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- Nishino, Chikae: See—  
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- Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Katuhiko; and Nakata, Yasushi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Metal hydride heat pump. 4,422,500, Cl. 165-104.120.
- Nissan Motor Company, Ltd.: See—  
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- Ezoe, Mitsuhiro, 4,422,421, Cl. 123-424.000.
- Hoshino, Yasunari, 4,422,292, Cl. 60-525.000.
- Mochida, Haruo, 4,422,521, Cl. 180-271.000.
- Otsuka, Hidehiro; Oda, Takaaki; Sato, Fumiyoshi; and Kikuta, Masaaki, 4,422,724, Cl. 350-307.000.
- Sakurai, Yukio; Okajima, Masao; and Inoue, Arifumi, 4,422,572, Cl. 237-12.30B.
- Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,422,353, Cl. 74-858.000.
- Yamaura, Tadao, 4,422,516, Cl. 180-70.00R.
- Nitzberg, Jerold I. Adjustable fulcrum hammer. 4,422,620, Cl. 254-26.00E.
- Niwa, Masatake: See—  
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- Noda, Toshiharu: See—  
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- Nojiri, Howard H.: See—  
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- Nozawa, Reikichi. Liquefied natural gas-freon electricity generation system. 4,422,298, Cl. 60-655.000.
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- Obetz, Judith E.: See—  
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- O'Brien, Barry M.: See—  
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- Gray, Thomas J., 4,422,961, Cl. 502-301.000.
- Katz, Lawrence E., 4,423,246, Cl. 564-102.000.
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- Orzalesi, Giovanni, to Societa Italo-Britannica L. Manetti-H. Roberts & Co. Derivatives of 2-amino-5-(o-sulphamidophenyl)-1,3,4-thiadiazol as antiviral agents and a process for the preparation thereof. 4,423,053, Cl. 424-269.000.
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- Patel, Gordhanbhai N.: See—  
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- Payne, Robert C.: See—  
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- Peck, Alan M.: See—  
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- Petrone, John J. Simulated wheel immobilizing apparatus. 4,422,633, Cl. 272-8.00N.
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- Subramanian, N., 4,422,982, Cl. 260-502.50F.
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- Steber, Charles E., to General Electric Company. Aft mounting system for combustion transition duct members. 4,422,288, Cl. 60-39.320.
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- Strickland, Benjamin W. Solar furnace apparatus. 4,422,446, Cl. 126-438.000.
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- Stroud, William R. Alkylation process utilizing absorption refrigeration. 4,423,277, Cl. 585-719.000.
- Strutton, Bernice M.; and Moore, Robert R. Micturition adaptor for conversion of a male bed urinal to female use. 4,422,188, Cl. 4-144.400.
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- Stucky, Dennis J.: See—
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- Subramanian, N., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,422,982, Cl. 260-502.50F.
- Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, to Nissan Motor Co., Ltd. Lock-up control method of and system for automatic transmission for automotive vehicle having engine provided with fuel cut means. 4,422,353, Cl. 74-858.000.
- Sugai, Haruo; Hamabe, Takafumi; Yamamura, Yukio; Otuka, Shinpei; and Moriwaki, Hiroshi, to Matsushita Electric Works, Ltd. Massaging apparatus. 4,422,448, Cl. 128-44.000.
- Sugimori, Fumio; Nishino, Chikae; and Harao, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. Vacuum container of radiation image multiplier tube and method of manufacturing the same. 4,423,351, Cl. 313-523.000.
- Sugimori, Shigeru; Kojima, Tetsukiko; and Tsuji, Masakazu, to Chisso Corporation. Liquid crystal benzene derivatives. 4,422,951, Cl. 252-299.630.
- Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozi; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus capable of performing special reproduction. 4,423,497, Cl. 369-47.000.
- Sugiyama, Katsuhiko; Ohsawa, Katsuyuki; Fujikake, Kenji; and Idota, Yoshinori, to Kabushiki Kaisha Toyota Chuo Kenyusho. Jet control type carburetor. 4,422,423, Cl. 123-438.000.
- Sugizaki, Tsugio, to Konishiroku Photo Industry Co., Ltd. Paper feeding device for recording apparatus. 4,422,631, Cl. 271-9.000.
- Suh, Nam P.: See—
- Haven, Richard E.; and Suh, Nam P., 4,423,191, Cl. 525-169.000.
- Sukopp, Wolfgang: See—
- Thill, Albert; and Sukopp, Wolfgang, 4,422,668, Cl. 280-804.000.
- Sullivan, Daniel R.: See—
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- Sullivan, Miles V.: See—
- MacChesney, John B.; O'Connor, Paul B.; and Sullivan, Miles V., 4,422,898, Cl. 156-655.000.
- Sulzer Brothers Limited: See—
- Hintsch, Otto, 4,422,482, Cl. 139-188.00R.
- Zweymüller, Karl, 4,422,187, Cl. 3-1.913.
- Sumi, Akiyasu: See—
- Kawai, Tohru; and Sumi, Akiyasu, 4,422,740, Cl. 354-25.000.
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- Sumitomo Rubber Industries, Ltd.: See—
- Arimatsu, Toshio, 4,422,987, Cl. 264-40.100.
- Sun Electric Corporation: See—
- Jacobs, William R.; Karlin, Richard A.; and Sun, Peter K., 4,423,379, Cl. 324-429.000.
- Sun, Peter K.: See—
- Jacobs, William R.; Karlin, Richard A.; and Sun, Peter K., 4,423,379, Cl. 324-429.000.
- Suncor, Inc.: See—
- Morgan, George W., 4,422,399, Cl. 114-42.000.
- Sundstrand Data Control, Inc.: See—
- Groenewegen, Johannes B.; and Meginniss, Stephen M., III, 4,422,598, Cl. 242-192.000.
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- Morishita, Takashi; Sunohara, Hideki; and Sono, Shinsuke, 4,422,985, Cl. 264-4.400.
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- Sutter, Ormond, to Lok Products Company. Cosmetic cover for channelled type grid systems. 4,422,272, Cl. 52-311.000.
- Suttus, David J.: See—
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- Suyama, Tadakazu: See—
- Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,423,061, Cl. 424-274.000.
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- Suzuki, Hirotsuke; and Ishigohaka, Norikazu. Flat cable. 4,423,282, Cl. 174-36.000.
- Suzuki, Mitsuo: See—
- Wada, Kazuo; Chihara, Toshita; Saito, Tetsuya; and Suzuki, Mitsuo, 4,422,707, Cl. 339-143.00R.
- Suzuki, Ryoichi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Electro-optical diaphragm with radial electrodes. 4,422,729, Cl. 350-336.000.
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- Suzuki, Tamotsu: See—
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- Svendsen, Gordon D., to Ampex Corporation. Programmable multiple frequency ratio synchronous clock signal generator circuit and method. 4,423,383, Cl. 328-63.000.
- Sverre, Severin F. Magnetic water conditioning device. 4,422,933, Cl. 210-222.000.
- Svoboda, Joseph J.: See—
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- Swanson, Larry D., to Deere & Company. Connection between telescopic suspension struts for snowmobile skis and stabilizer member. 4,422,657, Cl. 280-21.00R.
- Sweatman, Ronald E., to Hughes Tool Company. Method of grouting offshore structures. 4,422,805, Cl. 405-225.000.
- Sweet, Ralph: See—
- Poggemiller, Erhard; and Sweet, Ralph, 4,422,511, Cl. 172-260.500.
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- Swinbanks, Malcolm A., to National Research Development Corporation. Signal processing systems. 4,423,289, Cl. 381-71.000.
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- Swope, Jack G.; and Weiss, Harry C., to Rennco Incorporated. Brake mechanism for spool. 4,422,592, Cl. 242-75.450.
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- Li, Tsung-tee; and Marx, Michael, 4,423,068, Cl. 424-305.000.
- Verheyden, Julien P. H.; and Martin, John C., 4,423,050, Cl. 424-253.000.
- Walker, Keith A. M., 4,423,057, Cl. 424-273.00R.
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- Szostak, Jan, to Singer Company, The. Belt retainer guard for sewing machine. 4,422,396, Cl. 112-261.000.
- T & N Materials Research Limited: See—
- Atkinson, Alan W.; and Lancaster, Janet M., 4,422,894, Cl. 156-62.200.
- Tachi, Katsuchi, to Sony Corporation. Code signal reading apparatus. 4,423,440, Cl. 358-335.000.
- Tague, Steven A.; and Negi, Virendra S., to Honeywell Information Systems Inc. Data processor using a read only memory for selecting a part of a register into which data is written. 4,423,483, Cl. 364-200.000.
- Taisho Denki Kogyo Kabushiki Kaisha: See—
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- Takada, Juichiro. Belt clamps for vehicle occupant restraint belt systems. 4,422,593, Cl. 242-107.200.
- Takada, Koichi: See—
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- Takagi, Akinobu: See—
- Yamamoto, Ryuichi; Takagi, Akinobu; Katata, Masafumi; Obata, Kenji; and Mori, Shigeki, 4,422,976, Cl. 260-453.0PH.
- Takahara, Takeshi: See—
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- Takahashi, Masaaki: See—
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- Takahashi, Takeshi: See—
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- Takahashi, Tuiyoshi; Nishida, Hiroshi; and Shiono, Toshio, to Hitachi, Ltd. Magnetic data recording and reading device with magnetic head positioning mechanism. 4,423,446, Cl. 360-106.000.
- Takahashi, Tuiyoshi: See—
- Nishida, Hiroshi; Takahashi, Tuiyoshi; Shiono, Toshio; and Ohtsuka, Kiyomitsu, 4,423,447, Cl. 360-106.000.
- Takai, Kazuki: See—
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- Takao, Kosei: See—
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- Takasugi, Hisashi: See—
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- Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. 7-Acylamino-3-vinylcephalosporanic acid derivatives and processes for the preparation thereof. 4,423,213, Cl. 544-16.000.



- Takayama, Shoichiro, to Oki Electric Industry Co., Ltd. Thermal head for facsimile printer. 4,423,424, Cl. 346-76.0PH.
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- Takeda, Makoto: See—  
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- Takei, Toshihiro: See—  
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- Takeuchi, Akihiko: See—  
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- Takeuchi, Koichiro: See—  
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- Takeuchi, Koji: See—  
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- Takeuchi, Shigehumi: See—  
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- Takuma, Kenji: See—  
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- Talarczyk, Anthony R.: See—  
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- Talos Systems, Inc.: See—  
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- Tamarkin, Michael J. Video game control unit and lap board holder therefor. 4,422,640, Cl. 273-148.00R.
- Tamerlani, Giancarlo: See—  
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- Tamura, Ryutaro; and Endo, Yasushi, to Alps Electric Co., Ltd. Variable capacitance type push-button switch. 4,423,464, Cl. 361-288.000.
- Tamura, Sadahiro: See—  
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- Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Capacitance type distance detecting apparatus. 4,423,417, Cl. 340-870.370.
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- Tanaka, Kunimaro: See—  
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- Tangiku, Iturou: See—  
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- TDK Electronics Co., Ltd.: See—  
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- Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiiji, 4,423,453, Cl. 360-131.000.
- Okamura, Masatoshi, 4,422,550, Cl. 206-387.000.
- Okamura, Masatoshi; and Shiba, Haruo, 4,422,599, Cl. 242-198.000.
- Saguchi, Hiroto; Hayama, Masashi; and Sakai, Keitaro, 4,423,114, Cl. 428-403.000.
- Tokuda, Fuminori; and Nakashima, Yutaka, 4,423,115, Cl. 428-425.900.
- Technicon Instruments Corporation: See—  
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- Teepak, Inc.: See—  
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- Tektronix, Inc.: See—  
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- Wilke, William G., 4,423,337, Cl. 307-247.00R.
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- Temme, Helmut; and Beckmann, Erwin, to Gewerkschaft Eisenhütte Westfalen. Scraper-chain conveyors. 4,422,542, Cl. 198-735.000.
- Temple, Davis L., Jr., to Mead Johnson & Company. 2-[4-(4,4-Dialkyl-2,6-piperidinedion-1-yl)butyl]-1-piperazinylpyrimidines. 4,423,049, Cl. 424-251.000.
- Teng-Ching, Weng; and Chi-Ming, Yang. Combination electronic circuit element with multidirectionally adjustable joints. 4,423,465, Cl. 361-394.000.
- Teramoto, Kojiro: See—  
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- Teraoka Seikoshu Co., Ltd.: See—  
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- Teraoka, Syoichi. Method for molding hollow plastic articles. 4,423,000, Cl. 264-524.000.
- Tereschenko, Lev A.: See—  
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- Terui, Nobuhiko: See—  
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- Test, Howard R., II, to Texas Instruments Incorporated. Assembly of an electronic device on an insulative substrate. 4,423,435, Cl. 357-65.000.
- Tetro, Richard S., to Black Clawson Company, The. Method and apparatus for roll changing. 4,422,586, Cl. 242-56.00R.
- Teuopharm-Schiedam B.V.: See—  
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- Texaco Inc.: See—  
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- Williams, Dale; and Strickland, John C., 4,422,925, Cl. 208-75.000.
- Texas Instruments Incorporated: See—  
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- Texas Medical Products, Inc.: See—  
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- Thiel, Klaus F.: See—  
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- Thill, Albert; and Sukopp, Wolfgang, to Volkswagenwerk Aktiengesellschaft. Passive safety device. 4,422,668, Cl. 280-804.000.
- Thoenig, Marcel, to ETA SA, Fabriques d'Ebauches. Device for controlling the functions of a watch and for displaying the state of at least one of the controlled functions. 4,422,775, Cl. 368-74.000.
- Thomas, Alvin D., to Albany International Corp. Stud holders for reel assembly. 4,422,595, Cl. 242-116.000.
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- Williams, Russell H.; Garner, Peter; and Gordon, K. Scott, 4,422,715, Cl. 350-96.200.
- Thomas, Richard D.; and Kjeldsen, William R. Key case. 4,422,316, Cl. 70-456.00R.
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- Thorogood, Robert M., to International Coal Refining Company. Convective heater. 4,422,411, Cl. 122-7.00R.
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- Thurm, Siegfried; and Bunge, Konrad, to Agfa-Gevaert Aktiengesellschaft. Method of and an apparatus for classifying color films. 4,422,752, Cl. 355-41.000.
- Thurn, Carrol R., to FMC Corporation. Foundry pouring ladle protective liner. 4,422,625, Cl. 266-281.000.
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- Weber, Heinrich; Dungs, Horst; and Tippmer, Kurt, 4,422,858, Cl. 48-197.00R.
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- Trezequet, Jean-Pierre; and Vives, Jean-Patrick, to Les Cables De Lyon. Method of manufacturing an optical fibre cable. 4,422,889, Cl. 156-70.000.
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- Turiot, Andre, to Messier-Hispano-Bugatti (S.A.). Tripod type landing gear. 4,422,602, Cl. 244-102.00R.
- Turiot, Andre; and Derrien, Michel, to Messier-Hispano-Bugatti (S.A.). Landing gear for aircraft. 4,422,603, Cl. 244-102.00R.
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- Wisconsin Tissue Mills, Inc.: See—  
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- Witman, Jack H., to Armstrong World Industries, Inc. Differentially adhering release coatings for vinyl chloride-containing compositions. 4,423,100, Cl. 428-42.000.
- Witschard, Gilbert, to Occidental Chemical Corporation. Vinyl halide polymer blends of enhanced impact resistance. 4,423,188, Cl. 525-71.000.
- Wittman, Robert H.; Adkins, David E.; and Haws, Ronnie E., to Hughes Tool Company. Pressure energized pipeline plug. 4,422,477, Cl. 138-89.000.
- Wojtowicz, John A.; and Hooks, Haywood, to Olin Corporation. Preparation of cyanuric acid. 4,423,216, Cl. 544-192.000.
- Wolcott, Edward O.: See—  
Ware, James K., Jr.; and Wolcott, Edward O., 4,422,236, Cl. 29-876.000.
- Wolde-Michael, Girma. Oil concentrator. 4,422,931, Cl. 210-168.000.
- Wolfe, David L.; and Corson, Frederick P., to Dow Chemical Co., The. Vicinal alkylene oxide polymerization. 4,423,206, Cl. 528-416.000.
- Wolfe, Joseph I.: See—  
Harris, Steven D.; and Wolfe, Joseph I., 4,422,726, Cl. 350-331.00R.
- Wolfe, Ordell L.: See—  
Walker, Frank H.; and Wolfe, Ordell L., 4,423,028, Cl. 424-40.000.
- Wolford, Thomas L., to Dow Chemical Company, The. Selective conversion of chlorinated alkanes to hydrogen chloride and carbon dioxide. 4,423,024, Cl. 423-437.000.
- Wolfsen, Ronald I. Dual-mode stripline antenna feed performing multiple angularly separated beams in space. 4,423,392, Cl. 333-116.000.
- Wolowicz, James P., to AMP Incorporated. Active pin contact. 4,422,711, Cl. 339-252.00R.
- Wood, Mark S.: See—  
Sutherland, Ray; and Wood, Mark S., 4,422,325, Cl. 73-273.000.
- Woodworth, Archie G.: See—  
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,423,005, Cl. 422-61.000.
- Woody, Albert L.: See—  
Reinsma, Harold L.; Roussin, Michael A.; and Woody, Albert L., 4,422,650, Cl. 277-88.000.
- Woolfenden, Richard D. G.: See—  
Ridgway, Frank; and Woolfenden, Richard D. G., 4,422,945, Cl. 210-764.000.
- Wovcha, Merle G.: See—  
Knight, John C.; and Wovcha, Merle G., 4,423,146, Cl. 435-55.000.
- Wrigglesworth, Roger: See—  
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- Wright, John B.: See—  
Hall, Charles M.; and Wright, John B., 4,423,223, Cl. 548-163.000.
- Wright, Walter S.: See—  
Watt, Robert H.; Ladd, Richard H.; and Wright, Walter S., deceased, 4,422,301, Cl. 62-54.000.
- Wright, Walter Stockdale: See—  
Watt, Robert H.; Ladd, Richard H.; and Wright, Walter S., deceased, 4,422,301, Cl. 62-54.000.
- WSW Stahl-Und Wasserbau GmbH: See—  
Bredenbach, Dieter; and Mosebach, Wilhelm, 4,422,902, Cl. 201-14.000.
- Wu, Margaret M.: See—  
Forbus, Nancy P.; and Wu, Margaret M., 4,423,272, Cl. 585-640.000.
- Wu, Tsun Z. Coupling structure of the upper notch and ferrule on an umbrella or parasol. 4,422,467, Cl. 135-36.0TP.
- Wuerzer, Bruno: See—  
Becker, Rainer; Jahn, Dieter; Rohr, Wolfgang; Himmele, Walter; Siegel, Harro; and Wuerzer, Bruno, 4,422,864, Cl. 71-88.000.
- Schirmer, Ulrich; Rohr, Wolfgang; and Wuerzer, Bruno, 4,422,871, Cl. 71-120.000.
- Wuthrich, Hermann A., to United States of America, Air Force. Load proportional antibacklash gear drive system. 4,422,344, Cl. 74-409.000.
- Wyant, Gary M.: See—  
Walser, Richard J.; and Wyant, Gary M., 4,423,294, Cl. 200-5.00A.
- Xerox Corporation: See—  
Bullock, Randolph A.; and Mason, Lawrence J., 4,423,478, Cl. 363-89.000.
- Gottwald, Johannes F., 4,423,366, Cl. 318-696.000.
- Limburg, William W.; Pochan, John M.; and Beatty, Charles L., 4,423,131, Cl. 430-59.000.
- Stutius, Wolfgang E., 4,422,888, Cl. 148-175.000.
- Yabe, Masao: See—  
Sekiya, Masayoshi; Yabe, Masao; Suzuki, Tamotsu; Ochiai, Takeji; and Tatsuta, Sumitaka, 4,423,089, Cl. 427-171.000.
- Yaginuma, Satoshi: See—  
Otani, Masaru; Yaginuma, Satoshi; Tsujino, Masatoshi; Muto, Naoki; Saito, Tetsu; and Fujii, Tadashi, 4,423,218, Cl. 544-277.000.
- Yakovlev, Arian M.: See—  
Nikolaev, Nikolai I.; Tereschenko, Lev A.; Yakovlev, Arian M.; Kovalenko, Vitaly I.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K., 4,422,876, Cl. 106-104.000.
- Yamada, Hirotsuke; and Omori, Hisashi, to Kawasaki Steel Corporation. Blowing method in a top and bottom blowing converter. 4,422,873, Cl. 75-52.000.
- Yamada, Tsuyoshi: See—  
Fukawa, Isaburo; Satake, Kunio; Yamada, Tsuyoshi; Hayakawa, Kiyoshi; and Sato, Yasushi, 4,423,190, Cl. 525-98.000.
- Yamaguchi, Hisashi: See—  
Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, 4,423,356, Cl. 315-169.200.
- Yamaguchi, Isaburo: See—  
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- Yamaguchi, Katsumi: See—  
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, 4,423,445, Cl. 360-96.500.
- Yamaguchi, Takashi: See—  
Imazumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.
- Yamaguchi, Tsuneo: See—  
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,422,816, Cl. 414-331.000.
- Yamaguchi, Yozo, to Yamaguchi, Isaburo. Liquid hydrocarbon burner with vertically adjustable wick. 4,422,845, Cl. 431-153.000.
- Yamaha Hatsudoki Kabushiki Kaisha: See—  
Nomura, Kazuhiko; and Ichikawa, Satoru, 4,422,519, Cl. 180-219.000.
- Yamaha Motor Co., Ltd.: See—  
Matsuo, Noritaka; Takeuchi, Koichiro; and Muramatsu, Tokuji, 4,422,415, Cl. 123-52.00M.
- Minami, Shunji; and Kimura, Hiroshi, 4,422,295, Cl. 60-605.000.
- Yamaji, Katuhiko: See—  
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Katuhiko; and Nakata, Yasushi, 4,422,500, Cl. 165-104.120.
- Yamamoto, Haruhisa; and Yoneyama, Nobuaki, to Nippon Zeon Co. Ltd. Process for producing conjugated diolefins. 4,423,281, Cl. 585-626.000.
- Yamamoto, Hironori: See—  
Isohata, Junji; and Yamamoto, Hironori, 4,422,754, Cl. 355-43.000.
- Yamamoto, Hitoshi: See—  
Nakagome, Yukio; Amano, Kitsutaro; Nakai, Taiichiro; Niuro, Yasuhiko; Ejiri, Yoshihiro; Yamamoto, Hitoshi; and Yamazaki, Yoshihiko, 4,422,718, Cl. 350-96.230.
- Yamamoto, Junji; Kanou, Noboru; and Usami, Masayuki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Locking device for detachable panel of vehicle roofs. 4,422,689, Cl. 296-224.000.
- Yamamoto, Ryuichi; Takagi, Akinobu; Kataita, Masafumi; Obata, Kenji; and Mori, Shigeki, to Mitsui Toatsu Chemicals, Incorporated. Continuous preparation of organic isocyanates. 4,422,976, Cl. 260-453.0PH.
- Yamamura, Yukio: See—  
Sugai, Haruo; Hamabe, Takafumi; Yamamura, Yukio; Otuka, Shinpei; and Moriaki, Hiroshi, 4,422,448, Cl. 128-44.000.
- Yamanaka, Hideaki: See—  
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,423,213, Cl. 544-16.000.
- Yamashita, Sadahiko: See—  
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,423,396, Cl. 333-204.000.
- Yamauchi, Takashi: See—  
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,423,259, Cl. 570-144.000.
- Yamaura, Tadao, to Nissan Motor Co., Ltd. Axle housing leak oil discharging device. 4,422,516, Cl. 180-70.00R.
- Yamazaki, Haruo: See—  
Ogata, Yoshiro; Yamazaki, Haruo; and Akutsu, Hidezoh, 4,423,350, Cl. 313-493.000.
- Ogata, Yoshiro; Yamazaki, Haruo; Ikeda, Takashi; and Akutsu, Hidezoh, 4,423,353, Cl. 313-631.000.
- Yamazaki, Yoshihiko: See—  
Nakagome, Yukio; Amano, Kitsutaro; Nakai, Taiichiro; Niuro, Yasuhiko; Ejiri, Yoshihiro; Yamamoto, Hitoshi; and Yamazaki, Yoshihiko, 4,422,718, Cl. 350-96.230.
- Yan, Tsoung-Yuan, to Mobil Oil Corporation. Direct acid elution of anionic exchange resins for recovery of uranium. 4,423,008, Cl. 423-7.000.
- Yang, Kang; Reedy, James D.; McGuire, S. E.; and Kerfoot, O. C., to Conoco Inc. Removing color from polyphenylated alkane. 4,423,278, Cl. 585-823.000.
- Yanmar Diesel Engine Co., Ltd.: See—  
Tsugekawa, Takanori; Banba, Tosio; and Matsui, Masakuni, 4,422,426, Cl. 123-470.000.
- Yano, Hidetoshi: See—  
Kasahara, Nobuo; Nakahara, Tosio; and Yano, Hidetoshi, 4,422,405, Cl. 118-658.000.
- Yasuda, Naohiko; Iwagami, Hisao; Irie, Yasuo; Nakanishi, Eiji; and Saito, Hideomi, to Ajinomoto Company, Inc. Method of preparing sodium salts of imidazoledicarboxylic acid substituted cephalosporin derivatives. 4,423,215, Cl. 544-025.000.



- Yasuda, Osamu, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Hydrostatic bearing type coupling for use in vibrating machine. 4,422,334, Cl. 73-665.000.
- YCI USA, Inc.: See—  
Chen, Po-Shiun, 4,422,498, Cl. 165-47.000.
- Yeboah, Yaw D., to General Electric Company. Methods for preparing cyclopolyisiloxane. 4,423,240, Cl. 556-460.000.
- Yelton, James E. Combination mounting ring and catch basin for concrete trucks. 4,422,767, Cl. 366-40.000.
- Yih, Roy Y.: See—  
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,422,868, Cl. 71-98.000.
- Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, to Green Cross Corporation, The. Perfluorocycloamine emulsion preparation. 4,423,061, Cl. 424-274.000.
- Yokoyama, Toshiharu: See—  
Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, 4,423,252, Cl. 568-728.000.
- Yoldas, Bulent E.: See—  
Chickering, Ronald W.; Yoldas, Bulent E.; and Neuman, Bruce H., 4,422,965, Cl. 252-629.000.
- Yoneyama, Nobuaki: See—  
Yamamoto, Haruhisa; and Yoneyama, Nobuaki, 4,423,281, Cl. 585-626.000.
- York Research Corporation: See—  
Lewis, David F.; and Kaplan, Edward J., 4,423,152, Cl. 436-56.000.
- Yoshida, Hideo; and Tsuda, Hiroshi, to Sharp Kabushiki Kaisha. Speech synthesizer with capability of discontinuing to provide audible output. 4,423,290, Cl. 381-51.000.
- Yoshida, Kazuo: See—  
Kawasaki, Kikuo; Sano, Tomomi; and Yoshida, Kazuo, 4,423,506, Cl. 370-85.000.
- Yoshida, Ken: See—  
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Katuhiko; and Nakata, Yasushi, 4,422,500, Cl. 165-104.120.
- Yoshida Kogyo K. K.: See—  
Akashi, Shunji, 4,422,221, Cl. 24-434.000.  
Oda, Kiyoshi, 4,422,220, Cl. 24-421.000.
- Yoshida, Masanobu, to Fujitsu Limited. Semiconductor memory device. 4,423,492, Cl. 365-226.000.
- Yoshihara, Kenji: See—  
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryojo; and Yoshihara, Kenji, 4,423,497, Cl. 369-47.000.
- Yoshikawa, Kazuo: See—  
Higuchi, Takeshi; Yoshikawa, Kazuo; and Buto, Hideo, 4,422,722, Cl. 350-173.000.
- Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, 4,423,356, Cl. 315-169.200.
- Yoshimura, Masayoshi: See—  
Imaizumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.
- Yoshino, Hiraku: See—  
Nishimura, Tomio; Yoshino, Hiraku; Takao, Kosei; and Masumoto, Yuuji, 4,422,874, Cl. 75-238.000.
- Yoshitomi Pharmaceutical Industries Ltd.: See—  
Araki, Kazuhiko; Ao, Hideki; Aihara, Kenichi; and Kimura, Tomohiko, 4,423,052, Cl. 424-266.000.
- Young, Lewis B., to Mobil Oil Corporation. Extending catalyst isomerization life by treating with phosphorus and/or steam. 4,423,266, Cl. 585-481.000.
- Young, Richard: See—  
Buckingham, Howard A.; Feldman, Hugh V.; Gotley, Paul; and Young, Richard, 4,423,487, Cl. 364-551.000.
- Zabel, Herbert E.; and Lelyk, William, to American Home Products Corporation. Padlock. 4,422,311, Cl. 70-25.000.
- Zaidenweber, Gary A., to Medtronic, Inc. Battery reversal protection. 4,423,456, Cl. 361-77.000.
- Zaiko, Edward J.; and Ranken, Paul F., to Ethyl Corporation. Fluoro-substituted biphenyl compounds and processes. 4,422,979, Cl. 260-465.000.
- Zajicek, Ernst: See—  
Lugscheider, Walter; Riegler, Ernst; and Zajicek, Ernst, 4,423,512, Cl. 373-22.000.
- Riegler, Ernst; and Zajicek, Ernst, 4,423,515, Cl. 373-81.000.
- Zaneveld, Lourens: See—  
Kaminski, Joanne M.; Bauer, Ludwig; and Zaneveld, Lourens, 4,423,069, Cl. 424-310.000.
- Zanner, Georg: See—  
Maucher, Hans; Zanner, Georg; and Repa, Otto, 4,422,256, Cl. 42-73.000.
- Zarnoch, Kenneth P.: See—  
Iacovangelo, Charles D.; and Zarnoch, Kenneth P., 4,423,122, Cl. 429-45.000.
- Zeidler, Howard M., to VISA U.S.A., Inc. End-to-end encryption system and method of operation. 4,423,287, Cl. 178-22.080.
- Zeitlin, Robert J.: See—  
Machonis, John, Jr.; Schmukler, Seymour; Zeitlin, Robert J.; and Shida, Mitsuzo, 4,423,117, Cl. 428-475.800.
- Zenker, Franz R., to White Mop Wringing Company. Plastic mop holder. 4,422,203, Cl. 15-150.000.
- Zerbel, Allen J., to Wehr Corporation. Electrical steam generator having adjustable electrodes for an air humidifier. 4,423,310, Cl. 219-285.000.
- Zerlaut, Gene A.; Dokos, William T.; Putman, William J.; and Skousen, Russell K., to DSET Laboratories, Inc. Solar simulator and method. 4,423,469, Cl. 362-2.000.
- Zraggen, Martin A.: See—  
Penn, William B.; and Zraggen, Martin A., 4,422,234, Cl. 29-597.000.
- Zins, Howard M., to Angelica Corporation. Antistatic fabric and garment made therefrom. 4,422,483, Cl. 139-420.00R.
- Zitzman, George E. Apparatus for lifting reel-less coils of wire. 4,422,684, Cl. 294-97.000.
- Zuckerman, Matthew, to Dart Industries, Inc. Apparatus and method for measuring the concentration of gases. 4,423,407, Cl. 338-34.000.
- Zweifel, Hans; Schilling, Walter; Stormi, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives. 4,423,231, Cl. 548-451.000.
- Zweymuller, Karl, to Sulzer Brothers Limited. Shank for a joint endoprosthesis. 4,422,187, Cl. 3-1.913.
- Zwicker, Eberhard; and Daxer, Wolfgang, to Siemens Aktiengesellschaft. Method for operating a speech recognition device. 4,423,291, Cl. 381-43.000.

## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF DECEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Allied Corporation: See—  
Keller, James M., Re. 31,472, Cl. 339-223.00S.
- Brook, Greville B.; and Iles, Roger F., to Fulmer Research Institute Limited. Treatment of alloys. Re. 31,474, Cl. 148-11.50R.
- Clark, Douglas C.: See—  
McArthur, Colin S.; and Clark, Douglas C., Re. 31,478, Cl. 219-121.0LK.
- Damper Design, Inc.: See—  
Hagar, Donald K., Re. 31,471, Cl. 137-601.000.
- Edmonston, William H. Carburetor. Re. 31,475, Cl. 261-44.00B.
- Fulmer Research Institute Limited: See—  
Brook, Greville B.; and Iles, Roger F., Re. 31,474, Cl. 148-11.50R.
- Hagar, Donald K., to Damper Design, Inc. Multiple blade damper assembly. Re. 31,471, Cl. 137-601.000.
- Iles, Roger F.: See—  
Brook, Greville B.; and Iles, Roger F., Re. 31,474, Cl. 148-11.50R.
- Keller, James M., to Allied Corporation. Ignition cable terminal construction. Re. 31,472, Cl. 339-223.00S.
- Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., to Texas Instruments Incorporated. System for fabrication of semiconductor bodies. Re. 31,473, Cl. 425-6.000.
- Marshall, Joseph, to Thomas & Betts Corporation. Flat multi-signal transmission line cable with plural insulation. Re. 31,477, Cl. 174-115.000.
- McArthur, Colin S.; and Clark, Douglas C., to R. J. Reynolds Tobacco Company. Rotary beam chopper and scanning system. Re. 31,478, Cl. 219-121.0LK.
- McKee, William R.: See—  
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., Re. 31,473, Cl. 425-6.000.
- Mercer, Roger W. Cast ejector. Re. 31,476, Cl. 264-16.000.
- Porter, Wilbur A.: See—  
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., Re. 31,473, Cl. 425-6.000.
- R. J. Reynolds Tobacco Company: See—  
McArthur, Colin S.; and Clark, Douglas C., Re. 31,478, Cl. 219-121.0LK.
- Texas Instruments Incorporated: See—  
Kilby, Jack S.; McKee, William R.; and Porter, Wilbur A., Re. 31,473, Cl. 425-6.000.
- Thomas & Betts Corporation: See—  
Marshall, Joseph, Re. 31,477, Cl. 174-115.000.

## LIST OF DESIGN PATENTEEES

- Altman, Arthur A. Earring. 271,952, 12-27-83, Cl. D11-78.000.
- American Mobile Advertising Corp.: See—  
Nelson, Jules; Walker, Jimmie; Rossi, Joseph J.; and Leotta, Samuel S., 271,984, Cl. D20-10.000.
- AMS Ateliers de Moulage Specialise: See—  
Geiger, Reinold, 272,006, Cl. D28-5.000.
- Anchor Hocking Corporation: See—  
Ochs, Charles S., 271,945, Cl. D9-452.000.
- Atlanta Stove Works, Inc.: See—  
Chamberlain, Albert B., 271,991, Cl. D23-94.000.
- Autohaus Lorinser GmbH & Co.: See—  
Koch, Adolf, 271,916, Cl. D3-40.000.
- Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., to Coca-Cola Company, The. Vending machine. 271,982, 12-27-83, Cl. D20-5.000.
- Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., to Coca-Cola Company, The. Vending machine. 271,983, 12-27-83, Cl. D20-5.000.
- Bagby Engineering Co.: See—  
Bagby, Wilbur W., 271,978, Cl. D15-147.000.
- Bagby, Wilbur W., to Bagby Engineering Co. Crank disc for a high refuse wet washing coil jig. 271,978, 12-27-83, Cl. D15-147.000.
- Baker, William R., to Harding Brothers, Inc. Master collet for machine tools. 271,977, 12-27-83, Cl. D15-140.000.
- Beatrice Publishing Pty. Ltd.: See—  
Brangan, John L. M., 271,922, Cl. D6-140.000.
- Beise, Theodore W.; and Rasmussen, Howard J., to Stewart-Warner Corporation. Combined packaging and display container. 271,943, 12-27-83, Cl. D9-415.000.
- Bell Telephone Laboratories, Incorporated: See—  
Genaro, Donald M.; Gomes, Carl W., II; McGarvey, John N.; Sylvester, Gordon E.; and Tatarski, Joseph E., 271,971, Cl. D14-60.000.
- Genaro, Donald M.; Kowalik, John, Jr.; McGarvey, John N.; Sylvester, Gordon E.; and Tyler, Daniel W., 271,972, Cl. D14-60.000.
- Belser, Dana C. Fold-over twin pocket identification badge holder. 271,985, 12-27-83, Cl. D20-27.000.
- Belser, Dana C. Two pocket identification badge holder. 271,986, 12-27-83, Cl. D20-27.000.
- Bengtson, Jan I. H. Wet suit or similar article. 271,915, 12-27-83, Cl. D2-29.000.
- Beton Sports Canada Inc.: See—  
Painchaud, Antonin; and Painchaud, Jean-Marc, 271,989, Cl. D21-232.000.
- Brangan, John L. M., to Beatrice Publishing Pty. Ltd. Display holder. 271,922, 12-27-83, Cl. D6-140.000.
- Brown, Forest G., to Sigma Tek. Piston vacuum pump. 271,976, 12-27-83, Cl. D15-7.000.
- Brown, William J.; Kohler, Ramon C.; and Parks, John M., to Caterpillar Tractor Co. Control console. 271,966, 12-27-83, Cl. D13-32.000.
- Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard. 271,925, 12-27-83, Cl. D6-198.000.
- Calapp, David E. Ski clip. 271,941, 12-27-83, Cl. D8-395.000.
- Caterpillar Tractor Co.: See—  
Brown, William J.; Kohler, Ramon C.; and Parks, John M., 271,966, Cl. D13-32.000.
- Chamberlain, Albert B., to Atlanta Stove Works, Inc. High efficiency stove and zero-clearance fireplace insert. 271,991, 12-27-83, Cl. D23-94.000.
- Cheung, Kwok K., to Tong, Wing Kiu; and Tong, King Sing, a part interest. Vanity mirror. 272,007, 12-27-83, Cl. D28-83.000.
- Coca-Cola Company, The: See—  
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 271,982, Cl. D20-5.000.
- Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 271,983, Cl. D20-5.000.
- Cohen, Seymour: See—  
Segan, Marc H.; Cohen, Seymour; and Swartztrauber, Sayre, 271,968, Cl. D14-35.000.
- Combs, Marvin. Tool handle. 271,937, 12-27-83, Cl. D8-25.000.
- Compagnie Generale des Etablissements Michelin: See—  
Goretz, Jean-Philippe, 271,958, Cl. D12-147.000.
- Goretz, Jean-Philippe, 271,957, Cl. D12-147.000.
- Goretz, Jean-Philippe, 271,959, Cl. D12-147.000.
- Goretz, Jean-Philippe, 271,960, Cl. D12-147.000.
- Goretz, Jean-Philippe, 271,961, Cl. D12-151.000.
- Conner, Charles B.: See—  
Conner, Curtis G.; and Conner, Charles B., 271,935, Cl. D7-332.000.
- Conner, Curtis G.; and Conner, Charles B. Outdoor cooking appliance for use with a gas container. 271,935, 12-27-83, Cl. D7-332.000.
- Container Corporation of America: See—  
House, Richard F., 271,987, Cl. D21-89.000.
- Corning Glass Works: See—  
Faber, Candace M.; and Moskal, Loretta H., 271,929, Cl. D7-24.000.
- Faber, Candace M., 271,931, Cl. D7-36.000.
- Faber, Candace M.; and Moskal, Loretta H., 271,934, Cl. D7-39.000.
- Miska, Donna M., 271,930, Cl. D7-34.000.
- Miska, Donna M., 271,933, Cl. D7-39.000.
- Davis, Charles L.: See—  
Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 271,982, Cl. D20-5.000.
- Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., 271,983, Cl. D20-5.000.
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- Duffy, Mary E. Foldable display case. 271,919, 12-27-83, Cl. D3-74.000.
- Eastman Kodak Company: See—  
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- Flory, Walker L. Wall mounted folding ironing board. 272,008, 12-27-83, Cl. D32-66.000.
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- Fyffe, Tulla J.; and Hicks, Sandra L. Fireplace tool. 271,936, 12-27-83, Cl. D8-14.000.
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- Gemmill, Roderique S., to Radiation Concepts, Inc. X-ray developing tank. 271,980, 12-27-83, Cl. D16-35.000.
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- Harding Brothers, Inc.: See—  
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- Honda Giken Kogyo Kabushiki Kaisha: See—  
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- Ito, Jun, to Honda Giken Kogyo Kabushiki Kaisha. Front shield for a motor vehicle. 271,962, 12-27-83, Cl. D12-182.000.
- Janda, George M., to GTE Automatic Electric Labs Inc. Wall telephone base housing. 271,973, 12-27-83, Cl. D14-61.000.
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- Umehara, Nobuhiro; Kojima, Yoshio; and Nanba, Masumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Compact fluorescent lamp. 272,002, 12-27-83, Cl. D26-3.000.
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- Voltz, Carl W., to Sybron Corporation. Dental treatment cabinet. 271,992, 12-27-83, Cl. D24-4.000.
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- Yagami, Richard: See—  
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- Yasuda, Michihiko: See—  
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# LIST OF PLANT PATENTEEES

Armstrong Nurseries, Inc. See—

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Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant.  
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# CLASSIFICATION OF PATENTS

ISSUED DECEMBER 27, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

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505	4,422,193	159	4,422,252			CLASS 66		4,422,364	52 MF	4,422,416
		453	4,422,253				384	4,422,365	185 BA	4,422,417
451	4,422,194	CLASS 42		172 E	4,422,307		478	4,422,366	198 D	4,422,418
497	4,422,195	1 Y	4,422,254			CLASS 91			235	4,422,419
		69 R	4,422,255			CLASS 68	26	4,422,366	352	4,422,420
471	4,422,834	73	4,422,256				484	4,422,367	424	4,422,421
		CLASS 43		13 R	4,422,308	CLASS 92	105	4,422,368	425	4,422,422
86 A	4,422,196	3	4,422,257	16	4,422,309				438	4,422,423
CLASS 12		17	4,422,258	19.3	4,422,310	CLASS 98			447	4,422,424
1 A	4,422,197	18.1	4,422,259				11.5 SB	4,422,370	450	4,422,425
54.3	4,422,198	44.8	4,422,260			CLASS 99	36	4,422,369	470	4,422,426
				25	4,422,311				478	4,422,427
CLASS 14		51	4,422,855			CLASS 70			502	4,422,428
71.1	4,422,199	63	4,422,856				323.1	4,422,371	557	4,422,429
		CLASS 44		133	4,422,312	CLASS 100	353	4,422,372	568	4,422,430
CLASS 15		104	4,422,261						592	4,422,431
21 D	4,422,200	209	4,422,262			CLASS 71				4,422,432
104 A	4,422,201	197 R	4,422,857						74	4,422,433
106	4,422,202		4,422,858			CLASS 72			CLASS 124	
150	4,422,203	121	4,422,264						CLASS 126	
210 B	4,422,204	52 R	4,422,265			CLASS 73				4,422,435
222	4,422,205								25 B	4,422,436
236 R	4,422,206	58	4,422,266			CLASS 74			61	4,422,437
250.42	4,422,207	81	4,422,267						77	4,422,438
256.6	4,422,208	86	4,422,268			CLASS 75			120	4,422,439
257 R	4,422,209	100	4,422,269						123	4,422,440
302	4,422,210	106	4,422,270			CLASS 76			292	4,422,441
328	4,422,211	120	4,422,271						299 C	4,422,442
		52 R	4,422,265			CLASS 77			390	4,422,443
CLASS 16									418	4,422,444
29	4,422,212	58	4,422,266			CLASS 78			422	4,422,445
71	4,422,213	81	4,422,267						426	4,422,446
291	4,422,214	86	4,422,268			CLASS 79			438	4,422,447
		100	4,422,269							
CLASS 17		106	4,422,272			CLASS 80			46.1	4,422,881
1 G	4,422,216	182	4,422,273						CLASS 127	
1 R	4,422,215	186	4,422,274			CLASS 81			CLASS 128	
		302	4,422,275							4,422,447
CLASS 24		311	4,422,276			CLASS 82			1 D	4,422,448
16 R	4,422,217	410	4,422,277						44	4,422,449
68 CT	4,422,218	410	4,422,278			CLASS 83				4,422,450
176	4,422,219	509	4,422,279						62 A	4,422,451
421	4,422,220	511	4,422,280			CLASS 84			69	4,422,452
434	4,422,221	584	4,422,281						75	4,422,453
614	4,422,222	517 B	4,422,282			CLASS 85			80 G	4,422,454
		517 R	4,422,283						134	4,422,455
CLASS 26		741	4,422,284			CLASS 86				4,422,456
70	4,422,223	788	4,422,285						207.18	4,422,457
						CLASS 87			303.1	4,422,458
CLASS 28		134	4,422,286						671	4,422,459
272	4,422,224	374	4,422,287			CLASS 88			702	4,422,460
289	4,422,225								786	4,422,461
		16	4,422,859			CLASS 89			798	4,422,462
CLASS 29		67	4,422,860							
25.35	4,422,226	498	4,422,861			CLASS 90				
116 R	4,422,227								CLASS 108	
148.3	4,422,228					CLASS 91				4,422,463
156.8 H	4,422,229	320.2	4,422,283						CLASS 110	
434	4,422,230	328 R	4,422,284							4,422,464
509	4,422,231					CLASS 92			9	4,422,465
564.2	4,422,232								76.4	4,422,466
570	4,422,233					CLASS 93				
597	4,422,234	31	4,422,285						CLASS 134	
749	4,422,235	221	4,422,286			CLASS 94				4,422,882
876	4,422,236								22.18	4,422,883
		39.281	4,422,287			CLASS 95			55	4,422,466
CLASS 30										
85	4,422,237					CLASS 96			CLASS 135	
101	4,422,238	39.32	4,422,288						36 TP	4,422,467
124	4,422,239	404	4,422,289			CLASS 97			97	4,422,468
254	4,422,240	517	4,422,290							
		525	4,422,291			CLASS 98				
CLASS 33		547.1	4,422,292						315	4,422,469
1 BB	4,422,241	565	4,422,293			CLASS 99			484.2	4,422,470
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		606	4,422,295			CLASS 100			601 A	Re.31,471
										4,423,282



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101	4,423,284	446	4,422,552					307 R	4,422,679	85	4,423,387
115	Re.31,477	528	4,422,553	CLASS 241		CLASS 264		122	4,422,680	277	4,423,388
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		CLASS 208		39	4,422,579	4.4	4,422,985	CLASS 293			
17	4,422,513	8 LE	4,422,922	46.11	4,422,580	16	Re.31,476	CLASS 294		CLASS 331	
213	4,422,514	30	4,422,923	66	4,422,581	39	4,422,986	1 BA	4,422,681	4	4,423,390
		75	4,422,924	82.5	4,422,582	40.1	4,422,987	19 R	4,422,682	28 R	4,423,391
19	4,423,286	86	4,422,925			42	4,422,988	86 LS	4,422,683	116	4,423,392
22.08	4,423,287	211	4,422,926			45.3	4,422,989	97	4,422,684	164	4,423,393
			4,422,927	45	4,422,583	83	4,422,991			192	4,423,394
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18 FA	4,423,292	166	4,422,928	56 R	4,422,585	210.8	4,422,993	197	4,422,685	204	4,423,396
156 R	4,423,293	CLASS 210		56.2	4,422,586	219	4,422,994	219	4,422,686	219	4,423,397
		108	4,422,929	56.3	4,422,587	250	4,422,995	224	4,422,687	229	4,423,398
6.5	4,422,515	150	4,422,930	68.1	4,422,588	261	4,422,997	CLASS 297		202	4,423,399
70 R	4,422,516	159 B	4,422,931	72.1	4,422,589	335	4,422,998	CLASS 301		72	4,423,400
127	4,422,517	168	4,422,932	75.45	4,422,590	339	4,422,999	37 SS	4,422,692	107	4,423,401
175	4,422,518	184	4,422,933	107.2 A	4,422,591	524	4,423,000	CLASS 303		323	4,423,402
219	4,422,519	222	4,422,934	116	4,422,592	109	4,422,623	CLASS 307		15	4,423,403
247	4,422,520	321.4	4,422,935	129	4,422,593	182	4,422,624	CLASS 308		21	4,423,404
271	4,422,521	409	4,422,936	130	4,422,594	281	4,422,625	CLASS 310		25	4,423,405
281	4,422,522	411	4,422,937	192	4,422,595	282	4,422,626	CLASS 313		32 R	4,423,406
		411	4,422,938	198	4,422,596	CLASS 266		CLASS 317		34	4,423,407
211	4,422,523	445	4,422,939	217	4,422,597	CLASS 267		CLASS 318		3 S	4,423,409
215	4,422,524	631	4,422,940	CLASS 244		CLASS 268		CLASS 319		14 R	4,423,410
255	4,422,525	659	4,422,941	3.13	4,422,601	CLASS 269		CLASS 320		15	4,423,411
		659	4,422,942	102 R	4,422,602	CLASS 270		CLASS 321		74 R	4,423,412
36	4,422,526	716	4,422,943	110 B	4,422,603	CLASS 271		CLASS 322		91 R	4,423,413
92	4,422,527	736	4,422,944	203	4,422,604	CLASS 272		CLASS 323		103 M	4,423,414
145	4,422,528	777	4,422,945		4,422,605	CLASS 273		CLASS 324		107	4,423,415
			4,422,946		4,422,606	CLASS 274		CLASS 325		176 MF	4,423,416
15 R	4,422,529	15	4,422,554	CLASS 248		CLASS 275		CLASS 326		177 MP	4,423,417
CLASS 185		74	4,422,555	1	4,422,607	CLASS 276		CLASS 327		223 S	Re.31,472
29	4,422,530	119	4,422,556	205 A	4,422,608	CLASS 277		CLASS 328		252 R	4,422,711
CLASS 187		62 R	4,422,557	311.2	4,422,610	CLASS 278		CLASS 329		255 R	4,422,712
20	4,422,531	62 R	4,422,558	421	4,422,611	CLASS 279		CLASS 330		347 DA	4,423,409
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47	4,422,532	69	4,423,302	473	4,422,613	CLASS 281		CLASS 332		525	4,423,411
71.4	4,422,533	121 EU	4,423,303	475 R	4,422,614	CLASS 282		CLASS 333		629	4,423,412
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		121 PM	4,423,304	CLASS 249		CLASS 284		CLASS 335		825.03	4,423,414
3.28	4,422,535	137.9	4,423,305	19	4,422,617	CLASS 285		CLASS 336		825.07	4,423,415
3.57	4,422,536	202	4,423,306	229	4,423,322	CLASS 286		CLASS 337		825.52	4,423,416
45	4,422,537	202	4,423,307	229	4,423,323	CLASS 287		CLASS 338		870.37	4,423,417
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107 C	4,422,539	270	4,423,309	281	4,423,325	CLASS 289		CLASS 340		111.81	4,423,355
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		306	4,423,311	339	4,423,327	CLASS 291		CLASS 342		307	4,423,357
CLASS 196		388	4,423,312	358.1	4,423,328	CLASS 292		CLASS 343		371	4,423,358
14.52	4,422,901			374	4,423,329	CLASS 293		CLASS 344		6	4,423,359
CLASS 198		1.5	4,422,558	551	4,423,330	CLASS 294		CLASS 345		85	4,423,360
627	4,422,541	306	4,422,559	572	4,423,331	CLASS 295		CLASS 346		135	4,423,361
735	4,422,542	377	4,422,560	CLASS 251		CLASS 296		CLASS 347		139	4,423,362
782	4,422,543	461	4,422,561	58	4,422,618	CLASS 297		CLASS 348		375	4,423,363
838	4,422,544			130	4,422,619	CLASS 298		CLASS 349		440	4,423,364
		CLASS 200		4,422,562		CLASS 299		CLASS 350		561	4,423,365
5 A	4,423,294	55	4,422,563	4,422,563		CLASS 300		CLASS 351		696	4,423,366
61.27	4,423,295	153	4,422,564	8.5 C	4,422,947	CLASS 301		CLASS 352		803	4,423,367
61.54	4,423,297	99	4,422,565	8.5 LC	4,422,948	CLASS 302		CLASS 353			
67 A	4,423,296			8.8	4,422,949	CLASS 303		CLASS 354			
144 AP	4,423,298			186.38	4,422,950	CLASS 304		CLASS 355			
339	4,423,300			299.63	4,422,951	CLASS 305		CLASS 356			
		CLASS 201		392	4,422,952	CLASS 306		CLASS 357			
14	4,422,902	191	4,422,566	392	4,422,953	CLASS 307		CLASS 358			
CLASS 203		19	4,422,567	578	4,422,954	CLASS 308		CLASS 359			
19	4,422,903			583	4,422,955	CLASS 309		CLASS 360			
CLASS 204		111	4,422,568	628	4,422,956	CLASS 310		CLASS 361			
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95	4,422,909			25	4,422,622	CLASS 316		CLASS 367			
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					4,422,992	CLASS 354		CLASS 405			
					4,422,993	CLASS 355		CLASS 406			
					4,422,994	CLASS 356		CLASS 407			
					4,422,995	CLASS 357		CLASS 408			
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28 271,920	14 271,936	78 271,952	35 271,968	27 271,984	272,000
95 271,921	25 271,937	143 271,953	37 271,969	27 271,985	272,001
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4,422,609	4,423,050	4,422,209	4,422,908	4,422,705	4,422,656
4,422,249	4,423,057	4,422,253	4,422,992	4,422,771	4,422,852
4,422,624	4,423,068	4,422,344	4,423,135	4,422,829	4,423,151
4,422,883	4,423,079	4,422,356	4,423,248	4,422,886	4,423,072
4,423,286	4,423,088	4,422,364	4,422,468	4,422,944	4,423,201
4,423,335	4,423,137	4,422,377	4,422,236	4,422,956	4,422,218
4,423,339	4,423,143	4,422,440	4,422,258	4,422,959	4,422,400
4,423,369	4,423,145	4,422,445	4,422,273	4,422,967	4,422,429
4,423,384	4,423,149	4,422,456	4,422,313	4,423,005	4,422,503
4,423,398	4,423,191	4,422,489	4,422,435	4,423,006	4,422,799
4,423,409	4,423,237	4,422,619	4,422,460	4,423,019	4,422,900
4,423,469	4,423,260	4,422,639	4,422,493	4,423,069	4,422,929
4,422,183	4,423,268	4,422,703	4,422,540	4,423,096	4,422,975
4,422,192	4,423,269	4,422,721	4,422,600	4,423,117	4,423,025
4,422,241	4,423,287	4,422,755	4,422,610	4,423,150	4,423,025
4,422,251	4,423,324	4,422,768	4,422,637	4,423,173	4,423,198
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4,422,272	4,423,383	4,422,784	4,422,824	4,423,251	4,422,208
4,422,279	4,423,392	4,422,806	4,422,827	4,423,251	4,422,223
4,422,306	4,423,407	4,422,809	4,422,877	4,423,279	4,422,330
4,422,328	4,423,414	4,422,822	4,422,877	4,423,292	4,422,471
4,422,360	4,423,482	4,422,851	4,423,015	4,423,366	4,422,515
4,422,399	4,423,489	4,422,851	4,423,018	4,423,379	4,422,543
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4,422,409	4,423,503	4,422,990	4,423,320	4,423,422	4,422,620
4,422,438	4,423,529	4,422,998	4,423,390	4,422,293	4,422,638
4,422,524	4,423,538	4,422,998	4,423,416	4,422,335	4,422,646
4,422,554	4,423,544	4,423,254	4,423,468	4,422,422	4,422,658
4,422,574	4,423,554	4,423,283	4,423,488	4,422,494	4,422,760
4,422,660	4,423,574	4,423,300	4,422,235	4,422,496	4,422,855
4,422,663	4,423,647	4,423,388	4,422,283	4,422,557	4,422,880
4,422,677	4,423,666	4,423,418	4,422,914	4,422,587	4,423,076
4,422,713	4,423,688	4,423,448	4,423,103	4,422,710	4,423,393
4,422,720	4,423,698	4,423,450	4,423,385	4,422,787	4,422,217
4,422,732	4,423,748	4,423,467	4,423,477	4,422,793	4,422,237
4,422,757	4,423,789	4,423,490	4,423,415	4,423,049	4,422,240
4,422,758	4,423,803	4,422,418	4,422,390	4,423,065	4,422,244
4,422,792	4,423,804	4,422,544	4,422,206	4,423,148	4,422,269
4,422,803	4,423,805	4,422,552	4,422,266	4,423,399	4,422,287
4,422,804	4,423,812	4,422,552	4,422,311	4,422,199	4,422,393
4,422,805	4,423,819	4,422,648	4,422,316	4,422,341	4,422,583
4,422,844	4,423,820	4,422,725	4,422,354	4,422,345	4,422,615
4,422,860	4,423,832	4,422,819	4,422,355	4,422,348	4,422,679
4,422,869	4,423,832	4,422,819	4,422,387	4,422,463	4,422,811
4,422,888	4,423,832	4,422,819	4,422,430	4,422,469	4,422,861
4,422,904	4,423,832	4,422,819	4,422,536	4,422,562	4,422,911
4,422,968	4,423,832	4,422,819	4,422,559	4,422,562	4,422,964
4,422,970	4,423,832	4,422,819	4,422,596	4,422,596	4,423,004
4,422,982	4,423,832	4,422,819	4,422,613	4,422,613	4,423,037
4,423,027	4,423,832	4,422,819	4,422,629	4,422,629	4,423,124
		10 : 4,422,451	4,422,642	4,422,642	4,423,221
			4,422,644	4,422,644	4,423,311



## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,423,343	4,422,850	35 :	4,422,254	4,422,814	4,422,636	4,422,928
4,423,371	4,422,931	36 :	4,422,193	4,422,979	4,422,640	4,422,939
4,423,408	4,423,139		4,422,195	4,422,991	4,422,652	4,422,947
4,423,410	4,423,162		4,422,203	4,423,245	4,422,674	4,422,948
4,423,412	4,423,197		4,422,212	4,423,375	4,422,709	4,422,983
4,423,419	4,423,325		4,422,245	Re.31,476	4,422,711	4,422,984
4,423,421	4,423,336		4,422,250	4,422,238	4,422,715	4,423,153
4,423,483	4,423,364		4,422,264	4,422,303	4,422,765	4,423,170
4,423,519	4,423,425		4,422,288	4,422,336	4,422,766	4,423,249
Re.31,472	4,423,456		4,422,302	4,422,358	4,422,783	4,423,256
4,422,184	4,423,479		4,422,386	4,422,384	4,422,810	4,423,276
4,422,196	18 : 4,422,512		4,422,424	4,422,439	4,422,859	4,423,277
4,422,201	19 : 4,422,243		4,422,433	4,422,472	4,422,868	4,423,340
4,422,242	4,422,262		4,422,458	4,422,495	4,422,891	4,423,377
4,422,247	4,422,275		4,422,545	4,422,582	4,422,927	4,423,435
4,422,276	4,422,443		4,422,586	4,422,630	4,422,941	4,423,473
4,422,290	4,422,473		4,422,588	4,422,676	4,422,943	4,423,567
4,422,322	4,422,483		4,422,595	4,422,726	4,422,965	4,423,578
4,422,359	4,422,532		4,422,634	4,422,753	4,422,994	4,423,606
4,422,372	4,422,622		4,422,649	4,422,761	4,423,008	4,423,906
4,422,420	4,422,865		4,422,684	4,422,782	4,423,063	4,422,962
4,422,474	4,422,953		4,422,685	4,422,847	4,423,077	4,423,100
4,422,475	4,423,178		4,422,738	4,422,882	4,423,160	4,422,274
4,422,518	30 : 4,422,446		4,422,764	4,422,885	4,423,163	4,422,509
4,422,522	31 : 4,422,185		4,422,773	4,422,903	4,423,165	4,422,633
4,422,527	4,422,514		4,422,785	4,422,915	4,423,166	4,422,813
4,422,535	4,422,942		4,422,820	4,422,980	4,423,167	4,422,825
4,422,553	4,423,035		4,422,836	4,422,988	4,423,168	4,422,954
4,422,570	4,422,432		4,422,849	4,423,014	4,423,169	4,423,236
4,422,592	4,422,796		4,422,872	4,423,020	4,423,182	4,423,362
4,422,645	4,423,011		4,422,896	4,423,023	4,423,199	4,423,363
4,422,653	4,422,197		4,422,909	4,423,029	4,423,241	4,423,444
4,422,686	4,422,232		4,422,920	4,423,106	4,423,253	4,422,228
4,422,687	4,422,781		4,422,957	4,423,116	4,423,257	4,422,366
4,422,690	4,423,516		4,422,963	4,423,161	4,423,284	4,422,517
4,422,692	4,422,395		4,422,972	4,423,183	4,423,294	4,422,565
4,422,700	4,422,396		4,423,046	4,423,193	4,423,301	4,422,581
4,422,770	4,422,459		4,423,051	4,423,224	4,423,381	4,422,598
4,422,774	4,422,617		4,423,082	4,423,284	4,423,382	4,422,815
4,422,817	4,422,817		4,423,083	4,423,294	4,423,486	4,423,024
4,422,834	4,422,728		4,423,087	4,423,301	4,422,317	4,423,299
4,422,913	4,422,892		4,423,099	4,423,381	4,422,506	4,423,484
4,422,916	4,422,898		4,423,111	4,423,382	4,422,594	4,423,511
4,422,940	4,422,940		4,423,122	4,423,486	4,422,606	4,422,485
4,422,997	4,422,926		4,423,126	4,422,317	4,422,862	4,422,556
4,423,090	4,422,966	40 :	4,423,131	4,422,506	4,423,159	4,422,706
4,423,094	4,422,977		4,423,136	4,422,794	4,422,257	4,422,812
4,423,095	4,423,001		4,423,138	4,422,447	4,422,447	4,422,870
4,423,108	4,423,017		4,423,140	4,422,455	4,422,455	4,422,937
4,423,119	4,423,021		4,423,141	4,422,492	4,422,492	4,423,064
4,423,121	4,423,022		4,423,154	4,422,608	4,422,608	4,423,186
4,423,144	4,423,026		4,423,176	4,422,635	4,422,635	4,422,202
4,423,146	4,423,041		4,423,188	4,422,833	4,422,833	4,422,286
4,423,171	4,423,055		4,423,189	4,423,036	4,423,036	4,422,319
4,423,180	4,423,062		4,423,203	4,423,270	4,423,270	4,422,434
4,423,205	4,423,080		4,423,207	4,422,436	4,422,436	4,422,551
4,423,206	4,423,085		4,423,234	4,422,487	4,422,487	4,422,564
4,423,212	4,423,125		4,423,240	4,422,528	4,422,528	4,422,585
4,423,222	4,423,155		4,423,255	4,422,767	4,422,767	4,422,657
4,423,223	4,423,179		4,423,328	4,423,337	4,423,337	4,422,789
4,423,228	4,423,184		4,423,338	4,423,401	4,423,401	4,422,831
4,423,229	4,423,202		4,423,365	Re.31,471	4,422,504	4,422,996
4,423,230	4,423,209		4,423,373	4,422,219	4,422,505	4,423,310
4,423,262	4,423,211		4,423,376	4,422,234	4,422,507	4,423,322
4,423,309	4,423,265		4,423,380	4,422,255	4,422,508	4,423,334
4,423,332	4,423,266		4,423,442	4,422,277	4,422,571	4,423,344
4,423,451	4,423,272		4,423,463	4,422,281	4,422,571	4,423,378
4,423,460	4,423,274		4,423,478	4,422,324	4,422,621	4,423,404
4,422,191	4,423,280		4,423,494	4,422,325	4,422,667	4,423,458
4,422,413	4,423,296		4,423,501	4,422,328	4,422,704	4,423,459
4,422,437	4,423,321	37 :	Re.31,478	4,422,333	4,422,723	4,423,461
4,422,452	4,423,330		4,422,200	4,422,342	4,422,786	
4,422,625	4,423,374		4,422,226	4,422,374	4,422,800	
4,422,643	4,423,427		4,422,307	4,422,375	4,422,802	
4,422,702	4,423,432		4,422,454	4,422,381	4,422,818	
4,422,745	4,423,481		4,422,590	4,422,411	4,422,828	
4,422,759	4,423,500		4,422,665	4,422,549	4,422,830	
				4,422,568	4,422,835	
				4,422,614	4,422,925	

## DESIGN PATENTS

01 : 271,978	17 : 271,983	20 : 271,953	36 : 271,972	37 : 271,977	46 : 271,958
06 : 271,918	271,991	271,976	271,926	271,979	271,959
271,949	271,927	271,938	271,929	271,940	271,960
271,967	271,943	271,985	271,930	271,975	271,961
271,995	271,951	271,986	271,931	271,920	271,950
272,008	271,963	271,993	271,933	271,936	271,935
09 : 271,994	271,966	271,947	271,934	271,945	271,939
12 : 271,980	271,969	271,981	271,952	271,984	272,004
13 : 271,917	271,973	271,919	271,965	271,923	271,941
271,944	271,987	271,964	271,968	271,957	271,925
271,982	18 : 271,937	271,971			

## PLANT PATENTS

06 : 5,166	5,167	25 : 5,164			
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